MAR 1997

Bee Culture

WOOTEN'S GOLDEN QUEENS

SWARMS

Biology and Control
New Findings

POLLINATION

Contracts
New Research

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

Bee Culture
THE MAGAZINE OF AMERICAN BEEKEEPING

MARCH 1997 VOLUME 125 NUMBER 3

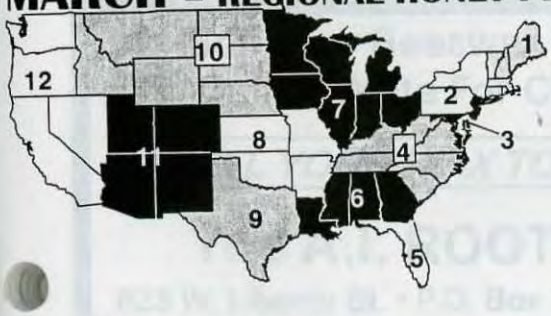
FEATURES

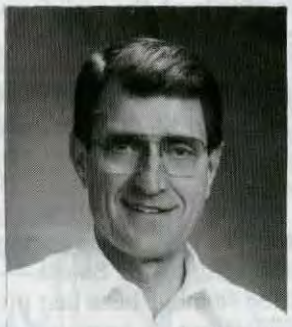
COVER
Preventing, and controlling swarming behavior is still a hit or miss practice for many beekeepers. Commercial operations don't have the time, and sideline and hobby outfits, especially those still considered beginners, often miss the mark. If making honey, or pollinating is your goal, you need to prevent your colonies from making this untimely departure. Three articles this month tell how.
photo by Kim Flottum

DEPARTMENTS

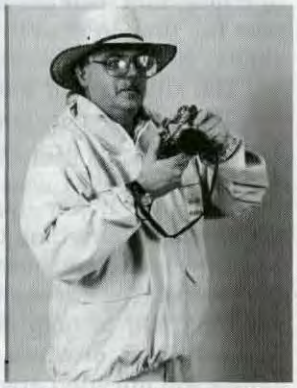
COLUMNS

MARCH – REGIONAL HONEY PRICE REPORT





JOHN ROOT
Publisher



KIM FLOTTUM
Editor

I Have Seen The Future

Horace Greeley, in an editorial in the *New York Tribune* borrowed the expression, "Go West, young man," from a *Terre Haute Express* newspaper article printed in 1851, written by John Babsone Lane Soule. Greeley expanded on Soule's "Go West . . .," to "Go West, young man, and grow up with the country."

My advice, friends, is that history repeats itself, and you would do well to follow that advice again. You may think me mad, or at least a bit daft, but in my opinion the future of the American beekeeping industry is . . . out West. Primarily California (the weather and the tremors notwithstanding), but Oregon, Washington, . . . well, you get the picture.

Why? Why is the future out West? Well, let's look at some generalities first. Where is most of the honey produced? Add the Dakotas to the aforementioned states and you have nearly 50 percent of all the U.S. honey produced last year.

And where is most of the U.S. pollination business conducted? Think of this. Three years from now, enough new almond acreage will come on line that half, yes half of *all* colonies in the U.S. will be used on that crop. Think of that a moment. Half of all the colonies in the U.S. will be in California for a month or more starting in February.

Then, take a look at the queen and package production capability in California alone. We've looked at three fairly good-sized outfits so far this year, and that's only the surface. Look at the ads in this and other journals. What state has *its own* bee breeders' organization? What state can afford to donate thousands of dollars every year to research? What state . . . well, there aren't any. A good friend who spends part of his life in California, and part in the Dakotas, refers to the former as the Great Sovereign Republic of California. He's right.

Not only is California on the upswing, the rest of the beekeeping industry isn't. The South won't rise again, and is, in fact, heading toward trouble. Foremost is the threat that Africanized genes(AHB) will be dominant in the whole region in the near future, despite the fact that lots of research shows that, with proper care (and extra expense) European genes can dominate in an AHB area. Why bother fighting the odds when you can operate a successful beekeeping business without the expense, the threat and the hassle somewhere else? And AHB will, to some degree, be all over the South. Not next week, or even next year, but soon. Sooner than you want.

I don't mean to say that the South is in shambles. It's not. Not by a long shot. But the handwriting is on the wall for anyone who'll take the time to read it. It's change, move or . . . well, in all probability, go out of business.

The change-and-move part makes the most sense, at least to me. There are generations of skill and knowledge in those families and businesses. And you can pick up hives and put them on a truck, very easily.

So. Huge honey, queen, package and pollination businesses are already flourishing in California (and other parts of the West), while the same are static or declining in the South.

I know that anyone who tried to move bees last month, anyone who has had to hold onto something or someone during one of those shakers, or who's run in the middle of the night to avoid the flames will question any future at all in California. Perhaps.

Even so, I have seen the future. And the future is California. You heard it here first, again.

With few exceptions the information published in the bee journals in their first years was in the form of letters sent to the Editors. Some senders were experienced commercial operators, some were, or were almost scientists (though the title Apiculturist was rare), and some were hobbyists and beginners making useful, if repetitive observations. One problem was that all (or nearly all)

Continued on Page 57

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**

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 3, 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.

KEEP IN TOUCH

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

MAILBOX

Research Thoughts

It seems to me that applied research would flow from basic/pure research. Got to know the basics so we can apply it? Let's tell kids just beginning in grade four – don't need the basics. Just some passing thoughts, not arguments.

Most of our East Texas bee club prefer your *Bee Culture*. You started a good discussion. I like *Bee Culture* for the variety of articles.

C.A. Burfoot
Rusk, TX

Top Bar Web Site

I have, with the help of many friends, established a website devoted exclusively to beekeeping with top-bar hives (tbh's). The site contains drawings for tbh construction and photos of hives, bars with comb and bees, and a "home-made" honey press, among other things. The web pages center around FAQ's dealing with history, construction, management, harvesting of honey and wax, and sources of additional information . . . all related to tbh's. If you've been seeking information about this alternative beekeeping, check out this URL: http://www.gsu.edu/~biojdsx/main.htm

I hope that you enjoy your visit.

James D. Satterfield
Canton, GA

Use A Jig

I am writing in regards to your Nov. 96 article on frame assembly. I am a small commercial beekeeper with 700 hives, and I certainly agree that staple guns are faster.

However, one more item that makes frame assembly faster and safer, is a frame assembly jig. The jig holds the frame parts for assembly, allowing you to hold the staple gun with both hands, and at the same time keeping your hands from staple injury, (as in holding the frame with one hand while stapling it).

A good jig will also produce frames that are square.

You can either make your own jig or order it from a bee supply company (Kelley's sells one).

Kevin Bradley
Finley, CA

Research Opinion

I have been reading in your fine magazine (and others) about the unregistered miticides.

Please ask the scientific researchers to sit down and shut up. I have heard enough "sour grapes" to last a lifetime. If they (researchers) question the use of natural substances to control bee ailments why shouldn't they do some testing to prove their position. I think the scientific researchers and some state beekeeping hierarchy types have shown their backsides on this one!

Why don't these good deed doers challenge other magazine advertisements (unproven claims) and damn them to hell? Think about it:

- Mite resistant bees?
- Mite free bees?
- High quality queens?
- Plastic foundation which is seemingly better than wax foundation?

Research people have singled out a possible great idea and condemned it based solely on "no data," how can they be so unscientific and subjective? I suppose the researchers feel their laurels are threatened because it wasn't their idea.

I must remind the scientific researchers that we have paid them extremely well to find cures to diseases and we're still waiting for CURES; scientific researchers offer nothing but very expensive treatments, while refusing to address natural healing techniques!

I wish to thank any beekeeper who cares enough about his hobby/profession to break ranks and do something to help my bees. If we leave it to scientific researchers, we'll likely be fleeced.

Brad Booth
Pleasant Garden, NC

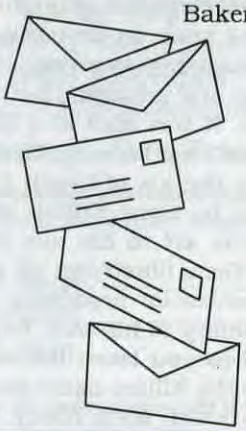
Dancing Butterflies

In reference to Toge Johansson's quote of Emperor Huitsung ("Dancing butterflies are confused by fragrant pathways"), the good emperor is obviously a good poet but, perhaps, not a good scientist.

Had the emperor been aware of the amazing ability of dogs to track a slight scent among a myriad of other odors he might have drawn a different conclusion from his observation. Had the emperor investigated further, he could have found that the "confused" behavior might have been a mating ritual (like a drone congregation area or a singles bar, where behavior can also appear confused).

If so, the emperor would be faced with a difficult choice: whether to write a significant, but little-read Ph.D. thesis or a really erotic poem that would last through the ages.

Joe Traynor
Bakersfield, CA



Correction:
The correct phone number for BeeToolz, makers of the teflon coated hive tool featured in the February issue New Products is 1-888-BEEMEN. Please call that number to order.

NEW

Beekeeping in Northern Climates is an easy-to-use 68-page manual ($15) and 40-minute companion video ($40) (set $45), produced by apiculture specialists at the University of Minnesota. Based on Dr. Basil Furgala's management system, this method ensures high honey production and successful overwintering.

You will learn about: equipment needs, ordering and installing packages, up-to-date management techniques, extracting, bottling and marketing honey, disease and mite control, wintering essentials.

Beekeeping in Northern Climates is for beekeepers in Zone 5 and colder areas of the United States and Canada. It's for: hobby or beginning beekeepers who want to establish colonies; experienced beekeepers who want the newest management information and techniques; apiculture students. To order by phone call (612) 625-8173, 1-800-876-8636.

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

Available this Spring on VHS for $45. post paid.

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

Homestead Year. Back To The Land In Suburbia, by Judith Moffett, 312 pages. ISBN: 1-55821-352-X. $22.95, Cloth. Ben Jacobs at Lyons & Burford, Publishers, 31 West 21st Street, New York, NY 10010.

Escaping the academic life of the University of Pennsylvania without escaping the Philadelphia suburbs, Judith Moffett spent a year homesteading, attempting to become as self-sufficient as possible in the town of Rose Valley, Pennsylvania. Homestead Year is her account of that year, an account of enduring value to anyone who has looked out of their window and seen the potential for more than a plot of green grass.

Homestead Year is a frank and compelling look at the trials and tribulations of Judith Moffett throughout her year of living close to the land. From one season to the next, we follow Judith in her success and disappointments as a suburban homesteader.

First she begins the task of planning and planting a full scale garden and donning a beekeepers suit to tend her hives. After digging a pond, Moffett introduces ducklings (to the curious eyes of friends and neighbors) and begins to farm her one-acre plot. As she progresses through the year and utilizes such techniques as maple syrup extraction, potato planting, duck farming, and honey extraction, Judith Moffett comes to realize that this year is more than an occasion to learn a few new skills, it is a lesson in living in harmony with the land, in hard work, and in a new awareness of the interconnectedness of all living things.

Moffett does a good job of describing the anxiety and confusion of a beginning beekeeper. She goes through all the steps of reading the books first, and finding out that what they say, and what you see aren't necessarily the same.

For this alone the book is worth reading, at least for a novice beekeeper. She spells out the transition from fear and unknowing to coming to grips, to a basic understanding of the hive, the colony and bees in general.

Apian Technology. Most queen rearing systems involve individual grafting by hand of the larvae into queen cells. This is time consuming, requires skill, a very steady hand and exceptionally good eyesight. The other method was using a single plug system in a cage.

After three years of trial and testing, with the help and advice of many experts, a new and easy-to-use system for transferring larvae to the queen cells has been developed and brought to market with worldwide patent protection, by Tony Fraser-Jones, from New Zealand.

The Ezi Queen Lay Cage is comprised of an improved lay cage (with 420 cells) which is inserted into a hive on a conventional frame.

At the rear of the cage is an ingenious set of plugs which are removed in strip form, 20 at a time.

These are transferred to the queen cells which are mounted on bars which fit onto the frame. This process is very quick and easy and there is no handling of the larvae. Tests show that the queens produced by this method are larger and hence better layers.

If you don't need queen bees but had always wondered how to produce your own Royal Jelly, a separate system is available, using slightly different components.

These two systems were developed by a beekeeper with over 30 years experience who has over 500 hives.

All components are supplied, including cell bars for mounting the queen cells and very detailed step-by-step instructions complete with colour photos for both queen rearing and Royal Jelly production.

Commercial beekeepers can graft up to 420 cells at one time.

For more information contact Apian Technology, P.O. Box 81096, Whenuapai Auckland, New Zealand.

NEW

MARCH – REGIONAL HONEY PRICE REPORT

Region 1

Prices rock steady since last month with demand steady also. Colony loses, so far, reduced, probably due, in part to a somewhat easier winter than last year. Spring will tell. Fewer than average number of new beekeepers surfacing this season.

Region 2

Honey prices showing some pressures from bulk and wholesale buyers as demand softens a little. Sales steady though. Easy winter so far, with far fewer than normal losses. Nevertheless, new beekeepers are nearly invisible, with very, very few showing up.

Region 3

Prices steady, but some changes at bulk taking place. Demand steady. Winter has been, perhaps too mild so far, causing undo activity and consuming stores. Fewer than normal beginners, but some bright spots.

Region 4

Prices rock steady since last month, but sales steady to increasing some. A promising sign. Winter losses are down this year, so far, even though the weather has been less than ideal. Beginners are about average, or up just a bit.

Region 5

Prices steady, mostly because the specialty crops haven't yet started strong. Sales steady. Winter, with only a couple of cool exceptions has been mild, and even with all the new snowbird migratory beekeepers, losses are down.

Region 6

Prices steady, some changes in local markets at retail and bulk. Sales increasing though especially at retail. Winter losses down this year, mostly because weather has been fairly stable, and average. Surprisingly, the number of new beekeepers is stable.

Region 7

Bulk and wholesale prices leveling off to dropping a bit, but retail steady to increasing a little. Sales, though, are strong. Winter losses, so far, way, way down, even though the early part of the season was hard, later has been a kinder season. New beekeepers are harder to find, but some spots overflowing with wannabes.

Region 8

Honey prices steady at all levels, while sales remain steady to increasing a bit. Winter losses about the same or decreasing a bit, mostly because the weather has been a bit easier, so far. Less new blood here, too.

Region 9

Bulk prices down a bit, probably a blip, but not a good sign. Nevertheless, sales and demand remain strong. Winter losses negligible so far, even though the weather has been about the same as usual. As usual, fewer new beekeepers appearing.

Region 10

Prices steady, as bulk sales dominate this market. Sales are strong though as demand for bulk product remains strong. Winter cold, snowy and dangerous for buried colonies. Losses unknown, since lots of colonies still in limbo.

Region 11

Prices up a little across the board. Reports of sales strong though, especially for bulk and wholesale. Winter about average so far, but losses are down. Some new blood showing up in places, a very good sign.

Region 12

Prices steady to rising a bit on wholesale, but sales increasing and demand strong. Winter losses heavier than anticipated, mites primarily the problem, but the weather hasn't been great, either. Some new blood showing up, though.

Summary

Winter losses are down this year, significantly, even though, across the country, the weather has been only a little worse than usual (except where you are, of course). Hone sales remain strong at all levels and demand hasn't changed much. By far, there are fewer, and fewer people entering the profession of beekeeping. A tide that must be turned, before there are too few to support the supporting businesses.

	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	67.26	70.60	72.95	70.67	72.95	64.50	66.00	81.00	50.00	72.95	79.25	64.60	50.00-99.99	68.87	68.23	48.03
60# Amber	62.55	66.82	66.96	63.25	66.96	61.00	62.10	63.67	47.00	66.96	70.00	57.67	47.00-90.00	63.88	65.61	46.26
55 gal. Light	0.93	1.09	1.01	1.00	1.01	1.03	0.96	1.00	0.90	1.01	0.95	0.90	0.82-1.23	0.97	0.97	0.70
55 gal. Amber	0.88	1.02	0.90	0.85	0.90	0.93	0.94	0.94	0.87	0.90	0.85	0.89	0.65-1.15	0.91	0.91	0.67
Wholesale - Case Lots																
1/2# 24's	29.94	28.49	33.02	34.22	23.60	32.00	27.12	28.00	30.00	33.02	35.17	33.13	20.40-48.00	30.66	30.22	22.97
1# 24's	42.81	38.81	56.29	41.20	41.20	38.45	42.06	40.77	45.00	56.29	56.58	41.20	30.00-96.00	42.86	41.45	34.09
2# 12's	38.65	35.75	42.94	42.00	37.70	36.90	39.45	39.20	36.00	42.94	46.73	37.00	29.40-60.00	39.41	38.64	31.85
12 oz. Plas. 24's	34.78	34.24	36.18	34.54	36.18	33.20	35.67	33.21	36.00	36.18	43.08	31.75	25.00-48.00	35.53	35.36	29.61
5# 6's	38.26	39.47	40.98	45.75	40.98	36.00	37.01	37.00	42.00	40.98	38.95	32.75	28.00-55.56	39.37	38.31	32.43
Retail Honey Prices																
1/2#	1.84	1.73	2.83	2.17	1.20	1.62	1.62	1.62	2.95	2.83	2.50	2.02	1.19-3.69	1.86	1.93	1.48
12 oz. Plastic	2.12	2.10	2.19	2.29	2.19	2.18	2.07	2.16	2.95	2.19	2.26	1.99	1.44-2.95	2.17	2.14	1.85
1 lb. Glass	2.61	2.50	2.69	2.99	2.00	2.63	2.47	2.58	3.50	2.69	3.07	2.42	1.40-4.00	2.66	2.64	2.16
2 lb. Glass	4.59	4.60	5.92	5.00	3.80	4.51	4.14	4.19	4.50	5.92	6.19	4.58	3.39-9.75	4.61	4.35	3.61
3 lb. Glass	5.75	6.75	5.84	6.25	5.84	6.32	5.75	5.60	6.00	5.84	6.51	4.97	3.09-8.50	5.92	5.78	4.65
4 lb. Glass	7.00	6.15	7.71	7.33	7.71	7.50	7.55	7.83	7.45	7.71	7.71	5.50	5.50-10.25	7.37	7.55	6.11
5 lb. Glass	9.35	8.78	12.77	8.93	12.77	9.00	8.40	9.51	9.25	12.77	12.23	8.12	7.00-21.99	9.32	9.21	6.92
1# Cream	3.23	3.13	3.82	3.73	3.82	4.31	2.67	3.09	5.25	3.82	3.50	2.91	2.19-6.00	3.27	3.30	2.51
1# Comb	3.81	4.00	3.96	3.83	3.96	4.48	3.39	3.57	5.00	3.96	5.38	3.90	1.95-6.00	3.93	4.16	3.73
Round Plastic	3.54	3.14	4.05	3.25	4.05	2.75	2.91	3.84	5.00	4.05	5.75	4.29	1.50-7.00	3.65	3.76	3.20
Wax (Light)	2.99	3.83	3.43	1.93	2.50	3.50	2.26	3.19	3.50	3.43	2.50	3.33	1.25-6.00	3.04	3.06	2.11
Wax (Dark)	2.60	3.38	3.08	1.76	1.75	3.09	2.12	2.93	3.00	3.08	2.25	2.65	1.10-5.50	2.64	2.66	1.69
Poll. Fee/Col.	36.48	42.17	42.33	33.20	30.00	32.25	41.42	35.00	15.00	42.33	35.00	33.17	15.00-75.00	36.99	37.14	34.74

GLEANINGS
IN
BEE CULTURE.

Devoted to Bees and Honey, and Home Interests.

Vol. X. MARCH 1, 1882. No. 3.

A. I. ROOT, Publisher and Proprietor. Medina, O.

Published Monthly.

Established in 1873.

TERMS, $1.00 PER ANNUM, IN ADVANCE; 2 Copies for $1.00; 3 for $2.75; 5 for $4.00; 10 or more, 75 cts. each. Single Number, 10 cts. Additions to clubs may be made at club rates. Above are all to be sent to ONE POST-OFFICE. Clubs to different postoffices, not less than 90 cts. each.

NOTES FROM THE BANNER APIARY. No. 28.

works speak for themselves;' and I say, let a man's works, or dealings, speak for themselves. Dealer after dealer has advertised to "guarantee satisfaction;" but, judging from the manner in which some

After the first tumultuous years of publication – establishment and serious conversion – *Gleanings* began to develop its own personality, slowly but surely.

Subscriptions were still $1.00/year in 1880, there were just over 3,400 subscribers in January, and W.Z. Hutchinson, from MI was still writing his Notes from the Banner Apiary column each month. Still popular were The Smilery, Bee Botany & Entomology, Box Hive Department, Humbugs and Swindles, The Growlery, Ladies Department, Heads of Grain, Notes and Queries, Blasted Hopes, Boys Department and certainly Our Homes. In January beeswax was selling for 22¢ and beehives went from first to third class freight, reducing rates.

During 1880 Frank Benton 'gone and got married,' and then traveled to Cypress and the Holy Land to investigate their bees. More later. In February the first-ever specific hive tool was shown. It was a modified chisel with one flat end and one pointed end. C.C. Miller was writing, honey dew was still being dissected, artificial pollen (rye flour and oat flour), was being used, wax was 25¢/lb., and Gleanings had 4,200 subscribers.

In March A.I. started the "Counter Store," where he had 5¢, 10¢, up to 50¢ 'shelves' of useful articles for sale, most not dealing with bees or beekeeping.

Troubles still were around. Mrs. Cotton was still selling miniature hives for full size prices, Mitchell was blackmailing beekeepers on bogus patents, and a company employee stole money and was sent to the penitentiary. In the Ads Section were a whole variety of products: Ink, hives, queens, raspberry plants, potatoes, magazines, foundation presses, poultry, rubber stamps, extractors, nucs, foundation, eggs (yes, eggs), smokers, books (bee books and gardening books), uncapping knives, pigs (really!), section honey boxes, chaff, foot powder and saws. An eclectic mix, for sure.

In Root had 68 employees, honey was selling for 10¢/lb. in barrels and there were 4,500 subscribers.

Braula was being discussed in March, and Root started listing catalogs (circulars) available from other companies. By April he was selling bees in pound cages, foundation wire was still difficult to install, and the praises of the Cyprus bee were being sung. Utah had an inspection program.

Ernest Root, A.I.'s son, was running the apiary by now, honey plant seeds were being sold by the bushel, the tinsmith developed a funnel for shaking bees into a package, and the first engraving of A.I. was printed in August.

During the Fall a small addition to the factory was made, and one visitor wrote, "Our visit to the Root Company shall ever be a green place in the garden of our memory." They just don't write like that anymore.

Cypriot bees were described as having a bright gold shield between their wings, and couldn't be robbed. There were 12 full pages of Heads of Grain and ABC was being changed on almost a daily basis. One dollar queens (hybrids) were for sale, G.M. Doolittle was writing regularly, and in November, A.I. offered a free smoker to anyone who quit smoking or using tobacco (if you started again you had to pay for the smoker).

The December issue had 60 pages, there were 5,049 subscribers, and, after many attempts, uncapping machine ideas were discarded.

A new cover graced the 1881 issues, subscriptions were still $1.00/yr., all new headings were used, Doolittle was paid $100.00 to review ABC, advertising rates were 20¢/line (200 lines/pg.), notes from the Banner Apiary was still going strong, and a new column, Lessons of the ABC Scholars (beginners) was started. A.I. held himself responsible for every advertiser, and asked customers to bear with him when he couldn't read their writing.

In February the first of A.I.'s articles on "Beekeepers should keep things cheap" came out, the lunch room opened and Seth Thomas clocks were selling for only $7.50.

Langstroth was in form in March and wrote on the Cyprian bee (nasty), the South American stingless bee (don't import it), and how, by mixing frames you could easily, and safely unite two colonies. There were 4,000 subscribers.

By June the Root Co. was selling Bibles, dictionaries, Robinson Crusoe books, and maple sugar candy ($4.75/50 lbs.) for feeding bees. There was a huge winter loss that year, Root lost 300 colonies with only 11 remaining, L.L. wrote extensively on dysentery and ventilation for Winter survival, Root's Simplicity smoker was hailed as the best there was (by A.I. himself), and C.C. Miller had 67 colonies.

In July, The American Bee Journal had finished it's first six months as a weekly (much to A.I.'s surprise) and there was a telephone ad (two cans and a mile of wire – honest!).

The rest of the Fall showed yet another new cover engraving, wax was 23¢/lb., MI passed an adulteration law, Root got back to 300 colonies and were selling preprinted honey labels. Bee venom as a medicine (ground up bees, strained) was discussed, they sold 2,000 lbs. of bees and 2,630 queens, and at year's end had 4,440 subscribers.

1882 saw yet another face lift (it seems to be in some Editor's blood), with new headings and larger, and more engravings. There were four full pages of ads, Doolittle thought foundation wasteful and expensive, and if you wrote a letter to the Juvenile Department (and were one), A.I. would send you a Sunday School book.

In February Doolittle said bees didn't need pollen for brood rearing, another hive tool was shown, this one similar to today's, with an L-shaped end, and in California

they were making honey from corn silk.

C.C. Miller, in March wrote about a malady he termed Bald Headed Brood, where the brood wasn't capped, and there were 4,238 subscribers. In April, a regular mailing was started and sent to juveniles – The Boys and Girls Bee Journal. Similar to the regular Gleanings, with letters, Editorials, ads and other reports. Much from the regular magazine was repeated, but rewritten in a simpler form. How to start with bees was a prominent subject.

By June Root had 300 colonies again (he never said where they came from) and was selling 5,000 smokers/year (maybe his were the best), had between 100 - 200 bee supply orders per day, and business was booming!

A new disease was described in July. Bees' wings were shivering, the abdomen became black and slick, they were unable to fly or crawl, had unsteady movements and were eventually cast out of the hive. At the same time Root complained that beekeepers didn't plan ahead and everybody wanted supplies at the same time. A not uncommon complaint even today.

Readers often commented (complained?) of the small type size used in the magazine during those years. This is an exact duplicate of much of what was printed. Any complaints?

A.F. Moon, Editor of Georgia's Bee World died in September, and bees bred to make honey should be the goal of all queen producers.

Swarms left hives, according to one writer because of: Bad smells, hives were in the sun, bees were dumped inside, poor ventilation, crowding, unnecessary interference, mixing brood, mixing bees and queenlessness. They didn't have it figured out then, either; or at least not quite.

Root colonies still didn't have foulbrood, but Muth advocated burning, because an infected bee could give it to any colony it even landed on, and Paris Green (a pesticide) was killing bees. The National Convention was held in October in Cincinnati, with many vendors attending, but very few beekeepers. Root said it had to be profitable for beekeepers to attend, and so published seven and a half pages of coverage – everything from foulbrood control to marketing.

By December there were nearly 5,400 subscribers, E.R. Root (A.I.'s son) was writing from Oberlin College about a beekeeper he visited, and it was suggested that air, not cool temperatures caused honey to granulate. Closed jars didn't, open jars did. So it goes.

The subscription price in 1883 was still a buck and all the regular columns were still in place (except Box Hive Department). A.I. had a long piece about his new home he was building. He wanted it brick, with 'most' of the modern conveniences. The 'Homestead' serves as Corporate Headquarters today. He had then about 10,000 customers. In February an engraving of W.Z. Hutchinson of Banner Apiary fame appeared, Root was offering up to a 5% discount on orders over $500.00, and a translation of the beekeeping writings of Virgil appeared, over several issues.

In March a frame holder tongs was shown, along with a wax extractor and O.M. Blanton, from MS. Root was looking for a variety of honey plant seeds, and wax was 35¢ a pound.

In April A.I. quit writing his answers and Editorials, and started dictating them to a stenographer who took short hand. He even showed a sample, and sung its praises. In May, C.C. Miller gave his report of the status of beekeeping in the U.S. He got 1,600 people from 38 states to respond to his survey. Getting information from this industry has never been easy. California appointed county inspectors (and kept them until a few years ago), there was a how-to for honey vinegar, and if you didn't put your county in your return address, "Well, we just couldn't be responsible if the freight company or post office delayed, or lost your order."

June saw 5,627 subscribers, there was an engraving of Charles Muth, and the letter opening clerks were complaining of people sending dead queens back in the mail. "Why on earth we would want a dead queen is quite simply beyond me," A.I. said. "If a queen we sell dies, simply tell us, don't return the dead thing, kind friends."

By July L.L. was writing again and they were selling 25 extractors and 100 smokers a day. August saw just over 6,000 subscribers, an explanation of 'fertile' workers by L.L., and 30-40 queens per day were being sold out of the Root Apiary. 148 foundation mills had been sold to date.

In October Root was selling shorthand books and L.L. wrote a long letter on how he came to develop his hive. Boardman (of yet-to-be feeder fame), strongly urged that lots of ventilation would help wintering.

It was in October, 1883 Root went to twice a month publishing. Though strangely silent on the reasons why, competing with seven other journals (some weekly, some twice a month) is suspected. Notes from the Banner Apiary appeared in the first issue each month, and other contributors showed up in the second.

Benton wrote about Apis dorsata (nope, don't want it here, I don't care how much honey it's supposed to make) and a full page engraving (the first inside the magazine) of California white sage appeared. The new addition to the factory was discussed with a detailed description of how the new steam boiler was used to both run the factory and heat the offices. Very clever.

In December, the old six HP boiler was listed for sale. It had just been reconditioned, and was just like new. There were 71 illustrations in the '83 numbers.

A.I. sold his subscriptions for a one year term, January to December, or at least that's how he started. So each January for the first few years his subscriber numbers went down, then slowly rebuilt during the year. But this evolved over time such that a subscription lasted a year, no matter when it started so the yearly cycles evened out. Too, so many subscribers didn't want to be bothered with remembering when to renew, they were invoiced instead of renewing. A dot was by your name on the label if that was the case. So, in January 1884, Root had 5,822 subscribers. You could send for a free sample of foundation, and Dadant's came up with a way to test for pure beeswax by mixing it with alcohol, and/or tasting it for contamination.

The problem, such as it was, was that with nearly 6,000 subscribers the amount of mail was becoming extraordinary. There was no way to get everything read, let alone published. A 50 HP engine was running the machinery and heating the whole factory, and A.I.'s house.

Continued on Next Page

125 YEARS ... Cont. From Pg. 15

A quick survey by a beekeeper in central Ohio showed there were 23 people within two miles who kept bees and how on earth could pure lines of queens be produced? (Sounds like California at almond time.) D.A. Jones, from Canada was becoming quite a supply producer, and got his picture (engraving) in the magazine.

In April that year New York started an inspection service and there was a fairly long article on how to cure a cow of kicking. In May all new type was used (old type was being sold for 20¢/lb.), and a hand wire embosser was introduced. Doolittle took Root to task about pricing, saying beekeepers should know their costs when setting prices, not just keeping them low to keep them low. So there.

The Novice Extractor changed its gearing from a horizontal to a vertical (and easier to turn) direction in June, and a detailed explanation and parts list was shown for making a Clark Cold Blast Smoker. Root had 400 colonies, was receiving 300 letters every day, and making 45,000 sections every 24 hours.

Over 200,000 A.I. Root catalogs (circulars) were sent out in July, and A.I. admonished readers to use standardized equipment because if you didn't you couldn't get extractors and the like to work. In August, he ran an article on how to raise rabbits

That Fall, the court case of Forncrook vs. Root on the patent rights of the one piece section box was settled. Seems Forncrook thought he had developed the idea and was suing Root for compensation for using his idea. The one piece box had gone through several evolutions, but the one still used today was what Root was making then. The attorney representing Root did his homework though, and found out that the idea and technique had originally been developed, and sold, (but not patented) by a strawberry box maker several years before it was used for honey. Root won, it cost him $1,000, and he again advocated the no-patents idea in beekeeping.

Later that Fall E.R. Root visited Jones in Canada, D.A. Given, of foundation press fame died, Doolittle was raising strawberries, and Root laid off just over 100 seasonal employees.

At the end of 1884, there were over 7,000 subscribers, J.T. Calvert was running the bees, The New England Apiarian had folded, wax was 26¢ a pound, and Root had found, and was selling, all metal carpet sweepers – "the best thing for the lady of the house since fly paper."

•

Life, and business get even more hectic at the Root Company, and for beekeeping in general, in our next installment. A longer, but busier time, and article!

Roger Morse

Research Review

"Bait hives work when it comes to capturing swarms. Here's how to make them even better."

Using bait hives to capture swarms is as old as the hills. Even the ancient Egyptians had empty hives that served the purpose. However, what honey bees want for a new home, if given a choice, was researched only recently and primarily by one person, Thomas Seeley. This information helps us design better bait hives.

Bait hives have two primary uses today. One is to track the movement of Africanized honey bees, and the other is for you to pick up swarms that would otherwise be lost. It is an easy way to increase your number of colonies. In the northern states, swarms are not as abundant as they were five years ago because they, too, have been plagued by diseases, but bait hives can still be profitable there. However, in the Spring, in the orange groves in Florida, I have found that swarms are as abundant as ever. Most commercial beekeepers do not control swarming as well as they think they do!

You can build and use bait hives effectively by following some simple guidelines. You must first know when bees start to scout for new homes and when swarming starts in your area. My notes indicate the first scouts are seen at bait hives in Florida during the last week in February and in New York state the second week in May. These are most likely the earliest and the latest dates for everywhere in the United States and probably most of Canada. The swarming season is stretched over a longer time in the warmer parts of the country and from May 15 to July 15 in the North.

There is a small amount of Fall swarming, but Fall swarms usually die because they have too little time to build a home and to gather the food they need for Winter. They are a nuisance for beekeepers because they require too much feeding if they are captured.

The Science

To determine what bees want if given a choice, Seeley built a number of cubical plywood boxes. These were hung on the sides of trees in pairs or a group of three so that the potential homes were about 50 feet apart. These experimental bait hives varied in one item only and were otherwise comparable. The pairs were placed about two miles apart, usually along a road so that they could be checked on a weekly basis from a car.

The results were clear. When they have a choice, the scout bees always select a box with a volume about that of a standard ten-frame Langstroth hive, which is about 40 liters. A box up to two and a half times this size, 100 liters, is acceptable if the 40-liter box is already occupied. However, in our experience, no swarm ever accepted a small box with a volume of 10 liters. Later research in Florida showed that a hive of 12 to 14 liters in volume is satisfactory, indicating how finely bees can measure.

Bees always took a box that was 15 feet high over one that was three feet off the ground. However, it was soon learned that taking down boxes filled with bees, and often honey, from such a height was difficult and even dangerous. I have since observed in Florida that bait hives six feet off the ground will be readily accepted and are much easier to take down. I have had good success placing six-frame nucleus boxes with old black comb on top of hives in an apiary. At one time we thought that swarms preferred to move a long distance from the parent colony, but that is not true. In nature there is a shortage of acceptable new home sites and bees are too practical to refuse a good home, even if it is close to the parent colony.

Bees want a nest that is shaded but visible. Swarms that have occupied bait hives that are suddenly exposed to the sun will abandon them if they have comb but no brood. Once there are eggs and larvae in a nest, it will not be abandoned.

In some cases bees have preferences but may accept alternatives. For example, they prefer nests with entrances that face east or south but will accept those that face west or north if nothing else is available. Three times out of four they prefer a bait hive with an entrance near the bottom versus one near the top of the hive. The shape of the entrance is not important, and bees have no preferences for boxes that are cubes over those that are elongate. The type of wood or tree is not important.

We believe there is good logic behind all of these preferences. Nests high in the air are not so easily attacked by bears and badgers or fire. Hives with small entrances are easier to defend. Those in the sunlight may overheat.

Make A Bait Hive

My experience is that used, standard eight- or 10-frame Langstroth supers make the best bait hives. I have also used six-frame nuc boxes successfully. You may use new wood to make a bait hive, but the odor from

Continued on Next Page

RESEARCH ... Cont. From Pg. 17

an old nest helps the bees find the bait hive and makes it more acceptable to them. When the bait hive is attached to the side of a building or tree, it may hang in any direction; it is not necessary to keep it in the flat, horizontal position used when a super is placed on a hive.

Cover the top and bottom of the super with pieces of plywood. The joints between the plywood and the super must be tight. If any light enters, especially near the top, the bees will not accept the bait hive. We often tape the joints with black photographic tape.

Drill an entrance hole about one and a quarter inches in diameter, no larger! The entrance should be positioned so that it is near the bottom of the bait hive however the super is hung. I usually drill the entrance hole in the plywood so as not to damage the super.

We have usually advised that you should not put old, black drawn combs in bait hives because they are easily attacked by wax moths. However, my experience is that bees accept a hive with old drawn comb more rapidly. More important, if comb is present, you do not need to transfer the swarm to a super with drawn comb. This can be a nuisance if the swarm has built much comb in the bait hive. Of course, if a bait hive with combs is left unattended for more than a month, it probably will be attacked by wax moths. However, if the bait hive is left out for only a month and/or examined frequently, there is no moth problem.

It came as a big surprise to learn that scout bees and their swarm will accept a dry cardboard box as rapidly as they will a wooden hive. You must cover a cardboard box with a plastic bag, such as a garbage bag, to protect it against rain. And, of course, bees in a cardboard box cannot be left there from a practical point of view. However, it will work. BC

References:

Seeley, T.D. and R.A. Morse. *Nest site selection by the honey bee.* Insectes Sociaux 25: 323-327. 1978.

? DO YOU KNOW ?

To Be A Mentor, You Need To Know The Basics

Clarence Collison

Spring is a time of new beginnings and each year there are those who decide to try their hand at keeping bees. Their interest in bees, honey, and pollination has been kindled by many different situations or activities such as reading an article about bees, encouragement from a friend or neighbor, viewing a documentary on TV, a desire to get closer to nature, love of honey etc., just to name a few. Regardless of the reason why they became interested in bees, it is important that this new beekeeper have a mentor in the area, someone he/she can turn to for advice and helpful hints. Your assistance and advice may mean the difference between them being successful the first year or failing on their own.

Please take a few minutes and answer the following questions to determine how well you understand beekeeping basics.

The first eight 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. ___ Package bees will become established and build up more rapidly on drawn comb than on foundation.
2. ___ Queen honey bees are usually sold as young mated adults that have been laying eggs for a few days.
3. ___ Honey bee workers forage for food according to their own needs.
4. ___ The interior of the hive should not be painted.
5. ___ The bottom board or floor of the hive should be tilted slightly downward at the entrance end to help keep the hive drier.
6. ___ When burr comb is built between supers and connects the top bars of one super with the bottom bars of another, it is an indication that additional supers are needed.
7. ___ Fluvalinate, the active ingredient of Apistan Strips, is a systemic insecticide, thus *Varroa* mites are killed when they ingest blood from their host.
8. ___ A colony preparing to swarm will normally produce more queen cells than a colony superseding their queen.

Multiple Choice Question (1 point)

9. ___ Evidence of *Varroa* mites being resistant to fluvalinate (Apistan Strips) has been found in:
   A. United States
   B. Canada
   C. Brazil
   D. Germany
   E. Italy
10. What are the two primary parts of a smoker? (2 points)
11. What is the primary reason for painting beehives? (1 point)
12. Name four different ways in which an individual can obtain bees. (4 points).
13. Why would a beekeeper choose to paint a hive white rather than dark green? (1 point)
14. Why is it recommended that a beginner start with more than one colony? (1 point)
15. Currently there are three formulations of Apistan® Strips commercially available. Give the specific use for each formulation. (3 points).
16. Why is it recommended that the entrance of a colony face in an easterly or southern direction? (1 point).
17. Name three approaches of introducing a new queen to a colony that you are requeening. (3 points).

ANSWERS ON PAGE 56

Mark Winston

Consulting

"Consulting jobs offer a window on how others view bees."

The businessman was fiftyish, with silvery hair and a briefcase that cost more than the annual income of a third-world country. Inside the case was wealth beyond imagination, over a billion dollars in cash and untraceable bonds, so it was not surprising that he looked around carefully before boarding the float plane. He was heading north, towards an isolated fishing camp in the wilderness of coastal British Columbia. What he didn't notice, however, was that a swarm of bees had landed inside the plane's cabin. As he entered the plane, he felt a sharp prick on his face, then another, and suddenly he was being swarmed by the vicious bees. His last thoughts as he fell into the water, his briefcase sinking into its watery grave, were . . .

OK, I confess: I made that up. Movie plots are on my mind this month because I just finished consulting for a television show, and it got me thinking about the various advisory jobs that have come my way as a Professor specializing in bees. I am fortunate to work at a University that encourages faculty members to get involved in off-campus activities. Simon Fraser is the antithesis of an Ivory Tower, and our faculty tend to be active consultants for business, the media, community groups, government, etc. I say fortunate for two reasons. First, outside consulting is a way of supplementing our regular income. University Professors are not poor by any stretch of the imagination, but our salaries are not bloated, either, and consulting work can be a very welcome addition to our paychecks. In addition to the income, consulting work provides a fascinating glimpse at how people in other professions make their living, and at the various perspectives with which they view bees.

My first consulting job was not at all lucrative, but it did have great impact on my future. I had just completed my graduate research on Africanized bees, and on my way home was invited to the island country of Trinidad-Tobago to advise their government on how to cope with these bees. Their Ministry of Agriculture was concerned about the possibility that swarms of Africanized bees might colonize their country by flying over the short nine mile strait separating Trinidad-Tobago from the South American mainland, which did occur a few years later. The beekeepers and government officials we met were wonderful hosts, taking us all around the islands and showing us beekeeping operations, tourist sites, marvelous nature preserves, and incredible beaches.

This was heady stuff for a young graduate student, and for the first time I realized that the work I did might have value to someone from outside the academic world. I came away from Trinidad-Tobago with the feeling that my future responsibilities might go beyond publishing papers in obscure academic journals, and that research could be important for beekeeping.

The consulting jobs that have come my way since then have diversified over the years, as I became more established. My consulting repertoire now includes legal work, and I am occasionally called upon to testify in cases involving bees. Lawyers certainly have a different perspective on bees than that of beekeepers or governments. To the legal profession, bees are lean, mean, income machines. Considerable money can often ride on a bee case, and expert witnesses may make the difference for awards in the hundreds of thousands of dollars.

For some reason, the cases I have worked on have all been in the area of workers' compensation. One case was especially interesting because I was able to shift the blame from bees to wasps, and help a poor widow in the process. Her husband was a long-haul truck driver, and was stung while carrying a load of wood shavings. He radioed in that he had gotten stung, and that was the last word until a passing driver found him dead at the wheel 25 minutes later. His widow applied for about $500,000 in compensation, but the government-run board turned her down, claiming that he was no more likely to be stung than an average member of the travelling public, therefore ineligible for compensation according to the applicable laws here in British Columbia.

I was brought in as an "expert" on bees, and quickly earned my fee by pointing out that there was no evidence a bee was involved. I argued that he was most likely stung by a wasp attracted to the wood shavings he was hauling, with the wasp interested in using the shavings for pulp to build its nest. This was a key point, because it meant that he was at higher risk of attracting a stinging insect and being stung than an average person driving down the road would be. The Board bought the argument, the widow received her compensation, bees were exonerated, and both the lawyer and myself were enriched by the process (the lawyer much more than myself, unfortunately).

Continued on Next Page

"Consulting work is interesting, but it also presents numerous dilemmas, and I have had to develop financial and ethical criteria to use in considering each job offer that comes along."

CONSULTING ... Cont. From Pg. 21

I also was able to help the image of bees on another consulting job, this one for an edition of the Magic School Bus books. This series is a spin-off from the Public Television show that has a teacher, Mrs. Frizzle, shrink her class down to miniature size in a school bus and take them on weekly science adventures. The bee book involved shrinking the class and driving the bus into a real bee hive, teaching kids about bees, honey, and pollination in the process.

This job was fascinating because I got to think about what it would be like for a kid to really enter the world of bees, and to observe the writer and artist work at creating a vision of bees that would be both informative and attention-grabbing for kids. I also did beekeepers a great service. The term "botulism" appeared in an early draft, but the authors fortunately followed my forceful advice to remove that dreaded word from the book.

Another call came in a few years ago from a novelist who wanted to use bees as part of a story he was writing. His idea was to have the President of the United States be an individual allergic to bee stings, and visit a farm with bees on it. The morning of his visit, a terrorist sneaks into the President's bathroom, substitutes deodorant containing alarm pheromone for the President's regular deodorant, and you can imagine the rest.

I think I dissuaded him from this far-fetched plot, by proposing an equally far-fetched plot. In my concept, the President was visiting a farm with bees on it, and was offered a banana for lunch. Bananas naturally contain iso-pentyl acetate, a component of the honey bee alarm pheromone, so when the president bites into the banana, he attracts bees, gets stung, and dies, with no obvious trace left by the terrorist. For some reason the novelist didn't like my suggestion, or even his own. At least, I've never encountered a book in print that includes bananas or deodorant as part of a terrorist attack on the President.

The television and movie industry is the most fascinating business to consult for, and also the most controversial, because these media look for the most lurid ways of depicting bees. Last year's made-for-TV bee movie (for which I was most definitely **not** the bee-wrangling consultant) had a gargantuan swarm of killer bees take over a California town, terrorizing a family in their home for most of the film. I avoid working on those deep-stinging, killer-bee-as-terrorist movies, but sometimes an interesting job comes along that depicts bees in ways that make you see them from a different perspective.

I recently did some work for a television show, the X-Files, whose basic premise is that aliens are here on Earth, the government knows about it, but the whole thing is hush-hush. The star of the series has dedicated his life to exposing the government-alien plot, and in one episode bees enter the picture. In this story, bees are the good guys. I am not allowed to say more about the plot, but I can tell you that they constructed an amazing "interior of a hive" set, that no expense was spared to put the bees in the action, and you clearly get the idea that bees only sting bad guys. I had never considered how aliens coming to Earth would use bees, or indeed what bees from another planet might be like, and that certainly was a mind-expanding experience!

Consulting work is interesting, but it also presents numerous dilemmas, and I have had to develop financial and ethical criteria to use in considering each job offer that comes along. Some questions that have come to mind include: Should I do "killer bee" movies? Should I charge beekeepers a fee for my advice? If a lawyer asks me to be an expert witness in a case against a beekeeper, should I accept? These and similar questions are knotty, and should give anyone offered a consulting job involving bees considerable pause for thought before making decisions about such work.

I've resolved these issues with three simple rules: I don't do killer bee movies, I don't charge beekeepers or growers for advice, and I won't advise on a legal matter in which my expert opinion might harm a beekeeper. Fortunately, my simple rules have yet to be put to the test. I haven't been offered work on a killer bee movie or for a legal case against a beekeeper, and I doubt that any beekeepers or growers would pay for my advice anyway. Now, if I could sell that plot to a movie company . . . BC

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

WORLD HONEY PRODUCTION

John Parker

News of devastation of the honey output in some areas of Mexico and Central America from Africanized bees is reflected in data on world production of honey. Yet, this may be the greatest decline registered for 1995, according to data from Food and Agriculture Organization (FAO). The Statistics Division of FAO in Rome, provides honey production statistics compiled after diligent research and receiving hundreds of answers from statistical headquarters for countries around the world.

Another source of information on honey production in major countries for output or trade is the U.S. Department of Agriculture. It has provided some remarkable reports in recent years about the honey situation in certain countries, particularly China and Germany. For output of honey in many countries where no FAS honey report is available, traders and analysts usually rely on FAO.

It is interesting to find that after the best and the latest numbers for world honey output are tabulated that a slight gain of almost one percent occurred in 1995. The total world honey harvest in 1995 was about 1.2 million tons, compared with 1.19 million tons in 1994 and 1.215 million tons in 1993. With the rise in U.S. prices for honey imported from China and Latin America this may be difficult for some traders to believe. The good news about increased honey output in 1995 came mostly from Europe, particularly Germany and Romania.

European gains more than offset the declining production in China, Mexico, and Central America. U.S. honey production has been relatively steady in the range of 100,000 tons annually during the last five years. A six percent production decline to 98,500 tons in 1994 followed the peak harvest of 104,686 tons in 1993. Following China, the U.S. is the world's second largest honey producer. Because of large imports and small exports, the U.S. leads the world in honey consumption. In some years the race between China and Germany for second place in honey consumption has been close.

China Produced, Exported Less

World exports of honey showed an impressive six percent rise to 305,549 tons in 1994, when China and Argentina combined accounted for half the total. When exports by Mexico were included, these three major exporters accounted for about two-thirds of world honey exports in 1994. The share for world honey exports by major suppliers changed in 1995 and 1996 as China's honey exports declined and Mexico's shipments were hurt by damage from Africanized bees and mites in various areas.

China's production had been on a high plateau averaging about 181,000 tons annually during 1992-94. Then a combination of adverse weather, changes in the labor market, and reduced enconomic incentives for beekeepers led to a decline to about 168,000 tons in 1995. Since China was the leading exporter of honey in the early 1990's this had a significant impact on world honey prices. Smaller supplies available for export from China plus increased government intervention led to substantial hikes to China's honey prices.

China's 1996 honey output remained below the earlier peaks and exports remained below the peak of 102,157 tons recorded in 1995, which was 56 percent of its honey harvest. Government intervention and reduced supplies caused China's 1995 honey exports to decline about a third. Since many importers in Germany and USA relied on imports of honey in bulk containers from China or Latin America, the smaller suppliers from traditional sources sent honey wholesale and retail prices higher.

Mexico's Output Down

Mexico's honey harvest declined a sixth to 51,195 metric tons in 1995. Damage from Africanized bees was reportedly more severe on the Atlantic coast area than along the Pacific. Mexico's honey exports fell 15 percent in 1994 to 30,279 tons as it became apparent that the 1995 harvest would decline. Mexico was the third major world exporter of honey in the early 1990's, a position it appears likely to lose to others in the late 1990's. While most of Germany's honey exports consist of attractively packaged honey originally from China or Argentina, the duty-free European Union trade is likely to push Germany ahead of Mexico as a honey exporter.

Mexico's decline had a significant impact on U.S. honey prices. The combination of smaller imports from China and Mexico contributed to higher retail prices for honey in U.S. stores. Mexico exported 58 percent of its 1993 honey harvest, but only 48 percent of the 1994 supply.

Argentina's Export

High world prices and the need for ample pollination by an expanding agriculture are likely to result in greater future Argentine honey output. However, production decline in Argentina combined with problems in other major exporters like China

Continued on Next Page

HONEY PRODUCTION BY SPECIFIED COUNTRIES, 1992-95.

	1992	1993	1994	1995
Country		metric tons		
China	183175	180895	181172	172000
United States	100056	104686	98500	101000
Argentina	56800	60000	67000	70000
Ukraine	57111	63678	62050	62334
Turkey	60319	59207	54117	54000
India	51000	51000	51100	51300
Mexico	63886	61973	62683	51195
Belarus	55000	53000	50000	50300
Russian Federation	47000	52700	43900	44000
Germany	24599	25319	22233	36000
Canada	30339	34245	30353	31500
Kazakhstan	30000	28000	28300	29100
Spain	23958	28393	28000	27700
Kenya	22000	23000	24000	25000
Tanzania	15500	23500	24000	24500
Ethiopia	23730	23700	23900	24200
Australia	18948	22556	24000	24100
Angola	20300	21000	21000	21300
Brazil	18841	18367	19000	19200
France	17183	17422	17694	18000
Hungary	10742	15873	23651	16236
Greece	1500	14826	15336	16000
Romania	10410	9936	9820	15000
Cuba	10500	10000	10450	10500
South Korea	10200	10200	10200	10350
Italy	12500	13200	12500	9450
Poland	12891	10728	9296	9400
Austria	5000	8000	8500	8600
Iran	7840	7980	8150	8500
Czech Republic	7025	7783	7611	7786
Uzbekistan	6800	7000	7000	7200
Uruguay	6000	6450	5500	5500
Chile	5030	5000	5000	5300
Bulgaria	5961	3881	4100	4150
Turkmenistan	3900	4000	4000	4050
Azerbaijan	4000	4000	4000	4000
Moldova	3500	3601	3660	3670
Slovakia	2500	3178	3601	3200
Kyrgyzstan	3010	3000	3000	3000
Israel	2125	2150	2050	2450
Other	121049	111784	98970	108096
Total	**1172228**	**1215211**	**1189397**	**1199167**

Sources: FAO Agrostat and estimates based mostly on FAS/USDA honey reports.

and Mexico can cause a jolt to 1996 world honey wholesale prices.

From the FAO data it appears that some earlier reports about a setback for 1995 Argentina honey production were exaggerated. The decline appears to have come in the early part of 1996. Argentina exported 97 percent of the 55,165 tons of honey harvested in 1992. Exports remained above 90 percent of the harvest during 1993-96. The FAS/USDA office of the Agricultural Attache in Buenos Aires has reported that when stock changes are considered, Argentine consumers purchase only about five percent of the country's honey output.

South America Surviving

The output of honey in most of South America to the south and west of the Amazon Basin has survived relatively well in view of the path of destruction for Africanized bees as they moved north from Brazil. Output in Brazil was steady in a range of 18,000 to 19,200 tons in the mid-1990's. Harvest by beekeepers south of Sao Paulo appears to have remained strong, particularly in the three southern states, where a temperate climate and modern commercial agriculture mean considerable technical help for beekeepers.

Uruguay exported over 90 percent of its honey harvest during 1991-93, but by 1994, the share had fallen to 87.9 percent. Uruguay's honey output fell from 6,450 tons in 1992 to 5,500 tons in 1994 and remained about the same in 1995.

Chile should have a larger honey output than the 5,000 tons reported. Bees are needed for pollination of the orchards and vineyards which are a major part of Chilean agriculture. Chile's honey exporters responded to higher world prices in recent years. Chile exported about a tenth of its honey harvest in 1992, but the share rose to over 20 percent of the supply during 1993-95.

Cuba's honey output remained steady so far in the 1990's in a range of 10,000 tons annually. The path of the Africanized bees appears to have skipped Cuba so far. Cuba would have ample stocks of honey for export, if trade numbers were the only factor. However, with shortages of candy and snack foods, Cuban consumers have been glad to purchase honey which foreign buyers cancelled contracts through trade agreements. This involved mostly trade with Former Soviet Union and East European countries.

Cuba's honey exports tumbled from 10,000 tons in 1992 to an about 3,000 tons in 1994. This meant that the share of the honey harvest which was exported fell from 95 percent to about 29 percent between 1992 and 1994. With the high prices German and other European importers are paying for honey, it is a puzzle why Cuba's traders were not able to find new customers when the Russians and Czechs stopped buying their honey.

Adjustments In Former Soviet Union

Breakup of the Former Soviet Union (FSU) after events in December 1991 created a new setting for beekeepers. The previous subsidies and advantages for beekeepers were changed. Production of honey for export appears to have suffered. The

HONEY EXPORTS BY SPECIFIED COUNTRIES, 1992-94

	Quantity Exported			Exports As Share of Production		
	1992	1993	1994	1992	1993	1994
	metric tons			Percent		
China	91756	96597	102157	50.1	53.4	56.4
United States	4821	4196	3888	4.8	4.0	3.9
Argentina	55165	54999	62436	97.1	91.7	93.2
Ukraine	300	700	1200	0.5	1.1	1.9
Turkey	3307	3012	2735	5.5	5.1	5.1
India	1561	633	425	3.1	1.2	0.8
Mexico	30093	35998	30279	47.1	58.1	48.3
Belarus	700	850	1200	1.3	1.6	2.4
Russian Federation	1151	345	800	2.4	0.7	1.8
Germany	12259	13799	13625	49.8	54.5	61.3
Canada	11137	8388	8510	36.7	24.5	28.0
Spain	4116	4181	5453	17.2	14.7	19.5
Kenya	11	18	35	0.1	0.1	0.1
Tanzania	90	50	60	0.6	0.2	0.3
Ethiopia	157	76	68	0.7	0.3	0.3
Australia	9029	9108	13595	47.7	40.4	56.6
Brazil	611	204	511	3.2	1.1	2.7
France	4516	2271	3932	26.3	13.0	22.2
Hungary	7525	13566	13498	70.1	85.5	57.1
Greece	394	318	576	26.3	2.1	3.8
Romania	1151	1020	1729	11.1	10.3	17.6
Cuba	10000	4000	3000	95.2	40.0	28.7
Italy	326	1131	1507	2.6	8.6	12.1
Poland	903	780	850	7.0	7.3	9.1
Austria	259	533	258	5.2	6.7	3.0
Iran	65	30	85	0.8	0.4	1.0
Czech Republic	2472	1558	2961	35.2	20.0	38.9
Uruguay	5500	6292	4833	91.7	97.6	87.9
Chile	481	1173	1384	9.6	23.5	27.7
Bulgaria	1357	3742	3940	22.8	96.4	96.1
Slovakia	800	876	1732	32.0	27.6	48.1
Israel	130	65	60	6.1	3.0	2.9
Other	26534	17732	18226	21.9	15.9	18.4
Total	**288678**	**288241**	**305549**	**24.6**	**23.7**	**25.7**

Sources: FAO Agrostat

Russians shifted from a net export position for honey to surprising net import setting in the mid 1990's. The significant trade between the 15 different republics of FSU remained because of duty-free arrangements of the Commonwealth of Independent States (CIS). Ukraine and Belarus remained net honey exporters, and Belarus had ample supplies for export to other CIS republics. Production of honey in Russian Federation declined in the early 1990's to levels below the 1980-89 average. Some efforts to keep a significant number of colonies to pollinate crops helped provide a rebound for Russian honey output to 52,700 tons in 1993. Then the 1994 harvest fell about a ninth to 43,900 tons, and the 1995 output was similar.

Ukrainian honey output has remained steady in the range of 62,000 to 64,000 tons since 1993. This may be partly because of the rising interest in agriculture on a private basis, with greater attention to private gardens and orchards. Also, Ukrainian honey has become a favorite item for sale by transit traders visiting Turkey, Russian Federation, and other neighboring countries. They earn money in the currency of the country they visit by selling items like honey. Then they purchase consumer goods in that country to bring back home to Ukraine where demand is strong and prices are favorable. Some of the items Ukrainian traders can be seen bringing back by boat after travel to Turkey include: candy, hazelnuts, pistachios, clothing, ceramics, cigarettes, and electronics.

Belarus was the seventh major world honey producer in the early 1990's, harvesting over 50,000 tons annually. Much of its supply is exported to Russian Federation and countries bordering the Baltic Sea. Small traders visit Belarus and purchase honey before transporting it by truck to their home market. Apparently many of the smaller purchases by traders from neighboring countries are not recorded in export statistics of Belarus. For a country of ten million people, Belarus has the world's highest per capita output of honey. It would be interesting to read how Belarus produces about half as much honey as the U.S.

FSU republics in Asia have maintained honey output at levels near the 1980's. Most of the supply has been consumed locally and less has been available for export. Kazakhstan was the tenth major world producer of honey in 1992, but its rank had declined by 1996. Part of the reason for the Kazakh decline for honey output has been a breakdown of the farm input and marketing system which resulted in a steep setback for crop yields during the last several years.

Some exports from Kazakhstan, Uzbekistan, and Turkmenistan move through Iran and then to Mideast markets. The quantity is smaller than the potential which importers in Saudi Arabia, Kuwait, and UAE would like to see. Even Iran would apparently be a good market for their honey exports, particularly if the traders would buy Iranian pistachios and raisins in return. Prospects for high prices for honey exports have helped maintain production in the range of 3,000 to 4,000 tons annually in each of four republics - Azerbaijan, Moldova, Turkmenistan, and Kyrgyzstan.

European Output and Trade Flourishing

Europeans are glad to obtain more honey from local producers or from neighboring countries. The reduction in deliveries of bulk honey for packaging from China greatly concerned German traders in 1995 and 1996. Germans working with firms which processed and marketed honey welcomed the bumper 36,000 ton harvest of honey in Germany in 1995. Also, increased output in Hun-

Continued on Next Page

WORLD HONEY ... Cont. From Pg. 25

gary and in Austria in the mid 1990's contributed to greater self reliance on local supplies for honey in central Europe. Czech Republic and Slovakia maintained good harvests and exported about a third of their supply during 1992-95.

Romania had a sensational rebound for honey production in 1995, with the harvest of 15,000 tons, up from 9,296 tons in 1994. The 1995 harvest was better than other years in the 1990's. Romania can export all the extra honey available at attractive prices to the European Union and the Mideast. Romanian honey exports increased about 70 percent to 1,729 tons in 1994 and advanced further in 1995 and 1996. Romanian traders would like to expand honey sales to the U.S. and Canada.

Poland's production declined from 12,891 tons in 1992 to about 9,400 tons in 1995. Poland has maintained exports of about 800 to 1,000 tons of honey annually because of good trade opportunities in neighboring countries.

Bulgaria's agriculture has faced difficulty in the transition from state and collective farms to a cooperative and private system. Bulgarian honey output fell sharply from 5,961 tons in 1992 to about a third less than this during the 1993-95 average.

Bulgaria exported over 95 percent of its honey harvest in 1993 and 1994. This may have been to obtain foreign exchange for purchases of highly valued consumer goods in neighboring countries, particularly Turkey and Greece. Some of the purchases of Romanian honey by Bulgarian traders from Romania apparently was not recorded in trade books.

The European Union

A combination of subsidies and duty-free trade within the European Union (EU) has prevented a decline in honey output in most member countries. German production gains in 1995 more than offset smaller harvests in Italy and Portugal. German imports of honey have remained high, in the range of 91,000 tons annually, despite its increased domestic output. This is partly because of the profitable business of packaging imported bulk honey in smaller consumer-ready containers, including a big export business. In addition to flourishing sales of honey to customers in other EU countries, Germany is a major exporter of honey to East Europe and the Mideast.

Following Germany, the second major EU honey producer is Spain. Output of Spanish honey remained steady at about 28,000 tons annually during 1993-95. Spain exports from 15 to 20 percent of its harvest with the help of duty-free EU sales.

France produces about 17,000 to 18,000 tons of honey annually, which is relatively small for its important agriculture. France exported 26 percent of this in 1992, but also made large imports from other European Union (EU) suppliers.

Italy has some of the most productive orchards in the world, particularly in the area between the Alps and Po Valley. Yet, output of Italian honey fell from 13,200 tons in 1993 to only 9,450 tons in 1995. This may have been partly because of rising labor costs and problems with pests.

East Africa's Output Stays Home

Kenya, Tanzania, Ethiopia, and Angola have a significant output of honey, ranging from 20,000 to 25,000 tons annually in each country. Yet, very little of their honey enters the world market.

During 1992-94, none of the four countries exported even one percent of their honey output. This means that in times of high world honey prices, traders may explore prospects of beginning purchases in East Africa.

South Africa should have a larger output of honey. Imports of honey are rising. Future plans to create rural employment may include programs to increase the number of colonies. One of South Africa's most successful export stories in the last several years has been the expansion of sales of decidious fruit.

Australia ExportHalf

Australia's honey harvest increased from 18,948 tons in 1992 to 24,000 tons in 1994 and remained near that level in 1995. Exports of honey by Australia increased from 9,108 tons in 1993 to 13,595 tons in 1994, which was 56.6 percent of its harvest. Australia has been a welcome supplier for importers of honey in Asia and North America.

Canada's Output Steady Up To 1996

Canada's honey production reached a peak of 34,245 tons in 1993 and declined an eighth in 1994, before rebounding 4 percent to 31,500 tons in 1995. Canada's honey exports declined from a high level of 11,137 tons in 1992, but averaged about a third less during following years, and most shipments were to the U.S.

•

World data on the 1996 crop are still being analyzed, but some indicators exist. China's output hasn't increased significantly, nor has Mexico's. Australia did increase production and exports in 1996. The U.S. and Canada both had average to short crops, but the high cost of honey has slowed consumption, thus imports. The dust has yet to settle on both fronts for 1996.

1997 should be interesting as some exporting countries are gearing up to take advantage of higher prices.BC

John Parker is a retired government statistician.

NEWS FROM NATIONAL MEETINGS II

ABF Pollination Day

Bee Culture Staff

The American Beekeeping Federation spent an entire day during their 1997 meeting studying pollination – from the science of pollen transfer to the business of pollination contracts to the specifics of particular crop requirements. Some highlights . . .

•

Blueberries are increasing in popularity, thus demand, and acreage. Two kinds are grown, highbush, the traditional crop, and lowbush, the 'wild' type grown in Maine.

Highbush are grown in several areas of the U.S. from Florida north on the east coast, across the northern states into Michigan. In Michigan growers use up to four colonies per acre. Because they bloom early they're often touched by frost. This means growers may look for more colonies to ensure as many blossoms as possible get pollinated, or, they cut back because there are fewer to pollinate.

In New Jersey blueberry pollinators have to keep an eye out for vandalism, and get only $30 - $35 per colony. They will, however make a little honey on this crop. In Florida Rabbit Eye blueberries are grown, providing the earliest berries of the season. Grown in small patches primarily, honey bees aren't the best pollinators available (though the most common). Lots of small, solitary bees and bumble bees are in these patches because these flowers need buzz pollination.

The annual lowbush blueberry crop in Maine, though not as big as the almond crop, is certainly the big boy of the east coast. Twelve to 15 operations move 35,000 plus colonies there, on or about Memorial Day.

Generally using two colonies per acre in doubles, or a deep and a super, they start strong but go downhill fast because of little pollen and no nectar. Growers look for at least six frames of brood in a colony, and some don't pay at all if weaker, while others give bonuses for more.

Pesticides and bears are the biggest problems, but crop timing is also critical as most pollinators need to move on to other crops, like cranberries in Massachusetts, and apples in a number of states.

Wisconsin and Massachusetts are the greatest cranberry producers, and getting bigger. Bogs vary in size, accessibility, and pesticide activity.

East Coast cranberry bloom has a tight window at the end of the Maine blueberry crop. Massachusetts uses about 20,000 colonies primarily from a half dozen commercial outfits. Two per acre are used and will only hold steady on this crop. Strong colonies will make honey, but weak colonies will go down. Growers try to move out before the post bloom sprays begin.

Apples are a mainstay nearly everywhere, though Washington is by far the largest producer. Last year Washington had a banner year because of good weather and lots of bees. The east coast, because of touchy pollination weather and a noticeable lack of feral colonies (heavily depended on by many growers), showed a 40% decrease in production. Beekeepers in the east are already being overwhelmed with requests.

Most growers want bees in apple orchards at from 0-10% king blossom, and stay until petal fall is from 25% - 75% complete. Gaining popularity is the trellis system of management, which, although the trees are smaller, produces more blooms per acre, requiring more bees – or so the theory goes.

Specialty citrus crops in Florida are also gaining popularity with pollinators, and growers. Getting $10-$12 per colony, and making a profitable honey crop is good business. Too bad it's not more popular than it is. Also in Florida, cuke pollination is different than most places. September and October vine crops compete with melaluca and pepper honey crops, so locations are in demand, and pollination fees are low.

Seed crops require pollination, and areas of Idaho and California specialize in hybrid seed production. The specialty crops are grown and crossed in small screened cages with usually a nuc inside. On a larger scale, carrots, turnips, radishes, leeks, chives and onions, are the major crops produced. Colonies need to be continually supplemented, and food, water and protein need to be monitored. It's profitable but tough on the bees, and a very specialized way to do business.

But all these crops pale in comparison to almonds – *THE* crop of distinction. Almonds are similar to many fruit/nut tree crops in that there are several rows of 'producers,' and a row or two of 'pollinizers.' Bees need to get pollen to the first from the second for a crop to be produced. That's what it's about.

Thousands and thousands of colonies are used for this crop. And with new growth coming on, by the year 2000 a million colonies will be

Continued on Next Page

NEWS ... Cont. From Pg. 29

needed to pollinate this grand daddy of all crops.

Several beekeepers discussed their particular interaction with this crop, and the people who grow it. Bob Brandi, from Los Banos, CA starts October 1 by feeding his colonies twice with pollen substitute and syrup. He contracts 85% of available colonies, leaving some to fillin the dead outs he'll find come Spring.

In November he moves to a warmer location so they'll build up by February 1. On older plantings, with 75-80 trees/acre he rents two colonies/acre. Newer plantings, with 125-150 trees/acre need three colonies. He guarantees four frames, with six average, and sets all colonies on orchard edges, rather than inside, where it's cooler. He stays three to four weeks.

Between 15% and 20% of the 900,000 colonies used in almonds are handled by brokers, which is the safest way to go for beginners in this frenzied market. Ken Seltzer, from central California both brokers bees and has his own.

Because his location is different, Ken starts preparations on Labor Day when he reduces his colonies to singles and moves to the foothills for tarweed and blue curl for Fall pollen. He's above the fog, and below the snow here. He guarantees four frames minimum and six average and gets about $40/colony. If the grower asks the county to inspect for strength he recommends either the broker or the beekeeper to be present. Not everybody uses the same math it seems.

John Miller, whose operation we featured here awhile back stresses good communication with growers. He has already contacted them before the end of the year to keep in touch. Miller's have 14 phone lines – six land and eight cell – to make sure growers can get in touch with them. Knowing the lay of the land is important (and not just for almonds). Have maps, help flag the locations and knowing the manager all help.

Pesticides are a problem, and registering locations when moving in will help reduce (though not solve) losses. Also, knowing the varieties is important – which bloom first so bees can be there earlier – makes managers happy. To counteract theft – a growing problem – make sure everything is branded, and have your company name on every truck. That helps spot those not appropriate. When first working with a grower, Miller suggests asking "Who is your banker, and who is your fuel supplier?", and anyone unwilling to answer is probably not a good customer.

"The best thing about almonds," says Shannon Wooten (see story this issue), "is that there aren't any bears!"

But Shannon has a somewhat different perspective on this subject, too. He rents his bees by 'the unit,' rather than just the box. A 'unit' is a frame, and depending on the grower he can rent up to a 12 maximum, but usually 10 or 11 frames/double. Of course this means a tighter inspection program, and a comprehensive pre-pollination preparation program, so that the colonies rented meet the needs of the grower. From 3% - 10% of the frames are inspected to insure reliability.

Shannon winters 200 colonies/yard and spends lots of time equalizing them. Then, when growers call they're all ready. Moreover, if one orchard isn't ready, those colonies already on the truck can be put anywhere, and he'll meet his minimum 'unit' count. The colonies he rents by the 'unit' pay between $4.40 - $5.50/frame, with a 10-11 maximum count. Others he rents by the box, eight-frame minimum, pay $40. He places as many as possible on the edge of orchards for accessibility, and has between 100-400 in reserve to fill holes and for extras.

Advice on moving bees in to orchards from all of these pollinators was varied. It takes about a dozen days to move 900,000 colonies into almonds, and about 16-18 to move out. In an emergency put some colonies in the more advanced part of the orchard (sandy soils), and scatter some around the orchard to catch the earliest bloom, then fill in with the rest of the colonies. This keeps growers happy and gets the job done.

The unknown this year, in early February, was how many colonies were lost in the floods. Estimates range from 6,000 - 40,000. Another problem this year is just getting into orchards (providing the orchard is still there). If bees can't get in, have pollinators not fulfilled their contracts? And, if an orchard is destroyed, has the grower not fulfilled? These, and other 'Act of God' clauses should be in a contract before the rain starts.

At the end of the symposium, Kevin Roberts, a pollinator and honey producer from northern California gave an overview of the advantages, and disadvantages of going into the pollination business.

Advantages include – a source of income; if you already move you already have the equipment so there's no (or little) capitol expense; growers are more willing to pay profitable fees because of the loss of both feral colonies and the fact there are fewer beekeepers; and, more growers are investing in pollination as a way to improve yields.

Disadvantages listed were – pricing is variable, competitive and is based on supply and demand in a local area; you may be trading a honey crop for pollination fees, so know your 'opportunity' costs; pesticides are a problem because crops, bugs and chemicals are a given; and you generally have to put bees where they are wanted rather than where convenient.

The biggest pricing problem lies with beekeepers who don't know costs. These include – labor, fuel, bee food, risks (queen loss, pesticides, etc.); and the loss of honey crop.

He summed it up by asking two questions, and they are the two you need to answer before you pollinate:

1. Will I collect more than I spend?

2. Can I make more money somewhere else?

All the information, research, experience, trial and error in the world can't answer those, only help.

You need to know the answers, before you start. BC

Growers, Beekeepers & Honey Bees

Making this 3-way relationship work for everyone.

James E. Tew

For a few weeks during the warm months of each year, growers, beekeepers, and bees all come together to begin production of the next year's fruit and vegetable crop. It's not necessarily a relationship made in heaven. Each party, to this three-way agreement, brings requirements and expectations to the relationship. If any one member of the relationship reneges on any part of the agreement, there is a significant possibility of the relationship failing with the results being bad for all involved.

A pollination contract, though often distasteful to both grower and beekeeper (the bees don't seem to care either way), is a good way to avoid future misunderstandings. An agreement should minimally include:

A. Dates (or stage of bloom) when bees are to be moved in and out of the field or orchard, and minimal notice times.
B. Rental fee and date of payment.
C. The strength (population) of the colonies to be rented and how that strength will be determined.
D. The Grower should agree:
   • To keep the beekeeper informed of pesticide applications on both the pollinated crop and on surrounding crops on which bees might be foraging.
   • To provide easy access to the rented colonies throughout the rental period.
   • To compensate the beekeeper for extra colony moves during the rental period due to pesticide application schedules.

E. The Beekeeper should agree:
   • To get bees into and out of the orchard on time - no excuses.
   • To maintain bees in good condition while on-site.

F. Other possible points that need discussion:
   • The colony distribution pattern to be used in the planting.
   • Selecting sites away from human activity and passage.

The Grower

1. Selling A Problem.

Most growers, when renting bees, are essentially agreeing to sell their pollination requirements to a beekeeper. It's a serious request that the grower is making. At first glance, a beekeeper may see a commercial pollination offer as (reasonably) easy money - move a few bees in - move a few bees out....and pick up the check. Such a scenario may happen under ideal conditions, but perfect conditions are not the norm. It rains too much, it's raining (or freezing) when the bees are to be moved out, or the weather was warmer than expected; therefore, you've got to get the bees out sooner than expected - and you had other plans for the evening. It's easy for a beekeeper to rationalize why he was unable to get the bees in or out, but for the grower, time marches on (as do blooming rates and pest populations). In nearly all cases, the beekeeper is selling the grower a service - NOT simply doing the grower a favor as many beekeepers seem to think. The honey bee provider should always be aware that once the blossoming period is over, there will be no more fruit set. It's serious for the grower.

2. Where's The Bees?

The grower has rented your bees and he or she expects to see them in the planting. It's a bit of a stressful time for growers, keepers and the bees. If it's cool, the bees won't be flying – no matter how many are in the hive. If the bees are flying, how many is enough? Well, I suppose having too many is very nearly impossible from the producer's perspective, but realistically-speaking readily seeing and hearing foraging honey bees in the planting is a good indication that the bees are on the job in the right place. Bees here - bees there - the sound of bees in the air - that's about all the beekeeper can do in providing good colonies. Now, what the bees decide to do is another story.

3. A Good Beekeeper From the Grower's View.

So...with all things considered, what does it take for a beekeeper to be a good service supplier to a grower? Two things: (a) personal reliability and (2) populated bee hives. To get that good reputation, both the beekeeper and the bees need to fulfill their obligations to the grower.

The Beekeeper

1. Of Utmost Importance!

Don't spray my bees. This rarely intentionally happens now, but it still does in some places. Growers are aware of the susceptibility of honey bees (actually, all pollinators) to a broad range of insecticides. But growers should be aware of pesticide drift. The beekeeper should expect the grower to have made preparations within the spray schedule to accommodate the visiting colonies.

Continued on Next Page

GROWERS... Cont. From Pg. 31

2. How Much Notification is Enough?

Touchy point here. The grower can only give the beekeeper a gut-guess as to when the bees should come in and go out of the planting. In early spring crops, the weather can be a real abrupt factor in determining when the bees are needed. The beekeeper should appreciate the predicament the grower is in. The grower, however, should realize that no matter how mechanized a beekeeping operation may be, it is still back-breaking work. The grower must be sympathetic to the fact that bees are livestock - not machines. They have good and bad days. Moving colonies on short notice - even when forewarned - can be tricky. The crop is important to the grower, but the bees are just as important to the keeper. If the weather has been bad, and timing is short, both the grower and the beekeeper must be tolerant of the problems of the other. All the while, the bees are stuck right in the middle of this situation.

3. Good Colonies = Heavy Colonies

Good colonies are heavy colonies, making trucks heavy and prone to getting stuck. Lighter trucks can even slip on dew-covered grass. The beekeeper needs to be able to dependably: (a) get the bees unloaded, (b) manage the bees during the pollination visit, and (c) get loaded back onto the truck when done. The best locations for sighting bees in a planting can frequently be right in the way of everything else (but it's only for a few days).

4. Put Some Here and Put Some There.

Where should bees go in the planting? The closer to the crop, the better - to a point. It's usually easier for the beekeeper to unload the entire load at one location, and though that's frequently good enough for most crops, growers like the colonies spread more. However, it is extra work for the keeper to make many stops with only a hive or so set off. Normally, groups of four - eight (or more) hives are acceptable for crops like apples or cucumbers. If the grower wants hives singly scattered, that should be discussed early in the agreement phase.

Better communications may have prevented this under pollinated situation.

5. Payment.

Who wouldn't want immediate payment when any given task is finished? That's the common preference for beekeepers also. Occasionally, half payment is made when the bees go in with the remaining half payment coming when the bees go out, but in general, total payment is made when the bees go out. Most beekeepers are reluctant to accept an occasional offer of half when the bees go out from the planting with the other half being paid when the crop is sold.

The Bees

1. Bees Have Their Own Agenda.

There are no Pied-Pipers of Beekeeping. The grower can only watch bloom development and, once notified by the grower, the beekeeper can only place the bees around the orchard when blooms are beginning to open. Since it's so close, most bees will remain to forage within the orchard, but some foragers have their own opinions and will select their own plants from which to shop for pollen and nectar. There's only a couple of little things either the grower or beekeeper can do that can be done to entice bees to think like us.

a. Eliminate competing flowering plants within the proximity of the orchard or field to be pollinated. For example, in many parts of the U.S., dandelions begin blooming just a couple of days before apple blossoms begin to open and then they continue to bloom throughout the spring season.

There's no reason to attempt to control dandelions on an entire farm, but controlling them in the immediate orchard is a good idea. (Don't forget - spray herbicides on dandelion plants in the fall - not in the spring when they are in full bloom and rental colonies are being brought in). When new forager bees issue from the colony, the grower and the beekeeper want apple blossoms (or the blossoms of the crop to be pollinated) to be the first food source encountered. Honey bees only memorize two or three blossom types at any given time. Be sure one of those is the right flower.

b. Bring in colonies having a lot of open brood. Developing bee brood requires pollen as a protein source. Supplying colonies that have clear pollen needs will insure that most bees will be out foraging for pollen - ergo pollinating the contracted crop. Bees foraging for nectar also pollinate crops, but not as well as pollen foragers.

2. Early Spring is a Good Time to Procreate.

Just when the beekeeper and grower want bees to be single-minded foragers, frequently their bee-minds turn to thoughts of colony fission (swarming). The beekeeper is caught both ways. The grower wants strong colonies, and strong colonies want to swarm. Giving plenty of extra room and keeping new queens heading colonies will limit swarming, but a few swarms will always leave. At least the grower can know that the keeper brought in populous colonies if swarms are observed.

Bee Attractants

Aside from putting naïve bees onto easily accessible blossoms that are in their prime, growers can use commercially-produced attractants that help train honey bee foragers to the desired flowers. Such sprayable materials are called "honey bee attractants". Though not the final solution, these attractants are useful in luring bees to target blossoms. These materials would be particularly useful during times of light bloom when foraging bees might be tempted to move to other crops.

Anyone Can Keep Bees

Apiculture (Beekeeping) is an old

craft having husbandry procedures that are widely documented. As honey bee availability, and consequently beekeeper availability, has decreased during recent years, more growers are considering managing their own colonies - mainly for pollination services. This is certainly an option, but if beekeeping was easy there would be a lot more beekeepers. The arrival and establishment of predaceous mites has required keepers of bees to be more alert and responsible. If one is considering purchasing colonies and letting them "fend for themselves", such colonies will be killed by mites within one - two years in most cases. Yes, growers can keep their own colonies, but only if they truly become beekeepers. In a reverse situation, it's equivalent to a beekeeper deciding to put apple trees in the back yard for some "free fruit."

Free Bees

Both growers and beekeepers have recently been made more aware of the rewarding activities of wild bees also called native bees. Various species of Mason Bees, Bumble bees, and Leafcutter bees are examples of native bees. These are species of bees that were in this country, and on the pollination job, long, long before the arrival of the honey bee.

In many instances such pollinators are undeniably better foragers than honey bees on selected crops. Growers should use these bees whenever and however possible. Also, beekeepers with in interest in pollination services more than honey production should learn more about these beneficial pollinators. However, growers should know that they have already been using these pollination specialists all along. They've been here for millions of years.

Do growers still need honey bees? Yes, as much as they ever have. Possibly even more since so many wild honey bee colonies have died. No insect pollinator is in particularly good shape. Wild pollinator populations, supplemented by honey bee populations will continue to be the best combination of pollination providers for most common crops. There are no super bees - of any kind.

Talk, Talk, Talk

Without a doubt, one of the best things growers and beekeepers can do to maximize their efficiency and teamwork is to communicate. Growers should communicate months (or even a full season in advance) in order to reserve the beekeeper's colonies for pollination services. After having made commitments to a grower, the beekeeper should then keep in touch with the grower concerning the development of the crop - especially with annual crops like watermelons or pumpkins. Sometimes annual crops like these fail - for whatever reason (lack of rain, disease, insects, or heat). Too often the beekeeper is the last to know and can be caught short without a crop to pollinate.

With different goals, interests, expectations, and demands, growers, beekeepers and bees can form a motley – but highly successful crew. When each member of the crew is satisfied with the agreement, everybody wins. EC

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

Wooten's Golden Queens

A Modern, Professional Beekeeping Business

In 1966 Shannon Wooten went to work for Homer Park, near Palo Cedro in Northern California. His first job, working for Homer, was cutting up burlap bags for smoker fuel. The burlap had been used to wipe down newborn lambs so it was 'ripe' to begin with. But it only got better (worse?) because the bags sat in Homer's barn, and his chickens tended to roost on the pile, leaving behind . . . well, other, smaller piles. Thus was Shannon's introduction to beekeeping.

There was a brighter side certainly. Homer was an excellent teacher, strict on how to do things the right way, and the jobs got cleaner, if not easier. Without realizing it, Shannon became a beekeeper. And of course there was the boss's daughter, Glenda, already a beekeeper, grafter and superb organizer.

It wasn't long before Shannon and Glenda moved on to their own business, taking what they'd learned from Homer and Lois, and what they'd learned on their own, and Wooten's Golden Queens came to be.

Today, the business has six full time and six to eight part time employees, produces about 20,000 queens per season, between four and five thousand three-frame nucs, rents about 5,000 colonies for almond pollination and several thousand for other crops in Washington, and sends several thousand colonies to Montana and Idaho for honey production.

The scope of this business is considerable, and the biological, and chronological, dance they do to make all these parts fit together is a good picture of what modern, commercial beekeeping is all about. They are in the business of producing bees – bees for the sake of bees (nucs), bees for pollination, bees for honey production and specialized bees (queens). Each is examined here as a separate entity, but certainly not run that way, since each interacts with, affects and is affected by the other.

Equipment & Facilities

Wooten's Golden Queens is located in Palo Cedro, California, near Redding right at the north end of the valley.

On the ranch they own they keep a few cattle and some horses, and their business complex. They operate a one-ton flatbed with booms, a two-ton and a Peter Bilt and trailers, plus numerous pickups and other vehicles. Two large enclosed warehouses dominate the scene. One has a shop, some general storage, an equipment assembly area and a grafting room. It also has a super storage room, cooled with a swamp cooler for wax moth control that runs in the evenings when it's warm. It is well insulated (R19) to hold the cool and keep adult wax moth inactive. He's never had a moth problem with this technique.

A second enclosed warehouse is for storage of mating nucs and other weather-affected supplies, with plans for another cooled super room. A large, open shed is used for storage of supers, nucs and wooden supplies, plus barrels and the like. . .

Part of the business is dealing with bears, and two bear traps are owned to protect apiaries. Strict laws governing bear treatment make this a more serious problem than it probably needs to be. But there are rules to follow, and trapping troublesome bears is one way, if not the best way, of reducing the damage.

Honey is extracted where it is produced, in Montana, Idaho or California. California honey is extracted at Steve Park's (Glenda's brother), facilities so the Palo Cedro operation has no equipment on site. All honey goes bulk to a packer.

Wax from broken combs and

cappings is used mostly for foundation trade since they sell between 12 and 15,000 frames a year in nucs. Some wax is used as wax cell cups for the cell bars in the queen operation. Wooden equipment, mostly from Miller Wood and Walsh Lumber, is bought in quantity and assembled on an as-needed basis.

Burlap is the exclusive fuel for smokers (chicken history notwithstanding) because it is easily accessible, and produces no spark. Fire hazards in the west can be a big problem.

Bees In General

The stock Wooten's use is originally from Homer Park's stock that has been enhanced and selected to meet the needs of this specific business. Italians, they are chosen for gentleness, building strong in cold weather with high brood production.

Producing bees for fast growth and large populations is the background, but being gentle and exceptional honey producers is also important.

About 30 breeders/year are selected and their progeny is observed for honey production and gentleness while in Montana and Idaho. Once moved back home in the Fall, they are put in an overwintering yard and by January are checked for Spring build-up (queen productivity), pollen storage, 'balance,' color, and 'how good it is.' It's an intuitive feeling Shannon has when deciding. If the colonies have done well thus far, the queen that produced those bees is noted, and kept.

Pollination & Nuc Production

About 5,000 colonies are moved to Chico, California about February first for almond pollination. A good share of these are rented on the 'unit' basis – that is, by the frame. This requires that all colonies be in top shape before then. Previous to moving they are inspected and equalized, but even before that they've been fed and inspected. Those that overwintered especially well (low food consumption, fast build-up) are considered for breeders.

On an iffy weather year growers may be demanding colonies on an uneven basis, and all colonies need to be ready to go to any grower, in any location.

Sometime during the first week or so of March the colonies return home, where nuc production begins. Strong colonies (and most are after almond pollination), are divided into the 'nucs.' A 'nuc' consists of a 10-frame box divided in half with four frames on each side. The four frames are bees, brood and pollen and honey, and a queen is added.

Some of those nucs are put together with the customer helping, in his equipment who comes in, sees what he's getting, loads up (240-250/truck load) and is gone in a day. Others are made up and let grow for a month or so.

The early nucs that are bought go to Washington for apple pollination in April, to honey producers in southern California and to the midwest for honey production a bit later in the season.

A partial view of the open storage shed with an assortment of equipment.

After about a month the nucs have grown considerably and are now colonies, and 1200-1600 are sent to Washington, where a broker moves them into apples, then cherries then pears.

After the three crops about a 1,000 colonies are moved to Deerpark, WA in mid-May, and requeened a month or so later. The remainder are moved back home and split for increase or sale.

Continued on Next Page

One of the large trucks in the operation, outfitted with all the appropriate gear for the job of long hauling bees.

A queen shipping cage with 25 queen cages.

Glenda Wooten runs the grafting team and the business side of the business.

The colonies in Deerpark gather honey until late July, and will make 40-60 lbs./colony. Then, the honey is removed and the colonies head to Hamilton, Montana for the main honey flow. The colonies in California are moved to Montana for knapweed, and Sheridan, Wyoming for sweet clover.

During the main honey production time in both places queens are evaluated for some of the traits important to the line they produce – honey production, brood production (both amount and rate) and gentleness. Promising colonies are marked for further evaluation back in California, where they go after harvest in late August or early September.

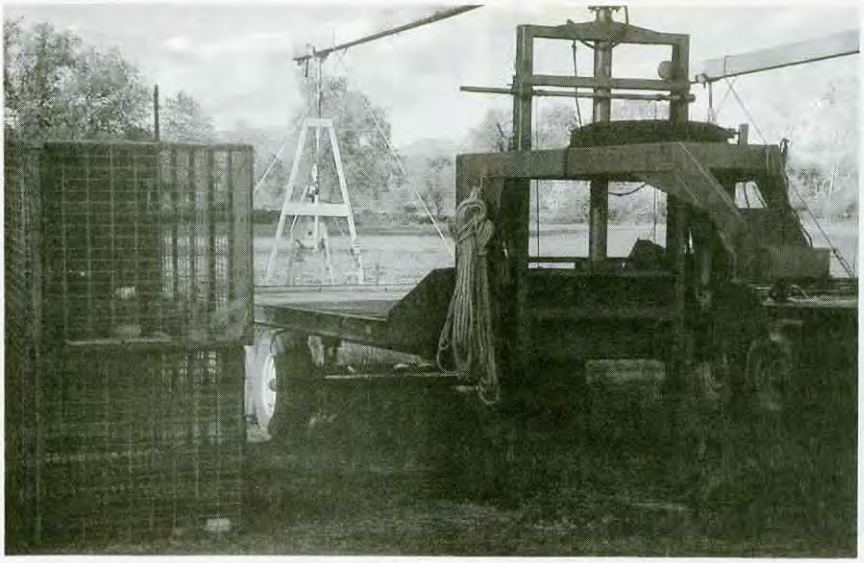
About 3,500 colonies stay in California all season. There are the colonies that didn't go east but came back from WA, those that were used for cell builders and mating nucs and the like. These strong colonies are divided and moved to honey locations in the area. They usually go as two, four frame nucs in a 10-frame box, with another deep on top. On a good year they'll put on 40 or more pounds of honey by season's end. These colonies, as with all the rest, are moved to Winter yards after the flow. These colonies will also be used for nuc production next season.

Queen Production

From the standpoint of industry visibility, the queen production side of the business is by far the best known. Both Shannon and Glenda play an active role in this, from breeder selection to shipping.

Wootens ship about 20,000 queens every season. Most are sold directly, preferably in lots of 25 or more (smaller orders are handled by another producer who uses the same stock), plus many more go to requeening their own colonies, and of course every nuc has a queen.

Production begins about February 20 and continues to the middle of June. About 30 breeders are used each year, many saved from the previous year. Some are as old as four and still used. Shannon is the breeder selector, a task he relishes. "It's fun, I've gotten pretty good at it,



Bear cages and trailers with booms are part of the business.

"I've always liked picking breeder queens. I'm good at it, and it's one of the enjoyable parts of my job." Shannon Wooten.

and can almost tell a queen mother just by looking at her." That, and over 30 years experience, results in good selections.

Breeder colonies are moved right to the ranch, just outside the warehouse grafting room. Fourty-eight wax cell cups they make themselves are put on the frame (three bars, 16 cells/bar), that then goes into the incubator before grafting. "This makes them less brittle, warms them to near colony temperatures, insures they are dry and results in increased acceptance," Glenda, who grafts about 1,200 cells a day, said. She's been doing this since she was 12 years old. "It was a good way to get out of helping with the house work, and I liked working with bees, and with Dad."

Cell bars are put in queenless cell starter colonies that are fed every other day with watered down HFCS 55 with just a touch of bleach added to keep bacteria under control.

An 80% acceptance rate is the goal, and anything less than 75% means there is a problem and is investigated. From the starters bars are moved to queenright cell finishers in the same yard. These, too are fed routinely. Cell builders are two-deep colonies with the queen on nine frames below, an excluder between and three frames of cells, two honey and the rest bees above. Young bees

are added every five to 10 days, to support this many cells.

The cells are left in these until two days before emergence (good records are absolutely required) and moved to the incubator to finish.

From the incubator the ready-to-emerge queen cells are taken to the queen mating nucs in the drone yards. These are chosen as carefully as the breeders because the resulting queen is a mix of the breeder queen and the drones she mates with. Wootens have about 12,000 mating nucs.

The virgins are left in the mating yard about 15 days, but the nucs are not neglected and are kept in top shape. Six or seven people work six hours/day (9 a.m. - 3 p.m.) at catching queens after they are mated, harvesting about 1,200 day, six days a week.

Besides being the head of the grafting crew, Glenda is also in charge of the 'office' side of the business. She books and ships queens, needing to know how many can be shipped a day. She makes and takes calls, does the scheduling, and sends invoices and deals with credit checks and the like.

Shannon is the overall manager of the business, is the principle long-haul driver, grafts when needed, sets up the starter and finisher colonies, deals with the pollination side of the business and, in his spare time finds and negotiates for new beeyards. He loves to pick breeder queens, but likes to help his uncle break and train horses almost as much.

The family, besides working bees, hunt and fish together when time permits, besides helping out the extended Park family bee businesses on occasion.

Queens to be shipped go out in Riteway or Koehnen shipping boxes, depending on what the customer wants. All are shipped priority mail or UPS, with two trips/day to the Post Office common. Apistan strips are not put in individual cages as Shannon feels a new queen suffers as a result of the exposure. This problem has been suspected since they were first used, but numbers are hard to come by.

For a brand new breeder special care is taken to insure her offspring meet the standards of the operation. And, some are kept as breeders themselves if they prove worthy. 'Looks' is the first test from a new breeder which includes color (very important) and size. A virgin queen should be as long as a quarter is wide, or bigger, according to Shannon. After a year's observation her progeny will prove themselves, or not, relative to production, build-up, gentleness and overwintering ability.

Early queens go to Southern California, Texas and Florida, then later queens go to Kansas, the Dakotas and north to Oregon and Washington.

•

Modern, commercial beekeeping is a complicated business. It requires the skills of a plant and animal biologist, a mechanic, a tax expert, a woodworker, truck driver, salesperson, bookkeeper, and personnel director. You can hire some of these skills, and most operations do. Wooten's, however, are fortunate to have most of these skills bottled up in Glenda and Shannon.

To contact Wooten's Golden Queens, write 11189 Deschutes Rd., Palo Cedro, CA 96073 or call (916) 549-3555.

EXPANDING

Richard Bonney

When planning on expanding consider these factors first.

Even the most level headed of us get carried away sometimes, and beekeepers are certainly level headed (as well as being friendly, courteous, kind, intelligent, and good looking). In spite of all that we are sometimes led astray; a good season often leads to thoughts of expansion. If I can make all that honey with only a couple of hives – so goes the thinking – just think about how much I could make with ten, or twenty, or thirty, or whatever number. Sometimes we are quickly brought back to sane and sensible thoughts; sometimes we just run with it. I know it happened to me some years back. I had three hives, lived in a great place for making honey, and had gone through two very good seasons. Obviously, expansion was the way to go. So, I did. Perhaps you would like to do it, too.

Be careful, though. Plenty of mistakes are out there just waiting for the unwary. I found some of them, but I learned. You may find some as well, but you will learn too. However, it will all go much more smoothly with a plan, with some forethought. So work on that forethought. First, is it really the thing for you? A year or two from now do you really want to have 20 or 30 or whatever number of hives. You are talking a change of lifestyle here, small perhaps, but that change will affect the whole family. So, the first and perhaps foremost question is – what does your spouse think about this? Unqualified support is the response you want.

Once you're past that hurdle and presumably have the support, what next? Money. What will this operation cost to set up? What will it cost to maintain? Sure, the price of honey is up, but so is the price of bees, and the cost of equipment creeps up a little every year. What kind of return do you require from your investment? Be sure you are looking at it as an investment. You're talking about several thousand dollars to make this expansion. As you think about your needs in terms of hives and bees, think also of such things as a larger extractor, more honey processing equipment, perhaps a different vehicle, and a place for all this.

Next, where will you put additional hives. Probably most of us don't live in a place that will support a large number of colonies. Going back, the history of agriculture and the many beekeeping success stories we read of evolved in an agricultural economy. We get further and further from that every day and people are less and less willing to see bee hives in their neighborhoods. This means one or more outyards. Will suitable locations be available? Suitable means accessible during at least three seasons of the year, with ample forage, no pesticides, and no serious competition from other beekeepers. And don't forget such intermittent problems as bears and vandals.

Then, what will be the market for that additional honey? In spite of what we would like to think, honey doesn't sell itself. It must be marketed. In the past I have talked with more than one small operator who

Continued on Next Page

It's tempting to go from a hobby to a business when times are easy. But make a plan, first.

HIVES OWNED			
Hives committed to:	1st year	2nd year	3rd year
Extracted honey			
Comb honey			
Pollination			
Total owned	18	33	48

INCOME PROJECTION			
	1st year	2nd year	3rd year
Extracted honey	__lbs @ $__ = $ ___	__lbs @ $__ = $ ___	__lbs @ $__ = $ ___
Comb honey	__secs. @ $__ = $ __	__secs. @ $__ = $ __	__secs. @ $__ = $ __
Beeswax	__lbs @ $__ = $ ___	__lbs @ $__ = $ ___	__lbs @ $__ = $ ___
Pollen	__lbs @ $__ = $ ___	__lbs @ $__ = $ ___	__lbs @ $__ = $ ___
Propolis	__lbs @ $__ = $ ___	__lbs @ $__ = $ ___	__lbs @ $__ = $ ___
Total income	$_____	$_____	$_____

has several hundred pounds of honey stored away unsold. Reasons were varied; not able to break into a market, or not enough honey to guarantee a year round supply to a retailer, or the beekeeper just wasn't interested in the selling part. This is a serious and important question if you expect to make money selling honey. We will come back to it.

If your interest is more in commercial pollination, a different set of questions apply. Are there growers within reasonable distance of you who need hives? Have you talked with any these growers? Are they accepting of the idea of a local, relatively small operator? Some aren't. They want the assurance that comes with a large, experienced operation. In such a situation you will have to sell yourself to these growers. Then, can you meet their needs in terms of numbers of hives? Some growers like the idea of getting a few hives from each of several beekeepers; it's a form of insurance. If one beekeeper doesn't come through for any reason, the grower isn't left without hives. Other growers prefer to rely on one source only, and have built up a working relationship with a supplier over the years. Either way, it can be hard to break in.

How many hives will you plan to rent out for pollination each year? As you set this number, think about winter losses. Be hesitant during the winter to make a commitment to a grower for all the hives you own. Most of us have some amount of winter loss, and not every colony that survives the winter is necessarily of sufficient strength to do a proper job of commercial pollination.

Do you know the rental fees for pollinating hives your area? Will you be able to compete? Large operators are often able to work at lower fees because of the economy of scale. Some new pollinators think that the way to go is to buy their way into a contract with a low fee. This seldom pays off in the long run, for both ethical and practical reasons. Know your costs, plain and simple.

With these questions out of the way, and assuming you are going to proceed, what next? Some specific planning is in order.

I will assume that you have been keeping at least a couple of colonies of bees successfully for several years and have decided on a phased expansion. For talking purposes let's say you are going to add 45 colonies, to be acquired at the rate of 15 per year for the next three seasons. Put your plan on paper, and be businesslike. Let me repeat that. Put your plan on paper, and be businesslike. Let the plan be built on two important constraints – reasonable expense of acquisition and earliest return on your investment.

You have a number of options as you plan and carry out this expansion. First, the bees. Will you buy overwintered colonies from other beekeepers; buy nuc's or packages; make splits from your existing hives; collect swarms; or a combination of these. For most of us, collecting swarms has too many uncertainties. It's probably best to ignore that avenue as part of a formal expansion program. The others are viable approaches, though.

Then, the equipment; will it be new, used, or a combination? Do you have the capability to make some of your own equipment? There are pro's and con's for each of your choices – availability, personal preferences, finances, and the like, but probably the most important consideration is standardization. As your holdings grow larger, ease of operation becomes more important. Buying used equipment, or buying from multiple sources, makes standardization more difficult. Finances may dictate that approach, though, but think each purchase out carefully. The larger the operation, the more efficiency there must be.

Of course, setting up your hives is one thing, using them is another. Presumably your main thrust will be honey production or pollination. Assuming that honey production is your goal, will you produce both extracted and comb? If both, what kind of comb – round, square, cut, chunk? If both extracted and comb, how many hives will be committed to each?

Then how will you market the honey? Possibilities include direct to the public from your home or other business, through a farmer's market, wholesale to stores, farm stands, and the like, or wholesale in bulk to a

MAKE MONEY MAKING BEES

One income possibility not to overlook is selling bees. Strong colonies can be split in the Spring to produce nucs for sale. The right colony, split the right way at the right time usually produces a good honey crop – as good as one not split. The income, of course, must exceed the cost of the equipment sold (boxes, frames) and the time involved in the work, and the sales (delivery, chit-chat, maybe even a few lessons for the beginner who bought the nuc).

Queens, too, can be raised and sold. Besides reducing your costs (providing your queens are as good as what you can buy), selling mid-late season queens can add a few dollars to your bottom line. But there is a cost, here, too. Colonies used for cell builders, finishers and holding probably aren't making honey, or much of it, so there is an opportunity cost to take into account.

packer. Don't ignore this latter possibility. The packer may be a large regional distributor or another small operator like yourself who has already established a market but can't meet the demand with his own production. You both benefit, the packer from a ready source of honey, you by not having to go through the hassle of bottling, labeling, and marketing and delivering.

Will you plan to sell any hive products other than honey? The most likely possibilities here are pollen, propolis, and beeswax. Bee venom and royal jelly are also possibilities, but remote. The market for these two products is small and collecting them is specialized and very labor intensive.

As a starting point, make a chart similar to the one on page 40 and write in some figures. For this one we have assumed an individual who has three hives and will add 15 per year for three years. How many hives will be committed to each aspect of the operation. The numbers in each column will not necessarily equal the total owned, since the different activities are not mutually exclusive. Although it is unlikely that hives used for comb honey production will be rented out for pollination, those used for extracted honey may be. Further, keep in mind that a new colony, one started from a package or nuc, is not likely to be ready for use as a pollinating hive in its first season (though they may work well for late crops).

Now think about where you will keep these hives, and how many at each location. Again think in terms of efficiency. If you will be pollinating, consider the capacity of your truck. It is best to be able to pick up a full load of hives from a single yard, rather than going to two or more yards for a partial load from each. If you are going to produce comb honey, perhaps you want those hives closer to your home so they can receive the more intense management that may be necessary. Of course, forage availability is a factor in any location.

Another chart might help you to make your income projections. Again, keep in mind colonies in their first season cannot (usually) be expected to perform at the same levels as overwintered colonies. For instance, in addition to not being strong enough for pollination, in many areas a package colony will not produce surplus honey in its first year. (Of course the opposite is true in some places, so keep that in mind, also.) Then, it is probably not a good idea to start this expansion program with the expectation of having income from all of the products listed here. Work into this gradually. In fact, you may never be interested in some of them. However, don't shy away from any particular hive products because you believe there is no market for them. My own experience has shown that once you are known locally for having clean, pure beeswax, or clean propolis, you will not be able to keep up with the demand. Further, many beekeepers believe there is no market for comb honey. They have it backward. Few people are producing comb, so there is little out there for sale. Again, have a consistent supply and before long you won't have any problems selling your product.

Once you have decided to go ahead with a new endeavor, putting your plan on paper is an important step towards clarifying your thoughts and making it happen. Charts such as those above help immensely. Once you have established the details of your expansion, make up more charts or tables reflecting the details. For instance, lay out what extracting and processing equipment you will need and in what year you will need it. Plug in estimated (but realistic) amounts. Do the same with your hive equipment. Know as accurately as possible what you are getting into financially.

Such information will also help when filling out the paperwork if you are applying for a loan to make this happen, and the lender will be impressed with your detailed presentation. BC

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

UNDERSTANDING SWARMS

Know the biology of 'why,' and you'll know 'how.'

Ann Harman

Swarming has held a curious spot in the history of beekeeping. Before the advent of the movable-frame hive back in 1851, swarming was a necessary and desirable part of beekeeping. Today we work very hard to avoid swarming. Why the switch?

In the days before Langstroth, bees were kept in skeps or logs cut from bee trees. The combs were fixed firmly in place, and the bees made little distinction between brood combs and honey combs. The honey was merely placed in a convenient (for the bees) location for brood rearing. Some skeps did have "honey supers" however, but swarming was still a part of beekeeping. In order to obtain the honey crop "destruct harvest" was the technique. The beekeeper simply reached into the skep and removed comb. Brood was destroyed; bees were killed. To replace the loss of that colony, the beekeeper hoped that he would catch a swarm and install it in the harvested hive. Most beekeepers harvested honey and wax from only half their hives each year. The other half were allowed to live – and swarm.

Today we recognize that swarming reduces the colony strength significantly, so much so that in many areas of the country, the honey crop is lost. If the main nectar flow is early, as it is here in Virginia with Black Locust and Tulip Poplar, the honey crop will be severely reduced. In areas with a Summer flow, say from clover, the colony may recover enough to produce a crop, but it, too, may be reduced. Therefore, today we try to prevent swarming.

Swarming is colony reproduction. A healthy, strong colony will reproduce itself for the continuation of the species. Swarming needs to take place early in the year so that the two parts of the split colony will have enough time to increase the numbers of bees and prepare the nest before Winter. Swarming is also queen replacement. The old queen who leaves with the swarm will be superseded in a few months. The part of the colony left behind has a new queen – the one that emerged just after the swarm left. Therefore, the two colonies now are going into the Winter with new queens, an ideal situation.

We are not able to see signs of swarm preparations until it is really too late to do anything to stop it. Swarm preparations begin to take place in the colony as soon as the queen starts to lay again in early Winter. Although she may start out by laying only several hundred eggs a day, as Spring approaches she is in full swing of laying up to 1,500 eggs per day. The population of the hive is now increasing dramatically. What the beekeeper sees at this point is very pleasing – a nice, strong hive for nectar collecting.

All the events leading up to the emergence of the swarm are not fully understood. We have learned that congestion of adult bees in the hive is one of the factors. But it is not just the fact that "elbow room" is non-existent that leads to swarming. The "queen substance" or queen pheromones simply are not being passed around to the entire hive thus assuring the workers that a queen exists. Laying room is difficult for the queen to find. The brood area has expanded; some space is taken up by pollen and honey – necessary food for brood rearing and for the adult bees, too. This lack of cell space means that the colony is healthy and successful. It is in such good shape that it can afford to lose up to half the adult bees and still remain a viable colony. The lack of pheromone dispersal and the lack of empty cells evidently help to trigger the workers into preparing for swarming.

Unnoticed by the beekeeper, the worker bees reduce the amount of food given to the queen so that she begins to lose weight in preparation for flight. The worker bees also slow down on cleaning and polishing the empty cells so that the queen cannot find as much room to lay. The worker bees then make certain that plenty of queen cups exist on the bottom bars, and since these are clean and polished, the queen will proceed to lay eggs in those cups.

At this point the beekeeper takes a look inside his hive and to his disgust finds the functioning queen cells. Now swarming is almost impossible to reverse. The queen is actually no longer laying, and swarm

preparations are basically complete. The swarm will emerge from the hive a few days before a new queen emerges. Clever planning! The old queen has left, leaving a queenless hive ready for the new queen. She will tear down any capped queen cells, and the worker bees will probably not complete any of the other uncapped cups.

With this knowledge, the beekeeper can "beat the game." The secret to swarm prevention is to anticipate the crowded conditions and provide room both for the adult bees and for the queen to find cells ready for laying. Assorted methods can be tried, but sometimes the most simple approach works best – reversing the hive bodies.

Reversing the hive bodies can be done as early in the season as is possible. That means when the bottom hive body is empty of brood. Take this empty hive body and put it as the top one, that is on top of the upper hive body. You have simply reversed the position of the two hive bodies. These instructions hold true whether you have bees in two deeps or in three Illinois (or half-depths). You must not reverse the hive bodies if brood still exists in the lower one unless the weather turns warm and the brood consists of old capped pupae.

Continue this reversing until the nectar flow starts on a week to 10-day basis. Once that happens, the bees convert from queen replacement to food storage. The queen will continue to lay, but not with the same intensity as before. The bees that were just hanging around the hive causing congestion are now flying to gather nectar.

Although the bees were not successful this year, you, the beekeeper, were by preventing swarming. You are now assured of a good honey crop because you have a hive up to full working strength of 60,000 or more bees. Congratulations!

What Do You Do With A Swarm?

Among the final steps honey bees take before leaving the hive as a swarm is to fill their honey stomachs with honey. Not only does this give them the necessary food for the trip to a new home, but it gives them the reserves needed to secrete beeswax. The beeswax, frequently noted falling from a swarm, is produced to start a new home – the new comb needed for brood and food storage.

A swarm can be caught and hived in a hive body with 10 frames of foundation. A swarm will readily draw this into excellent comb. In fact, hiving a swarm on foundation will give you your best drawn comb because it is drawn quickly. The foundation should be installed correctly in the frame – straight and positioned properly.

Because the original colony that produced the swarm is in that particular mode of behavior, the captured swarm from that colony cannot be re-introduced into the original colony. If attempts are made to do that, the swarm will usually come right back out of the hive.

A captured swarm can be used to strengthen a weak colony. However, the best method for doing this is to hive the swarm in an empty hive body, let the swarm draw the foundation and establish itself as a functioning colony. Then it can be united with a weak colony. It is important to remember that the swarm queen will be superseded within six weeks to three months after the swarm. This period can be an ideal time for uniting – and for requeening. BC

SWARM BEHAVIOR

Roger Morse

"There's more that goes on here than is at first evident."

Honey bee scouts from a swarming (dividing) colony will defend a new homesite they find acceptable before it is occupied by their swarm. This includes attacking and killing scouts from other hives that attempt to investigate the site. Since there is usually a shortage to good nesting sites for honey bees there is keen competition for those that do exist. I observed about 50 scouts from one colony successfully defend a new site, day and night, for 19 days before it was occupied by their swarm. As many as 35 bees may stay all night for this purpose. Bees rotate constantly between the parent colony and the new home as shown by arriving and departing marked bees.

•

Populous colonies of honey bees divide naturally in the spring through a process called swarming. At this time, the queen, 30 to 70 percent of the worker bees, and several hundred drones, if they are present in the population, will leave the parent colony. Five to seven percent of the older field bees in a hive are scouts that normally search for food and advise the remainder of the workforce of its location. As the time for swarming approaches, these bees turn their attention to finding a new home. Often the scouts have found a new home before the swarm departs.

After the swarm has left the parent colony it settles and clusters nearby so as to make certain the queen is present. At that time the scouts reconfirm the existence of the new home. They guide the swarming bees to the site using a complex of pheromones. We counted the number of bees in more than 200 natural swarms and found a great variation, ranging from 2,400 to 49,000. The average swarm contains about 12,000 bees.

I now report new information about the elaborate protection given a newfound home by scouts before its occupation by the whole swarm. Observations on the defense of new homesites began in 1994 and were continued during the following two years at the Archbold Biological Station in Florida especially in the swarming season in March. Because the swarming season is short and bell curved in Florida, bees search for new homesites most actively during that month. All of the swarms observed and reported in this paper were natural. The parent colonies were unknown and could have been feral or human-kept colonies within a few miles of the experimental site.

Innocent as this bait hive may appear, there's warfare going on inside.

In my first observations I used a bait hive about the size of a full-depth 10-frame Langstroth super. It was hung on the shaded north side of a building with its entrance about six feet above the ground. When scouts began to investigate the site they flew in, out, and around the box and inspected it carefully. This is typical scout bee behavior. Every day I expected the swarm to occupy the site but when this did not occur I marked bees at the entrance and followed their routine. In 1994, I observed marked scouts arriving at sunup and departing at sundown, at times when only a one-way trip was possible because of the light or darkness.

I observed that some bees remained in the nest box all night but I could not determine their number. Then, one day, I saw a bee standing just inside the nest entrance on her four hind legs with her two front feet raised and her antennae outstretched, which is a typical guarding posture. Later, I observed a pair fighting at the entrance of the nest box and I suspected the box was being protected against exploitation by bees from other colonies.

I gathered additional information on six swarms in 1995. These

swarms occupied my bait hives between two and nine days after scouting was first observed. Again, I saw guarding at the entrance but because the bait hives were isolated, with no competing box nearby, I saw no fighting. I also confirmed that some bees remain in the nest boxes all night.

My latest observations were conducted in 1996 using four nest boxes all approximately six feet above the ground. Two of these were inside a cement block building where I placed two 1 1/2 inch diameter plastic entrance pipes in holes cut through the blocks, each leading to a nest box. The inside face of each box was covered with clear Plexiglas and a black cloth that could be raised for viewing. The two boxes were on the north and east sides of the building about ten feet apart. These boxes were purposely close together with no special markings at their entrances so that the bees might confuse the sites. The other two nest boxes were of a competing size and position and approximately 100 feet east and the same distance southwest of the building and mounted on the sides of cages. These boxes were of a different color and far enough away to avoid confusion.

Two swarms simultaneously scouted and eventually occupied the two nest boxes inside the building where the final observations were made. One of the swarms, estimated to contain about 16,000 bees, occupied the nest box on the east side of the building ten days after scouting was first observed. The second, estimated to contain 6,000 bees, occupied the box on the southwestern cage after 19 days but continued to scout the bait hive on the north side of the building until the day it occupied the southwestern nest box. Delays in occupying a new home may occur because of inclement weather or the inability of the old queen to fly, in which case the swarm leaves with the first virgin queen to emerge in the parent colony.

I learned in 1995 that after one to two days of scouting the scouts may agree that the nest box is suitable and that the satisfaction-measurement stage that involves active flying in, out, and around the bait hive stops. At this stage I could see two to ten bees standing or walking slowly around the nest box entrance at any one time and the nest box was never abandoned, day or night. These bees become defensive only when a strange bee flies by. Under these circumstances the bait hive is almost as secure as a fully occupied hive with sentries at its entrance. However, I could not learn the total number of bees engaged in this activity until I built the two nest boxes with Plexiglas sides inside of the building.

My observations of the two bait hives in the building revealed that up to 50 bees may be present at one time and that as many as 35 bees may remain in a box all night; these bees do not cluster but stand individually, scattered and motionless, around the inside of the nest box. Again, I watched scout bees move back and forth between the nest box and the parent colony. None is visible at the entrance on a cool evening. During the day only ten to fifteen percent of the bees in the bait hive are visible at the entrance. These bees behave much as do bees at a colony entrance and take up a guarding stance only when threatened.

During a time when two swarms were investigating and protecting two nearby sites much fighting occurred, and I have seen as many as three pairs fighting inside of a bait hive at one time. I also observed fighting at the entrance. I have counted as many as 16 dead bees inside an actively scouted bait hive at one time. Bees protecting a site did not carry wax scales or build comb and did not perform housekeeping tasks except to remove the dead that resulted from the fighting.BC

Scouts from the same colony will inspect all aspects of this potential new home, then, some will stay the night, for many nights, to protect what they want.

SWARM PREVENTION In Tennessee

Walter Wright

"Checkerboarding" is a completely natural way to control swarming. Population growth and honey production are both encouraged.

Swarm prevention by what I call "checkerboarding" (CB) has only one basic requirement: Provide nectar storage space immediately above the open-cell nectar/honey feed band at the top of the brood nest.

Taking honey from the brood nest has been taboo down through the ages because we thought the bees needed that honey to build up to strength in the Spring. It turns out that they needed some of the solid overhead honey to insure the reproductive process of swarming. That solid overhead honey ring, however, forces new nectar to be stored in the top of the brood nest area, triggering swarm preparations, so we take honey out of the upper part of the brood nest.

Checkerboarding takes some getting used to. It is fairly radical when compared to normal Spring management. The objective is two and a half stories of brood prior to redbud bloom here in Tennessee. It may be some other nectar source where you live that triggers swarm cell building, but you should know what it is, and when it occurs. Redbud blooms locally the second half of March and overlaps the beginning of dogwood.

We need to anticipate the swarm trigger by at least a couple of weeks to add space in time. The bees need that time to adjust their "space available perception." They do not immediately start storing nectar in a super when it is added. They have to look around in it for a while. Therefore we need supers in place in early March.

The configuration of the brood nest might need some adjustments before you start. First bottom the brood. If an empty hive body is on the bottom, you can use it for deep brood comb, or you can reverse hive bodies. If you need deep brood comb for use on other hives, stand it on end in front of the hive for the bees to evacuate. In my area of Tennessee the bees will sometimes not move down into the bottom hive body in the Fall. They may store substantial pollen in it but not occupy the space for lack of backfilling nectar or the foragers to collect it. Frames not fully plugged with pollen can be used in checkerboarding upper levels.

Occasionally you will find a cluster that is two or three frames wide and two stories high. Put all frames of brood in the bottom box. Maintain their pollen frames adjacent to, and facing, the frames of brood.

If you Wintered in two stories, and the lower is now empty, you can reverse the two. In which case you probably still have the solid band of capped honey above the brood nest. *The intent of checkerboarding is to perforate that capped honey band.* Consider placing a couple frames of brood with the most honey at the top of the frame up into the now empty super you just placed above. Close-in the lower brood nest by moving all brood frames together. Add empty frames from the top to the outside of the lower box. This does not appreciably increase cluster volume requirements, but does break up the honey barrier. Remember, if you split your brood nest by raising a couple of frames, make sure there are enough bees to cover the whole area.

Solid capped honey overhead impedes brood nest expansion upward. The open-cell feed band between the capped honey and brood cells is quite thin, leaving very little nectar storage space. When alternate frames are empty overhead, nectar is stored there. We do not fully understand why brood nest expansion should be accelerated with alternate frames of nectar, but this appears to be the case. When all capped honey is consumed and only nectar is overhead, brood expansion is even faster.

If you Winter in one and a half stories (a deep and shallow super), checkerboarding is easy. Alternate the shallow capped honey into a second shallow of brood comb such that each shallow has alternate frames of honey and empty comb. Add an empty of brood comb on top to make a two and one-half story brood volume. Monitor nectar storage in the empty comb frames. As it approaches the top of the brood volume of two and a half stories, add honey supers of drawn comb. That's assuming, of course, that you have removed your mite control medication. Honey supers can be added earlier with no ill effects, but they should definitely be in place before your local swarm trigger (here it is redbud) blooms.

If you Winter in double hive bodies, there is more involved. When there is solid honey in the top hive body, several options are available:

a. Extract three or four alternate

frames, being careful to protect cell depth. Put them (or other empty frames) back in and add a super of brood comb on top.

b. If you have extra frames of brood comb from Winter losses or queenless combines, they can be used as described above in the story and a half – extracted, of course. The extra hive body can be harvested after the brood nest recedes to a lower level.

c. You can wait until brood expands into the second hive body. A one-time hive body reversal and addition of a super of brood comb provides the two and one-half stories of brood nest with continuous overhead storage space. However, early brood nest expansion has been retarded by this method.

In all of this shuffling of combs of honey, we make a concerted effort to keep honey acquired during mite treatment periods out of the marketable honey. Combs raised into supers from the brood nest are marked with an "X" with a felt permanent marker. These are set aside during extraction to be extracted later for bee feed only. It's handy to have a few jugs of real honey to feed the bees when needed.

When you have configured your two and a half stories of brood volume with continuous storage space for nectar, stay out of the brood boxes. You will find it difficult to believe that this many bees are not thinking *swarm*! If you absolutely must prove it to yourself, check for swarm cells on a weekly basis on a few colonies.

One other item we might mention that is not specifically part of checkerboarding management is the building up of slower developing colonies. We wait until most colonies have a double hive body of brood. A slow starter that still has not expanded into the second hive body needs a boost. We give them a quantum leap forward by doubling their brood volume. If you do not have brood comb to substitute for brood taken from the strongest, do not use foundation. It won't be used until they transition to the expansion mode, and that may be two months away. That makes a dead space in the interior of the brood volume. If you don't have empty comb on hand, take five frames from the slow starter. Shake the bees off and leave the slots open until you return with five frames of brood. Use those frames to substitute for brood taken from the strong colonies. Take one or two frames from the second hive body of the strongest. Frames in the second hive body were originally filled with brood incrementally with brood nest expansion. If you take all capped brood, some should be emerging soon.

"This technique has the potential for eliminating brood nest operations because swarm prevention occurs in the *top* of the hive during the swarm season."

To improve survivability, take some bees from each colony by shaking a couple super frames over the box. We find looking for emerging brood to be unrewarding early in the buildup. Be careful not to abduct their queen along with the adhering bees on the brood frames.

A few tips are offered for transporting loose frames of bees between locations:

- Collect the brood on the first day of a warming trend when warmer weather is expected for 3 or 4 days.
- If travel time is more than a few minutes, soak a few bricks in hot tap water and place in the bottom of the carrier for heat and humidity.
- Use a frame spacer in the carrier to maintain separation and do not load the outside slots. Heavy frames can slap the outside walls during transport.
- Load them on the truck crosswise. You will seldom start and stop fast enough to slap frames, but rough terrain can cause abrupt side-to-side motion. BC

Walt Wright is a TN beekeeper who has had success with this technique, in his home state.

Pollen & Syrup Feeder You can make tonight

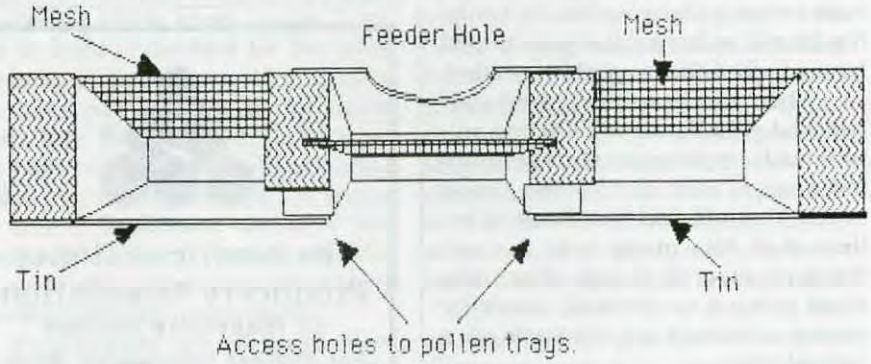
Peter Coyle

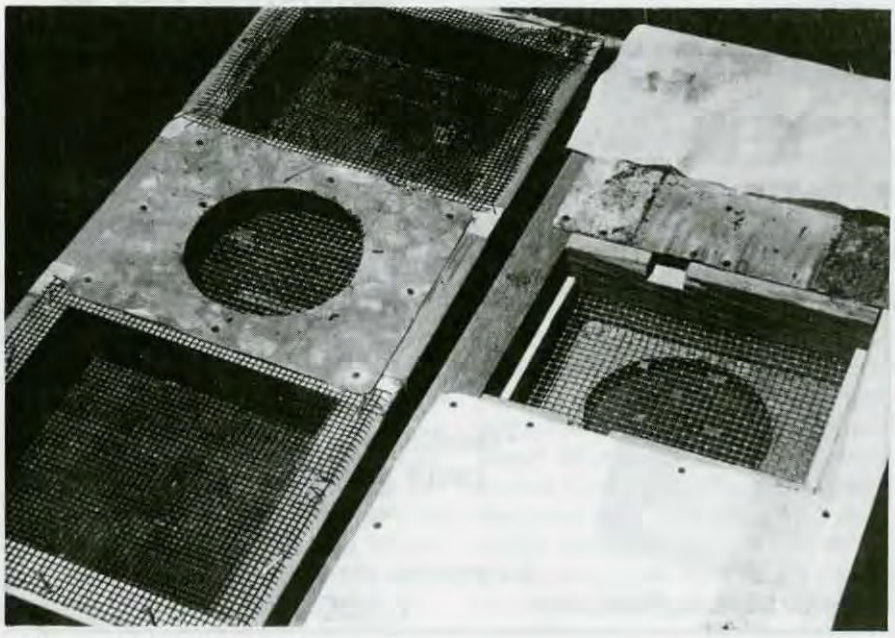
Being drawn to beekeeping by a love of comb honey on freshly baked bread, I found I was even more enamored of it by the multiplicity of "unnecessary equipment" that could be designed and made in my spare time. Reading the old books from the era when it seemed that the philosophy was to get a hammer, a saw, planks and nails and get cracking, and when there seemed to be more patented and unpatented wonders for beekeeping than one could shake a stick at, I could ignore the Winter storms and reduce the dimensions of the scrap lumber pile in the workshop to some supposed good end.

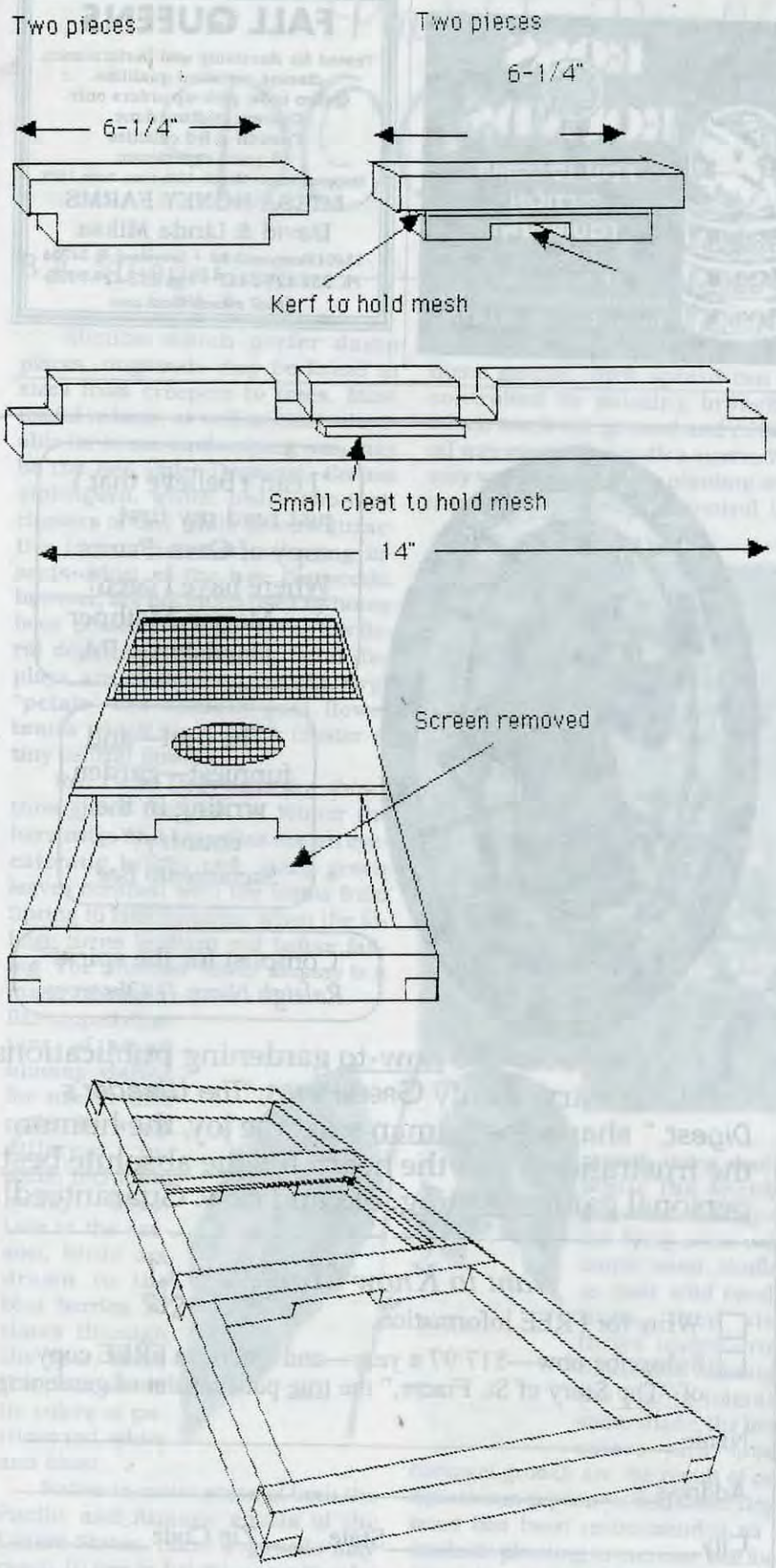
Much of the "improved" equipment gathers dust, but in the dark end of the year, these ploys first filled me with hope and wonder, then in the Summer season gave me greater respect for the designs in current use. Nevertheless, each Winter I still hanker after the new or improved – "something or other." The past two Winters, it has been feeders. I made the Szabo hive top feeder, which was wonderful except that unless there were a lot of bees and the weather was warm enough for them to be up into the feeder, the syrup went moldy. Just the glass jar over the handhold was simple and effective but could not be used under fiberglass insulation without more than a little confusion and bees coming at me, so I made a kind of hive top Boardman feeder, closed at the sides and open at the bottom, with eight-mesh screen just under the feeder mouth so that I could replace the jar easily.

Since I keep bees in an area where the nectar flow runs dry about the third week in June, I have learned that I must have a very early buildup to catch what comes. The main flow starts with the month of June, after a steady buildup from the first pollen gathering about the second week in March. I wrap my hives in homemade cardboard cartons coated with roofing compound, which are sufficiently tall to include an extra empty super filled with fiberglass insulation. This does seem to help them through the Winters better. Although the literature describes the need to open hives for inspection and feeding in February, with the weather usually so awful, I feel reluctant to do so, and since another proviso is to continue

SECTION THROUGH THE FEEDER LENGTHWISE.







feeding once started, I would like any feeding to be as easy and sting-free as possible. I later read that some bees will not rear brood while there is no supply of pollen, and since almost all of my bees are trapped in bait hives along two rivers where there are no apiaries to my knowledge, these "57 variety" types exhibit this behavior. I previously had success with the homemade feeder with screen under the lid of the syrup jar. The bees could reach the syrup but not me; and not wanting to have to place pollen patties over the brood nest to get them going in the Spring, with all the manipulation involved, I thought I might extend the syrup feeder to include two trays with mesh above so that I could replenish the pollen supplement I use through the mesh. This would be equivalent to open feeding the colonies, only inside the hive, where I hoped the bees would take it to exactly the right place. It would also allow me to see how both the syrup and the pollen were being used.

An added advantage would be that when the local nectar flow shuts off toward the end of June, I could lend a hand to my "wild" colonies which usually dwindle until the goldenrod and asters bloom, so keeping them strong enough to withstand the onslaught of the robbing yellow jackets and bald-faced hornets. Although not so satisfying as sitting with a fly swatter, nailing each invader as it landed, I felt sure this would be a more effective strategy.

The feeders were made with 3/4"lumber, 1-1/4" deep, although I'm sure an inch would be plenty. The mesh was from old package cages and the tin from flattened cans, so the materials were hardly costly. To keep any fiberglass out of the trays, I stapled a cloth cover for each to the side of the feeder. Since many of my bees are seriously into gluing, I used lap joints, but I'm sure butt joints would be fine.

When it is still too cold to break the cluster and when fresh pollen is available, the pollen and supplement are largely ignored, but on rainy days I have seen the bees use both the syrup and the pollen. BC

Plants For Bees & People

DOGWOODS

B.A. Stringer

Shrubs which prefer damp places, dogwoods may be found in sizes from creepers to trees. Most useful to bees, as well as most adaptable for home landscaping use, may be the Red Osier Dogwood, *Cornus stolonifera*, which bears two-inch clusters of tiny white flowers attractive to many nectar-collecting insects. Most of the tree dogwoods, however, are not much used by honey bees, possibly because of the low floral density. Their showy floral displays are misleading, as the large "petals" are actually just flower bracts which surround a cluster of tiny central flowers.

Red Osier Dogwoods are showy throughout the year. In Winter the bare twigs and branches are an eye-catching bright red. Deep green leaves contrast with the stems from Spring to late Summer, when the foliage turns brilliant red before falling. The Summer flower display is a mass of white, flat-topped clusters of small blooms visited for nectar and pollen by many different insects, including honey bees. Late in the season, birds are drawn to the blue berries. At times through the year, then, this plant shows its colors of patriotic red, white and blue!

Native to moist areas of both the Pacific and Atlantic coasts of the United States, these dogwoods may reach 10 feet in height, spreading by underground stems and rooted branches. The dense thickets so formed prevent erosion on stream banks in their native habitat. In the home garden, their spread can be controlled by pruning branches which touch the ground and cutting off wayward stems with a spade. You may wish to border the planting with a path or driveway to control the growth more easily. While the shrubs grow best in damp or low-lying areas with ample water, similar to their wild conditions, they also thrive under drier conditions. Although the plants tolerate some shade, the best colors and most compact growth are the result of adequate sun exposure. Red Osier Dogwood has been recommended as a roadside planting to increase bee forage in New Jersey, a situation where the plants would encounter both sun and dry soil and be dependent on natural rainfall for water.

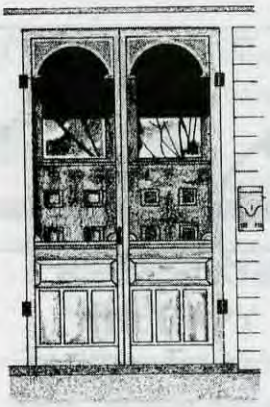
Once established, Red Osier Dogwoods may be cut to the ground in late Winter to stimulate growth of the bright red new twigs. These supple stems will grow head-high in the next season and may be used in basket-making, like willows are. In fact, 'osier' refers to the pliant twigs of various willow species that were used in medieval times for making baskets. Be aware, though, that the flowers are borne on older wood, so you may wish to prune back only half of the stems each year to ensure color in the regrowth as well as flowers for the bees.

Other ornamental dogwoods attractive to bees are available as varieties of the Red Osier Dogwood. The Colorado Redtwig Dogwood, native as far north as the Yukon, grows only five or six feet high. Another variety, Yellowtwig Dogwood, has golden yellow branches. There is also a dwarf form of the Red Osier, growing only knee-high, which has bright red stems.

Growth habits of *Cornus* species range from the small ground-cover Bunchberry (*C. canadensis*) to the tall Flowering Dogwood trees (*C. florida*). The tall shrubs of *C. stolonifera* are named for their habit of spreading by stolons, or runners which take root. The generic name of *Cornus* is the old Latin name for the Cornelian Cherry or Dogwood.

The tree dogwoods, though elegant in their floral simplicity, are not easy to grow. They resent root disturbance and may sulk for years after transplanting. Potted specimens of the shrub dogwoods are readily available at nurseries. Once established, the plants will spread, and prunings from the parent shrubs may be used to start new plants. BC

Bertie Stringer is a beekeeper, and honey plant author from Blodgett, OR, and is a regular contributor to these pages.



Ann Harman

Home Harmony

California Here We Come

California! What an interesting state! Someone once said that more songs have been written about California than about any other place in the United States. California can inspire almost any song since you have a wide assortment of scenes, climate, growing conditions, cities and countryside. You can have desert, mountains, beaches, fog, snow and sun. California can boast of its orchards of fruits and nuts and vast fields of vegetables. Tens of thousands of honey bee hives help the growers there so that the rest of the regions of the United States can enjoy a year-round supply of many foods.

This month, we'll take a culinary visit to California and see what good things we can make with a combination of California's foods and your honey.

FIG FILLING

First, we are going to use some California figs to make a filling to go between cake layers. We just put frosting on top and in between layers so often that we sometimes forget that a filling really adds a special touch to a plain cake. This filling is quick and easy and really delicious.

1/2 cup chopped figs
1/2 cup honey
1/4 cup water
2 tablespoons orange juice
1 tablespoon cornstarch

Mix ingredients in top of double boiler and cook until thick enough to spread. While hot, spread filling between cake layers.

Old Favorite Honey Recipes
Amer. Honey Institute & IA Honey Prod.

HONEY FIG LOAF

If you are looking for a recipe that is a little different - it uses figs - and is sure to win a prize at a honey cookery contest try this quick bread. In keeping with California produce, this loaf also uses walnuts.

1 cup (1/2 pound) chopped golden figs
2 tablespoons cooking oil
1 cup honey
1 teaspoon vanilla
3/4 cup boiling water
1 egg
2 cups sifted all-purpose flour
1 teaspoon salt
1 teaspoon baking powder
1/2 teaspoon soda
1 cup coarsely chopped walnuts

Combine figs, oil, honey and vanilla. Add boiling water. Stir to blend. Cool. Beat in egg. Sift together dry ingredients. Add with nuts to cooled fruit mixture. Blend only until well-mixed. Spoon into well-greased 9x5x3-inch loaf pan. Bake at 325° for 1 hour and 15 minutes or until done in center. Cool on rack 5 minutes. Remove from pan. Complete cooling on rack. Makes 1 loaf.

Treasured Honey Recipes
CA Honey Advisory Board

Unfortunately, the California honey cookbooks are no longer available, but I find their recipes so good that I use them from time to time. So keep watching this column for more from these booklets.

ORIENTAL WALNUTS

In the introduction of the cookbook containing the next recipe, the author makes a comment about some of her childhood memories: "A special lunchtime treat was crunchy walnuts mixed with cream cheese and honey sandwiched between slices of homemade raisin bread." That's a "recipe" we should all try. And, of course, she gives us a recipe using walnuts and honey. This recipe makes a nice gift, too.

2 tablespoons soy sauce
2 tablespoons Dijon-style mustard
1 tablespoon vegetable oil
1 tablespoon honey
1 teaspoon ginger
3/4 teaspoon crushed rosemary
1/2 teaspoon garlic salt
2 cups walnut halves and pieces
sesame seed

In a bowl combine soy sauce, mustard, oil, honey, ginger, rosemary and garlic salt. Add nuts; toss to coat. Lift out with slotted spoon; toss with sesame seed to coat. Place in single layer on lightly greased baking sheet. Bake at 250° about 30 minutes, until golden and crisp. Cool. Store in airtight container. Makes about two cups.

Calif. Walnuts - Talk Of The Town
Walnut Marketing Board

ALMOND CRUNCH

Almonds are the California crop most important to honey bees – or is it the other way around? At any rate, almonds are a versatile nut and can be substituted for other nuts in many recipes. This next one is an easily made snack, and it even contains some California oranges.

3/4 cup blanched almonds, finely chopped
1/4 cup honey
1 tablespoon butter or margarine
1 tablespoon grated orange peel
dash of salt
1-1/2 cups corn flake cereal

Combine almonds, honey, butter, orange peel and salt in heavy frying pan. Cook over low heat, stirring constantly, until almonds are golden. Remove from heat. Add corn flakes and mix carefully. Spread on buttered baking sheet. When cool, break into small pieces. Makes two cups.

The Honey Kitchen
edited by Dadant & Sons

BRANDIED GREEN GRAPES

Grapes from California are famous! This recipe is a delicious way to serve grapes as a dessert.

1/3 cup mild-flavored honey
1 teaspoon fresh lemon juice
2 tablespoons brandy or Drambuie
1 pound seedless grapes
1/2 cup sour cream

Mix honey, lemon juice and brandy. Remove grapes from stems and add to honey mixture, stirring to coat evenly. Cover and refrigerate several hours. Four hours before serving, add sour cream to grape mixture. Stir lightly. Refrigerate until ready to serve. Makes four to six servings.

Honey ... Any Time
California Honey Advisory Board

CENTRAL VALLEY BRISKET

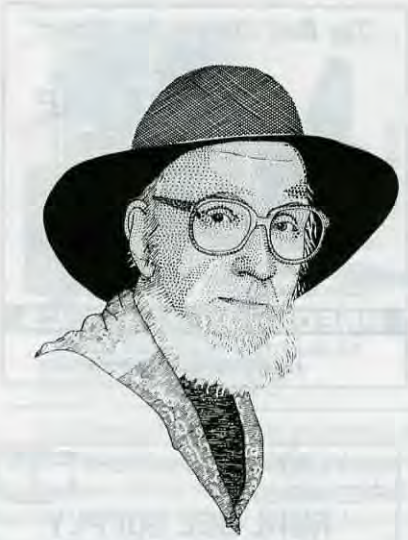
California recipes wouldn't be complete without using apricots and raisins. This recipe even has a California title.

1 envelope dry onion soup mix
3 to 3-1/2 pounds lean beef brisket
1/3 cup mild-flavored honey
1-1/2 cups orange OR apple juice
3/4 teaspoon cinnamon
3/4 teaspoon ginger
1/2 teaspoon ginger
1/2 teaspoon black pepper
1 tablespoon grated orange peel
1 cup dried apricots
1 cup golden raisins

Sprinkle half the soup mix in bottom of 9x13-inch baking pan. Lay brisket in pan and sprinkle remaining soup mix evenly over meat. Cover pan tightly with aluminum foil. Bake at 350° for 2-1/2 hours. In medium bowl, combine honey with remaining ingredients. Uncover pan and spoon off fat. Spread fruit mixture over meat. Cover pan with foil and return to oven. Cook until meat is very tender (about 1 to 1-1/2 hours). Slice brisket across grain and serve with fruit and juices. Steamed brown rice or buttered noodles make a good accompaniment. Makes eight to 10 servings.

Honey Naturally
California Honey Advisory Board

Well, there are lots more California fruits and vegetables that these recipes haven't mentioned. But you can use your imagination and your favorite honey recipes to celebrate California's produce. And if you get inspired, you can even sing a California song while you cook. BC



Richard Taylor

Bee Talk

"(Seeley's) book refers in its very title to the wisdom of the hive, as though a colony of bees could exhibit the uniquely human capacity for wisdom, rare even among people."

Last time I summarized the remarkable and still young career of the biologist Tom Seeley. Now it is time to present some of the fruits of his extensive and painstaking research. This will have to be a small sample, for his recent book, The Wisdom Of The Hive (Harvard University Press), is packed with information and, with no wasted words, runs to nearly 300 pages. It is without doubt the most important scientific treatise on honey bee biology in decades.

First, though, a few words about terminology. Many readers can remember how, in their college biology classes, they were strenuously taught not to read human traits into animal behavior. You should not speak of birds as "singing" nor, emphatically, as singing because they are "happy." Plants, as a recent correspondent reminded me, do not "bend" to the sun; they tilt. And you should not, as I recently did, speak of honey bees as "deciding," "discovering," "catching on," and so on. Above all, you must not speak of animals, especially insects, as utilizing language in the sense that we understand the term. All this is anthropomorphic, we were told, and out of place in scientific discourse.

Dr. Seeley ignores this exhortation. His book refers in its very title to the wisdom of the hive, as though a colony of bees could exhibit the uniquely human capacity for wisdom, rare even among people. He speaks of bees "recruiting" and "dispatching" scout bees, of "dancing," and even refers to the part of the hive where such dancing occurs as the "dance floor." When I pointed all this out to him he just looked at me, with a twinkle in his eye, and said: "Yes." But here is the point: He carefully and precisely *defines* all such expressions, in purely empirical and behavioral terms. The result is that, without departing in the least from the most rigorous requirements of science, his writing glows with clarity. You can spend hours studying this engrossing book without any feeling of plowing through heavy and perhaps pretentious scientific terminology.

It is without doubt this fear of anthropomorphism that has evoked skepticism in some minds concerning the work of Karl von Frisch and his successors, for at the very heart of their discoveries is what they unabashedly (though usually in quotation marks) have referred to has the "dance language" of the bees. This mode of expression has made some readers' hair stand on end, and they have felt compelled to counter it with simplistic theories that seem to them more plausible, the commonest one being that bees simply respond to odors, such as the scents of flowers.

This is, however, no longer a fit subject for debate, for it has been proved with conclusiveness that the so-called "dances" of bees have precisely the role in the colony's foraging behavior that von Frisch described. No experimental scientist actively engaged in honey bee research now questions this. The doubters, whatever may be their scientific credentials, are all outsiders. In addition, the suggestion that such behavior can be explained in terms of bees' responses to scents and odors has been conclusively shown to be incorrect. No one having an inclination to doubt these two statements should even venture an opinion on the subject without first grasping the totally probative evidence that can be found in the research results of Dr. Seeley and others. It leaves no room whatsoever for doubt.

Consider first, then, one of the several proofs of the dance language hypothesis, as interpreted by Dr. Seeley. This is found on pages 55 and 127 of his book, where the experiment is described with more precision than I shall undertake here. It has been repeated many times and always with the same unambiguous result.

An observation hive is set up, and at equal distances from it (400 meters) two feeding stations are set out, one to the north, the other to the south, so the bees easily distinguish between the two. At one of these the bees are offered a syrup that is 60% sugar and scented with anise, an odor very attractive to bees. At the other the bees are offered the same, but with only 15% sugar. Before long 20 individually marked bees are going back and forth between each stand and the hive. Other, unmarked bees arriving at the feeding stands are captured on the spot and prevented from returning to the hive. The behavior of the marked bees, after they have returned to the hive, is monitored by a video camera for five hours, after which time the unmarked bees are counted and released and the experiment is concluded. Analysis of the film discloses that there are 500 of the so-called waggle dances of the 20 marked bees returning from the stand with the weaker solution, but 4,500 such dances by the other 20 marked bees returning from the richer solution. Thus, the dances performed by the

scout bees returning from the sweeter solution exceed those performed by the scouts returning from the other by a ratio of nine to one. *Moreover*, the numbers of recruits – that is, the unmarked bees captured at each feeder – exhibit the very same ratio: There are about nine bees arriving at the sweeter feeder for every one arriving at the other.

Of course the numbers of bees vary from one trial of this experiment to another, and those nice round numbers I have given – 500 dances vs. 4,500 – are chosen for simplicity. But no matter: The *ratios* of dances, and of bees recruited, remains the same, nine to one, whenever and wherever the experiment is performed. This shows that the colony preferentially directs its foragers to the richer feeder, but does not direct all of them to that one. Equally significant, we see (1) that the behavior of the returning marked scout bees, referred to as the waggle dance, is precisely correlated with the behavior of the recruits, in the manner described, and (2) that the odor of the target source, that is, the feeder, is without significance in this experiment, for the odor and distance is the same for both feeders and yet the ratio remains the same regardless of wind direction. If scent were playing a role then more bees would appear at the feeder that is up wind.

What is here referred to as the "waggle dance" has long been well known to bee researchers and to beekeepers themselves, so I shall not describe it in detail. Anyone watching an observation hive sees it, especially in the morning. Basically, it is this: A "scout" bee, that is, one searching for nectar or pollen sources and having found one, returns to the hive and, in a well defined area of the hive (the "dance floor") moves about in a pattern resembling a figure eight, wagging her abdomen. The vigor of this "dance," that is, the number and speed of the waggles, is precisely correlated with the value of the discovered source; for example, its richness and abundance. The direction of the central part of the dance, in relationship to the direction of the sun, is, astonishingly, a precise indicator of the direction of that source. If the bee dances straight up, then the source is in the direction of the sun: if straight down, it is in the opposite direction; if at, say, 30° to the right, then the source is 30° east of the direction of the sun, and so on. And the duration of the waggle part is an accurate indicator of the distance.

No one casts doubt on the *existence* of this behavior, nor its complexity and uniformity. More important, it is accepted by all that this dance behavior is in fact correlated with the discovered nectar or pollen source, or potential nesting site of a swarm, in *precisely* the *manner described*, for this has been proved over and over. Indeed, a human observer can "read" this dance and then go find the indicated target, as has been done many times. This is especially obvious when the target is not a food source, but a potential nesting site for a swarm, for the information on the distance and location of this is conveyed by the very same dance behavior. Indeed, observers have thus interpreted the dances, on the surface of swarms, and then, acting on that information, arrived at the indicated nesting site ahead of the swarm!

Those who have sought to cast doubt on the dance language hypothesis have suggested that bees find food sources simply by following scents. They are thus in the strange position of conceding that the behavior of the bees is as described, and that this behavior contains valuable and complex information that can be decoded even by a human observer, but that all this has no real relevance to the bees' foraging or nest seeking success. That is strange, on the face of it, but more to the point, it is provably incorrect.

How is information conveyed by the waggle dance? This is not entirely known. Certainly the other bees do not stand around and watch the dancer, check the position of the sun, and then draw complex inferences. perhaps it is the absurdity of such a notion that has fostered the doubts. Bees, after all, cannot see in the dark, much less draw inferences. It has, however, been discovered that the dancing bee emits sounds, of frequencies inaudible to us, and that these convey information. it is also known that vibrations are set up in the comb itself, the dance floor, to which bees are sensitive.

That honey bees exhibit a dance language, and that it *is* a language in the sense that it conveys information of a complex nature, is not merely remarkable, it is quite amazing, perhaps as astounding as anything to be found in the whole of creation. It seems to violate what we were once taught to think of as a scientific view of the world. But science consists not of some preconceived view of what the world must be like, but of taking observable facts, and what those facts point to, for what they are. We should perhaps remind ourselves that there was once a "flat earth" society whose dedicated members, without trying to prove that the earth is flat, labored instead to show that all of the data adduced to show that the earth is a globe could be reconciled with the hypothesis that it is flat after all. We laugh at this now, but that society, I have been told, took itself very seriously.

I've already noted that not only has the dance language hypothesis been shown to be true, but that the alternative odor-search hypothesis has been proved false. I have touched upon that; more, next time. BC

Richard Taylor is a philosopher & lifelong beekeeper who lives in the Finger Lakes region of NY.

Questions?

Pollination Prices?

Q **A grower wants me to provide 20 colonies for his blueberry field this Spring. What should I charge?**

Mose T. Schwartz
Prattsburg, NY

A Pollination fees fluctuated wildly in 1996, due to the general scarcity of bees. Fees of $50 and more were not uncommon. I think a charge of $35 per colony would be reasonable, assuming that the hives are strong.

Editor's Note: *One presumes that the 'cost' of moving bees for pollination is known before setting a 'price.'*

Carniolans and Swarming

Q **Are Carniolan bees excessively prone to swarming?**

Mitchell Drinnon
Sneedville, TN

A I have for years had both Carniolan and Italian bees in my apiaries, and I never noticed that the Carniolans were more prone to swarming.

Division Reduction?

Q **Will a colony division in early Spring seriously retard honey production for that year?**

Mitchell Drinnon
Sneedville, TN

A No. Splits made early in the Spring and given new, mated queens build up very fast. It is certainly better to split a colony than to let it split itself by swarming.

Freezing Honey

Q **Is it true that honey can be prevented from granulating by storing it in a freezer?**

Name Withheld

A I inserted this question so I could pass along the account given to me by Mr. Richard Cordes, an Ohio beekeeper. Years ago a beekeeper gave his father some comb honey, which was put into their deep freeze and forgotten about until 1995 when the freezer was cleaned out and the honey discovered. Mr. Cordes's mother always dated everything that went into the freezer, and this had the date 1976. There was no granulation after 19 years. Of course the honey may have been of a very slow granulating kind, such as basswood, and might not have lasted so well had it been, say, goldenrod.

Nosema Threat?

Q **I have a two-story hive that contains honey but no bees. Will I risk nosema disease if I feed this honey back to one of my colonies? And should I therefore treat for nosema if I do this?**

Monroe S. Miller
Sears, MI

A I have spread nosema in my apiary by doing this, so it is a real danger. It should be added, however, that colonies usually recover from nosema when the weather warms up, especially if they are where it is dry and out in the sun. Treating for nosema, under the conditions you describe, would no doubt be a good idea, though probably not essential.

Making Splits

Q **How many colonies can I make out of the eight I now have if they are used solely to make increase and not for honey production? How should I do this, with the minimum of feeding?**

Randy Stieg
Reed City, MI

A You can easily make 24 colonies out of those eight by splitting each one into three. Take six combs, with adhering bees, from each colony, making as sure as you can that you do not get the queen. Put three combs in each of the new 16 hives, making sure you have as many bees as you can, plus brood (the more sealed brood the better), plus some honey, and add frames of foundation as needed. Give each new colony a new mail-order queen; do not let weak colonies raise their own queens. Check the parent hives after a few days to make sure you left the old queens in them. If one is missing – that is, if you inadvertently transferred one to one of the new hives – then give it a new one, destroying any queen cells you find. Plug the entrances of the new colonies with some grass immediately, to reduce the number of bees flying back to the parent hive, but make sure the entrances are open after a day or two. If you do this when the dandelions and fruit trees are blooming you should not have to feed sugar syrup. Give each colony an Apistan strip. Keep the three combs together; do not spread them out with foundation between them, and have the strip between the two combs containing most of the brood. These hives will all build up surprisingly fast, and you will probably get a pretty good crop from them, especially from the eight parent hives, as these will be the fastest to build up.

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

INNER ... Cont. From Pg. 6

letters were published. This gave the same credibility to the lowliest beginner that Langstroth, Quinby and other specialists were due. Well, almost anyway. And to an unknowing reader, the credibility *was* the same.

And there were lots of letters. Hundreds, then thousands arrived each month with questions and compliments and complaints and general communications. After all, there wasn't T.V., movies or other 'distractions' to waste time back then. In one of his Editorials A.I. discussed the mail he received – the amount ("It takes two clerks just to open each day's receipts.") and the length of some ("These 18 and 19 page letters just are too much!"), were his subjects. So, too, were his replies. Initially he read and answered every letter that arrived. Then, when the number increased he read and dictated the answers. Finally, he had a drawer, a specially made large drawer labeled 'Letters I'll never get to,' because there were so many, so long, and all so much the same.

Through the years this hasn't changed, that is letters coming to this office. I suspect this is true of many Editors' offices, though I can't confirm that.

Letters still arrive here, though not many in the 18-19 page range. By far the majority are one, two or a few at four or five page length. Most are handwritten on lined paper, but many are typed. All are in search of an answer, airing a grievance, offering a compliment, or telling a story worth telling in the eyes of the writer. All are welcome, and all are encouraged.

But, unlike A.I., no 'clerks' open the mail now. No 'stenographer' takes responses in shorthand, and no 'running boys' take those freshly typed responses to the post office three or four times a day. Such is progress. Today, responses from this office are usually scribbled on a post card, or on the bottom of the original letter sent in. Not professional? Perhaps. I'm not so sure. But if you're looking for an answer on a crisp, freshly typed piece of paper don't hold your breath. I've got a deadline to meet. If it's fancy letters you're looking for write the other Bee Journal. They always seem to have the time.

Kim Flottum

BOTTOM ... Cont. From Pg. 66

health became in a short time so much impaired that he was obliged to give up his pastoral charge, and in 1839 removed to Greenfield, MA where for a few years he was engaged in teaching. Finding that outdoor labor and exercise of some kind was absolutely necessary, he devoted such time as he could spare from his duties as a teacher to his apiary, and carefully verified all the experiments of which he had read, and entered into many of his own, for the purpose of gaining such knowledge by actual observation as might be useful to him or to beekeepers in general. The methods of management then in use were not at all satisfactory to him, and he was constantly endeavoring to devise some way or means whereby complete control of the whole interior of the hive might be given him. He thoroughly tested bars and slats, and even endeavored to make a practical use of the leaf hive of Huber. This leaf hive, however, was too clumsy (as any one may learn by attempting to use one) and he became almost discouraged at the poor success he met with. At last the idea came to him, that if bees will build comb on bars set on top of the hive, why will they not build it in a frame hung in the hive? He tried this plan with fear and trembling. Failure had been his lot so many times, that he had hardly dared to hope for success with this his new fancy. As we all know, this experiment did succeed; and the result was, that in 1852 he introduced the frame to the public; and so well was his work matured, that the same style of frame he then devised is now used more largely than any other, in the exact form he first devised it, and by the ablest apiarists in the country. It will be needless to enter into the many discouragements and great opposition with which he met in his endeavor to bring his frame into general use. It has been introduced, and introduced fully and completely; and such are its merits that the Langstroth frame is now used wherever bees are kept.

By the term Langstroth frame, I do not mean simply the original frame he devised, and which he still advises; but do mean that all sectional movable hanging frames, by whatever name they may be known, are Langstroth frames.

It was the hanging, sectional, movable-frame principle, of which he was the inventor, and the so-called "Gallup," "American," "Adair," or "Bingham" frames (or, in fact, all hanging movable frames) are Langstroth frames.

As an inventor, the name L.L. Langstroth will live as long as bees are kept, and generations yet unborn will revere his memory. By means of his powers of invention, and through his instrumentality in putting that invention before the public, the apiarist of today, with a few days' practice only, is enabled to see and observe for himself all those mysteries of which Virgil has so beautifully sung, and which the various writers of the past were only enabled to find out, as was Huber, by long years of patient labor, such were the difficulties that then surrounded them. With the introduction of the frame, a new era began, and through its means bee culture has been raised from a business of insignificance to one that is now barely second to any other. With the old box-hive, it was possible to gain 23 lbs. of surplus from a single colony in a season. When we compare this with the average of 150 lbs. per colony in many large apiaries, and with the 1,000 lbs. from a single colony obtained by B.F. Carroll, we may well be led to assert, that Rev. L.L. Langstroth is a great public benefactor.

Mr. Langstroth is now an old and feeble man. His health was impaired in early youth by too close attention to his studies, and now he is able to do but little for himself. For a few months past he has been in better health than for some years, and we hope his health will remain good, and he be spared for many years to give us, through the various bee journals, the matured thoughts of his ripened mind.

Modest and unassuming in his manners, and confiding as a child in the honesty of the world, he today, *instead of having reaped a fortune as the result of his valuable invention, is not worth a single dollar. But for all this, he stands before the world as one of Nature's noblemen, an honest man. He has fairly and fully earned the proud title that all beekeepers, who know him, admit belongs to him, – the prince of apiarists: the Huber of America. – J.E. Pond, Foxboro, MA*

?Do You Know? Answers

1. **True** When package bees are installed on drawn comb rather than on foundation, they build up faster since the queen can begin laying eggs almost immediately. In order to use foundation, the bees must first draw out some comb for nectar storage and egg laying by the queen. The delay time in producing wax and building storage space will delay colony development.
2. **True** Queens that are sold individually or those that are shipped with package bees, will be mated and will have started laying eggs prior to being placed in the shipping cage.
3. **False** Honey bee workers forage for food not according to their own needs, but in response to the needs of the colony. There is a colony level consensus reached through the activities and communication of numerous individuals. For example, when nectar collecting is in progress, the foragers return to the hive with their nectar load and transmit it to younger house bees. The speed at which the house bees accept their load gauges the nectar demand. When delivery times are long, the foraging bees eagerness for collecting dramatically decreases.
4. **True** All exterior parts of the hive, exposed to the weather, are normally painted to extend the life of the wood. The interior of the hive should not be painted, since bees varnish it with propolis.
5. **True** Since the bottom board is open in front, the colony should be tilted forward slightly to prevent rain water from running into the hive.
6. **False** When burr comb is built between supers, it is an indication that bee space (1/4-3/8 inch) was not properly constructed. The gap between the top bars of the lower super and bottom bars of the upper super is greater than 3/8 of an inch.
7. **False** Fluvalinate, the active ingredient in Apistan Strips, is a contact poison, not a systemic insecticide. Therefore, the bees must come in contact with the strip and pick up a tiny amount of the active ingredient which in turn kills the mites when they come in contact with the material on the bees.
8. **True** A colony that is making preparations to swarm normally has more occupied queen cells than a colony of the same size and strain that is preparing to supersede its queen.
9. E) Italy
10. Firepot, Bellows
11. Prolong the life of the equipment
12. Obtaining package bees
    Buying a nucleus (nuc) colony
    Purchasing an established colony
    Collecting a swarm and installing it in your equipment
    Trapping bees out of a building wall or hollow tree
13. Painting the hive exterior with a light color such as white is desirable since it prevents heat buildup in the hive during summer. Darker colors absorb heat energy from the sun, thus forcing the colony to expend additional energy in cooling the hive.
14. A beginner beekeeper should start with at least 2 colonies of honey bees because of the possibility of queen failure. Having more than one colony allows the beginner to take brood from a queenright colony and salvage the colony in which the queen has failed. Also having more than one colony gives the new beekeeper a better sense of what to expect as colonies grow and develop, since colonies are rarely equal.
15. Apistan Strips (10% fluvalinate)-detecting and controlling varroa mites in bee colonies.
    Apistan Package Strips (2.5% fluvalinate)- for package bee shipping cages. Apistan Queen Tabs (1% fluvalinate)- for individual caged queens.
16. Bees are less irritable and easier to handle when located in the open where they can get plenty of sunshine. When the entrance of the hive receives the early morning sun, the hive warms up quicker, and the bees begin foraging earlier in the day. Shade from trees retards the flight of workers and hinders finding the queen and seeing eggs within cells.
17. *Introduce the queen in a Benton-type mailing cage and allowing the bees to release her.
    *Release the queen into a push-in cage that is forced into the face of the comb over a small area of capped brood.
    *Introduce the queen into a nucleus colony by one of the above techniques and at a later time, combine the nucleus colony with the queen after she has started laying, into the colony to be requeened.
    *Place the queen in some type of protective cage, suspend it into the colony to be requeened and release her in 3 to 4 days.

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

Gleanings

MARCH, 1997 • ALL THE NEWS THAT FITS

Mega Merger Complete

NEW COMPANY PROMISES TO KEEP APISTAN®

The coming of the new year has brought a new name to the crop protection industry. Novartis Crop Protection, Inc., officially formed on Jan. 1, 1997, was created from the merger of Ciba Crop Protection and Sandoz Agro.

Novartis Crop Protection, headquartered in Greensboro, NC, is the nation's largest supplier of crop protection products. Based on 1995 results, Ciba was the crop protection leader in the United States with more than $1.1 billion in product sales. The merger with Sandoz strengthens that position, and provides Novartis with stronger research and development capabilities than Ciba or Sandoz had before combining operations, according to a company press release.

"Our customers can expect an even higher level of service than they received under the Ciba and Sandoz names. Novartis will combine resources from two industry leaders to set a new standard of customer service, and to help our customers leverage new technologies to meet their crop protection needs," said Emilio J. Bontempo, president of Novartis Crop Protection.

Novartis Crop Protection lists more than 10 prospective products in its development pipeline, with five expected to receive Environmental protection Agency (EPA) registration within the next three years.

Plans to merge Ciba-Geigy Ltd. and Sandoz. Ltd. of Basel, Switzerland, were announced in March of 1996. provisional approval of the merger by the U.S. Federal Trade Commission in December cleared the way for completion of the merger.

As a condition for FTC approval, Sandoz Agro agreed to divest its dicamba and dimethenamid corn herbicides and their mixes. The sale of those products to BASF also was finalized in December.

The apicultural and other products produced by Sandoz-Agro will be spun off to yet another company, but plans not finalized as of early February. Company sources indicate the honey bee products will be continued and perhaps expanded.

At presstime the merger has brought out yet another group, Vaughan's Seed Co. and S&G Seeds, Inc., will become part of Novartis Seeds along with sister companies Rogers, Northrup King, and Hilleshög. Vaughan's and S&G will continue to serve the commercial flower industry in North America. "We at Vaughan's and S&G are not combining with any other companies within Novartis, and our business distribution channels will not change," says Fred Fuller, president designate of Vaughan's.

ANIMAL RIGHTS ACTIVISTS ATTACK FISHING

Having tried to disrupt fishing tourneys across the country this Summer, PETA has decided it can somehow elevate fishing to its list of cruel and inhumane activities. Its goal is to discourage the eating of fish by disrupting the big money tourneys. "This is the final frontier," says PETA. "We've tackled issues with almost every animal in the country." Possible actions include rock throwing to scare fish away, or riding around in a boat where people fish during tourneys.

Dutch Gold Annual

BINFORD WEAVER AWARDED

On January 18th, at the American Beekeeping Federation's Annual Meeting in Norfolk, VA, the recipient of the 1997 Dutch Gold Honey Bear was announced. This award is given annually to an individual in the beekeeping industry that has made a long-standing personal contribution to the industry. This year's recipient is Binford Weaver of B. Weaver Apiaries in Navasota, Texas.

Binford Weaver has nearly 50 years experience in the honey industry. Growing up in a family that was focused on beekeeping, Binford began his career in queen production while still in elementary school. When Binford graduated from high school at the age of 16, the United States was in the midst of World War II. Binford decided to postpone college and become the primary queen expert for the family business. After graduating from Texas Christian University, in Fort Worth, he returned to take over the packaged bee and honey production.

Binford's dedication to the beekeeping industry is well-known. He has served as president of the American Beekeeping Federation, the American Bee Breeders Association, and the Texas Beekeepers Association. He was the first chairman of the National Honey Board's Nominations Committee, which selects the members of the National Honey Board. As a National Honey Board member, Binford served two years as Chairman and is currently chairman of the Board's Advertising and Consumers Information Committee.

Binford's lifetime of dedication to the beekeeping industry would not have been possible without the love and support of his wife of 38 years, Bennie Lou. Bennie Lou has been a lifetime supporter of the industry and her husband. They have two sons, Danny, who is in partnership with his father, and Robert, who passed away two years ago.

At present, Binford and Danny own and operate B. Weaver Apiaries, Inc. They produce Buckfast and Weaver All American queens, package bees and produce honey in Texas and North Dakota.

Dutch Gold Honey and the Gamber family congratulate Binford on his lifelong dedication to the beekeeping and honey industry.

The Dutch Gold Honey Bear is awarded in honor of Luella and Ralph Gamber, the founders of Dutch Gold Honey, Inc. The bronze honey bear on a walnut base, is a replica of the original model created by Woodrow Miller and W. Ralph Gamber in 1957. A $2,500.00 research grant in honor of Mr. Weaver will be presented to the institution of his choice.

The recipient of this award is chosen from nominations submitted by the Editors of *Bee Culture, American Bee Journal* and *Speedy Bee.* Dutch Gold Honey appreciates the time and thoughtful consideration given by these individuals to the selection process.

Bees, Not Beekeepers

USDA LOOKING FOR SURVIVORS

The USDA, ARS Honey Bee Breeding, Genetics and Physiology Laboratory in Baton Rouge, Louisiana, is continuing to evaluate U.S. honey bee germplasm for traits which contribute to resistance to, or tolerance of, *Varroa jacobsoni*. Beekeepers are urged to contact us if they know of infested colonies that have survived for more than a year without acaricide treatment.

Last Spring, queens from "survivor" colonies were provided by beekeepers from five states. Twenty-five colonies were established with uniform bee and mite populations to measure the population growth of *Varroa jacobsoni* and study factors that potentially influence this population growth. Mite infestations were highly variable at the end of the 11-week test. The best colony had only a 36% increase in the adult mite population, while the worst colony had a 1,000% increase. In our test, reduced mite infestations were associated with 1) a longer reproductive cycle of the mite, and 2) greater hygienic activity by the bees. After seven months with no treatment, approximately one-third of the test colonies had died or dwindled to inviable populations. The remaining colonies, especially the least infested, will be used to further select and breed resistant bees.

We ask the nation's beekeepers to check for possible "survivor" colonies as beekeeping activities are stepped up in the weeks ahead. Our project can accommodate newly contributed "survivor" queens. They will be evaluated this summer, and the best will be used for further stock research and development. Each contributing beekeeper will be sent the results of the evaluation and a replacement queen (or queens) from the selected, propagated material.

The chief goal of this project is to deliver an improved stock back to U.S. beekeepers. Thus, this is a unique opportunity for concerned beekeepers to contribute to the well-being of their industry. Anyone wishing to support this effort should contact one of the principal investigators (listed below) by mid April. **Please do not send queens before making arrangements with us.**

Robert Danka (tel. 504/767-9294, email rdanka@asrr.arsusda.gov)
John Harbo (504/767-9288, jharbo!asrr.arsusda.gov)
Thomas Rinderer (504/767-9281, trindere@assrr.arsusda.gov)

USDA, ARS Honey Bee Breeding, Genetics and Physiology Laboratory
1157 Ben Hur Road
Baton Rouge, LA 70820-5502
Tel. 504/767-9280, fax 504/766-9212

Native Bee Newsletter

AUSSIE BEE AVAILABLE

Australia has over 2,000 species of native bees ranging tiny insects like mosquitoes to large, furry bumblebee look-alikes. Many are solitary and raise their young in tiny burrows in the ground or inside twigs. Others are social, with queens, drones and hundreds of workers in large colonies. Australia's social bees are stingless and make delicious aromatic honey. Native bees are important pollinators of Australia's unique wildflowers and are currently being studied as potential pollinators of some exotic crops. Unfortunately until now, no detailed information on these fascinating insects has been available to the general public.

To fill this need the Australian Native Bee Research Centre is launching a quarterly bulletin called *Aussie Bee* and a series of information booklets on native bees. For full details and a free copy of the historic first issue of the bulletin, send a self-addressed, business-sized envelope to: The Australian Native Bee Research Centre, P.O. Box 74 - B4, North Richmond NSW 2754, Australia.

ABF RE-ELECTS INCUMBENTS

The American Beekeeping Federation re-elected its incumbent officers during the ABF annual convention in Norfolk, Jan. 15-18, and expressed support for the expansion of the National Honey Board activities to include mandated pre-harvest honey bee research and a honey quality assurance program. About 600 attended the convention.

Re-elected was president Bill Merritt of Sopchoppy, FL, Vice Pres. David Hackenberg of Lewisburg, PA to the ABF Executive Committee Pat Heitkam, Orland, CA, and Troy Fore, Jesup, GA, as Exe. Dir., a new title for the secretary-treasurer position authorized by a by-laws amendment.

CANADA'S NEWS

Check Off Programs, Honey Crops and Bear Protection

The Canadian Honey Council has proposed a mandatory check-off program to raise funds for the support of Canadian apiculture research projects.

The program has to be put to Canadian beekeepers for discussion and proposes a basic levy of C$25 per hundred colonies, estimated to the nearest 100 colonies operated at June 30 of any given year, with a minimum levy of $25 and a maximum levy $250.

There would also be a basic levy of one cent a pound on all honey imported into Canada.

Each province would be required to collect the beekeeper levy and send the money directly to the council.

Revenue Canada, through its Customs Department, would collect the levy on imported honey for the council.

Council president Wink Howland said provincial organizations would have the option of not participating in the program.

"However, provincial associations, once having made the decision to participate, would have to provide at least one full fiscal year's notice if they wished to withdraw from the program."

He said if provinces wish to use the levy system to raise additional funds for locally directed promotion, administration or research, they could – by satisfying provincial legislation – ask that a larger levy be imposed on their beekeepers.

The council proposes charging an administration fee of five percent of the value of the annual levy and would assume the responsibility for the accurate accounting of all expenditures.

•

Preliminary estimates indicate Manitoba beekeepers harvested a slightly less than average honey crop of about 140 pounds a colony, down from 170 pounds a colony the year before, for a total of 10.5 million lbs.

The Manitoba Beekeepers Association said the lower harvest followed a relatively long and harsh 1995-96 Winter and a late Spring that caused higher bee mortality than normal. That resulted in a slower population build up of colonies.

Offsetting the lower crop was higher honey prices. Wholesale honey prices for bulk honey have been at C$1.20 - C$1.35 a pound. This was up from 78 cents a pound a year ago and 60 cents a pound two years ago.

Preliminary reports from Saskatchewan and Alberta also indicate less than average production resulting in reduced overall Canadian production for 1996.

•

The Manitoba Beekeepers' Association is to evaluate a new product aimed at eliminating bear damage to beehives.

Manufactured by Amtek, the CritterGitter units use passive infrared, body heat and motion detection to detect animals as they enter a protected area.

The units emit a high-pitched sound along with high intensity flashing lights intended to frighten the intruder away. It then re-sets for the next intrusion. The sound patterns are constantly changed to prevent animals from becoming accustomed to them.

The association will buy several of the units and set them up under controlled conditions to determine their efficiency in a field trial during the coming summer.

Each unit can protect a diagonal area of up to 40 feet depending on the size of the animal.

NUT COUNCIL MAKES VIDEO

The International Nut Council recently financed a made-for-TV video segment on the nutrition of tree nuts which was utilized by various CNN channels and generated an estimated 195 million TV impressions, according to INC president Don Soetaert.

"This is undoubtedly the most impactful event on potential nut consumers made on behalf of the tree nut industry ever," Soetaert noted.

The video cost the INC $17,000 to produce and generated publicity which was worth perhaps $1 million or more, Soetaert said.

The focus of the segment was on generic nuts and was a positive statement on behalf of all tree nuts. However, almonds, walnuts, hazel-nuts, pinenuts and macadamias were mentioned specifically in the segment CNN lifted from the video.

OBITUARIES

Mr. James R. Smith, 66, of Yuma, AZ, died January 15, 1997, at his residence.

He was born December 27, 1930 and his parents were Yuma area Pioneers. He served in the U.S. Army and was a veteran of the Korean War.

He was a farmer and beekeeper in the Yuma area, with nearly 20,000 colonies.

A long time member of the Valley Baptist Church, he was also a member of the Sioux Honey Association and the Farm Bureau.

Survivors include wife Joann; son and daughter-in-law Rick and Mary Smith of Yuma; daughter and son-in-law Pam and Orvel Dewhirst of Yuma; mother Willie V. Smith of Yuma; sisters Virginia Hills of Yuma, Betty Campbell of Spanaway, WA; and numerous grandchildren. He was preceded in death by father, Thomas M. Smith.

His son and wife will continue the business. There are 18 full time employees.

Contributions suggested to: Valley Baptist Church Memorial Fund, 3830 W. 8th Street, Yuma, AZ 85364.

William "Bill" Preston Nye, 79, died Dec. 15, 1996, in Hyrum, UT.

He was born January 10, 1917, in Logan, the first of two children of Preston William and Lucy Isabella Armstrong Nye. He married Helen Faye Paulsen on August 24, 1945.

He graduated from Logan High School in 1936 and from Utah State University with a bachelor's degree in 1940 and obtained a master's degree in entomology in 1947.

He began working for the Federal Bureau of Entomology and Plant Quarantine, U.S. Legume Seed Research Lab, U.S. Department of Agriculture, in 1947 at Utah State University. His assignment was bee behavior and pollination of agricultural crops. he retired in 1977 after 30 years with the U.S. Department of Agriculture.

As a research apiculturist, he also wrote and taught a class on "the biology of the honey bee," at USU and taught Extension classes at Heber City, Moab and night classes at USU.

He received numerous photo awards from the Entomological Society of America and the Pacific and North Central Branches, Apimondia, and International photo societies; Certificate of Merit Award 1968 from the USDA, ARS; certificate for contribution to research project from the Marion W. Meadows Awards, Horticultural Society; Outstanding Service Award, Western Apicultural Society, 1985; The Hive Tool Award, Utah Beekeepers Association, 1989.

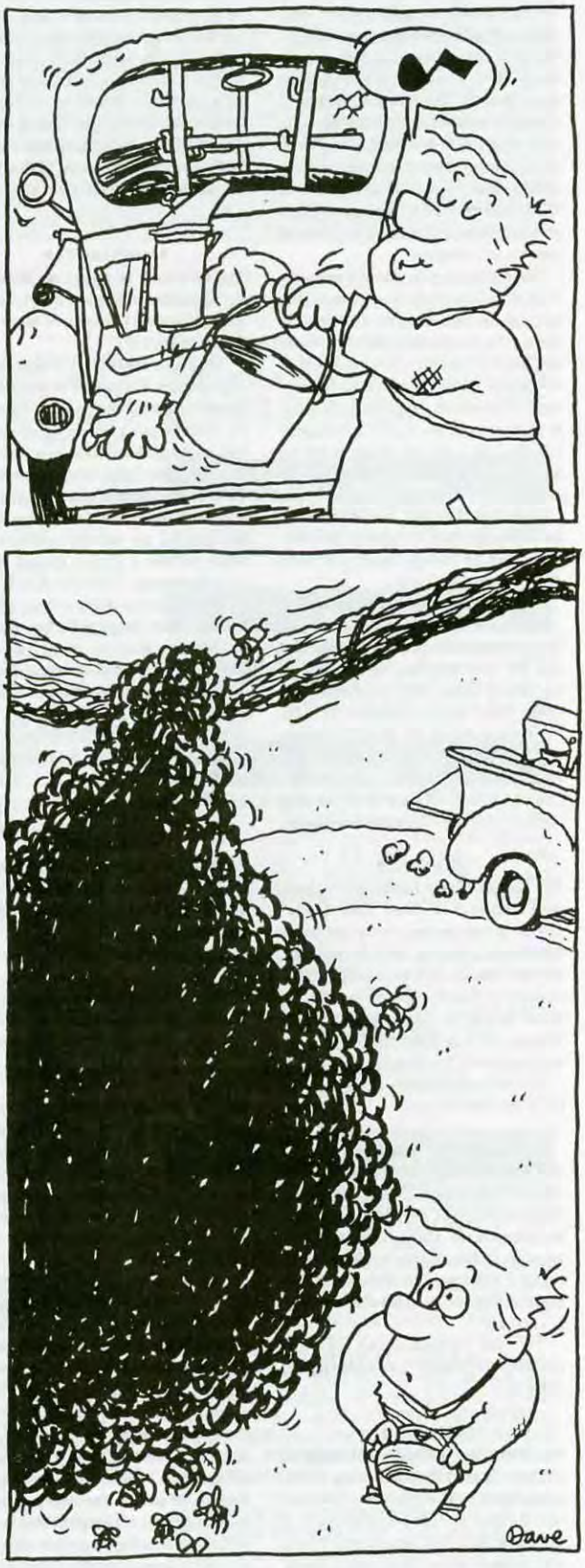
Gerald H. Rose, a long-time resident of Eagle, CO died Dec. 23 after a lengthy illness. He was 82.

Rose was born March 14, 1914, in Montrose, CO to The Rev. Forrest H. Rose and Blanche Longstreth Rose. He was the youngest of three children.

Rose started keeping bees at age 14 in Littleton, CO, and turned beekeeping into a full-time business which lasted 64 years. During World War II, Rose worked for Remington Arms in Lakewood as a supervisor in addition to keeping bees. Rose was a Sue Bee member, and nearly always exceeded CO production with his two-queen colonies. He ran as many as 500. Working with Bill Wilson, he helped research the extender patty in use today. He served as president and vice president of CO Beekeeper's Association over the years, and was an ABF member.

SEND US YOUR MEETING NOTICES AT LEAST TWO MONTHS IN ADVANCE

Smokey Dents



"On second thought, maybe I need a bigger pail," Smokey thought, "a much bigger pail!"

L.L. Langstroth

The following biographical sketch of our friend Langstroth, we copy by permission from the *American Apiculturist* for January, 1884. The editor has also kindly loaned us the engraving of friend L. which will doubtless prove interesting to many of our readers. The article has an additional interest, coming from our good friend J.E. Pond.

The beginner in bee culture of the present day can have no conception of the many difficulties that were met with under the "old box-hive and brimstone" style of management, or the almost insurmountable obstacles that prevented themselves to the old-time amateur in an attempt to solve those mysteries which now are made plain as an open book. True it is, that in days long gone by something had been learned in regard to the habits of the honey bee; the methods of management then in vogue, rude though they were, still were productive of some little gain. The late lamented Quinby, a man of vigorous frame, possessed of rare intelligence, and an acute, active, and far-reaching mind, not only had shown that, even with the box-hive, and such rough appliances as he necessarily used therewith, one could, by close attention to the business, and by careful, intelligent management, bring about results that were fairly remunerative, but was one of the first to see and appreciate the value of the movable frame of Mr. Langstroth, and also to adopt and use it; by which use he encouraged and emboldened Mr. Langstroth to make his invention public, and thus aided in making apiculture what it now is, one of the leading industries of the world. Mr. Quinby also by close observation enabled himself to garner in those facts which, when published and given to the world, opened a new field for labor, both intellectual and manual; and his work on bee culture today, as revised by his son-in-law, Mr. L. C. Root, stands out before the world as one of the best treatises on the subject which has ever been written.

Prior to 1852, the ablest beekeepers of both the old and the new world were endeavoring to render the management of their bees more simple and easy, and many plans had been devised (none of which were really practicable) to enable the whole interior of the hive to be put under the complete control of the owner. Bars and slats of various kinds had been used to some extent; but still, although a great improvement, they were not just what was desired. The march of improvement in this direction was slow; still some progress was made; but not until the Rev. L.L. Langstroth devised the sectional movable frame, and introduced it to public notice, was success made positive and certain; and with its introduction the doom of the old box hive was sealed, and brimstone relegated to its natural home.

Who is the Rev. L.L. Langstroth? is a question that is often asked by beekeepers of this generation, and perhaps it may be of some interest to know something of his history.

Lorenzo Lorain Langstroth was born in Philadelphia, December 25, 1810. As a boy he took great interest in natural history, and the happiest days of his youth were those spent in watching the habits of the various insects found in and near the city of his birth. His parents were of the old school, and, deeming such studies the height of youthful folly, gave him no encouragement therein; and it was not until the year 1838, that he began to learn something of the honey bee. At that time he procured a colony or two of bees, and began studying them under great disadvantages, he at that time never having seen or heard of a work on bee culture; and for the first year of his pursuit in this direction, the only published work of the kind that came to his notice was written by a man who doubted the existence of a queen bee. After graduating at Yale College, he pursued the study of theology, and was settled over his first church at Andover, MA. His

Continued on Page 57

BOTTOM BOARD