MAY 1997

Bee Culture

1996 U.S. Honey Imports ... 13
An analysis of How Much and Why.

Pollinating with Singles 21
Check out the advantages.

Races Of Bees 32
Which is best for your area?

What To Do With Swarms .. 38
Once they're home, what's next?

Honey Stand Sales 47
Sell more than you thought possible!

The Inner Cover 6
You need to heed copyrights.

May Honey Report 9
Check out our U.S. colony health survey.

Bottom Board Bio 64
Anna B. Comstock, and her book.

Mentor 19
From Mark Winston.

Making Nucs 51
Richard Taylor makes 3 frame nucs.

Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

MAY 1997 VOLUME 125 NUMBER 5

FEATURES

U.S. HONEY IMPORTS 13

An analysis of the U.S. Honey Import picture from 1996. A Bee Culture *exclusive.*

by Kim Flottum

CUKES POLLINATED WITH SINGLES 21

There are advantages to pollinating with singles rather than doubles, and it isn't only the weight.

by Michael Meyer

ISLAND ODYSSEY 25

Santa Cruz Island offers a variety of exciting experiences, not the least is Adrian Wenner and his bee projects.

by Joe Traynor

BLUE RIBBON SECTIONS 30

After three-quarters of a century raising bees, and comb honey, Stanley Weiser has a few words of wisdom, and a lot of experience to share.

by Richard Trump

EXPLORING RACES OF BEES 32

Each race, and each hybrid has its own unique set of characteristics. Knowing these will help you pick the best bee there is, for your location.

by Linda Batt

HONEY BEE TEMPERAMENT 35

An ornery colony not only makes beekeeping less enjoyable, it can pose a serious threat to anybody, or anything near by.

by Mark Headings

WHAT WILL YOU DO WITH ALL THOSE SWARMS 38

No matter what we do, sometimes colonies swarm. Now, what do we do with them?

by Richard Bonney

COVER

Pollination colonies sitting near a vegetable field in Northwest Ohio.

photo by Kim Flottum

BUILD, & USE THIS HONEY BEE VACUUM 41

Owning a vacuuming system can be a real advantage if you remove bees or collect swarms. This one works well and is easy to make.

by James E. Tew

VIPER'S BUGLOSS 44

Viper's Bugloss was once a sought after honey plant. Today, you'll seldom see it except in old-fashioned gardens.

by B.A. Stringer

FROM THE LAND OF MILK & HONEY 45

Mixing cows and bees may sound odd, but this farmer profits from both the milk and honey produced.

by Pam Moore

ROYAL HANDSHAKE 46

County Fairs are a bit different in the U.K.

by Brian Sherriff

HONEY STAND SALES 47

A strategically placed, and attractive honey stand can dramatically increase your sales!

by Beverly Stanier

DEPARTMENTS

THE INNER COVER 6
You need to heed copyrights.
by Kim Flottum

MAILBOX 9
Stop The World; Using Approved Products; A Scientist Speaks Up; ETO Problems.

MAY HONEY REPORT 12
(Field Reporters)

QUESTIONS & ANSWERS 54
Shook Swarm Problems; Drawing Foundation; Requeening With Nucs.
by Richard Taylor

GLEANINGS 57
Doans Honored; Honey Board News; Bee Labs Evaluated; CA Awards.

CLASSIFIED ADS 61
Bargain Pages

BOTTOM BOARD BIOGRAPHY 64
Anna B. Comstock

Anna B. Comstock

This symbol indicates this article is available for reading or copying on our Web Page. Check out Bee Culture's Brand New Web Page at www.airoot.com

COLUMNS

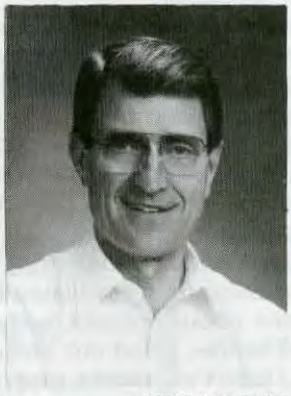
RESEARCH REVIEW 14
Pollination Press; AHB Nucs; and Hot Plants
by Roger Morse

DO YOU KNOW? 17
What do you know about queen biology?
by Clarence Collison

MENTOR 19
You can change a person's life by being a good boss, teacher, or beekeeper.
by Mark Winston

HOME HARMONY 48
Quick breads.
by Ann Harman

BEE TALK 51
Making nucs solves several problems, and it's easy to do.
by Richard Taylor



JOHN ROOT
Publisher

KIM FLOTTUM
Editor

Bee Culture is Printed on Recycled Paper

INNER COVER

I have, over the years, given a score of workshops on how to improve your newsletter. I've made it a point to further my education along this line, got my start in this business because of a Newsletter I was writing at the time, and have edited, written, produced, published and paid for several over these same years. I feel pretty well grounded in Newsletters. If you've read one I was involved in you already have an opinion. If you haven't, take my word for it.

One thing I stress, to Editors starting out, is to use good information that's already been published. Most Editors start their jobs with something like the following...

"I want to thank the members for entrusting me with the position of Editor. Remember, this is your newsletter, so we encourage contributions, letters, articles..."

Those contributions are, usually, few and far between. Maybe none. So, to both give members something for their money, and to fill space, Editors occasionally rely on already-published articles, charts, stories and the like.

In my workshops I encourage Editors to give their readers good, solid information - and, that information sometimes comes from the Bee Journals. I do, however, strongly insist that the Journal be contacted and permission granted to reprint all, or even part of an article, before it is published.

Let me tell you about Copyrights, and problems regarding this tool. Publishers, artists, writers, musicians and other creative types have copyright laws to protect themselves from everything from good-natured, well-meaning borrowing, to outright theft.

People who produce "Intellectual Property" are, or would be at the mercy of anyone and everyone who took their work and claimed it as their own, and changed it, sold it or gave it away, if it were not for these copyright laws restricting that behavior.

This magazine "Copyrights" everything you read on these pages. From the cover photo, articles, photos, to this editorial. We pay for this protection. And, if it's violated knowingly and blatently we can, and will seek damages. We have in the past, and will do so in the future if we feel it necessary.

Plain and simple. You can't copy or reprint anything published in this magazine without paying, or getting prior permission to do so. If you copy, photocopy, scan, reprint or in any way reproduce anything here without due process, you are in violation of the copyright laws. You have, in essence, stolen something that is not yours, and distributed it without permission of the copyright holder.

If this was the *New Yorker*, and you lifted an article by John Updike and reprinted it in your newsletter or magazine, you would have more lawyers on your front lawn than bees at a birdbath in August. It would be costly, and uncomfortable.

We are not the *New Yorker*. And, as I said earlier, I encourage using information already published. But ask first. Call, write, fax, or email and ask. Most often that permission is gladly and freely given. But, sometimes it can't be given. Some authors protect their work, and don't let it go, at least without something in return.

But I will be unhappy, very unhappy, if you blatantly copy something, written by myself, or one of our authors, and publish it in your newsletter. Providing, of course, I find out about it. Not getting caught doesn't mean you didn't violate the copyright, though.

This entire mess also applies to web pages, which is what started all this, really, a month or so ago. You cannot copy or reprint all or part of a copyrighted article, photo or other material onto a web page anymore than a newsletter or other distribution vehicle. You can't do it. The laws protect those who create these articles or photos or whatever from those who feel they can take them and call them their own. Of course the permission thing works here, too. You want it - ask. Maybe you can have it. Maybe not.

In either case, if you copy something from my magazine without permission you've violated a trust between 'maker' and 'user'.

Lesson here? Ask first. Then give credit where credit is due. It's only fair. And it's the law.

•

In case you were wondering, there isn't the regular piece on the history of *Gleanings* this month. Working on it though, and it'll be back next month.

Just in case you wondered.

Kim Flottum

You Need To Heed Copyrights.

Reader Assistance

To subscribe to *Bee Culture* remove or copy the form below, fill it in and return it and your remittance to the address at the bottom. Please allow 3 - 5 weeks for your first copy to arrive. And Thank You!

☐ Please Renew ☐ New Subscription ☐ Send Sample

☐ 2 Years (24 issues) - $33.00 ☐ 1 Year (12 issues) - $17.00

☐ 2 Years (Foreign) - $50.00 ☐ 1 Year (Foreign) -$27.00

Airmail on Foreign Subscriptions Available on Request. Find my enclosed check, or charge to my Credit Card. Call for information on back-dated subscriptions.

Name _____

Address _____

City _____ State _____ Zip _____

Phone # _____

Please check one.

☐ Visa ☐ MasterCard ☐ Discover

Expiration Date

ADDRESS CHANGE

If you are moving, please fill in the form below so we can process the change without undue delay. Also, if you have 2 addresses during the year (i.e., winters in Florida and summers in Connecticut), let us know which months you spend where and we can pre-program your address change so you will find us waiting when you move – No Delays, No Fuss!

FOR PERMANENT CHANGE:

Name: _____

Old Address: Street _____

City _____ State _____ Zip _____

New Address: Street _____

City _____ State _____ Zip _____

FOR TEMPORARY CHANGE:

Name: _____

Address No. 1: Street _____

City _____ State _____ Zip _____

Circle Appropriate Months: J F M A M J J A S O N D

Address No. 2: Street _____

City _____ State _____ Zip _____

Circle Appropriate Months: J F M A M J J A S O N D

Send to: The A.I. Root Co., 623 W. Liberty St., Medina, OH 44256

Bee Culture is available on microfilm from: University Microfilms, Inc., 300 N. Zeeb Rd., Ann Arbor, MI 48103

Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

Publisher . . . . . **John Root**

Associate Publisher . . . . . **Robert Stanners**

Editor . . . . . **Kim Flottum**

Production Coordinator . . . . . **Kathy Summers**

Photo Reproduction . . **Moonlight Graphics**

Circulation & Advertising . . . . . **Dawn Feagan**

Publications Assistant . . . . . **Mary Weigley**

Contributors . . . . . **Richard Bonney, Roger Morse, Richard Taylor, Mark Winston, Clarence Collison, Ann Harman, B.A. Stringer, James E. Tew**

Subscription Information

United States, one year, $17.00; two years, $33.00. Newsstand price: $2.50. All other countries, (U.S. Currency only), $9.50 per year additional for postage. Send remittance by money order, bank draft, express money order, or check or credit card. Bee Culture (ISSN 1071-3190), Volume 125, Issue 5, is published monthly by The A.I. Root Co., 623 W. Liberty Street, Medina, OH 44256. Periodicals Postage Paid at Medina, OH and additional mailing offices. POSTMASTER: Send address changes to BEE CULTURE, The A.I. Root Co.,623 W. Liberty St., Medina, OH 4256

Advertising

For information on placing display advertisements, contact Dawn Feagan in our Advertising Dept. 1-800-289-7668. Ext. 3220

Circulation Figures reviewed monthly by Ernst & Young Accounting Firm, and are available on request.

MAILBOX

KEEP IN TOUCH

Write: Editor, 623 W. Liberty St., Medina, OH 44256
FAX: 330-725-5624
EMAIL: BCULTURE@AOL.COM

New Members Help

I am writing to thank you for your excellent magazine – *Bee Culture* – and in particular *INNER COVER*. My association subscribes to your magazine and I have the good luck to collect the mail so have the first read!

I was more than just interested in the October and November issues. Namely, *Newsletters* in October and *Keeping New Members* in the November issue. As President of our club I am constantly saying to my committee "Are we doing enough for all members? Are new members being looked after? What more can we do, etc. etc.?" Members are, after all, a club's greatest asset. One has to work hard to keep them. One can never sit back and say – well, that's it!

Our members receive an envelope on joining with much information – i.e. 'Kit.'

At our recent committee meeting it was decided new members who do not own a hive be offered a hive, say a five-frame nuc, or single deck eight-frame. They pay a deposit and MUST come to our monthly Field Days and learn to look after it. They will be given tuition by the Apiary Officer or an experienced member. After a year they pay the balance owing and take it home as a two-deck hive. We will trial this and see how it goes.

Sue Ellison
Lower Mangrove, Australia

Stop The World

I disagree with your "Inner Cover" (March 97) that the future of beekeeping is in CA. Most of your readers are hobbyists with a few hives in their back yard or sideliners like me with maybe 50 or a couple hundred hives near home. We take great joy in puttering in our beeyards and our honey houses, reading about bees, perfecting our craft, swapping experiences at bee meetings, entering honey shows, and making a little money on the side. I've known commercial beekeepers who haven't read a bee journal or bee book in years, whose beekeeping consists of carting supers to their distant apiaries in the Spring and carting them to the honey house in the Fall, meanwhile loading and unloading bees here and there for pollination fees. They spin out their honey crops with big and expensive machines then cart it off in drums to get what they can for it. It has always looked to me like a hard way to make a living, and by the time they are too old for the heavy work, and with piles of equipment stacked around, they are likely to have no sons with the strength and interest to take over.

Africanized bees are already in the southeastern corner of CA, and yesterday I read that 10 to 20,000 colonies of bees have been lost to flooding. A friend moved from OH to CA and found the beekeepers' meeting so dreary he stopped going. They don't talk about bees; just honey prices, pollination fees, pesticides, etc.

The best places for beekeeping, in my experience, are MA (a mostly marginal area) and OH. That's where the truly fine beekeepers live, where enthusiasm is always high, and where beekeeping is rewarded in the ways that ultimately count. If, as you suggest, the future is CA, then stop the world, I want to get off.

Richard Taylor
Interlaken, NY

•

I enjoyed, sort of, your March editorial with its allusion to Lincoln Steffens' famous quote on being asked if he had been to Russia, "I have been over into the future, and it works." The time was 1931; it doesn't look now as if worked very well.

Neither does the CA of the future, as the population is headed toward 50 or 60 million or more. How much agricultural land will remain? Will urban uses have coopted the water that might otherwise go through those almond groves? And with the changes in its racial and ethnic composition, its chances of becoming a cultural and political battleground are excellent. On the other hand, maybe that **is** the future. I certainly hope not.

Your editorial indicates that Africanized genes (AHB), while a threat in the southern U.S. are not a threat in CA. If that has been covered in *Bee Culture*, I missed it. Could you cite me an article where I could read up on this?

Your journal is one of my favorites, just as beekeeping is one of my favorite activities. I've been at it for 40 years.

John H. Tanton, M.D.
Petoskey, MI

Choices

Because of diminishing hive numbers, and increased honey prices, commercial beekeepers now have the volition of not subjecting themselves to the volatile business of pollination in the Pacific Northwest, where they are subjected to low profit returns, heavy pesticides(s) damage, transportation costs and damage, theft, the local bureaucracy's harassments threatening hive confiscations, and a life away from home. It is now a suppliers market!

Quoting Jan Wong, "In Chinese, the word for crisis is wei ji, composed of the character wei, which means danger, and ji, which means opportunity.

Chester Ferguson, Jr.
Yakima, WA

Uses Approved Products

This is in response to a letter in March's edition which was highly critical of researcher's views toward unregistered miticides. As a hobbyist beekeeper for over 20 years, lost the last of my four

Continued on Next Page

MAILBOX

remaining colonies to the mites this past Fall and early Winter.

I used Apistan and Mite-A-Thol in 1995 with success. Last Summer I tried one of the unregistered miticides with the loss of my four colonies. One of the colonies was heavily infected and it's demise was expected. The strongest colony when treatment began had 15 to 20 pounds of bees. The treatment was applied as directed and if there was an error, that occurred by application of the product more often than recommended. Although I agree researchers probably slant recommendations toward registered miticides but these products have proven to kill mites. As with the unregistered product, it is the user which places faith with the manufacture. In my case, the product did not produce the desired results – protection of the bees from the mites. As for the premise of the author that we'll be fleeced by the researchers; in my case I feel that has already occurred. Any research requires that repeatable data or results are obtainable. The results with the unregistered miticide which I tried would not enhance any data but refute the premise that the product would effectively control mites. As for waiting for CURES, instead of address the natural healing techniques, the natural cure for which I utilized; failed with a "F."

I plan on obtaining new packages this Spring, but the use of Apistan and Mite-A-Thol will be paramount in my protection against the mites until a non-toxic product has been proven to be effective. I believe beekeepers would prefer to use effective non-toxic methods and if a product is developed and proven I will switch from using chemicals. Until then, I will rely on proven methods.

Vernon C. Burch
Bloomfield, IN

A Scientist Speaks Up

I've read various responses and scientist bashing sent to *Bee Culture* the last few months, and feel obliged to comment.

Several years ago Dr. E.R. Jaycox wrote about a paradigm shift in the thinking of beekeepers regarding pesticides – and yes oils added to a colony to control mites are pesticides! Years ago the cry from beekeepers was agriculturists were killing bees with "indiscriminate" use of pesticides. If beekeepers didn't want pesticides banned altogether they certainly wanted them regulated so it would be difficult to ever again kill bees.

Then came the mites and beekeepers were willing to throw almost anything into their colonies if it was first of all cheap and then some beekeeper said it had "saved" his bees. These same beekeepers would yell foul if a farmer in their neighborhood decided to use Penncap-M on his blooming alfalfa (name your favorite crop) because a farmer friend said it would kill those nasty insects.

I personally don't think we can have it both ways. We need to abide by the same laws we expect the users of those "bad" pesticides to follow. Thus, either we get good data on efficacy and residues in

MAILBOX

honey for any chemicals we might put there, or we will be out of the honey marketing game. The first hint of contamination of any substance, no matter how benign we think the chemical is, will put us out of business for a long time.

Roger Hoopingarner
Dept. of Ent. MI State Univ.

Fancy Vs Fact

Johansson's bee "language" letter in the January issue, a retort to Wenner's October contribution, contains seemingly fanciful distortions of fact. As Thoreau wrote in 1854 (*Economy*), "it is characteristic of wisdom not to do desperate things." Perhaps Johansson could have benefitted from that philosophy. With that in mind, consider the following comparisons of fancy vs. fact:

1) Fancy – Johansson wrote: "John Eckert would be surprised to learn his landmark studies may not be considered experiments."

Fact – Actually, Wenner had written: "Johansson failed to provide readers with a balanced account of the excellent results published by John Eckert in the early 1930s." Wenner's remark was directed toward Johannson, not Eckert!

2) Fancy – Johansson wrote: "Wenner and Wells don't believe animals capable of communication ... (*Anatomy* p.67) but I'm surrounded by chickens, turkeys and dogs that obviously communicate."

Fact: Johansson has substituted the word "communication" where we used "language." Neither in *Anatomy of a Controversy* (Columbia U. press, 1990), nor anywhere else in our writings, do we question the truism of *nonlinguistic* animal communication. Johansson, in apparent desperation, twisted the meaning of one sentence on p. 67 to suit his purpose.

3) Fancy – Johansson wrote: "... results of the crucial two-hive experiment reported in Anatomy pp 136-138, Fig. 8.3 could be reinterpreted."

Fact: Johansson confused an incidental observation reported in our Chapter 8 (an anecdote) with the double-controlled experiments described in Chap. 9 and the "crucial experiments" detailed in our Chapter 10. A "crucial experiment," is one in which the predictions of one hypothesis are pitted against those of another (if results support one hypotheses, they refute the other). In this case, results verified an odor theory while refuting language.

To Thoreau, Johansson's tactics would seem more desperate than wise. We are reminded of last year's televised "trial of the century," when lawyers invented fanciful scenarios about marginal issues in the hope of neutralizing large bodies of unwelcome factual evidence. However fashionable that may be in criminal law, it is counterproductive in science.

Patrick H. Wells
Los Angeles, CA

Bananas & Bees

I just read Mark Winston's article on Consulting, in the March issue of *Bee Culture*, and his comments on bananas bring to mind a brief and informal experiment I performed some years ago.

Dr. Winston refers to the bees supposed antipathy to bananas, caused by the iso-pentyl acetate in the fruit. I heard of this and decided to test my bees. I took a banana, and standing within three feet of a hive I peeled and ate the banana. Then I placed the peel on the entrance board. The bees ignored me, the banana, and the peel. I was disappointed – sort of.

There was a honey flow on at the time. I've never repeated the experiment, but now that it has come up again, I think I will. Perhaps others will, too.

Richard Bonney
Charlemont, MA

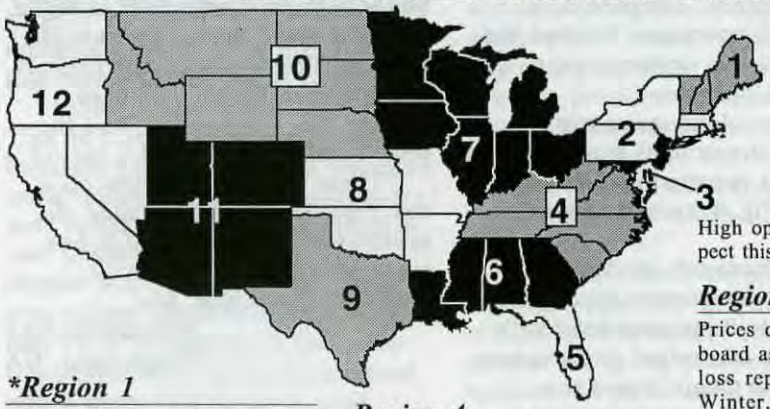
ETO DOA?

The EPA would like to hear from beekeepers, honey producers and pollinators, about the impact of banning ETO as a beekeeping equipment fumigant. If you have had your hives treated with ETO, please write to Mrs. Prunier and explain to her the savings it has meant to you. Include not just the dollar value of the equipment, but an estimate of the time it would take you to assemble equipment, the value of drawn comb, and the difference it makes to your bees whether they start on drawn comb or bare foundation. If you do not live in a state with an ETO chamber and had your equipment destroyed, write to the EPA and document the cost of loss, in the same manner as given above.

The queen is laying. Thoughts of honey flows and hard work are at hand. Please, take a moment to write a short letter to help you beekeeping compatriots. Write to: Vivian Prunier 704-308-8034, Office of Pesticide Programs, 7508 W. US/EPA, 401 M St., S.W., Wash., DC 20460.

David Morris
Laurel, MD

MAY – REGIONAL HONEY PRICE REPORT



*Region 1

Prices easing down a bit as weather warms. Colony conditions indicate Winter losses at about 13%, average ranking causes are mites (36%), unknown (25%), diseases and starvation the rest. Of remaining, 66% strong, 26% average, 9% weak, 1% very weak. 60% believe this is the best Spring in years, 40% about the same as past few years.

Region 2

Prices steady to higher a bit from last month. Colony losses only 7%, and almost all from starvation. 64% strong, 30% average, the remainder will need help. Interestingly, most beekeepers feel this year will be about the same as the last few years.

Region 3

Prices steady to down just a bit. 20-25% Winter loss this Winter, mostly from starvation, some from mites. 70% strong, 25% average, the rest will need help. Most beekeepers feel this year will be like the past few.

Region 4

Prices rock steady. 22% Winter loss on average, with over half lost to mites only 10% to starvation. The rest? Of those left, 70% strong, 20% average, the rest need help. Most feel an average to better year expected, but a few are still in trouble.

Region 5

Prices dropping in some places rapidly, but mixed on what's changing price. Wholesale about the same. About 19% Winter loss, with 30% of those from mites, but over half from unknown causes. 64% strong, 20% average, the rest need help. Most feel this will not be a good year, but a few bright spots in the region.

Region 6

Prices steady, but some commodities are up, others down. Primarily bulk up, retail down. Only 8% Winter loss, of these 43% to mites, 56% to starvation. 64% strong, 23% average, the rest need help. High optimism here, as most expect this to be a great season.

Region 7

Prices dropping a bit across the board as sales slow. 21% Winter loss reported in the region this Winter, with 22% attributed to mites, 35% to starvation, and the rest to queen loss, unknown, or not-even-a-clue. 55% are strong, 33% average, the rest need help. Optimism high here, too, with *nearly* everyone expecting a year better than last.

Region 8

Prices steady to down just a tiny bit in most places. 20% Winter losses reported here, with just over 60% of those lost to mites and 33% to starvation. 65% are now strong, 20% average and the rest need help. Moderately optimistic for this season is the average.

Region 9

Prices rock steady this month. Few Winter losses, (only about 7%), with mites and starvation neck and neck for causes. Over 90% strong, 5% average and some still need help. Cautious is the word about this season.

Region 10

Prices steady, and pretty much unchanged here, but some report they are slowly dropping. Losses still being counted since Spring so erratic, but 15-20% seems to be the norm. Starvation the biggest problem, with mites a far distant second. Cautious optimism this season, with still-high prices, and good moisture.

Region 11

Prices down in seasonal lull, and reduced offerings from packers, we're told. Also, some have been holding out for higher prices, and are now selling. 36% Winter loss this year, due to nearly 80% of those from mites. The rest, mostly to starvation. Over 70% strong, 20% average. Moderate optimism abounds.

Region 12

Prices steady so far, but many question the import problem. Winter losses only 13% this year, with 20% of those to mites, and unknown (queenlessness and pesticides suspected) most of the rest. 61% are strong, 21% average and about 20% need help. Cautious optimism lurking, but not shouting out loud. Wait and see the norm.

**Honey Reporters were surveyed for losses, causes, current conditions and predictions based on their operations. 72 respondents contributed, averaging 266 colonies (range is 4-8,000). All regions represented.*

	Reporting Regions												Summary		History	
	1	2	3	4	5	6	7	8	9	10	11	12			Last	Last
Extracted honey sold bulk to Packers or Processors													Range	Avg.	Month	Yr.
Wholesale Bulk																
60# Light	67.04	71.83	72.12	71.25	54.00	76.50	63.98	78.00	54.00	72.12	78.33	65.33	52.80-95.00	68.57	70.48	50.87
60# Amber	62.85	64.97	68.35	65.15	54.00	62.33	60.86	66.00	51.00	68.35	70.00	62.75	51.00-90.00	64.06	66.08	50.30
55 gal. Light	0.94	1.23	1.01	1.00	0.90	1.03	0.97	1.00	1.05	0.90	0.90	0.92	0.84-1.23	0.97	1.00	0.76
55 gal. Amber	0.88	1.08	0.90	0.93	0.84	0.90	0.94	0.97	1.00	0.90	0.84	0.90	0.65-1.15	0.91	0.93	0.71
Wholesale - Case Lots																
1/2# 24's	29.50	28.98	33.37	30.61	38.00	32.65	27.96	33.37	35.00	33.37	28.75	28.60	17.95-52.00	30.16	31.00	25.03
1# 24's	41.45	41.36	44.88	41.02	42.33	38.45	42.70	40.92	50.00	44.88	47.43	43.33	32.40-60.00	42.23	43.28	35.25
2# 12's	36.30	39.02	36.78	39.51	33.00	38.70	36.75	40.00	37.95	36.78	40.10	35.13	25.00-48.00	37.35	38.64	32.94
12 oz. Plas. 24's	35.02	38.59	33.53	35.93	37.88	33.20	36.09	32.88	38.00	33.53	42.63	30.27	16.56-48.00	36.03	35.29	30.97
5# 6's	37.51	39.84	36.97	43.63	39.00	36.20	37.12	41.50	45.00	36.97	38.95	35.65	24.00-48.00	38.90	**40.60**	**34.84**
Retail Honey Prices																
1/2#	1.75	1.91	2.83	2.17	1.64	1.49	1.73	1.59	2.96	2.83	2.35	1.77	0.95-3.00	1.78	1.88	1.48
12 oz. Plastic	2.17	2.40	2.31	2.29	2.15	2.12	1.92	2.23	2.99	2.31	2.41	2.20	1.44-3.29	2.21	2.23	1.86
1 lb. Glass	2.65	2.78	2.89	2.73	2.64	2.62	2.36	2.75	3.75	2.89	3.01	2.69	2.00-4.00	2.68	2.71	2.20
2 lb. Glass	4.35	4.76	4.62	4.76	3.96	4.35	4.28	4.24	4.75	4.62	4.35	4.29	3.45-6.00	4.42	4.57	3.78
3 lb. Glass	5.77	5.90	6.08	6.12	5.43	6.45	5.69	5.56	6.25	6.08	6.05	5.93	4.50-7.80	5.93	6.19	4.79
4 lb. Glass	6.72	7.08	7.19	7.23	7.50	6.53	8.60	7.19	7.75	7.19	7.19	5.50	5.50-8.95	7.13	7.56	6.12
5 lb. Glass	8.37	8.58	8.46	8.86	7.63	7.70	8.57	9.99	10.00	8.46	9.28	8.18	4.25-12.50	8.63	9.87	7.33
1# Cream	3.18	3.52	3.71	3.53	2.58	3.30	2.70	2.70	6.00	3.71	3.37	3.27	1.89-6.00	3.24	3.45	3.07
1# Comb	4.09	4.43	4.38	3.83	4.00	3.54	3.93	3.87	6.10	4.38	5.98	4.17	1.95-7.00	4.20	4.12	3.70
Round Plastic	3.78	3.60	4.48	3.15	4.48	4.00	3.44	3.75	4.00	4.48	5.75	4.31	2.60-7.00	3.85	3.77	3.23
Wax (Light)	2.87	3.16	3.38	2.20	2.20	3.45	2.65	2.50	4.00	3.38	3.03	3.18	1.25-6.00	2.90	3.07	2.21
Wax (Dark)	2.53	2.71	2.89	1.96	1.75	3.23	2.40	1.80	3.75	2.89	2.75	2.59	1.10-5.00	2.58	2.22	1.80
Poll. Fee/Col.	34.23	38.33	35.03	35.57	23.75	33.75	37.14	35.00	15.10	35.03	45.00	31.20	15.10-55.00	35.00	37.21	32.66

Bee Culture's 1996
U.S. HONEY IMPORTS
An Analysis of How Much & Why

Kim Flottum

In 1996 just over 345 million pounds of honey were used in the United States – 198 million produced here, and 147 million pounds imported. That means 42 percent of the honey consumed here comes from somewhere else. Where that honey comes from, how much it costs, how it compares to last year, and what to expect for next year affect marketing plans for domestic honey producers, packers and users.

Domestic & Import Production & Price

	U.S. Honey produced (million lbs.)	Average $/lb. W	ELA	LA	Other	All	Imported Honey (million lbs.)	Average $/lb. W	ELA	LA	Other	All
1995	210.5	.698	.675	.668	.683	68.5	86.2	53.1	51.1	46.9	57.3	51.7
1996	198.1	.907	.885	.867	.978	89.4	146.8	72.8	68.8	70.0	73.1	71.8

Honey is produced for the express purpose of exporting to the United States in many countries because it is a low tech, small-capitol-investment means to generate U.S. dollars for the local economy. Back in 1995, only 19 countries contributed to the cause, but in 1996

IMPORTS FROM THE FOUR MAJOR COUNTRIES

1995

	WHITE			ELA			LA			OTHER			TOTALS			
	Million lbs.	% of Total	Avg. $/lb.	Million lbs.	% of Total	Avg. $/lb.	Million lbs.	% of Total	Avg. $/lb.	Million lbs.	% of Total	Avg. $/lb.	Million lbs.	% of Total	U.S.$ x Million	Avg. $/lb.
Argentina	19.7	52.2	.474	1.5	10.5	.533	3.6	15.8	.506	2.8	24.5	.570	27.6	32.0	13.5	.491
Canada	12.5	33.0	.606	3.4	23.7	.787	2.5	10.9	.552	6.1	53.4	.574	24.4	28.3	15.1	.618
M China	5.3	14.0	.619	9.1	63.8	.409	12.8	56.1	.440	.9	8.1	.524	28.1	32.6	13.1	.466
Mexico	.2	.6	.593	.3	2.1	.512	3.9	17.6	.475	.9	7.8	.541	5.3	6.2	2.6	.493
Imp. Totals	37.7		.531	14.3		.511	22.8		.469	11.4		.573	86.2	100.0	44.5	.517
U.S. Totals			.698			.675			.668			.683	210.5	100.0	139.8	.685

1996

	WHITE			ELA			LA			OTHER			TOTALS			
	Million lbs.	% of Total	Avg. $/lb.	Million lbs.	% of Total	Avg. $/lb.	Million lbs.	% of Total	Avg. $/lb.	Million lbs.	% of Total	Avg. $/lb.	Million lbs.	% of Total	U.S.$ x Million	Avg. $/lb.
Argentina	44.0	60.8	.740	9.2	37.9	.744	5.6	17.7	.734	9.4	50.3	.740	68.1	46.4	50.4	.740
Canada	5.2	7.2	.905	.2	.1	.920	7.9	25.2	.789	1.3	7.2	.787	14.7	10.0	12.2	.832
M China	19.0	26.2	.671	12.1	50.0	.625	10.3	32.8	.611	1.3	7.2	.661	42.7	29.3	27.5	.643
Mexico	.2	.2	.766	2.3	9.3	.780	5.4	17.4	.716	4.1	21.8	.709	12.0	8.2	8.7	.727
Imp. Totals	72.4		.728	24.4		.688	31.4		.70	18.6		.731	146.8	100	105.4	.718
U.S. Totals			.907			.885			.867			.978	198.1	100	172.1	.894

To read this chart start in the upper left hand corner, reading across. In 1995 Argentina sold 19.7 million lbs. of white honey to the U.S., which represents 52.2% of the white honey sold by the big 4, for an average price of $.474/lb. Read across the same for ELA, LA and Other. When you reach totals, Argentina sold 27.6 million lbs. of all honey to the U.S., for 32% of the Big 4 total, for $13.5 million, at an average price of $.491/lb.

Reading down from upper left corner. Each country's contribution in each category is represented. Next to the bottom, there were 37.7 million lbs. of white honey imported into the U.S. at an average price of $.531/lb. At the same time, the average U.S. price for white honey was $.687.

Roger Morse

Research Review

"The American beekeeping industry has demonstrated that it has tremendous resiliency, especially in the Southern states, where early nectar and pollen flows make it possible to grow honey bees with ease."

There was a disturbing and misleading article about pollination in a recent issue of the *American Fruit Grower,* published by Meister Publishing, in Willoughby, OH. Honey bees are not in "critically short supply" as was stated. Despite the serious bee disease problems we have had in the past 10 years, the 1.1 million colonies of bees needed for the commercial pollination of the food we eat are available and working. Pollination fees have increased slightly in the past year, but this is more in response to a world shortage of honey and rising honey prices than a shortage of bees.

The author of this article suggests that growers should find-quart size cans and fill them with "milkshake-size" paper drinking straws. These should be attached to the south sides of buildings and fence posts. It is written that by making homes available for solitary nesting bees, such as the orchard mason bee, a grower's pollination needs will be met. It is suggested that all that is needed to grow solitary bees is to provide them with a home. Life in the real world is not that simple! The maker of this recommendation obviously never tested the technique himself.

Over the past few decades, I have collected and placed in the Cornell insect collection over 80,000 of these solitary ground- and twig-nesting bees. I have used a number of collecting techniques, including trap nesting. I get a great variety of these species in my trap nests, but I also get wasps and other species that are essentially useless as pollinators. Some of these creatures have no names, and the life histories of most are not known. There are almost no articles on their diseases, pests, and predators. These insects play a role in our lives, but they are not very important insofar as modern commercial agriculture is concerned.

The American beekeeping industry has demonstrated that it has tremendous resiliency, especially in the Southern states, where early nectar and pollen flows make it possible to grow honey bees with ease. We have suffered tremendously from mites, chalkbrood, and a lack of concern on the part of many states over American foulbrood control, but the industry is very much alive and still playing an important role. The greatest change that has taken place in the beekeeping industry in the past 10 years is that beekeepers themselves, not state apiary inspectors, are responsible for the identification and control of honey bee pests, predators, and diseases in many states.

Reference:

O'Dell, C. 1997. *Grow your own disease-resistant pollinators.* American Fruit Grower 117: 24-25.

Living With Africanized Bees

Central America and some of the more southern parts of the United States are now the adopted home of Africanized honey bees. One little problem with these bees is making mating nuclei. It is not possible to make small colonies of only 1,000 to 1,500 bees as it is with European bees because such small colonies of Africanized honey bees will abscond. Experience making over 900 mating nucs in Brazil shows that five frame nucs, including two frames of brood covered with an appropriate number of bees, works best. The author does not mention a number, but by his writing I assume a pound of bees (4,000 to 5,000) would be needed for each colony. The author of the paper below states he has made three-frame nucs, but it is more difficult to do so.

Another feature of Africanized bees that is different is that one cannot mix bees from different colonies to make a nucleus colony. If you do so, the bees will fight. Our queen breeders in the United States routinely mix bees from several colonies to make mating nucs.

References:

Duay, P.R. 1996. *A technique for installing mating nuclei with Africanized honey bees.* Bee World 77: 212-215. 1996.

Hot Plants

There are several plants, especially in the family called the *Araceae,* in which the flowers are warmed by the plant itself. A few of these plants produce as much heat as do some birds and insects while they are in flight. At least three of these plants not only heat up, but they regulate the amount of heat they produce.

Why would the flowers of a plant warm themselves? There are at least three reasons. One is to vaporize an

odor(s) that makes them attractive to pollinating insects and to guide the insects to them. A second reason is that warm flowers may also help to warm insect pollinators during cool weather, and this would help them fly to the next flower. A third reason is that the higher temperature may protect the plant against cold weather and perhaps aid in pollen tube growth.

One of the more common of these heat-producing plants is skunk cabbage. It is reported that it may melt the snow around it. Skunk cabbage is an important pollen plant in the part of world where I live; in fact, it is one of the first pollen sources available in our area in the Spring. It was found by the author of the paper I am reviewing here that at a time when the outside temperature was 68°F, the hooded and protected skunk cabbage flower could be as high as 104°F. Furthermore, the plant held a high temperature for a period of about two weeks while it was in flower.

Not too much is reported about how the plants generate heat, but apparently some use carbohydrate while others burn fat similar to that found in some animals. BC

References:

Seymour, R.S. 1997. *Plants that warm themselves.* Scientific American 76: 104-109.

IMPORTS ... Cont. From Pg. 13

(when the price of honey went up), 29 countries added to the collection.

But several issues cloud this picture. The restriction on imports from mainland China in 1996 due to a trade action changed the way business was done globally, and a world shortage of honey last year skewed the works even more.

There is no way to predict what U.S. honey production will be in 1997, but early indicators point to more bees and more beekeepers concentrating on honey production because of the simple fact that honey is, finally, profitable to produce.

Other early indicators show that, even with the price increases sales have remained steady, or are increasing especially in the industrial and food service areas. And retail sales, though only steady generally, have strengthened in the niche market and specialty arenas.

See chart on page 13 that compares overall 1995 and 1996 honey production, import and price data.

That honey prices increased last year is no surprise. The fact that use increased from 296.2 to 344.9 million pounds and the price increased is pleasantly surprising (a 14 percent increase). And, although there was some initial sticker shock and sales leveled off, they didn't stay there long, and continued to grow. Of course there is still resistance to the higher prices in some localities, and with some of the industrial users who have changed either their formulas, or their products to accommodate using less, or no honey.

Although sales have remained strong, toward the end of last year and early this year there has been a slight decline in prices. This has been due to several factors – somewhat reduced demand for some types of honey; seasonal slow downs; increased imports; and a freeing up of some domestic honey held by beekeepers in anticipation of even higher prices. Too, there have been allegations of Chinese honey entering the U.S. under assumed brands, and at lower than market prices, which, whether true or not has helped hold prices down.

But the biggest factor in both supply and price has been the import picture. The chart on Domestic and Import prices speaks for itself. Import prices are customs-priced at the dock, so for most there are additional freight charges on top. Nevertheless, imported honey is at, or below domestic honey prices.

And, although many countries play this game, there are only four that count: Argentina (Argen.), Canada (Can), Mexico (Mex) and Mainland China (MChin.). This has been true for the past two years, and will probably remain so for the next several years. In 1995 these four countries contributed 99.1% of all imports, in 1996, 93.7%.

Honey is sold in essentially four categories: White; Extra Light Amber; Light Amber; and 'other.' The big chart on page 13 details each country's contribution in each category for '95 and '96. It is revealing.

Argentina, especially took advantage of reduced U.S. and Canadian crops last year, exceeding all others in increase. Mainland China, of course has restrictions on amounts, but, after a slow and regrouping 1995 bounced back.

White honey increased the most, from 37.7 to 72.4 million lbs., while each of the rest went up about 10 million lbs. each.

One other number of note is that although both imported and domestic prices increased significantly, the overall average U.S. price is roughly $.16 above imported average price both years, with the exception of the 'Other' category. This catch-all runs the gamut from fancy, exotic retail, to bulk bakery grade.

Will that difference remain in 1997? Will, as predicted, Argentina become an even stronger, and more aggressive exporter next year?

And what will happen to all prices if both the U.S. and Canada have even an average year, let alone a bumper crop?

Your marketing plan for 1997 hinges on these variables. The difference between a good financial year (regardless of crop production) and a bad one (read debt, bankruptcy and worse), depends on how all these variables shake out, your relationship with a packer, and, sometimes, just good timing. BC

U.S. Honey Production figures supplied by USDA NASS Agr. Statistics Board. Import figures supplied by U.S. Dept. of Commerce, & National honey Market News.

? DO YOU KNOW ?

Queen Biology

Clarence Collison

Regardless of your geographical location, the essence of Spring management is the development of strong productive colonies. Since colony growth and the fate of a colony depends almost exclusively on the queen, it is imperative to have a young vigorous queen present. If you choose not to requeen your colonies on a regular schedule, then the colony will usually replace their queen whenever she begins to fail.

Please take a few minutes and answer the following questions to find out how well you understand honey bee queen biology, management, and related problems.

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

1. ___ The queen lays all of the eggs in a honey bee colony.
2. ___ Egg development within the ovary occurs within tubes called ovarioles and each egg takes approximately seven days to mature before being laid.
3. ___ The surface of the queen's spermatheca is covered in a mass of blood vessels.
4. ___ During egg fertilization, sperm enter the egg through the chorion.
5. ___ Queens are sexually mature when they emerge from their queen cells.
6. ___ Queens normally go on their mating flight in the morning.
7. ___ Queens can be reared at anytime during the brood-rearing season.
8. ___ Queens are capable of laying 2500 eggs per day.
9. ___ Queen honey bees produce three different kinds of eggs which become workers, queens, and drones.
10. ___ Only one queen is ever found in a honey bee colony.

Multiple Choice Questions (1 point each).

11. ___ The queen honey bee has ___ pear-shaped ovaries.
    A. Three
    B. One
    C. Five
    D. Four
    E. Two
12. ___ Queens develop from fertilized eggs or from young larvae that have hatched from fertilized eggs that are less than ___ days old.
    A. 3.5
    B. 5.0
    C. 3.0
    D. 4.0
    E. 4.5
13. ___ The maximum egg production of a queen is reached when colony populations are at ___ bees.
    A. 20,000
    B. 30,000
    C. 40,000
    D. 50,000
    E. 60,000
14. How do worker honey bees aid the queen prior to leaving for her mating flight and upon her return? (2 points).
15. Name two situations which will result in a colony being headed by a drone layer. (2 points).
16. Name three impulses or colony conditions that result in a honey bee colony raising new queens. (3 points).
17. Give three reasons why a beekeeper would consider requeening a colony. (3 points).
18. Please give two reasons for marking queens (2 points).

ANSWERS ON PAGE 50

Mark Winston

Mentor

"A wise and trusted counselor or teacher."

Mentor: "A wise and trusted counsellor or teacher."

I traditionally end my introductory entomology class each year with a lecture on "Killer Bees," partly because I think it's an interesting insect subject, but also because it gives the students some ideas about how entomologists practice their craft. This year, I began my annual lecture reminiscing about how I became an entomologist, and before long, most of the class time had gone by. When I looked up at the clock and noticed the class period was almost over and I had not yet even mentioned the word "bee," I realized that the lecture period had been consumed by remembering mentors.

Each of us can look back at a teacher, employer, family friend, or relative who was instrumental in influencing the directions our lives have gone. For some, it might be strange Uncle Harold, who patiently let us accompany him out to the beeyard to tend his few hobby colonies. For others, it might be a Summer job working for a commercial beekeeper whose patience, hard work, and love of long hours with the bees rubbed off. Or perhaps it was that high-school biology teacher who kept a hive of bees on the school's roof, and stayed after school with the Apiculture Club even though he wasn't getting paid for it.

I ended up as a bee researcher for reasons that had nothing to do with bees, and more or less by accident. I did not grow up with bees, was not interested in bees, and in fact, didn't see the inside of a hive or even get stung until I was 25 years old. There also was nothing about my university performance that even would have hinted at my becoming a professor. A barely passing, low "C" grade point average does not usually lead to an academic life.

I had one thing going for me, however. My parents gave me only enough money for university tuition, and insisted that I work to earn my own living expenses. I ended up with a string of part-time and Summer jobs that changed my life, although at the time I was completely unaware that I actually was moving in a particular direction. Many of my jobs, of course, were simply moneymakers. I baked bagels for the stoned hippies in Boston who would come in at 3:00 a.m. with the munchies, delivered mail in Cleveland, Ohio, and worked the day shift at a fiberglass factory outside of Philadelphia grinding down the front ends of locomotives. Besides paying the rent, these jobs were useful because they showed me what kind of work was available without an education.

A more positive influence that pushed me toward research were jobs working for professors, mentors whose examples gradually rubbed off on my dense post-adolescent brain. My first such job was at the University of Chicago, where I spent the first two years of my undergraduate education. I applied for a job working for Leonard Radinsky, a professor in the anatomy department, which interested me because I had illusions of becoming a medical doctor, and I figured I was a shoo-in for medical school because the word "anatomy" could go on my resume.

I got the job, but soon discovered why no one else had even applied. The work involved picking up dead animals from Chicago's Brookfield Zoo, cutting off their skin and flesh, and putting the remains of the bloody corpses into a room full of dermestid beetles that devoured any remaining muscle and blood, leaving the bones for study. Radinsky was a paleoanatomist who compared fossil brains with those of living species, and I was at the very bottom of the process to feed his need for specimens. I did get to perform my gory task in the same room where the real medical students dissected human corpses, which was as close as I ever got to medical school.

One day, however, Radinsky invited me into his real laboratory and said he had something different for me to do. He handed me a 50-million-year-old fossil skull from Wyoming and a few dental tools and asked me to clean the dirt from the head so that he could make a latex cast of the skull to compare to casts from contemporary skulls. And "Oh, by the way," he said, "be careful; it took me an entire Summer to find this skull, and it's the only one like it ever found."

I was appropriately terrified, but soon forgot my fear as I became immersed in meticulously and gently scraping grains of sand from the skull. As the days passed, Radinsky began talking to me as I picked and scraped at the skull, weaving tales of ancient fossils and exposing me to a world of evolution and change that had never come alive for me in a classroom. He gave me dusty tomes from arcane paleontological journals to look through, and I gradually began to feel the excitement of delving into the past, and to understand why a 50-million-year-old piece of skull might be relevant to our human condition today. When I was done, we made a cast of

Continued on Next Page

"Each of us can look back at a teacher, employer, family friend, or relative who was instrumental in influencing the directions our lives have gone."

MENTOR ... Cont. From Pg. 19

the inside of the skull and saw the imprint of this animal's brain, a brain from a body that had once walked the earth and now was revealing its secrets. It was a defining moment for me, in some ways a deeply religious one, a moment that showed me for the first time why people do science.

I moved on to Boston University shortly afterward to finish my undergraduate training, and again was fortunate to fall into a situation that changed my life and direction. At that time, the U.S. National Science Foundation sponsored undergraduate students to conduct research in faculty members' laboratories during the Summer. There were 10 positions available at Boston University that summer, there were 10 applicants, and yes, I was ranked a dead-last number 10.

My appointment was to work for the cell biologist Lynn Margulis, who was and remains an academic rebel. I appealed to her sense of rebellion because I had long hair, wore overalls every day, and was a near-failure as a student, all qualities that distinguished me from the clean-cut, straight-A students that held the other nine positions. Margulis did something quite different from my classroom professors: She treated me as an equal and a colleague, gave me a project of my own, and expected me to conduct my work with the same high level of professionalism, diligence, and enthusiasm at which she worked.

I spent two years working in her laboratory, and this experience changed my life; but what I remember most clearly is one moment very early in my time working with her. My first experiment involved forcing one-celled organisms to shed their mouthparts, then checking them every two hours as they grew new mouths. The objective of the work was more significant than it might appear. We were screening the effects of potential anti-cancer drugs on this process, because mouthpart growth in these organisms is similar to aspects of how cancerous cells divide.

The experiment took 24 hours to conduct, and I had to return to the laboratory every two hours to check the cells. At first, I spent the intervening time around the corner at a student party, imbibing various substances and reluctantly running back to the lab at the appropriate times. However, as the night progressed, I stopped returning to the party and became fascinated by the data that were emerging from this experiment. I could barely wait for the next check times, and as each two-hour segment passed, I would graph the data to see what pattern might emerge. By the next morning, after an all-nighter, my graph was done. The data revealed an almost-perfect straight line demonstrating that the chemical we were testing could prevent the runaway cell division that is typical of how cancers grow.

This experiment didn't cure cancer, of course, and played only a very minor and almost invisible role in medical history. Similarly, the fossil skull cast I made with Radinsky did not lead to radically new insights about where humans came from, or to a new theory of evolution. No, these projects were trivial in the great scheme of science, but enormously important to me personally.

Radinsky, Margulis, and subsequently other mentors impressed me by their examples of dedication, curiosity, commitment, and ultimately their underlying belief that science can make a difference to the human condition, even if individual contributions may seem small and inconsequential. This is something I had not seen before in my classes, but was screamingly apparent when I went one-on-one with a real experiment in a practicing scientific laboratory.

I find it ironic that I now teach, give exams, and encourage students to get good grades, because I hated being a student, blew most of my own exams, and became successful in spite of dismal grades. Furthermore, class work did not lead me to bees, but rather these early experiences with hands-on research motivated me to continue, and it was only coincidence that my life's work ended up in apiculture. Another temporary job assisting a professor doing wasp research in Mexico led to another temporary job working for the U.S. Department of Agriculture gypsy moth program which stimulated me to do a master's thesis on hermit crab behavior which led to my going out to the University of Kansas for a Ph.D., where my major professor, Chip Taylor, just happened to have recently landed a grant to study Africanized bees in South America. I heard "tropical adventure" instead of "killer bees," so I said, "Can I come along?" and bees finally entered the picture.

Bees did turn out to be the right thing for me, and I've stuck with them for 22 years, but it easily could have been something else. What kept my life from going nowhere was not bees but rather mentors. These teachers gave me much more than specific information about their subject. They were truly wise counselors who saw a bored student who simply needed to be taken seriously and provided with expectations much greater than just getting an "A" in a class.

The right word of encouragement at the right time, an opportunity to perform, the assumption of excellence, an attitude of collegiality rather than superior teacher to inferior student: These are the tools of mentoring. What we may teach our young students or employees about bees means little compared to the more fundamental attitudes about study or work we can provide by example. It is the people we help mold rather than the facts we discover that are our most important contributions. Bees, bee research, bee teaching, and beekeeping are no more than the pallet on which we paint. BC

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

Cukes Pollinated
WITH SINGLES

Michael Meyer

This Missouri beekeeper makes it look as simple as it is.

When opportunity presents itself, look carefully at all factors involved, apply experience, research known information, come up with a plan, and hope for the best. Such was the case last Summer in pollinating a large cucumber planting (1,000 plus acres) for a grower in my area of Missouri. The Fall before, I met with the grower to ascertain his pollination needs. From this meeting I found he wanted 350 to 400 hives for the cucumber pollination season, based on previous experience. I'll detail later why I decided to use single-hive-body hives, but my first problem was to convert this 400 double-hive figure into singles.

Basing my figures on many years' experience, I knew that full-blown, strong colonies would average about 10 full deep frames of brood. A few with vigorous young queens might average 12 frames, but those headed by older queens might average only eight, so 10 was a good average figure for all hives. I figured that, allowing for honey and pollen frames on the outside, my singles headed by young queens that I raised from cells would average seven frames of brood. Some would have eight or more, but some might have only six, so seven was a fair average to my way of thinking. Simple arithmetic converted the 400 double figure to 571 singles, so I informed the grower that he would need 550-600 singles to get the same number of bees in his fields.

Based on hive dynamics, I feel that my estimates were correct. Any hive goes through a building process in its population growth before it plateaus at a peak population where field force die-off equals new bee production. During this building phase, when the hive's main concern is increasing population numbers, the most active foraging (pollination) occurs. Later in the season, when a surplus of honey is on board, and especially when the main honey flow has tapered off, you may find large colonies 'loafing.' That is, the percentage of the field force actively foraging is lower than that of a 'building' hive whose population has not peaked. Problem number one was solved on paper, anyway.

Some grower-based problems were those of hive numbers, times of pollination, different locations for the different fields, and seasonal moving of the hives. Cucumber blossoming in this area starts the last week of June, and, based on continuous planting, would normally peak around the third week of July, continuing at that level for about a month, and then slowly wind down until the first week of September. This meant that the first group of singles would need to be ready by June 25 and all bees ready by July 15. This schedule would be fine-tuned according to the grower's actual planting schedule, since the cukes would start blooming about 30 days after planting, under normal conditions. This meant that groups of hives could be moved into the fields in an orderly fashion about every five to seven days for a period of three to four weeks. Many times in pollination work, the bloom time is a huge problem in that a grower wants more bees in an area quicker than a beekeeper can move the bees into that area, so in this case, a potential problem was eliminated from the start.

Another grower-based problem was the physical locations of the hives. These needed to be adjacent to the fields that provided some sort of afternoon shade, if possible, so that fewer bees would have to take on water chores. After some time mapping locations, we found that about 80 percent of the locations met that requirement. Several potential locations had to be eliminated as they were inaccessible, in the grower's normal

Singles in the field were double stacked with shade boards on top.

Continued on Next Page

This old trailer worked perfectly for moving colonies from field to field.

Colonies on the trailer had their entrances alternated, and drifting wasn't a problem.

WITH SINGLES ... Cont. From Pg. 21

path of operations, or too close to a dwelling. Next, let me explain a bit about how these cukes are physically grown. The grower takes a 160-acre field and uses about 130 acres of it in a circular, center-pivot-type irrigation operation. He plants each field in straight rows, but those cukes outside the 'water line' usually do not amount to much. This arrangement leaves a nonirrigated triangle at each of the four corners of the 160-acre field. These corners were mowed and the bees placed there.

Traditionally, bees were moved into the 130-acre field for the bloom period (maybe two weeks), then moved to another field which was far enough away that the foragers would not return to the same spot. However, in looking at the grower's field maps, about 70 percent of the time, bees could be located between fields, so that they could fly one-quarter to one-half mile in one direction to pollinate the first field; then as those blossoms declined and an adjacent field came into bloom, the bees would naturally find the new field, which would become more attractive for them. This would save the grower money and save the bees and the beekeeper a hot Summer night move.

The last problem was that some fields were far away, and after the initial pollination, the bees would be through and needed elsewhere. Also, several fields in a general area would be coming into bloom, and for a short time more bees would be needed in that area. To solve this problem, the grower got several old 40' flatbed trailers, refloored them where needed, and added an angle-iron rail on the outside to keep the hives on the trailer. When I brought the bees in, they were set up on these trailers instead of in the fields. He was able to move the bees wherever needed, the only requirement being that the bees be moved at least a mile from the last location. The hives which were in shade locations were set as singles on the ground.

Cucumbers are attractive to bees nectarwise, but since the honey flow in the area would be over by July 10, all hives were fitted with nine frames and an inside feeder. This meant getting all extra wax off the shoulders of the frames so that it all would fit into a single deep hive body. To help with heat stress, as many hives as possible were given locations with afternoon shade. Singles in open locations were double-stacked, facing in opposite directions, and the top hive was fitted with a 'shade board' plus a rock or brick to keep the shade board from blowing off. These shade boards were 18" x 24" wafer board three-eighths-inch thick, painted with aluminum paint. All hives on the trailers were fitted with shade boards. No hives seemed to suffer from heat stress, although it ran 101° to 104°F for a 10-day stretch. No hives had to be fed for the season.

A veteran beekeeper told me years ago that in the active season, a single hive could tend to its needs better than a double hive, and none of these hives seemed to suffer for the season. All had plenty of frames (six to eight) of brood, and none 'plugged' out on honey, either.

The typical single inside would have six-eight frames of brood with a honey ring around and over each frame. Some had brood on every frame with a ring of capped honey on the upper third of each frame. Others had full brood frames (wall to wall) in the middle frames with the outside two or three frames consisting of capped honey and pollen. Very few (10 percent) had open cells. It looked like a race between the queen and the workers when a cell became open as to whether that cell would get an egg, pollen, or nectar.

Drifting was largely eliminated by having different hive colors and facing the hives in all directions in the field groupings. The hives faced alternately in and out on the trailer, plus groups of four or five were separated by a gap provided by a 4 x 4 or a 4 x 6 piece of wood. Through the season, hives were not observed to drift to one side of the trailer or another. Sites were bush-hogged, and since the sites were not irrigated, most of them had few weed problems. Evening weed-eater chores were performed at a site or two.

One huge potential problem was handled nicely due to the techniques first made known to me by the Stanley brothers of Iowa. They maintained that a nuc with four frames of brood would build into a full hive in about six weeks. I used this theory with some modifications in

that I wanted nucs to just fill a single box as the cuke season approached. So, three, four, or five frames of brood in a single were given a ripe cell. Generally, I used three frames through mid-May, four frames through June 10, and five frames of brood until June 25. Keep in mind that the late nucs were the ones to be used around July 15-20 for pollination, not the ones needed before July 1.

The last problem was one of wintering. Should I combine these singles or Winter them as singles? I decided that with all the young queens raised, I would Winter over these as singles, and only had a three percent loss, so that problem was overcome and will be the subject of a whole other article on wintering singles.

The last potential problem other beekeepers thought I would run into was swarming. We were long past the normal swarm season, and although each single was 'packed' with bees, all were headed by young queens, and little swarming was observed. Most old queens were superseded during the season, however. The hive crowding phenomenon might be likened to the goldfish theory in that a carp kept in a small bowl adapts to its surroundings and becomes known as a goldfish, whereas that same fish turned loose in a large pond becomes many times the size of the original fish in the goldfish bowl. The same theory seems to hold true in this case for the singles.

Following are some other observations of interest to pollinators and growers.

Pollination Bee counts were adequate in each field, and bees flew all day long, although the greatest numbers were observed in the cuke fields during the morning hours, sometimes commencing work just after dawn.

Weight Hives gained weight during the season, none needed feeding, and 40 percent or so made enough weight that no feeding was necessary for Winter survival.

Brood Hives slowed brood production during August, and the hive body was packed with honey and pollen for Winter.

Robbing The only observable robbing occurred on the trailers in September. No explanation for this, but in future hives will be entrance-reduced late in the season on the trailers and set off the trailers as soon as possible.

Extra bonus The grower planted and irrigated 60 acres of buckwheat for the bees. They loved it!

Medication Apistan® and Terramycin® were used year-round *since no honey was taken from these bees.*

Right now I'm gearing up for another cuke season. Singles need splitting, queen cell production is in full swing, and I like the whole concept of working with singles. The only variation is that singles that have been split and have filled their box completely during our honey flow month of June will be given a queen excluder over the single and fitted with one honey super at a time. This will be pulled prior to moving the bees to the cukes. For those hives with excess bees, nucs will be moved to the yards and placed behind the hives to be 'unpopulated' at night; then the large hives will be moved the next day. The field force will thus go into the smaller hives moved behind the larger ones, and the large hives will peak again in about two weeks as all sealed brood hatches – an easy way to equalize without splitting.

This concept may hold advantage in other crop situations throughout the year, not only for cukes. Let me know if you're using this for any other crops. Good pollinating!! BC

Michael Meyer is a commercial pollinator from Springfield, Missouri. He is an occasional contributor to these pages.

ISLAND ODYSSEY

Joe Traynor

Santa Cruz Island and a visit with Adrian Wenner

Three years ago, I fulfilled a daydream common to many – I spent a week on a Pacific island.

The island, Santa Cruz Island (SCI), is the largest (approximately 100 square miles or about three times the size of Manhattan) in a chain of five islands (called the Northern Channel Islands) that lie 25 miles off California's coast near Santa Barbara. To make things better, the month was April, always (in my opinion) the best month in California, especially for one with an interest in bees and flowers. The island sojourn was not really a vacation, as I was there to observe Adrian Wenner's work on removing honey bees from the island.

Island Background

First, a brief history: Evidence of human life on SCI goes back 7,500 years. The original Native American population gave way to Spanish, then Mexican rule, and in 1860, 10 Americans purchased the island. The Americans introduced agriculture, including cattle, sheep, vineyards, and European honey bees. Island ownership evolved down to one owner, who established a working relationship with the University of California at Santa Barbara (UCSB) in 1965. In 1966, UCSB set up a field station devoted to research and teaching. The Nature Conservancy (TNC) took over ownership in the 1980s (at a fraction of the market value) and TNC and UCSB work closely to maintain the island. This work includes returning the island to its natural state, which means eliminating introduced species, including honey bees.

As the resident bee expert, Adrian Wenner volunteered to eliminate honey bees from the island. Over a seven-year period, Wenner located over 200 feral honey bee colonies and eliminated 150 of them – a remarkable task considering the rugged terrain and limited road access on the island. Location of these feral colonies was based on windborne odor detection and communication by honey bees; the methods used for this "search and destroy" mission were published in 1992.

Wet winters in 1994 and 1995 resulted in prolific swarming (one colony became 14 in just 18 months), and it was decided to introduce Varroa mites to eliminate the remaining honey bee colonies. The Varroa mites have been effective, and elimination of honey bees from SCI is now in the final stages. In the unlikely event that a colony survives, that colony (or colonies) will be of great value to bee breeders.

An Ideal Research Site

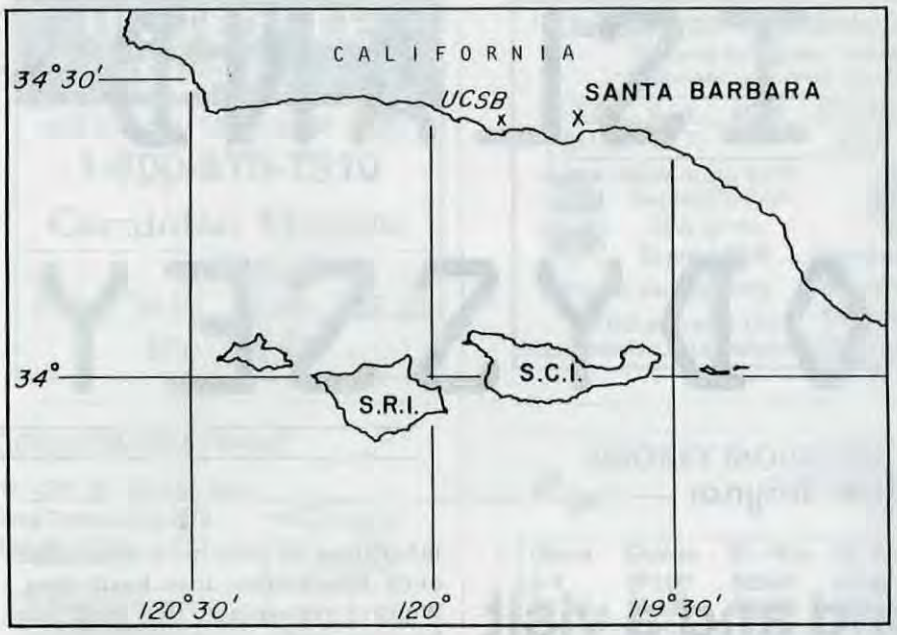
SCI has been dubbed a "miniature Galapagos" and has become a Mecca for researchers in a wide range of disciplines. As can be deduced, it is a dream workplace for bee researchers desiring to evaluate the impact of honey bees on wild bee populations. The authors of the recent popular book *The Forgotten Pollinators* speculated on honey bee vs. wild bee dynamics (and the consequent impact on plant species), but they could only speculate because they could not control honey bee populations. SCI is the ideal laboratory in which to crystallize such speculation into hard data. Wenner recognized this and has been generous in sharing this resource with others, including Robbin Thorp, who has come up with some excellent data on plant-pollinator interactions.

Accommodations on the island are Spartan – bunkhouses and a large mess hall – but more than adequate. My first day on the island was spent checking feral colony locations with Wenner and his assistant, and the experience gave me the opportunity to appreciate the accomplishment of removing 150 feral bee colonies. We used a Jeep to check a series of honey bee colony sites in order to determine if nests previously anesthetized and sealed with polyethylene were indeed moribund and had not been recolonized. Occasional swarm traps were also checked.

Keeping Up With Wenner

In checking colony locations, our route appeared to be haphazard, but Wenner honed in on each site with amazing accuracy, rarely referring to his records and with only an occasional twitch of his nose – he obviously had a precise mental picture of the locations of well over 100 colonies. Many locations were well off the road and had to be accessed on foot over terrain suitable mainly for mountain goats. Being in good shape, I welcomed the challenge, as well as the opportunity to demonstrate how fit I was. I was able to keep up with Wenner and his assistant for the first few stops, but as the day wore on, it became more dif-

Continued on Next Page



Santa Cruz Island lies 24 miles off the coast of California. (Santa Rosa Island, another of the Channel Islands, lies to the west.)

ISLAND ODYSSEY ... Cont. From Pg. 25

ficult. By the end of the day, I was forced to admit that I had been outhustled by a man approaching 70. Subsequent days were spent in similar fashion with asides to observe bee activity (including native bees) and other research projects on the island.

Several botanically oriented research-study groups from U.C. Berkeley and U.C. Santa Cruz passed through during my stay, greeting Wenner as an old friend and entering into animated discussions on a variety of topics. A grad student planning a Ph.D. thesis on honey bee communication was part of a U.C. Davis contingent and, needless to say, there was a spirited evening discussion on dance language that lasted far into the night. I retired at 10 p.m., but Wenner was still going strong at midnight. What impressed me about Wenner in these discussions was the sheer joy he took in them – unlike many such discussions which turn into contests (particularly among the male of the species) as to who can score the most debating points. It was the give-and-take of the discussion itself that energized Wenner – getting lost in the pleasure of the serve and volley of the game rather than concentrating on winning the point.

In spite of demanding workdays and late-night discussions, Wenner was invariably the first one in the mess hall in the morning. Following his midnight session, I made it a point to get to the mess hall at 6 a.m., a half hour earlier than usual, confident that I would be the first one there. I was greeted by Wenner, who apologized for the coffee not being ready yet.

Dance Language vs. Odor

From my limited exposure to the "dance language controversy" previous to my visit, I was aware that Wenner's position (that odor, not dance, was the primary means of recruiting honey bees to a food source) was at odds with the conventional wisdom on the subject and had spawned much criticism. One might think that this barrage of criticism would cause Wenner to hunker down, become subdued, defensive, or even paranoiac. One would be wrong.

My impression of Wenner is of a high-energy individual totally immersed in the task at hand, whatever that task might be. Although he is well aware of his critics, they appear to be no more than a minor annoyance, which, if anything, energizes rather than subdues him – "happy warrior" would be an apt sobriquet for Wenner. I won't get into a lengthy discussion of the dance language controversy here, but any sketch of Wenner would be incomplete without some comment on the subject.

First, anyone who takes the requisite hour to read the three pages of a 1968 experiment by Wenner et al. and doesn't come away, if not convinced of Wenner's position, at least receptive to it, hasn't been focused during that hour. This experiment was done in August, a time of year when California is bone-dry, and interfering, competing odors are minimized. This convergence of time and location provided an excellent arena in which to conduct bee communication experiments using introduced odors. This test also considered wind velocity and direction, a critical component of any communication hypothesis and one that has been ignored time after time by language proponents (ask any deer hunter about the importance of wind direction in odor transmission and detection).

Odors, Odors, Everywhere

I work as an agricultural consultant in the San Joaquin Valley and have observed a technological explosion in insect monitoring and control over the past decade. This revolution is based on odor, specifically pheromones, that either lure insects to traps (to monitor their populations) or are used directly to confuse and control them. There is hardly a crop grown in California today that does not depend on pheromone traps to monitor insects, and one sees these traps everywhere – 6" x 6" cardboard "houses" coated with pheromone and a sticky substance to trap the target insect. These traps have proven highly successful and are based on the remarkable ability of insects to detect odors. The fact that honey bees respond just as vigorously to queen pheromone shows that honey bees surely possess a similar, finely tuned odor-detecting mechanism.

When one drives or walks past one of the ubiquitous insect pheromone traps, one detects no odor whatsoever – the odors are far beyond the receptive capacity of our crude odor-detection mechanism, the nose. If the size of our nose was proportionally increased to achieve the odor-detecting capacity of insects, it would not be a pretty sight. It is, perhaps, a conceit of man that

if he can't detect something – odor, in this case – then that parameter must not be important. Is it not possible that it is this arrogance that has prevented researchers from devoting more time to investigating odor communication by honey bees rather than concentrating on something they can readily see and quantify, i.e., dance movements by bees? Devising an experiment that sets up rigid controls over a parameter (odor) that one cannot readily detect requires a degree of intellectual rigor not possessed by everyone.

Wenner is certainly not isolated in his position on bee communication. He is supported by a number of biologists and, with mounting evidence of the pervasive influence of odor on all phases of insect biology, the ranks of Wenner supporters are increasing. It is noteworthy that a significant number of these supporters are long-term members of the honey bee research community, people who are immersed in all facets of honey bee biology as opposed to general biologists or newcomers to apiculture. Possibly the most experienced, productive honey bee researcher today is the USDA's William Wilson. Wilson says that Wenner "is a fresh breeze blowing across an area that no one was supposed to approach. . . . He has asked some very good questions, and he has presented some very convincing information."

Wenner has maintained a bemused detachment to the controversy swirling around him, serenely confident that his position will be vindicated with time. He has not allowed the language controversy to deter him from fruitful work in an eclectic mix of subjects including crustacean biology, monarch butterfly biology, and a discourse on mammoth elephants on the Channel Islands. He has also co-authored a popular book on environmentally safe pest control.

Wenners As Diplomats

It is worth mentioning that Wenner's response to his critics has been rational and evenhanded. His published responses, although often forceful, are noticeably lacking in polemics, unlike the superior, condescending tone sometimes found in academic debates. This refrain from personal attacks is a quality that was also found in Wenner's cousin, the late Darrell Wenner, a northern California bee breeder who was active in beekeeper politics in both California and the United States (and the world). Those familiar with the California beekeeping scene know that beekeepers there are a contentious lot divided into three main factions: queen breeders (mostly Northern California) pollinators (central California) and honey producers (Southern California), with the disparate interests of each group guaranteeing intergroup skirmishes that can descend into name-calling. Darrell Wenner was one of the few who had the deserved respect of each group, and with a gentle manner, was a tremendous unifying force in California beekeeping. I have since concluded that there is a Wenner gene for diplomacy and that if such a gene could be implanted in all heads of state, this world would be a far better place. One could take Adrian Wenner's diplomatic demeanor, including the ability to conceal a low tolerance for fools, as a sign of weakness. This would be a mistake. If I were making a list of people that I would not want to get in a fight with, either intellectually or physically, Wenner would head the list.

Adrian Wenner at work.

UCSB recognized Professor Wenner's broad range of skills, including diplomacy, and in 1989, appointed him to the prestigious post of provost of the College of Creative Studies. Such a position is a no-win situation in today's academic world, and it was not long before Wenner was involved in another controversy: A group of students and faculty, using art and freedom of speech as their rationale, wanted to, then demanded to exhibit photographs of

Continued on Next Page

ISLAND ... Cont. From Pg. 27

nude males in a variety of poses. The exhibit area was in full view of people of all ages who passed by in the hallway. Wenner, father of a world-renowned artist himself, employed a Solomonlike solution: A temporary partition that shielded the exhibit from passersby. This solution has subsequently been emulated by other institutions confronted with similar situations.

Wenner is currently an emeritus professor at UCSB, where he maintains an office. He continues a rigorous and productive work schedule, including frequent trips to SCI.

Plan An Island Trip

For those interested in traveling to Santa Cruz Island, there are day trips for $49 or work trips. Call (805) 642-1393 or 962-9111 for more information. Should you visit the island, you may catch a glimpse of a white-bearded, smiling, diminutive chap with a twinkle in his eye, scrambling about the island cliffs. Should such a sighting turn into an encounter, make sure you have your wits about you. BC

Joe Traynor is a crop consultant, author & pollination broker from Bakersfield, CA.

References

Wenner, A., J. Alcock and D. Meade. 1992. *Efficient hunting of feral colonies.* Bee Science. 2: 64-70.

Buchmann, S. and G. Nabham. 1996. *The forgotten pollinators.* Island Press/Shearwater Books.

Thorp, R., A.M. Wenner and J.F. Barthell. 1994. *Flowers visited by honey bees and native bees on Santa Cruz Island.* Pp 351-365 in: Halverson and Meader (eds.), Fourth California Islands Symposium. Santa Barbara Museum of Natural History, Santa Barbara, CA.

Wenner, A., P. Wells and D. Johnson. 1969. *Honey bee recruitment to food sources: Olfaction or language?* Science. 164: 84-86, also called the "crucial" experiment in the 1990 book by Wenner and Wells, Anatomy of a Controversy. Columbia University press.

Reynolds, C. 1991. *Lord of the gadflies.* Los Angeles Times. Nov. 5, E1, E8.

Klein, H. and A. Wenner. 1991. *Tiny Game Hunting.* Bantam Books. (Australia/New Zealand edition, 1993).

BLUE RIBBON SECTIONS

Richard Trump

If you want to know how kids started keeping bees nearly three quarters of a century ago, ask Stanley Weiser of Adel, Iowa. He is the one who walks away from the Iowa State Fair with blue ribbons for his section comb honey. The 1996 award was his seventh in sequence. He began with bees in 1921 when he was 10 years old.

From behind a big maple tree, Stanley watched his grandpa work a "swarm" that was storing honey in combs that hung from strips of lath. "Why are you shaking bees on the ground?" the boy asked. "Where is the queen bee? . . . Why aren't they stinging you? . . ."

"Grandpa had a big family," Stan recalls. "He had a big garden, too, and bees were their source of sugar. Although the brood combs were just hanging on laths spaced across the box, his grandfather was producing comb honey before the split sections were commercially available.

"I guess he knew I was really interested because he said if I wanted to sell honey, he would give me a swarm. But he told me not to do it his way. He said I should go out and see Mr. McKee because he had good equipment and knew how to use it.

"McKee looked like Moses," Stan remembers. "I don't think he ever shaved or cut his hair. I watched him examine one of his hives, and he said if you move slow, bees won't sting."

Despite being stung a few times by his grandfather's bees in that old red hive, Stanley was convinced that he must have more bees and better equipment. Encouraged by his dad, he used his odd-job savings to order the essentials from A.I. Root. The shipment included a copy of *Starting Right With Bees.*

"Reading that little book, I could see that my grandpa was right: Do it the way Moses McKee does it. Instead of melting a little strip of foundation onto the comb box, use the new split section idea. That gives you neater combs, and leaves the bees more time to harvest nectar. I broke a few sheets of foundation before to fold if you in water.

"My big plunge came when there was an ad in the paper about nine hives for sale in Clive, $5.00 per hive. My dad borrowed a truck from the lumber company for hauling them home. Those hives were in terrible condition. We had to stuff a lot of paper in the cracks before loading them.

"I thought it might be hard to move the bees out of an old box into a new one. But I found that if I took the cover off the old hive and set the new hive (without the bottomboard) on top, I could drive the bees up by hammering on the old box. I learned later that this is called drumming the bees. There were no frames in those broken-down boxes, just strips of wood for the bees to hang their combs on."

Because the stores were not interested in selling his honey, the boy, then 11, took his combs in a basket, door to door. They brought 15 cents per comb. Today Weiser gets $1.75 wholesale, and the stores sell the combs at $2.50. With requests from other beekeepers as well as from food markets, his 38 colonies cannot meet the demand.

Have Weiser's methods changed over these 74 years? "Not much," he says. At first he used only one brood chamber. Now he gives the queen more space, in a two-story (full-depth) chamber. "If there's any one requirement that's most important in getting full sections, it's having a very strong

shipment included a copy of *Starting Right With Bees.*

"Reading that little book, I could see that my Grandpa was right: Do it the way Moses McKee does it. Instead of melting a little strip of foundation onto the comb box, use the new split section idea. That gives you

colony. The queen must not be crowded."

There is an apparent contradiction, however, in his plan for the coming year. To step up production, he has ordered 10 nucs from Texas. For these nucs, which he assumes will not build up fast enough for swarming problems, he will confine the queen to one brood chamber with a queen excluder. He hopes the colony will fill one layer of section combs. As the main flow tapers off, he will place a shallow super with drawn comb above the brood chamber so the bees can store Fall honey for Winter use.

What is the condition of the other colonies when he supers? The nectar is coming in fast enough that it's just beginning to crowd the queen. "That's a critical time," he admits. "If I don't give them space above the brood nest, they'll swarm. For extracted honey, I may add a super above the sections. But some colonies don't cooperate. The field bees go right past those sections and store in the drawn extracting combs."

Would it help to delay adding the extracting super until they are really working on the sections? Stanley is trying that approach. "But the timing is tricky," he adds. "You must wait long enough that the bees get a good start on the sections, building and filling the cells – but not so long to invite swarming.

"I sometimes have a two-brood chamber colony so strong that I make a Spring split, giving the queenless half a new queen. And I give both of them an empty brood chamber of combs. If they are a bit unequal in strength, I take the stronger one off to a new location. Then, if any of them drift back to the original location, they strengthen the split that needs them.

"I learned beekeeping mainly by trial and error, with plenty of errors. When I was about 15, I bought my first queen and split a strong colony. Even though I had read about queen introduction, I let her out too soon. She was quickly balled. But I had read that if this happens you should plunge the ball in water. It worked. I then sprayed the whole brood chamber. This gave the bees another problem to take their time, and it saved the queen.

"I don't requeen on a regular schedule as many beekeepers do. But when I see that a queen's pattern of brood isn't good, I replace her. And I've found that a queen is accepted better if I wait a few days before putting her in the queenless split."

Working bees for 74 years! That must be close to a record. How do you explain it, Stanley?

"I had a fortunate start: My grandpa's interest, that man McKee, and then when I was in high school, our agriculture teacher asked Professor Paddock from Ames to talk to his class. F.B. Paddock was much involved with Iowa beekeeping. He used my colonies to demonstrate for the class. Believe me, I was proud. And he spent a lot of time with me after the class was dismissed. That was a boost.

"And you know, here 70 years later, I had help from the state apiarist, Bob Cox. He found mites. My colonies would have been wiped out if he hadn't shown me what was wrong and how to take care of it.

"But it's not quite true to say I never gave up. I once tried to quit. I was awfully busy with my dairy business when foulbrood hit. It hit hard, and I burned all of my frames. After cleaning the boxes, I stored them in the machine shed. Then one day I noticed bees coming and going at one of those hive bodies. A swarm had found it. I had to get some frames and take that swarm out to the orchard. What else could I do?"

Well, Stanley, that suggests one more comment: Your section comb winnings at the state fair have given some producers the impression that you have a secret approach, that you know something they don't know. What about it?

"There's no secret at all. It's common knowledge. It takes a strong colony and watchful timing, getting the sections in when the nectar is really coming in. And in addition, select your six best-filled combs and clean any deposits of wax from the wood. Then there will be other winners at the fair." BC

Richard Trump is a freelance writer and photographer with a strong background in beekeeping. He has written beekeeping books and several articles for Bee Culture.

Exploring RACES OF BEES

Linda Batt

Pick The Best Bees For *Your* Location

I own three vehicles: A sports car, a minivan and a hefty four-wheel-drive truck. I pick the one I want to drive each day depending on my purposes, the weather conditions and the occasion. I wouldn't take the Cub Scouts on a field trip in my sports car or drive a friend to the opening night at the opera in my pickup.

The availability of three races of honey bees with very different characteristics allows keepers to make the same kind of common-sense choices when they queen their hives that I made in picking a vehicle to drive. Purpose, weather conditions and occasion can be considered before a purchase.

After all, operating costs remain the same if a hive produces 40 pounds of honey or 140 pounds of product, and they increase if the colony is sick, weak or doesn't make it through the Winter. So it's good strategy to look at your needs and conditions and match them to a race.

Our different races of bees came across the Atlantic as part of the baggage of early American settlers, and where they came from originally determined their characteristics. Professor Friedrich Ruttner of the Institute of Apicultural Research at the University of Frankfurt referred to the races as "geographic races" and said the region acted to naturally select bees with characteristics best adapted to the area's climate, flora and enemies.

For example, to extract pollen from red clover, a bee needs a long tongue. Areas with a red clover food source produced bees with long tongues. Cold climates produced races that built up smaller colonies and consumed less food to help the bees overwinter.

Anthony Jadczak from the Maine Department of Plant Industry explained that natural barriers kept the gene pool tight in past time periods. In the last 200 years, the movement of bees to new areas has resulted in more hybrid species.

The importation of live bees to the United States was stopped in 1922 as part of an attempt to keep bee diseases and other pests from infecting this country's population, but by then four distinct races were flourishing here: German Black, Carniolan, Caucasian and Italian bees. These races were used to form several popular hybrid strains, and even more selections within a race. Each race, and each hybrid has its own set of characteristic traits.

Ruttner said, "Each beekeeper should classify for himself the characteristics of the bees as favorable or unfavorable for his own requirements." Poor wintering ability doesn't affect the keeper in a warm climate. Gentleness is appreciated, but it isn't absolutely necessary for commercial operation. There is no absolute "best bee."

It's good advice to study the commercially available races before ordering and to also inquire about developed hybrids, but, as Jadczak pointed out, bees will "outbreed," and to keep the desired race characteristics, you must requeen regularly. Remember that hybrid stock will definitely change characteristics as soon as the colony requeens itself. New queens must be ordered to maintain the characteristics you want.

Taking Ruttner's advice let's look at some of the requirements of keepers and the traits of the races.

CLIMATE

One of the first considerations in your choice of stock must always be climate. You can't control the weather, but you can select a race that likes your weather. Jadczak suggests looking at a map of Europe. "Our bees were brought here from Europe. Look at where the bees came from and ask yourself which of those climates is like yours," he said.

Caucasian bees (*Apis mellifera caucasica,* Gorbachev) originated in the Caucasus and Little Caucasus mountains near the Black Sea and parts of Azerbaijan where the climate can be warm and humid or cold and damp. Because of this climate, they fly in cool temperatures and rain and forage well despite the weather.

Because of the variation of climate in their original habitat, these bees respond to unfavorable weather conditions by adjusting brood rearing. In a hot, dry Summer, brood decreases. They maintain a small overwintering cluster which requires less stores and is likely to survive.

Caucasian bees are a good choice for coastline climates or areas with high rainfall. They do well in cold climates as well as in warmer areas.

Carniolan bees *(Apis mellifera carnica, Pollman)* originated in the mountains of Austria and Yugoslavia. The continental air movements in this area result in long, cold Winters, short Springs and hot Summers. The Carniolan race responds to changes in weather. They build up the colony quickly because of the short Springs, and their adaptation to the severe Winters causes them to overwinter in small colonies that

THE A. I. ROOT CO.

P. O. Box 706 • Medina, Ohio 44258

Phone 1-800-289-7668, Ext. 3219

Beekeeping Supplies, Books, Videos & Labels Price List

● HIVES & HIVE PARTS

CAT. NO.	PKG.	DESCRIPTION	RETAIL	SHIPPING WEIGHT
A1	**C/1**	**Standard Hive**	**$75.00**	**28 lbs.**
A2	**C/5**	**Standard Hives**	**330.00**	**140 lbs.**
A12	**C/1**	**Beginner Outfit**	**145.00**	**42 lbs.**
B1	C/1	Metal Cover w/inner	32.00	12 lbs.
B1A	**C/1**	**Metal Cover ONLY**	**20.00**	**9 lbs.**
B2	C/5	Met. Covers w/inner	128.00	51 lbs.
B8	C/1	Inner Cover only	13.25	3 lbs.
B9	C/5	Inner Covers only	53.65	12 lbs.
B10	**C/1**	**Vent. Escape Board**	**12.00**	**2 lbs.**
B12	**C/1**	**Bottom Board**	**14.00**	**7 lbs.**
B13	**C/5**	**Bottom Boards**	**59.50**	**30 lbs.**
B18	C/1	Entrance Reducer	1.20	call
B14	**C/1**	**Slatted Rack**	**10.50**	**4 lbs.**
B20	C/1	Observation Hive	70.00	10 lbs
B25	C/1	Hive Stand	10.50	4 lbs.
B35	C/1	Wood & Wire Excl.	13.50	4 lbs.
B36	C/10	Wood & Wire Excl.	118.80	31 lbs.
B37	C/1	Wood Bound Excl.	11.00	3 lbs.
B38	C/10	Wood Bound Excl.	100.00	26 lbs.
O67	C/1	1 Gallon Wood Guard Preservative	30.00	10 lbs.

● SUPERS, FRAMES & FOUNDATION

C1	**C/1**	**Deep Hive Body, Empty**	**19.95**	**12 lbs.**
C1F	**C/1**	**Deep Hive Body w/Fr.**	**36.00**	**18 lbs.**
C2	**C/5**	**Deep Hive Bodies, Empty**	**80.00**	**43 lbs.**
G14	C/10	9-1/8 Frames	17.00	5 lbs.
G15	C/50	9-1/8 Frames	58.50	24 lbs.
G16	C/100	9-1/8 Frames	107.50	45 lbs.
H8B	C/10	Deep Wired Fnd.	13.35	2 lbs.
H11B	C/50	Deep Wired Fnd.	63.75	8 lbs.
H21	C/10	Deep Medium Brood Fnd.	11.20	2 lbs.
H23	C/50	Deep Medium Brood Fnd.	52.10	8 lbs.
B50	C/10	Frame Supports	2.50	1 lb.
G50	C/100	Wedges for Top Bar	15.75	2 lbs.
C19	**C/1**	**6-5/8 Super w/Frames**	**30.80**	**11 lbs.**
C20	**C/5**	**6-5/8 Supers, Empty**	**64.20**	**31 lbs.**
C21	**C/1**	**6-5/8 Super, Empty**	**14.50**	**7 lbs.**
G45	C/10	6-1/4 Frames	16.50	5 lbs.
G46	C/50	6-1/4 Frames	58.00	23 lbs.
G47	C/100	6-1/4 Frames	102.10	39 lbs.
B57	C/1	Spacers	.50	1 lb.
G50	C/100	Wedges for Top Bar	15.75	2 lbs.
H60	C/10	Medium Wired Fnd.	9.65	2 lbs.
H61	C/50	Medium Wired Fnd.	38.95	7 lbs.
J32A	C/10	5-11/16 Thin Super Fnd.	6.90	2 lbs.
J 33	C/50	5-11/16 Thin Super Fnd.	27.55	5 lbs.
C12	**C/1**	**5--11/16 Super, Empty**	**13.20**	**6 lbs.**
C13	**C/5**	**5-11/16 Supers, Empty**	**58.00**	**26 lbs.**
C17	**C/1**	**5-11/16 Super w/Frames**	**28.95**	**9 lbs.**
G24	C/10	5-3/8 Frames	16.00	4 lbs.
G27	C/50	5-3/8 Frames	56.00	21 lbs.
G28	C/100	5-3/8 Frames	99.75	37 lbs.
B57	C/1	Spacers	.50	1 lb.
G50	C/100	Wedges for Top Bar	15.75	2 lbs.
H27	C/10	Shallow Med. Brood Fnd.	7.40	2 lbs.
H29	C/50	Shallow Med. Brood Fnd.	30.75	5 lbs.
H50	C/10	Shallow Wired Fnd.	9.00	2 lbs.
H51	C/50	Shallow Wired Fnd.	39.25	6 lbs.
J27	1 lb.	Thin (4-29/32 X 16-3/4") Fnd.	8.65	2 lbs.
J29	5 lb.	Thin (4-29/32 X 16-3/4") Fnd.	43.00	7 lbs.
D5	**C/1**	**Beeway Super w/Fix.**	**21.00**	**7 lbs.**
J6	1 lb.	Thin (4-1/8 X 17-1/8") (Split) Fnd.	10.90	2 lbs.
J8	5 lb.	Thin (4-1/8 X 17-1/8") (Split) Fnd.	49.40	7 lbs.
F48	**C/1**	**Ross Round Super Assembled**	**74.50**	**13 lbs.**
F42	C/36	Ross Round Half Fr.	55.00	12 lbs.
F43	C/200	Ross Round Rings	26.00	5 lbs.
F45A	C/200	Ross Round Covers	42.95	8 lbs.
F46	C/100	Ross Round Labels	9.50	1 lb.
J1	1lb.	Thin (3-7/8 X 16") Fnd.	11.05	2 lbs.
J3	5 lb.	Thin (3-7/8 X 16") Fnd.	49.25	7 lbs.

● UNCAPPING KNIVES

N36	C/1	Plain Knife 10 X 2"	32.00	2 lbs.
N37A	C/1	Economy Electric Knife	86.00	3 lbs.
N38	C/1	Master Electric Knife	92.20	3 lbs.
N92	C/1	Cappings Scratcher	12.00	1 lb.

● STRAINERS & EXTRACTORS

M62	C/1	Plastic Uncapping Tub	130.00	18 lbs.
M62N	C/1	Cappings Net for M62	35.00	1 lb.
M26B	C/1	Cheese Cloth	6.00	1 lb.
M26C	C/1	Nylon Strainer Cloth	8.00	1 lb.
M28	C/1	Filter Sock 150 mesh	12.25	1 lb.
L23	C/1	3/6 Frame Extr., hand	419.00	65 lbs.
L24	C/1	3/6 Frame Extr., pow.	600.00	65 lbs.
O62	C/1	14-1/2 oz. Grease Cart.	7.50	1 lb.
O63	C/1	Epoxy Tank Coating	16.00	3 lbs.

● VEILS, SUITS, COVERALLS & GLOVES

N11	C/1	Alexander Veil	18.00	1 lb.
N10	C/1	Indestructible Veil	18.50	1 lb.
N12	C/1	Delphos Steel Veil	21.15	1 lb.
N16A	C/1	White Ventilated Helmet	12.80	1 lb.
N16C	C/1	White Plastic Helmet	13.00	2 lb.
N20	C/1	Replace. Zipper Veil	21.15	1 lb.

CAT. NO.	PKG.	DESCRIPTION	RETAIL	SHIPPING WEIGHT
N19	C/1	Coveralls w/veil (All sizes)	80.00	5 lbs.
N95	C/1	Coveralls (All sizes)	50.00	4 lbs.
N95 (XL)	C/1	Coveralls (XL)	50.00	4 lbs.
N98	PR	Leg Straps	4.00	1 lb.
N21	PR	Med. Soft Leather Glove	18.00	1 lb.
N22	PR	Large Soft Leather Glove	18.00	1 lb.
N22X	PR	XL Soft Leather Glove	18.00	1 lb.
N25A	PR	Small Vinyl Impreg. Glove	13.00	1 lb.
N25	PR	Med. Vinyl Impreg. Glove	13.00	1 lb.
N26	PR	Large Vinyl Impreg. Glove	13.00	1 lb.

● SMOKERS

N4	C/1	4 x 10 Giant SS Smoker w/shield	39.00	3 lbs.
N6	C/1	4 x 7 Stainless Smoker w/shield	37.00	3 lbs.
N9A	C/1	4" Fire Chamber	1.15	1 lb.

● WIRING and EMBEDDING TOOLS

G62	C/1	1/2 lb. Frame Wire	7.00	1 lb.
G63	C/1	1 lb. Frame Wire	10.00	2 lbs.
G64	C/1	5 lb. Frame Wire	24.00	7 lbs.
H13	C/43	Support Pins	4.00	1 lb.
H13A	C/205	Support Pins	14.00	1 lb.
N65	C/1	Spur Wire Embedder	4.25	1 lb.
N77	C/1000	Metal Eyelets	4.00	1 lb.
/79758	C/1	Eyelet Hand Punch	2.50	1 lb.

● HAND TOOLS and ACCESSORIES

N81	C/1	10" Hive Tool	7.00	1 lb.
N83M	C/1	Alum. Frame Hand Grip	12.00	1 lb.
N85	C/1	Bee Brush	3.60	1 lb.
N91	C/1	Frame Cleaner	4.75	1 lb.
NL23	1 lb.	Hive Staples	3.50	2 lbs.
O8	C/1	Queen and Drone Trap	15.00	2 lbs.
O9	C/1	Entrance Guard	6.00	1 lb.
O17		Wax Cell Cups - 1,000	59.50	3 lbs.
O21		Wood Cell Cups - 1,000	34.50	5 lbs.
N100	C/1	Fume Board (unassembl.)	10.50	4 lbs.

● HIVE FEEDING & HONEY REMOVAL

O2	C/1	Boardman Feeder w/lid	2.25	1 lb.
O3	C/1	Feeder Pail w/lid	5.50	2 lbs.
O5P	C/1	Plastic Bee Escape	1.85	1 lb.
O6	C/1	Conical Bee Esc. Board	19.00	4 lbs.

● MEDICATIONS and CHEMICALS

O71	C/1	1/2 Gram Fumidil-B (Makes 6 Gal. Feed)	14.00	1 lb.
O73	C/1	2 Gram Fumidil-B (Makes 24 Gal. Feed)	36.00	1 lb.
O83	C/1	6.4 oz. Terramycin S. P.	7.50	1 lb.
O84	C/1	1 lb. Terra-Brood Mix	6.00	2 lbs.
O88	C/1	5.25 oz. Apicide Powder	5.00	1 lb.
O90	5 lb.	Beltsville Bee Diet ™	28.35	6 lbs.
P38	1 lb.	Paradichlorobenzene	6.00	2 lbs.
P39P	C/10	Menthol Crystals, 10 packs	39.50	2 lbs.
PA10	C/10	Apistan® Strips 10's	25.00	1 lb.
PA100	C/100	Apistan® Strips 100's	185.00	2 lbs.

CAT. NO.	PKG.	DESCRIPTION	RETAIL	SHIPPING WEIGHT

● HONEY CONTAINERS

Q12	C/24	8 oz. Gamber Jar w/lids	13.20	10 lbs.
Q17	C/24	1 lb. Gamber Jars w/lids	15.00	15 lbs.
Q22	C/12	2 lb. Gamber Jars w/lids	10.50	12 lbs.
Q40	C/6	5 lb. Round Jars w/lids	12.00	9 lbs.
Q60	C/12	2-1/2 lb. Square Jars w/lids	13.50	12 lbs.
/78883	C/120	48mm Lids Only (8 oz. & 1 lb.)	10.50	3 lbs.
/78924	C/60	63mm Lids Only (2 lb.)	8.00	2 lbs.
/78967	C/60	G70 Lids Only (5 lb.)	9.75	3 lbs.
/78940	C/60	89mm Lids Only (2-1/2 lb.)	15.50	3 lbs.
Q75	C/250	8 oz. Honey Bears	75.00	20 lbs.
Q7512	C/12	12 oz. Honey Bears	4.00	3 lbs.
Q75250	C/250	12 oz. Honey Bears	85.00	25 lbs.
/78958	C/250	Extra No Drip Hi-Flo Lids	25.00	4 lbs.

● COMB HONEY CONTAINERS

T10	C/100	Window Cartons	22.00	6 lbs.
T11	C/500	Window Cartons	90.00	25 lbs.
Q76	C/1	Plastic Cut Comb Box	1.20	1 lb.
Q76B	C/100	Plas. Cut Comb Boxes	86.00	35 lbs.

● PLASTIC PAILS and GATES

M15P	C/1	2" Plastic Gate	12.50	1 lb.
M18P	C/1	1-1/4" Plastic Gate	12.50	1 lb.
R20	C/1	5 Gal. Plas. Jug (Square)	6.50	3 lbs.
R20B	C/1	1-1/4" Gate for R20	13.00	1 lb.
R33	C/1	Lid-Off Pail Opener	13.25	2 lbs.
/79774	C/1	5 Gal. Pail w/Hole Only	18.50	3 lbs.
/43597	C/1	5 Gallon Pail Only	7.00	3 lbs.

● HONEY SIGNS

U50	C/1	14 X 22", 'Honey for Sale'	2.25	1 lb.

● CANDY

Q79	1 lb.	Regular Honey Candy	3.95	2 lbs.
Q80	1 lb.	Green Apple Honey Candy	3.95	2 lbs.
Q81	1 lb.	Lemon Honey Candy	3.95	2 lbs.

● CANDLE MOLDS AND WAX

Q99L	C/1	Stuffed Bear Mold	8.10	1 lb.
Q99N	C/1	Spiral Mold	7.25	1 lb.
Q99Q	C/1	2-Taper Tin	33.00	1 lb.
Q99H	C/1	18 oz. Spray Mold Release	8.50	2 lbs.
T12	C/1	Candle Gift Box	.90	1 lb.
R32B	5 yds.	Craftwax Wicking	1.75	call
R32BS	C/1	1 lb. Spool Wicking (contains approx. 330 yards)	31.50	2 lbs.
BW1	C/1	3/4 oz. Beeswax Cyl.	.75	1 lb.
BW3	C/1	1# Beeswax Cyl.	10.00	2 lbs.
/01058	11 lbs.	Bulk Candle Wax (Paraffin Blend)	14.50	12 lbs.
X214V		Video - Candlemaking For Everyone	33.50	

CAT. NO.	PKG.	DESCRIPTION	RETAIL	SHIPPING WEIGHT
X28		Book - Making Craftwax Candles	3.95	
X39		Book - Craftwax Creations	5.95	

● CRAFTWAX & BEESWAX SHEETS FOR CANDLES

X(color)	C/10	Craftwax – 10 sheets	8.00	2 lbs.
C(color)	C/100	Craftwax – 100 sheets	70.40	14 lbs.

Colors: Red, Wine, Plum, Dusty Rose, Mauve, White, Ivory, Dark Green, Teal, Navy, Slate Blue, Peach, Black, Eggplant, Garnet Red, Yellow, Jade, Orange & Mulberry.

(We do not ship craftwax when the temperatures are below 35°F.)

H21	C/10	Pure Beeswax Foundation (measures 807/16 x 16-3/4"_	**11.20**	2 lbs.
H23	C/50	Pure Beeswax Foundation (measures 8-7/16 x 16-3/4")	**52.10**	8 lbs.

● BOOKS (postpaid)

X1	Eyewitness Account of Early Amer. Beekeeping	**3.69**	A.I. Root
X4	Breeding Super Bees (Close-out Special)	**8.99**	S. Taber
X5A	The 40th Edition of ABC & XYZ of Bee Culture (over 500 pgs.)	**30.00**	R. Morse/Flottum
X14	Honey Board Cookbook	**3.95**	
X16	Queen Management - Best of *Bee Culture*	**7.99**	
X18	Selling Honey - Best of *Bee Culture*	**7.99**	
X21	Smoking Allowed	**7.99**	P. Jackson
X22	Colony Record Book	**10.99**	
/83494	Colony Record Pad Only	**4.99**	
X38	Equipment Supply Record	**4.99**	
X52	Sales/Purchase Record	**4.99**	
X23	Honey Bees & Beekeeping	**15.49**	K. Delaplane
X25	Beekeeping, A Practical Guide	**19.00**	R. Bonney
X26	Queen & I	**13.49**	E. Weiss
X27	A Honey Cookbook	**6.99**	A.I. Root Co.
X28	Making Craftwax Candles	**3.95**	A.I. Root Co.
X29	Hive Management	**16.49**	R. Bonney
X30	Living With Killer Bees	**12.95**	Flakus
X33	The New Complete Guide	**15.99**	R. Morse
X34	Making Mead	**9.95**	R. Morse
X35	Health & The Honey Bee	**13.95**	C. Mraz
X36	**New –** The How-To-Do-It Book of Beekeeping	**16.95**	R. Taylor
X37	The Joys of Beekeeping	**7.50**	R. Taylor
X39	Craftwax Creations	**5.95**	A.I. Root Co.
X40	Biology of The Honey Bee	**22.99**	Winston
X42	Wisdom of The Hive	**49.95**	Seely
X44	Killer Bees	**12.99**	Winston
X45	The Best of Bee Talk	**9.99**	R. Taylor
X48	A Year In The Bee Yard	**15.95**	Morse
X50	Rearing Queen Honey Bees	**15.95**	Morse
X51	Beeswax Crafting	**19.95**	Berthold
X53	Dance Language of The Bees	**33.95**	von Frisch
X56 NEW	Swarming - Best of *Bee Culture*	**7.99**	
X58 NEW	Beeswax Crafts **(color)**	**19.95**	

TO PLACE YOUR ORDER CALL **1-800-289-7668, EXT. 3219** WITH YOUR VISA, MASTERCARD OR DISCOVER CARD #.

X62	The New Comb Honey Book	**10.95**	R. Taylor
X65	Beeswax	**9.99**	Morse
X78	Putting It Up With Honey	**11.49**	Geiskopf
X84	The New Starting Right With Bees (137 pgs.)	**$7.99**	Flottum/Sammataro

● VIDEOS – (postpaid in Continental U.S. - foreign additional)

(Videos may not be returned for credit. If video is defective it will be replaced with a video of the same title.)

Cat. #	Title	Description
X214V	Candlemaking For Everyone - **$33.50**	How to make rolled foundation, poured mold candles, tapers & more.
X204V	Beginning with Bees - **$29.95**	60 Min. Professional tape.
X221V	Intro To Beekeeping - **$35.95**	118 Minites
X222V	Package Bees - **$25.95**	27 Minutes
X223V	Splits & Divides - **$25.95**	17 Minutes
X224V	Medications - **$25.95**	24 Minutes

● SPECIALTY VIDEOS (postpaid)

X218V	Honey Bee Emergencies - **$40.00**	Training film for fire & rescue departments.
X219V	The Honey Bee - A Grower's Guide - **$49.95**	USDA Produced Colony Evaluation Video for Pollination. A. I. Root Co. Exclusive!

● MARKETING/TEACHING (postpaid)

Cat. #	Title	Price
X75	Beekeeper's Year Wall Chart	13.25
X46M	Life Cycle of the Honey Bee Wall Chart	13.00
X69	12 Color Study Prints	32.00
XP102	6 Full Color Beekeeping	1.95

BEE CULTURE MAGAZINE

Y10	1 Yr. Subscription	$17.00
	1 Yr. Foreign	$27.00
Y20	2 Yr. Subscription	$33.00
	2 Yr. Foreign	$50.00

ADD SHIPPING & HANDLING CHARGES PER CHART

WEIGHT	SHIPPING & HANDLING
1	$4.35
2-4 lbs.	4.90
5-7 lbs.	5.40
8-10 lbs.	5.70
11-13 lbs.	6.20
14-16 lbs.	6.95
17-19 lbs.	7.85
20-22 lbs.	8.75
23-25 lbs.	9.65
25+	Please Call

● BEEKEEPING LITERATURE (postpaid)

Contains 50 per title in each pack.

Cat. #	Title	Price
Q79865	Rendering Old Combs	$4.00
Q79873	Beeswax: A Quality Product	4.00
Q79881	Seasonal Honey Recipes	4.00
Q79899	Bee. in Residen'l. Neighborhood	4.00
Q79906	Pollen	4.00
Q79914	City of Bees	4.00
Q79922	Language of Bees	4.00
Q79930	Honey Bees: For Pleasure or Profit	4.00
Q79948	Craftwax Candles	4.00
Q79956	Starting A Bee Association	4.00
Q79964	Story of Pollination	4.00
Q79972	Beginning With Package Bees	4.00
QKIT	Bee Lit Kit (Contains 1 each of the above.)	4.00

PLEASE CALL FOR QUANTITY DISCOUNTS ON ALL SUPPLIES, BOOKS, VIDEOS

● HONEY LABELS (postpaid)

Blank Honey Labels are sold as follows: 151MPS – $10.49 for 250; 167PS – $14.49 for 250. All others are sold in packs of 100 for $5.75. Preprinted labels sold as follows: 124G – $7.99 for 500, $11.49 for 1000; 163PS, 164PS, 165PS & 166PS – $6.49 for 250;Others are priced as follows:

Cat.#	500	1000	Add. 1000
P96C	39.95	54.95	44.95
P101G	39.95	54.95	44.95
P103G	39.95	54.95	44.95
P108DG	39.95	54.95	44.95
P113G	39.95	54.95	44.95
P143G	39.95	54.95	44.95
P150CG	39.95	54.95	44.95
P151G	39.95	54.95	44.95
P161G	39.95	54.95	44.95
P161PS	39.95	54.95	44.95
P162G	39.95	54.95	44.95
P167PS	45.95	65.95	59.95
P175G	39.95	54.95	44.95

To Order Bee Supplies, Books, Videos, fill out and return this form to the address below or FAX to the number listed.

ORDER FORM

CAT. NO.	DESCRIPTION	QTY.	UNIT PRICE	TOTAL PRICE	WEIGHT

Photocopy or use an additional piece of paper if needed.

TO ORDER PLEASE CALL OR WRITE TO

THE A.I. ROOT COMPANY • 623 W. LIBERTY ST., MEDINA, OH 44256

1-800-289-7668, EXT. 3219

FAX 330-725-5624

VISA • MASTERCARD • DISCOVER

CARD # _____

Exp. Date _____ Day Phone # _____

Subtotals (price & weight)			lbs.
Sales Tax (Ohio Residents Add 5.5%) (Texas Residents Add 8.25%)			
Shipping (check one): See shipping fees.			
___Ground ___ 2nd Day Air ___ Next Day Air Call For 2nd or Next Day Delivery			
TOTAL AMOUNT			

THE A. I. ROOT COMPANY
P.O. Box 706
Medina, OH 44258-0706

Bulk Rate
U.S. Postage
PAID
Permit No. 3200
Cleveland, OH

Name: _____

Address: _____

_____

require limited food. The Carniolans adjust the brood nest to match the food supply.

This race does well in the northern sections of the United States and can be successfully kept by New Englanders who do not move their hives south for the Winter.

Italian bees (*Apis mellifera ligustica*, Spinola) originated in the Apennine Peninsula in Italy and do well in temperate and warm climates. Because of their original location, which provided abundant stores, this race maintains a large brood regardless of the food supply. Cold, wet Springs or hot, dry Summers can cause these colonies to starve. Italians keep a large colony with high food demands during the Winter, and northern keepers can lose hives to starvation.

From these three races, hybrids have been genetically developed. The breeders determined the characteristics they wanted and selected queens with those characteristics. The hybrids will have the basic qualities of their dominant race but may exhibit some stronger, better qualities. In the United States, three hybrids are frequently marketed.

Buckfast bees are a hybrid first bred at the Buckfast Abbey in England. One characteristic important to the breeders was wintering ability. It's a favorite among Northeast keepers who testify to its survival in cold Winters and damp, late Springs.

Starlines are another popular hybrid bee. They're produced from several strains (not races) of Italian bees and do well in warm climates. Northeast keepers who move their colonies south for the Winter often queen their colonies with this bee. They make lots of honey.

Midnite bees are also a hybrid of Caucasian strains. They do well in cool, damp climates.

PURPOSE

Each race of bee contributes to the pollination process, makes honey and reproduces its species. Some are better at one process than others. If you're practical, you will look at your operation's primary purpose and requeen or begin new colonies with the bee best suited to your purpose.

Pollination – If you want to take your colonies into orchards as part of your management, you'll want a race that has a fast Spring buildup. Carniolan and Starline, (or other Italian hybrids) bees have a rapid spring buildup. Other races and hybrids have slower spring buildup.

"I put 350 hives out for apples," said Norman Farmer, a commercial keeper who needs the Carniolans to get the work done. "The Carniolan hives explode in the Spring. They need pollen for that early buildup. They're out there flying. That's what it takes to pollinate the fruit trees," he explained. Some Italian, Caucasian, Buckfast and Midnite bees have a slower Spring buildup.

Honey production – If you don't put your hives out for early pollination and primarily want top honey production, most keepers recommend Italian bees. "The Starlines are great honey producers," reported Jadczak. This hybrid of Italians was developed with the commercial beekeeper in mind and is a very popular choice in the South and among northern keepers who move their hives south in the Winter. Farmer also agreed and said, "Italians produce the most honey if you can get them to Winter through."

The original geographic location of this race is responsible for the high honey production. In Italy, their food supply was abundant and available over a long, warm season, so the race could always build up a large brood population. Today, lots of brood means more pounds of product.

While Italians are the top honey producers, you need to remember the section on climate here. Italians need abundant flora and pleasant weather to produce their honey.

Caucasians and Carniolans may not produce as much honey as the Italians (but they often do) but they will produce in more adverse conditions. They will fly earlier and later in the day than Italians, and they will forage in cool, rainy weather. Under the right conditions they will greatly outproduce Italians for a harvestable crop.

HANDLING QUALITIES

Some races are easier to work than others, and adverse characteristics may add hours to the harvest of honey or may make the hobby unpleasant for a small keeper. The temperament of the race is an important characteristic to consider in this category. "Smoky Mountain Grey Caucasian Bees-gentlest bees in the world," an ad in *Bee Culture* reads. Most keepers agree with this claim and say Caucasians are the gentlest of all the races.

Midnite bees, another hybrid, retain the gentle characteristic of the pure breed. Carniolans also get high marks for usually calm, nonaggressive behavior. The Starline breeders have worked to include gentleness as a selected genetic characteristic, so these bees also tend to be easy to handle, but Italian and Buckfast stock may be less amenable to working.

"The meanest bees I ever worked were a hive of hybrids that hadn't been requeened for years," Jadczak warned. Remember, hybrids lose breed characteristics rapidly.

Part of working your hives is taking the supers apart. Heavy propolis production can keep you prying for what may seem like forever. "Caucasians produce a lot of propolis," Farmer reported. Most keepers, on the other hand, gave the Buckfast and Carniolans rave ratings for low propolis production. Starlines and Italians fit a middle range, while Midnites went for the top range.

Work involved with beekeeping also increases if colonies swarm. Caucasian, Midnite and Buckfast bees have a low tendency to swarm. Starlines, and most Italians in general have a moderate average. Carniolans, however, frequently swarm because of their rapid Spring buildup, but this can be easily curtailed with timely management.

DISEASE

"We can't work bees the way we did years ago, without chemicals," Farmer said. "We've got to control disease." That's true, but breeders have been developing stock genetically resistant to disease. Here is where the hybrids excel. "The Buckfasts are disease-resistant," Jadczak said. According to many, many research reports, the Buckfast was developed specifically for disease resistance, and low levels of tracheal mites in this breed are documented.

Norman Farmer's genetically selected pool of characteristics also is engineered for disease-resistance. By keeping "survivor bees" separated

Continued on Next Page

RACES ... Cont. From Pg. 33

from others and breeding from them, he also has documented hives with resistance to tracheal mites. "Now things are coming back. It's exciting to experiment," he said about new developments of genetically disease resistant bees.

Even with improvements in the area, whatever race you select will need to be monitored for disease and treated properly if the bees show signs of illness.

Knowledge of race characteristics should help guide your purchase of new queens, but there are several other factors to keep in mind.

"The bee population in the United States is more homogenized now than it was a hundred years ago," Jadczak said as part of his advice when purchasing a race. "We've moved bees around, and there's been outbreeding." To get stock that has more of the noted race characteristics you want, Jadczak suggested ordering from areas with a high population of the race. "Georgia, Florida, the southern states have high populations of Italian bees. California is a zone where they raise a lot of Carniolans," he said, but also added, "Mutts aren't bad either."

By "mutts" Jadczak is referring to crosses or strains that develop naturally in local areas or are bred by local keepers. "Mutts" or local hybrids may be the perfect bee for your apiary, especially if they have been developed by a beekeeper like Norman Farmer. Farmer is actively working to produce a stock of queens with characteristics perfect for New England's cold Winters. He calls his stock International Bees and sells 200 to 400 five-frame nucs of his hybrids each year.

"A guy called me and said I could have 250 hives for nothing. I just had to clean them out. They were all dead but one. I took that one and separated it from my other bees. If that one hive lived, there had to be something special about those bees," he said, describing a step he has taken repeatedly to find bees that Winter over in bad weather.

"We can raise bees and keep them here all year long," he said with certainty.

Farmer is considering his requirements and matching traits to them. That's what each of us should do. But we must also heed this last warning.

After my study of all the races and hybrids, I thought of handling the situation the way I solved my car problem: Buy several models and cover all bases. Bees, however, are not as easy to garage as vehicles, and as Tony Jadczak pointed out, they will homogenize. It's best, if you want to maintain a colony true to its original characteristics, to regularly requeen from known stock from a producer you trust.

With all this in mind, I made a purchase. I ended up buying five-frame nucs of Carniolans from a local keeper. Since I live in upstate New York where it's very cold, I needed a bee that would Winter over well. My hives are close to the apple trees and a few yards from the garden. Carniolans will fly right out and pollinate those fruit trees. Since I'm a hobby keeper, the disposition of the Carniolans appealed to me. We have skunks and bears, but we also have two dogs to keep these enemies at bay. I'm not weighing my honey produce with dollar signs in my head, so I didn't need less Winter-hardy Italians.

I selected the best race for me. Now all I have to do is manage those colonies and with luck, harvest the honey. BC

Linda Batt is a sideline beekeeper and freelance writer from Rensselaer Falls, NY.

Controlling HONEY BEE TEMPERAMENT

Mark Headings

Maintaining a gentle colony not only makes beekeeping easier for you, it can save you a ton of grief.

Differences in temperament between honey bee colonies must certainly have been observed and experienced by most beekeepers. When working with my own colonies, it does not take long for me to discover which have a stronger aversion to my presence. From the human standpoint, one of the negative aspects of honey bees is getting stung. It is probably a greater concern for the general public and new beekeepers than for those of us more experienced in the craft. I recall an old-time beekeeper once telling me that he occasionally spoke to school children about honey bees. One of the frequently asked questions was, "Do you get stung?" His reply would be, "Well, when you go swimming, do you get wet?" Of course, to the experienced beekeeper, getting some stings is not of great concern as long as the number does not exceed his or her own acceptable threshold. I have been keeping bees for nearly 18 years and can attest that there is a limit to the number of stings that I am prepared to tolerate without uttering some choice verbal comments and making rapid, drastic changes in my behavior.

When I first considered becoming a beekeeper, I decided I would begin in a big way. Therefore, rather than start with one or two colonies, I began with 15. I purchased 15 three-pound packages of bees with beautiful, golden, hybrid queens. They were placed in new equipment on undrawn foundation. All 15 of these hives were lined up in a straight row, and all painted a beautiful white color. The colonies all flourished, and for a new beekeeper, they seemed reasonably docile. I had heard that when this strain of hybrid queen was superseded, the new queen could be more aggressive. I later learned that was an understatement. By about the second or third year, I noticed that one colony on one end of the row had become very aggressive. For a new beekeeper, this was my version of a "killer bee" colony. I believed the original queen had been superseded although I cannot recall verifying that. The original queens were painted so it would have been easy to confirm. I wore a veil zipped to my bee suit along with gloves. In spite of being well-protected and using smoke when opening up the hive, the bees from that colony would stream out and attack me as if I were the single worst enemy they had ever encountered. I would soon discover bees inside my suit and veil and marvel at how they got in. The wonder would soon turn to panic once I realized I had become a living pincushion. With the veil and suit tightly zipped together, it was not easy to run and quickly shed that cocoon.

One Spring day, I decided to split that colony, and not once, but twice. In so doing, I thought I could really weaken the colony. At that stage, it had reached a point of revenge more than anything else. I was once again severely punished by the bees in the process of splitting the colony. Once the job was finished, I had this sense of having gained the upper hand and having conquered the "beast." What I discovered later was that the bees had the last laugh.

At that time, my children had some pet chickens in an outdoor pen

Continued on Next Page

Mark Headings and his 15 brand new colonies.

HONEY BEE ... Cont. From Pg. 35

100 feet or more from this "killer bee" colony. What I did not realize when splitting that colony was that I was not the only recipient of their aggression. They also flew to the pen and began to vent their anger on those helpless chickens. It was later that evening when I asked my daughter to go with me to help catch the chickens and put them in cages that I realized what had happened.

Upon approaching the pen, I could see that some type of catastrophe had occurred. A couple of the chickens were dead, a couple more had their heads hanging down, and several others were still running around. Upon inspecting the chickens more closely, I noticed that the heads of those affected were covered with bee stings. There were also soft-shelled eggs which had been aborted lying on the ground. We caught the ones that had been severely attacked, but were still alive, and began removing the stings from their heads, one by one, with a forceps. I estimated 30 stings per head. We then gave the chickens an oral dose of Benadryl and placed them in cages. They survived and began laying eggs again within a week or two.

I realized that I could have changed the temperament of that colony when I first discovered it by killing the old queen and installing a new one. However, beekeepers are human, and I had put off doing what I knew should have been done. The genetics of the queen is key to the disposition of the entire colony.

The Africanized honey bee *Apis mellifera adonsinii* is well-noted for its aggressive behavior. Guzman and Page reported that hybrid workers (Africanized and European descent) were as strongly defensive as "pure" Africanized colonies. It would appear that the strong defensive behavior of Africanized bees is genetically dominant. An investigation by Villa demonstrated that bees from Africanized colonies stung twice as fast and left eight times more stings than those from European colonies. A study of the guarding behavior of bees from colonies exhibiting high and low defensive responses led Breed and Rogers to conclude that guarding behavior is at least partially controlled by genetics. Needless to say, factors other than genetics may also sporadically affect aggressiveness, such as environmental conditions and the availability of floral food sources. As a casual observation during my beekeeping years, I would say that the more aggressive colonies I have encountered have also tended to be good honey producers.

Requeening colonies every year with young queens from known genetic stock is a good practice to follow in order to alter the overall temperament of your bees. It's also good for your chickens. BC

References

Breed, M.D. & K.B. Rogers. 1991. *The Behavioral Genetics of Colony Defense in Honeybees Genetic Variability for Guarding Behavior.* Behavior Genetics 21 (3): 295-304.

Guzman, Novoa E. & R.E. Page Jr. 1994. *Genetic Dominance and Worker Interactions Affect Honeybee Colony Defense.* Behavioral Ecology 5 (1): 91-97.

Taber, Steve. 1987. *Honey Bee Temper.* Gleanings in Bee Culture 115 (3): 167-168.

Villa J.D. 1988. *Defensive Behavior of Africanized and European Honeybees at Two Elevations in Colombia.* Journal of Apicultural Research 27 (3): 141-145.

Mark Headings is an associate professor at the OH State Univ. Agricultural Technical Institute, Wooster, OH.

What will you do with all those SWARMS?

Richard Bonney

Swarms happen. In spite of our best intentions and our best efforts, swarms do happen. After all, we are fighting nature, and Mother Nature is a formidable opponent. She intends for bees to swarm, and it is in the best interest of the bees in the natural scheme, where there must be some way to replace colonies that die of fire, flood, famine, and disease. If we didn't have swarming, we would have no feral colonies. Without feral colonies, the natural world, home gardens, and even many commercial growers would have a substantial reduction in the available pollination force. We have seen this in recent years, as mites have decimated our colonies and reduced the number of pollinators from both kept and feral sources.

So, I will gripe and complain if my bees swarm, but I can comfort myself a little in knowing that it is for the greater good. On the other hand, when some other keeper's bees swarm, and I am able to pick them up, I will rejoice in my good fortune.

With these thoughts in mind, and as the swarm season approaches, I will review both my swarm-control procedures and swarm-prevention techniques, and I will expect my bees not to swarm. But, I will also be prepared if they do.

A part of this preparation is to have equipment ready, and furthermore, to have the equipment with me whenever I am out and about. You can capture a swarm in something as simple as a cardboard box or even a paper shopping bag, but a more substantial container is so much better. Routinely, I carry in my vehicle, usually the pickup truck, at least one single-story hive with 10 frames of foundation and a bottomboard already stapled in place, and a pair of covers. As often as not, this equipment is old and tired, something I might not routinely use on a hive, but good enough to pick up and hold a swarm until I can decide what its ultimate disposition is to be. I also usually carry a nuc box with frames of foundation for picking up a small swarm. If I use either, then I replace it in the truck with another like piece of equipment as soon as possible.

As a part of my day-to-day routine during the beekeeping season, I carry a box of paraphernalia which includes a hammer, hive staples, screening, small pruning shears, and grass clippers. During swarm season, I add a small pruning saw, a pair of long-handled loppers, and a coil of half-inch rope. I also include in my kit an old sheet or other piece of material that will serve as a ground cloth. I'll come back to that. I don't usually carry a ladder, but if I receive a swarm call, and the description sounds as though one would help, I put a stepladder on the truck. With this array of equipment, I am ready for most contingencies.

When I get a swarm call, I routinely ask questions. Where is the swarm hanging? Can I get to it? How high off the ground is it? How long has it been there? Is it bothering anyone? Has anyone disturbed it or tried to chase it away? I have learned to listen carefully and ask more probing questions if the initial answers are vague or disquieting.

The answers can be interesting and very misleading. For instance – "It's right there on a bush, you can walk right up to it." Upon arriving, I find the swarm to be in the middle of the bush and only a snake could get in there. Furthermore, it is not just a bush. It's a prize ornamental and not to be damaged. Other times, in answer to how high is it, I hear something to the effect, "Oh, it's right overhead. You can reach it easily." The swarm turns out to be 30 feet up in a tree, and out six feet from the trunk.

Certain answers automatically turn me away, or at least affect the way I approach the situation. If the swarm is high up

When I get a swarm call I routinely ask questions ...

- ***Where is it hanging?***
- ***Can I get to it?***
- ***How high?***
- ***How long has it been there?***

in a tree, I lose interest quickly; I'm not interested in climbing. My life is worth more than a swarm. If the homeowner has been attempting to drive the bees away by spraying the swarm with a hose, or if the swarm has been hanging there for a couple of days or more and is "dry," that is, it has used up the food reserves it was carrying, I treat it with great respect. Such bees tend to be feisty.

The swarms I prize are the ones found within three or four feet off the ground, hanging on a bare limb with no obstructions around or under. Surprisingly, I find quite a few of these, compared to the ones up high. With these low ones, it is a matter of spreading the aforementioned sheet on the ground directly under, setting the hive in place on the sheet, temporarily removing a few frames, and shaking the swarm so that it drops into the hive. One firm but vigorous shake usually does it. Some of the bees will spill over onto the ground around the hive. The sheet helps to keep them from getting lost in the grass, and they crawl across the sheet to find the hive entrance quickly. Sometimes a little judicious smoking helps them to move along, but I find that smoke is not necessary to work with a swarm. The bees are normally and naturally calm. If I treat them gently, they will treat me gently. But isn't that the way with bees most of the time?

Once on the cloth, they'll usually march right in.

The easiest swarm I ever collected resulted from a call from a beekeeper. One of his hives had swarmed, and he didn't want to deal with them. He wasn't afraid of them; he simply couldn't be bothered. I arrived to find the bees spread out flat on the ground on a bed of pine needles in a grove of pines. I was able to drive up to within six feet of the swarm. I set the hive down on the edge of the mass of bees, puffed a little smoke on the far edge of the mass, then waited about 15 minutes until they had all marched in. With the covers in place and a screen on the entrance, I was ready to go. The beekeeper, observing all of this, wished me well as I drove away with half his colony.

On another occasion, I discovered a swarm in my own yard, wrapped around the trunk of a small tree, about three feet off the ground. This one, too, was easy. I placed a sheet on the ground on the side of the tree where the swarm was thickest, set the hive as close under the swarm as it could go, then whacked the tree trunk once with a heavy crowbar. The shock of the blow was enough to jar the bees loose. They fell neatly into and around the hive and soon all the bees marched in.

Of course, not all swarms are collected so easily or successfully. Another one involving my bees was a disaster. I was not at home one day when a swarm emerged from one of my hives. Another beekeeper, a friend, was passing by just as it happened, and he stopped. The bees alighted in a convenient location, and he was able to capture them in a five-gallon plastic pail that he found in the garage. He then put the lid in place, set the pail in the shade, left me a note, and departed. About a half-hour later I arrived home to find that all of the bees had suffocated in the pail. It was a huge swarm. I have since had occasion to capture swarms in a pail. I have been sure to close the pail with screening or cheesecloth, though.

A pail, or even a cardboard box, does make a suitable receptacle in the absence of a hive or nuc box, but I always put something into such a container for the bees to cling to, usually a stick of some sort. Often it is the small branch the swarm was clinging to when I captured them. Without this stick, the bees end up in a mass on the bottom of the container. That may be OK for a few minutes, but not for a jolting ride in a vehicle.

What do you do with those swarms after you capture them? Choices abound. An obvious one is to use it to start a new colony, and this is the route many beekeepers take automatically. I know a novice beekeeper who managed to capture nine swarms in one season. (It was a good year.) He set up nine new colonies, without regard to the size of the swarm. Only three of those colonies were able to build up to survive the following Winter.

If you don't want a new colony, or if the swarm is a small one, then another obvious choice is to combine it with a weak colony, or with an earlier caught swarm. Even if you don't want another colony, perhaps you could set it up anyhow, in decent equipment, and offer it for sale. Of course, this depends on the demand for bees in your area, but it usually is not difficult to sell a good colony.

I make it a point to keep a couple of nucleus colonies on hand throughout the active season, usually in four-frame nuc boxes. Small early swarms are an excellent way to get these nucs started. They grow rapidly, so they are an excellent resource all through the season, donating frames of brood to weaker colonies, supplying a queen in an emergency, or as a source of bees to establish an observation hive. A nuc is also a handy way to provide a ready source of bees to an arthritis or multiple sclerosis sufferer who is practicing bee venom therapy.

Continued on Next Page

SWARMS ... Cont. From Pg. 39

A swarm hived in a nuc box will expand quickly into the limited space. If control measures aren't taken, the nuc itself may swarm.

What if you just plain don't want more bees? That's easy if you get a swarm call. You don't accept the opportunity and refer it to another beekeeper. If it is a swarm from your own hives, though, what do you do? A temptation is to immediately combine the swarm back with its parent colony. Don't do it. The bees will probably swarm again. Combining immediately means that you have re-established in the hive the conditions that caused the bees to swarm in the first place. You have not satisfied that very real phenomenon, the swarm impulse. It must be satisfied, either through actual swarming or by causing the bees to believe they have swarmed.

A simple way to do this is to accept that, temporarily, you must have an extra colony. Install the swarm in a single-story hive with bottomboard and covers and place it on top of the parent colony – two separate and distinct colonies, one on top of the other, both colonies oriented to the same stand. The bees will have successfully swarmed, and the swarm impulse will abate. In about two weeks, destroy the queen in the swarm colony (she is old) and recombine the two colonies into one. Keep in mind that in the parent colony, the new queen emerged about a week after the swarm left. She is still maturing and may not yet have started laying as you go to combine. Treat that hive gently, perhaps even delaying another week or so. BC

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

Build & Use This Honey Bee VACUUM

James E. Tew

Many years ago, I needed a bee vacuum system in order to conduct some research assignments. I had to remove bee populations, estimate their numbers, estimate brood populations, and then put everything back into the hive – even during the middle of Winter. I developed a simple vacuum to help me with this unusual beehive manipulation. The description of the vacuum trap that follows is the result of the evolution of our bee vacuum over the years.

Uses for a Bee Vacuum A bee vacuum can be used for picking up swarms, removing bees from the walls of buildings, removing bees from flight cages or other research projects, removing bees from honey processing rooms, taking bees off people who have presented bee beard demonstrations, and filling packages for making splits or divides.

Vacuum Source The vacuum power can be either an electric shop vacuum or a gasoline-powered tripod bee blower available from some bee equipment companies. Normally, a bee blower is used to *remove* bees from honey supers. In reality, nearly any vacuum device, such as a leaf blower, can be modified to provide suction for the vacuum device. The advantages to using an electrically powered vacuum include reduced equipment cost, and simplicity; but electricity is required. The advantages to modifying a bee blower to serve as a vacuum are that the device is self-powered and it will work anywhere. Second, it offers another use for what is normally a single-use piece of equipment. The obvious disadvantage is the initial cost of the bee blower and its mechanical maintenance. For those not interested in purchasing a blower or building a vacuum trap, a commercially produced vacuum device is available from Southwest Ohio Hive Parts that sells for $325.95.

Modifying the Blower to Accept a 2¼" Vacuum Line A tripod bee blower, such as is available from Dadant & Sons, comes with a simple screen covering over the air intake hole. This is a safety feature that prevents both bees and fingers from getting into the impeller. Remove this screen and replace it with a plywood board six inches square. Attach the board with quarter-inch machine nuts and bolts. Be sure that they clear the impeller blades. In the center of the board, bore a hole measuring 2¼" to accept the vacuum line. Naturally, if you are using a larger or smaller hose, modify the opening to accept the size vacuum line you are using. There is no requirement that a 2¼" hose be used, but they are readily available, they don't clog as easily as smaller lines, and they give a more even vacuum pressure.

Vacuum Hoses Initially, a four-inch plastic drainage line was used as the vacuum hose from the blower to the trap box. Though it was inexpensive and worked well, it was bulky and did not travel well. As the vacuum became more diversified, we changed all lines to common 2¼" shop vacuum hoses. Extra hoses are available at building supply outlets or hardware stores. Adapters and couplers are available for increasing the length of either the vacuum hose or the trap hose. We routinely use appropriately sized black plastic tubing for making a long, rigid exten-

Continued on Next Page

The unit, including box, hoses, nozzle and blower. The white hose is connected to the intake opening of the blower using a piece of plywood. On the left, the standard package that sits inside is shown. Air flow goes from the nozzle, through the black hose, into and through the box, continues through the white hose and into the blower.

Inside the box the standard package is held in place with supports, to keep the bees from clogging the exit hole, and to provide air movement space. The air exit hole is shown on the far wall, near the bottom.

sion for retrieving swarms from high locations. This is nothing more than a long nozzle.

The Trap Box Occasionally, I hear of someone who just vacuums bees into a common shop vacuum for subsequent removal. A few bees survive, but most are mangled and killed. It would be comparable to spending about a half-hour in a tornado. A trap in the line is necessary to prevent vacuumed bees from passing through the vacuum impeller or being swirled around within the vacuum canister.

Within reason, the trap can be any size. The first trap I built was nothing more than a modified deep hive body. The trap we use now is made from three-quarter-inch stock with the top and bottom being made from half-inch plywood. We have chosen the dimensions of our current trap box after considering portability, capacity, and suction efficiency. The INSIDE dimensions of the trap box are: 14¾" wide x 11¼" long x 10" deep. There is a removable common bee shipping package in the trap. We selected a style of shipping package of which we have many so we can replace cages as they become full. The bees are drawn into the trap vacuum line at the tip of the hose, pulled into the shipping package where they are constrained by the screened wire walls of the shipping cage, and the air continues into the blower. In order to allow space for air movement, the shipping package does not fill the entire trap box, but is held in place by two wooden cleats. If the cage is too close to the vacuum line exit, bees will be hopelessly drawn against the wire wall of the shipping cage. If they are unable to move away from the vacuum exhaust, increasing numbers of bees can plug the air flow. The shipping package that we use requires a space 14¾" wide x 5" long x 10" deep in the trap box. The 6¼" space *not* filled by the shipping package is for air movement and to keep the side of the package a few inches from the exhaust vent hole. The inside lip of the trap is lined with adhesive-backed weatherstripping in order to assure a good vacuum seal.

When determining your own trap dimensions, consider how the trap will feel on your shoulder as you stand near the top of a ladder with a swam still several feet above and a bee blower running, full throttle, beneath you. Big traps are not always better traps even though they have more capacity.

Vacuum Line Openings The vacuum trap line opening in the top is positioned so it is directly over the hole in the shipping cage when the top is in position. The vacuum line hole exiting to the blower is positioned four inches from the trap bottom. All openings are 2¼".

Vacuum Pressure Shunt Too much vacuum pressure can harm bees. A 2¼" opening in the trap top is positioned over the empty space within the trap (i.e., on the opposite side from the trap vacuum line in the top). Though bees should not be in this part of the trap, nevertheless, the shunt hole is covered with 8-mesh hardware cloth. A simple wooden flap is closed to increase vacuum pressure or is opened to bypass the trap vacuum, thereby decreasing vacuum pressure. Partially opening or closing the shunt hole will adjust the vacuum pressure. The pressure of the vacuumed air will hold the flap in place while the blower is running.

Vacuum Trap Operation Bees are drawn, by vacuum pressure, into the hose that the beekeeper is using to pick up bees. Normally, the far end of the hose has a nozzle on it, but that is not required. Vacuumed bees tumble down the trap hose and enter the vacuum trap through the top hole. The bees fall into the shipping package where they are confined. The vacuumed air continues to flow through the screened package out the exit hole, through the vacuum line to the blower where air is exhausted from the blower. Ironically, in this bee vacuuming process, although this air is considered to be "waste" air while removing bees from honey supers with a bee blower, the exhausted air is the critical principle in blowing bees from supers. In this instance, using opposites – vacuuming and blowing – achieves the same goal - removing bees from something.

The amount of pressure needed to vacuum bees can only be learned from experience. If the operator touches the comb with the vacuum nozzle and bees are whisked away effortlessly, there is a good chance the pressure is too high. At the correct vacuum pressure, bees should cling to the comb, holding on for just a second, and then be lightly drawn into the vacuum trap tube. The bees striking the wall of the vacuum trap tube should have a velvety feel while sharp thuds would indicate too much vacuum pressure.

Again, only experience can tell you when the package is full. Surprisingly, the trap vacuum line can be removed – with the blower running – and a flashlight can be used to determine how full the package is. Bees are unable to fly or even crawl out of the top opening due to the resistance of the vacuum airflow.

IMPORTANT Note that confined bees in the trap box will die within minutes if the airflow is stopped and the bees are confined to the trap. The bees are very disoriented and excited. Confining them in the trap with no airflow allows excessive heat to build up within four to five minutes if the package is nearly full. As a note of interest, drones die first.

ALSO IMPORTANT Note that bees that are vacuumed into a shipping package and then are immediately released usually have a major attitude problem, especially if they were taken from a hive rather than from a swarm. There are significant stinging occurrences when freshly vacuumed bees are immediately poured back out. Feed the package sugar syrup, keep it dark and cool, and let the bees settle down for a few hours, or even overnight. Then release them.

Removing the Shipping Package With the blower running, remove the trap vacuum line, soundly thump the trap on the ground, briskly remove the trap top, and immediately place an appropriately sized plywood cover onto the package. Remove the shipping package from the trap and do with the bees as you wish.

Odds and Ends The entire vacuum contraption can be attached to a hand truck if a shelf bracket is built to hold the trap near the top of the hand truck with the blower attached at the bottom of the hand truck by elastic straps. Another comment: Obviously, the longer the vacuum lines, the greater the required vacuum pressure. Early data collected indicated that bees collected with minimal vacuum pressure were unaffected by the ride to the shipping cage. Interestingly, over the period of more than 25 years of use, not one queen has died from being inadvertently vacuumed. However, if the queen can be found and removed, I would certainly recommend it. Don't let the trap vacuum line pick up exhaust fumes from the gasoline engine.

Over the years, this vacuuming device, and all its different styles that were not discussed in this article, has been extremely useful to us. If you have either a shop vacuum or a bee blower (or both), building a trap for the vacuum line is a good idea. You can give the bees the ride of their short lives. BC

Contacts:
The Ohio Southwest Hive Parts
52 Marco Lane
Centerville, OH 45458
1-800-765-5112

The vacuum pressure shunt, or pressure regulator, hinges on top, and controls the airflow inside.

Dadant & Sons
51 S. 2nd St.
Hamilton, IL 62341
217-847-3324

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

VIPER'S BUGLOSS

B.A. Stringer

Neither a snake, nor a lost bug.

In the September, 1882 issue of *Gleanings in Bee Culture,* a letter introduced the principal honey plant of Spotswood, New Jersey, as Viper's Bugloss, "a kind of Boragewort which farmers call a noxious weed. It seems to thrive in the most barren, sandy fields, and blooms well from May till August. It was introduced here by fertilizing a buckwheat patch with nightsoil, and has now, in three years' time, spread over several acres. The honey from this weed is deliciously flavored, and of bright amber color."

Other reports state that the color of Viper's Bugloss honey is white, rather than amber. The "beautiful white honey" collected during the four month bloom of the plant interested many of the bee men of the time. Over 200 pounds of "white box honey" was reported from a single colony in one Summer.

There was some concern about the weediness of the plant, after its successful start in the state. Mr. A.I. Root cautioned, "We have really no right to make our honey farm a nuisance to the neighborhood by bringing in foul weeds; so perhaps you had better take your bees down where it grows, instead of sending for seeds."

Mr. Root explained in 1901 that Viper's Bugloss was not a thistle at all, "but more properly a near relative of the borage." The fears of Viper's Bugloss being another perennial rampant weed were allayed when it was realized the plant was "no worse a weed than the borage ... It dies root and branch every Fall and is therefore entirely unlike the dreaded Canada thistle."

Other countries did not share this opinion. A settler named Patterson introduced Viper's Bugloss to Australia where it spread rapidly and became known as "Patterson's Curse." It yielded some honey but little surplus. Canada also became a site of naturalization for the plant. However, in the high country of New Zealand's South Island, Viper's Bugloss is considered desirable pasture for bees, the source of fine light honey with delectable flavor, and locations of the plant are sought after by beekeepers.

Throughout the early 1900's, Viper's Bugloss was apparently common in the meadows and along roadsides in the eastern United States. But, by 1926, Lovell noted the plant was "formerly abundant in the Shenandoah Valley, owing to the planting of large orchards."

Viper's Bugloss was selected for sowing on cuttings and embankments of roads and railways in Germany, to improve bee pasturage, during the 1930's. It was also recommended for sowing in waste places.

Honey from Viper's Bugloss was described as having good flavor and body. The plant grows about two feet tall, and bears blue flowers which bloom in August and September. Historically, the plant was thought by the Greeks to discourage serpents. The root, drunk with wine, was regarded both as good for snakebite and also as continuing protection against being bitten in the future.

Echim, the Latin name, is derived from the Greek "echis," a viper, and *vulgare* means "common." The unusual common name, contrary to first impressions, has nothing to do with lost bugs! Bugloss is a generic term applied to some rough textured plants and derived from Greek words for ox (*buos*) tongue (*glossa*). A combination of folklore and general description results in the common name of Viper's Bugloss.

The plant is also known as blue week and blue thistle. These common names can be confusing because there is another unrelated plant also called blue thistle.

Although the plants are biennial, some may bloom in their first year if sown early enough. The rough speckled stem produced bristly leaves, then pink flower buds open to blue flowers in mid to late Summer. Both nectar and blue pollen are produced by the blooms.

Today, the relentless onslaught of agriculture has done away with many of the hedgerows and waste areas where weeds such as Viper's Bugloss once thrived. Cultivated relatives of the plant are grown as ornamentals and are also attractive to honey bees. The tender perennial "Pride of Madeira," *Echium fastuosum*, grows three to six feet tall with large flower spikes in May and June. "Tower of Jewels," E. *wildprettii*, is a long-leafed, low-growing plant in its first year, sending up a six-foot high column of rose-colored flowers in its second year. After the thick column finishes blooming, the plant dies, leaving a proliferation of seeds to grow the next year. BC

Seeds of Viper's Bugloss and other varieties of *Echium* are available from Thompson and Morgan, Box 1308, Jackson, NJ 08527.

B.A. Stringer grows bees, and bee plants near her home in Blodgett, Oregon.

From The Land Of

MILK & HONEY

Pam Moore

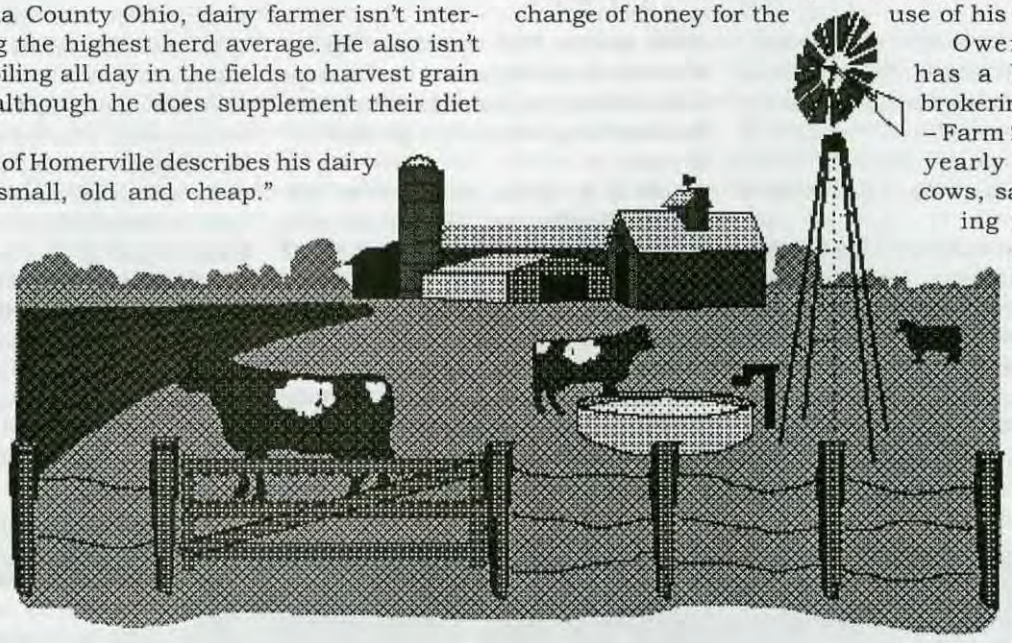
Why would a beekeeper want to make friends with a dairy farmer?

If it's a dairy farmer who practices clover grazing with his herd, such a relationship could be profitable for the beekeeper. Acres and acres of clover with peaceful cows munching away could be an ideal location to place bees.

The problem might be finding a dairy farmer who uses grazing – as most dairy farmers feed grain to their herds. Grain can produce higher herd averages in milk production.

One Medina County Ohio, dairy farmer isn't interested in getting the highest herd average. He also isn't interested in toiling all day in the fields to harvest grain for his cows, although he does supplement their diet with corn.

Fred Owen of Homerville describes his dairy operation as "small, old and cheap." Although this isn't the way most dairy farmers describe their operations. Owen said he plans to continue to make money in a financially gloomy milk market.



Through the use of his computer, Owen linked up with New Zealand's Graze-L, and learned how farmers there used grazing pastures on a rotation basis. Owen's 62 acres, except for house and barns, is completely in pasture. As the clover and grass mature in an area, the cows are moved to that area and enclosed by an electric wire fence. The clover blooms from late May till the first frost – depending on the daylight hours.

Trees have been removed from the pasture because cows congregate around trees. Owen wants them to spread their manure throughout the pasture to promote the growth of clover and grass. If the weather is too hot, he rigs up a hose on a ladder to keep them cool.

While we were walking through an area of the pasture not occupied by his 80 cows, a number of bees buzzed through the lush clover. Owen said the nearest beekeeper is seven-tenths of a mile away. He also said that he had been approached by a beekeeper to place his hives in the pastures.

"Bees don't bother cows very much," he said. When asked how he would work a deal with a beekeeper, Owen said he might take money or he might consider an exchange of honey for the use of his rich pasture.

Owen, who also has a business in brokering dairy cows – Farm 2 Farm, and a yearly auction of cows, said that grazing is still not a popular alternative for dairy farming. A beekeeper might have to do some research to locate such a farm in his area.

"Pasturing isn't really popular in this part of the country," he said. "It's big in Wisconsin and Pennsylvania. In Wayne County (Ohio), maybe 20 out of 600 dairy farmers do it, and 30 more may be in transition," said Owen.

It might be an odd combination – dairy cows and honey bees, but the beekeeper might just enjoy the profits from a dairy farmer who wants to keep his operation "small, old and cheap." BC

Pam Moore is a freelance writer, and one time regular contributor to these pages.

Royal Handshake

Brian Sherriff

Brian & Angela Sherriff (left) are given a Royal Handshake by Princess Alexandra. (©photo by Julia Fox)

If you drive north in England, traveling between the cities of Bristol and Birmingham, you will see on the skyline to the west a row of hills, known as the Malvern Hills, some eight miles long, rising nearly 1,000 feet.

At the foot of these hills lies the little town of Malvern, which spreads along and up the sides of the hills, and it is here that the Three Counties Showground is to be found. This is one of the many sites in the United Kingdom where the agricultural shows are held each year.

These shows attract thousands of people and are primarily shows for members of the farming community, who bring along their prize cattle, sheep, pigs, poultry, and so on. In the main ring, they hold the trials for the prestigious Horse of the Year Show, which culminates at the end of the season in Olympia London and is seen on our U.K. television screens for several nights in a row.

Many other things attract the public to these shows, and there is always something going on in the main ring – from horse jumping and pony club events to the showing of the cattle, motorcycle racing, massed military bands, falconry, and other events. And of course, the ladies are always attracted by the large tented shopping area where they can buy anything from food to garden furniture.

It is at these shows that the British Beekeeping Association has a large marquee containing rows of prize judged honeys, competition notions and novelties, beeswax flowers, honey cakes, and cookies. In the center of the tent and around the sides are stands of the trade exhibitors selling beekeeping books, honey cosmetics, beeswax foundation, beekeeping equipment, beehives, smokers, hive tools, honey jars, and all the paraphernalia that goes with the art of beekeeping.

We exhibit at most of the large agricultural shows and take a stand in the Bees and Honey tent, showing our wide range of protective clothing for beekeepers, including bee suits, smocks, and jackets with hoods and beekeepers' gloves. We also have on our table an assortment of gift items, which we sell to the general public. These products are all "bee"-related and include honey soap, honey cosmetics, tea towels, costume jewelry, cuddly bees, and many small items, all prominently displayed.

This attracts the general public, and sometimes we have visits from members of the royal family. At the Three Counties Show at Malvern we were honored with a visit from Princess Alexandra. She is a member of the royal family who enjoys visiting agricultural shows and especially seeing the Bees and Honey tent. Before her arrival we are visited by the police, who check on the security of the tent and sometimes bring sniffer dogs. Soon after, a large crowd of people will collect outside the tent and then in comes the princess.

She likes to look first at the observation hives and meet the officials of the beekeeping association. Then it is our turn, and she comes to our stand, where my daughter Angela and I are introduced to her. Over the years Princess Alexandra has visited our stand several times at various shows, and she refers to this in our conversations. The first time we met her was at the Royal Cornwall Show at Waldebridge in the Duchy of Cornwall in the extreme southwest of England. We had an observation hive on our table that year, and she spent some time asking questions about the queen bee and her workers; then she bought some honey marmalade from us. In subsequent years, she has visited our stand, and this year, at Malvern, she decided to buy some of our honey soap which is one of the best-selling items on our counter. The princess was amused to see that she was not the only person wearing a bright red suit as I was dressed in red, but my suit was a bee suit! I had hoped that she might buy one to complete her wardrobe, but I was disappointed.

To those who enjoy good music, it is interesting to know that the composer, Sir Edward Elgar, was born at Malvern in 1857. The whole area around the Malvern Hills is very attractive and well worth a visit, especially in June, when the Three Counties Show takes place over four days. If you are able to come, don't forget to visit the Bees and Honey tent as you will be certain to see a queen bee and maybe, with luck, you may meet a real queen! BC

Brian Sherriff designs and sells protective clothing for beekeepers, and travels much of the world in that pursuit.

For More Sales, Try A
Honey Stand

Beverly Stanier

For four years, our large honey sign with its animated bee brought only a dribble of honey customers to our door. Was it our long driveway; were people afraid to "bother" us; were they afraid to be captives to prices that didn't suit them?

Two years ago, we inherited an old garden cart. Our daughter suggested and then designed a honey cart which moved our product from the house to passersby at the end of the driveway. We kept a limited stock on the cart along with an honor box for payment. Our first season of cart sales (late May to mid-October) brought in over $1,000. Tourists stopped to buy and to take family photographs beside the cart. Townsfolk who had driven by the house daily and had never stopped for honey, became regular customers. The cart gave us recognition and established the fact that we were serious beekeepers. Now when someone asks where we live, we mention the honey stand and they know exactly where to find us.

The cart attracted attention and achieved our goal, but it did have its drawbacks. Only those products that could withstand the sun could be set out – no comb, no candles, no wax. On rainy days, we were unable to set out the cart, and a quick mountain shower would send us scurrying to retrieve our products. We needed a set-up which allowed some weather protection and the ability to keep and store product without having to put away everything each evening.

Our next season, Ted designed a honey booth with shelves, storage areas, and doors to open wide for displaying product – honey, candles, candy, wax, cookbooks, lip balm, and hand cream. A bee flag fluttering beneath the apple tree and new honey signs attract passing motorists. We have a steady flow of customers now. Unfortunately, we don't meet them personally, but their notes let us know they are, once again, returning to buy. One customer always draws a happy face and leaves it with her payment.

Our honor box holds a minimum of change, business cards, paper, and pencil. Some folks will leave a tally of their purchases; some do not. We still leave only a minimum of product visible. One glance at the booth, and we know what has sold. Overloading the booth makes it difficult for us to tell what's missing and, psychologically, product is easier to remove without payment. Theft, yes, we've had some, short on payment, that, too. But other folks will leave a little extra and some have thanked us for the honor system. Our losses have been about one percent.

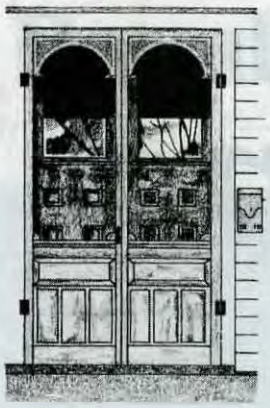
We place a security seal on all our jars to discourage tasting. Because we do not wish to attract bees or yellow jackets, we do not set out a taste sampling jar. The candles, lip balm, and hand care are displayed in a case covered with Plexiglas. Those who are serious about buying will take the time to open the case. For those who are not, it discourages damage.

In October, we load the booth on our pickup and move it to Winter storage. For the remainder of the Fall through Christmas, we have customers come to the door for honey and beeswax products . . . customers who may never have come to our door had they not been attracted to the booth to become familiar with our bee products. BC

Bev Stanier, and husband Ted run Mountain Harvest Honey Farm in Conway, New Hampshire.

Our original garden cart stand.

New & Improved. Protected from the weather, flags, signs, flowers and lots to choose from.



Ann Harman

Home Harmony

Quick Breads

In looking through honey cookbooks, it becomes obvious that the breads known as "Quick Breads" must be the most common type of recipe. Quick breads use fruits and nuts, as well as cereals such as bran and oatmeal. They have quite a few advantages and can be enjoyed in many ways. Indeed, they are quickly made – you don't have to wait for a yeast dough to rise. They are easy to stir together. You can serve them warm or not; they can be buttered or eaten with cream cheese, jams and jellies, and, of course, with honey. Many of them are so moist that they require no topping. Some are suitable to accompany a main dish; some are sweet enough for dessert. And all quick breads can be munched on any time of day – they make a wonderful late-night snack! No potluck is complete without a quick bread. Quick breads also go along with cookies for refreshments at a bee association meeting.

One problem has been encountered with quick breads, however, even in honey cookery shows – burned crust. Quick breads do take a long time in the oven, and perhaps they are easily forgotten. Many quick breads are dark, especially ones with chocolate. Sometimes it may be difficult to tell if the bread is done, so it gets baked until the crust is really brown, which usually means nicely burned. So if you're going to weed the garden while the quick bread bakes, try weeding the houseplants instead. Then you can keep track of the baking. Although honey makes quick breads nice and moist, it can contribute to burning if you're not careful with oven temperature and baking time. Sometimes you may need to decrease the temperature to prevent burning.

Many honey cookery contests offer a class for quick breads. Select your favorite recipe and enter. Then you can add a "blue ribbon winner" to the breads you give to others. Some hints for a blue-ribbon winner: Make certain the batter is distributed evenly in the pan before baking; don't substitute a juicy fruit for a dried one unless you experiment at home first, and don't burn the crust.

Quick breads freeze very well. You can bake a loaf, slice it, and keep it in the freezer as a good backup when something is needed in a hurry. You can also take advantage of seasonal fresh fruits like cranberries and blueberries. Use them in season; enjoy them out-of-season. Quick breads make wonderful gifts. You could start baking Christmas gifts in October and freeze the individual unsliced loaves tightly wrapped in foil. Now, in many parts of the country, the cool, pleasant days of Spring are here. Make a few loaves of quick breads now for those picnics held on steamy Summer days when the thought of a hot oven is horrible.

BLUEBERRY NUT QUICK BREAD

Although you may have some really good quick bread recipes, you might want to try some of these to have a variety stored in the freezer.

2 eggs
1 cup honey
1/2 cup milk
1/4 cup butter or margarine
3 cups flour
1 teaspoon salt
4 teaspoons baking powder
2 cups fresh blueberries
1/2 cup broken walnuts

Beat together honey and eggs. Heat milk and butter; add to honey and eggs. Mix to lemony color. Combine dry ingredients and mix well. Add dry ingredients to liquid mixture and stir until just blended. Toss nuts and blueberries together with a small amount of flour to keep them from sinking to the bottom of the loaf and add to batter. Grease two small loaf pans and divide batter between them. Bake at 350° for 30 to 40 minutes.

The Vermont Beekeeper's Cookbook

HAWAIIAN DATE LOAF

This next recipe is a wonderful combination of dates and pineapple. It is worthy of an entry in a cookery show.

1/4 cup butter or margarine
1/2 cup mild-flavored honey
1 egg
2 cups sifted all-purpose flour
1 teaspoon salt
1/2 teaspoon soda
1 tablespoon baking powder
1 can (8-1/2 ounce) crushed pineapple
2 teaspoons vanilla
3/4 cup finely snipped pitted dates

In mixing bowl, cream butter until soft. Continue creaming while adding honey in a fine stream. Add egg; beat well. Sift together dry ingredients. Add dry ingredients alternately with pineapple to creamed mixture, beating after each addition until smooth. Stir in vanilla and dates. Spoon batter into well-greased 9x5x3-inch loaf pan. Bake at 325° for one hour or until done in center. Cool on rack 10 minutes. Remove from pan. Complete cooling on rack. Makes one loaf.

Treasured Honey Recipes
California Honey Advisory Board

CARROT 'N' HONEY BREAD

Here's a recipe you can vary with your favorite nuts. You will want to use a light and mild honey so you don't mask the other flavors.

1 cup flour
1 cup whole wheat flour
2 teaspoons baking soda
1/2 teaspoon cinnamon
dash nutmeg

1/2 cup honey
2 eggs
1 teaspoon vanilla extract
1 cup vegetable oil
1-1/2 cups grated carrots
1 cup chopped nuts: walnuts, pecans, sunflower seeds

Sift dry ingredients together. In a separate bowl, blend the honey, eggs, vanilla, and oil together and mix well. Stir the dry ingredients into the honey-egg mixture. Blend well. Fold in the carrots and nuts. Pour the batter into a greased loaf pan and bake at 350° for one hour. Loaf is finished when it pulls away from the sides of the baking dish.

A Honey Cookbook
A.I. Root Company

FRESH ORANGE BREAD

1/4 cup shortening
1 cup honey
1 egg
1-1/2 tablespoons grated orange peel
2-1/2 cups flour
2-1/2 teaspoons baking powder
1 teaspoon salt
3/4 cup fresh orange juice
3/4 cup finely chopped walnuts

Cream shortening; continue creaming while adding honey in a fine stream. Add egg and beat well. Add orange peel. Combine dry ingredients. Add alternately with orange juice, a small amount at a time, beating after each addition until smooth. Stir in nuts. Spoon evenly into 9x5x3-inch loaf pan that has been greased and lined. Bake at 325° for one hour or until done. Let cool in pan 10 minutes. Turn out of pan. Cool completely. Store wrapped overnight to blend flavors and for easy slicing.

Honey Cookbook
Missouri State Beekeepers Assn.

PEANUT BREAD

Here's a bread for the kids, not only to make but for a good snack. This bread will also be a good accompaniment to a bowl of soup for lunch.

2 cups whole wheat flour
2 teaspoons baking powder
1/2 teaspoon salt
1 cup peanut butter
1 cup honey
1 cup milk
2 tablespoons oil
1/2 cup peanuts, chopped

Combine flour, baking powder, salt, and peanut butter in a large bowl. Blend the honey, milk, oil, and peanuts together in another bowl. Slowly add honey mixture to the flour mixture, blending well. Pour into greased 9-inch loaf pan. Bake at 350° for one hour or until done in center. Cool before slicing.

The Book Of Honey
Claude Francis & Fernande Gontier

LEMON NUT BREAD

1/3 cup butter or margarine
2 eggs
1/4 teaspoon almond flavoring
1 teaspoon baking powder
1/2 teaspoon salt
1/2 cup chopped nuts
1 cup honey
1/2 teaspoon lemon flavoring
1-1/2 cups flour
1/4 teaspoon soda
1/4 cup milk

Combine margarine and honey. Beat in eggs, one at a time. Add flavorings. Combine dry ingredients and add alternately with milk. Fold in nuts. Pour into 9x5x3-inch loaf pan and bake at 325° for one hour. Combine 1/4 cup sugar and 3 tablespoons lemon juice and pour over hot loaf. Cool 10 minutes and remove from pan.

Kansas Honey Producers Cookbook

GOLDEN BLOSSOM HONEY QUICK RAISIN NUT BREAD

This next recipe would make a good breakfast. You could bake it at a nonbusy time, slice, and freeze it. You can even serve it toasted.

2-3/4 cups flour
1 teaspoon baking powder
1/2 teaspoon baking soda
1/2 teaspoon salt
1 egg
2 tablespoons shortening
1/2 cup honey
3/4 cup milk
1/4 cup plain yogurt
1 cup raisins
1 cup walnuts or pecans, chopped

Sift together dry ingredients. In another bowl, beat egg, shortening, and honey. Stir flour mixture into egg mixture alternately with milk and yogurt just until dry ingredients are moistened. Add raisins and nuts. Put into 9x5x3-inch pan. Bake at 325° for one hour and 10 minutes or until tester comes out clean. If bread browns too quickly, cover with foil. Remove bread from pan. Cool on rack.

Now you should have a whole library of quick and easy breads, just in time for summer picnics, beekeeper potlucks and honey cookery contests at the summer fairs. You can cut slices of quick breads in little squares as taste samples to convince honey customers they can bake with honey. Enjoy your quick breads at all hours of the day. BC

?Do You Know? Answers

1. **False** The queen is normally the only bee in the colony capable of laying eggs that will produce both workers and drones. Laying workers, however, may be found in normal "queenright" colonies during the swarming season and when the colony is headed by a poor queen.
2. **False** Individual egg cells start developing in the tips of the ovarioles (egg tubes) and reach the oviduct in two to three days, at which time they are ready to be laid.
3. **False** The receptacle for storage of semen, the spermatheca, is spherical in shape is recognized by its bright silvery surface. This is the covering layer consisting of a thin network of tracheae which ensures the supply of oxygen to the spermatozoa in the spermatheca.
4. **False** During the fertilization of the egg by the queen, sperm are released from the spermatheca upon the surface of the egg. The chorion is the shell that covers the egg and sperm enter the egg by passing through a tiny pore, the micropyle, found on the anterior end of the egg.
5. **False** About five days after emergence, the virgin makes convulsive movements with her abdomen and at the same time the abdominal orifice opens for several seconds, signifying that the virgin is sexually mature.
6. **False** Mating flights of queens occur when the weather is warm, the wind is fairly calm, and during the afternoon between 1:00 and 5:00 p.m., with the greatest frequency between 2:00 and 4:00 p.m.
7. **True** Since queens are reared from larvae that have hatched from fertilized eggs, queens can be produced at any time workers are being reared by the colony and a stimulus is provided to raise queens. Even though queens can be reared during the winter, colonies will not end up with high quality, mated queens.
8. **False** Estimates as to the number of eggs that a queen can lay in a day are highly variable; ranging between 1500 and 2000.
9. **False** Honey bee queens produce eggs, fertilized and unfertilized. Unfertilized eggs develop into drones and fertilized eggs become either workers or queens, depending on the diet fed to the larvae.
10. **False** There is normally only one queen in a colony, however, under conditions of supersedure an old queen and her daughter may be present and laying.
11. E) Two
12. C) 3.0
13. C) 40,000 bees
14. The virgin queen when ready to take her mating flight appears at the hive entrance accompanied, and often appears to be driven there by several workers. If for some reason the queen is hesitant to fly, workers will prevent the queen's return into the hive and try to force her to flight. While she is on her mating flight, a group of fanning bees with their scent glands exposed, gathers in front of the entrance to assist her in recognizing the hive upon her return. During this time normal flying and foraging almost ceases. So the mating of the queen not only involves the queen and drones she mates with, but the whole colony participates in the event.
15. Several situations can result in a colony being headed by a drone layer. If a virgin queen has not made a successful mating flight within three to four weeks after emergence, she usually becomes incapable of mating and becomes a drone layer. When the queen's supply of sperm in the spermatheca is depleted she also becomes a drone layer. In addition, there are numerous diseases and physiological problems that can prevent the queen from laying fertilized eggs. These problems are often divided into four categories: lack of fertilization, unsatisfactory fertilization, exhaustion of the sperm in old age and pathological drone-laying.
16. New queens are reared by the colony under the emergency (queen is accidentally killed, lost, or dies unexpectedly), supersedure, and swarming impulses.
17. Reasons for requeening colonies are:
    A. reduce the swarming tendency.
    B. increase the chances of winter survival.
    C. control of some bee diseases, i.e. European foulbrood, sacbrood.
    D. production of larger forager populations to increase honey yields.
    E. improve colony temperament.
18. Queens are often marked for the purpose of:
    A. quickly locating them within the colony.
    B. recording the age of the queen.
    C. identifying genetic lines.
    D. knowing when queen replacement or supersedure has occurred.

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

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

Richard Taylor

Bee Talk

"An alternative to packages, and in many ways a better method, is to make up nucs. These can be used to enlarge your apiaries or, if you do not want to do that, you can sell them."

May is when things happen fast in the beeyard and you have to be on your toes. The problem is to keep from falling behind. Here we'll probably have a May frost, and we're very likely to wake up some morning to find patches of snow, but by the second week, the dandelions will be in full bloom, gilding the meadows for miles around, and before the month is over, we are likely to see swarms, especially if we have let the bees get ahead of us. Colonies build up with astonishing speed in May, faster than at any other time of the year. My first comb honey supers will go on in May, and some of the colonies will store an early crop from the fruit bloom. After all these decades of being in the beeyards in May, I am still astonished at how fast things happen.

We had a bee meeting the other day, and all the beekeepers reported that their apiaries are in great condition. Quite a contrast to last year at this time, when most, and in some cases all, of our colonies were dead! Apparently the *Varroa* mites died with them. This is going to give beekeepers a splendid opportunity to increase their colonies to make up for last year's losses. Interest in beekeeping is also way up, possibly stimulated by high honey prices. More and more people are coming to bee meetings, many of them new to beekeeping. And that means there is going to be a demand for bees.

How are we going to increase our colonies and supply bees to the newcomers? Package bees have gotten very expensive, and there are other problems, such as uncertainties about shipping dates. Also, once you have installed a package of bees, you do not get a single bee added to its population for another three weeks, which means that the colony is in decline during that time. Still, I have had very good luck with packages, having a supplier who has never once, in the many years I have done business with him, failed to get the bees to me when he said he would. Last year, after reviving almost all of my hives with packages, I got a record crop.

An alternative to packages, and in many ways a better method, is to make up nucs. These can be used to enlarge your apiaries or, if you do not want to do that, you can sell them. I've done a lot of that, and have never been able to supply the demand. The three-comb nuc is worth at least $30, which is quite a bit less than a three-pound package, and it already has hatching brood, so there is no initial period of decline. You are also almost certain to have no rejection of new queens, provided you do things right. And, of course, you can make up the nucs pretty much when you want them. You do not have to depend on a distant supplier for timing.

The standard way of making a

Continued on Next Page

BEE TALK ... Cont. From Pg. 51

nuc (nucleus colony) is to remove three combs of brood and bees (but not the queen) from a colony, place them in a three-frame nuc box, and give them a new queen, normally a purchased one still in her mailing cage. After a few days, the queen will be released and be laying, and the three combs, with bees, can be put into a regular hive, together with the additional drawn combs or frames of foundation needed. Now you have another hive of bees, which will build up rapidly and give you a good honey crop the first year.

This simple method can be improved upon, as we shall note shortly, but meanwhile, some precautions must be observed.

The first is to make sure you did not get the parent queen when you took those three combs of brood and bees, and it is very hard to be certain of this. If she was on one of those combs and you failed to see her, then of course you'll get two queens in your nuc, and one of them – probably the caged one – will be murdered. Meanwhile, the parent colony will rear a new queen, and you'll probably never know what happened unless you discover that there is a laying queen in that nuc and a dead queen in the mailing cage.

Second, you should, in taking those three combs of brood, try to get mostly sealed brood; there should also be some honey in at least one of them.

Third, as soon as you put those three combs in your nuc box, many of the bees will start drifting back to the hive, depleting the population of the nuc. Therefore, you should try to have those combs covered with as many bees as possible when you take them, and then, once they are in the nuc box, you should plug the entrance of the nuc with grass. After a half-hour or so, you can loosen the grass a bit to let air in; the grass will wither and dry out by the next day so the bees can then come and go.

And fourth, once the nuc is made up, set it on an active hive. Then when you eventually cart the nuc away, the flying bees will have a hive to go into. Otherwise, you will find them flying about, where the nuc was, for days, and they are all likely to perish.

The way to improve on that method, and one that requires almost no extra work, is as follows.

Set a full-depth hive body on one of your strongest colonies, separated from the bees below by a queen excluder. Next, take combs of mostly sealed brood from several different colonies, shaking all or most of the bees from each comb back into the hive. That will make it easy to be sure you do not have the queen. Put all those combs of sealed brood – nine or 10 (I use only nine) – into that empty hive body that is over a queen excluder, and replace the covers. Result? Lots of nice, young nurse bees from the colony below immediately move up through the excluder and cover the combs of brood. But the queen stays below.

Now you can proceed as before, making up three-frame nucs (now you see why I like to have only nine combs in that hive body) and giving each a new queen, still in her mailing cage.

The advantages of this method are that you do not inadvertently get the parent queen into one of those nucs, and you get mostly young bees, which are far less likely to drift back to the parent hive. Also, queen acceptance is virtually certain, since these younger bees are very accepting of a new queen, unlike the older bees. And you get more uniformity of population in the nucs, rather than a few very strong bees and a few weaklings.

Of course, this procedure draws a lot of bees out of the parent hive, but don't worry about it. That is why you selected a very strong colony in the first place. It will restore its population very quickly, and meanwhile, you may have forestalled (but not necessarily prevented) swarming in that colony by the sudden decrease of population.

So far I have spoken only of three-frame nucs. A nuc can, of course, be larger – four or five frames, for instance – and many beekeepers construct their nuc boxes so as to hold that larger number. But three are enough. Fewer than three are not enough. I like to compare a nuc to a fireplace fire. Three logs burn well. So do four or five, but not just one or two.

You can make up nucs even if you have no nuc boxes. The best way to do that is to set a full-depth hive body on a strong hive over an excluder, as described above, put three, four, or even five combs of brood in it, and then fill it up with drawn combs or foundation, and replace the cover. Bees from below, but not the queen, will quickly move up onto the brood, and you give them a new queen. Now the next step is crucial: Replace the excluder with a double screen, that is, a wooden frame, the same size as an excluder, which is screened on both sides. If you do not have such a double screen, then use an inner cover with the hole screened over on both sides. Or, if you don't have that, you can get away with just a solid piece of plywood. Create a crack, front or back, for the bees to go in and out. You can do this simply by raising the hive body a bit and sticking a pebble in to preserve the crack. After a few days, the new queen will be laying, and you can move the new colony thus created to a new hive stand. But you need not rush this, as the nuc, in this full-depth hive body, will continue to build up.

This is an excellent method for making increase, especially if you do not need to move the nucs to another yard, or sell them. It is quick and easy, you can use as many or as few combs of brood as you wish (but not fewer than three), and you go a long way toward forestalling swarming. The nucs are not likely to swarm, with their new queens, and the parent hives are less likely to swarm.

Now why did that divider have to be a *double* screen or, lacking that, a solid sheet? Because if you have only a single screen separating the nucleus colony from the parent hive below, then the queen is almost certain to get murdered. The bees above will think they have a queen, since the distribution of the queen substance continues through the single screen, but not through a double one. This is an extremely important biological principle to keep in mind.

By the time anyone reads this, we'll be off to a great year. I know it. Though in the back of my mind, I also know that bees can upset the most confident predictions. BC

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

Questions?

Shook Swarm Problems

Q The shook swarm method of getting comb honey results in a new super of drawn combs every season, and with only three hives, I do not need these. Would it not work to scrape these combs down to the foundation each year and reuse them for shook swarms? Or would the bees just build drone comb in them?

William Rooney
W. Buxton, ME

A You could do that, if you do not mind spending the time at it. Or you could just hive your shook swarm on these drawn combs, instead of on foundation, contrary to what I have recommended in the past. You should be warned of two things, however: First, most of Maine is not a very good area for comb honey production; and second, producing comb honey by the shook swarm method can result in lots of pollen plugs in the comb honey, due to the proximity of the super to the brood nest.

•

Q With reference to shook swarming for producing comb honey, would the following work: Rather than disrupting a strong colony during the honey flow, could I hive a three-pound package with queen in a shallow super with foundation and perhaps a comb of honey for rapid buildup, then super over that?

Lance T. Biechele
Princess Anne, MD

A That would miss the most important factor in shook swarming. Remember that the shook swarm is hived on the parent stand, so that the swarm itself, which is considerably more than a three-pound package, is augmented by all the foraging bees of the parent colony, since these all return to that stand. Also, the shook swarm procedure is not performed during the honey flow, but just prior to it.

Drawing Foundation

Q I've noticed that when a colony of bees draws out new foundation, they neglect the outermost frames, so I exchange these with frames from the center that are all drawn out. I was told by an experienced beekeeper not to do this. Does it in any way harm the bees?

Tim Armstrong
Ashtabula, OH

A Not really, but it would be better to exchange those outermost frames, with undrawn foundation in them, with the ones adjacent to them, assuming that these are pretty well drawn. By taking combs from the center of the hive, you may be moving brood to the outermost part of the hive, which does no real harm, but it is not where the brood is normally found.

Dandelion Honey

Q If you put supers on when the dandelions are in bloom, do you get dandelion honey in them? I believe dandelion honey is bitter and that the wax is yellow.

Maurice E. Pouliot
Cambridge, VT

A Dandelion, being one of the earliest significant nectar flows, is normally used by the bees for buildup. I do not know whether a significant amount of this honey gets into the supers, but I do know that I have never gotten a bitter honey from any early nectar flow.

Requeening

Q How long can you keep a new queen in her mailing cage before introducing her into a hive? And how do you know when to introduce her? Is timing critical?

Walter H. Brackmann
Apple Valley, CA

A You can keep a queen in her mailing cage a week or more, provided she does not get dehydrated. To prevent this, put a drop of water on the screen of the mailing cage, with your finger, each day. Be careful not to overdo it, or the candy plug will begin to dissolve, and the queen and attendants will get all sticky and die. As for timing, you can requeen a hive at any time, but it is much easier in the Spring.

Requeening With Nucs

Q When you requeen with a nuc, do you put in all three combs with the queen? Does the rest of the colony accept this new queen?

Robert B. Neumann
Troy, OH

A Yes, you simply combine the nuc with the colony to be requeened. The resulting colony will accept this new queen, provided the old one has been removed and there are no queen cells. Sometimes the new queen will take over even without the precaution of removing the queen already there, but you cannot count on this.

•

Q Some beekeepers recommend switching a weak hive with a strong one in the Spring to build up the weak one with the foragers from the strong hive returning to their accustomed hive stand, while other beekeepers say that the returning foragers are apt to overwhelm the weak colony and kill the queen. On the other hand, a well-documented method of requeening involves removing the old queen and placing a queenright nuc in

the brood nest. I should think that this would be even more likely to result in the queen getting killed. What is your experience?

Robert Robinson
Plain City, OH

A This is an interesting question. I have found that switching weak hives for strong ones, while it is fairly safe and is a quick and effective way of equalizing colonies, does, in fact, quite often – maybe one time out of four – result in the murder of the queen in the weaker colony. The method of requeening using a queenright nuc, is, on the other hand, quite safe, provided it is done with minimum disturbance on the part of the beekeeper. As an added safety measure, it is wise to insert the nuc on the side of the hive, rather than right in the center of the brood nest, to give the bees from different colonies more time to mingle. The reason these seemingly similar procedures have different outcomes is that it is the older bees, that is, the foragers, that are aggressive toward a strange queen. A queen in a nuc is surrounded by young bees all going about their business as expected and is not seen by the other bees as threatening.

•

Q When requeening with a nuc, when do you destroy the old queen – at the time you introduce the new queen, or before?

Robert D. Lacey
Farmington, MO

A I think it is best to remove the old queen at the time you combine the nuc to the colony; otherwise the bees will have started supercedure queen cells. And when you combine the nuc to the now queenless colony, it is a good idea to have the new queen on a comb off to the side, rather than right in the center of the hive, so that the bees will not suddenly find a strange queen right in the middle of the brood nest.

Feeding Packages

Q I started two hives from packages in May and have been feeding them ever since. They are now (July 16) consuming two quarts per day. When do I stop feeding them? I was told that they would stop taking the sugar syrup when nectar became available.

Chris Stauffer
Hillsboro, OH

A When packages are hived on foundation you should stop feeding when all but the outermost combs are drawn out and the dandelions and fruit trees are blooming. If hived on drawn combs give them maybe a gallon of syrup to get them started. It is not true that the bees will discontinue taking the syrup when nectar is available, and it accomplishes nothing to go on feeding them. The combs get so filled with syrup that the queen has little room to lay.

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

Answers!

Richard Taylor

Gleanings

MAY, 1997 • ALL THE NEWS THAT FITS

NY Beekeepers A First
DOANS WIN FARM BUREAU HONOR

James and Alayne Doan have been named among the best farmers in the country.

The American Farm Bureau Federation named James and Alayne Doan first runners up in its annual Young Farmer and Rancher Achievement Award competition for 18- to 35-year-olds earlier this year.

The couple also won first place in the NY state Farm Bureau competition in December. Jim and Alayne competed with 36 other state winners in the national competition. They received a beautiful plaque, model of a Case tractor, and a year's use of a Case International tractor of their choice. When they captured the state competition in December, they won a 486 computer, $500 check from Dodge truck and a trip to Nashville to compete in the American Farm Bureau Young Farmer Achievement Award competition.

Dale Mattoon of Union Springs, a partner in a 500-cow dairy farm and President of the Cayuga County Farm Bureau, took top honors in The Young Farmer Discussion Meet held at the American Farm Bureau Convention in Nashville. Mattoon won the four-round competition that included 39 contestants. Mattoon was awarded a 1997 Dodge 2500 HD ¾-ton 4x4 pickup truck. In the New York State competition he won $500 from Dodge truck.

Sandra Prokop, coordinator of the State Farm Bureau's Young Farmer Program said the Doans excelled in each of the criteria used to judge the competition, including management ability, participation in day-to-day operations, progress since inception and community involvement.

In addition to running the farm, James is president of the Empire State Honey Producers, an active member of the Farm Bureau and a member of the Hamlin Conservation Board.

His wife keeps the farm's books, helps care for the bees and runs her own candle business. Together, they've expanded the farm and implemented new ideas and technology.

"They're just an outstanding young farmer couple," Prokop said. "They've set their goals and worked diligently to achieve them."

Winning the awards would be an honor for anybody, but for the Doans it is a major accomplishment. They lost 90 percent of their bees two years ago and had to start almost from scratch last Spring.

They assembled 1,000 hives of their own, leased another 500 and produced 150,000 pounds of honey last Summer. They also improved their facilities and hired their first three employees.

They plan more improvements this Summer, including buying another 1,000 hives and installing a new honey extraction system that should increase production and decrease labor.

Jim got his first hive when he was about seven years old. His wife, on the other hand, hadn't dealt with bees until she met James, but she's very active now, working 50 to 60 hours a week during the busy season.

Their kids are involved in the business, too. Benjamin, 7, has two hives of his own, and his sister, Laura Ann, 8, has one.

Laura Ann recently won third place in the 1997 American Honey Show for a honeycomb she and her grandmother had prepared and entered, and Benjamin made some money when his teacher called him to get rid of a swarm of bees at her house.

In addition to produced honey, the Doans lease their bees to fruit and vegetable farmers to pollinate their crops.

NC CALENDAR

The North Carolina State Beekeepers Association's 1997 calendar is now available.

It is produced primarily for the members of the NCSBA but is for sale to non-members. The calendar measures 8½ by 11 inches when closed and a full 17 by 11 inches when it is opened and hanging on the wall. Each month provides information on beekeeping management and the availability of blooming plants that are nectar and/or pollen sources, primarily for North Carolina conditions, but the information is of value to any nearby states as well.

To obtain one or more of these calendars, you may purchase a calendar for $6.00 per calendar (includes shipping and handling) or you may join the NCSBA for 1997 and receive a free calendar. Dues for the NCSBA are $10.00 per year. Send your check (indicate calendar order or membership with free calendar) to NC State Beekeepers Association, 1403 Varsity Drive, Raleigh, NC 27606. Make checks payable to the NCSBA.

Don't Do This
GAS & PLASTIC TRUCK BEDS

Fill gasoline cans on the ground only – never fill a gasoline can in the bed of a pickup truck equipped with a liner.

According to safety experts, the insulating effect of the plastic bed liner prevents the static charge generated by gasoline flowing into a metal can from grounding. As the charge builds, it can create a static spark between the can and the gas nozzle. The gasoline can spontaneously ignite, burning the person pouring it and anyone else in the vicinity.

The experts say 23 injuries or deaths have been attributed to truck owners fueling a gas can or tank that is sitting in the back of their pickup truck. Major companies, including Ford Motor Corp., Standard Oil Co., and Chevron, have issued technical or service bulletins warning about the danger. Chevron advises that all cans be placed on the ground away from vehicles and people when being filled.

BETTER DELIVERY

Here is some good news! Delivery of mail is improving fast, according to Price Waterhouse, which tracks overnight local delivery. Over 90% of 1st-class mail arrives on time, up from 79% three years ago. Best performers: Omaha, NE, City of Industry, CA, Harrisburg, PA, Honolulu, HI, New Brunswick, NJ, Wichita, KS and Van Nuys, CA.

HONEY BOARD NEWS

EXPORTS UP FROM ONE YEAR AGO U.S. honey exports were up significantly in January compared to one year ago, reports the U.S. Department of Commerce Census Bureau. Bulk shipments increased 55 percent, from 156 metric tons to 235 metric tons. Retail shipments were up 17 percent, from 119 metric tons to 139 metric tons. In other news, Nielsen reports that retail honey sales for the 52-week period ending February 15 were down 5.1 percent in pounds and up 18.9 percent in dollar volume.

•

SURVEY OFFERS INSIGHT INTO COMMERCIAL HONEY USAGE The National Honey Board commissioned Food Processing magazine to conduct a survey of its readers to determine if they have increased or deceased their use of honey in product formulations. Highlights of the survey include: 1) The majority of the respondents were in research and development, and purchasing. 2) Sixty percent of respondents use honey in their products. 3) When asked if they had used honey in the reformulation of products, 15 percent reported increased usage, 11 percent decreased usage. 4) Nearly three-fourths of respondents are using the same amount of honey as they were a year ago; only seven percent of respondents have discontinued the use of honey in the past year. 5) The two reasons most often mentioned for no longer using honey in a product were cost (40 percent) and the fact that a product simply had been discontinued (40 percent). 6) Almost half of respondents expect to use honey in new products sometime in the future. And within the next year, 16 percent expect to use honey for the first time in the reformulation of existing products.

•

THE QUEEN BEE WANTS TO KNOW! State beekeeping associations are asked to keep Tina Tindall, the Honey Board office's "Queen Bee," informed. Please call her at 1-800-553-7162 with the names, addresses and phone numbers of any newly-elected officers. Also, be sure to include the Honey Board on your state's newsletter mailing list so we can stay in touch with what you're doing. In return, we'll be happy to supply you with handouts or a speaker for your next meeting. Just be sure to give us at least two weeks notice!

•

TREASURER'S REPORT Each year the National Honey Board authorizes an independent audit of its books. The audit was conducted in accordance with generally accepted auditing standards as well as the Government Auditing Standards issued by the Comptroller General of the U.S. In addition, the Board adhered to new guidelines issued by the U.S. Department of Agriculture's Agricultural Marketing Service.

The Board's financial statements are prepared on a cash basis. Revenue is recognized when assessments are collected by the Board, rather than when earned. Expenses are recognized when a bill is paid, rather than when the expense was incurred. Some of the 1996 projects will extend into the 1997 calendar year. Board-approved expenditures for these projects will continue to be recorded in 1997 as they are paid.

Total assessment revenue for 1996 reached $3.1 million, up from $2.9 million in 1995. With the termination of the loan program, the percentage of domestic assessments collected by packers continues to grow. During this year's audit, special attention was paid to how well packers were complying with the requirement that they report assessments collected.

On Dec. 31, 1996, the Board had cash on hand of $40,658 with short-term investments of $1,310,045. The USDA requires that these short-term investments are deposited in only the most secure investment accounts.

The National Honey Board is committed to using your assessment dollars wisely. The board budgets conservatively and will continue to maximize the amount of funds available to programs that help strengthen the market for your honey.

Copies of the report and complete financial statements are available from the Board office. Call Bruce Boynton at 1-800-553-7162 to request.

Are Bee Labs In Trouble?

USDA EVALUATES RESEARCH FACILITIES

Agriculture Secretary Dan Glickman announced (March 25) appointments to a panel charged with reviewing the nation's federally financed agricultural research facilities. The newly-created 15-member Facilities Review Task Force will recommend to Glickman and Congress priorities for agricultural research facilities in the next decade. Glickman said, "Limited federal dollars and shifts in national research priorities make this the optimum time for reevaluating our research capacity and streamlining our research network." Created in the 1996 Farm Bill, the task force will have two years to produce a 10-year strategic plan which will recommend priorities for development, modernization, construction, consolidation and closure of existing agricultural research facilities.

EXOTIC BUG EATS HONEY PLANT

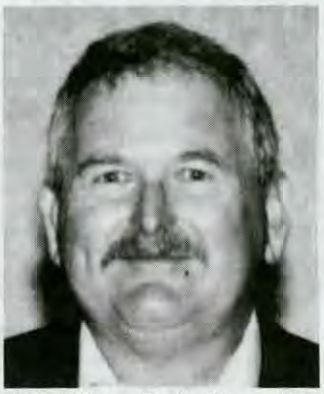
The U.S. Department of Agriculture is releasing an environmental assessment that finds there would be no significant impact to the environment from releasing exotic weevils to combat an infestation of melaleuca, or paperbark trees in Florida. The weevils proposed for release, *Oxyops vitiosa,* are native to Australia and feed on the leaves. Alfred S. Elder, acting deputy administrator for plant protection and quarantine with the Animal and Plant health Inspection Service said, "The weevils offer an excellent opportunity to attack a long-standing, growing problem without posing significant risks to the native vegetation and wildlife." USDA's Agricultural Research Service will introduce weevils on the grounds of the University of Florida's Institute of Food and Agricultural Sciences Research and Education Center at Fort Lauderdale and on certain sites in southern Florida.

USDA STANDARDS AVAILABLE

The U.S. Department of Agriculture's quality standards for hundreds of agricultural products are now available on the Internet's World Wide Web. They can be accessed at http://www.ams.usda.gov/standards. Working with industry and consumers, USDA's Agricultural Marketing Service has developed and issued more than 600 U.S. standards for more than 235 agricultural commodities. U.S. standards facilitate the sale of agricultural products by providing a common language of trade between buyers and sellers. They also provide a basis for Federal-State market news reporting that, in turn, helps traders in agricultural buying and selling decisions.

CA AWARDS

David Kellum, Supervising Entomologist for San Diego, CA, received the CSBA Distinguished Service Award for his work with the San Diego-Imperial Counties Africanized Bee Task Force.



Bob Miller, Santa Cruz, CA, was named CSBA Beekeeper of the year. Bob has been a beekeeping merit badge counselor for the Boy Scouts, and a California Beekeeping Association member for more than 20 years. He served on the California Honey Advisory Board, is a member of the local African Bee task force, and was committee chairperson for the Marketing, Constitution, and Awards committee, and a member of various other committees. While serving as Vice President he worked to recover over $20,000 of CSBA missing money, and then served as President of CSBA in 1995. He continues to serve on the board of directors of the CSBA, and as a delegate to the American Beekeeping Federation.

CA AUCTION

A molded wax figure of a beekeeper made by Liz Vaenoski of Wisconsin, and donated by her to the California State Beekeepers was auctioned at the annual banquet held in Redding, brought a whopping $1400 at the spirited auction. Two bidders kept vying for the right to own the beautiful beeswax figure, and when the auctioneer, Wilse Morgan of Arizona slammed the gavel down, Carl Powers of Powers Honey Company, Arroyo Grande, CA was the winner.

AUSSIE REGISTRATION REFUSAL COSTS STEEP

Some 1,500 beekeepers in the Australian state of New South Wales have been warned they face fines of up to A$2,000 (US$1,530) for not renewing their registrations.

A state department of agriculture spokesman said a review of the register indicates a large number of beekeepers have not responded to registration renewal notices or to subsequent reminders.

Registration is required under the Apiaries Act 1985 to aid the industry's disease eradication and management programs. It provides the penalty of up to A$2,000 for people failing to comply.

Registration is for two years and costs A$18 along with a compensation levy of A$3 for each 10 hives.

The money is used to pay for disease eradication and management programs including: tracing owners of hives; recording disease outbreaks and payments for compensation; honey sampling programs to monitor for American foulbrood; and compensation for hives that are destroyed because of American foulbrood.

NEW OFFICE FOR JAR

To better serve your needs, the International Bee Research Association is announcing a new Regional Editorial Office in Sydney, Australia. Dr. Benjamin Oldroyd will be rejoining the *Journal of Apicultural Research* as an Associate Editor and will head the Sydney office. All editorial functions for manuscripts submitted to that office will be carried out from there.

The Journal of Apicultural Research is **the** quality international journal for bee science with an editorial team dedicated to excellence combined with speedy publication. For those wishing to submit manuscripts to the *Journal of Apicultural Research, please* send them to one of the following addresses: Dr. Thomas Rinderer, Editor, *Journal of Apicultural Research* Honey Bee Breeding, Genetics and Physiology Laboratory, 1157 Ben Hur Road, Baton Rouge, LA 70820, USA, FAX (+1) 504-766-9212, email: lbeaman@asrr.arsusda.gov or Dr. Benjamin Oldroyd, Associate Editor, *Journal of Apicultural Research,* School of Biological Sciences, University of Sydney, Sydney, NSW 2006 Australia, FAX: (+61) 2-351-4771, email: boldroyd@usyd.edu.au.

For more information contact IBRA, 18 North Road, Cardiff CF1 3DY, Tel: (+44) 1222 372409, FAX: (+44) 1222 665522.

DONATED EXTRACTOR

The Delaware Beekeepers recently presented a four-frame Root Extractor to the Chiriqui Beekeepers of Panama. Dewey Caron presented it to the recently elected officers including president Bolivar Aparicio who was a student of Dr. Caron nine years ago when he taught a beekeeping class at the University of Panama. The visit and extractor gift was part of the Delaware/Panama Farmer-to-Farmer Program financed by US. AID and Partners of the Americas.

DON'T PAY ANYMORE THAN YOU HAVE TO! We will not be undersold. Great price reductions for PURE FRESH ROYAL JELLY. Our Royal jelly is tested and certified as HIGHEST POTENCY PURE 100% ROYAL JELLY. 2 oz., $7., 1 lb. $30., 1-10 kg. $45./Kg plus shipping. Inquire for larger quantities, guaranteed BEST PRICE. Also available BEE POLLEN, BOTANICALS, VITAMINS etc. Royal Nutrients, Inc., P.O. Box 604604, Bay Terrace, NY 11360. 800-683-7775. (TF)

HONEY WANTED

ALL TYPES OF SPECIALTY HONEY: Clover, Orange, Sage, Basswood, Alfalfa, Mint, Buckwheat, Tupelo, Tulip Poplar, Gallberry, Mangrove, Fir Honey, Honeydew, & other single source honey. We pick up anywhere. ODEM International Inc., 320 Boul. Industriel, Unit 15/16, St-Eustache, Quebec, J7R 5R4. 800-387-3789 FAX 514-974-1450.

FEEDING

SUGAR FOR FEEDING Granulated sugar. 1,000 lb. minimum order. Available in most U.S. locations. Please call: Bill Heerdegen, St. Simons Trading Inc. 1-800-621-9935. FAX (906) 884-2747.

VIDEOS

BEGINNING BEEKEEPING VIDEO 2 hrs! All survival essentials: building hive; installing, feeding, medicating, inspecting, managing bees; harvesting, diseases & parasites; behavior. $35. Dr. Iacobucci, 172-BC Washington, Pembroke, MA 02359 (617) 826-8888. (TF)

SELLING OUT

FOR SALE. EQUIPMENT FOR 500 colonies. Cowen Extractor. (517) 655-3792.

PERIODICALS

RURAL HERITAGE – bi-monthly magazine supporting farming & logging with horses, mules, & oxen. Subscription includes THE EVENER Workhorse, Mule & Oxen Dir.; $22 for 6 issues; sample $6. Rural Heritage, 281-B Dean Ridge Ln, Gainesboro, TN 38562.

WANT INFORMATION ON EXOTIC animals & the marketplace? Wings & Hooves. $16 yr. Dept. 1, Rt. 1, Box 32, Forestburg, TX 76239-9706.

THE SCOTTISH BEEKEEPER. Magazine of The Scottish Beekeepers' Assoc. Rates from D.B.N. Blair, 44 Dalhousie Rd., Kilbarchan, Renfrewshire, PA 10 2AT, Scotland, U.K. Sample $1.

DIE NEUE BIENENZUCHT Monthly magazine for beekeepers interested in German beekeeping. Hamburger Str. 109, D-2360 Bad Segeberg, West Germ.

IBRA: INFORMATION At Your Fingertips. IBRA is *the* information service for beekeepers, extension workers & scientists. Our members support this service & enjoy the benefits of belonging to IBRA, which includes *Bee World*. We need your involvement - join IBRA - support this important information network & extend your beekeeping horizons. Contact: IBRA, 18 North Road, Cardiff CF1 3DY, UK. Phone (+44) 1222 372409. Fax (+44) 1222 665522.

SCOTTISH BEE JOURNAL. Monthly magazine. Sample from Robert NH Skilling, FRSA, 34 Rennie St., Kilmarnock, Scotland. $4. per annum.

BEE CRAFT – Monthly journal of British Beekeepers Assn. Subs., including post. £13.68 surface mail to L. Connor, P.O. 817, Cheshire, CT 06410.

IRISH BEEKEEPING. Read An Beachaire Published monthly. Subscription $15./year, post free. Seamns Reddy, 8 Tower View Park, Kildare.

THE AUSTRALASIAN BEEKEEPER. Published monthly by Pender Beekeeping Supplies Pty. Ltd. Send request to: The Australasian Beekeeper, PMB 19, Maitland NSW 2320, Aus. Sub. $US 27. per annum, Surface Mail (in advance). Payment by Bank Draft. Sample free.

RARE BREEDS JOURNAL. Bi-monthly journal about exotic, minor & rare breeds of domesticated animals & their owners. $18. (U.S.)/year, $24. Foreign; $2.50 for sample copy. Rare Breeds Journal, Dept. Bee, HCR 1, Box 45, Hebron, ND 58638 (701) 878-4970.

BRITISH BEE JOURNAL. Month single copies 33p + postage. $15./yr. U.S. Annual subscription postpaid. Subagent: 46 Queen St., Geddington, NR Kettering, Northants, NN14 1AZ, Eng.

Bee interested. For information read the AMER. BEE JOUR. New editorial emphasis on practical down-to-earth material, including question & answer section. For free copy, write to: AMERICAN BEE JOUR., Hamilton, IL 62341.

THE AUSTRALIAN BEE JOUR. Monthly, SeaMail $35. (Aus.), AirMail $50. (Aus.). Write to: Victorian Apiarists' Association Inc., Editor, Ms. Eileen McDonald, R.S.D. McKenzies Hill, Castlemaine, Victoria, 3450 Australia. Sample on request.

ANIMALS EXOTIC & SMALL The premier journal of the Exotic and Miniature animal industry. Subscriptions $10./one year, $19./two years, $29./three years U.S. MasterCard, Visa, American Express and Discover welcome. AES, 1320 Mountain Ave., Norco, CA 91760-2852 (909) 371-4307 FAX (909) 371-4779 e-mail AES01@aol.com.

The New Zeakand Beekeeper. Published Feb - Dec. by Nat. Beekeeper's Assn. of NZ. Write for rates & indicate airmail or surface mail. NZ Beekeeper, Farming House, 211-213 Market St. S., P.O. Box 307, Hastings, NZ.

SOUTH AFRICAN BEE JOURNAL. The official organization of the S.A. Federation of Bee-Farmers' Associations. Published bimonthly in English & Africaans, primarily devoted to the African & Cape Bee races. Subscriptions including postage (six copies). 1995 all subscribers outside of South Africa R100-00 surface mail, payment to be made in S.A. Rands. NB. Sample available on receipt of a donation. P.O. Box 41 Modderfontein, 1645, South Africa.

BOTTOM ... Cont. From Pg. 64

plained that he didn't get any honey. In looking back, I wish I had had this book to give to him. He did what I told him to do. He kept an eye on his bees so often that he was opening up the hive, checking for the queen and queen cells, and otherwise disturbing the hives so much that the bees just didn't get any honey.

Comstock has given me a new appreciation for a how-to-do-it book. I am sure to try having "my fingers made." She provides instructions: "As the wax was cooling, the finger was dipped in it, and the film was cooled while the finger was held very still; then the film was slipped off, a crucial point in the process, and used as a mold into which was poured the cooling wax; and presto! There was the finger as natural as life to every crease and wrinkle, but with a deathlike pallor that rendered the row of fingers thus made a fascinatingly gruesome collection, as if they had been chopped off with a hatchet." And a little bit of practical advice with a found swarm: "A little sprinkle of water will keep it clustered safely until the hive is made ready to receive it." She doesn't indicate how long this might be, however.

This is an excellent how-to book, well-written and illustrated. It may be a bit hard to find, but would be a valuable addition to any collection of bee books. BC

Bees & Queens
Bee Happy Apiaries 8
916-795-2124
Can-Am Apiaries 16
800-228-2516
Curtis & Son 34
941-675-1566
Foster, John 8
916-787-3044
Friesen Honey Farms 28
916-934-4944
Glenn Apiaries 24
760-728-3731
Hardeman Apiaries 56
912-583-2710
Harrell & Sons 16
334-548-2313
Hawaiian Queen 50
808-328-2656
Heitkam's Honey Bees 62
916-865-9562
Hel-Le Bee Farm 23
904-997-4511
Koehnen, C.F. & Sons 24
916-891-5216
Kona Queen 28
808-328-9016
McCary Apiaries 11
601-648-2747
Miksa Honey Farm 24
352-429-3447
Park, Homer 29
916-549-3555
Pendell Apiaries 43
916-963-3062
Plantation Bee Co. 53
912-634-1884
Rossman Apiaries 29
800-333-7677
Shuman's Apiaries 37
912-367-2243
Smokey Mountain Bee Co. 24
423-787-0574
St. Ambrose Apiaries 43
904-521-0164
Strachan Apiaries 36
916-674-3881
Taber's 16
707-449-0440
Tollett Apiaries 56
916-547-3387
United Bee Supply 24
800-875-7310
Weaver, B. 28
409-825-7312
Weaver R. 2
409-825-2333
Wilbanks Apiaries 24
912-739-4820
Wooten's Golden Queens 29
916-549-3555
York Bee Co. 1
912-427-7311
Zou, Cathy. 43
909-820-6669

Education
American Honey Producers 11
Apitherapy Course 10
415-454-0692
Comb Honey Video 16
Queen Rearing Video 56
803-754-8739
EAS '97 2

Equipment
ANP Comb Inserts 34
209-784-9241
Bee Cool Hive Vent. 8
802-864-5662
Bridge Box Co. 53
603-747-2921
Catamount Farms 4
800-773-2307
CC Pollen 4
800-875-0096
Cowen 40
801-477-8902
Dakota Gunness 53
701-553-8393
Extractor Adaptors 8
905-473-5456
Golden Bee Products 23
504-737-3901
MDA Splitter 24
616-241-3235
Mid-Valley Tarp 56
800-553-4222
Pierco Inc. 23,29
800-233-2662
Plastools Honey Punch 16
360-676-9869
Swinger Fork Lifts 55
517-427-5232

Related Items
Am. Bee. Federation 49
912-427-4233
Bee Serv. Candle Supply 56
214-270-0683
Beehive Botanicals 8
800-283-4274
Custom Labels 15
414-567-0392
Endless Mtns. Honeystix 16
717-465-3232
Howalt-McDowell Ins. 37
800-584-7054
Observation Hive 29
219-865-2898
R. M. Farms 37
313-722-7727
St. Simons Trading Co. 17
800-621-9935
Tuttle Apiaries 49
360-225-9631
Weaver, Morris 17
409-825-7714

Suppliers
B&B Honey Farm 31
800-342-4811
Betterbee 40
518-692-9669
Browning Cut Stock 56
208-276-3494
Brushy Mountain 37
800-233-7929
Dadants ..... Inside Front Cover
217-847-3324
Kelley, Walter 63
502-242-2012
Mann Lake Sup 4
800-233-6663
Maxant Industries 28,36,55
508-772-0576
Mid-Con 4,16
800-547-1392
Perma-Comb Systems 58
818-224-2191
Precision Plastics 29
800-289-2583
Root ..... 18,24,43,53, Back Cover
800-289-7668
Ross Rounds 37
330-837-9778
Rossman Apiaries 29
800-333-7677
Ruhl Bee Supply 34
503-256-4231
Sherriff, B.J. 37

One of the interesting finds I have made is a book entitled simply, *How to Keep Bees* by Anna B. Comstock. She was an entomologist, as was her husband, and was selected by E.R. Root to write an article, "Beekeeping for Women," in the 1920 edition of The ABC and XYZ of *Bee Culture*. As he says in the introduction to that article, "It is presumed, of course, that no ordinary man would be entirely competent to write on a subject of this kind. In looking about for some woman to do this, the author could think of no one more able than Mrs. Anna B. Comstock . . ."

The book, published in 1905, became one of a number of how-to books. It is an interesting book, with the female touch. I found her to be exact and complete in directing this book to the beginner, and a beginner will still find value in her approach to beekeeping. It is a recipe of things to do, down to a beginner's order of supplies and extra equipment needed for one colony of bees. In regard to advertising catalogs, she says, "To the would-be beekeeper, these catalogs are so delightful that, if the purse is long enough, he feels inclined to order a specimen of everything listed. However, this is not the best way to do."

This book has a number of very fine photographs of honey plants, equipment, and beeyards. She advises the readers to use the movable hanging frames developed by Langstroth. Her own beeyards were made up of eight-frame Langstroth chaff hives, but she does explain the 10-frame hive and why she uses the eight-frame hive for comb honey. Comstock was not a commercial beekeeper and was bringing the art of keeping bees down to those who would be classified as backyard beekeepers. I appreciated the directness of her advice. For example, "We confess frankly that we were once driven out of the bee business because we were too successful. Caring for 15 or 20 hives was a delightful avocation. We kept our colonies strong, for we wished to make comb honey; consequently, splendid swarms came off, and we had the fatal gift of seeing them when they came and of hiving them successfully. Thus our vocation began to intrench upon our avocation in a most alarming manner."

One also might be struck with the reference to the hive being a perfect commune and to the socialistic traits of the bees within the hive. For one studying political systems, it may well be a good example; however, the value of this book rests with the excellent presentation of topics in beekeeping that a beginner must deal with. To begin with, she tells the beginner to find a person already engaged in beekeeping, buy a swarm from that person, and then develop knowledge from that person. This is still an excellent way to get started, although beekeepers today might sell a "colony" of bees rather than what whe refers to as a swarm.

Some items that definitely date this book are: "If bees be kept in town, they must be placed on a roof or else a high fence must intervene between the hives and the highway, so that the plane of bee flight shall be set above the heads of horses and drivers; for these brave little honey makers have never been taught to turn to the right, and so they often dispute the way with teams and usually come off victorious; and this might make the beekeeper unpopular in his community." Or one might keep sheep as automatic lawn mowers in the apiary. She says, "People say as silly as a sheep, but that is a silly saying, for many people may learn something of value about the management of bees from the sheep, which, when attacked by them, thrusts its head philosophically into a bush where the bees cannot reach the tender parts, and trusts to its wool to protect it elsewhere." Then the author adds, "The reprehensible way of leaving bees out-of-doors in single-walled hives with no protection during the Winter is no longer practiced by civilized people." I guess I would be considered not civilized by her standards because all of my hives are wintered outdoors in single-walled hives as are almost everyone else's bees that I am aware of. No longer do we use chaff or double-walled hives, at least not here in central Ohio, or use tenement hives which are a combination of hives placed within a protective box. It was still acceptable to winter hives in cellars as well.

The strength of this book lies in each chapter ending with a number of maxims for the beginner. For any of us seeking to communicate with a beginner, it is wise to rethink how we instruct them. Most of us have at one time or another helped a beginner out and were eager to answer the thousand questions they had, only to find out later that what we said was not understood. I can well remember a young man coming to me for advice. He had 10 hives of bees, and I indicated that he should keep an eye on them and know the conditions of the bees at all times. This way he could add supers when the bees needed more room, check for swarming, etc. That Fall, he com-

Continued on Page 62

Anna B. Comstock

VISIT THE VIRTUAL BEEYARD

Bee Culture Magazine's brand new web page is set up in a virtual beeyard, ready for any, and everything any beekeeper needs, or wants. Let's take a guided tour . . .

CHECK OUT – Takes you to the current issue of the magazine with 3-4 stories ready-to-read (and copy and reuse), and the rest listed.

THE SIGN POST. The top takes you back to the A.I. Root Home page. **OLD ARTICLES** takes you to the nearly 40 archived articles from the last year, ready to use for your newsletter or whatever. **BOOKS**. Need a good beekeeping book? Here's where to order them. **BEE SUPPLIES**. Need a bottomboard fast? Order electronically, in the middle of the night, and one is on its way by noon the next day. Fast and simple. **ADVERTISE?** If you're a beekeeping business, here's the best way we know to get the word out. Over 13,000 visits/month, every month, from beekeepers worldwide. Call us!

WHO'S WHO ON THE INTERNET will put you in touch, via email, with any State Extension Specialist, University Scientist, State Inspector or other official that has email in the whole U.S.

WHO'S WHO IN THE BEEYARD is the annual listing from *Bee Culture* of every association in the U.S. Find it fast.

TALK TO THE EDITOR, puts you in direct email touch with *Bee Culture's* Editor's desk. Right now!

DISEASE CONTROL CENTER takes you to a Disease Control Management Center that helps you identify the problem, and how to control it. Indespensible.

SPRING SPECIAL. This information section shows how to put in packages, the right way. Watch for Summer, Fall and Winter specials, too.

HOW TO SUBSCRIBE gives you an easy way to start, or renew your subscription so you can get all the rest of the Best . . . of *Bee Culture*, The Magazine of American Beekeeping.

125 YEARS takes you through a nostalgic trip of 125 years of *Gleanings In Bee Culture*, and the A.I. Root Company. Read, and look at years of photos, woodcuts and more, from the longest running family owned Beekeeping Magazine in America.

Tune in to www.airoot.com for a trip to the Virtual Beeyard . . . Today!

www.airoot.com