Bee Culture

JANUARY 1993

VARROA FACTS
roger morse

MAKING EQUIPMENT
dick bonney

HERBAL HONEY
stephen bambara

RECORD KEEPING
jeff ott

cover story . . . .

ORLEY TAYLOR
The Man Who Loves Mysteries

Janu

COLUMNS

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Contributors: *Roger Morse, Richard Taylor, Michael Burgett, Dewey Caron, Jeff Ott, Dick Bonney, B.A. Stringer*

Subscription Rates:
United States, one year, $15.00; two years, $28.00. Newsstand Price: $1.95. All other countries, (U.S. Currency only), $7.50 per year additional for postage. Send remittance by money order, bank draft, express money order or check. Published monthly. Change of Address: Return completed form contained inside issue. Articles are solicited opinions expressed by the authors are not necessarily those of the publishers.

Advertising:
For information on placing display advertisements, contact our Advertising Dept. 216-725-6677 Ext. 220.

Postmaster:
Please send form 3579 to: The A.I. Root Co., 623 W. Liberty St., Medina, OH 44256. Tele. 216-725-6677.

Circulation Figures reviewed by Deloitte & Touche. CPAs.

The A.I. Root Co., Publishers 623 W. Liberty Street Medina, Ohio 44256

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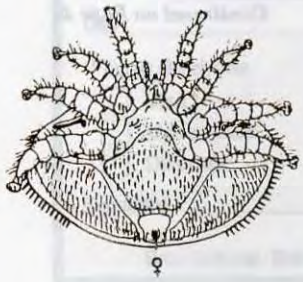
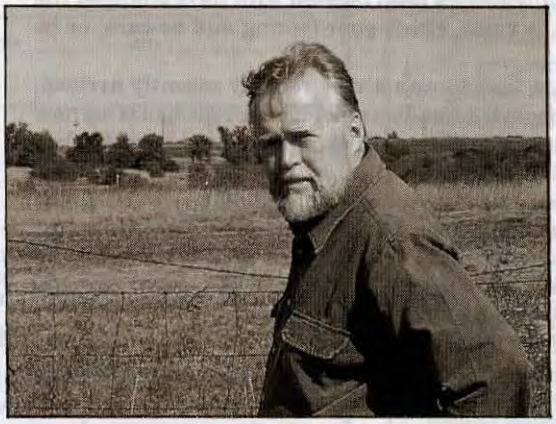


FEATURES



Cover
Dr. Orley 'Chip' Taylor hails from the University of Kansas, but his heart resides in the tropics. And there, too, resides the African honey bee. Meet this top notch honey bee researcher, and find out where Kansas, the tropics and African honey bees meet.

INNER · COVER

January often brings the emotions of hope for the future and thoughts of the past to the fore and even if now isn't the new year for you, I'd like to share some of our new and old, and I invite you along for the ride.

The past 12 months have been much the same, and much different than any past 12 month span. Similar because the weather was good, and bad, and the honey crop the same, depending on where you happened to be at the time. Of course the rules have evolved, the hills are steeper and the slopes slicker – the mites we've been blessed with have changed the game. Learn the rules, check your footing and beware, or be gone.

The good is that there's a new remedy recently arrived, giving respite from the insidious insider. But the bad is we now have a tolerance for foreign stuff in our once pure crop. Such is life.

But even so, comrades have fallen and there are fewer members in the fraternity of the care of honey bees. Our most recent survey shows there's been a 10% drop since 1990. No Virginia, there really aren't 200,000 beekeepers in our fair land anymore, in spite of what the experts say.

On other fronts the price of honey has risen, generally, but at the same time we seem to be selling more of somebody else's crop. A mixed blessing at best, but the eleventh hour meeting of packers, importers, producers and others seems to have started the healing needed to mend the rift. Time will tell, but the right foot has been put forth – read more of this below.

Our newest guest has moved through Texas like a hot knife through butter and is already knocking on New Mexico's east door. Chip Taylor has some thoughts on this, but the picture remains cloudy. Wait and see, wait and see.

Hasn't it been fun?

But there's more of course. We've experienced the biggest surge of new beekeepers this year in my memory. New blood. New and eager folks who accept all of the above as business as usual, (which it is, of course), and enjoy the fine and fun times they have with bees and beekeepers.

Honey prices, at least in the retail arena have increased, too, and that's always good news. Long term prospects seem even brighter, and honey, as a value added product is moving up the 'best choice' curve for consumers, bakeries and others. That future is definitely bright, and getting brighter.

Our most obvious contribution to new is the change you see on the pages and cover of the magazine. The biggest among them is the absence of the word *Gleanings* in our title. Did you notice? This marks our 120th year in the business of making this magazine, and the first without that particular word on the masthead. The reasoning behind the change is simple, really. When the magazine was created most of the population came from an agricultural background, and GLEANING was an oft used term. Now less than 2% of our readers have that same past and that word is uncommon in daily use. *Bee Culture* now stands alone, and seems to say what we're all about, and what we do best. Our focus hasn't changed, our purpose hasn't changed and our goals are still the same.

We will continue to provide the best information we can on bees, beekeeping, beekeepers, the industry we are a part of and anything else we feel affects what we do or how we do it. We trust the changes made make this magazine easier to read, easier to use and even more enjoyable to receive every month. We also

Continued on Page 48

1992/3 HAPPY NEW YEAR

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- Circulation figures are reviewed by Deloitte & Touche Accounting/Auditing.
- We encourage letters to the editor on any subject whether appearing in the magazine or not. Direct your letters to: Editor, P. O. Box 706, Medina, OH 44258. We reserve the right to edit letters for content and length, but will avoid this if possible.

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NEXT MONTH

It's already time to start planning for the coming season and next month we've got the best 'get-up-and-go' reading imaginable, no matter where you are at the moment – whether it's 80° and time to start feeding, or 20° below and the fire needs another log.

Our Weekender finishes his two-parter on record keeping in time to get everything ready for whatever you need this season. Beekeeping is better with good records and a good system. Besides, wouldn't tonight be more fun if you were reading what you did last season than watching a rerun of some insipid sit-com?

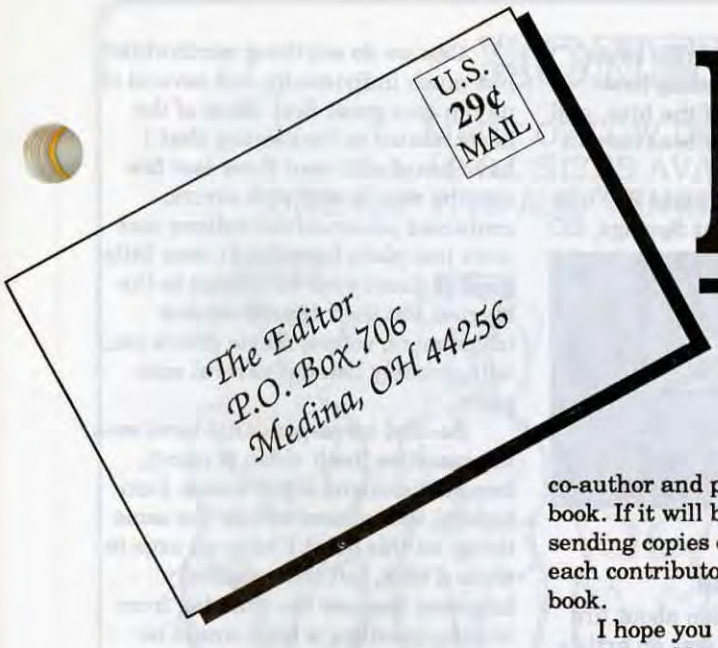
Management techniques to reduce tracheal mites? Yes, it can be done. It's not a cure-all, but it helps, and anyone can do it. Tune in next month and find out how.

Spring feeding isn't for everybody, but for those who need to, there's no substitute. Our out-spoken O.B. Wiser has a whole feeder full of good ways to do the deed as easily, and inexpensively, as possible.

Last summer Andrew Matheson, the newest Director of the International Bee Research Association (IBRA), visited the U.S. for about a month, and there were several opportunities to gain some insight into what makes this transplanted New Zealander tick, and what plans he has for IBRA, and even how they may affect U.S. beekeeping. Don't miss this profile of Andrew Matheson, next month.

Finally, we'll have a first ever look at the honey packing industry in the U.S. We've talked to honey packers from coast to coast, visited plants all over the country and included businesses that range from less than a million pounds a year to some that handle over 30 million pounds per year. We've included small shops that are independent, brokers, salespeople, managers, owners and more.

Find out how they work, the equipment they use, how they do business, their marketing techniques and more. Don't miss this once in a life time peek at 'the other side'. Take a look at 'The Packers", next month in *Bee Culture*.



MAILBOX

■ Author Needs Help

I am preparing a voluminous bee book about world beekeeping and am looking for support of each beekeeper who is a reader of this journal. The book will be published in four volumes. Each volume for one continent, Asia and Australia in one volume. I need informations about the history of beekeeping in your country or area running until now, including hive types, races of bees, management of honey bee colonies and other bees managed by man.

It would be a nice matter to get some photographs, black and white or color and slides, or drawings. Of course, I will make references of each co-author and photographer in the book. If it will be wanted, I am sending copies of the book-parts to each contributor after publishing the book.

I hope you understand my request and hope to hear from you soon.

Klaus Nowottnick
Hauptstrasse 1
P.O. Box 15
0-6086 Kleinschmalkalden/Thuer.
Wald, East Germany
Phone & Fax: 0049 36849-1353 (The last number will be altered at the end of 1992 into 20003)

We encourage letters to the Editor on any conceivable subject – previous articles, opinions, observations, information, speculation, comment or criticism.

Two-way communication is essential to make the magazine as good as you want it to be. And, if you've information to share, the more people that see it the better.

Share your thoughts, ideas or comments with over 12,000 readers. Bee Heard!

■ More Hemp!

Although I am not a beekeeper myself, my involvement in the field of agriculture has made me keenly aware of the importance of these winged wonders to our health and survival. For that reason, I was pleased to see my first copy of *Bee Culture*. It's a fine, and finely focused, magazine.

More specifically, I'd like to congratulate you on the article on hemp that appeared in your September '92 issue. Hemp is, of course, a great pollen source, but there are other reasons that beekeepers might want to give the plant a second look. Agricultural chemicals pose perhaps the greatest threat to bee populations in North America and other parts of the world. To the extent that a naturally pest-resistant fiber crop like hemp could replace pesticide dependent crops such as cotton, hemp could go a long way toward restoring wild and protecting cultivated bees.

I am not suggesting that beekeepers rush out and plant fields of hemp. As noted in the article, hemp cultivation is illegal. But there is a growing sense among farmers, environmentalists and health professionals that the total ban on hemp cultivation deserves re-examination. That movement deserves the support of beekeepers everywhere. Don't be mislead. This is not a "drug" issue. Prior to prohibition, the commercial hemp varieties grown in the Midwestern United States were nearly devoid of the psychoactive substances found in "marijuana" French growers have now developed a cultivar that has no psychoactive properties whatsoever.

So why is hemp cultivation illegal? It's a good question and one that beekeepers and others with an intimate stake in the preservation of the environment need to be asking.

Don Parker
Editor, *Growing Edge* Magazine
Corvallis, OR

■ Better Than Hefting

I agree with O.B. Wiser that hefting is an art and to be good at it you must practice. However, each time you heft a super a lot of bees stick their head out to investigate and get decapitated creating an awful mess, especially if you heft several times to get the feel of it. You will also notice that the supers feel much heavier at the end of a tiring day or when you are under the weather.

I get better results, by using a suspension scale with a modified hook – similar to the ones fishermen (fisherpersons?) use to weigh their catch. Simply hook it to the back bottom of the super and pronto, you have an accurate relative weight plus some squashed bees.

John Bunicci
Shoreham, NY

■ Queen(s)?

I really appreciated the two stories about how the "big boys" do it in the October issue. But I don't understand one aspect of the Adee's

Continued on Next Page

MAILBOX

queen acceptance procedure. It violates what other writings have taught me and my own experience as well.

The newly emerged queen, from the installed queen cell, doesn't kill the emergency queen larvae the bees began when they were queenless? Then if the installed queen doesn't mate, the emergency queen takes over the hive?

What happens if the installed queen *does* mate: Doesn't the emerged emergency queen kill the installed queen: One did in *my* hive. Surely Adee cares since he went to the trouble to raise Hybribee Starlines.

I don't think you are telling me that a nuc-becoming-a-hive can have two young queens so one must kill the other(s). Please be explicit about which one survives under each of the several circumstances.

Dan Hendricks
Mercer Island, WA

■ Looking For Work

My name is Bezik Toiganbaej. I am a 30-year old man, with honey bees I've worked for almost 12 years. My experience included honey production (extractive and comb), queen rearing, pollination for various agriculture crops, produce package bees and collection of bee venom (for commercial).

Please forgive me for troubling you but I should be very grateful if you could help me.

I want to work in apiary because I am very interested in American beekeeping, and I will do all my best for good work.

If you are able, please print my advertisement in your journal.

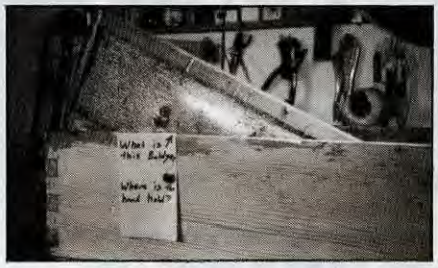
I am single and do not use drugs or alcohol. I may work full time or seasonal beekeeper.

Russia
125422 Moscow
A-422 D/C
Toiganbaevu B.M.

■ A Bit Off

I'm not real proud of this super, but it certainly is interesting how bees utilize every inch of the hive, and 1992 was a good year for bees here in N.W. Colorado.

James E. Ficke
Steamboat Springs, CO



■ Fire Ants, Plus

Just saw the question about fire ants today, when there was an article about them in today's paper.

The Florida University in Gainesville has the answer, but getting government approval is too expensive. One way to kill fire ants without chemicals is pouring boiling water in the nest. But there are so darn many of them, and making fire outdoors isn't permitted either.

Perish the thought? Perish the thought – somewhere in Nov. *Bee Culture.*

Questions – Richard Taylor – Nov. Bee Culture page 633 Mr. John E. Palmer, Newmarket, NH asks if it is important how to face hives in any particular direction. I faced a few hives towards the north in NH, experimenting and in spring time all the combs were moldy.

Gerhard K. Guth
St. Petersburg, FL

■ Need Good Publicity

The silly season is here. As you know, this is a season of the year when demagogues sound off, muckrakers write, bureaucrats and politicians mumble and the victims and beneficiaries spend time identifying the scapegoat or heroes of some recent event. Apparently, beekeepers are 80% victims and 20% beneficiaries.

Unfortunately our reaction to adverse publicity is short-lived. After expressing concern (among ourselves) for a few days, we usually decide there isn't much we can do about adverse publicity. Result: we do very little.

Can we do anything worthwhile? Not much individually, but several of us can do a great deal. Most of the news related to beekeeping that I have heard and read these last few months was flawed with errors, contained preconceived notions and were just plain harmful. It does little good to direct your complaint to the biggies, but their constituencies (consumers, voters, movie critics etc.) will probably listen if several complain.

Several correspondents have sent me cassettes (both video & print), news articles and a few books. I am hopeful that others will do the same thing. At this point I have an urge to write a book, but this is quickly forgotten because the time-lag from writing to selling a book would be years. We need an aggressive publicity program – now.

Glenn Gibson
Minco, OK

■ Perfect Temps

Maintaining 57°F was once a problem of making creamed honey, but a new device has solved this problem. Programmable thermostats designed for room air conditioners can be used to control refrigerator temperatures. These thermostats are sold in the lighting section of department stores for $25 to $40 and they control temperatures from 32 to 99°F. Each thermostat has a temperature probe that can be placed inside a refrigerator. The thermostat is programmed for the perfect 57° for creamed honey and then plugged into an electrical outlet. The refrigerator is plugged into the outlet on the thermostat. The thermostat turns the electricity on and off to maintain the programmed temperature. Always use a separate refrigerator to make creamed honey because 57°F is too warm for kitchen food storage. During winter months, the thermostat can be used with an electric heater to control the temperature of an entire room.

For more information contact Hunter Fan Company, 2500 Frisco Avenue, Memphis, TN 38114.

New For 1993

Kärcher introduces the HDS 1200 BE, Cold-Hot-Steam High Pressure Washer. This direct drive, skid mount unit is durably constructed and designed for applications where optimum cleaning power and gasoline independence are musts.

The HDS 1200 BE comes complete with infinitely variable operating pressure, water volume temperature control, and chemical metering. This high-performance electric-start unit features a +90% fuel efficient burner system, automatic idle down when the trigger gun is released, and low water, fuel, and oil cut off which protects the machine from damage.

SPECIFICATIONS:

Operating Pressure:	870 - 3200 psi
Water Volume:	2.4 - 5.3 gpm
Temperature:	175 285 °F
Weight:	452 lbs.
Dimensions - LxWxH:	45 x 30 x 33 in.
Motor:	16 HP Vanguard Twin-Cylinder

The HDS 1200 BE is part of a complete line from Kärcher, the world's largest manufacturer of high pressure cleaning equipment.

Literature available from: Alfred Kärcher, Inc., P.O. Box 778, Browertown Road, West Paterson, NJ 07424, Tel: 201-890-0444, Fax: 201-890-9541.

Cook & Beals, Inc. of Loup City, Nebraska, purchased the rights to manufacture and sell the Fager Wax Melter from the Fager Corporation of Kewaunie, Wisconsin. The wax melter will be made in standard and king sizes to accommodate the needs of smaller honey operations of approximately 250 colonies to larger expectation of 1000 colonies or more.

The Fager wax melters separate slum, wax and melter honey into individual containers with minimal product degradation. The compact insulated melters are self-contained and simple to operate. They operate under thermostatically controlled heat and are made of aluminum for rapid heat transfer.

"The Fager wax melter will allow Cook & Beals to diversify into products suited for smaller size honey producers", says Cook & Beals company president, Pat Kuehl. "We're proud to offer a product that has earned an excellent reputation among long-time honey producers"

According to Kuehl, the melters work best when most of the honey is removed from the wax, making the Fager melter a perfect companion to the Cook & Beals Spin Float Honey-Wax Separator, which is capable of separating up to 99% of honey from the wax.

Cook & Beals, Inc. is a full line producer of honey extracting equipment. The 32 year old company also builds custom truck beds and honey storage tanks.

For more information regarding the Fager Wax Melter, contact Cook & Beals, Inc., 308-745-0154, or write to P.O. Box 220, Loup City, NE 68853.

A nongrafting, push in queen cell cup has finally been designed for beekeepers that want to raise their own queens with a minimum of time and labor. A frame of 24-hour old larvae can be brought to your out yards and except for the time to make up the cell builder, the manipulation of pushing in the cell cup etc. will take five minutes or less. This eliminates all grafting houses, requires average eyesight and steadiness with very little skill. Because two behaviors are involved, the removal of foreign objects and the cell building behavior, the cup had to be designed to give the cell builders the advantage.

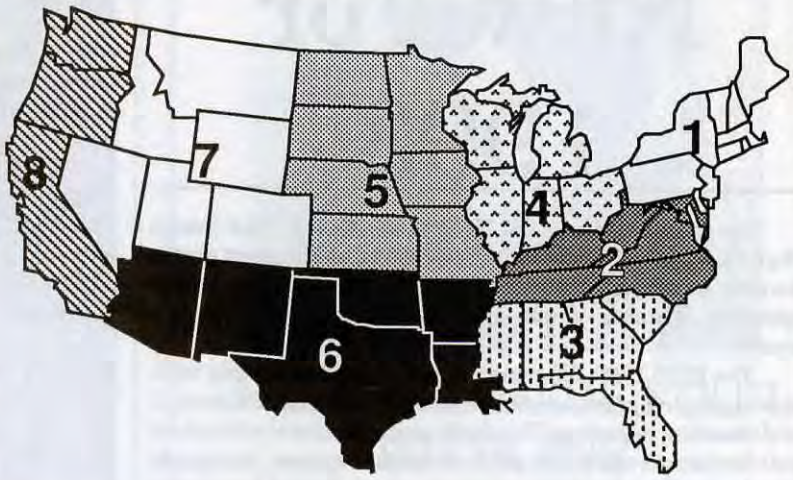
These queen cell cups will be presented in kit form for your convenience. A sample cup with all instructions can be ordered for $2.00 postpaid in the U.S. from IMN Inc., P.O. Box 9552, Wyoming, MI 49509.

JANUARY Honey Report

January 1, 1993

REPORT FEATURES

Prices shown are averages from many reporters living in a region, and reflect that region's general price structure. The Range Column lists highest and lowest prices received across all regions, from all reporters.



	Reporting Regions								Summary		History	
	1	2	3	4	5	6	7	8			Last	Last
Extracted honey sold bulk to Packers or Processors									Range	Avg.	Month	Yr.
Wholesale Bulk												
60 #Wh.	46.66	40.83	44.07	42.40	40.20	43.05	42.55	38.04	31.20-58.00	42.13	43.16	42.05
60 # Am.	44.38	40.63	40.46	38.00	36.19	41.50	40.49	34.32	27.60-58.00	40.58	40.02	40.89
55 gal. Wh.	.618	.537	.528	.565	.555	.563	.525	.600	.48-.79	.576	.575	.596
55 gal. Am.	.568	.495	.495	.535	.535	.503	.515	.520	.46-.79	.530	.524	.552
Wholesale – Case Lots												
1/2 # 24's	20.48	22.35	21.69	19.34	17.13	21.72	22.17	22.00	16.50-26.88	20.96	21.18	21.55
1 # 24's	30.42	31.24	34.70	29.99	27.27	34.22	29.93	24.32	16.95-48.00	30.67	30.44	29.15
2 # 12's	27.66	28.90	33.10	27.40	24.75	26.08	28.58	30.48	22.80-40.80	28.12	28.05	27.43
12 oz. Bears 24's	27.98	28.39	31.16	25.43	25.80	25.01	27.35	19.65	13.95-37.68	26.60	26.92	24.26
5 # 6's	31.05	29.08	34.06	30.50	27.20	29.78	28.33	26.53	25.00-48.00	30.12	30.16	28.68
Retail Honey Prices												
1/2 #	1.16	1.30	1.27	1.11	.91	1.16	1.15	1.20	.82-1.75	1.17	1.17	1.23
12 oz. Plas.	1.62	1.61	1.89	1.49	1.37	1.43	1.50	1.34	1.24-1.98	1.55	1.54	1.53
1 #	1.72	1.90	1.87	1.82	1.60	1.88	1.82	1.76	1.42-2.49	1.80	1.73	1.71
2 #	3.17	3.29	3.48	2.82	2.58	2.84	2.96	3.13	2.39-3.98	3.09	2.98	2.96
3 #	4.74	4.55	5.35	3.92	4.32	3.85	4.37	4.15	3.50-6.19	4.34	4.44	4.35
4 #	5.86	5.25	5.38	5.37	4.62	5.03	5.00	5.11	3.99-7.40	5.25	5.16	5.23
5 #	7.46	6.45	5.95	7.28	5.75	6.06	6.14	5.74	4.59-8.75	6.47	6.69	6.35
1 # Cream	2.18	2.61	2.22	1.84	1.93	2.45	2.11	1.94	1.49-2.95	2.21	2.16	2.32
1 # Comb	3.37	2.75	3.00	3.02	3.38	3.32	3.33	3.70	2.35-4.99	3.25	2.82	2.70
Round Plas.	2.34	2.75	2.75	2.76	2.25	2.51	2.49	2.91	1.99-3.75	2.53	2.46	2.40
Wax (Light)	2.94	1.26	1.26	1.22	1.33	1.93	1.15	1.33	1.15-3.80	1.83	1.63	1.22
Wax (Dark)	2.24	1.18	1.18	1.17	1.21	1.44	1.06	1.20	1.00-3.50	1.45	1.37	1.06
Poll./Col.	34.90	22.50	22.50	30.00	30.00	26.00	30.00	30.00	20.00-40.00	30.53	28.46	28.10

MARKET SHARE

Now's the time of year that supplies get short and customers start looking for more – and you don't have it in stock. What to do, what to do?

Don't ever let them go without, but don't sell an inferior product either. If you must, buy from another beekeeper. But only buy the best, and worry later about the price. Try and pass an inferior product now, and your customers will be buying from someone else next season (then shortages won't be a problem!).

Region 1

Prices steady to a bit lower, even considering the increased demand due to seasonal sales. Harsh weather has helped, too, but the NE is still struggling and the extra dollars aren't flowing freely yet. Production not great so honey is being bought, reducing profits. Colonies in fairly good shape, but early restrictions on movement mean mites are still moving in, causing problems.

Region 2

Sales steady to increasing and prices reflecting that demand. Production average, but fall crop seems fair, reducing feeding overall. Bees in good shape, and although mites still causing concern, pockets of resistance showing up. Weather has helped in treatment applications. Beekeepers generally optimistic.

Region 3

Prices steady but demand seems to be increasing a bit. Production was good and early crops seem promising. Varroa mite problems increasing in the south, reports of resistance to Apistan being heard. Spring will tell.

Region 4

Prices decreasing to steady, demand only steady and local beekeepers trying to figure it all out. A poor production year coupled with lower prices haven't helped, but a poor fall requiring feeding, along with mite problems not abating have added to the burden. A wet fall promises good for next spring... beekeepers are eternal optimists.

Region 5

Prices steady but demand increasing seasonally with cold weather. Mood generally upbeat inspite of a meager production year. Late summer and fall weather bode well for next spring. Mites not a major factor, but control still a major cost.

Region 6

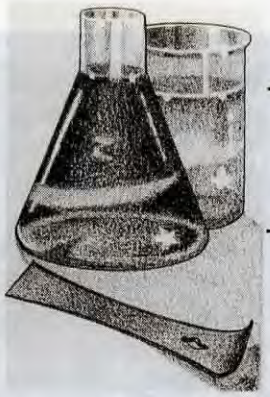
Prices increasing generally, but more so in small markets than large. Demand across the region increasing. Some suggest all the attention the AHB has brought, from the press to the classroom has helped. Colonies in good shape and good fall weather promises a strong flow this spring.

Region 7

For the first time in a long time prices not incredibly strong with prices tearing up the field. No explanation, except perhaps the race has showed and other economy aspects are moving in. Colonies in good shape but spring will tell.

Region 8

Sales, prices and demand steady to increasing, for a change. Northern areas wintering well, expecting strong crop next spring due to adequate moisture, finally. Pollinating colonies moving into almond orchards, getting stronger for crop. Water restriction will cut some crops, but to what degree isn't known, yet.



RESEARCH REVIEW

roger morse cornell university ithica ny

"Worker African bees, guards and timing"

During the past few years there have been a number of papers researching the division of labor by worker bees in a hive. Two excellent research papers have appeared in the past few weeks showing that the guarding system is part of this fine-tuned division of labor.

The first of these papers points out that when live bees are placed in the middle of a colony not their own the resident bees pay little attention to them. At a colony entrance, however, these same foreign bees are attacked rapidly by the guards. The authors conclude that the removal of foreigners is a "major responsibility of guard bees" While bees in the interior of the nest "can express discrimination" – "they are much less likely than guards to do so."

In one series of tests reported in this paper new guards appeared at colony entrances at a rate of 2.8 per hour. However, when guards were removed by a researcher, an average of 4.9 guards appeared in an hour; this is a significant difference. It is obvious that a colony has a method of replacing lost guard bees. It is suggested that under normal circumstances prospective guards may be inhibited by the presence of active guards. "Continued colony defense relies on rapid guard replacement because guards are easily lost to predators," write the authors. There is obviously a continuous flow of information about hive activities through the colony.

Another question raised in this research study was whether or not the duties of guard bees and undertaker bees, may overlap. They do not. Tests indicated the guard bees did not aid the undertaker bees in removing dead bees that were introduced nor did undertaker bees attack foreign bees inside the nest.

The second study was done in Ghana in West Africa. The goal of this research was to determine how to handle African bees without being stung excessively. It was found that the defensive behavior of a colony of African honey bees varies during the day. When there is more flight from a colony the bees are more defensive. During the non-productive summer rainy season a peak of aggressive behavior could be seen at one time in the morning. During the honey flow in the winter dry season the bees were more aggressive at one time in the early morning and again late in the afternoon. The author points out that others studying aggressiveness in honey bees have not taken into account variations that may exist during the day.

The observer found that one colony "defended itself so vigorously at one time of day that it was impossible to examine all the combs." However, there was a time of day when this same colony was less aggressive and it could be examined with ease. Furthermore, at this time only a little smoke was used. It was also observed that under some circumstances "smoke irritated the bees" and should not be directed at the combs, but rather used outside of the hive to keep the bees in.

Conclusions

It must be remembered that this second study was done with African bees in a hot climate. These bees have the habit of foraging early and late when the day is cooler. Nevertheless, I believe the information has an application for those working with European honey bees. It is important to select times and circumstances when bees are less aggressive to manipulate colonies.

As I read more about the division of labor within a honey bee colony I realize that work is carefully defined. Guard bees at an entrance expect trouble there, not inside the nest. It is only the entrance they guard. At the same time, nurse bees do not expect foreign bees to appear in the center of the brood nest and thus pay scant attention to them when they are introduced there. ○

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? DO YOU KNOW ?

Getting Started

clarence collison

Getting started in beekeeping is difficult for many individuals since they are embarking on an adventure that they know very little about. Many beginners start by collecting a swarm, ordering a beginner's kit which includes a package of bees from a catalog or buying a colony from a local beekeeper. Little or no thought is given toward selecting the right type of bee for local conditions. Honey bees vary in behavioral, morphological, and physiological characteristics such as color, size, tongue length, defensive behavior, biology, dialects of dance language and susceptibility to diseases. How familiar are you with the various species of honey bees and different races and hybrids that are available? Please take a few minutes and answer the following questions to determine how well you understand this important topic.

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

1. ____ The western honey bee, *Apis mellifera*, originated in Europe, Africa and Western Asia.
2. ____ The black German Bee was considered to be inferior to Italian stock so was replaced by Italians because of its aggressive behavior and susceptibility to brood diseases.
3. ____ The European honey bee (*Apis mellifera*) and eastern honey bee (*Apis cerana*) are capable of interbreeding.
4. ____ Tropical honey bees are much longer lived than temperate races.
5. ____ Caucasian and carniolan honey bees are dark gray-black with brownish areas on the front part of the abdomen.

It has been estimated that there are at least 24 races (subspecies) of honey bees in the world. These races are often grouped into three primary groups: European, Oriental, and African races. Based on historical evidence, representatives of at least eight recognized honey bee races have been introduced into the United States. Listed below are several honey bee races. Please match the appropriate description/ characteristics with the appropriate race.

A. *Apis mellifera mellifera* (Black German Bees)
B. *Apis mellifera carnica* (Carniolans)
C. *Apis mellifera caucasica* (Caucasians)
D. *Apis mellifera ligustica* (Italians)
E. *Apis mellifera scutellata* (Africanized Honey Bees)

6. ____ Maintain brood rearing as long as weather is favorable and honey/pollen are available.
7. ____ Overwinter with small colonies and small food consumption.
8. ____ Use excessive amounts of propolis.
9. ____ First race of honey bees imported into North America.
10. ____ Race having the largest bees.
11. ____ Strong tendency toward swarming.
12. ____ Race with the longest tongue.
13. ____ Reported to be the quietest and most gentle race.
14. ____ Produce brilliant white cappings, making beautiful comb honey.
15. ____ Overwinter with strong colonies and with high consumption of food.
16. ____ Most popular race of honey bees.
17. ____ Strong tendency toward absconding.

Besides the various races of honey bees, there are numerous strains of honey bees offered by queen and package bee producers throughout the country. Please answer the following questions about these various strains.

18. Buckfast honey bees were developed by _____. (1 point).
19. A Buckfast strain of honey bees are sold in the U. S. by _____. (1 point).
20. Queens produced by the Kona Queen Company are produced in _____. (1 point).
21. Starline honey bees are 4-way hybrids developed by crossing inbred lines derived from the _____ race. (1 point).
22. Midnite honey bees are 4-way hybrids developed by crossing inbred lines derived from the _____ race. (1 point).

Currently there are five species of honey bees found in the world.

A. *Apis laboriosa*
B. *Apis mellifera*
C. *Apis dorsata*
D. *Apis florea*
E. *Apis cerana*

23. Which of the above two species are kept and managed by man for honey production? (2 points).
24. Based on size of bee, type of comb, defensive behavior and nesting habits, which specie above is most closely related to *Apis laboriosa* ? (1 point).

ANSWERS ON PAGE 45

VARROA FACTS

roger morse

EASY TO FIND, ALMOST AS EASY TO CONTROL

On September 25, 1987, Asian varroa mites that infest larval, pupal, and adult honey bees were found in Wisconsin. This was the first time this pest had been found in North America. The infested bees belonged to a Florida-Wisconsin migratory beekeeper. Searches made immediately in Florida and several other states showed the varroa mites (*Varroa jacobsoni*) were widespread in the U.S. At the time the mites were first discovered it was too late to take steps to prevent their further spread.

In the past few years the most serious losses from varroa mites have been in Florida where thousands of colonies have died as a result of mite infestations. During this time the number of colonies dropped from approximately 360,000 to about 220,000. Part of this loss has been as a result of economics (low honey prices) but diseases, including varroa mites, have played an important role. By 1990 heavy varroa mite infestations had been found in western New York, eastern Massachusetts, Maine and a few other northern states, as a result of the movement of many thousands of colonies from Florida to these states for honey production and the pollination of blueberries, cranberries, and apples.

History and World Distribution Varroa mites are widespread in the world. Their native host is the small Indian honey bee, *Apis cerana*, a honey bee that is found throughout Asia and west to Iran. Varroa mites were discovered and named in 1904. While they are found in colonies of the Indian honey bee infestations are always low and they appear to pose no economic threat. Our first indication these mites could pose a problem came in 1963 when varroa mites were found in European honey bees that had been imported into the Philippines. Within a few years all of approximately 1000 colonies in that fledgling beekeeping industry were dead.

We are now aware that varroa mites had been introduced into the Ukraine in the late 1940's but we were not told about this until after their discovery in the Philippines. Varroa mites are now widely distributed on all continents except Australia. In many cases we are able to trace their introduction into Europe, Africa, and South America as a result of good-will gifts or in other careless ways. It is a fact that the present day international movement of goods and people is causing the spread of many pests, predators and diseases of our agricultural plants and animals. It is also true that much of this spread occurs innocently and without knowledge of the devastation it may cause.

Biology Mated female varroa mites ready to lay eggs move into brood cells with mature honey bee larvae that are about to pupate. They crawl to the bottom of the cells and burrow into the small amount of larval food, worker jelly, that is found there. This is immediately before the worker and drone cells are capped. The mites, and the maturing honey bee larvae, engorge on the royal jelly until it is consumed. At this time in its life history the honey bee larvae is transforming into a pupa. The varroa mites deposit their eggs in the cells and the hatching young and the old mother mite(s) feed at will on the pupa's blood. If the number of feeding mites is small the bee may mature but may have deformed wings and legs and a shorter life. If the number of mites is larger the pupae may die. The varroa mites mate in the cells and the males rmain there. Mature female mites crawl out of the cells and attach themselves to the underside of a worker bee's abdomen. They burrow under the sclerites, the overlapping body segments, and insert their mouthparts into the bee's body and feed on its blood. When the mites detach they mate and move into brood cells and the cycle is repeated. Mites are spread from hive to hive by drifting bees.

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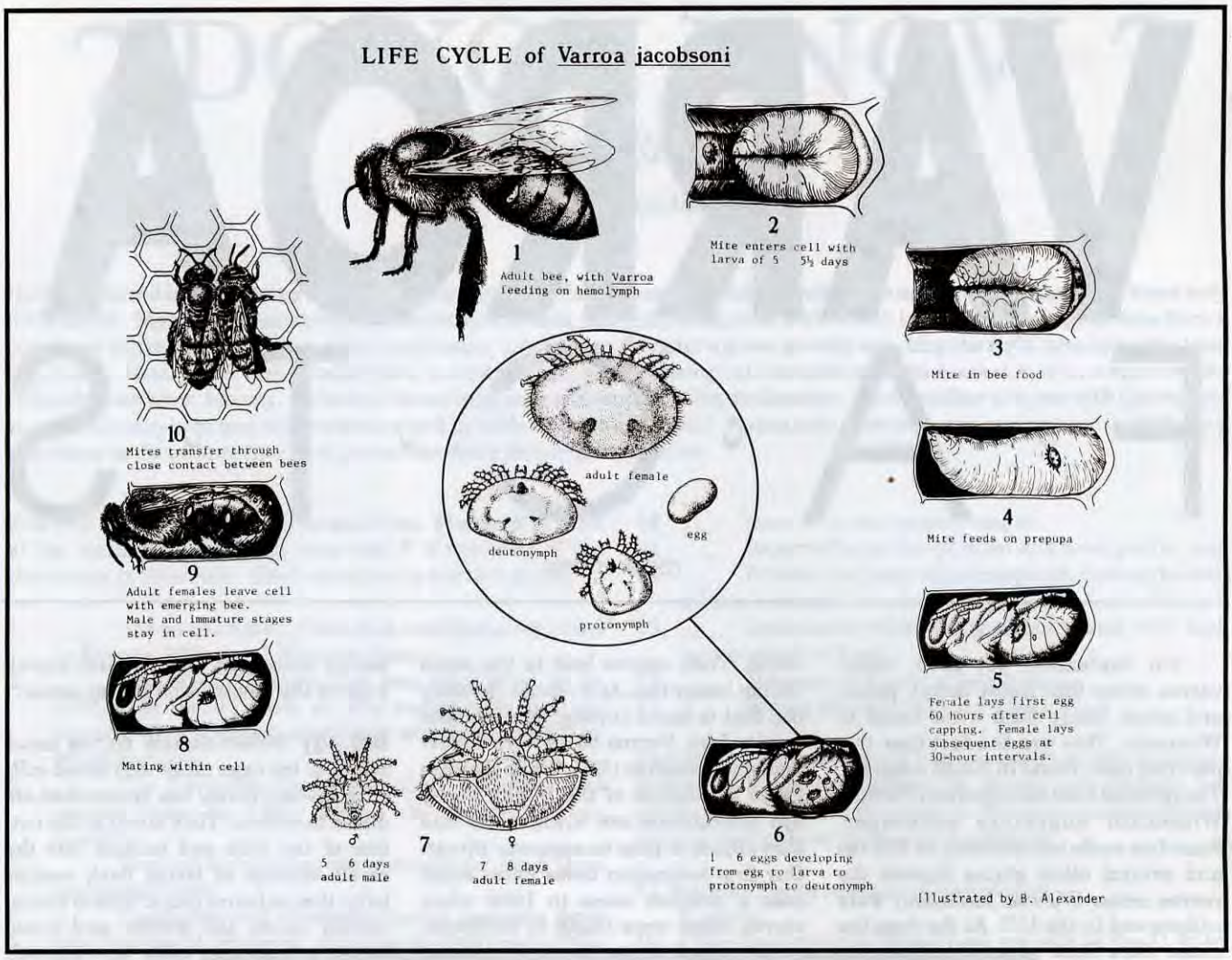

VARROA ... Cont. From Pg. 17

Diagnosis Adult varroa mites are reddish-brown, hard, flattened, more or less oval shaped, and about the size of a pinhead. They may be seen crawling around on a bee's body or on the comb. Immature mites are white or light brown. One may sometimes see bees with deformed wings, legs, and/or antennae in a hive. Such bees are usually removed rapidly by house bees. If such bees are seen the most likely cause is varroa mites; however, other diseases and malnutrition may also cause deformities.

Varroa mites are easily confused with the wingless fly or bee louse, *Braula coeca*, that is sometimes found in the U.S. though it is not widespread. Braula is common in Maryland and the surrounding states but has been found only once in Florida and New York. Braulids are little known. They apparently cause no harm in a colony where they feed by inserting their mouthparts into a worker bee's mouth and beg for food. They are about the same size, shape, and color as varroa mites.

If varroa mites are present in a colony they are more likely found attached to drone pupae. There are several methods used to find varroa mites. One is to uncap drones cells and remove the pupae with forceps. The dark varroa mites are easily seen on the glistening pupa's white body. A fast method is to uncap a large area of drone brood with a sharp, serrated knife and to strike the comb on a light colored table, board, or hive cover so as to dislodge the pupae where the mites can be observed.

One of the easiest methods of determining if varroa mites are present or not is to use a cappings scratcher. The teeth on the scratcher are inserted horizontally into a patch of drone brood so as to grasp the drone pupae by the necks. The drone brood is lifted from its cells. The wax cappings and heads of the drones are on the upper side of the scratcher while the thoraces and abdomens hang below. One may easily grasp 20 to 50 drone pupae at a time with this method.

A popular method of examining for varroa mites on the part of apiary inspectors is to use what is called an ether roll. In the ether roll, two to four hundred worker bees are raked or sucked into a wide-mouth clear glass jar. Ether, in the form of car starting fluid, is sprayed into the jar. The mites drop off their hosts and stick to the inside of the jar where they are easily detected as the jar is revolved.

Another method of examining for varroa mites is to place a sheet of clean white paper on the bottom board of an active hive. Three or four thin cleats are placed on the paper and a sheet of eight mesh hardware cloth is placed over the paper. The purpose of the cleats is to prevent the house bees from removing the debris that falls from the hive's interior onto the paper. The paper may be examined every few days for mites. If

one of the chemicals toxic to mites, and not toxic to bees (such as an Apistan strip), is placed in the hive the number of mites one will find, if they are present, will be even greater. While this method is very effective it requires more than one visit to the apiary.

The Most Accurate Diagnostic Method An accurate measure of the number of mites present in a colony may be made by brushing a few hundred adult worker bees into a two quart glass jar and adding water containing about 5.0% detergent. This method is used in many research laboratories but is more time-consuming than the above. It is especially useful in determining low level mite infestations such as when only one or two mites per 100 bees may be found. The jar is shaken vigorously for several minutes and its contents poured over an 8-mesh hardware cloth (wire cloth with eight wires per inch each way). The bees will remain above the wire and the mites will be washed through. A second and even a third washing should be made to be perfectly accurate as occasionally a mite clings to a bee. After shaking bees in a soapy water solution for a few minutes more than 95% of the mites will be dislodged from the adult bees. After shaking for 30 minutes, in a gentle shaking machine, we have found that all of the mites are dislodged. A 70% alcohol solution may be used in place of the soapy water. After shaking and sorting one counts the number of mites and the number of bees to obtain a ratio.

Methods of Control One chemical, fluvalinate, has been specially formulated and is approved for varroa mite control by the Environmental Protection Agency in the U.S. Fluvalinate is a synthetic pyrethrin. Natural pyrethrin is present in the petals of a daisy-like flower and has been used as an insecticide for at least 400 years. One of the finest attributes of this class of insecticides is their low toxicity to mammals. Fluvalinate is highly toxic to varroa mites but has no measurable effect on honey bees or humans. It is a selective pesticide. Fluvalinate is sold under the trade name Apistan. It is classified as a general use miticide and as a result may be purchased over the counter from bee supply dealers. Directions for its use are found on the package.

While we are all honorbound to abide by the directions that appear on a pesticide package, there is no question that the recommendations for the use of Apistan are antiquated. Since the directions were first printed we have had the benefit of additional studies in Europe and the U.S. A thorough understanding of varroa mite-honey bee biology is needed to understand how Apistan should be used correctly. In a natural or man-made beehive the brood nest, or brood-rearing area, takes the shape of a ball or football. The brood area may occupy several frames. The important point is to place the Apistan strips in the very center of the brood nest. For example, it has been reported that Apistan strips work well if laid across the top bars of the frames in a super. This is true if the brood nest occupies two supers and the top bars of the lower super are in the center of the brood rearing area. However, in most situations strips should be inserted between the frames as the directions indicate.

One problem with the synthetic pyrethrin is that insects and mites gain resistance, or tolerance, to them rapidly. This statement is based on observation of mites on other animals and crops. Thus, after several generations, we expect that this material may not be effective in controlling varroa. Searches are underway for other control chemicals. There are several compounds that are approved for use in other parts of the world. More importantly, it appears we may be able to develop bees resistant to the mites.

Resistance. . . mites to some chemicals, and bees to the mites is already evident.

Disease-Resistant Honey Bees In 1990 a colony of honey bees that is apparently resistant to varroa mites was discovered in Florida (Morse, Miksa and Masenheimer, 1991). Bees in this colony groom the mites from their bodies, bite and puncture them, and carry them outside of the hive where they are dropped onto the ground and consumed by other insects. This is one of the protective mechanisms used by varroa's native host, the Indian honey bee (Peng and others, 1987). It is also the method apparently used by Africanized honey bees in South America for protection against varroa (Moretto, Goncalves and DeJong, 1991). When they are searched for, varroa mites are found in every hive of Africanized honey bees in Brazil that is examined but the number of mites is never very high and Brazilian beekeepers seldom treat their colonies for varroa nor are they concerned about them.

Another method that honey bees may use to control varroa mites was discovered recently in Europe. Some bees apparently have the ability to detect live mites in capped pupal cells (Boecking and Drescher, 1991). They open the cells, remove and discard both the bee pupae and the mites. While this causes some loss of developing bees, it appears to be an effective method of control.

More recently, a research paper from Germany demonstrates yet another form of resistance in which worker honey bees bite off the mite legs with a shearing action (Ruttner and Hanel, 1992). This is interesting from several points of view including the thought that worker honey bee mandibles are designed for chewing, not shearing.

The colony of apparently resistant bees found in Florida came from a 400-colony apiary where all of the rest of the untreated colonies had died. We have now found that many colonies of European honey bees may groom varroa mites from their bodies but most do so in such low numbers that it is not an effective method of control and the colonies die.

The important point about these natural methods of control is that they were found in areas where thousands of colonies had died. Honey bees are variable animals. No two colonies are alike. Unfortunately, many had to die for these few colonies to be found. The fact that these variations among bees exist leads us to believe than we may find more colonies with the same behavior patterns or with other mechanisms of control. The resistant Florida colony was found by a beekeeper who understood that he had discovered something different and he called this to the attention of others. While it is recommended that beekeepers treat colonies in infested areas with chemicals it is also important that they watch feral and unattended colonies in the event one proves to be successful in an area where

Continued on Next Page

VARROA ... Cont. From Pg. 19

others die. A thrifty feral colony may be naturally resistant to the varroa mites, tracheal mites, chalkbrood, and perhaps even other diseases. In past years we have paid little attention to feral bees in hollow trees and houses. However, they may become very important sources of breeding stock in the future simply because they have survived attacks by varroa mites and other disease-causing organisms.

Who is Breeding Varroa Resistant Stock? At the present time there is no in-depth program to select and breed honey bees resistant to varroa mites. Federal and state research budgets are being reduced, redirected, or limited by inflation. Several beekeepers and researchers are making selections but no one has any proven stock for sale yet.

Obtaining Clean Stock Varroa mites and the organisms that cause other honey bee diseases are so widespread in the U.S. today that all sources of stock, except those from Hawaii, are suspect. However, the producers of package bees and queens are very much aware their reputations are at stake when they sell bees. It is our experience that the package bee and queen industry is taking every precaution to produce clean bees.

Complications with Other Diseases Any time a living organism suffers from a disease it is weakened. In such a condition it is more susceptible to attack by another disease-causing organism. Beekeepers in varroa-infested areas should use effective chemicals to reduce attacks by organisms that cause American foulbrood, European foulbrood and nosema so as to keep colonies as healthy as possible.

Conclusions and Recommendations American beekeepers must increasingly assume responsibility for bee disease control. At one time, bee disease control was largely in the hands of state departments of agriculture. This is no longer true. In the U.S. today we are seeing state after state reduce its agricultural budget including the money allotted to bee disease control. Bee diseases are now largely beekeeper problems and must be solved by beekeepers. Proper diagnosis is especially important. Good methods of control exist for most bee diseases, including varroa mites. Every beekeeper should conduct a varroa check of colonies twice each year. We have high hopes that with good detection methods we can treat infested colonies only once a year.

An especially important consideration in beekeeping is the selection of the apiary site. An ideal location is exposed to full sunlight, slopes to the east or south, has good air and water drainage, and a source of clean water nearby. An apiary must be accessible so that the colonies may be examined with ease and treatments made as needed.

A beekeeper must determine the carrying capacity of an apiary. That is, how many nectar and pollen plants are present within a mile or two of an apiary and how many colonies will an area support. A natural abundance of food, both pollen and nectar, is necessary for successful beekeeping. Commercial beekeepers prefer to keep 40 to 50 colonies in one location. It may take a beekeeper three to five years to fully assess the qualities of a site.

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OREGON ORDEAL

michael burgett

For the past four years the Honey Bee Laboratory at Oregon State University, in cooperation with the Oregon State Beekeeper's Association, has sent a winter loss survey to all registered Oregon beekeepers who own more than 25 colonies. From this information we gain some appreciation of the magnitude of annual colony winter losses and some of the causes (Burgett and Stringer 1989, Stringer and Burgett 1990, 1991). The first survey was motivated by beekeeper reports of elevated winter losses supposedly caused by the honey bee tracheal mite, *Acarapis woodi*.

The appearance of mites has affected beekeeping nationally and we anticipate an increase in distribution and severity in the coming decade. The costs of maintaining healthy colonies have dramatically increased.

The honey bee tracheal mite was first discovered in Oregon in October of 1985 (Oregon Department of Agriculture pers. comm.) and rapidly spread throughout the state. During the winter of 1988-89 beekeepers began to observe elevated colony mortality and associated the relatively recent presence of mites with the increased hive death rate. Oregon has also been "invaded" by *Varroa jacobsoni* with the first discovered infestation in October of 1989 (Burgett unpub.). While beekeepers have not yet reported elevated colony losses due to the varroa mite, this brood parasite is now distributed in all beekeeping regions of the state (Oregon Department of Agriculture pers. comm.) and we anticipate a substantial impact on colony numbers in coming years. A number of commercial beekeepers within the state have begun acaricidal treatment programs for varroa.

During the winter of 1991-92 a total of 30 beekeepers returned survey forms. They are grouped as follows: 12 commercial operators owning a total of 15,378 colonies and 18 non-commercial beekeepers owning a total of 2,040 hives. We classify a commercial operation as one with more than 300 colonies and non-commercial as less than 300. The reported losses are: 3,385 commercial colonies (22%); 270 non-commercial colonies (13.2%). These data are found in Table 1 which also includes the reported losses from the three previous years. The average loss of commercial colonies for the four-year period was 21% annually; for non-commercial colonies 16%.

One aspect of any honey bee pathogen or parasite is that it does not effect every beekeeper the same way in the same year. Tracheal mites are a good example of this. Many beekeepers who suffered severe losses one, two or three years ago, now report fewer colonies dying, while some beekeepers are only now reporting increased losses, having experienced relatively normal winter loss during the first several years of the tracheal mite "plague" So a state-wide loss of 22% does not mean that every beekeeper suffered. As Disraeli said: "There are lies, there are damned lies and then there are statistics." A closer look at the losses suffered by the twelve commercial beekeepers in this year's survey should illustrate this point. Table 2 shows each operation's reported colony numbers, beginning October 1 of 1991 and ending April 1, 1992.

The time of colony death is also interesting. Again looking at Table 2 we see that 67% of the reported mortality took place in the four-month period of October 1 to February 1; one would think that most of the colony deaths occurred in December and January as opposed to October and November. The death rate is not necessarily uniform for the six months of the reporting period (October through March). More colonies are dying earlier in the winter as opposed to late winter/early spring. This suggests that starvation, which is normally most severe in March and April in Oregon, is not a major contributor to the winter loss reported by the 12 commercial beekeepers.

The survey also requested information concerning types of treatment

TRACHEAL MITE TRENDS CONTINUE

From Table 2 we can glean a number of insights. Nine of the 12 beekeepers incurred colony losses of less than 22%. Beekeeper No. 1, with a loss of over half his colonies, had 34% (1,145) of the total number of reported dead colonies (3,385) in the survey. By combining the losses of beekeepers Nos. 1, 2 and 3 (1,985 hives) we see that these three beekeepers represent 59% of all reported losses. Beekeepers Nos. 6 through 12 (half of the reports) had 45% of the colonies (6,985) but only 12% of the total loss (832 dead hives). These six individuals all experienced less than a 15% colony loss. We could continue this arithmetic exercise *ad nauseam*, but the point is that winter loss is very erratic among any group of beekeepers, and the situation of even one beekeeper can dramatically color the regional picture.

used for mite control. Three of the 12 commercial beekeepers treated for varroa mites and two treated for tracheal mites. Chemical control included amitraz and fluvalinate. Non-chemical control methods were reported more frequently than chemical acaricides and included the use of vegetable oil extender patties, late summer stimulative feeding of sugar syrup, late summer requeening and uniting of weaker colonies in the late summer. The last three non-chemical techniques are good

Winter Losses – Commercial & Non-Commercial 1989-1992

Year	% Colony Loss Comm.–	Non-Comm.	# Hives Surveyed
1991-92	22.5%	13.2%	17,418
1990-91	19.0%	16.9%	20,624
1989-90	21.3%	22.3%	15,352
1988-89	21.7%	13.0%	10,812
AVG.	**21.0+1.4%**	**16.3+4.4%**	

management practices with or without the presence of mites.

Is there any difference in colony loss between those beekeepers who treated for varroa and/or tracheal mites with acaricides and those beekeepers who did not treat? While the sample size is small, the following results are shown: Colony loss for treated colonies was 19.6% (1,108 hives dead from a population of 5,643 colonies); colony loss for untreated colonies was 23.4% (2,277 hives dead from a population of 9,739 colonies). Considering the small number of beekeepers who treated and the variety of materials used, no conclusions concerning the effectiveness of any given acaricide can be reached.

In summary, the 1991-92 winter loss of 22% for commercial beekeepers was very close to the four-year average of 21%. The 13.2% loss for non-commercial beekeepers is also close to the four year average of 16.3%. One wonders what an "average" winter loss in Oregon was before the arrival of honey bee mite parasites? An old "saw" says that good beekeepers normally experience a winter loss of less than 10%. Has this really been the case? Hindsight tells us that we will probably never really know what the situation was in Oregon prior to 1988. I am not suggesting that honey bee mites have not been a serious factor in overwintering colonies in the Pacific Northwest. As varroa becomes more prevalent we can anticipate further losses and by continuing our annual survey we hope to provide some documentation of the effect of this very serious parasite.

I wish to thank all the beekeepers who have taken the time to complete the surveys. It is my hope that they will continue to carefully monitor their winter losses and be willing to share that information with the larger beekeeping community.

Table 2. Winter Loss – Commercial Beekeepers

Beekeeper	Living Colonies Oct. 1 '91	Feb. 1 '92	Mar. 1 '92	Apr. 1 '92	% Loss
1	2,200	1,105	1,055'	1,055	52%
2	1,325	1,050	1,000	950	28%
3	1,825	1,820	1,420	1,360	26%
4	2,100	1,900	1,800	1,700	19%
5	643	558	525	525	18%
6	300	285	275	250	17%
7	3,500	3,200	3,100	3,000	14%
8	750	675	650	650	13%
9	1,075	950	950	950	12%
10	900	830	830	830	8%
11	400	380	375	375	6%
12	360	348	348	348	3%
Total	15,378	13,102	12,328	11,993	22%
Dead Hives	0	2,276	3,050	3,385	
% Seasonal Loss	0	67%	90%	100%	

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Spray Kill In February?

o.b. wiser

I walked into one of my bee yards last February to check on the bees and asked myself, "Do I have mites?" Then I thought, "Do farmers spray their crops in February?" Any beekeeper who cannot tell the difference between a spray kill in February and a mite kill is missing the boat.

Like many beekeepers, I got a first hand glimpse of a tracheal mite kill. I saw it for what it is – 10 times worse than AFB; a thousand times worse than nosema; and a million times worse than chalkbrood. The only thing I can compare it to is total starvation. I lost 50% of my bees because I thought the mites would not reach economic levels in Utah until the fall of 1992, and I was hoping that by then we would have a control that was more than a bandaid. *I was wrong!*

Research labs, microscopes, high priced tests — do I or do I not have mites? All this poppycock about something that is as obvious as a wart on your nose. Mites killing beehives have simple, straight forward symptoms that the novice or the pro can pick up as easily as feeling the temperature of a sick child with the palm of your hand. You do not need microscopes or high-priced technicians to find out that you have mites.

All North American beekeepers have mites in their honey bees – everyone's honey bees, not just mine or yours, but everyone's bees have them right now. Mites do not hit and miss. They are like a tidal wave covering everything in their path. Beekeepers who think they do not have mites are fooling only themselves. The ridiculous attempts to try and exterminate beehives with mites to control their spread makes as much sense as building a sea wall to stop a tidal wave.

It has come down to one simple reality – treat for mites or lose your bees.

And so what are the symptoms of a mite kill? Having experienced spray kill in the summer many times, I have some sort of a handle on a comparison. Mosquito Abatement kill in Ft. Bridger, Wyoming in June leaves a carpet of bees in front of every beehive and it stinks to high heaven. Well that's what a mite kill looks and smells like in the early spring in Utah – a mild to medium pesticide kill.

Mites weaken the whole system of the hive and they cause the bees to be susceptible to cold, nosema, chalkbrood, AFB, EFB, starvation, moving or any stress. When you have mites, you will have worse problems with all of the above.

Mites have been infesting bees for eons, and effective treatments have been developed by other countries – countries who pride themselves in producing pure honey for consumers. Right now, the government may be our the biggest obstacle in preventing the use of effective mite controls across the U.S.

I have prepared a table to compare different miticides. This material has been gleaned from current research from several countries, as well as conversations with researchers. Note the references for the sources. I have also given my ***personal*** grade to each method. I have tried menthol and formic acid in a research project and have noted my observations accordingly. I have made an assessment of other methods in unpublished material.

About Mites

I would like to give some personal observations about mites. First nearly every beehive in the Americas probably has at least the tracheal mite, and Varroa will soon be everywhere, too. There is no way to eradicate mites. Quarantines and killing hives won't slow their spread. Mites kill bees when they reach an economic number in the hive. Until that point is reached, however, their damage is minimal and difficult to detect.

The goal of mite control should be to keep the populations of mites below that economic level, but to do this certain factors must be established. What external environmental factors such as weather, the season, honey flow, humidity, cold, stress on hive encourage mite populations? How long are tracheal mites in the sub-adult stage (immature)? How long does it take eggs to hatch? What is the life span of adults? How many batches of eggs are laid and how often? Where is the weak link in their life cycle?

Mites live on every thing on the face of the earth – even human beings are covered with mites. When I worked for the World Health Organization we studied mites and ticks on African animals. All animals – bats, birds, elephants, mice, snakes, insects were infested with mites.

The reality is that we cannot eradicate honey bee mites and killing them with some type of miticide is doomed to, if not failure, at least constant frustration. We must learn to live with mites, and so must our bees. They are here to stay. The natural method of a parasite is to live harmoniously with its host, not killing its free lunch, and mites will eventually get to that point here, but it may take many years.

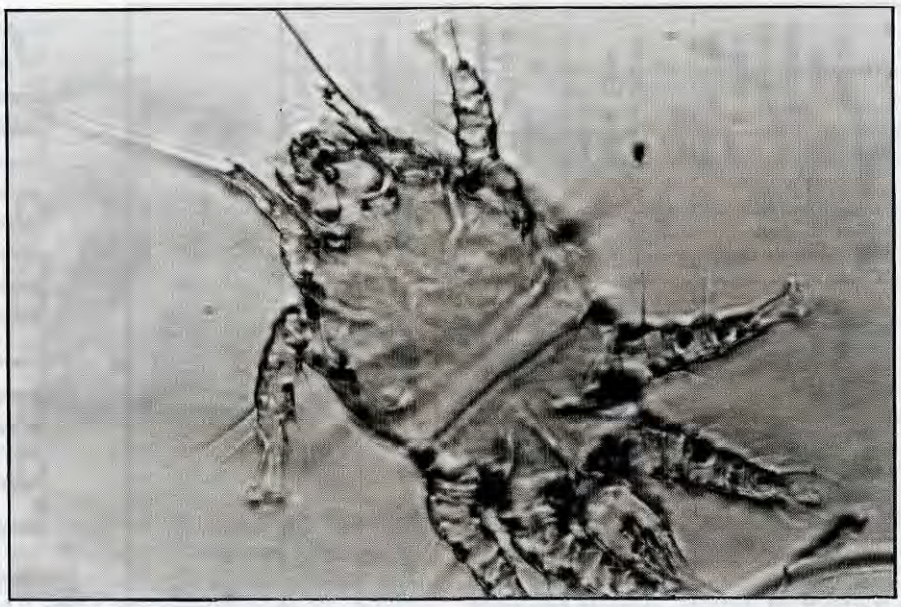
The ultimate control of mites will be genetic resistance, but the next best approach is to reduce stress on hives and encourage the natural immune system of bees to act against mites. But in order to take advantage of natural selection, that is, eventually reach an equilibrium between mites and bees, we would have to let all bees be killed that are susceptible. The few that did not die would be used for genetic stock. This would probably cause the bee industry to disappear for several years.

Continued on Page 26

Method	Cost	KILLS TRACHEAL MITES Eggs	Immature	Adult	KILLS VARROA MITES Eggs	Immature	Adult	QNS	Worker	Brood	CONTAMINATION Honey	Pollen	Wood	Wax	Safety to Humans	Temp of Treatment	Dates Used	OB's Grade
Amitraz Liquid (References)	3¢/hive 17	No 15	No 15	80-100% 6	No 15	No 15	80-100% 6	Yes 15	13-20% 6	Yes 15	Yes 15	Yes 15	Yes 15	Yes	Unsafe 18	Brood Range 6,18	Year Round Not during honey flow	F - Illegal
Amitraz Miticur Strips (References)	$1.66/hive 18	No 15	No 15	70-100% 15	No 15	No 15	70-100% 18	Yes 15	?	?	No 7,18	No 7,18	No 7,18	?	Safe 18	Broad Range 18	Year Round Not during honey flow	C Expensive but eff.
Fluvalinate Apistan Strips (References)	$3.82/hive 18	No 15	No 15	No 15	No 15	No 15	60-90% 15	Yes 6	2-12% 6	?	No 18	No 18	No 18	No 18	Safe 18	Broad Range 6,18	Year Round not during honey flow	C Expensive – Kills only Varroa
Formic Acid 65% (References)	3-12¢/hive 5,15	No 3,15	No 5,15	50-100% 3,4,5,7, 8,11,12, 15	No 5,15	No 5,15	50-100% 3,4,5,7, 8,11, 12,15	20-60% 11,12 15,16	2-10% 15	Yes 15	No 3,4,8, 15	No 15	No 15	No 15	Moderate Safety** 5,8,9, 10,14 15	Eff. Temp 50-86°F Ideal 60-79°F 4,5,7,8, 11,12	Spring-Tracheal 7,5,11 Fall-Both 4,12,15 4,12,15	B Kills both mites Inexpensive to purchase very exp. to prepare
Menthol Vapor (Reerences)	$2.80/hive 18	No 15	No 15	0-98% 1,2,4,7	No	No	No	Yes 4,6,11	Yes 4,6	Yes 4,15	Yes 1,15	Yes 1,15	Yes 1,15	Yes 1,15	Safe 15	Use only between 70-79°F 18	Limited 4,6,15,18	D Unprect. Expen.
Veg. Short. (References)	Cheap 13,15	No* 15	No* 15	No* 13,15	No* 15	No* 15	No* 13,15	No 15	No 15	No 15	No 15	No 15	No 15	No 15	Safe 13,15	Useful Only during heavy brood rearing 15	Warm period of year 15	D Unpred. to need more info on use
New Queens (References)	$6-8.00 15,16	No# 16	No# 16	No# 16	No# 16	No# 16	No# 16	No	No	No	No	No	No	No	No	Any Temp 15	Spring/Fall 15	C For Now
10-40 Oil (References)	2¢/hive 15	100% 15	100% 15	100% 15	100% 15	100% 15	100% 15	Yes 15	Yes 15	Yes 15	Yes 15	Yes 15	Yes 15	Yes 15	Safe 15	Any Temp 15	Anytime	F Likely Kills

*Does not appear to KILL mites in bees. Prevents transfer to new bees.
**Any use requires extensive protective equipment, excellent ventilation and aplication training. Requires organic vapor mask nd care in handling liquid rubber gloves, etc.
#At preset time, death rates of bees have not allowed genetic resistance factors to be effective (minimum 10-20 years needed).

O.B.'s Guide to Tracheal Treatments



The Killer

SPRAY KILL ... Cont. From Pg. 24

In the late 1960's Dr. Norm Gary, of the University of California at Davis, was one of the first researchers from the U.S. to have firsthand experience with the African bee in Brazil. Afterward, he said that only time would tell whether Dr. Warwick Kerr of Brazil, who imported the African bee into the Americas, would be considered the savior of North American beekeeping, or its destroyer. Dr. Gary looked down the road and realized that African genes were not only resistant to AFB, but were probably resistant to mites and other diseases. I, too, believe the African bee will be a blessing to the bee industry in the future.

But until then we have only the various miticides. At present, my observations and research have indicated that the chemical with the most promise is formic acid (FA). However, my experience with it has shown that current research both in the U.S. and Canada, has not addressed all the problems that exist. I lost 56% of the queens in the colonies I treated with FA in the fall of 1992. Two researchers, one from the U.S. and one from Canada, reviewed my methodology, which was recommended from their research could not tell me what I did wrong, what mistake I made, or what factors caused the loss of queens.

My observations indicate that FA affects bee behavior and it affects different strains of bees in different ways. The queen breeder who supplies my queens has experienced queen losses of 60% when testing FA. The reason is unknown. The researchers whom I spoke to said they had not experienced such losses, so ours must be a quirk. I believe the recommended dose of 40ml used for the first application is responsible, and it should be reduced to 20ml. Then the second should be 30ml and the third 40ml, or some such method to gradually adjust the bees to formic acid. These numbers are taken from published research, not my own trials.

Formic acid kills both kinds of mites. It does not appear to contaminate honey, and it is relatively effective. When ample precautions are taken it is also safe to use. But we still do not know what causes the loss of queens and bees.

My observations are that it is critical how FA and water are mixed, if diluting a concentrate. Are mixtures made by weight, volume, or molarity? FA is heavier than water and needs to be agitated to get a good mix. An absorbent material that will quickly release the FA vapor is used to hold the fumigant and keep the FA from dripping onto the bees. Some materials (bath towels) hold onto FA and keep the hive under fumigation too long upsetting normal behavior possibly causing the loss of bees and queens.

I would like to remind scientific researchers and readers of the rules of the Scientific Method. Science can only offer hypotheses, theories and laws, all of which are strictly falsifiable. This means that all scientific research can only be proven false (falsifiable), but it can never be proven *absolutely* true. There are no such thing as **Scientific Facts.** In all areas of science, hypotheses, theories, and laws can only be falsifiable. Those are the scientific rules which science must play by.

Unfortunately, I have had to learn once again the hard way that scientific research does not have the final answers to beekeeping problems. But, I also learned that to do nothing doesn't cut it either, especially if you expect to stay in bees for the next several years. I'm Older, but Wiser – but mistakes still take place in the learning process. ○

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HERBAL HONEY

stephen bambara

Beekeepers and other members of the honey industry are always looking for new markets, new products, and new ways to sell more honey. Well, there is one trick we can borrow from our home gardening friends, and that is the use of herbs in honey. We are all familiar with the fact that most of our common herbs are also good nectar plants, bur rarely does the nectar produced by a plant impart much of the flavor character of the leaves.

Herbalists have been making infusions with water (tea) for centuries. Recently herbal infusions with oils, and vinegar have shown some popularity. It is also possible to make herbal infusions in honey. This is clearly a specialty product, but should have appeal to a certain sector of the population, namely, upper-income households and "natural conscious" individuals.

The method for making honey/herbal infusions is quite simple, but fresh herbs are essential. Coarsely chop the desired herb and mix with honey in any size jar. Place in a sunny location five to 10 days. It is best not to overdo the sun treatment because too much can damage the honey. Strain out the herbs. Pour honey into a nice, clean jar and enjoy a new flavor. There are many variables to the process which can be adjusted to taste. Milder herbs such as chamomile or lavender could be used in greater quantity and allowed to infuse for a longer time. Stronger herbs such as mint or anise may be used in lesser quantity and allowed to infuse for a shorter time.

The flavor of the honey is also important. Mild-flavored honey works best because it does not compete or conflict with the flavor of the herbs. Suggestions for herbs to try are lemon balm, thyme, mint, sage, lemon verbena, pineapple sage, anise, basil and stick cinnamon.

A short cut method might be to place the mixture in the microwave and warm for a short period. You can experiment with different methods such as using large pieces of the herb which can be removed without re-straining, or bottling the honey with an herb sprig still inside the jar.

Use the honey in tea, on muffins, fresh fruit, yogurt, or added to softened butter for a spread on bread or glaze on carrots. Serve it with fried chicken. Herbal honey can be substituted for all or part of the sugar in some recipes. Compensate by reducing liquid and temperature appropriately.

Finally, be sure to use an attractive jar and an attractive label. Be creative. Add a ribbon or a pipe-cleaner bee. Don't overlook the fact that the purchaser may not be the final consumer. Consider packaging it as a gift item. Know your market and determine the needed profit. Don't make up a price arbitrarily. Plan now to grow those herbs next summer and give it a try!

Herb Honey Jelly

2 cups herb honey
3/4 cup water
1 bottle pectin
Follow directions on the pectin bottle for making jelly with honey.

Cheese Thumbprints

2 cups flour
1 tablespoon herb honey
3/4 cup butter, softened
3-ounce package cream cheese
1/2 teaspoon salt
1/4 teaspoon baking powder
herb honey jelly for filling
powdered sugar
Mix all ingredients together. Roll 1/2 inch thick. Cut with a round 1-1/2" cookie cutter that has a crimped edge. Press a dent in the center of each cookie with your thumb and fill with 1/4 to 1/2 teaspoon of herb honey jelly (lemon verbena or lavender work well). Bake at 350°F for 20 to 25 minutes or until pastries just begin to brown. Sprinkle with powdered sugar.

(Recipes from *The Herb Companion*)

THE MAN WHO LOVES MYSTERIES

kim flottum

To solve at least some of the problems of his day, Shakespeare suggested "... the first thing we do is, we kill all the lawyers"

And although lawyers will certainly play some role in the high stakes drama 'African Bees — Born In The U.S.A.', Chip Taylor may just have a better idea.

"The first thing we do is, we kill all the swarms", says Taylor, a University of Kansas Professor and African honey bee specialist, who definitely plays a lead in the drama now unfolding across the southern U.S. But first - back to the beginning.

Dr. Orley Taylor, (he prefers Chip to Orley), did his graduate work in entomology at the University of Connecticut studying a unique hybridization aspect of the common sulphur butterfly. But this story begins when his major professor 'strongly' suggested he take a course in Tropical Ecology.

"I saw all sorts of things I never imagined existed, and all sorts of questions that needed answers," he said. "It was the turning point in my career, I think", then added, "and I'm still looking for some of those answers."

In 1969 he finished school and moved to Kansas to begin his academic career. He now teaches classes in Honey Bee Biology, Experimental Field Ecology and Evolutionary Biology. He tries to teach two courses, or a course and a seminar each semester, but tries harder to squeeze two courses into fall semesters so he can spend a longer piece of time doing research.

Although his work has touched many bases over the years, the subject that has kept his attention the longest, and has undoubtedly created the greatest controversy is the African honey bee. First introduced to this "marvelous creature" during his studies of tropical ecology, it soon commanded most of his attention, and subsequently that of many of his 14 PhD graduate students. But it wasn't until July, 1974 that he officially began studying this insect.

"Two things about the African honey bee caught my attention while I was in the tropics," he said, "its incredible adaptability in a new environment, and what the future held because of that remarkable trait."

The USDA funded his initial work in South America and he and several graduate students carried out much of the early work on the bee. These studies included basic biology and swarming behavior, and it is the latter that continues to fascinate him. This work, coupled with that of South America's researchers was put together to design the 'proposed' advancement map that has received both praise and criticism over the years.

This early work also brought a fair amount of attention to Taylor and the insect he was studying. The African honey bee has always commanded its share of media coverage, and Taylor's work began to draw attention from the scientific community.

"Before the bee entered Texas I was being interviewed 50 - 60 times per year," Taylor said, "and even though it took a great deal of my time, it kept the problem on the front burner, it wasn't shoved to the back or dominated by the party line of the USDA work going on at the same time," he added.

Critics claim this 'grandstanding' has been for reasons other than pure information distribution, and that Taylor has had a personal axe to grind. On the surface this may seem to be the case. Shortly after he began attracting attention the USDA began their own studies in South America and Taylor's funding slowly dried up.

Not only that, some USDA studies drew conclusions that were not only different than Taylor's, but some were directly contradictory. This is most assuredly the stuff that makes news and the media ate it up, drawing even more attention to not only Taylor, but the USDA researchers and the honey bee that started it all.

Taylor obviously has a different view. As do many of the people that have spent any amount of time interviewing him.

"He is an intelligent, articulate and interesting person," said one newspaper reporter recently, "that seems only to have the welfare of American beekeepers and the public at heart. He seems to have no other agenda,". This is more or less the consensus of many of the magazine and newspaper reporters and editors we contacted.

"Yes", says Taylor, "being associated with a University means I'm not restricted in what I say or do. You're free to say

what you think has to be said, based on your experience. I have to be honest and say what I believe, even if I'm wrong."

Basically, Taylor believes the money spent to date would have been better used had it been directed toward learning to manage the bee, not trying to stop it or avoid it.

"Every country that has encountered this bee so far has had the initial opinion that 'we will survive as we were', but that hasn't been the case.

"Realistically, we will have to learn to adapt, to learn to manage it. They have in Brazil. They've pretty much eliminated swarming, absconding and they have increased honey production," Taylor says.

"In the southern states, where there will be a permanent population the African honey bee will very probably be the superior biotype. We'll have to learn to manage it, and I think we can using applied genetics. I bet anything the industry comes to believe this", he added.

His results so far tend to support these predictions, and they definitely give credence to his advice on 'killing all the swarms'

But procuring this data hasn't been easy. Although his early work was federally supported, up to a couple years ago most of his funds came out of his own pocket. He worked for two and a half years applying for a NSF grant, which he finally received two years ago. The grant, which was for $253,000 and is to last for three years, has set Taylor up in a house/research station in Mexico, 150 miles south of McAllen TX, right in the path of northward moving African swarms.

Taylor's current studies are looking at the interaction between African and European bees in this dynamic environment, trying to discover why the African bee is, and has remained so pure and hasn't hybridized. He's asking what selection actions are working in the system, and why are the ephemeral intermediates (African x European) so short lived.

But there's more, of course, and Taylor outlined some of the problems the U.S. will encounter when the bee gets here in force, especially with swarms.

"In an area that swarms are actively moving through some amazing things happen," Taylor said as recently as last October.

"For instance, if there's a queenless colony in the area that's been there for five days or less, it will attract a 'small' African bee swarm that will move in and essentially take over.

"A queenless colony is putting out nassonov pheromone by fanning, which acts like a magnet to these small swarms," he said.

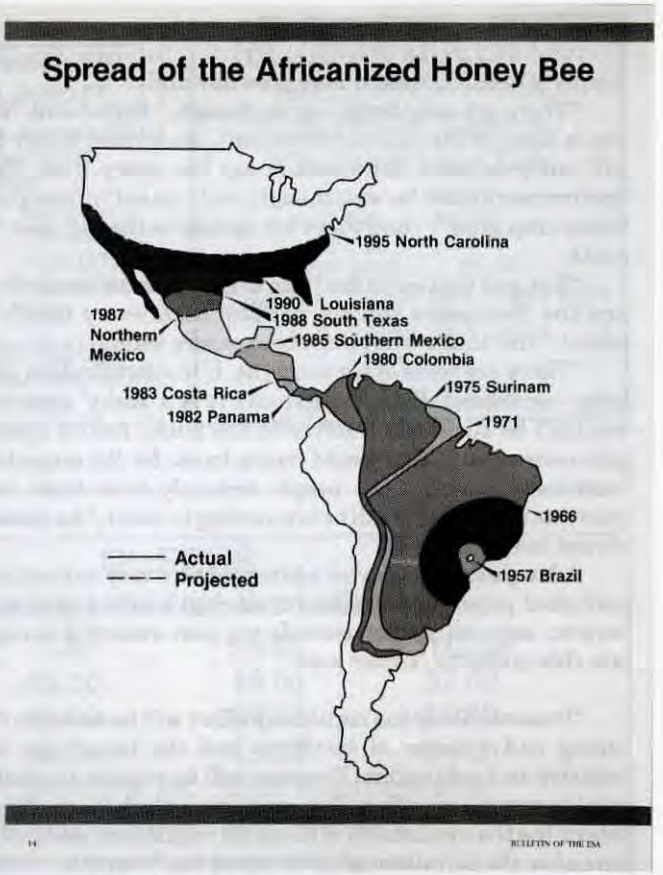
"In fact, we've tested this by smearing a synthetic form of this pheromone on the side of a tree and watched small swarms land there not one or two but sometimes more.

"This is still in the theory stage", Taylor said, "but we suspect that by ganging up, several small swarms would stand a better chance of survival than a single small group. We've seen multiple swarms gather, watched the queens fight, and then go on as a large swarm," he added.

"However, large swarms won't do this and in fact will become quite defensive if they encounter another swarm," he said.

"There's more," he added, warming to the subject, "you should see what happens when it rains in an area that's been dry for a season.

"Within 24 - 48 hours swarms begin arriving in the area. They can't be reproductive swarms because colonies can't react that fast," he said, "so they must be either absconding



swarms or what I call a homeless swarm.

"I've seen what I think was a homeless swarm form something like a summer cluster – dormant like, no comb, no eggs, but foraging for food. They may stay that way for 30 days or so, just waiting for some place to go, some cue in the environment to take off.

"It's wierd," he added, with a smile.

"There's some other things we've noticed that U.S. beekeepers will have to get used to, and that's not only their defensive behavior, but when they're defensive.

"For instance, they're relatively calm when in the swarm mode," he said, "just like Europeans.

"But in established colonies, during a honey flow and hot weather, they're just the opposite – very, very defensive. Not at all like the Europeans we're used to", he said with emphasis.

"And unlike Europeans, they tend to be calm on cool days, so go figure," he added.

The subject of African bees and their defensive behavior is always a news maker, and there will definately be some changes in the way bees are kept, and how bees and beekeepers are viewed from a regulatory standpoint.

"For instance", Taylor said, "if a European queen mates with one or two African drones, there's a better than 10 or 20% probability that any queens raised from that queen will be African gene favored. That means workers raised from the second generation queen will all be somewhat intermediate.

"Then, if a queen is raised from that queen (a third generation) who then mates with an African drone, the resulting workers will be somewhere in the neighborhood of 75% Africanized," he said, "and that's probably unacceptable from a beekeeper's perspective.

"If those colonies are requeened with pure European queens it should be alright," he added,"but if that queen is

Continued on Next Page

MYSTERIES ... Cont. From Pg. 31

simply killed ., well, it only goes downhill.

"There are some bright spots, though," Taylor said, "and one is that, in the right environment, an African honey bee will out produce a European honey bee every time. That environment must be wet, though, and located in 'marginal' honey crop area . . and there are spots like that all over the south.

"But, put that same bee in an area of intense honey flows and the Europeans will out perform them every time", he added, "and that's what most beekeepers want.

"There are some other concerns. If the certification plan being considered doesn't work, and it is a 'leaky' system, I wouldn't be surprised if forces in the public health system gain momentum. This would create havoc for the migratory business and those people certainly have their own interests to protect. It will be interesting to watch," he mused, almost half to himself.

A few years ago Taylor addressed this very subject in a published paper, and it seems to sum up much of what may happen, especially when considering past attempts to regulate this industry. Taylor says

"It seems likely the regulatory effort will be scaled to the timing and number of incidents and the impact on the industry and pollination. Pressure will be required to maintain the regulatory effort. This pressure (or lack there-of) will determine the availability of funds for regulation, *and will in time alter the definition of Africanized bee."* (emphasis ours)

In 1985, in a paper published in the Entomology Society 'Bulletin', Taylor stated "The source of most African bee problems will be the feral population . . suppression will be necessary". But in almost the same breath he admits there are no effective ways to control feral populations. The dilemma is obvious, and thus the claim at the beginning of this article.

There are some limiting factors however, and they were outlined by Taylor in a paper he gave at a conference in 1987 in Ohio, where he outlined the environmental limits this bee must deal with. The most obvious of which is that the bee has only expanded south to the 16° line (and about 17° in South Africa). They also produce small nests with appropriate populations, have little honey storage and a short life span. Couple these lifestyle choices with the fact that areas further north (than about 16°) have colder weather, limited plant growth and nectar production (seasonally), a high number o days of confinement, a longer broodless period and fewer available days to forage and northward expansion seems unlikely.

With limited northward movement, probably, it seems even more likely that 'Killing all the swarms' is the best bet for control in the south. Perhaps the only means, because even with highly managed colonies, swarms will continue to move north from Mexico. And these swarms will be essentially 'pure', which means they will keep their advantages of different mating times, early seasonal production of drones and queens, high swarm production and faster queen development.

To that end, Taylor's study of swarm behavior in Mexico seems particularly appropriate. And since it will be funded for another year, and perhaps longer, he hopes to find at least some of those answers he started looking for years ago.

But in another, somewhat related field, Taylor's tropical adventures continue. He still has an avid interest in the ecology of the tropics, and takes a group of legislators to Costa Rica each year for a week to show and explain the problems there – pollution, reforestation and certainly the impact of the African honey bee.

Taylor's group sort of stumbled on another of the mysteries he's so fond of finding while in Mexico last year. There was some sort of 'disaster' in the overwintering location of North America's monarch butterfly population, and many died. Nearly 70% it seems, which took out most of the east coast population. In an effort to find out what happened, Taylor designed a marking system that was distributed to school kids all over the country.

"It was a lot of work," he said, "and we did it on less than a shoestring, but we got great exposure to a serious problem, got lots of kids interested in entomology and, hopefully, did some good," he added.

So whether it's killing swarms or saving butterflies, Chip Taylor's basic instincts show through – he's a man who loves to solve mysteries. Q

Prospective limits of feral African honeybees in the United States. The 60°F (16°C) and 66°F (19°C) isotherms represent the mean high temperatures for January (from Taylor and Spivak 1984).

ASSEMBLING EQUIPMENT

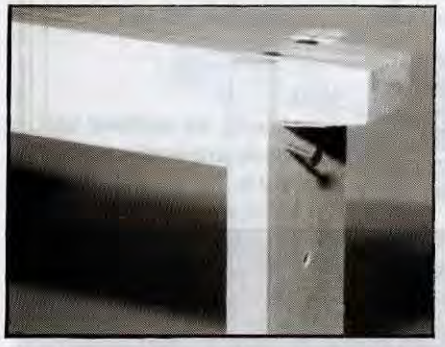
richard bonney

Tips on Making What You Make Better

Over the years I have developed some prejudices about hive equipment. For instance, I don't like plastic, I detest frame spacers, I dislike rabbet joints, I question the need for glue except perhaps on frames. If I work at it, I could come up with several more, but instead let's think about a couple of those I have mentioned.

I really don't like plastic or frame spacers, but those are not the ones I'm going to talk about. I just threw them in for free. I am going to talk about hammers and nails and joints and glue, in the context of assembling hive equipment, and I will mention some specific pieces of hive equipment along the way.

Let's start with hammers. For many people, a hammer is a hammer — any one will do. Do you realize, though, that without any great effort, you could assemble a collection of about a dozen different kinds of hammer, all useful, and that with a little additional effort, you could come up with at least another dozen. Further, most of these hammers come in sizes. However, most of us are not going to find anywhere near that number of hammers around the house. But you may find that you have two or three. Are they all suitable for assembling hives? Maybe.



Here is one of the most important nails in a hive. Driven in all the way, it prevents the top bar from being pried loose from the frame.

The hammer most likely to be found in most homes is an ordinary claw hammer. It is a common and useful tool for dealing with nails, whether you're driving them or pulling them, and it's one of those that comes in sizes. These sizes are measured in ounces and refer to the weight of the head. If you go into an average hardware store, you will probably find at least two or three weights in the range of 12 to 20 ounces and up. (Look on the head. The weight is usually stamped there.) Each size has a specific use, or set of uses. For instance, a 12 ounce hammer is a typical, all around household hammer, one you keep handy for hanging pictures and making light repairs. The 16 ounce size is a bit more serious. If you are building a dog house, for instance, or making repairs to your home, you will appreciate the added authority of the extra ounces as you drive in those larger nails. And if you are building a house for yourself, or a garage, or a shed, anything that involves framing lumber, 2" x 4"s and larger, then a 20 or even a 24 ounce head really makes those large nails and spikes go in easier.

A couple of things to keep in mind here. A hammer that is too small for the job at hand means harder work. You must take more strokes to drive a given nail. You must also hit harder, since there is less weight coming down on the nail head. Hitting harder usually means less accuracy and control, more bent nails and dented wood. On the other hand, a hammer that is too heavy will tire you faster. It, too, may be harder to control because of the additional weight, and being heavier can do more damage if you don't hit your target squarely.

If you're putting together a hive body or a super, or anything with similar wood thickness, a 12 ounce claw hammer should work well, especially if the nail holes have been predrilled. Something a little larger may also be okay — 14 or even 16 ounce, depending on your own size and experience — but, the added weight is going to tire you faster and make the hammer a bit harder to control. However, if you are assembling a lot of equipment and your hammering arm has had plenty of experience, you may want the added weight and authority of the heavier head. In theory at least, the heavier the head, the fewer the strokes necessary.

Frames are another matter. From what many new beekeepers have told me over the years, they have more trouble assembling frames than any other piece of hive equipment. I suspect it is from using a hammer that is too big. Frames are made of lighter wood, and are assembled with smaller, thinner nails. Thin nails bend more easily. A lighter hammer is in order. I prefer a so-called tack hammer. These also come in sizes, from perhaps 3 to 10 ounces. I have two of my own, one about 4 ounces, the other about eight. I prefer the heavier one. The Walter T. Kelley catalog shows one at 9 1/2 ounces. I have handled Kelley's and it has a nice heft. Some of these tack hammers have the added advantage of a magnetized end (instead of a claw), very handy for holding and starting small nails such as the 5/8" I use for frame wedges.

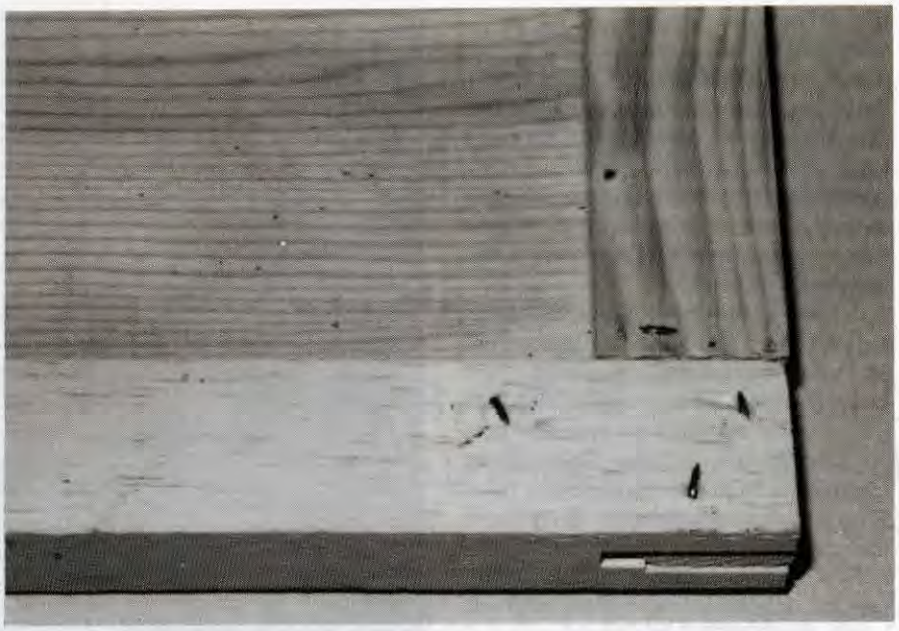
Which gets us into nailing. However, it might be worthwhile to talk first about glue. Nails and glue often go together. The use of wood glue is frequently misunderstood. Its purpose is to bond together two pieces of wood. Glue, working alone, can do this, without the need for nails or screws for added strength. However, there are sev-

eral prerequisites. The wood must be clean, dry, and smooth, and the abutting surfaces must be parallel and fit tightly to each other. Further, no end grain should be involved, only long grain. And finally, the joint should be clamped together as it dries. The nails perform this clamping function in bee hive assembly. That is why nails and glue go together (unless you're making fine furniture.) If all of these prerequisites are met, the resulting joint should be as strong or stronger than the surrounding wood.

Glue is not a wood filler though, nor is it intended as a sealer. Of itself, it has no strength. The strength of a glue joint comes from the bond formed between the two wood surfaces by a very thin layer of glue. In effect the two pieces of wood become as one. A thick layer of glue is a weakness. The glue itself may break. Further, end grain, aside from being rough, (comparatively speaking) absorbs glue. The result is that there is not the requisite thin layer of glue on a smooth surface. No proper bond is formed.

What happens in bee hive construction? Sometimes it all works out, often it doesn't. Hive parts are usually mass produced, and they are made from softwood, most commonly pine. Pine does not always machine well, especially in mass production. The cut surfaces at the joints are often rough, and sometimes they are not parallel or do not fit tightly. Other times they are too tight. Further, several of the surfaces involved are end grain. We could sand the wood smoother, or true up the surfaces, but this would create a looser fit in most instances, since we would be removing wood in the process. Because of all this, I do not bother with glue for hive bodies, supers, bottoms, covers, and the like. I rely on nails. In corner joints, the nails go in from two directions. Once a hive body is nailed together it is about impossible to disassemble it without destroying the corners.

I find this to be true whether I am dealing with a box joint or a rabbet joint, if they are each nailed both ways. In my experience, joints deteriorate because moisture seeps in. They rot out rather than pull apart. A long step towards keeping moisture out is to paint the surfaces of the joint before the equipment is assembled, especially the end grain. Conventional primer paint is best for this particular purpose, but any exterior grade paint is better than no paint at all. Occasionally, in a piece of



Use oversized nails in the inner cover and bend the tips over to lock the parts together.

equipment that has been in use for a while, you will see nails starting to back out of their holes, all of their own volition. This is usually a sign that the wood was not properly protected and the joint is beginning to deteriorate.

Frames are a different matter. There is much more stress on frames than on other hive parts because of beekeeper manipulations. Frames can use all the help they can get. Gluing probably is worthwhile for frames because of the nature of frame manufacture. The machining tends to be more accurate, the fit is better, and a reasonable amount of long grain to long grain is involved. Even so, I don't glue my frames. I rely on a couple of extra nails.

So, let's talk about nailing. Most instructions for assembling frames talk in terms of eight nails per frame, usually 1 1/4" long, a so-called berry box nail. I have found this size to be effective, but eight nails is not enough. Ten nails are necessary. The two extra nails go through the end bars and into the length of the top bars. They lock the top bar in place so that it will not be pried loose from the end bars when the frame is being removed from a heavily propolized hive body.

Some suppliers offer what I consider to be inappropriate nails for frames. For instance, a couple of catalogs suggest 3/4" nails for fastening bottom bars to end bars. I use the 1 1/4" nails for this purpose. Generally speaking, with nails, length is strength. The longer nail makes a stronger joint and helps keep the corners square. Some suppliers offer 3/4" nails for frame wedges. I feel that these are too long. Many times I have had the points of such nails protrude through the top of the top bars, a real nuisance when you're trying to scrape them. I like 5/8" nails for wedges.

I said earlier that I would talk about some specific pieces of hive equipment. I have alluded to hive bodies and similarly constructed pieces, and I have talked about frames a little. Inner covers are also worth some thought. I prefer inner covers made entirely of pine. Masonite, chipboard, and plywood are second class materials for the condi-

This bottom board is old, but it is still sound. All the surfaces of the rabbet joint were painted for assembly.

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ASSEMBLING ... Cont. From Pg. 35

tions found in a beehive. They sag, shred, delaminate, and do other strange things. They usually are not long lived. (Yes, I know there are exceptions, especially if you make them yourself from scratch and understand woodworking.) Maybe that's why some people don't use them, especially out west.

Even with pine, though, there can be problems. Consider the abuse that an inner cover receives. The bees glue it down with comb and propolis, and then just about every time we open the hive we forcibly pry it loose. The biggest problem is that the nails do not hold. The component parts of the cover begin to separate, at the corners and elsewhere. This is easily remedied use longer nails. Use nails that protrude through the wood by an eighth of an inch or so, and then bend or peen them over so the nail cannot pull out. Do this with every nail in the cover. You can add years to its life.

Although this bottom was once painted, it was neglected as it aged. Weather and insects were able to attack from underneath as well as though the joints.

Standing water on landing platform can seep into the joints, even in a well constructed bottom board. This one is still sound. It has been kept painted.

You can also paint inner covers. Conventional beekeeper wisdom says don't paint the inside surfaces of hives, the bees won't like it. I think the only time they don't like it is when the paint has not been allowed to dry long enough for the odors to dissipate—several days minimum, though a couple of weeks is probably better. I know several beekeepers who paint their inner covers with no adverse effects. I know one who paints his entire hive inside and out, except for the frames.

Bottom boards are also frequent problems. In my experience, they are one of the first pieces of a hive to fail. The design of the reversible bottoms especially is such that water can easily seep into the joints where it is trapped. It then enters the wood through the unprotected end grain of the floor boards. Again, painting the joint areas before assembly is a long step in protecting these pieces. After assembly, paint the entire bottom board. This is another piece of equipment that often is not painted at all, at least in the floor area, because of the belief that the bees won't like it. I always paint the entire bottom board.

Well, we have a new season coming on fast. Have you checked your hammer weights yet? You will want a proper selection on hand for your next round of hive assembly.

THE WEEKENDER

jeff ott

Record Keeping

All of us, no matter how large or small our operation keep some kinds of information about our hives. These methods could be as simple as a certain placement and position of a rock or brick on a hive top, to an elaborate laptop computerized, bar-coded tracking database with the capability of using a cellular phone to "phone home" the data to a central computer. Does it sound far fetched? Just hold on to your bottom boards and read on!

No matter what system is used, you have to decide what information to keep track of. What information could we keep to make the effort worthwhile? In this two part series I will first look into what does a beekeeper want to keep track of, and why, and how this information can be beneficial. Next month, I will show what is available to help record this information. Whether you have two hives or 2,000, you and your bees will benefit by keeping records.

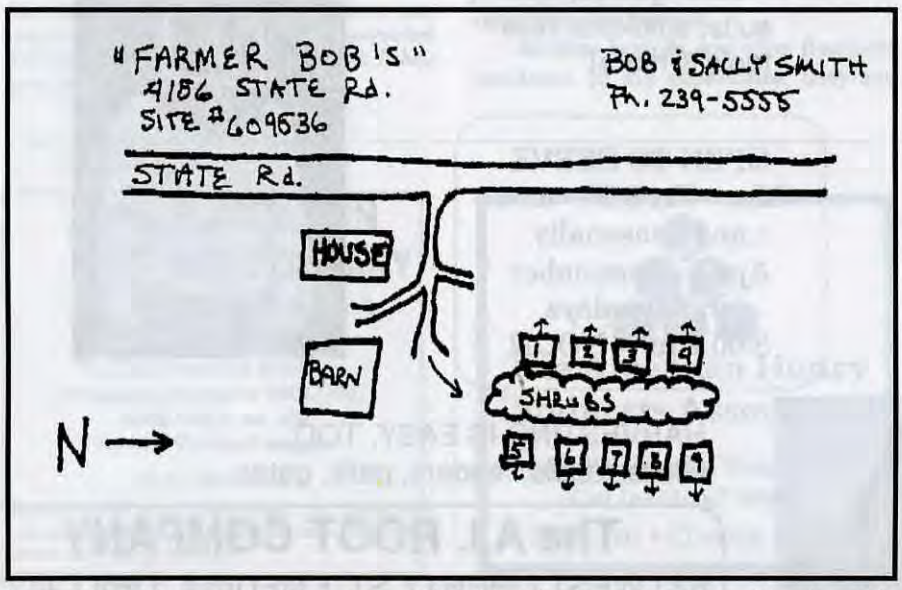
One of the first things you want to consider is what the scope of your record keeping system will be. If your outfit is very large, with hundreds of hives and many different yards you may find it better to keep a record of the yards. You probably work every hive in each yard in the same manner; requeening all hives at the same time, feeding, supering, etc. All of this is recorded by *yard*, not by individual colony. Of course you can make a note of the special needs of a particular colony, but on the whole, the energy of your operation focuses on the needs and output of a yard, and not an individual colony.

Most of us fall into the category of having to deal with *individual colonies* and maybe just one or two yards to move between. Here, our energy focuses on the lives (and deaths) of individual colonies. The only thing about yards we are concerned with is where it is and how to get there.

This may seem a bit simplistic, for the sake of illustration, but the point has been made. For the purpose of this series I will be looking primarily at this second recording method.

No matter how you run your outfit, the basic information you'll want to record will be the same. A beekeeper with lots of time, dedication and desire could record all the information on every hive, and sum it up for every yard. However, I've not met a beekeeper yet with *that* much time, or that much *money* to pay someone just to keep detailed records.

Lets look at the different items you should consider keeping track of.



A simple hand drawn map of the apiary will help identify colony placement and location. Add this to your record keeping for greater clarity.

The Yard . . .

There are several items you should list at least once for each yard. Of course if your only yard is your back yard you can skip to the next section. It is a good idea to record the owner's name, phone number and address. The reasons for this are obvious. In fact, this should be secondary to the written agreement you already have with the land owner.

It is also good when sending Christmas cards in season. If you note the owner's family members by first name, you can always ask the friendly, "... and how's Sally and Jimmy been doing?" The owner will appreciate the fact you remember his or her children's (or grandchildren's) names. This is simply good public relations. A couple of other

items to keep track of are primary honey sources and blooming dates in the area, state registration numbers, and anything else you personally believe to be important and useful in your operation.

Queens . . .

When was the last time you requeened? Do you know what color she was marked? Better yet, was she even marked? Finally, what race was she and from whom did you buy her?

Record these important pieces of information because they help determine if the queens are working out. Some queens just do not produce for some people. If you cannot remember where you got the queen you're working with, how can you keep from repeating any mistakes? If you are going to only keep one piece of information, this may be it. Without accurate information about the queen you really don't know what is going on in the hive.

Another bit of information to keep track of is the queen's ability to fill a brood frame. Does she fill the entire frame with brood or does she hit and miss cells, giving a splotchy, patched appearance to the frame. This may be indicative of a failing queen or one that was poorly mated. If you record this when you inspect, you can rely on your notes instead of your memory when making comparisons on queens or deciding how many queens to buy to replace current stock.

Colonies . . .

Some of the information concerning the colony could just as easily be kept with the information about the queen. Where to make this distinction is your call, but the thing is, record it *somewhere*. One of the first things about the colony that will literally jump out at you is its overall temperament. Is it aggressive, or gentle? Are they calm and easy going, or do they run all over the place when you inspect a frame? These are ultimately traits passed on by the queen, but if you don't do your own requeening, just noting this information could be helpful in the future.

One of the things I like to record, especially when viewed along with the information on the queen is the amount of propolis build-up I have in different colonies. Some seem to produce more propolis than they do honey. I know this may also be a function of bee space in the hive, but it also is a colony trait. Of course this is desirable if you collect and sell it.

How well does (did) the colony over winter? Does it always seem to come through very strong or is it only a weak survivor. Wintering ability, in and of itself is not the only thing to use to judge a colony's overall value. However, the stronger a colony is at the end of winter the quicker it builds up in the spring.

Spring management of a colony includes feeding. Record when and what you feed it. How often are you feeding it? Once you start feeding a colony, how long will depend on the food you're supplying. The queen will respond by laying more eggs, resulting in more hungry larva for the bees to feed. If you were to let a feeder run out before there was an adequate nectar and pollen source available you may sentence many young larvae to die from starvation.

You can avoid this scenario by accurate record keeping.

Medications . . .

At one time, the only medication you'd record giving would be terramycin for American foul brood, but now there are several medications approved for use in the hive. Record the dates you medicate and when the next treatment is due. Read the label of the medication and determine just how to administer it properly. Treat bee medications with the same respect you give the medication for your own children or grandchildren. It is not candy. If the label says to remove the medication after 45 days, figure out when that is and record it. It is much simpler than trying to remember *just what* Saturday it was you last medicated them.

Inspection . . .

This is the worksheet area of a record system. In this area, you record what you did and what you saw when you went into the colony. Even if you opened the hive and everything appeared normal, record it. It will help you the next time you open the hive and find that the colony was cleaned out by a pesticide kill or mites.

If you cannot remember just what you did the last time you checked in on the hive, you can take a look here and know for certain. Even if you medicated, record it here *and* under medications. One will tell you that you medicated, the other will tell you what and how much you medicated.

Are the queens you're buying working out for you. Record information such as queen productivity and you'll know for certain.

Production . . .

Is the colony producing honey for you? If so, how many supers have you pulled off the hive. If not, how are the other hives in that yard fairing. Was the honey you pulled off light, amber or dark. Was the flavor good? Regardless of what type of honey you are producing, comb, chunk, extracted or something else, notes on a colony's ability to produce will be valuable. By examining the recorded information you will be able to fine-tune your management practices to get the most out of you and your bees' efforts.

Equipment . . .

You could go crazy trying to keep track of every piece of equipment. However, you can record what equipment the hive has in place. When did you super? Does the colony have a slatted rack? Does it have a feeder installed. What size super in on the hive at this moment? Are you running with nine or 10 frames in the honey super or brood chamber? Again, this is information you would know if you were in the apiary staring at the hive, but if it was recorded in some meaningful fashion, you'd know it six months later when you where trying to decide what and how much money you needed to spend on repairs and new equipment.

Continued on Next Page

WEEKENDER ... Cont. From Pg. 39

This is where a computer with a bar code reader would be fun to have. As you will see in next month's column, someone is working on this right now for the large scale beekeeper. You could bar code every piece of equipment, every frame, every super and every top and bottom and by the press of a few key strokes or the click of a mouse know exactly what makes up every hive in the apiary. Also by keeping track of your inventory, you could reduce costs through better control.

Miscellaneous . . .

Finally, you need a "catch all" area of your record. Here's what you think is important enough to note. This could include vendor information, such as the date you ordered new equipment, or sent it back. This is your area to use as you need. Use it as a journal of sorts, noting the weather, new area crops, or ideas you had while inspecting.

Record keeping can be a valuable part of your beekeeping operation. Whether it is a brick on the hive or a computer on your desk at home, make the most of this tool. You could have the most sophisticated record keeping system in the world, but if you don't use it it's useless. Record keeping is like everything else in beekeeping, you do not have to do it like anyone else to do it well. You've just got to do it.

Was the queen marked? If so, what color was the marking. Important information like this is easily found if you record it.

A VISIT TO HEIFER INTERNATIONAL

dewey caron

One out of eight humans on our planet suffers daily hunger. Heifer Project International helps hungry people produce food and income through education and livestock management. Providing honey bees for people here in the U.S. and overseas exemplifies their philosophy of "A helping hand is better than a handout."

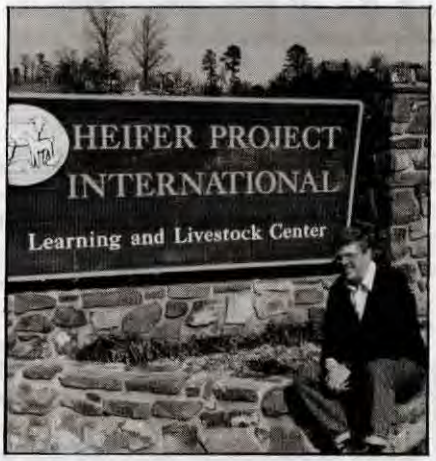
Since the end of World War II, Heifer Project International (HPI) has provided some 90,000 animals and nearly two million poultry. They have helped people in over 100 countries and more than half of the U.S. states. They do not know how many bee colonies they have provided or individuals they have helped teach beekeeping. Currently they have active honey bee projects in Kentucky and in India, the Dominican Republic and Mexico.

Typical of Heifer Project International is the Madhudhan Honey Bee Project. In cooperation with a reforestation project, an international group teamed with HPI to establish a series of beekeeping cooperatives in this central area of India close to the capital of New Delhi where the farming is marginal. The families would benefit from the honey itself while using the bees to develop an income source. New tree plantings could help the bees by providing bloom, the bees would pollinate the trees and eventually reforestation would help provide income to the farmers.

The program aim was to train three individuals who would in turn train others. Beehives established for the training would become property of the farmers. Each person helps "pass on the gift" by establishing at least one other individual in his/her community with a split after colony management is mastered in keeping with the philosophy of HPI.

Heifer Project International has been a leader in development of superior livestock. I recently visited their Learning and Livestock Center in Perryville, Arkansas, about 40 miles west of Little Rock. The "ranch" is a 1200-acre living classroom. Here the Brangus cattle breeding herd was maintained and the flock of Katahdin, a hair sheep breed, was kept. Now 20 years old, the ranch is being reorganized with a phasing out of breeding animals and development of a "living classroom" of Holistic Resource Management (HRM) – an integration of livestock and land to mutual benefit in a sustainable agriculture program.

At the ranch you will see several apiaries. You can visit the Guatemala Village and learn that five people in Central America can and do live in a structure smaller than a child's playhouse. In the hillside around the house, modeled after those built by Habitat for Humanity International, you can see



working examples of the agricultural and animal husbandry practices that HPI helps implement in poor rural villages around the world.

Heifer Project International doesn't have a current Central American bee project but it does have a project in the Central Highlands of Mexico. They did have a successful bee project several years ago in the mountains of Guatemala that helped develop a 200-page manual in Spanish on beekeeping, "Guia Apicultura". Published by Heifer Project International World Headquarters in Little Rock, it is an interesting and extremely well illustrated, very practically-oriented instructional text designed especially for Spanish speaking countries.

Unfortunately, the Africanized bee has halted some of the HPI projects in the Americas. Instructing and helping poor peasants start bee colonies now is a difficult challenge and chances for success are not assured.

Heifer Project International does have an active project involving bees in the Dominican Republic where the Africanized bee has yet to invade. In the central mountain area of Salcedo, a cooperative organization of some 140 farm families has added a bee project to an existing service program that distributed pigs to over 50 families. Groups of 10 to 20 farmers organize to learn about beekeeping and establish an actual apiary of 15-20 colonies. The families benefit from the distribution of honey that they can resell or use in their own households. After a year, each apiary is expected to pass on five populated hives to another group.

Heifer Project International bee projects can benefit from donations to existing projects. One bee group, the Eastern Apicultural Society, is exploring the possibility of developing a bee project cooperatively with HPI through donations from EAS members. The active project in Kentucky (CLIP – Cooperative Livestock Improvement Project) is targeted for Owsley County, which has the lowest per capita income in the state. They could use donations of actual bees or beekeeping equipment.

Heifer Project International exists on donations. They need over $9 million for their 1991-92 organization-wide programs already underway. If you are interested contact the World Headquarters of Heifer Project International in Little Rock, AR (P.O. Box 808, 72203, 1-800-422-0474) or one of eight regional offices around the U.S. They welcome visitors to the International Center in Perryville and are open year round.

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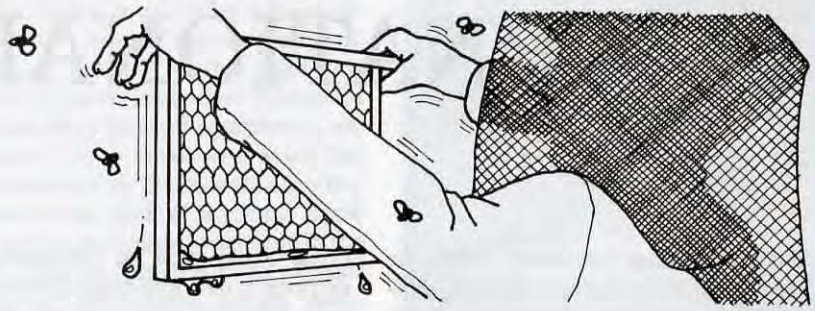


EXCLUDERS

tom sanford

Few questions in beekeeping circles seem to provoke as much argument as whether or not to use queen excluders. Vocal proponents exist on both sides of the issue. It shows how philosophies can differ among beekeepers who are all using good common knowledge about the insects they manage.

An eminent educator with a good deal of experience in apiculture once said that many times the philosophy of bee and beekeeper are different. As an example, he brought up a topic dear to many beekeeper's hearts, preserving the woodenware of beekeeping equipment. Although it may mean a lot to the beekeeper, he concluded, the bees don't care whether their hive is painted white, some other color, or preserved at all.

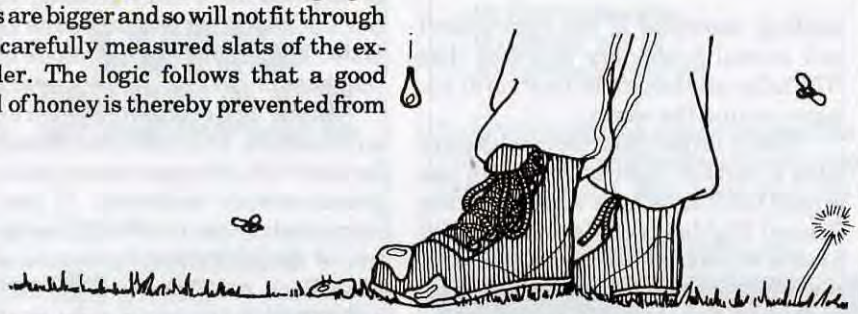
Although the speaker may have exaggerated the case, it emphasized an important point. Does a management technique stem from some human perception of what bees need or want?

A prevalent idea by those who condemn use of excluders is that engorged bees are bigger and so will not fit through the carefully measured slats of the excluder. The logic follows that a good deal of honey is thereby prevented from entering the super. Management procedures by these beekeepers apparently avoid problems that queen excluders are designed to eliminate, such as the presence of either brood or queen present in honey supers removed for extraction.

It is well known that once a layer of ripening nectar is deposited above the brood nest, the queen will rarely cross it to lay eggs. Beekeepers who don't want to risk losing the queen or contending with brood in partially filled supers at extraction time, however, stick strictly to excluders. And they argue that excluders do not adversely affect honey production. Confining the queen to certain areas of the nest is also standard beekeeping practice in many queen rearing operations. This would be impossible without excluder technology.

The inevitable answer, therefore, to the question of who's right about excluder use is that both sides are. The decision whether or not to use the technology stems from its perceived utility in specific operations.

Learning to manage honey bee populations takes time and willingness to listen. Perhaps the best way to gain the kind of knowledge necessary is to train under a master beekeeper. Another way to become informed is to attend meetings. Your state and local bee association can usually provide ideas to improve your beekeeping. Q



ON·MY·BOOTS

HOME HARMONY

ann harman

Favorite Recipes From KC Dickman

The neatly printed label, "Honey Curried Squash" caught my eye as I opened my daughter's refrigerator. I knew that, because of her busy equine veterinarian's schedule, she had someone preparing meals for her. I sampled the squash and decided that the dish was made by a very good cook indeed. When my daughter returned from her rounds I told her that I wished to meet the honey-using cook and find out if she would share her recipes with *Bee Culture* readers.

And so K.C. Dickman (she is called "KC") from Orlean, Virginia, arrived with some of her favorite recipes. KC is not a caterer, but rather a "personal cook", cooking in small quantities for individuals who wish to eat good, nutritious food but because of busy schedules might have to resort to "fast food" places entirely too often. KC makes and delivers soups, pastas, sauces, casseroles – all sorts of foods that can be combined to make a meal. Each container is carefully labeled and many come with heating or cooking instructions. Certain foods can be frozen so that week's set of meals can be delivered in one trip. KC takes into consideration an individual's likes and dislikes and likes to introduce new and creative recipes into her repertory.

I wondered about the size of her cookbook collection. "Oh, about two shelves" was KC's description. Her favorite is *Complete Vegetarian Cuisine* by Rose Elliott. She substitutes honey for sugar wherever possible and always uses honey in making granola, in baking, in sauces, with vegetables and fruits. She prefers a honey mustard and uses honey in making ice cream.

Although she purchases honey in 60-pound buckets, KC also buys jars of local or specialty honeys. She considers tulip poplar honey to be "really good" and orange blossom is a special treat. She has found some wildflower honeys to be strong, masking the flavor of the dish she prepares. Clover honey is her choice for an all-around useful honey since its mild flavor blends well with her different recipes. The many flavors of honey fascinate her and she likes to try new ones whenever possible.

Crazy Applesauce Cake

KC began her cooking career when a child, but not with honey recipes. She discovered honey cookery when her first child was born and she decided to prepare tasty but healthful foods for her family. Her own children were encouraged to cook from an early age. The older boys, now Boy Scouts, are teaching other Scouts how to cook. KC's children had another project, however. They baked the Crazy Applesauce Cake for sale at a local health food store. The kids named their enterprise "The Bulging Bakery" and prepared three double-size recipes each week. When I asked about the origin of the name, KC explained that the children thought a jolly, happy baker would look "bulging". Children are quite logical thinkers. Here is their recipe. "A no-egg, no milk recipe, this cake is so good I ALWAYS double it!! A recipe so easy children can make it. It can be made right in the baking pan. No extra mess!"

1-1/2 cups flour (whole wheat, unbleached, or a mixture)
1 tsp baking soda
1/4 tsp salt
1 tsp cinnamon
1/4 tsp cloves
1/4 tsp nutmeg
1/3 cup honey
1 tsp vanilla
1/3 cup oil
1/2 cup water
3/4 cup applesauce
1/2 cup raisins OR 1 apple, chopped
1/2 cup nuts chopped (optional)

Pre-heat oven to 350°F. Combine dry ingredients and stir well. Add vanilla, oil, water, honey and applesauce and mix well, scraping sides to be sure that all the flour is mixed in. Stir in raisins or apples, and nuts if desired. Pour into ungreased 8" x 8" pan (or 9" x 13" pan if recipe is doubled). Bake 30 minutes or until toothpick comes out clean. Cool before cutting.

Whole Foods For The Whole Family

At a recent annual visit to my doctor, I was informed that my honey had come to his rescue. (You see, I pay my bill with money and honey.) He spotted some ice cream in the grocery store that proclaimed "No fat, no cholesterol!!!" So he bought some in the hope of a delicious dessert that might be healthy at the same time. After one bite he proclaimed it as "awful". After some thought as to whether to throw it out or do something to improve it, he decided to pour honey over it. It still wasn't a great dessert, but he said the honey improved it immensely – and didn't contribute any fat or cholesterol either.

KC has found the advantages of cooking with honey: honey adds flavor and makes foods taste better. Many times she needs to add less honey when substituting honey for sugar in a recipe. She also knows that honey keeps forever – but she never keeps it around that long since she uses it every day. Her children's favorite lunch sandwich is peanut butter, honey and banana. Lemon and honey is a favorite remedy for sore throats.

KC recommends adding a table-

Continued on Next Page

HOME ... Cont. From Pg. 43

spoon of honey to split pea soup to enhance the flavor. Try it – it doesn't make the soup sweet, it just makes it delicious.

Honey Curried Vegetables

Here's the recipe that started this article:

2 cups brown rice, cooked
3/4 cup kidney or small red beans, cooked
2 Tbs butter or margarine
1 Tbs arrowroot or 2-1/2 Tbs flour
2 cups milk
(3/4 cup instant nonfat dry milk, optional)
oil as needed
1/4 cup sesame meal
1 medium onion, diced
2 cloves garlic, minced
2 medium carrots, diced
2 small zucchini, diced
1 Tbs lemon juice
1 Tbs honey
2 tsp curry powder
1/2 - 1 tsp salt

Mix rice and beans together and turn into an oiled casserole. Make a cream sauce out of butter, arrowroot or flour, milk, and if desired, powdered milk. Saute vegetables and sesame meal (sesame meal can be made by putting whole sesame seeds through a blender, food mill, or coffee grinder). Saute until onion is transparent, adding the zucchini for only the last minute of sauteing. Stir lemon juice, honey, curry powder and salt into cream sauce, then stir in the vegetables. Pour this sauce mixture over the rice and bean mixture. Bake for 20-30 minutes at 350°F.

Diet For A Small Planet

Sweet and Sour Cabbage

KC gave us another recipe, this one quite an interesting variation of the Chinese sweet and sour vegetables. This dish is quickly made and a nice addition to any meal.

1 large carrot
3 tomatoes
3-3/4 Tbs oil
1-1/4 Tbs honey
1 Chinese cabbage or hard white cabbage
1-1/4 Tbs cornstarch
1/2 cup plus 1 Tbs water
2 Tbs tamari
2-1/2 Tbs wine vinegar
2-1/2 Tbs sherry

Peel and grate the carrot; chop the tomatoes; Heat 1-1/4 tablespoons oil in a pan and add the carrots and tomatoes; fry for 2 to 3 minutes over medium heat, stirring all the time. First mix the cornstarch with a little of the water, then add the rest, followed by the tamari, honey and vinegar. Add this to the tomato mixture and bring to a boil, stirring until thickened. Simmer gently while preparing the cabbage. Shred cabbage and stir-fry in the remaining oil in another large pan for 3-4 minutes, stirring all the time. Add the sherry and mix well; cook for 2 minutes. Pile the cabbage onto a dish and pour the sauce over. Serve immediately.

Gourmet Guide To Chinese Cooking

It is nice to know that good cooks like KC Dickman appreciate the qualities that honey brings to delicious foods.

?Do You Know? Answers

1. **True** The exact origin of *Apis mellifera*, the western honey bee is a matter of uncertainty but the natural distribution of this species included Europe, Africa and western Asia. *Apis mellifera* was not present in North or South America until colonization by the European settlers.

2. **True** The first bees introduced into the United States were black German bees. They were used for over 200 years before Italian bees were introduced. Italian stock rapidly replaced the black German bees through large scale requeening efforts, since Italian bees were found to be superior. The black German bees were very nervous, aggressive and highly susceptible to brood diseases and wax moths.

3. **False** The eastern honey bee (*Apis cerana*) and western honey bee (*Apis mellifera*) are so similar in morphology and behavior that they have frequently been considered distant races of the same species. Although *A. cerana* and *A. mellifera* queens and drones attempt to mate with each other, no offspring result. Further research using instrumental insemination of queens with semen from both species revealed that hybrid fertilized eggs cease development during the embryonic stage.

4. **False** Tropical honey bees are much shorter lived than temperate races. For example, Africanized honey bee workers during the dry season in South America, which is equivalent to a temperate summer, survive on average only 12-18 days in comparison to 30+ days for the European races.

5. **True** Both caucasian and carniolan honey bees are dark races. As a result, their queens are not as easy to find as are those of yellow races. Their grayish/black appearance results from gray pubescence covering a black body. Both races may have some brownish makings on the front part of the abdomen.

6. D. *Apis mellifera ligustica* (Italians)

7. B. *Apis mellifera carnica* (Carniolans)

8. C. *Apis mellifera caucasica* (Caucasians)

9. A. *Apis mellifera mellifera* (Black German Bees)

10. B. *Apis mellifera carnica* (Carniolans)

11. B. *Apis mellifera carnica* (Carniolans) **OR** E. *Apis mellifera scutellata* (Africanized Honey Bees)

12. C. *Apis mellifera caucasica* (Caucasians)

13. B. *Apis mellifera carnica* (Carniolans)

14. D. *Apis mellifera ligustica* (Italians)

15. D. *Apis mellifera ligustica* (Italians)

16. D. *Apis mellifera ligustica* (Italians)

17 E. *Apis mellifera scutellata* (Africanized Honey Bees)

18. Brother Adam of Buckfast Abbey in Devon, England.

19. Weaver Apiaries.

20. Hawaii

21. Italian

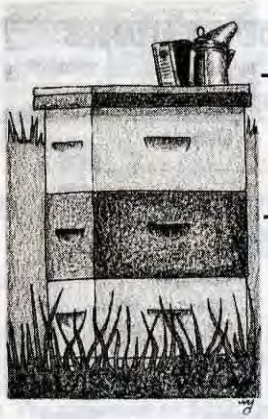
22. Caucasian

23. B. *Apis mellifera* and E., *Apis cerana*

24. C. *Apis dorsata*

There were a possible 25 points in the test today. 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



BEE TALK

richard taylor

"Propolis. It's as much a mystery as it is valuable."

Here's something to think about. Beekeepers around here got very good crops this past summer. But one of the beekeepers in our club averaged 260 lbs. per colony, and that is not merely good, it is tremendous, at least in these parts, and would be extraordinary almost anyplace. How did he do it? The same way he gets big crops every year. In the early spring he splits every colony into two, side by side. He gives the queenless half a new queen. (He knows which half is queenless because, a few days prior to splitting them, he slips a double screen between the two stories, then checks to see which one has no eggs a few days later.) He raises the honey crop on both halves. Come fall, after he has harvested all the supers, he reunites the two halves, with the youngest queen on top. He gets almost no swarming, and his colonies all get routinely requeened. The only problem is, of course, that he has to have two bottoms, two covers and two inner covers for each colony, but it is obviously worth it.

I asked him whether, in figuring that average yield per colony, he was counting the colonies before he split them, or after. And you guessed it – *before*. Still, it is an impressive performance.

It wouldn't work for me, though, because most of his crop comes from the later nectar flows and, being a comb honey beekeeper, I must get mine on the early flows, the earlier the better. Comb honey made late in the season is of very inferior quality.

Now I have to change the subject, because I was asked to write about something I've never said much about – propolis. The reason I have never said much about it is that I don't know very much about it. I thought I could solve that problem by getting down a good beekeeping encyclopedia and reading up, but then I found that what the encyclopedia said was what I already knew. Well, I'll just have to do my best here.

The word is of ancient origin. It means, in Greek, "before the city" (That's how we get city names like Indianapolis, Minneapolis, etc., as well as words like metropolis, acropolis, etc.) The ancients thought the bees got started by plastering surfaces with propolis. The bees do not manufacture it, the way they do wax, but gather it from trees and woody plants, carrying it home on their hind legs the same way they carry pollen.

Propolis is a valuable hive product, and well worth saving. It should never be just melted up with beeswax, for it is an entirely different substance and seriously degrades otherwise pure beeswax. But you should try to keep it clean. Don't save propolis that has dirt or paint or anything like that mingled with it. I don't get an awful lot of propolis with my comb honey operation, but still, I get enough to make it worthwhile. I keep a plastic bucket on my work table, and pieces of propolis that break off as I work go into that. You can sell it to buyers who advertise in the bee journals, and you'll be surprised how much they will pay you for even small amounts of nice, clean propolis.

I'm not sure what it is used for. A violin maker once got some from me, following the example of Stradivarius, the greatest of violin makers, whose fiddles are now worth a million dollars. He used propolis in the varnish. Some people have claimed great health benefits from chewing small amounts of propolis regularly. One nice lady practically claimed that my propolis was keeping her in the land of the living. I would dole her out small amounts at a time, no charge, so that she would have to come by fairly often, because I enjoyed having her call on me. I think she chewed it to counteract some serious allergy. I have also seen propolis tablets for sale, at a rather dear price. It was not clear, from the label, just what they were supposed to do for you.

Most beekeepers know that some bees gather lots more propolis than others. Caucasians seem to be the heaviest users. I have had colonies whose entrances were almost completely plastered over. Propolis is not really a problem for the beekeeper, however. If a hive is left unopened for years then it is sometimes almost impossible to pry the frames apart, but with effort it can usually be done. The difficulty of getting frames loosened is pretty much overcome by using only nine brood combs and spacing them carefully.

Sometimes the manufacturers of hive parts seem unaware of propolis. The split bottom bar is an example. These have a very short life, because sooner or later they become glued with propolis to the top bars underneath and break when the frames are removed. Wooden inner covers are another example. The rims are fastened with small nails, and soon come apart because of propolis.

Finally it should be noted that propolis can, over time, become extremely irritating to a beekeeper's hands, causing painful cracks in the skin. This happened to me, after many years of contact with it, and other beekeepers have told me the same. I do not understand why this happens, but there is a good remedy. It is called "Bag Balm", and is obtainable from agricultural outlets, being in common use for cattle. It is an antiseptic ointment which, rubbed on and kept in place with a bit of gauze, solves the sensitive beekeeper's problem overnight.

QUESTIONS? ANSWERS!

Richard Taylor

Which Comb?

Q. Which is better for producing comb honey, the plastic round section equipment or the new plastic "cassette" square section equipment?

John Iannuzzi
Ellicott City, MD

A. This is a question I received some time ago, and I responded by giving my strong preference to the round sections. Not surprisingly, I heard from the resourceful inventor of the cassette system, Mr. John A. Hogg, to the effect that I had not sufficiently appreciated the merits of that system. So I am reintroducing this important question, and will try to set forth the advantage of both systems in a way that will be fair to all.

The great advantages of round sections are (1) there are no corners, so the bees fill them to the edges very quickly, it being of their nature to build round combs rather than square ones; (2) the sections cannot become propolized, so they require no scraping; (3) the finished product is attractive, virtually leak-proof and easily stacked for display or shipped; (4) partially filled sections can be returned to the bees to finish; (5) the rings from culled sections can be reused; and (6) the supers can be assembled, with foundation, and then harvested easily. All of these considerations make round sections much superior, in my view, to the traditional *wood* sections.

The plastic cassette sections, however, have some distinct advantages. Thus: (1) any propolis is easily removed without staining the section; (2) the finished product is, like the round section, attractive, leak-proof and easily stacked or shipped. In addition, (3) the cassette super is assembled even more easily than the round section super, since there is no foundation to insert; you simply put the cassettes, ten at a time, into the super, for a total of forty; (4) there are no frames, section holders or separators, thereby improving simplicity; (5) the comb honey has a much reduced wax content, since the bees build only a *half* comb in each cassette. Instead of a sheet of foundation, in the center of the section, the cassette comes with a thin layer of beeswax coated on the bottom and embossed with the honey comb pattern, so the bees simply build their comb up from that.

I have used both systems and, while marvelling at the ingenuity of Mr. Hogg's extraordinary invention, I still have a preference for the round sections. The cost of the package is worth comparing. The lowest price I have found for the cassettes, straight from the supplier, is 87¢ each, plus shipping. The cost of the circular pack (2 rings, 2 covers plus foundation exchanged for crude wax) is less than half that, even with no commercial discount.

To this should be added, however, that the frames, necessary for round sections, are quite costly, but they are virtually indestructible and are used over and over. Some of mine have been in use for nearly forty years. I think, too, that the round section gives the beekeeper more flexibility with respect to unfinished sections, reuse, and so on. The one great and undeniable advantage of the cassettes is that there is less wax content in the finished section.

One other significant difference needs mentioning; namely, that while both the round and the square sections are sold in the plastic container in which the bees build their comb, the honey of the cassette must be *served* in that container. This is not the case with the round comb. So there are advantages and disadvantages on both sides, and no doubt the best way for serious comb honey beekeepers to make up their minds is to try both.

Eating Wax

Q. I have been building up a good trade in comb honey, but one of my customers has become concerned about eating the wax. He is worried about its effect in his digestive system and whether it might enter his bloodstream and so on. I am sure it cannot hurt him, but how I can assure him?

Brian Longo
Corinth, VT

A. Beeswax is extremely stable and does not break down in the digestive system. It therefore has no nutritional value, but it is probably a healthy component of the diet that our grandmothers used to call "roughage" I consume about 100 round sections per year, have been doing so for decades, and I am at 73 in excellent health. I have several customers who have for years bought 50 or more sections each year for their own consumption. I am very sure that there can be no bad effects from the wax, and I certainly much prefer comb honey to any other.

Bees & Trees

Q. My bee yard is 200 feet from a Christmas tree farm. The owner tells me that bees gather from aphids on the trees, and that he uses a pesticide on the aphids. Will that affect my bees?

Larry Thorpe
Milton, FL

A. I do not think this will harm the bees so long as the pesticide does not drift over to your hives, and there are *no* blooming plants on the orchard floor bees are visiting. The secretions bees sometimes gather from aphids is not nectar, of course, but honey dew, and it tends to degrade honey when it gets mingled with it.

(Questions are welcomed. Address Dr. Richard Taylor, Box 352, Interlaken, NY 14847, enclosing stamped envelope for response.)

INNER ... Cont. From Pg. 4

hope you'll let us know what you like, and dislike about these changes, or anything else that comes to mind. We aim to please.

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In late December the National Honey Board hosted a Round Table On Honey Marketing in Denver that included representatives of the industries of honey packers, producers, importers and producer/packers. The recent surge in China imports, the reduction of the buy back and a general lack of communication recently have caused all sorts of misunderstandings, distrust and a basic industry-wide malaise among all of the above.

The goal was to have each group explain their position and problems so other segments could get a feel for what makes them tick.

Space doesn't permit a full report of what happened (there were over 40 pages of reports), but we talked with three of the invited (and read those 40 pages) and think it worth reporting at least some of what happened.

Don Schmidt, President of the American Beekeeping Federation made a rather unique proposal that most participants felt worth exploring. His research turned up the fact that when the one penny tariff was placed on imported honey, way back when, that penny represented roughly 20% of the cost of domestic honey, which was about a nickel then. His proposal represents only a technical correction, but it is outstanding. If, as then, the U.S. had a 20% tariff, shouldn't our current one cent be readjusted to reflect a 20% tariff now? That would come to about a dime or so, but certainly far more than the penny pittance charged today. Not a bad idea in my opinion, and certainly worth pursuing.

Discussions between packers and producers regarding the assessment paid to the honey board came up, and some changes were suggested that make sense, too. Under discussion was a proposal to have packers contribute to the honey board's financial future at the same rate producers do – essentially a penny a pound. However, there were some amendments suggested that made it seem more plausible, at least to some.

Some packers do advertise, and the feeling was they should be compensated for these activities. If their advertising met certain criteria, they would be reimbursed by the honey board for those expenses. At least up to some portion of their costs. Promoting honey is promoting honey, and as long as honey is selling, how the advertising gets paid for seems less important than it gets done. Not a bad idea either, I think.

Discussions also touched on education at all levels, standards, quality, grades, imports, the buyback program, tariffs, better communication and more. An ag economist from Texas A & M gave a presentation that addressed most of these things, and some that weren't – marketing, safety, co-ops, goals, commodity products, quotas, long term commitments, quality and other topics.

The people we talked to seemed to think the meeting worth while and thoughts were expressed to have another some time down the line. All of these suggestions would require enabling legislation to change the Board's rules, but that seems easy enough if all agree on the goals.

Another item that seemed to come from this meeting was a more or less agreement to have all segments of the industry work toward the same goal on the next farm bill, cooperatively, and not independently, and certainly not as adversaries. Now that is worth noting!

All in all, not a bad ending to last year, and certainly a positive note to start 1993 on.

It could have been worse.

Happy New Year.

•

Have you taken the time lately to notice those things in your life that always seem to be there when you want them and need them the most?

Maybe it's the old pickup that always starts, no matter how cold or how wet the weather. It goes when the car won't and it goes when you absolutely must be on time, every time.

What about that lazy dog, sleeping out there in the dust in the shade? Starts your day, every day, just happy you're there and can't wait for you to get out of the car when you get home, still just as happy you're there. Strangers, beware this homestead guardian, and friends – well, the 'glad-you've-been-here' tail is worth more than any thousand words you could ever say.

But it's the people in your life that are always there when you need them the most, and when you expect them the least that should be attended to, too.

Neighbors who help when you need a hand; the guy at the garage who fixed that thing in the truck for free because it only took a minute; the lady at work who always has an extra sandwich when you forgot to pack a lunch

You know these people. They're there every day, whether you think of them or not, care about them or not. They're the people who keep you in place, keep you from moving too far to the left or the right, too far up and certainly too far down. Like family in a way, but more just because they're not family and don't have to be there when you need them there. They just are.

I think of these fine folks as anchors in my life. Not holding me down or holding me back, but rather offering the stability that keeps me where I should be. Some are strong and weathered ties that hold through any storm. Others, like cobwebs are gentle and fine and hardly there at all. No one better than the rest, nor any slight enough to cast aside.

One anchor slipped away recently. Not the strongest in my life, not any more anyway. But Mary was there the longest and that is the hardest of all to lose. For the longer they're there, these anchors of ours, guiding and helping and just being there, the easier it is to think that is the way it always will be. It's not, of course. And life, and death are never fair.

A hundred, hundred people will miss her now. Friends and family and neighbors and more. A daughter, too. And me.

Kim Flottum

GLEANINGS

JANUARY, 1993 ALL THE NEWS THAT FITS

FEDERATION MEETS IN KS CITY

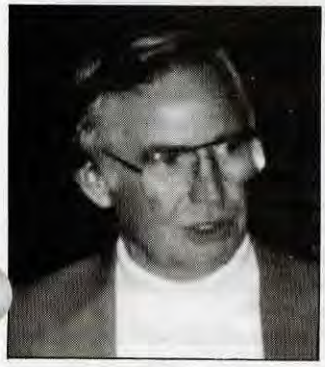
The 50th Anniversary Convention will be called to order by ABF President Don Schmidt at 1 p.m. on Wed., January 20. Visiting beekeepers will be welcomed by Beverly Gibbs Breckenridge, who was the 1966 American Honey Queen. ABF Vice President David Sundberg will respond. Following the President's Address, the Keynote Address will be presented by Dean Kleckner, president of the American Farm Bureau Federation. The presentation of 1992 American Honey Queen Kari Kester, 1992 American Honey Princess Kristine Stowell, and the 1993 Honey Queen Contestants will conclude the session.

Paul Jackson

Dean Kleckner

Jim Tew

Anita Collins



Richard Adee

Jane Phillips

The general sessions include AHB update, progress on mite control, the price support program, National Honey Board, Pollination and much more. Speakers include Gene Brandi, Keith Deleplane, Joli Winer, Anita Collins, Orley Taylor, Paul Jackson, Jim Tew, Jane Phillips, Richard Adee, Morris Weaver, and many more.

In addition, there will be special sessions on package bees, suppliers, hobbyists and others, plus a whole afternoon of education workshops – candles, skeps, requeening, honey labels and others.

A special trip is planned to Osage Honey Farms for Sunday after the meeting.

For more information contact Troy Fore at (912) 427-8447.

MANN LAKE EXPANDS QUEEN DELIVERY LINE

Mann Lake Supply, in Hackensack, Minnesota, announces the purchase of the Riteway Container operation from David and Rose Kerr in OR.

"This product compliments our line of products available to the commercial beekeeper", states Jack Thomas, Pres. of Mann Lake.

"We already are a major supplier of (corn) syrup and protein supplement for feeding", he added "and are also distributors of the JZ BZ queen cell cups, cages and cell protectors."

Mann Lake intends to expand the Riteway Container line to include bars to hold the JZ BZ queen cages, will change the color from dark tan to white to help temperature regulation and will soon be able to 'customize' the boxes for individual queen producers.

"This addition to our line means we now cover the entire spectrum of queen delivery", Thomas said.

Mann Lake will have a display of all of these products at the two national meetings this month, and other regional and state meetings later in the year.

For more information contact Mann Lake, County Rd. 40 & 1st St., Hackensack, MN 56452, 1-800-233-6663.

EAS AWARD NOMINATIONS NEEDED

The James I. Hambleton memorial award was established by the Eastern Apicultural Society of North America to recognize research excellence in apiculture. The E.A.S. Student Apiculture award was established to recognize students studying apiculture at the undergraduate or graduate level in a recognized college or university in the U.S. or Canada. The awards for 1993 will be presented at the annual meeting of the society in Maine this July.

Continued on Next Page

USDA NEWS

Researchers in USDA's Agricultural Research Service in Colorado have found an alfalfa variety with yellow flowers, instead of the usual purple, that has drought tolerance. This variety could give ranchers new options for growing the nutritious forage crop without irrigation. It also increases the odds that ranchers can someday grow the variety to graze livestock in areas that have little rainfall. The yellow-flowered seedlings grow about as vigorously as most commercial varieties of the common purple-flowered alfalfa. However, researchers point out that western growers who irrigate alfalfa, either as hay for their animals or as a cash crop, would get better harvests from purple-flowered alfalfa. The parent plant seeds are descendants of yellow alfalfa found in the former Soviet Union, and supplied by the agency's Plant Introduction Station in Ames, Iowa.

USDA's Animal and Plant Health Inspection Service has an agency that can provide help with nearly any type of animal threat. The Animal Damage Control agency has offices in most states throughout the country staffed by professional wildlife biologists, trained in handling a variety of situations. ADC offers suggestions to the public on how to eliminate the problem, usually without having to take the life of the animal. One example involved roaming coyotes in NM. The coyotes killed a dog and wandered into backyards. An ADC wildlife biologist evaluated the situation and suggested the county cut the vegetation around the neighborhood. The recommendations were followed and the coyotes have stayed away from the neighborhood. ADC has a toll-free hotline which receives calls involving nearly every animal-related problem imaginable. About 40% of the calls are related to health and safety problems caused by wildlife. The number is 1-800-442-0708

Deputy Secretary of Agr. Ann M. Veneman was present for the opening of a new U.S. agricultural trade office in Mexico to help American farmers and agricultural exporters tap the growing Mexican market. The office will be operated by USDA's Foreign Agricultural Service and will promote sales of U.S. agricultural products in Mexico and serve as a contact point for Mexican importers seeking to buy products from the U.S. Veneman said much of the recent growth in U.S. farm exports to Mexico is attributable to Mexican trade liberalization that began in 1987 and to economic benefits accruing to Mexico as a result of those reforms. Veneman added that ratification of the North American Free Trade Agreement will increase U.S. agricultural exports to Mexico because it will eliminate tariffs, quotas and licenses that act as barriers to trade between the U.S. and Mexico.

Three new publications regarding sustainable agriculture are available from USDA's National Agricultural Library. "Sustainable Agriculture in Print: Current Books" and "Videocassettes in the NAL Collection Pertaining to Alternative Farming Systems" are bibliographies of available books and videotapes. The "Calendar of Events Related to Sustainable Agriculture" includes an eight-page listing of national and regional seminars and conferences. To receive these free publications, send a self-addressed mailing label, with a request specifying the name of the desired publication to: AFSIC, Room 111, National Agricultural Library, 10301 Baltimore Blvd., Beltsville, MD, 20705-2351.

EAS AWARD ... Cont. From Pg. 49

Each award nomination must include a biographical sketch of nominee, a list of his/her publications, specific identification of research work on which the nomination is based and an evaluation and appraisal of accomplishments of nominee, especially of work the last five years for Hambleton award nominees (a shorter period for Student nominees).

Judgement of nominees will be made on the basis of demonstrated excellence in Apiculture (teaching, research, extension and beekeeping), letters of recommendation (at least two required) and other supporting information supplied by nominee and person who submitted the nomination.

Nominations and supporting information should be submitted to Hambleton Awards Committee, c/o Dr. Eric Erickson, Carl Hayden Bee Research Center, 2000 E. Allen Rd., Tucson, AZ 85719. Deadline for submissions is February 1, 1993.

BEAR POPULATIONS INCREASING

A Manitoba beekeeper says the number of bears in his area is out of control after the predators caused more than C$50,000 damage this year.

Ed Podolsky, who operates one of the five biggest beekeeping operations in the Canadian province, said he has had to kill more than 2,200 bears in the last 20 years to protect his apiary, located about 230 miles northwest of Winnipeg.

"We had one man hired all summer this year for the sole purpose of hunting bear," he said.

Podolsky said he finds shooting bears repulsive, utterly repulsive, but he had to do it. Despite his efforts bears destroyed 250 of his hives this year.

"There are more bears here than cattle," he said. "The situation is out of hand here. Conservation groups and government must decide whether this region is for farming or a wildlife preservation district."

Podolsky said a growing bear population is due to laws that protect bears, including one implemented this year that shortened the bear-hunting season from three months to two.

"The pendulum has swung too far in favor of protection and conservation of bears," he said.

The province's Natural Resources Department said its records show Podolsky had killed about 400 bears in the last 30 years, but he said the real number is higher because he usually doesn't notify local conservation offices.

Farmers are allowed to destroy bears to protect their property. However, they are supposed to report the killing of a problem bear within 10 days.

Natural Resources officials concede the actual numbers shot on all farms is considerably higher than the 200 to 300 bears annually reported as being shot on farm property.

OBITUARY

The history of beekeeping is full of colorful characters who advanced the craft in many ways. Certainly Ralph Wadlow, who died October 4 in Fort Myers, was one of these. His passing is a true milestone in Florida apiculture. Mr. Wadlow was one of the pioneers who brought beekeeping below the frost line in Florida some 40 years ago. He was also instrumental in convincing vegetable growers that pollination by honey bees increased yields. Although he didn't study botany or genetics in college, Mr. Wadlow, nevertheless, cooperated on bee research projects at Cornell University, the University of Bogota in Colombia and the University of Florida. He was once quoted as saying he "assisted the Ph.D.s with their lily white dukes, testing theories with blisters, backaches and sweat."

Mr. Wadlow was so active in Florida and national beekeeping associations it is difficult to conceive that he will no longer be present at these functions. A charter member of the Florida State Beekeepers Association, he was a prime mover in that organization for decades, attended almost every meeting and held many responsible positions. He held all the offices in the Southern States Beekeepers Federation, regularly attended Eastern Apicultural Society gatherings and was often one of Florida's delegates to the American Beekeeping Federation. He was also involved in international apicultural activities, consulting in South America (Bolivia) and attending several Apimondia conventions.

In a newspaper article about Mr. Wadlow in 1975 he said: "In South America, I am El Doctor. Here, I am a beekeeper, quite an ordinary fellow." The many who knew Ralph don't cotton to this idea. He was extraordinary in every way.

(from APHIS – M.T. Sanford

CANADA'S PRODUCTION CONTINUES TO DROP

Canadian commercial beekeepers had an average yield of 131 pounds a hive this year, down from the average 140 pounds in 1991, but well up on the five-year average of 121 pounds.

Preliminary estimates issued by Statistics Canada at the end of October showed total 1992 national production at 63,312,000 pounds, down from 69,680,000 in 1991.

The honey flow was most copious in Saskatchewan, where commercial beekeepers averaged 210 pounds a hive, up 10 pounds from the previous year.

In British Columbia, where a glorious summer saw water restrictions in some areas, the average yield was 85 pounds, up almost 42% from 60 pounds a hive. B.C.'s total production was estimated at 3,674,000 pounds, up from 2,430,000 pounds in 1991.

In eastern and central Canada, where the summer was significantly cooler and wetter than normal, there were much lower returns this year than in the summer of 1991.

On Prince Edward Island, total production fell to 47,000 pounds, down from 85,000 pounds in 1991 and the average over the last five years of 77,000 pounds.

The number of beekeepers across Canada was almost unchanged in 1991, at 13,080 – down 18 from the previous year – but significantly lower than the five-year average of 17,014. The number of hives was estimated at 499,620, up from 498,780 in 1991.

Statistics Canada, in releasing the following figures, noted Newfoundland's returns were not yet available and emphasized this year's figures were only preliminary returns from the annual commercial beekeeper's survey.

	#Beekeepers	Colonies	Yield/ colony
P.E.I.			
Average 86-90	95	774	99
1991	66	680	95
1992	70	720	65
Nova Scotia			
Average 86-90	414	6,000	62
1991	400	7,000	66
1992	430	8,000	49
New Bruns.			
Average 86-90	412	5,000	70
1991	400	4,800	55
1992	400	4,500	50
Quebec			
Average 86-90	2,410	73,240	86
1991	1,000	37,800	122
1992	1,030	37,800	99
Ontario			
Average 86-90	5,000	113,000	79
1991	4,500	100,000	94
1992	4,500	100,000	68
Manitoba			
Average 86-90	1,210	95,400	158
1991	1,000	76,000	190
1992	800	75,500	165
Sask.			
Average 86-90	1,580	105,600	161
1991	1,400	85,000	200
1992	1,400	84,000	210
Alberta			
Average 86-90	1,203	165,700	136
1991	830	147,00	143
1992	750	145,000	140
B.C.			
Average 86-90	4,690	53,500	80
1991	3,500	40,500	60
1992	3,700	43,000	85
Total			
Average 86-90	17,014	619,214	121
1991	13,098	498,780	140
1992	13,080	499,620	131

Statistics Canada also issued the following figures on total production and its value:

	Total production (000#'s)	Total Value (000-$)	Value of Honey & Wax - $
P.E.I.			
Average 86-90	77	110	110
1991	85	97	97
1992	47	–	–
Nova Scotia			
Average 86-90	372	466	476
1991	483	520	526
1992	437	–	–
New Bruns.			
Average 86-90	351	469	480
1991	264	303	309
1992	225	–	–
Quebec			
Average 86-90	6,294	7,273	7,404
1991	4,623	4,210	4,225
1992	3,742	–	–
Ontario			
Average 86-90	8,948	7,903	8,068
1991	9,363	10,412	10,625
1992	6,781	–	–
Manitoba			
Average 86-90	15,107	7,109	7,335
1991	14,440	8,332	8,531
1992	12,458	–	–
Sask.			
Average 86-90	17,054	7,885	8,115
1991	17,000	9,707	9,937
1992	17,640	–	–
Alberta			
Average 86-90	25,568	11,290	11,513
1991	21,032	12,150	12,472
1992	20,300	–	–
B.C.			
Average 86-90	4,285	3,849	3,952
1991	2,430	2,083	2,128
1992	3,674	–	–
Total			
Average 86-90	75,058	48,354	47,453
1991	69,680	47,814	48,850
1992	63,312	–	–

CLINTON'S ROLE IN AGRICULTURE

Export Enhancement Program Could Be Cut

Environmental Concerns Could Take Higher Road

The nation's food and agriculture industry is doing some watching and waiting.

A pair of agricultural policy experts at Ohio State University say Bill Clinton's views on farm and food policy remain unclear and may not even matter because of the role Congress will play in shaping the nation's food and agriculture policy over the next four years.

"Bill Clinton has gone out of his way to avoid making any commitment to agriculture and to keeping open his options on the subject," says Luther Tweeten. "So it's a little hard to project the views he'll take on farm policy."

Part of why farm and food policy was notably absent from campaign discussion was that the U.S. farm economy has remained in pretty good shape overall. Farm policy analyst Carl Zulauf says agricultural policy has historically been driven by bipartisan agreement with major changes caused by crises. Such crises include surplus farm commodities, low farm income, rising food prices and high budgetary costs. No "emergencies" currently exist, so Clinton hasn't been forced to get specific on farm policy, he says.

It's unlikely the Clinton administration will get specific soon, Tweeten says.

"I think Clinton will basically embrace the current policy," he says. "I don't look for any big cuts in federal agricultural spending. But he will face great pressure to hold down farm spending to free up money for his ambitious social agenda."

Tweeten and Zulauf say there could be cuts to the Export Enhancement Program – an unpopular program with both political parties.

They also say a Clinton administration might call for more flexible base acres in grain programs and could make more environmental programs mandatory. Expect lots of traditional lip service to rural development programs.

But Congress is key to any major changes, they say. Despite the influx of new senators and representatives, the legislative branch will still likely be protectionist in basic philosophy, Zulauf says. That could cause some anxious moments early in the new president's term.

"Clinton is going to have to deal with a protectionist Congress during some very sensitive final trade negotiations," Zulauf says.

The Clinton campaign appeared indecisive on both the General Agreement on Tariffs and Trade and the North American Free Trade Agreement, he says. But implementing the agreements would help Clinton meet his budget-cutting goals, Zulauf says. Both agreements would also scale back U.S. farm programs that cost taxpayers money, he says.

In addition, Tweeten says that President Bush vetoed legislation to remove most-favored-nation trade status for China. If Clinton signs such legislation, it will hurt agricultural exports to China and Hong Kong, he says.

Zulauf thinks Clinton wants to expand free trade while providing protection for the environment and displaced workers. But trying to adjust the structure of proposed trade agreements could compromise the overall economic benefits of free trade, he says.

The hard reality is that success in today's world economy will mean new kinds of jobs, not simply retooling old processes in manufacturing, Zulauf says.

He and Tweeten offer these additional insights about the new administration's impact on agriculture and food production:

- Clinton's talk about a "managed economy" still needs definition. If it means a more active role in farm policy, a Clinton administration could stifle free-market activity. If it means improving regulatory and marketing efficiency, then a "managed economy" will be good news for agriculture.
- Under Clinton, farmers can expect much more environmentally based scrutiny than they received from the Bush administration. That doesn't necessarily mean more regulation, because Clinton advisers have talked peripherally about providing economic incentives to improve the environment, Zulauf says.
- The food and agriculture sector should keep an eye on Clinton's tax policy. The president-elect said he'll raise taxes on the wealthy, but it's still unclear who else will pay more. Clinton could embrace a congressional proposal to lower the estate tax exemption by two-thirds, but turning that proposal into law would create problems for intergenerational transfers of family farms, Tweeten says. It remains uncertain how many indirect taxes, such as agricultural exemptions from various regulations, will be repealed, Zulauf says.
- A Democratic-led congress and administration could pass a campaign reform law to limit or redefine the role of Political Action Committees. Farm groups and agribusiness are major users of PACs. They may have to change their lobbying strategies.
- Clinton's top three issues – education, health care reform and rebuilding the nation's infrastructure – don't directly address farmers' production concerns. However, all three issues impact farmers as consumers. If educational reform helps rural schools, then production agriculture and agribusiness benefit. If health care reform cuts costs and improves the quality of rural health care, agriculture also wins. Infrastructure improvement directly benefits agriculture's ability to do business in an internationalized world. However, higher taxes and user fees for services and infrastructure maintenance could hurt agriculture's competitiveness.
- Cutting the federal debt was rated a major issue by only 20% to 25% of voters. That's not a public mandate for reducing the debt, Zulauf says. H. Ross Perot's candidacy did raise consciousness levels on the debt, but Americans aren't ready to take on the issue and all its associated pains, he says.

AG CENSUS IN PROGRESS

Farm operators across the Nation are about to participate in a statistical portrait of U.S. agriculture through the 1992 Census of Agriculture conducted by the Commerce Department's Census Bureau.

The portrait will provide a clear picture of agriculture on the national, state, and county levels, showing in detail how farmers and ranchers stand today compared with five years earlier.

The picture will focus on key information, including the number of farms, farm size, operator characteristics, crop and livestock production and sales, and financial conditions of farmers and ranchers.

Data reported by individual farm operators in the census is held confidential by law (Title 13, U.S. Code). Data are summarized to prevent identification of individual farms. Even other government agencies cannot have access to individual reports, which are exempt from the Freedom of Information Act.

Farmers and ranchers can do several things to make this census an effective tool to help chart the future. They can return their census forms and make sure the information is complete, accurate, and timely. They can also use the statistics to plan practical improvements in U.S. agriculture.

How do you convert agriculture census numbers into dollars and cents? Here are some examples:

- The U.S. Department of Agriculture can use county-level census data to define problem areas and help farmers recover from outbreaks of disease and pests.
- Farm organizations, Congress, and state and local governments who plan programs to help farm operators get the most for their investments will find census statistics helpful.
- Farm machinery manufacturers can more effectively target their industries to where they are needed, all for the economic benefit of farm operators.
- Seed and fertilizer producers can compare yields and other information to help operators do the most effective job.
- Irrigation specialists, water resource developers, and conduit manufacturers can learn much from census data and convert that knowledge into practical advice for farm operators.
- Congress can determine by using census data where to allocate dollars to benefit agricultural producers.
- Farm broadcasters and editors can convey census results to their audiences, and use data to help focus their stories to important areas of agriculture.

The Census Bureau will mail report forms late in December to the Nation's more than two million farm and ranch operators to collect data for the 1992 calendar year. Farmers will be asked to return their forms by February 1, 1993.

Many of the questions will be similar to those asked in the 1987 census. Data will be collected from all farmers and ranchers on land use and ownership, crop acreages and quantities harvested, numbers of livestock and poultry, value of crops and livestock sold, and operator characteristics. New items include number of hired workers, amount of direct sales, and number of injuries and deaths.

Report forms sent to 20% of the farmers include additional questions on production expenses, fertilizer and chemicals, machinery and equipment, market value of land and buildings, and income from farm-related sources. The report forms are tailored by region to make them less burdensome on respondents.

In developing the report forms, the Census Bureau obtained the advice of farmers, farm organizations, agricultural universities, members of the Census Advisory Committee on Agriculture Statistics, and state and federal agencies. The forms were tested on 40,000 farmers to make sure the questions were clearly worded and that farmers could provide the requested information.

Farmers and ranchers will not be the only group involved in a census. The 1992 Economic Censuses, which cover manufacturing, mining, construction industries, retail and wholesale trades, service industries, and transportation, also will be taken. These censuses together will provide a detailed picture of most segments of the Nation's economy.

Send Your Meeting Notices to *Bee Culture* at least TWO MONTHS in Advance so we can publish them for you.

OHIO AG BOOK

A wagon train rumbles past split-rail fences. Ohio's biggest bank barn towers over nearby trees. A Curtiss "Jenny" biplane streaks low over a woodlot.

These and other images from Ohio's farming past are featured in *The View from the Tower* (45 pages), a book of facts and historical photos from the first 100 years of Ohio's agricultural experiment station.

It's being promoted as an economical holiday gift for agriculture lovers.

The author is Robert E. Whitmoyer, historical records officer for the Ohio Agricultural Research and Development Center. He wrote the book for the center's 1992 centennial celebration in Wooster.

OARDC, formerly known as the Ohio Agricultural Experiment Station, is part of Ohio State University.

Whitmoyer, who also heads OARDC's electron microscope lab, derived the book's title from the tower of the center's 95-year-old Administration Building. He writes: "From the first director, Charles Embree Thorne, to the present day, the tower provides a bird's-eye view of the happenings and conditions of the research center."

Chapters include "How We Got Here", "The Mighty OAES Bank Barn" and "Agriculture Takes to the Air" A chronology lists key breakthroughs from the past century. Photographs from center archives illustrate most of the pages.

Since 1882 (beginning in Columbus), center scientists have conducted research in agriculture, natural resources and human ecology and reported their findings to the people of Ohio.

Copies of *The View from the Tower* are $2 each. Orders placed by Dec. 11 will be received by Dec. 23. Write to SIAC Mail Room/A, Ohio State University/ OARDC, 1680 Madison Ave., Wooster, OH 44691.

Display Index

Am I Too Scents-ative?

mike drummond

Scientists in California have developed an organic cologne for honey bees. The active ingredients are hexadecane and methyl docosonate, but the vice president of marketing will probably rename it something like . "Bee Mine, I Must Hive You", or maybe "Bee-havior Self." Now vacationing bees who wander into a strange hive on the other side of the tracks gain immediate and total acceptance from the usually territorial and hostile home-bees. BC (Before Cologne) they wouldn't have passed the sniff test and might not have escaped alive and certainly would have lost their wallets.

Why scientists chose to devote years of their time and mountains of other people's money to this "problem" is beyond the scope of this column and depressing besides . government grant money, the scramble for tenure, etc. (Sigh) The boondoggle aroma is disagreeable, but the fact remains these folks were able to solve a problem that bugged them.

If only there were such a cologne for humans, one that guaranteed universal acceptance by one's peers. A New Age paradise on earth might follow. On the other hand, how much bliss can one stand? There would be little drama in daily life, no sudden surges of adrenalin caused by petty conflict and friction. Providing, of course, that scientists could come up with an industrial-strength version of the cologne, one strong enough to work its magic on government landfill employees and telephone salespeople who call during dinnertime.

Perhaps it would make sense to have two scents, one to solicit acceptance, and the other to act as a repellant for those times when you just don't feel like embracing all humanity. Raw garlic would be the organic choice, but some entreprenuer will want to make a patent remedy. "Bug Off" is a little crude, but it is one brand name possibility. There is even a whole New Age school devoted to the study of "Aroma Therapy" as a way of modifying moods and behavior.

Unfortunately all scent solutions are temporary, as I've found whenever I try to protect my garden vegetables from marauding bands of bunnies and squirrels. Fences are a more tangible form of defense against garden pests, and usually work well. But a truly determined deer or Jehovah's Witness can hop over any barrier I construct. Fences generally are not portable, and even if they were, would prove to be awkward in most social situations away from home. And there are so few places where one can comfortably wear a full suit of armor anymore. But that is a moat point and will have to keep.

Yes, scents and science may be the way to go. Who knows, world peace may follow quickly when the scientists unlock the secrets of our noses. (Let's hope they don't blow it)

And while it is too late for this particular celebrity (a well-known recluse, now deceased) to endorse the repellant product I mentioned earlier, how's this for a name. "I Vant To Be Cologne."

BOTTOM·BOARD