AUG 1999

Bee Culture

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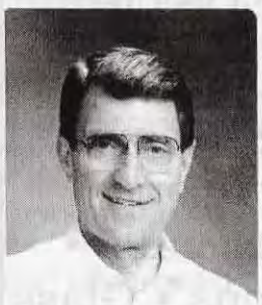
Bee Culture

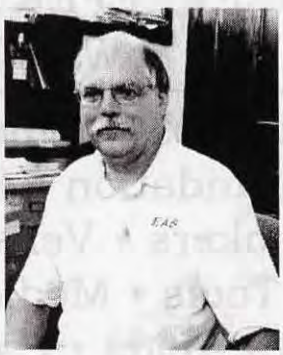
THE MAGAZINE OF AMERICAN BEEKEEPING

AUGUST 1999 VOLUME 127 NUMBER 8

FEATURES



JOHN ROOT
Publisher



KIM FLOTTUM
Editor

COVER

Feeding honey bees can be expensive, labor intensive and needs to be timely. Feeding them the best for the least amount of money – cost of material, application techniques and labor – is a problem every beekeeper solves in his or her own way. But to start, you need to know the facts. See page 37 for our feeding article. The photo was taken in Maine, just before these bees were moved to blueberries.

photo by Kim Flottum

Bee Culture
THE MAGAZINE OF AMERICAN BEEKEEPING

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Subscription Information

U.S., one year, $17; two years, $33. Newsstand price: $2.50. All other countries, (U.S. Currency only), $9.50 per year additional for postage. Send remittance by money order, bank draft, express money order, or check or credit card. Bee Culture (ISSN 1071-3190), August 1999, Volume 127, Issue 8, is published monthly by The A.I. Root Co., 623 W. Liberty Street, Medina, OH 44256. Periodicals Postage Paid at Medina, OH and additional mailing offices.

Advertising

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

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On the Richter scale, the earthquake that shook the Honey Board at their annual meeting in June registered at about 9.7. But like quakes that occur in the depths of the ocean, the whole thing wasn't seen. Only the Tsunami that rolled over everything in the way could be measured.

Briefly, Bob Smith, the Board's CEO, tendered his resignation effective the end of the year. Sherry Jennings, the Board's Executive Vice President did the same. Bert Belliston, the co-op member and Chairman of the Board resigned, as did Lyle Johnston, producer representative from Region 2. But this isn't all.

According to Board members at the meeting a suggestion was made to elect a new CEO, voted on and passed as a straw vote. Meanwhile, Smith and Jennings announced that they are leaving to form a management company to manage . . . yes, commodity group boards. After an evening of discussion, argument and politicking another motion . . . to not replace the CEO but hire a management company officially passes. Steve Conlon, a three-year veteran is elected Chairman and charged with seeking out the best management company to take over the day-to-day activities of the Board.

This activity comes at what can only be described as an unstable juncture in the Board's evolution. This has not added to its stability.

The timing comes at a moment of heightened sensitivity and attention due to the upcoming referendum on changing the assessment policy. Hotly debated, the divisions in this industry have never been more visible, and the real or perceived gulf between producers and packers widens daily. This is enhanced by the consolidation and reduction of the voices on each side of the line. Fewer but bigger packers and fewer, but bigger producers has fine tuned the focus on the differences these groups profess.

Of course the continued low price for domestic honey – supposedly in all segments of the marketing chain – coupled with the competition of honey produced offshore has not given a softer edge to any business dealings between the two groups.

Add to this that, after a dozen or so years, the ultimate purpose of the Board – to increase honey consumption – has not been fulfilled. USDA and U.S. census Bureau data presented here a couple of months ago indicates that the U.S. population increased between 1993 and 1998 by 13 million and honey production and imports went from 362 million pounds down to 347 million pounds. Less honey and more people – per capita consumption actually decreased by my figures leaving total honey consumption in the U.S. virtually unchanged. Some will argue this based on other data, but it's not easily accessible.

The producer/packer gap widens further when you consider the only real price increase producers have seen in that dozen years was due to the producer driven anti-dumping action against China. Now, another anti-dumping action, (good, bad or indifferent) this time focusing on Argentina is in the works, which, if history repeats, will again reduce the short term supply that packers can draw from and drive up the price domestic producers will receive, again probably short term. Meanwhile, some proucers have been less than forthcoming when dealing with this year's darker-than-average early crops, complicating packer problems with deliveries.

The internal conflicts are obvious. The lack of results are obvious. The future is very unclear.

But there's certainly more to this than the problems mentioned. There are the stunning successes. There is no doubt that the actions of the Board over the years have improved the image of honey in the eyes of those who use it – food service, restaurants and the like. The everyday consumer, too, has been enlightened to some degree on the uses and the value of honey. Not enough, it seems, to increase sales significantly, however.

Also, through the Board's efforts, individual beekeepers have been able to improve their marketing professionalism with information and tools for labeling, quality control and the like.

Even those who don't contribute to the Board's coffers have benefited, and will continue to benefit (providing there's a Board), in a hundred ways. National Honey Month packets, jar tags, news releases, clip art . . . the list of easily identified benefits is long and visible.

The Board has also funded numerous research projects on new and different uses for honey, in the commercial baking and dairy industries among others, and worked with several restaurant chains to have them feature honey recipes on their menus.

There's more the Board has done, much more. And according to Steve Conlan, the newly elected Board Chairman, none of this will change when the Board goes from an in-house bureaucracy to a hired gun management team.

According to those who supplied the information to the Board, eight of 10 commodity Boards are now managed by Commodity Management Companies. Consolidation of staff to reduce overhead costs, increased negotiating power with ad agencies and synergy with compatible commodity groups under the same roof are the positive aspects of this change. That and there will be no change in service, attention to specifics and focus.

Cost, however, was the main argument. It costs more, say those who favor the change, to keep a staff

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Managing The Honey Board

KEEP IN TOUCH

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

MAILBOX

Sharing Knowledge

The Agricultural Office of the American Embassy in Pretoria received a proposal from the International Bee Removal experts of South Africa dated April 28, 1999.

The company is an expert in tracing and removing African bees without killing them.

They therefore propose to share experiences and knowledge with American Bee Keepers or Bee Removal Companies, and are prepared to either visit America or invite American Bee Keepers for this mission.

Kindly assist us with contacts and any information of this nature.

Patricia Mabiletsa
Agricultural Specialist
Pretoria, South Africa

Cardboard Fuel

After reading about the new smoker fuel in the June issue, page 18, I wondered why anyone would buy smoker fuel when cardboard boxes are a good smoker fuel. I cut boxes in strips 5" x 24" long, roll it up and tie it. You can have a large supply handy and it will last for hours. Cardboard is all I ever use and it works well.

Charles Yonker
Letart, WV

Have We Forgotten?

I have just one question on the April *Inner Cover*. Are we, as a nation so hindsight myopic that we have forgotten the gas lines of the late 70s, of being held hostage by the Middle Eastern oil cartels? Why do we think if we allow our family farms to fall by the wayside and begin importing the majority of our food, that the same thing will not happen with wheat, corn, beans, etc., etc., etc.

O.K. two questions. The frightening part is the comment was rumored to have been spoken by a government official, and when that happens, rumors tend to have some basis in fact!

Coleene Davidson

Sioux Honey Response

We in Sioux Honey know that the service rendered to our members and to the honey industry by our marketing cooperative is, and has been, important for all concerned. As such it is gratifying to read *The Wise Guy* from your May issue.

Our management team, led by Gary Evans, our President, is very skilled in their operations and, as you have observed, conduct the business of Sioux Honey with a high degree of ethics and honesty.

I feel fortunate to be a member of this organization.

Thanks for your very positive comments about our company.

L. John Milam
Chairman of the Board
Sioux Honey Association

Mellifera or Mellifica?

Richard Bonney, in the April 1999 *Bee Culture,* wondered why (and when) the scientific name for the honey bee was changed from *Apis mellifica* to *Apis mellifera.*

The answer is a long time ago, but in fact the change happened in the opposite direction.

The correct name is *Apis mellifera*, which means 'honey bearing bee.' The name was given by Carl Linnaeus, the father of taxonomy (the science of classifying organisms). It appeared in the 10th edition of his famous book *Systema naturae,* which appeared in 1758. That's an important date.

Later Linnaeus changed the name to the more accurate *Apis mellifica*, which as Richard points out means 'honey making bee.' But there's a set of international rules governing scientific names for organisms, under which 1758 is the date under which properly applied names cannot be changed. So while the name isn't the most accurate, the later change can't be accepted.

This information comes from H.A. Dade's book *The anatomy and dissection of the honey bee,* published by the International Bee Research Association. Dade comments that "Linnaeus had his second thoughts too late from this point of view."

Andrew Matheson
Wellington, New Zealand

Thanks!

Thanks for a great magazine and Catch The Buzz web page. I'm one of those new beekeepers that started a new business in 1998. Money is tight right now so being able to read *Bee Culture* on the computer is an asset to the bee business. I'm sure I speak for all of us new businessmen who are a little short of money right now. All of the information you provide is priceless and welcomed. When I'm successful I will be a subscriber. Thanks for the morning newsletters.

Ennis Salter
Mt. Shasta Honey Farms

Let's Hear It For Mac

In the article discussing Y2K problems, Kim talks about the potential problems on an old Mac. As I understand it, this is not a big issue in the Apple world. When Apple first designed the Mac, they used four digit years in the operating system. So the Mac has been 2000 compliant since it's inception. Another design kudo for Apple. My 64K Mac (the original Mac) is still being used occasionally at my house as a MIDI interface for my piano keyboard. It can play, record, and edit my keystrokes today just as well as 15 years ago.

Evan Twombly
Bonney Lake, WA

Continued on Next Page

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Africanized Concerns

I am a subscriber . . . also a keeper of five hobby hives. I haven't noticed many articles on this subject. I live in the mountains of San Diego County, where Africanized bees are known to exist. Recently one of our hives became extremely aggressive as my partner and I performed routine inspections. This occurred several times over several weeks. We had trouble introducing a new queen this year and think that this hive ended up raising a queen of their own. We ended up making the decision to exterminate the hive as we had great concerns over the safety factor especially regarding innocent passersby. Do you have any other similar accounts from readers, if so how did they deal with the situation. Is there a known way to positively determine if the hive was truly Africanized? We are sad to lose this great number of bees and the lost effort in preparing them for the honey season. Any information on this subject would be appreciated.

Ken Wright

Editor's Note: *Marked queens are the first step in good ID techniques.*

Loves *Bee Culture*

I just want to tell you how much I love *Bee Culture*. This is my first year in beekeeping and my first time with any bee magazine. I will be sure to subscribe to you next year. I like your magazine's "how to" articles best. I am talking about how you have ways to prevent swarming, make splits, etc. I also like the *Bee Culture's Beeyard* articles. The articles about other beekeepers I like best are the ones about the Adees. That is a lot of hives to manage and there has to be short cuts. I like reading about the short cuts.

P.D.

Academia?

I have just read Mark Winston's article "Scholars" (*Bee Culture*, June 1999) for the second time and am wondering why it appears in a bee magazine, rather than an educational journal.

Mr. Winston does not mention bees, and not until the sixth and final column does he mention "beekeepers," when he tries to compare the beekeeper profession to a professor's. But then he concedes that those professions "differ most profoundly." I didn't get his reasoning for mentioning beekeeping. Why was his dissertation published? Was it because he is program director of Apimondia 1999? Is *Bee Culture* turning into a voice for academia? Maybe your publication had a slow news month and used the "Scholars" article as an unrelated filler!

Fred Fulton
Montgomery, AL

Make It Easier

Every year those 70-80 pound deeps seem to get heavier. Setting them down on, and lifting them up from inverted top covers on the ground gets harder as I get older. So I bought a couple of folding camp stools with the folding canvass tops for $7 apiece. I take an extra hive cover to my small apiary and invert it and the hive's top cover on the two stools, one to hold the stack of honey supers and one to hold the top brood chamber, allowing inspection of both deeps separated. Saves a lot of bending and lifting, and an aging lower back.

Bob Smith
Perrysburg, OH

Queen Quantity vs. Quality

I am 50 now and got my first hive at 5 years old from my grandmother. We only had a few diseases and no pests to deal with then. I have run 5 to 500 colonies during this period, always as a HOBBY? 15 years ago my wife and I started collecting colonies again and got to 400 again over the next few years. I run a large computer network for Alcon Labs - part of Nestle's Corp and we really spend long weekends and most extra vacation time keeping the bees going. She works for Baxter Health Care.

Then the mites hit and we went from 400+ down to 80 hives in just one Winter. We stacked the equipment until our arms ached, but it did give us more free time that winter to consider if we wanted to continue.

We used no treatments for either mite at that time, but we had not hit the external mite then either. We got back up to 250 by a lot of splits that Summer and went down again to about 125 that following winter. Remember, we only do this on weekends and only for the fun of it so we were not driven to medicate our bees...that is until the *Varroa* appeared. We were up to a steady 200 then and lost 80 that September in about a 3 week period. One week they were 20 frames of bees and the next they were a cup between two frames! Well, we bought strips, obviously too late that year and were back down to 100 or less. We finally got to the point where if we treated for the *Varroa* we could keep 300 hives going with no problem.

Then came the big one, we decided to go for 400 again, and requeen a lot of our hives at the same time. Until then we simply pulled several frames of bees into empty equipment and allowed the bees to raise their own queen. We purchased queens of excellent quality and background from several breeders and made some magnificent splits that year! My back is still sore from the lifting of honey that year as El Niño had hit here big time. That Fall as we did in the Spring, we placed strips as soon as we pulled all the honey. By December all but 8 of the almost 200 queens we bought that summer were dead! They had produced an excellent crop and stayed neck to neck with each other and were treated the same as our other hives. We never went back and pulled the queen cages from those hives as it was too much just to keep adding boxes and pulling the honey so we knew exactly who had the new purchased queens. We lost 3 of our other hives with old stock queens. We did the same exercise that next Spring - last year, and had the same results, those hives

MAILBOX

headed by purchased queens died like proverbial flies! The ones who didn't die crashed as they went into the Spring and would have died off if we had not been able to pull liberal amounts of bees from our other hives.

Well, after sitting down and putting all the pieces together we realized that while the queens we purchased were of excellent quality, they had been kept medicated from head to foot and once it ended, they did not last long. We know that the breeders have to use treatments to get the maximum from their queens, but I think they are adding to the susceptibly to problems by never watching to see which hives do better without help. I have read the recent articles about Mr. Adee and I at first thought how well his bees must be progressing, using the best of his stock to raise his cells and make splits from, but is he maintaining them through Menthol and formic?

I don't expect the large breeders and beekeepers to make it on the methods we use – we do it for fun and I'm happy if they pay for the gas and the vehicles, but how are we ever going to get over the crunch if someone doesn't bite the bullet and let the weaker bees die out and use the survivors for new stock? My son, who is 21 recently decided he liked working the bees more than going to college and wants to go to 600 hives this summer and 1000 next. I have shown him how to produce queens from the best stock and am hoping he can do it without purchasing outside queens. If we have to buy queens, how can I know who to buy from that has any resistance to the mites? Everyone claims it, but who has it? Any thoughts on how to proceed without going backwards everytime we buy queens?

Bob Johnson & Lydia Johnson
Whittier, CA.

Editor's Note: *Legitimate resistance is available in this business, but it generally is specific to breed, or breeder. If your bees produce honey, and live you're doing it right.*

Thank You!!!

My name is Rose Morris and I have been The Wilbanks Apiaries, Inc. secretary for the last five years. This job has given me more pleasure than any position I have ever held and although there comes a time in each of our lives when we have to make changes a piece of my heart will remain "in the bees."

Before leaving Wilbanks I wish to take the opportunity to thank the people that have made my work such an enjoyable experience. First and foremost I wish to thank the entire Wilbanks family for the opportunity to be a part of their operation. Their dedication to the bee industry is something that has been an inspiration to me to learn as much as possible about the hardships facing this industry and the strength that it takes in the family unit to make this business what it is. Reg, Alva, Tim & Patrick Wilbanks have been great to work for and with and their friendship past the employment status will always be valued. Mr. Warren and Mrs. Vernelle Wilbanks have not only taken the time to teach me the little things but their example of FAITH has been a life lesson I will not forget.

I may answer the phone, take the orders and schedule the shipping, but what makes "Bee Season" possible is the men and women who ***work the bees.*** Dennis Oliver has been employed by Wilbanks Apiaries for close to 28 years. He is what is considered the "Queen man." His firm belief in educating yourself for the job you have taken made me read every book in Reg's office so I wouldn't sound "bee-ignorant" when I had to answer a call. Dennis' dedication is something rarely found in this day and time. Mark Griffin, Michael Griffin, Jeff Griffin and Wayne Waters form what consists of the regular crew. I wish that people who were considering keeping bees would come and see the hard work, effort and time that these men put into keeping the Wilbanks' standard of quality. They sacrifice more than just time to keep the mass confusion of "Bee Season" on schedule. Their support of me during the learning process and everyday after has been a blessing—they are not just coworkers, they are my friends. I wish I could thank each one of our seasonal staff by name, but it would take more room in the *Bee Culture* than they may want me to have. I have truly made friends all over the world.

The next ladies on my list to thank are those ladies who share customers, time, tears and laughter with me from Betterbee, Inc. and Brushy Mountain Bee Farm. If we published our experiences and stories I firmly believe we could retire comfortably from the revenues and I still think that the **Bee Secretaries Union** is not a bad idea ladies!

My customers are on my list but I will miss them the most. A heartfelt thank you to all of you who understood that honey bees do not always cooperate by our timetable and neither does Mother Nature. You folks have been wonderful to work for and with and your faithfulness in returning to the Wilbanks Apiaries, Inc. year after year is appreciated more than you know and in no way just by me. The Wilbanks family knows that they rely on your business and in return I can tell you from personal experience that they go above and beyond to give you the quality product that not only you expect but deserve.

Lastly, a thanks to *Bee Culture* magazine for allowing me this space and for their attempt to shed some light on the hard work and dedication that it takes to make bee keeping a success.

Thank you and God bless you all!

Rose Marie Morris
Claxton, GA

Apimondia 1999

The best beekeeping congress ever to take place in North America will soon occur. Apimondia'99 will be held from 12-17 September, 1999, just one hour north of the U.S. border in Vancouver, British Columbia. The scale of Apimondia'99 will surpass

Continued on Next Page

MAILBOX

that of any beekeeping convention you have attended previously. More than 450 papers have been accepted for presentation at Apimondia'99 by beekeepers and researchers from throughout the world. The associated trade show, ApiExpo99, fills a room two times the size of a football field, making it the largest beekeeping trade show ever to be held.

Why is the National Honey Board (US) sponsoring a plenary session? Why is the American Bee Research Conference a part of the Apimondia'99 program? Why have beekeepers from dozens of countries booked flights to Vancouver? Because there will be so many opportunities to interface with people in all aspects of the beekeeping industry. Participants will have opportunities to meet world renowned researchers after hearing their presentations, discuss management issues with beekeepers from every part of the globe, and view products never before displayed in North America. All of this is set in a world-class convention centre overlooking Vancouver Harbour and the mountains beyond.

I have always been impressed by the cleanliness and safety of Vancouver. That along with the wide variety of tourist opportunities were important in our selection of Vancouver as the site of the congress. Remember: your money goes further in Canada because the US dollar is worth almost $1.50 Canadian.

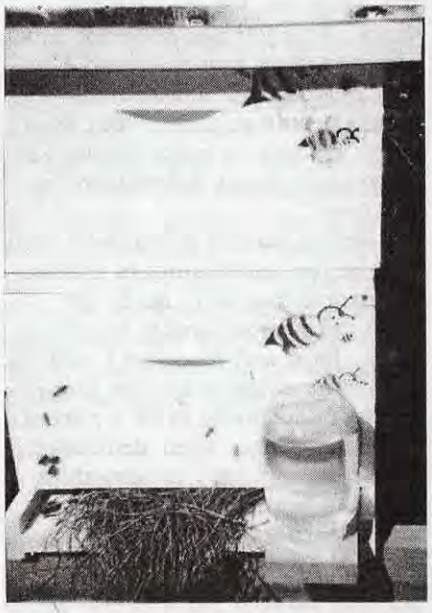
You can find out more about Apimondia'99 from our website: www.apimondia99.ca. Or contact Venue West Conference Services today to receive a registration package (Tel: 604-681-5226; Fax: 604-681-2503; e-mail: congress@venuewest.com). I hope to see you there.

Dr. Gard W. Otis
University of Guelph
Guelph, Ontario, Canada

Comforts of Home

Before Ranny Randolph, member of the Tidewater Beekeepers Association in Virginia Beach, VA, introduced his packaged bees to their new home, his wife, Jean Marie, decided to paint a family of "greeters" at the front entrance.

Floyd Watkins
Tidewater Beekeepers Association



Attention!

The October issue will be mailed approximately one week later than normal to accommodate the latest information available from the Apimondia meetings. Please be patient, and get the absolute latest in beekeeping information.

THE WISE GUY

I may sound like the ghost of a past article but they tell me you need to hear something seven times for it to sink into your brain. We need to be reminded over and over about things that work and ideas that are good. My one thing for you to remember is floral source. Know where your honey comes from and make sure you separate the floral sources.

One of our biggest problems in the honey business is the common use of the barrel. They are large, 55 gallons, so when you store them empty they take a lot of room, and when you store them full they take up more room because you store them on end rather than stacking them. Also, you need a loading dock or a lift vehicle to move them to a larger vehicle to haul away. But the biggest problem we have is they are just a big container! We all feel that a small amount of darker honey won't affect that white honey in that large container. So we empty that holding tank into that drum and now we have lowered our standards. In effect, we are like a packer where we take an inferior product (foreign honey), and mix it with a superior product (U.S. honey).

My point is we need to grade and sell our honey based on floral source, and not color. What does color have to do with anything here? We should be selling taste and pleasure – not color. If you look at the coffee industry, they no longer sell caffeine or no caffeine, they sell flavor. They used to sell color of cans and name recognition, like Hills Brothers, Folgers, and Butternut. When I was young, 25 cents would buy you the best cup of coffee in town. Now $3.00 is a reasonable price for a cup of flavored coffee. Look around you, the hottest products today are coffee and water.

If you told me 15 years ago people would be buying bottled water to drink at $2.00 per bottle, while soda pop was $1.00, I would have told you that you were nuts. The water people have done much the same as the coffee people to make their product distinct. Make it something the consumer wants. Make people want your product because it was filtered through granite rocks in the Ozark Mountains of Missouri where Harry Truman once roamed.

The people that market our product try to base it on price, and everything is promoted . . . as honey. We get only a generic term, honey, which does not reflect the quality of the honey in their jar. If they did in many cases it would have to be about some South American term or Chinese term because that seems to be the source of their honey. We must get away from mine is a nickel less!

That leads me all the way back to – if you don't market your product to the public *you* will face the same problem in the future that you face today. Low prices!! Our marketing arm (packers) uses price as their big lever with the public. Their labels look much like they did years ago, and the only reason they went to a different container was cost – not because the product looked better.

Folks, be a leader don't be a follower. Go out into the world and sell your product. Know what floral source your honey is and when that store owner says, "I can buy from this fellow for 15 cents per pound less", then explain why yours is 50 cents better than anyone else's! Find that market that wants your honey. Don't sell to someone only on price. If price is the only issue, then you win on price and loose on price. When that person you are selling to says all honey is the same, that is him saying, tell me why yours is better. Don't let an objection be unanswered.

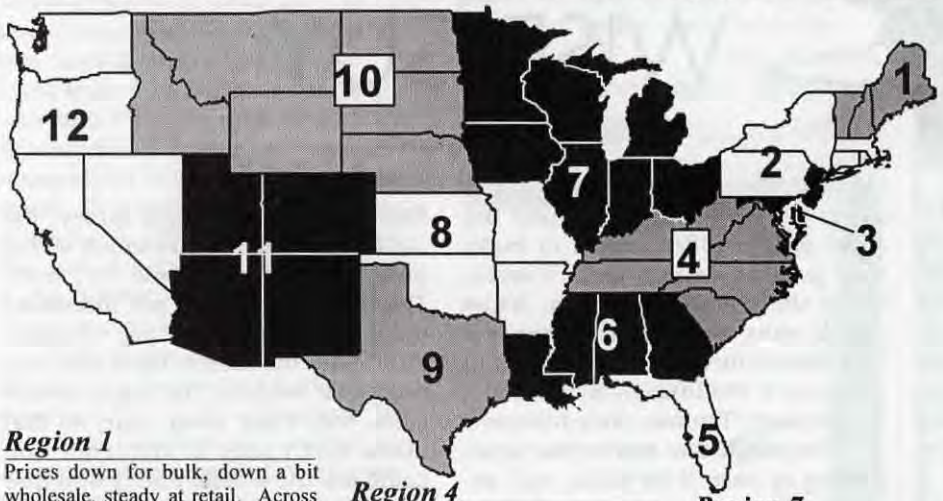
All honey is not the same and the public needs to know that. Do not accept that as a reason - do not sell *honey* to someone. Promote your product as well as yourself. One thing that worked great for me was when trying to sell a Health Food Store and Bakery some honey, the manager asked me how much of this product I had and I said very little. The manager seemed not interested until I let him taste the product, plus I said the reason there was very little was because the floral source came only every other year; so that made this honey in demand. You could see the wheels rolling and now we sell all of that floral source honey to them and they make a big deal about it in bread sales and bulk honey sales, and get more per pound than generic honey.

Go out and try to sell your product! If you don't you know exactly how much you will sell! Don't be afraid of a "No"! The more "no's" you get, the more "Yes's" you will get.

One last request, Honey Producers are asking the government to purchase 10,000,000 pounds of honey to be put into the public school system. The thought is get young people in this country to try our product. Then they become users of honey. The Packers in this country have written a letter of protest saying that they sell to schools and it would take away their market. I have called *200 school districts and public universities* and I found only one university that buys honey. Would *you* make an effort to call the school districts in your area and ask them to report back to this magazine in care of me? I would appreciate it. BC

Wise Guy

AUGUST – REGIONAL HONEY PRICE REPORT



Region 1

Prices down for bulk, down a bit wholesale, steady at retail. Across the board reporters don't belong to National groups, support the tariff on Argentina honey, half produce more than 6000 lbs., support the referendum and are having an average crop.

Region 2

Pail prices down, barrels steady, wholesale up and retail steady. Two-thirds of reporters belong to a National group, all support a tariff, 2/3's produce 6000 lbs. or more and 2/3's support the referendum and the crop is average to better.

Region 3

Prices down for pails and bulk, steady for wholesale and retail. Half of reporters belong to a National group, all support the tariff, half produce more than 6000 lbs., all support the referendum and the crop is average to good.

Region 4

Bulk prices down a bit, but pails, wholesale and retail steady. Two-thirds belong to a National group, all support the tariff, 1/3 produce more than 6000 lbs., half support the referendum and an only average crop expected.

Region 5

Pail and bulk prices down, wholesale and retail up. Across the board reporters belong to a National group, support the tariff, produce more than 6000 lbs., support the referendum and predict an average or less season.

Region 6

Pail and bulk prices down, wholesale and retail inching up a bit. Two-thirds don't belong to a National group, all support the tariff, 2/3's produce more than 6000 lbs., none support the referendum and a below average crop is predicted.

Region 7

Prices down for pails and bulk, up wholesale and steady retail. Two-thirds of the reporters do not belong to a National group, 100% support the tariff, half produce more than 6000 lbs., about 10% do not support the referendum, and a pretty good crop is expected.

Region 8

Prices steady for bulk, pails and wholesale, but up a bit for retail. Half belong to a National group, 75% support the Argentina tariff, half produce more than 6000 lbs./year, the other half, interestingly, supports the NHB referendum, and it looks to be an average crop.

Region 9

Prices steady to inching up a bit, a little bit at all levels. Just over half belong to a National group, all support the tariff, over half produce 6000 lbs. or more, 75% support the NHB referendum and it looks like an average crop.

Region 10

Prices steady for pails and retail, down for bulk and wholesale. Reporters across the board belong to a National group, support the tariff and the referendum, produce 6000 + lbs. And it will be a pretty good crop.

Region 11

Prices up for pails, barrels and wholesale, steady at retail. Reporters are a carbon copy of region 10 in support, size and crop predictions.

Region 12

Prices up for everything but barrels, which are steady. Strong support for the tariff, the referendum, National groups and an average crop overall, but very, very spotty.

Survey Results

We surveyed our honey reporters this month about current topics, and sorted out their responses by region. Overall, 46% do not belong to either the AHPA or the ABF. Only 6% do not support the proposed tariff on Argentine honey. 48% produce less than 6,000 lbs. of honey/year, and 33% of all reporters do not support the proposed NHB referendum.

	Reporting Regions												Summary		History	
	1	2	3	4	5	6	7	8	9	10	11	12			Last	Last
Extracted honey sold bulk to Packers or Processors													**Range**	**Avg.**	**Month**	**Yr.**
Wholesale Bulk																
60# Light (retail)	69.74	68.75	59.50	70.25	84.20	60.00	62.00	61.25	93.75	62.00	100.00	72.00	42.00-140.00	70.59	71.03	67.55
60# Amber (retail)	67.13	59.15	56.50	68.67	77.54	57.00	62.14	77.54	93.33	62.00	90.00	72.00	39.00-125.00	68.63	67.76	64.24
55 gal. Light	0.57	0.60	0.60	0.65	0.57	0.52	0.60	0.67	0.70	0.58	0.65	0.65	0.42-0.75	0.68	0.61	0.73
55 gal. Amber	0.57	0.58	0.56	0.56	0.63	0.57	0.58	0.60	0.61	0.56	0.60	0.62	0.39-0.70	0.68	0.57	0.71
Wholesale - Case Lots																
1/2# 24's	27.81	29.85	29.48	31.45	24.00	25.00	30.32	29.48	30.00	29.48	22.00	29.48	22.00-37.20	29.23	29.91	29.11
1# 24's	41.78	39.83	46.80	45.96	48.00	41.00	43.27	39.92	44.70	43.50	38.00	46.80	27.00-54.00	43.04	43.04	43.09
2# 12's	38.50	39.07	45.60	45.79	43.20	36.60	39.25	40.20	39.82	36.00	32.00	42.00	29.40-52.58	39.66	38.74	37.39
12 oz. Plas. 24's	34.98	37.06	43.20	33.34	38.48	32.80	37.07	34.74	36.60	38.40	38.00	37.20	19.20-48.00	36.06	36.57	35.44
5# 6's	40.98	45.39	54.00	44.75	46.54	46.54	38.12	39.00	44.10	37.50	39.00	40.50	30.00-67.50	42.13	41.99	41.22
Retail Honey Prices																
1/2#	1.87	1.61	2.83	2.17	1.50	1.64	1.87	1.74	2.50	1.59	3.00	1.85	1.35-3.69	1.90	1.86	1.76
12 oz. Plastic	2.22	2.19	2.75	2.04	2.00	2.00	2.30	2.12	2.57	2.36	3.20	2.13	1.39-3.60	2.27	2.26	2.22
1 lb. Glass	2.81	2.38	2.95	3.20	3.00	2.61	2.99	2.61	3.02	2.55	3.25	2.98	1.58-5.89	2.84	2.69	2.67
2 lb. Glass	4.55	4.39	4.80	5.76	5.00	4.70	4.37	4.63	4.79	4.02	4.80	5.00	3.00-6.00	4.69	4.55	4.42
3 lb. Glass	6.57	6.46	7.50	7.13	7.57	5.43	7.37	6.43	6.67	5.77	6.60	6.05	4.00-12.00	6.70	6.32	6.08
4 lb. Glass	7.55	7.29	8.28	8.80	8.28	10.25	8.31	8.28	7.00	8.28	8.28	8.28	6.50-10.25	8.08	7.72	7.74
5 lb. Glass	10.46	9.54	11.00	10.44	15.36	11.20	11.16	10.99	8.75	7.90	11.10	9.25	7.79-28.00	10.28	9.37	9.06
1# Cream	3.36	3.49	3.73	3.65	3.73	2.75	3.15	3.22	5.50	4.78	4.25	3.20	2.25-5.50	3.45	3.25	3.13
1# Comb	4.11	4.08	3.50	4.31	4.08	4.00	4.00	3.00	5.50	4.08	6.00	5.00	1.95-6.00	4.30	4.23	4.19
Round Plastic	3.68	3.11	3.50	3.96	3.94	3.94	3.49	3.83	5.50	3.94	4.25	4.13	2.00-6.00	3.82	3.76	3.86
Wax (Light)	1.48	1.96	1.38	1.50	1.35	1.80	1.18	1.25	2.00	1.40	1.50	2.00	1.00-3.00	2.54	1.68	3.04
Wax (Dark)	1.18	1.41	1.18	1.25	1.39	1.48	1.13	1.00	1.00	1.30	1.25	1.50	0.90-2.95	2.27	1.77	2.62
Poll. Fee/Col.	35.47	39.50	31.00	35.00	20.00	37.50	35.43	40.00	20.00	37.18	52.00	35.50	20.00-55.00	36.55	37.16	34.03

Mark Winston

Endless, endless questions

"We too often focus on the "How" questions in research, without understanding the underlying "Why" issues."

I work in a milieu of questions, mostly ones we ask of and about the bees. Queries bounce across the laboratory lunch table, of the "What if, Suppose we tried to, How about" variety, drawn from observations my students have made about bee behavior, suggestions by beekeepers for a disease treatment, or something we read in a recent journal article. The questions then get more rigorous as we design experiments, analyze data, interpret results, and eventually write an article with some answers, but invariably conclude with "More research is needed . . . ." The questions don't end, they just move on to the next stage.

There are other questions, however, that filter in from outside the academic and beekeeping communities. These questions are drawn from a public fascination with bees, fear about stings, curiosity about apitherapy, or simply reaction to the latest media blurb. People are interested in bees, but the public's issues are not always the same as ours. While Joe Public can be briefly stimulated to share our concerns about *Varroa* mites, colony shortages and trade issues, his interests lie in different directions, and in other questions.

For instance: I've done lots of bee beards, putting a few on myself, but hanging quite a few more on other people, usually with some media around taking pictures. I do it because I think it's good publicity for our community, and can be used to bring attention to beekeeping issues as well as accustom the public to seeing bees in non-threatening poses. What could be more user-friendly than thousands of cuddly bees walking around on the face of a cute beekeeper, like myself, for instance? Yet, friends, neighbors and even total strangers who see my face, covered with bees in the paper or on television never ask me about the issues I wanted to get across. No, the public's interest lies elsewhere, in two questions of overriding importance: "How do you get the bees off?", and "Don't the bees get caught in your beard?" Rarely, I get asked whether I got stung or not, but the important issues I'd hoped to emphasize almost never see the light of day.

Another set of questions revolves around stings. Experienced beekeepers don't think too much about stings. We get them, pull them out, and carry on. For a non-beekeeper, a sting is a life event, to be recounted years afterward, embellished with each telling until it reaches the mythical. It's amazing how an adult can reflect back to remember every detail of a childhood sting:

"I was standing with my best friend Alice; she and I used to go to the Dairy Queen down the street during the summer, you know, the one that used to be on Sixth Street but then moved to Queens Avenue. Anyway, we had just bought our cones and were hanging around having the first bites. I remember because it was hot that day, and we had just had a thunderstorm, and we were on our way to play on the swings, but just before we left I felt something under my shirtsleeve. I was wearing my favorite Mickey Mouse T-shirt that day from our family trip to Disneyland the year before, the time we took Grandma on Space Mountain and she just about had a fit. So I absentmindedly brushed at the tickly spot when suddenly I got stung . . . ."

Never mind that it was probably a wasp and not a bee, and that to you and me, the Travis Tritt country music song is our unspoken reaction (You know the one, "Here's a Quarter, Call Someone Who Cares"). I had tuned out the story shortly after the Dairy Queen, but tucked in between the sting rambles can be interesting questions from a naïve perspective that bring a new angle to our blasé attitudes about stings and stinging. For instance, I often get asked "Why do bees sting?", or "I heard that bees die after they sting. Why?" We too often focus on the "How" questions in research, without understanding the underlying "Why" issues, and if we pay attention, these public intrusions into our assumptions can divert our thinking channels from the mundane to the more fundamental.

Honey is another source of endless queries from civilians, once they find out I'm a beekeeper. These questions reveal weaknesses in honey marketing and presentation that should be strong hints about where our advertising and public information campaigns need to focus. One common comment about honey is "What's wrong when it crystallizes?" All honeys, of course, will

Continued on Next Page

"If we pay attention to what's behind these questions, we can see research directions we hadn't considered."

crystallize eventually, and can be reliquefied by gentle heating, but few customers seem to know that, or believe it. Consumers treat crystallization as a defect, and we don't seem to have made much headway on that particular question.

Another common question is "Why are honeys different colors?" Marketing of unifloral honey is an excellent sales tool, but many customers still don't get where honey comes from, or that it gets its characteristics from different nectars collected from various flowers. Or is it that we've been too accepting of the imposter honeys on too many supermarket shelves, labeled as from a unifloral source but obviously a blend? How are consumers to realize that fireweed honey is unique, for example, if fireweed honeys on the shelves come in every color and texture under the rainbow due to mislabeling by beekeepers? These public questions about honey should ring some bells for us, since consumer queries will reflect sales trends at the end of the day.

Health aspects of honey are another public concern. Pasteurization of honey comes up frequently. When customers come to my laboratory to buy our private-labeled Heavenly Honey, they often ask "Is your honey pasteurized?" It then takes a long-winded discussion to convince them that heating honey drives off the flavors and aromas that make our honey such a valued commodity, and that pasteurization of honey is not needed, and is not done by most packers anymore. Fortunately, I don't get the botulism questions anymore, but those are just a news report away.

Another genre of questions that come in, usually by phone following a media interview on some completely different subject, are apitherapy queries. I actually know very little about this subject, and am always surprised that these callers assume that anyone involved with bees is intimately acquainted with apitherapy. The calls come in waves, changing each year according to the latest subculture health articles in the self-help press. For a while, I couldn't understand why I was receiving so many calls about eating pollen, until someone showed me an article in the local alternative press about how eating pollen can cure allergies. In the last year or two, I've gotten many calls about using bee stings for multiple sclerosis patients, undoubtedly because this treatment has swept through the natural health grapevine lately.

A final set of public queries are in the "killer bee" range. These are the hardest to deal with, because they rarely even approach fact, and the Hollywood movie/television cartel is hard to compete with. My favorite calls are in the "I found a killer bee in my garage, what should I do?" line, since the closest KB is about 1,500 miles south of here. And it really doesn't matter what you say to the KB questions; media influence in this area is so pervasive that our reality check responses just don't register. When you've seen killer bees take over a town in California on TV, destroy a Texas nuclear weapons base in the movies, or mobilize the entire U.S. armed forces in a book, it's a bit tough to counter with "Africanized bees are a race of honey bee imported from Africa that are slightly more aggressive than the bees we're used to here . . . ."

There's another type of response I get when bees come up, and it's more memory than question. Most people remember someone they are related to or knew when they were children who kept bees, usually connected with the old days and the family farm. Memories of rural lifestyles run deep and long, beyond "I remember" to "My grandmother used to tell me about . . ." These stories involve a gentle, elderly, bearded guy with few teeth left, who always had some candy in his pocket for the kids. He would bring the grandchildren, nieces and nephews out behind the barn where the bees were kept, and after smoking the heck out of them would reach in and bring out a piece of honeycomb, bees brushed off, for the kids to eat. These are powerful stories, touching a lode of connection with our farming past that make beekeeping a profession to admire, and bees a link with nature past.

All of these public questions and memories about bees illuminate the folkloric power these little insects hold in people's lives. There's word out on the street about bees, and it may not be the same rhythm that we hear. Yet, questions from unexpected angles often are where the best ideas come from. If we pay attention to what's behind these questions, we can see research directions we hadn't considered, marketing strategies we should employ, and media angles we might pursue. The public may be on a different wavelength, but perhaps we should tune in. BC

Mark Winston is a professor and researcher at Simon Fraser University, Burnaby, B.C. Canada. He is program director for Apimondia 1999.

? DO YOU KNOW ?

Honey Flows

Clarence Collison
Mississippi State University

Recently we made a trip to the northeast and traveling through Virginia and Pennsylvania we admired the beautiful mountainsides with large patches of blooming black locust and wild cherry. The weather was beautiful so I assume the beekeepers in those areas were experiencing an excellent late spring honey flow. In keeping with that theme I decided to devote the column this month to factors that affect honey flows and the bees behavior in collecting the nectar and pollen that is available to them. How well do you understand the factors that impact honey flows and honey production?

Please take a few minutes and answer the following questions to determine how well you understand these important topics.

The first nine 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. ___ When field bees return to the hive with a load of nectar, they empty the contents of their honey stomach directly into open cells containing partially ripened honey.
2. ___ Foragers from a hive normally forage at the nearest, most profitable floral sources.
3. ___ Pollen collectors normally make less foraging trips per day in comparison to those collecting nectar.
4. ___ A colony with 60,000 bees will make more than twice as much honey as will two colonies each of which has 30,000 bees.
5. ___ Honey bee workers forage for food according to their own needs.
6. ___ The intensity of dancing in the hive is related to the quality and quantity of the food source.
7. ___ Some individual foragers learn to work two species of flowers at different times of the day as pollen and or nectar become available.
8. ___ Colony flight patterns change as floral sources change.
9. ___ Bees are able to locate the sun on a fully overcast day.

(Multiple Choice Questions, 1 point each).

10. ___ The enzyme that is involved in the ripening of honey is:
    A. Invertase
    B. Glucase
    C. Fructase
    D. Diastase
    E. Sucrase

11. ___ Foraging for either nectar or pollen generally does not begin until the temperature reaches:
    A. 70-74° F
    B. 50-54° F
    C. 64-68° F
    D. 45-49° F E. 54-58° F

12. ___ Workers as they forage choose which pollens to collect based on pollen _____.
    A. Moisture content
    B. Nutritive value
    C. Age
    D. Odor and physical configuration of the pollen grains
    E. Color

13. Please explain how you can tell when honey is fully ripened. (1 point)
14. Please describe three instances when worker honey bees fan their wings. (3 points)
15. Name two situations when you will observe a flying frenzy around the hive entrance. (2 points).
16. Name two materials that honey bee foragers carry back to the hive internally. (2 points).
17. Name two senses used by the honey bee to find its way through a changing environment while foraging away from the hive. (2 points).
18. Various floral characteristics are used by foraging honey bees in distinguishing between floral species. Please rank the following characteristics in order of importance with 1 being most important and 3 least important in discriminating between flowers. (3 points).
    ___ Shape or floral pattern
    ___ Odor or fragrance
    ___ Color markings

ANSWERS ON PAGE 48

Roger Morse

Research Review

"Some of the natural chemicals we know best and often use in our gardens are nicotine, rotenone and pyrethrins."

Many people believe that following Mother Nature's methods is best. While I don't agree completely with this thought, I do agree there are many natural products that are useful, especially in the control of some honey bee pests. I have a favorite book I use from time to time that has a self-explanatory title, *Handbook of Plants with Pest-Control Properties.* While it was published 11 years ago, it is still an excellent reference for those who want to study natural control, and I thought it timely to review its contents.

Plant pest control is a vast but still simple subject. Plants can't run and hide from their enemies as animals usually can. As a result, many plants became, through evolution, chemical factories making a great variety of products that could kill, stun, and/or repel enemies. Some of the natural chemicals we know best and often use in our gardens are nicotine, rotenone and pyrethrins.

This book catalogs and gives references for about 2,400 plant species that have, or have been suggested to have, chemicals that may be used for pest control. Sometimes it is the whole plant that contains the substance, while in other cases it is the leaves, flowers, roots or fruit that have the maximum amount of the toxic material. Page 1 of the book lists 41 plants that exhibit broad-spectrum pest control properties. These are what the authors call the "cream of the crop," that is, the plants that are best known for their pest-control properties. The list includes the neem tree, black pepper, castor bean, tobacco, two marigolds, hellebore and ginger. All of these plants are known to contain one or more chemicals that have been effective, under at least some circumstances, in controlling a pest.

The first section of the book, nearly 300 pages, lists those plants about which we have at least some information regarding their pest-controlling ability. Information about the type of plant, where it grows best, and whether it is an annual or perennial is given. There is also information about the effective life of the toxic part of the plant, how it is extracted, stored, and used. References are cited, and the bibliography contains 1,398 references.

Over 80 pages of the text are devoted to listing pests and plants that control them. This includes a little over a page listing mites and ticks which some plant has been effective in controlling. Since the book was published about the time the two bee mite species were found in the United States, there is no mention of them, though I am certain several plant toxicants were investigated in Europe in regards to tracheal mite control in the 1920s and 1930s.

I recommend this book as a good starting place for those who would like to learn more about plants and the toxic properties some of them exhibit. I presume it is out of print and is not available from the publisher, but you should be able to borrow it from any one of several agricultural-type libraries. There is no question that many of our modern ideas about pest control came from nature itself.

Grainge, M. and S. Ahmed. *Handbook of Plants with Pest-Control Properties.* John Wiley and Sons, New York. 470 pages. 1988.

Role In Today's Market

Ropa (1999), a consultant for the National Honey Board, has a flowery report that states that consumers are increasingly buying foods that have a "natural" image. This appears to be a nationwide phenomenon. Foods with high fat levels are increasingly being shunned. We have all noticed how the number of foods with labels indicating they are cholesterol-free, cholesterol-reduced and/or fat-free or with low oil content is increasing. Ropa writes, "Honey, a product viewed by consumers as natural and healthful, possesses many functional characteristics that can improve the natural appeal of low-/no-fat baked goods." However, behind this image, Ropa continues, is a great deal of sound data and information supporting the fact that honey can improve the quality of many food products. In the paper I list below, he is concerned with baked goods.

Honey in bread & bagels

To support his claim that honey has these special qualities, Ropa cites work done at the University of Nebraska and at Colorado State University on bread and bagels respectively. In the Nebraska study, bread containing honey was as good as the control but had a desirable honey aroma and flavor. "The addition of honey can increase color changes, improve bread moisture, and add noticeable sweetness."

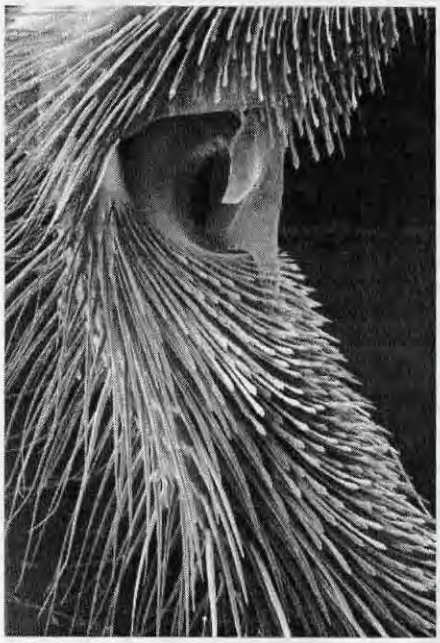
In the study on bagels, a $3 billion per year industry, it was found that honey adds sweetness to the final product as well as providing food for the yeast that was used. Taking the fat out of baked goods has appeal for many consumers but this may also reduce the product's taste. Ropa's theme is that honey can do much to restore this loss of flavor and taste appeal.

Ropa, D. J. The functional role of honey in baked goods. *Cereal Foods World 44: 140-142. 1999.*

A Leg Up . . .

L.A. Royce & B.A. Stringer

Legs in honey bees, as in other insects, have functions beyond just walking. Legs are also used in grooming, handling and carrying pollen and propolis, and hanging in festoons in the colony or swarm, as well as for tools in building or wax manipulation.

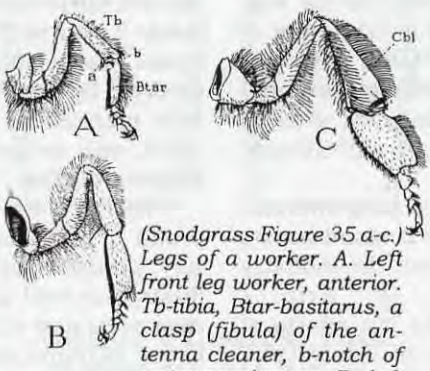


SEM honey bee leg I, antennal cleaner and comb x 100. The spurs on the end of the fourth segment of the first leg close over the notch at the top of the fifth segment. When the antenna is placed in the notch and the leg straightened, the antenna may be pulled through the comb to clean it. (Royce/Stringer photo)

All legs of the honey bee are not created equal: Each pair of legs is slightly differently adapted for specific functions. Because the two legs in a pair are mirror images of each other, it is helpful to view the six legs of the honey bee as three distinct pairs. Each leg has six parts, or segments, which are connected by movable joints. In order from the body of the bee to the "toes," these segments are known as the coxa, the trochanter, the femur, the tibia, the tarsus (which is divided into smaller parts) and the pretarsus or "foot" (on which are the claws and the pad).

SEM honey bee antennal comb x 160. The antennal comb is a specific adaptation of the leg joint designed for keeping the sensory antennae clean. (Royce/Stringer photo)

On the fourth joint of the first leg of the honey bee worker, queen and drone, there is an extraordinary structure. Formed by spurs at the base of the fourth segment and a notch in the fifth segment, the small hollow functions as an antennal comb. The antenna is placed in the notch, and when the leg is straightened, pulled through the opening formed by the spurs and notch, and so combing the antenna clean.



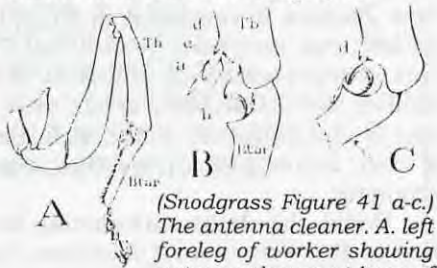
(Snodgrass Figure 35 a-c.) Legs of a worker. A. Left front leg worker, anterior. Tb-tibia, Btar-basitarus, a clasp (fibula) of the antenna cleaner, b-notch of antenna cleaner. B. left middle leg of worker, anterior. C. Left hind leg of worker, anterior (outer surface). Cbl-corbiculum (pollen basket).

SEM honey bee leg 1 comb x 500. The blunt hairs of the comb on leg 1 are used for cleaning pollen from the bee's antennae and head. (Royce/Stringer photo)

These structures are found throughout the Hymenoptera order but the most developed is that of the honey bee. It is a specific anatomical feature designed to clean the sensory antennae, upon which the insects are so dependent.

Just down the leg from the antennal cleaner, there are special hairs on the honey bee leg which act like a comb to clean pollen from the head. The honey bee regurgitates nectar onto these combs to moisten dry pollen grains caught on head and body hairs. The pollen becomes pasty when it is so moistened, making it easier for the bee to manipulate. BC

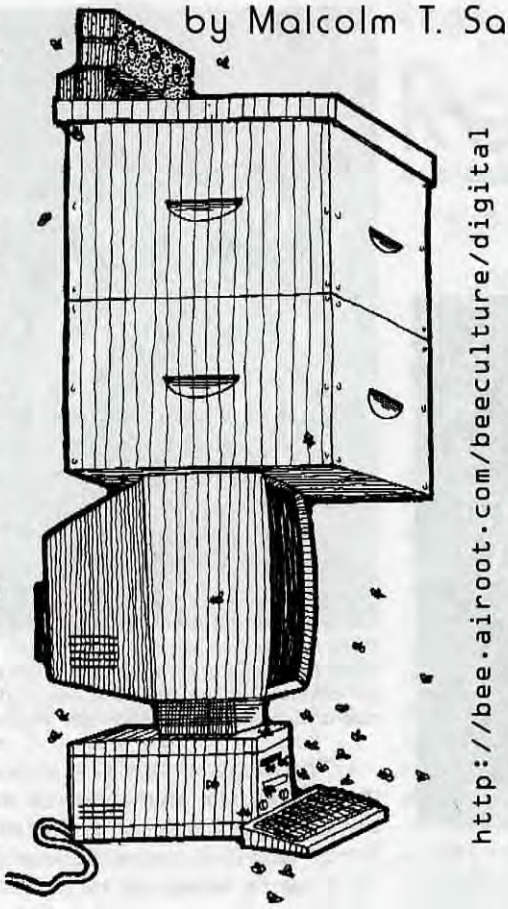
Bertie Stringer and Lynn Royce study honey bee plants, and honey bee legs all around their homes in Blodgett, OR.



(Snodgrass Figure 41 a-c.) The antenna cleaner. A. left foreleg of worker showing antenna cleaner at base of tarsus. B. Antenna cleaner open. C. Same, closed. Btar-basitarsus, Tb-tibia, a-closing lobe (fibula) of antenna cleaner, b-notch of antenna cleaner, c-anterior lobe of fibula, d-tibial process at base of fibula. Reprinted from R.E. Snodgrass: Anatomy of the Honey Bee. *Copyright © 1956 by Cornell University Press.*

Beekeeping In The Digital Age

by Malcolm T. Sanford



http://bee.airoot.com/beeculture/digital

New Zealand's Page

The rise of the Internet and World Wide Web is resulting in a much greater information flow about beekeeping activity around the world. This has been especially true for nations cut off from many parts of the globe by large oceans and great distances. New Zealand is one of these. Detailed information on New Zealand beekeeping is listed in the Apiservices database. Of the 3,500,000 inhabitants, 5,306 are beekeepers. They manage about 286,806 hives, producing 8610 tons of honey per year. Of the $48 million generated by beekeeping activity in the country, 58 percent comes from domestic honey sales, 18 percent from pollination, 16 percent from export honey and five percent from live or package bees. Many of the latter are imported by North American beekeepers. Pollination value of managed bees in New Zealand is estimated at $1,201,346,000 for vegetable, fruit and seed production. The lion's share of this is represented by Kiwifruit ($530,000,000) and Pipfruit ($411,000,000). Other more detailed information is also available on the Web. Beekeeping, thus, is a vital, active part of the New Zealand agricultural economy.

Unlike the chaos surrounding beekeeping information on the Web in other countries, New Zealand boasts a central site from which most data about the industry can be accessed. Its URL is http://www.beekeeping.co.nz/. This is due to the efforts of Nick Wallingford, employed at the Bay of Plenty Polytechnic College, where he teaches business administration. Nick sends an e-mail saying he has been involved in the apiculture field for 25 years, was part of the National Executive of the National Beekeepers' Association for 6 years, serving as National President for two years. Like many Web projects, this is a "e;labor of love,"e; done with little financial remuneration. The Bay of Plenty merits its name. It is a major tourist attraction, locally called "The Coast with the Most."

The New Zealand home page features a panoramic photo of a beekeeper surrounded by immaculately white colonies. Flanking this beeyard are snowcapped mountains and down the valley a view of the South Pacific. This view confirms the image many have that this verdant country remains a relative beekeeping paradise, principally because European foulbrood and the tracheal and *Varroa* mite are absent. At the top of the page, there is a weather forecast, currency converter (one New Zealand dollar equals U.S. $.053) and area euphemistically called rules of thumb. More will be said about this section later.

Under the photo is a link to the nectar and pollen plants of New Zealand, written by Andrew Matheson, former Apicultural Advisory Officer for MAF (Ministry of Agriculture and Fisheries) Advisory Services. This section is divided into Summer, Autumn/Early Winter, Winter/Early Spring, and Spring/Early Summer. It is important to realize that the seasons are reversed in New Zealand from those we are used to in the Northern hemisphere. The plants are categorized by growth habit (vine, shrub), and major and minor nectar and pollen sources. An online discussion board is available. Currently this contains several messages from beekeepers selling equipment and honey. Other sections link to national field days at Bay of Plenty (May 1999), Waikato (March 1999) and Canterbury (November 1998). In keeping with the British tradition, these events begin with a tea drinking. Many photos of the events are included, along with a synopsis of the programs presented.

Details about the Year 2000 Tour scheduled to depart Los Angeles, CA January 25 and visit New Zealand through February 9 are also found linked to this home page. The price of U.S. $4098 per person includes sightseeing & entrance fees for activities (unless otherwise specified) external/internal airfares and use of luxury coach, accommodation (twin shares all rooms contain full private facilities). Also included are 14 breakfasts, 3 course Table D'Hote dinners including traditional Maori Hangi concert and daily Lunches. Fully escorted by Trevor Bryant, the itinerary has been carefully planned to combine New Zealand's scenic highlights with an excellent cross section of visits to beekeeping outfits.

The web site also contains an incredibly detailed profile of New Zealand beekeeping. Sections on the history, products and services, and composition of the industry, as well as those on government involvement, research, and education and training endeavors are listed. Perhaps most interesting is the appendices section, which contains a listing of threats to the industry. These include European foulbrood, *Varroa*, (*Tropilaelaps clareae*) the Asian bee mite, the tracheal

mite (*Acarapis woodi*), bee louse (*Braula coeca*) and the Africanized honey bee (*Apis mellifera scutellata*).

Online editions of articles from the national beekeeping magazine (New Zealand Beekeeper) are also liked to the main page. These include a beginners section on feeding sugar, supering, the value of requeening, and how to requeen without looking for her. In addition, there is a listing of beekeeping clubs and suppliers of beekeeping equipment.

The New Zealand site contains some unique information not found elsewhere. There is a section that helps users easily subscribe to and unsubscribe from the beekeeping mailing lists. The rules of thumb section contains an integrated calculator to determine volumes, weights and 22 other calculations. Brood production and mixing sugar might be of most interest to beginning beekeepers. A live beekeeper chat is also available to talk with any beekeepers who might be online. Finally, there is the autoresponder . A drop down menu reveals an impressive list of publications that can be requested through regular electronic mail. Those without World Wide Web access can simply send an e-mail message to index@beekeeping.co.nz.

A most interesting situation in New Zealand beekeeping is that surrounding honey from the Manuka plant. Dr. Peter Molan at the University of Waikato has been researching this sweet and found it has remarkable healing properties. Not all of this honey, however, is the same. Only that classified as "active" has the sought-after properties. Active Manuka honey is thought to be effective in killing *Helicobacter pylori*, the bacteria believed to be responsible for duodenal and stomach ulcers.

As is the case for most World Wide Web sites, it is impossible to give only but a small review of all the information available at http://www.beekeeping.co.nz/

The best advice for those who want to see more is to personally pay a visit. It is hoped that this extremely important resource will be more valuable to the world beekeeping community as the digital age matures. BC

Dr. Sanford is Extension Specialist is Apiculture, University of Florida. He publishes the APIS Newsletter: http://www.ifas.ufl.edu/~mts/apishtm/apis.htm

CHARGE MORE For Pollination

Joe Traynor

During Spring pollination, a colony of 8-frame (of bees) strength can send out 7 to 10 times as many workers as a 4-frame colony.

For most crop pollination, the range of prices for bee rentals – 0 to $60 or more – is large enough to make a seasoned economist throw up his hands in despair. Colonies placed for no charge ("freebees") are placed solely for the location (usually a truckload at one site) while colonies at the high end of the price scale usually reflect the strength of the colony and the time and effort a beekeeper has put into the colonies (such colonies are usually scattered in groups of 12 or more).

To get paid at the high end of the scale, the beekeeper must convince a grower that his (the grower's) money is being spent wisely. When a grower spends $100 per acre for bees he wants to make sure the bees (now *his* workers) are putting in a good day's work. The grower will observe the colonies (usually from a vehicle) and if he sees enough colonies over the years he will eventually find one or two that have less activity than the others—this is his first clue that not all bee colonies are equal.

A more indelible impression occurs when the grower finds one or two colonies that are working far better than the others, a situation often followed by a call to the beekeeper asking why all the colonies aren't as active "as that one there." Occasionally "that one there" is a colony that is being robbed out by other colonies but more often, differences in bee activity among colonies represent differences in colony strength.

The savvy grower (and most growers are savvy or they don't remain in business) soon realizes that he'd be better off paying twice as much to rent colonies that do 2 to 3 times the work. Beekeepers can hasten this learning curve on the part of a grower by opening a few colonies for a grower to let the grower see what he's paying for (perhaps taking along a dead-out for comparison).

For cool weather (e.g., Spring) pollination, the economic advantage of strong colonies becomes even greater because during cool weather, proportionally more bees must remain home to keep the brood nest at the desired 95°F. During spring pollination, a colony of 8-frame (of bees) strength can send out 7 to 10 times as many workers as a 4-frame colony. In this situation, a grower that pays twice as much for the 8-frame colony gets a bargain since one-seventh the number of colonies can be rented.

The vastly superior pollinating effectiveness of strong colonies was neatly demonstrated by John Edson in a 1976 experiment (published in the Feb. 1977 American Bee Journal, pp. 78, 79, 92). During almond bloom (late Feb., temperatures in the low sixties) Edson compared the amount of pollen collected by 4 colonies of 4-frame strength and found that the 8-frame colonies collected *7 times more pollen* (than the 4-frame colonies). Edson maintained the same colonies through prune bloom (late March, temperatures in the low seventies, at which time the "strong" and "weak" colonies were 10 and 5 frames of bees respectively) and found that the strong colonies collected "only" 3 times as much pollen. Edson's study is summarized in Table 1.

About the same time that Edson's study came out I had a personal experience that confirmed much of his work. At the time I owned several hundred bee colonies and had about 100 of them on melon pollination (mid-May when temperatures are in the 80's). My bees had just come out of oranges (as most melon bees do) and were 2 boxes, full of bees. About a week after the bees were placed on the melons, a severe pesticide kill occurred (from Orthene on nearby cotton). Both the melon

Table 1 – John Edson study, 1976

GRAMS OF POLLEN COLLECTED DAILY (per colony)	
@61.5°F (late Feb.)*	**@70.8°F** (late March)**
8 frame bees 12.8 g	10 frame bees 30.2 g
4 frame bees 1.8 g	5 frame bees 11.1. g

*4 day period, almond bloom
**4 day period, prune bloom

grower and the cotton grower were surprised when I complained because a beekeeper on a neighboring melon field (closer to the sprayed cotton) had assessed his bees and concluded that there was "no problem". Indeed, there were no more than the normal amount of dead bees in front of the neighbor's hives while the ground in front of my hives was black with dead bees. The "mystery" was solved when the county bee inspector came out to check on the kill—it turned out the neighboring colonies had only a few frames of bees in them while mine still looked good in spite of the kill. (It is possible that my bees were foraging earlier in the morning when the cotton was sprayed.)

Thus, although not recommended, a pesticide application can reveal colony strength. After a bee poisoning incident, the dead bees in front of a hive represent mainly foraging bees and account for only part of a bee kill (some poisoned foragers don't make it back to the hive and some are carried away by "housekeeper" bees). In this case, the melon grower took note, and didn't complain about our high prices again.

An inadvertent pesticide application during the 1999 almond pollination season provided a further opportunity to evaluate colonies of varying strength. A grower on which we placed 12-frame strength colonies rented cheaper bees from another beekeeper. Although I didn't look at the other bees, the grower and beekeeper assessed them at a "weak 8-frames" (the grower had contracted for 8-frame colonies from both of us). Both ours and the other colonies were placed in the same bee drive, with sets only a few trees apart. On February 15th a pesticide application took place and above average numbers of dead bees could be seen in front of both ours and the other beekeeper's hives; the bees continued to die the following day (high temperatures were 56° and 61°F for the 2 day period). Because there appeared to be far more dead bees in front of our hives, it was decided to count the number of dead bees; the data are shown in Table 2.

The 7 to 1 dead bee ratio shown in Table 2 conforms neatly to the 7:1 ratio found by Edson. (Temperatures during the 1999 "test" were slightly cooler than during Edson's test; had they been warmer, the ratio might have been less than 7:1).

Providing only strong colonies for a pollination project is costly for a beekeeper. It requires culling out sub-standard colonies and, for early spring pollination, it usually requires feeding of both sugar – syrup and pollen (or pollen substitute) in order to build colony populations to 8 or more frames of bees. This extra work can easily cost $10 or more per colony.

There is ample evidence that high rental fees for strong bee colonies are a bargain based on their superior foraging activity. Growers that have made first-hand observations (counting in-out bee flight) have confirmed this, but don't count on such growers to give you a price increase unless you ask for one.

To recoup the expense of providing strong colonies, the beekeeper must convince the grower that the extra money is a sound investment. For almond pollination we have done this by offering a sliding price scale for colonies of varying strength—2, 4, 6 and 8 frames of bees—and providing information (such as Edson's data) that the 8-frame colonies are the best buy. In 25 years of business we have had only one grower that wanted bees of less than 8-frame colonies (and several paid even more for 10-frame colonies).

Table 2 – PESTICIDE KILL DURING 1999 ALMOND POLLINATION

Colony Strength	Dead bees per colony*
12 frames	1145
7 frames**	150

*Six 12-frame colonies and eight 7-frame colonies were used to get the per-colony average.
**evaluated as a "weak 8"

Putting pollen traps on selected colonies (as Edson did) represents another way to convince growers to pay more for pollination. Year to year variables (mainly weather) make it difficult to come up with "pollen collected" standards but pollen traps (perhaps serviced by the grower) at least demonstrate that the bees are putting in a good days work.

For most pollination jobs, the target crop is overstocked with bees (to make sure pollination is adequate) and as a result, colonies lose weight – a 20 to 30 pound loss per colony is normal for many pollination jobs. Setting up scale colonies at the pollination site can show the grower the honey (money) you are losing. Weighing truckloads before and after a pollination job (in-out weights) will more accurately demonstrate the honey lost. (Make sure surround crops aren't significant honey producers before going too far with weight-loss demonstrations.)

I have found that the best way to convince growers that it's worth paying more for strong colonies is to open our hives for them—let them see for themselves. Then remind them that an 8-frame colony can do up to 10 times the work of a 4-frame colony and their per-acre pollination costs can be reduced by cutting down on the total number of colonies used rather than cutting back on the rental price per colony. BC

Joe Traynor is a pollination broker in Bakersfield, CA.

Acknowledgement

The author is indebted to beekeeper Anne Woodard for gathering and putting together the information on the 1999 almond test.

The Enigma of NECTAR SECRETION

Plant functions, including nectar secretion and pollen dispersal, are fairly predictable under controlled conditions, but such diagnostic conclusions do not always work out so precisely in nature.

Larry Goltz

Sometimes during the first and second weeks of June, it is not unusual to experience a sudden cool period after several weeks of what we consider to be normal weather for late Spring in the Central Valley of California. Intermittent light rain accompanied by cloudy, cool days is typical of these periods. A southward swing of the jet stream, allowing cold, unstable air from the north Pacific to flow into California is the most likely cause. Since most of us amateur observers of the vagaries of weather are concerned with local conditions, we form our own conclusions about how these conditions affect our bees and nectar gathering in progress. Actually, firsthand observation is what usually constitutes up-to-date weather reports to the public. Weather experts with their plethora of instruments and maps predict, more or less accurately, our local weather several days in advance. On any particular day, however, nearly anyone can look out a window and observe the local weather conditions. What we cannot see are the preservative, sometimes invisible and often unmeasurable elements of our environment that affect, for example, nectar secretion in plants.

As beekeepers we are naturally interested in nectar secretion, the basis of a honeyflow. Nectar secretion and fruit and seed set in plants are in a large measure related to climatological and other environmental conditions, seen and unseen. This may be a very general statement that has broad implications, perhaps suggesting that we have somewhat limited control over the nectar yields of plants. Scientists have fairly well identified the principles of plant physiology related to nectar secretion. Possibly they have yet to completely understand the variables that prevent us from predicting and quantifying possible honeyflows in many geographical areas.

It is good that scientists can simulate to a degree and study under controlled conditions what occurs during plant nectar secretion. They have identified the organic compounds, structural components and cellular activities involved in nectar secretion. While not always visually observable in the field, nectar secretion can be measured with the aid of instruments. Beekeepers do not generally have available or use such instruments. Most scientists realize the gap that exists between botanical research and its application to a beekeeper's knowledge of nectar secretion and honeyflows. Astute observers of bee-plant relationships, including some experienced beekeepers, may have knowledge that fits into the gap, particularly within their own locality. This is a source of information that may not have been sufficiently utilized by scientists in the past.

The reasons why there are sometimes intense nectar yields and other times dismal failures may seem plainly evident from observable conditions, but such convictions may be misleading. Even with the exacting instruments and methods of scientific research, the enigma of nectar secretion is far from being resolved, at least to the satisfaction of beekeepers. Plant functions, including nectar secretion and pollen dispersal, are fairly predictable under controlled conditions, but such diagnostic conclusions do not always work out so precisely in nature.

What actually occurs during a period of nectar gathering in a colony of honey bees is subject to a wide variety of conditions, nectar secretion being important, but only one of the many variables. While plant processes and the specialized tissues and organs involved in nectar secretion are as well-known as bee behavior, there occur a multitude of interactions during a honeyflow that defy accountability. Largely because of this unpredictability, beekeepers must rely upon past experience based on memory, records, and upon intuition, however gained.

The benefits of field experiences shared by beekeepers can be significantly enhanced with knowledge of some of the principles of botany related to nectar secretion.

A detailed explanation of the structure and function of plants and the many specialized parts that have evolved for nectar secretion is rather beyond the scope of this article. Botanical references in libraries and other sources are sufficient to satisfy the curiosity of those who have interest in the subject. Cellular biology, photosynthesis, respiration and digestion, growth and differentiation, flower and seed production, pollination and fertilization and inheritance are more or less related to nectar secretion.

Perhaps as significant as the plants role in nectar secretion are the environmental or biotic conditions that affect plants.

A quote by Dr. John Lovell in *Honey Plants of North America*, credited to E.W. Alexander, pretty well sums up the story of nectar secretion.

"Temperature and proper conditions of soil and atmosphere, or what is commonly called the season have a thousand times more bearing on the

Continued on Next Page

In order for nectaries to secrete nectar, the cells must be distended with a solution of mainly water and sugar.

surplus than the amount of bloom or the number of colonies in a single apiary."

A portion of the following information about the secretion of nectar should be credited to Dr. Lovell from Chapter III in his *Honey Plants of North America*, a dated publication but nevertheless a proper source of information on many botanical facts.

NECTAR SECRETION

There has been a considerable amount of research devoted to nectar secretion of plants and data accumulated, but the influence of soils, moisture and dryness, heat and cold, light and altitude are as yet not completely understood.

Floral nectaries consist of a group of specialized cells, variable in structure, location and productivity, depending upon the flower species or variety. Some flowers produce no nectar. The biology of nectar secretion is complicated. There is no need to go into details except that it may be worthy to note that in order for nectaries to secrete nectar, the cells must be distended with a solution of mainly water and sugar. The nectar must exert a strong pressure outward, distending the elastic walls of the cells. Hence, the nectaries of plants secrete nectar only when the parts concerned are turgid. If the cells are flaccid, no nectar is secreted. Droughts lead to cessation of a nectar flow. Secretion of nectar ceases with pollination, or soon after. Secretion likely begins by the forcing of nectar through the ectoplasm and epidermis of the nectary which are probably modified by the turgor pressure that may amount to as much as five atmospheres.

RAINFALL AND HUMIDITY

As mentioned previously, moisture and dryness have a direct effect on nectar secretion and honeyflows. Rainfall or irrigation promotes vegetative growth, the development of flowers, secretion of nectar and plant reproduction. Naturally, wild plants may be more subject to irregular nectar yields than irrigated crops because of the unpredictability of rainfall. Some plants are more drought-resistant than others, and produce nectar, whereas plants less tolerant of aridity fail to produce. Yellow star thistle (*Centaurea solstitialis*) of our Central Valley foothills of California yields a honey crop during the dry months of Summer, producing abundant nectar when other sources have dried up. The plant has a deep root system, up to six feet, that taps underground water. The foliage has a coating that reflects heat and winged stems that reduce the heat load and transpiration during the typically hot days.

The timing of rainfall may be as important as the amount. Plant flowering generally follows rains, which usually peak in Spring and early Summer. Species of such Fall-blooming plants as goldenrod and aster yield late-season nectar due to their "short day" photoperiodism. Adequate soil moisture must be present for bloom and honeyflow from the Fall flowers. Fortuitous rainfall during Autumn increases the nectar flow from the late-season plants. A quick response to rainfall is typical of plants such as the flora of the Southwest deserts. In this semiarid region, showers at any time during the Spring or Summer will bring a number of nectar plants into bloom in a few days. Mesquite (*Prosopis spp.*), a desert chaparral shrub, may bloom at any time from late Spring to early Autumn, the number of bloomings depending upon the number of substantial rainfalls, and that may be several times a season.

Excessive rainfall may stimulate vegetative plant growth but not necessarily increase the nectar flow unless the extra moisture is distributed evenly over the bloom period. Our Winter El Niño rains in California brought twice the normal rainfall (60 plus inches vs. the normal 32 inches). From personal experience I would say that our honey flow from yellow star thistle, our main crop, was about normal. The fact that the star thistle bloom is in late July and August, months after the heavy rains occurr may account for the normal nectar output. Nectar may be washed away from some open-flowered plants by heavy rains. Plants that wither several times in the course of their growth may yield less than one-third as much nectar as normal plants. If the plant's leaves and flowers droop from lack of water, no nectar will be produced.

Nectaries tend to secrete more during periods of high humidity because the passage of water through the stomata of the leaves is less, and the excess water accumulates in the plant cells under greater pressure than when there is little moisture in the air. While the amount of solution passing through the nectaries increases during humid weather, the quantity of sugar secreted remains about the same. Honey stored in hives in a humid atmosphere is likely to have a higher moisture content than that stored when the air is dry. Our California honey crops from yellow star thistle are stored in the combs during late Summer months when the atmospheric humidity may range between 10 and 20 percent, resulting in capped honey with between 12 and 15 percent moisture content. In regions where honey is stored in combs during rainy periods with 75 to 100 percent humidity, the moisture content of the honey may be 19 percent or higher, causing "weeping" combs and fermentation when extracted.

TEMPERATURE

It is said that temperature exerts a greater influence on the functions of flowers, including nectar secretion, than does light, humidity or rainfall. The temperature at which nectar secretion begins and peaks varies from species to species but in general high temperatures favor nectar secretion. During periods of high temperatures the nectary membranes are more permeable and various chemical actions of the plant are speeded up. In the midwestern United States, where a large portion of the honey is produced, the highest yield of nectar occurs when the temperature is between 80 and 100°F. Alfalfa yields are best when there is ample ground moisture and

a succession of hot days. There is a limited number of honey plants that thrive and yield nectar at moderate or even relatively low temperatures. The mustards (*Brassica* spp.) and wild radish (*Raphanus* spp.) are examples of early Spring plants that yield nectar during cool weather. Unfortunately, the extent of honey gathering during bloom from these plants is often limited by unfavorable flight conditions for the bees. Very high temperatures, above 100°F, may restrict nectar secretion.

Cold or cool nights followed by warm days tend to favor nectar secretion. The most favorable temperature for the growth of most honey plants is between 77 and 90°F. Favorable growth conditions usually lead to abundant nectar production for plants attractive to bees.

LIGHT

The secretion of nectar is closely related to the amount of sunshine the plant receives. Light stimulates a process in plants called photosynthesis in the green cells called chloroplasts. In the absence of photosynthesis all living things, with a few minor exceptions, would cease to exist within a short time. Photosynthesis utilizes two common substances, carbon dioxide and water, that are converted into several products, including sugar, part of which finds its way to the plant nectaries as a solution of mainly sucrose and water.

The amount of natural light available to plants depends upon the amount of sunlight reaching the plant and the plant's capacity to absorb the energy of light through its leaves. The leaves of plants, with their green pigmentation, absorb in full sun only about 3% of the total light. Frequently, less than 1% of the absorbed light energy is converted into chemical energy. The rate of photosynthesis tends to be approximately proportional to the light intensity received by the foliage. Nectar secretion is dependent on the food reserves (sugars) made by the leaves through photosynthesis.

Plant geography studies tell us the long days of northern regions promote the manufacture and secretion of more plant sugar than in lower latitudes. The same result is produced by the more intense light of alpine heights. The long, warm days and cool nights of the Peace River region of Alberta, Canada, acting on extensive stands of clover produce excellent honey crops. The extra day length and intensive solar light of the northern regions stimulates clovers and other honey plants to bloom.

Plant geography studies tell us that the long days of northern regions promote the manufacture and secretion of more plant sugar than in lower latitudes.

Flowers at high altitudes have brighter colors and may secrete more nectar than those in lowlands. Here again, the increased nectar flow is due to the more intense light and the wide range of temperatures between day and night. In one instance, measured at an altitude of 8,510 feet, chemical activity of plants, due to the increased solar energy, was 11 percent greater than at sea level.

SOIL

Soils of the United States vary greatly in composition. Plants do not flourish equally well everywhere in the same soil due to the difference in rainfall, light intensity and other biotic influences. The distribution of plants in the United States is in part due to soil differences. The clovers, for example, grow best in soils of higher pH value than the neutral 7. This soil condition is usually the result of the incorporation of pulverized or disintegrated limestone in the soil. Goldenrod and asters thrive in acidic soil, a point or two below neutral. We commonly describe soil texture in terms of being sand, loam, silt or clay. A typical loam soil contains about 40 percent each of sand and silt with 20 percent clay. Soil may also be classified according to its particle size. Many important agricultural soils are loams with varying amounts of sand, clay and silt. In addition to the minerals of soil, other components are important to plants, including soil air, water, macronutrients (N, P, S, K, Ca and Mg) and trace elements. A fertile soil is one that will supply the essential elements at the time and in the quantities needed by plants. Living organisms are usually associated with fertile soils, although they can be either beneficial or harmful. Reduced fresh organic matter called humus is frequently a part of fertile soil.

It is safe to say plants thrive on soil that fulfills their needs. It follows, then, that nectar secretion, important in plant reproduction, is best in plants that are adapted to the soil in which they grow.

SUMMARY

While we conveniently categorize the various influences on nectar secretion – rainfall, temperature, light and soil, we cannot so easily classify the enormous range of secretory possibilities that occur in plants day to day and from one geographical area to another. The interactions of the various influences on nectar secretion are so complex that the only way to begin to understand this process is to become familiar with the fundamentals as outlined and then apply this information to what you observe of the plants that your bees work for nectar and pollen. Not only may the true conditions of your area vary from your neighbor's, but where nectar conditions are nearly equal, your interpretations may be at variance with other beekeepers.

Nectar secretion by plants is an important part of gathering a crop of honey, but it should be noted that also involved are the factors of colony condition, apiary location and flight opportunities.

Much has yet to be thoroughly researched with respect to nectar secretion. Field studies as well as laboratory research have provided many answers to the mysteries of nectar secretion, but what may be termed "practical information" has sometimes come from beekeepers' experiences. Should someone call upon these knowledgeable and observant individuals, we hope they respond for the benefit of all beekeepers. BC

Larry Goltz is former Editor of this magazine and remains a frequent contributor. He lives in Redding, CA.

James E. Tew

Bee Culture's Beeyard

An Early Summer Evaluation

As I write this for you, it's the first of July. As you read this it's probably sometime in August. Where does time go? My summer is very nearly half over and it seems that I have only begun to accomplish anything meaningful for this season.

Could we review for a few sentences? As some of you may recall reading, this past January,1999, I undertook the project of keeping bees in the manner in which I was instructing you to keep bees. I started from a woefully managed yard having 3 established colonies and about 3 accidentally overwinterd nucs. I kept you informed as the winter months passed on the deaths of various colonies and the surprising survival of all the nucs. I built hive stands and selected pieces of equipment. I ordered some new equipment and assembled it in several articles. I bought packages and splits and introduced them to the yard. I mowed grass. I put some weed killer around the colonies. I added equipment as the hives grew. Now that the year is approaching half gone, What has worked and what has not worked?

The bad things first

(1) Sufficient equipment was not prepared in advance. It's true that I assembled equipment during the winter months and assembled it correctly. What I did not prepare myself for was my eagerness to get bees again. I planned on having 5-6 colonies on which I would dote and manage intensively. I currently have 10 colonies with 4 nucs. I had to scramble for more equipment; consequently about half of the equipment is not painted and does not match very well. The frames that are in use are an eclectic mix of old frames and new frames - plastic and wood. Some are good frames while I would be embarrassed for you to see others.

Reprimand I should have assembled and prepared more equipment than I needed - probably as much as 50% more - including painting.

(2) My record keeping has been lousy. But this project has not been the real world. Though I need to keep adequate records for future procedures, my articles in BC are a record - of sorts - of what I have been doing. Though that might be an acceptable excuse, it is not an acceptable reason. Ultimately, such records should be published on the web.

Reprimand Keep a running journal of what events have occurred within the yard and within each colony. In fact, I have already begun this procedure.

A Summer day view of some of the colonies in BC's *yard.*

Continued on Next Page

BEEYARD ... Cont. From Pg. 27

Triplex nucleus colony with a "Skunk Block" in place. Outer cover removed for your view.

What has gone well?

(1) I have bees coming out of my ears. You may remember that I ordered two packages from Harrell and Sons. They have worked out great. I bought New World Carniolan queens for two colonies and started them from 4-frame nucs. I bought two cordovan queens from Simpson's Bee Supply and they, too, have built up nicely and are as orange as the carniolans are black. In a way, it's good news that the colonies that have not built up very well are colonies from last year's swarms. Though there is no science involved in this observation - my observation for this season is that *any* commercially produced queen has out-produced *all* my naturally produced queens.

(2) The apiary shed is working out well - as it has for years. I admitted to you in earlier articles that it is nothing more than a military surplus truck body but it has windows and electricity. In fact, I am writing to you from this apiary facility. Not pretty, but functional.

(3) The yard layout looks good and is pleasant to visit. The hive stands are working out well and the mulch gives things a managed look.

Please give me a minute to digress here - actually quite far from my subject.....Beekeepers come in all shapes and sizes and with radically different interests and expectations. In years past, I have hauled bees to Florida for the winter. I have traveled the world looking at bees. I have raised and instrumentally inseminated queens and done pollination research. None of my ramblings here are an attempt to impress you or convince you that I am an accomplished beekeeper, but rather a convoluted effort to explain to you that something as mundane as a pleasant yard layout is increasingly important me. At this moment, the sky is blue with perfunctory white clouds. There's a gentle breeze and everywhere is the buzz of bees coming and going. This is a pleasant moment and I enjoy it. I just put on a couple of supers (on one of the nucs that overwintered -colony #1 and one on the Harrell package, colony #9), but I really don't care if they fill them or not. A few sentences ago, I made the statement that beekeepers have different expectations and interests. I know many of you want to make all the honey you can and I support you in that, but on this day, it's pleasant just to sit in the yard and enjoy the results of a lot of work that has transpired since last January without feeling stress that I should be doing something significant with the bees. Just some quiet time in the bee yard. Now back to the main theme.....

Skunks By nature I am a tenderhearted person. Though as a youth, I enjoyed hunting, I never really enjoyed killing anything that I hunted. Doesn't make much sense does it? Now, after all that I have done to get bee hives back in this yard, I've got marauding skunks in the yard. If I could figure out how, I would kill them. With that comment, I have probably just offended some of you, but my frustration factor is high. These skunks have several hundred acres of woodlands where they can do their natural skunk-things. Yet night after night, they are here in my apiary scratching on the hives making a mess and keeping the bees stirred up. Though not a general recommendation, one of the nucs that had a simple 3/4" hole for an entrance was easily made skunk-proof by simply standing a cement block in front of the hive. The bees fly down the hole in the block and the skunks have problems reaching the entrance - so they moved to other colonies. (See Figure 2) More on this problem later.

Observations on Frames Again, no effort at true science intended here, but the plastic frames have worked out well. The instructions tell you to spray the frames in sugar syrup and I suspect that would help, but I never did it. It *would be easier just to put a feeder on* the colony. Where existing wooden frames are positioned near new plastic frames, bees do seem to favor the older comb. No surprise there. Additionally full plastic frames don't seem to have the rigidity as a full wooden frame. But the ease of installation was amazing. Just open the big box and put frames in colonies. How I did like that feature.

Smokers and Smoker Fuel My beekeeping efforts began in the southeastern U.S. where pine needles are plentiful. They give off a (somewhat) pleasant smoke are easy to light. The problem is that needles burns fast and require frequent "recharging" as Dr. Blake at Auburn University use to tell me. By an innocent fluke, I have worked out a

compromise that really works well. You remember that I put mulch around the hive stands and around the apiary shed. It was low-quality mulch being predominately chipped vines and branches. I light the smoker with pine needles (also called pine straw) - get a good flame going - add another small wad of needles and then pack the smoker canister with the course mulch that surrounds the hives. Finish it off with a small charge of pine needles to keep the mulch from blowing out when the bellows are pressed. My recommendation - put coarse mulch around your hives and then burn it for smoker fuel as the season progresses. Always convenient and serves to suppress weeds also.

The triplex nucleus hive. Knock on wood, but I have had remarkably good luck with queen introduction. So far, I am 100%. Having heard so many bad luck queen stories, I was prepared for something to go wrong - and no doubt it will, but for now everything is queen-right and happy. In anticipation of needing queens at some future time, I have stocked a triplex nuc with two more Italian queens and a Caucasian queen that I got from Mississippi. I marked them with green spots.

Essentially the triplex nuc is a single deep super that has ¼" plywood partitions that divides the deep hive body into three 3-frame nucs. A ¾" auger hole is bored near the tops of the nucs and serves as the only entrance. A metal strip serves as an entrance closing device. A useful feature of this particular style nuc is that it has both screen tops and bottoms so splits can be made somewhere else and safely moved to a new location with little fear of suffocation. As with most nucs, there is not a convenient place to put the queen cage, but space can be improvised between frames. After being released into their respective nucleus compartment, I allow the queen to live in these small nucs until needed. A feature that I think needs some improvement is that once the outer screen is removed, all three nucs are exposed. There is a chance that queen from one nuc could drop or otherwise get into one of the other nuc sections. I plan to cut plywood pieces to cover the two nucs sections that are not being manipulated. When the time comes for queen replacement, I will replace the queen with an established nuc rather than replacing with a queen cage. Having three new queens at the ready is a real luxury in the bee yard.

Bottom Ventilator from the old beekeeping literature. Don't have this device on during a flow.

The old literature reported the use of a "Bottom Ventilator". It was reported to keep the bees cooler and was essentially a slatted rack without the slats. I built one and put it on. It's basically an empty box with holes cut in it. At the time, I admonished myself to take it off before the flow started. Well the flow was slow in starting and then a drought ensued. I forgot the contraption. Working this colony yesterday, I found that I had a bit of a mess in the bottom of hive #10. I cleaned it up and told myself that I was sloppy in letting that get by me. (Note to myself - only put the bottom ventilation on when there is no flow ongoing!) BC

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A Random Question

Dear Dr. Tew,

My question concerns finding a queen in a swarm which you mentioned in the last BC issue. How do you find her? Do you stick your hands into the swarm and stir them around looking for her? I can find a queen in a hive pretty well, but the bees are only one layer thick. Thanks for your help.

Peter from New York

Dear Peter,

Finding the queen in a swarm - there's no easy solution. It is the bee needle in the hive haystack. I estimate that I am able to find the queen in a swarm about 50% of the time. Your luck will depend on the size and position of the swarm and how well you can see the bees.

First Effort - Have a cage handy. Move near the swarm and closely study the bees as they scurry around. Lightly brush the bees, blow on them, move them with a twig - all the while watching for her. If you should see her, you cannot be timid. Reach in and pick her up - quick. Using you fingers, try to get her by her wings - if not her wings, her thorax. Then into the cage she goes. There is no way to practice this - just do it without thinking.

Second Effort - The first effort not working, and if possible, shake the swarm onto a cloth or plastic bag in front of the hive and watch the bees as they rush in. If possible have someone else watch the original swarm site in case the queen flies back to the original swarm site. Again, be quick and decisive. She will be fast.

When to give up If the bees seem to be settling and the swarm is obviously moving into your equipment, I would chalk it up as a loss to find the queen. Opening the hive up and searching again would only run the risk of having her take off again. That's all you can do short of improvising traps on boxes for which I don't much care for. Best of luck. jtew

A Homemade Single Frame Extractor

Ray Nabors

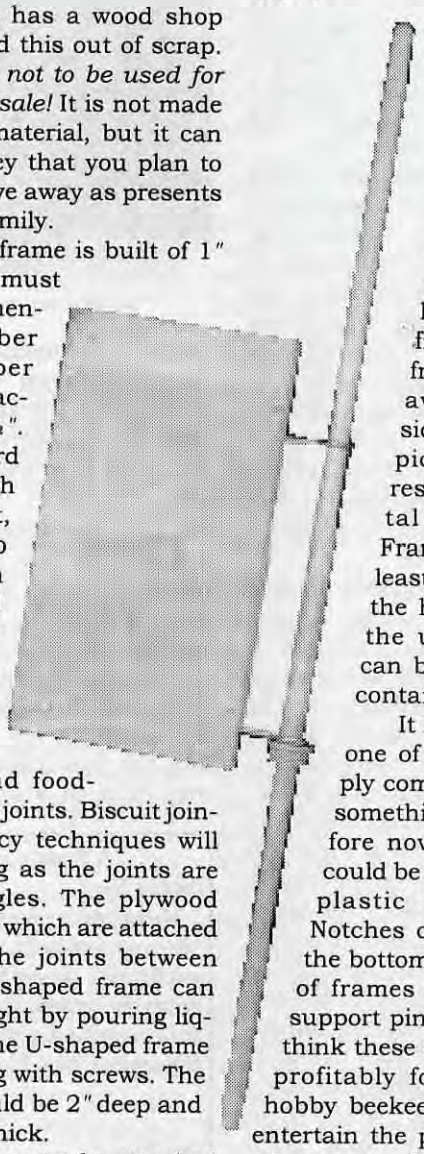
The cost of an extractor that holds two frames is $100 minimum. That extractor will extract only one frame at a time by extracting one side of each of two frames. Radial extractors have many advantages. One is that they will extract both sides of the frame simultaneously, but radial extractors are expensive and large. The radial extractors currently on the market are essentially built for large-scale beekeeping operations. A hand-crank plastic two frame (one frame) extractor is effective for a hobby beekeeper, but the device is expensive in relation to the benefit received. An economist would say the two-frame hand crank extractor has a poor cost-benefit ratio. These plastic tub extractors with a hand crank are not suitable for use by a beekeeper with more than 10 colonies.

A one-frame radial extractor can be built with wooden materials for a cost of about $10:

2 pieces of ¼" plywood 2' x 14 $2
2 eye bolts with 11/2" holes $2
1 dowel 1" x 5' (any 1" handle) $1
5' of 1" x 2" board $2
drywall screws & metal pins $ .50
rubber plumbing fixture with 1" hole $2
beeswax to seal it $ .50
total ***$10***

Anyone who has a wood shop could easily build this out of scrap. *This extractor is not to be used for honey that is for sale!* It is not made of "food-grade" material, but it can be used for honey that you plan to eat yourself or give away as presents to friends and family.

The wooden frame is built of 1" x 2" lumber. This must be a true 2" dimension. Remember that the lumber shed variety is actually ¾" x 1½". This finished board is not wide enough for the job. First, cut the 1 x 2 into strips 2 feet in length. This will leave a 1-foot strip for the bottom. A U-shaped frame can be assembled using wood screws and food-grade glue for the joints. Biscuit joinery or other fancy techniques will work fine as long as the joints are nearly right angles. The plywood pieces form sides, which are attached using screws. The joints between the sides and U-shaped frame can be sealed watertight by pouring liquid beeswax on the U-shaped frame before assembling with screws. The finished box should be 2" deep and 14" wide and 2" thick.



The eye bolts must be attached by drilling holes in one side of the 1 x 2 frame. The bolts are then fixed into the frame about 1" apart. The eye bolts must be turned so that the eyes will fit over the handle. The rubber washer with the 1" hole is forced over the handle. This must be a tight fit. The washer should be 1" off the end of the handle. The eye bolts can then be slipped over the handle to the rubber washer which will act as a stop. The box will now sling around the handle providing centrifugal force with which to extract honey. It is operated by slinging the frame around the handle until your arm is tired or all the honey is extracted.

The extractor can be made to accommodate any size frame. Place the frame in the box and drill two holes in the plywood sides. These holes should be in front of the frame. The frames should be held away from the distal side of the box. In the pictures, the frame is resting against the distal side of the box. Frames should be kept at least 2" into the box. Once the honey is slung out of the uncapped frames, it can be dumped out into a container.

It is amazing to me that one of our beekeeping supply companies has not made something similar to this before now. The extractor box could be made with food-grade plastic for the container. Notches could be molded into the bottom to hold various sizes of frames in conjunction with support pins for the top. I would think these could be made to sell profitably for under $50. Most hobby beekeepers would certainly entertain the purchase of this type of extractor for less than half the price. I can even envision the unit made without the handle. This would ease shipping and allow less expense for the beekeeper. Wooden or metal handles could be easily acquired. The Nabors 1 frame radial extractor is for the hobbyist. BC

Ray Nabors is Extension Apiculture Specialist for MO.

Save Your Back . . .

BEE TRUCK

Jim Higgins

. . . and Save Trips, Money & Time.

Many years ago I injured my lower back, and I shouldn't be keeping bees because of it. But I do some special exercises every day, and if I don't overdue it I get along fine. But beekeeping really strains things, and over the years, I've put up with the trucks and equipment that I had, even though they were very hard on my back.

In the back of my mind, however, I have designed what seemed to me to be an ideal truck and handling system to lessen the strain on the back so I that I could put off or at least delay as much as possible that day when I could no longer keep bees.

1998 was the year when I finally decided it was time to quit fooling around and make my move.

I keep 60 hives in six apiaries, and I drive 22 miles if I do a complete round trip and visit all of the apiaries. During apple pollination it's many more miles. But because I still work 7 a.m. to 5 p.m., six days a week and do Bee Venom Therapy three evenings a week, go to church and various meetings, etc., beekeeping for the most part is a Sunday afternoon sideline that has to run pretty smoothly if I'm going to get the job done. I don't have all day to run up and down the road getting this and that or going after something that I have forgotten. Spare boxes, frames and all of the other parts, even queens, need to be on the truck so they are there when needed.

In the Spring, it's handy to be able to load 120 shallows on board and go super the hives in one trip.

As the swarming begins, if I'm out making my rounds, I can be reached by cell phone, and I have enough equipment on board to cope with a number of swarms without returning home each time.

As I make my rounds, I can add supers as needed, there on the truck. Of course, you have to restock the truck when you get home, so make a list.

I purchased a used 1993 Ford 350 15-foot Ryder Truck (Ryder has a very good preventive maintenance program and gives a guarantee on their used trucks). As you can see, it has a 12-foot ramp, making it possible to load or unload empty or loaded supers using a two-wheel dolly, which I'll talk about later. You can also see the ladder rack on the side.

I had the truck painted white so it would be much cooler in the Summertime. Although the truck has air conditioning, I find I don't need it because the attic over the cab offers very good shade. It also has an automatic transmission and trailer hitch with both two-inch

A used rental truck, painted white and equipped with everything you'll need on the road.

Continued on Next Page

Inside, ceiling to floor poles and on-the-floor braces keep supers from moving. Storage space in the 'attic' works for small items, and a walkway in the center makes it all easy to get to. Tall enough to prevent bendings, it also saves the back when working inside, and everything is high, dry and clean.

The two-wheeler I use has several construction advantages, just fits the ramp, and lets me move supers or hives without straining my back.

and 2-5/16-inch balls. This makes for smooth acceleration, something that I like when pulling a trailer load of bees for pollination. I'll switch to mud and snow tires one of these days. Oh, it has tow hooks, and the trailer lights plug in on the back end.

Up front inside, the attic carries all the little things like rope, mouse guards, pressure-treated shims and carpenter's level, wood chips for smoker fuel and lots more all arranged in cardboard pop can flats to make separate trays. I also carry a hammer and transport straps and newspaper for combining two hives. I try to have it all where I can reach it.

Inside on both sides, starting at the front and going back to where the overhead door interferes, are racks holding supers, hive bodies, lids, bottomboards, inner lids and queen excluders; some supers are empty, and others are full of frames with comb or foundation. All are held in with spring-loaded poles (like you see in trucks hauling windows). Along the walls are 1-1/2"-inch angles from floor to roof that keep the stacks from falling forward or backward. To remove a box, just push down on the spring-loaded pole, release it from the track on the roof, lift it out of the track in the floor and set it aside, remove what you need, and put it back. Everything stays in the neat stacks and can't fall over, and you can get what you need because each stack has just that size super in it.

Near the door on one side, I keep my tote tray with smoker, fuel, hive tool, frame grip, pencil and 3 x 5 cards to record notes, etc., held against the wall using a tarp strap so it won't slide around. On the other side is a five-gallon bucket with some water, Clorox soap, stainless steel piece of steel wool and a spray bottle of Lysol Direct so I can clean up at the end of work in each apiary just like a bee inspector. (I've had foulbrood once. That's enough). Tarp straps hold all of that still.

The truck is tall enough that I can stand up instead of having to be bent over, a real back-saver, and it's all under roof, secure from robber bees, dry and out of the rain showers that pop up.

Now the two-wheel dolly. This is the real back-saver. It is built using angle iron on the base and tubular steel verticals (more on that later), and the wheels just fit in the ramp. When moving a full hive, I strap it using the Kevlock strap. Then, using a hive tool or crowbar, I tip the hive forward and put a 1-1/4-inch block under the back of the bottomboard. (I have slipped a two-piece screen into the entrance to block that.) Now I can raise the toe of the dolly onto the hive stand (usually a piece of railroad tie or pressure-treated 6 x 6) by leaning the dolly back and pushing it forward. Then push the rear of the dolly up against the back of the hive, and you can wiggle the angle iron in under the bottomboard. Now just tip the dolly back, and the angle iron will let the load slide off the rear of the stand onto its wheels on the ground. Then it's just a matter of pulling it over to the ramp (don't push it) and up into the truck. There are lights in the truck bed so you can see at night.

Now set the hive down with the shim under the middle of the back of the bottomboard and go get the next one. Hives can be stacked close enough so they will not tip over or you can change the wheels on the dolly design to be behind the hive instead of beside it as I have them. Then you can put hives tightly side by

side. (You can still do it with my design.)

As you can see one man can move a heavy hive by himself and not strain his back.

When you are moving hives to a new location, one man can still get the job done. Approach the hive stand from the rear, tip the hive back, and push it forward against the stand. Now tip the hive up and rock it forward gently until you have it where you want it, put the shim in at the back, and slip the dolly out backward. The shims get removed later or I suppose you could leave them in if they were about 12 inches wide. Your bottomboard sure wouldn't hold water if you did.

When harvesting honey I use a transport cover turned upside down to stack my full supers on, and at one end I do have a 12-inch-wide shim permanently attached; thus the dolly slips under and out again very easily. (I only go five or six shallows high; otherwise the load is too heavy to get up the ramp.)

When it was time to harvest last Fall, I had the good fortune to have a helper for the day (we were both 66 years old). We used two fume boards to chase the bees down, and stacked the supers as described above on transport covers. While the hives were open, we put in Apistan strips and a Terra patty as well.

The dolly carried the supers up into the truck and back down again into my basement (the honey house), and each super was lifted just once by hand, when it was taken off the hive (a real back-saver).

We harvested 198 supers from 56 hives and made only two trips to the honey house that day.

I never would have been able to do that as I was equipped before, and what a reduction in the strain on the back.

Another thought. If the uprights on the dolly are made using angle iron, a stack of *loose* supers can be moved over rough ground without losing them as they will be held in the stack by the flange of the angle iron. I have one of this design and with the wheels behind being fabricated.

Also the entrance screens I spoke of are made by taking a 3 x 8-inch piece of screen or 1/8-inch hardware cloth, putting it in a break to make it look like a piece of 1-1/2 x 1-1/2 x 8-inch long angle, but don't stop at 90 degrees; go to about 135 degrees. Take two of these and slide them past each other to match the full width of the entrance (about 14-7/16 inches+) and wedge them into the entrance. The bees can't get out, but they get plenty of air, and at the other end of the move they are easy to pull out. I store a bunch of them in the attic on the truck.

I see in the January issue where Bob Smith came up with a clever way of sliding supers down his basement steps. If he could build one of these dollies like I use, he would only lift the super once to make it from the truck to the final destination in his basement and could handle five or six at a time. It only cost $200 at the local welding shop. BC

Jim Higgins keeps bees, does apitherapy and saves his back, from his home in Hillsboro, OH.

Fall (& Spring)

FEEDING

HFCS 55? 42? Drivert? Liquid Sugar? Dry Sugar? Which Is Best?

Mary & Bill Weaver

You can undo a lot of good beekeeping and lose a lot of potential profits if your bees consume all their stores before dependable spring nectar flows. Michigan commercial beekeeper Jess Steed told us recently, "I lost no colonies to starvation last year. I won't tolerate it."

Every beekeeper can and should make the same resolution. Your investment in your bees is too important to waste because of such an easily preventable problem.

But for many beekeepers, the question is, feed what, and in what kind of container? For this article, we spoke with commercial beekeepers from across the country to find out how folks whose livelihood depends on their bees are doing their feeding, and what they see as the pros and cons of the various methods, and tips they have on efficient ways of getting the job done.

By virtue of the number of hives commercial beekeepers must feed, they must find efficient methods.

Like many commercial beekeepers, Kirk Jones, who has a 3800 colony operation in northern Michigan, feeds 55 fructose, which he buys in tankers. Kirk heats the syrup to 90 degrees, then adds 10% water to make crystallization less likely.

"I throw a 5 gallon pail of water into a barrel, then fill it up with fructose," he said. This water/fructose mixture, then, is what he feeds his bees, using the same concentration for both fall and spring feeding.

As a feeding container, Kirk uses plastic buckets, 3-1/2 gallon buckets for fall feeding and 2 gallon buckets for spring feeding. Why the switch to smaller buckets in the spring? It's important that the buckets be filled full," Kirk explained.

When you turn the bucket upside-down over the bees, some of the syrup leaks out until a vacuum is created in the bucket, which stops further leaking. A partially full bucket leaks considerably more syrup before the vacuum is created than a full one.

So in the Spring, when his hives generally need less feed than in the Fall, rather than putting partially full buckets on the hives, Kirk simply switches to smaller buckets, filled to the top.

Kirk saved a lot of money by buying the basic plastic pails and putting in the screen inserts himself.

He bought 40 mesh stainless steel screening, already cut in circles a bit larger than the ¾ inch holes he drilled in the bucket lids with a ¾ inch drill bit. He got the already-cut screen from Anrod Screen Co. in Cass City, MI (517-872-2101).

It was helpful to buy the screen already cut, Kirk explained, because stainless steel screen is very tough, and is difficult to cut. He then drilled a second hole in the lid for filling, which is covered with a plastic fitting when the pail is full.

Then, taking a propane torch with a homemade "bell" attachment made by a local tool and die company, he melted the screen circles into the plastic lids over the hole. "It helps to roll it a little as you melt it in," he commented.

Kirk feeds heavily in spring because, in his northern Michigan location, the main honey flow comes quite late in the season. "All that syrup is turned into bees, "he said.

Jerry Stahlman, with 6,000 hives in South Dakota, also uses plastic pails (2 gallon size) with screen inserts and 55 fructose diluted with 10% water.

Jerry prefers a larger hole for the screen, however, suggesting a 1-1/2 to 2 inch hole. "When we first started using the pails, "Jerry said, "everybody was putting in 4 or 5 quarter inch holes," but he's decided he prefers one larger one. Like Kirk, he uses the same strength syrup spring and fall.

Jerry puts his pails on top of the outer cover, unprotected by an empty deep hive body. His inner and outer

Feeder pails come in various sizes, but all have a screened hole on the top. The pail is placed top down, with the screened hole over an opening in the cover, inner cover or directly on the frames.

Continued on Next Page

In-hive or division board feeders have the advantage of being close to the bees, but you need to open the colony to fill them.

covers have 1-½ inch holes in them, cut with a hole saw. The wooden plugs that came from his outer covers when he cut the holes are nailed to a slightly larger circle of tin.

Most of the year, the tin-covered plug is in place in the outer cover. When he's ready to feed a hive, he removes the plug, leaving a 1-½ inch hole through which the bees can come up to take the syrup.

With the pail not covered by an empty hive body, Jerry noted, in sunny weather, the sun can warm the syrup.

Jerry also feeds honey in the comb, particularly in early spring when he makes his divides. "The natural thing is better," he said.

Washington State Beekeeper Doug Peterson is down to about 100 colonies now, from 500 several years ago. He prefers to feed honey to hives that are low on stores.

"Each year I use some foundation in my deep supers," he said. "I put one or two frames of foundation in each box. The new comb should be disease free.

A hive top feeder sits on top of the top box and the bees come up through the 'chimney.' A lattice of some sort is needed for the bees to walk on.

"The price of honey is close to sugar," he continued, "that till I figure labor, the convenience of the honey is worth it. Those new deep combs are what I feed back to my bees.

"I just stack the deep boxes of comb on my truck, throw on lids, and I'm ready to go. I have the impression that the bees do better on honey," he added.

Long-time New Jersey commercial beekeeper George Schaeffer, who with his son now keeps about 1,000 colonies, mixes his own sugar syrup to feed in division board feeders.

"I mix two parts sugar with one part hot water in a barrel, using the same strength syrup in spring and fall. I stir the mixture with a wooden paddle until the sugar is dissolved."

In the division board feeders, to prevent drowning, George doesn't casually throw in some sticks or straw and hope for the best. He cuts pieces of wood about 1-1/4 inches wide that are long enough to reach from one end of the division board to the other.

"The stick takes up a lot of the sugar syrup area," he said, "making it much less likely the bees will drown."

George prefers Mann Lake's division board feeders. "The sides are more roughed than those of other companies," he said "giving the bees more secure footing as they climb up and down."

Unlike many commercial beekeepers, George doesn't do a lot of feeding. He makes a point of leaving his hives with plenty of stores. They winter in at least two deeps, and sometimes he also gives them an additional 6-5/8 of honey for wintering.

"I only feed the ones that need it," he says.

New York beekeeper Bob Kime uses dry granulated sugar to feed hives in mid- winter when it's too cold for the bees to take syrup.

"I put a couple pounds of dry granulated sugar around the inner cover," he said. "I can get about 4 pounds around the hole if I need to. Then, if they start to use it, I give them more every two weeks. The sugar will keep them alive until I can get the syrup in at the end of February or early March."

Mel Sodestrom, another Michigan beekeeper, uses homemade wooden feeders that have worked well for him. To make them, he cut deep hive bodies in half, to make shallow supers. (At the time, he said, it was cheaper to purchase hive bodies than plain lumber, and they had the additional advantage of having dovetailed corners.

He next glued on tempered masonite bottoms. (It's important that they be tempered masonite,) with a high bond glue, the same type of glue that is used with Formica. The glue makes a watertight bond. In the masonite, he has cut a small, square hole in the center.

Around that hole, he constructs, out of pine, a "chimney" up through the center for the bees to climb up into the feeder. Around the chimney, he places a removable, rectangular wooden lattice float for the bees to stand on as they take the syrup.

The chimney, in addition to providing an entrance for the bees, also conducts warmth upward from the cluster into the feeder.

The advantage of these feeders, Ken Bates, who works with Mel, pointed out, is that the bees can take the syrup very quickly because they're not limited to a small feeding area.

Mel's feeders, which vary in size, can hold from 3-½ to six gallons of syrup, and Mel uses 55 fructose corn syrup, but at a different dilution from the beekeepers mentioned earlier. He uses 10 gallons of water per 55 gallon drum.

Strachans of California, the queen breeders, feed their colonies an L50 blend, 50% high fructose corn syrup and 55% liquid sugar, developed and sold by LSI Oakland.

"Most beekeepers in California buy from this company," said Valerie Severson, with whom we spoke. "Smaller beekeepers will come to us to buy maybe 100 pounds or so. "For feeding," Valerie continued, "we use

If you buy a tanker load of syrup, you need some place to store it. This is one technique.

1 gallon rectangular cans, the same size and shape as the cans one gallon of paint thinner comes in. In fact, we used to get them from a paint company."

The Strachans paint the outside of the cans with Rustoleum, and coat the inside with a paraffin type wax. Then they poke 2 or 3 holes in the lids.

Although some beekeepers heat jars of syrup that has crystallized to reliquify it, Strachans simply take off the lids of the cans and let the bees clean out the crystallized sugar.

"Sometimes, too, to stimulate the bees, we mix drivert (sugar) and Bee Pro pollen substitute and scoop that mixture on the hives," said Valerie.

To find out more about different kinds of syrups and sugars that could be considered for feeding bees, we consulted Stuart Volby, Sales Manager for Mann Lake Ltd.

Most commercial beekeepers use high fructose corn syrup (HFCS), which, Stuart said, has only been mass-produced for about the last 20 years. HFCS is produced by an enzymatic process which leaves no starches, only sugars, which is ideal for bees.

Before HFCS became available, corn syrup was produced through acid hydrolization, making a syrup that resembles Karo. This type of corn syrup has a very high starch content, producing severe dysentary in bees. So the only corn syrup recommended for feeding bees is HFCS.

There are two types of HFCS, 42 and 55. 42 HFCS is 71% solids, of which 42% of the solids are fructose. The rest are dextrose and higher saccharides. 55 HFCS has a 77% solid content, with 55% actual fructose.

Except in the south – Georgia, Florida, Mississippi and Texas – where temperatures are so warm that crystallization is not a problem, most beekeepers feed 55 HFCS. "There is a big difference in feed value," said Stuart. "55% HFCS has 6% more solids."

"Also, 42 HFCS is more unstable, and will granulate in 1/3 or less the time. 42 also granulates at a higher density level. Where 55 will turn slushy when it granulates, with 42, the dextrose will actually drop out and settle to the bottom, while the fructose remains on top."

To use the crystallized HFCS, the beekeeper must heat the syrup to about 95 degrees to remix it. If 42 crytallizes in the combs, it gets so hard, it's difficult for the bees to use, Stuart pointed out.

About the only time northern commercial beekeepers use 42 fructose is when they can buy a tanker and feed the whole semi-load in a week. In that short time, they don't have to worry about crystallization, and on paper, they can save approximately $1,000 on a semi-load of 42 versus a semi-load of 55.

But to a surprising extent, those paper savings of about $1,000 can largely evaporate when one considers other factors. "Beekeepers have to remember," said Stuart, "that 42 HFCS has 6% less solids, and therefore 6% less sugar, than 55 HFCS. In addition, 42 is 2-3% higher in higher saccharides, which are basically non-caloric—they give the bees no energy.

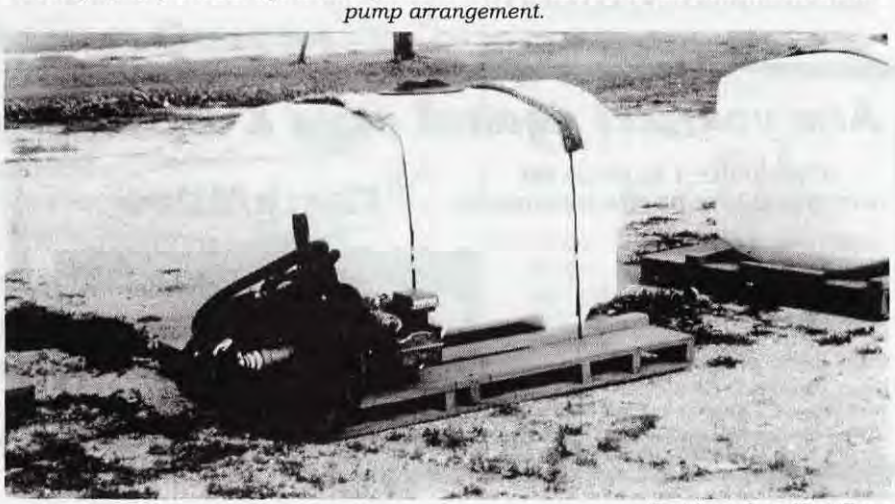
"So this gives between 8 to 9% difference in sugar content between 42 and 55 in reality. This means that you could take a tanker load of 4,000 gallons of 55 syrup and add 9% water, giving you 4400 gallons of syrup at the same level as 4,000 gallons of 42.

"This means that in buying a tanker of 42 instead of 55, when you consider the actual usable sugar content for the bees, your savings are more in the range of several hundred dollars than about a thousand.

"Then, too, you need to consider the handling characteristics, since 42 granulates so much more quickly. Also, if it is the fall season, and the bees are storing some of the syrup for the winter, another consideration is that if the syrup granulates in the comb, it is difficult for the bees to use. This is why most commercial beekeepers feed 55 rather than 42 HFCS.

HFCS is normally sold by the tanker or half tanker, although Mann Lake and several other HFCS handlers have pick-up facilities for smaller amounts. HFCS is 30 to 40% cheaper than table sugar or sucrose,

Getting syrup from storage tank to feeder can be handled with an on-truck tank and pump arrangement.



Continued on Next Page

FEEDING ... Cont. From Pg. 39

which is why most commercial beekeepers use it.

Some beekeepers, to save money, buy what is called "scrap sugar," sugar deemed not fit for human consumption. Stuart doesn't recommend scrap sugar because it comes with no analysis that labels it for specific use. "It's a buyer beware situation," said Stuart. We have heard of beekeepers who purchased scrap sugar contaminated with table salt, for example, or that consisted of sweepings, where nobody knew what else might have been on the floor it was swept from.

"Drivert," Stuart continued in his listing of sugar types, "is a pure sucrose used for confectioneries and for different kinds of candy. It has no starch content, making it ideal for bees. On the other hand, in Confectioners sugar, like 10x for instance, the powderiness is starch, which is toxic to bees."

Liquid sugar is 66-1/2% sugar (solid sucrose) mixed with water. This is the highest concentration of sucrose you can get without the sugar settling out.

To get a higher concentration than 66-1/2%, manufacturers produce invert sugar, a very thick liquid, which normally goes up to 77% sugar. "Cost-wise," said Stuart, "Invert sugar is much more expensive than HFCS. First of all, it's made from sucrose, which is itself more expensive than HFCS, and then the manufacturer has to invert the sugars, and that drives the cost higher – up to double the cost per pound of HFCS."

Stuart also gave some tips for heating HFCS, as, for example, to liquefy it when it has crystallized. "Don't heat it long," he said. "Treat it the way you would honey. You can flash heat it, but then cool it down quickly. Both honey and HFCS, in fact all sugars, if overheated, can discolor and caramelize. Overheated sugars of any type are somewhat toxic to bees, and can cause a high mortality."

Michigan commercial beekeeper Jess Steed, with about 400 hives, is the only commercial beekeeper we spoke with who used 42 fructose. "I've been using 42 for nine years now," said Jess. "Some people say it can give dysentery, but nobody told my bees. They do well on it."

Jess buys his 42 fructose from a soft drink bottler. But he doesn't use it "as is." Because 42 fructose granulates rapidly, Jess had the soft drink bottler add water to dilute it, a little at a time, until they got a mixture that was much slower to granulate.

Regular 42 fructose is 73 brix (Brix is a measure of sugar content.) "We kept adding water until we got to 61 brix," said Jess, "and that works quite well, and is economical to use."

But, in the end, no matter how you feed, or what you feed, Fall and Spring feeding are often necessary and expensive activities. Whether you have one colony or a thousand, you can pick the best feed and apply it in the most efficient manner for your operation. BC

Mary and Bill Weaver are producer/packer beekeepers from Pennsylvania and are frequent contributors to our journal.

Ann Harman

Home Harmony

Keeping Cool

Whew! It is hot. And sticky! Except perhaps in the desert where it's just hot! Really hot. During the Summer, it is important to keep plenty of cooling drinks on hand. Sure, water is good, but there are many times when just sitting down with something cool and refreshing is called for. You can pull up a lawn chair in the shade of some wonderful big tree or retreat to the coolness inside the house. Just remember next January that today you were dreaming about making a snowman. Could it be that last January you were dreaming about the lawn chair under the tree?

Go fill up the ice cube trays so that you will be ready to make some of these cool, refreshing drinks. The honey in them will give you that little bit of energy needed to conquer the Summertime temperatures.

It is a good idea to mix some of these drinks in quantity so that you can always find something good in the refrigerator. And also you will have something to serve a friend or neighbor who has decided to join you under the big tree.

REFRIGERATOR HONEY ICE TEA

Ice tea is a wonderful Summer drink. I have always wondered why people try to sweeten ice tea, nice and cold, with sugar. The sugar just does not dissolve; it sits sullen and wet at the bottom of the glass. Honey is, of course, the best choice of sweetener. This recipe is a good one since it makes a large quantity.

4 cups (1 quart) boiling water
12 tea bags
juice of one lemon
1/4 cup honey
1 quart cold water
mint sprigs

Add tea bags to boiling water and allow to steep 3 to 5 minutes. Remove tea bags and add lemon juice and honey. Stir to combine. Add cold water and refrigerate. Pour over ice cubes in a tall glass. Garnish with mint. Makes about 10 10-ounce servings.

Honey ... Any Time
California Honey Advisory Board

HONEYED COFFEE

Some people prefer iced coffee to ice tea. Try this different approach to iced coffee. You can use a dollop of vanilla, coffee or chocolate ice cream instead of the dollop of whipped cream.

4 ounces unsweetened chocolate
1 teaspoon cinnamon
1/4 cup honey
4 cups strong coffee
4 cups milk
cracked ice
whipped cream
dash cinnamon

Melt chocolate over hot water. Add cinnamon, honey (more if desired) and coffee; blend. Add milk. Pour over cracked ice and serve with whipped cream and a dash of cinnamon. Serves 8.

A Honey Of A Cookbook
Texas Department of Agriculture

HONEY LEMONADE WITH FROZEN FRUIT CUBES

Lemonade must be the number one Summer drink. It is best, of course, made with real lemons. The secret is to make up a quantity of lemonade so it is available whenever you are thirsty. You can use the ice cube recipe for other cool drinks, too, including ice tea.

1-1/2 cups lemon juice
3/4 cup honey
9 cups water
48 small pieces assorted fruit

Combine lemon juice and honey in large pitcher; stir until honey is dissolved. Stir in water. Place 1 to 2 pieces of fruit in each compartment of 2 or more ice cube trays. Fill each compartment with honey lemonade and freeze until firm. Chill remaining lemonade. To serve, divide frozen fruit cubes between tall glasses and fill with remaining lemonade. Makes 9 cups.

Sweetened Naturally With Honey
National Honey Board

ORANGE BLOSSOM

Keep the freezer well stocked with sherbets. They are a useful addition to a number of refreshing drinks.

1-1/3 cups orange juice
1/4 cup honey
1 cup milk
orange sherbet
sparkling water

Mix orange juice and honey and divide among 4 glasses. To each glass add 1/4 cup milk, 1 scoop orange sherbet and top with a bit of sparkling water. Makes 4 large glasses

A Honey Of A Cookbook
Alberta Beekeepers Association

LIME AND HONEY GRANITA

This next recipe is more like a sherbet or an ice. The mixture can be kept for one week in an airtight container in the freezer.

3 limes: chopped flesh and any juice
3-1/2 tablespoons honey
1-1/4 cups champagne or sparkling wine at room temperature
slivers of lime zest for decoration

Beat the lime and the honey together in a bowl until they are well blended. Pour the champagne or sparkling wine into the bowl, beating constantly. When the honey is dissolved, pour the mixture into a shallow tray that will not mark when scraped with a fork. Place in the freezer for 7-8 hours or overnight. Remove the tray from the freezer and, using a fork, crush the ice mixture to break it up. Place the granita in the freezer for at least 2-3 hours and serve decorated with lime zest strips. Serves 4.

A Taste Of Honey
Jane Charlton & Jane Newdick

PEACH TREAT

August is peach season. You can

make a wonderful slushy drink with some fresh peaches. A nicely flavored honey will enhance the flavor of those peaches.

1 cup vanilla ice cream
1 cup yogurt
1 teaspoon vanilla
1/4 cup honey
3 peaches, peeled, pitted and quartered

Put the ice cream, yogurt, vanilla and honey in a blender and whirl until well mixed. Add the peaches and whirl a couple of seconds more. Pour the peach mixture into four champagne or sherbet glasses and freeze until slushy. Serves 4.

Cook With Honey!
Beverly Kees

STRAWBERRY SLUSH

1 box frozen strawberries, partially thawed
1-1/2 cups milk
4 tablespoons honey
1 6-ounce can frozen orange juice concentrate
6 ice cubes
1 teaspoon vanilla

Combine all ingredients in blender container. Blend until frothy. Keep refrigerated. Stir well or blend before serving.

Kansas Honey Producers Cookbook

PEANUT BUTTER FROSTY

This next recipe is strictly for peanut butter lovers! Serve well chilled.

2 tablespoons peanut butter
1 cup cold milk
1 tablespoon honey

Place all ingredients in blender and blend on high for 15-20 seconds.

Kansas Honey Producers Cookbook

HONEY SANGRIA

Are you having some friends over for a barbecue? Perhaps you would like to serve them a sangria made with honey. Although dozens of recipes exist for sangria, this one uses a delightful assortment of fruits. You can make an ice ring with some pieces of the fruits if you wish.

1 bottle Burgundy
3 tablespoons apricot brandy
1 cup orange juice
1 lemon, unpeeled and thinly sliced
1/2 cup fresh lemon juice
1/4 cup honey
1 orange, peeled and thinly sliced
1 lime, unpeeled and thinly sliced
2 fresh peaches, peeled and thinly sliced
1 apple, diced
1/2 cup strawberries, sliced
1 bottle, 7 ounces, club soda, chilled

Combine all the ingredients except the club soda in a serving bowl. Blend well and chill. Add the club soda just before serving.

The Book Of Honey
Claude Francis & Fernande Gontier

HONEY CHILLED SUMMER TOMATO SOUP WITH FRESH BASIL

A cold soup can be as refreshing as a drink. Cold soups can be for lunch, along with a sandwich, or can be for supper, followed by a hamburger or chops from the grill. Since fresh vegetables such as tomatoes are in season now, this cold soup has all the ingredients right at hand.

1 large yellow onion, chopped
2 stalks celery, chopped
1 tablespoon olive oil
6 large tomatoes, peeled and chopped
1 cup chicken broth
1 tablespoon honey
salt and pepper to taste
1/3 cup fresh basil, chopped

Sauté onion and celery in olive oil in large pot about 5 minutes until onion is translucent. Add remaining ingredients except basil. Bring to a boil. Reduce heat. Simmer for 30 minutes. Remove from heat. Process in food processor until smooth. Pour into a bowl. Add chopped basil. Cover and chill. When ready to serve, spoon into bowls and garnish with a basil leaf. Serves 4.

Golden Blossom Honey Beeline

With all these choices you can now face the rest of this Summer's heat. I think I'll go fill my glass and head for the shade of that big tree. I see that the dogs have already arrived and picked the coolest spots.

Richard Taylor

Bee Talk

"If experience is the great teacher then I know a lot about bee stings."

"D'ya ever get bit?" That's the first stupid question you are likely to get when someone learns that you're a beekeeper. Of course the answer is no; bees never bite. (Though I do recall having a queen I was holding grab me with her mandibles once). But of course we know what the questioner really means, and my friend out in Oregon, Lee Larson, has suggested tat I say something about this, namely, stings.

Apitherapy? No, I'm not going to talk about that. I don't have much confidence in it. I've heard many, many claims, almost always about someone totally unknown to me who, it is claimed, was greatly helped or even cured of arthritis or MS by bee stings. But I have yet to find such a person, and I have seen several who undertook this regimen of bee stings who were not helped at all. What we need is proof, of a scientific nature, instead of anecdotes, and there is no such proof that I know of.

So let's just talk about stings. If experience is the great teacher then I know a lot about bee stings, because I've gotten an awful lot of them over a lifetime of beekeeping. As a kid, I recall, I proudly went off to school with one eye swollen shut by a bee sting. Children love to show off wounds, of whatever kind.

A lot has changed since then. Now, if I get a sting on the nose or lip or ear or wherever, there is no swelling up at all, but it does hurt still, a lot, causing my eyes to water up and my nose to run, but still, no swelling. After a minute or two, and a few sputtered oaths, everything is back to normal.

There are a few basic facts about bee stings, how to get them and how to avoid them, that are worth passing on, especially since some of these are not fully appreciated even by some beekeepers.

The first is, that bees sting only to protect their nests, not to protect themselves. I believe this is true also of all other social insects that sting. You can stand in the middle of an alfalfa field with bees all around without any threat of a sting. Bees will not leave a clustered swarm to sting you, even if you are only a foot away. It is only a threat to the colony, or what the bee perceives as such, that prompts this defense.

Now there is an exception to this, of course. If an isolated bee is trapped, stepped on, swatted, gets in your hair or clothing, something of that sort, then there is apt to be a sting. This is obviously just an automatic response to injury.

Nor do trapped bees necessarily sting. In fact they almost never do unless injured somehow. Bees trapped in your honey house give no thought to stinging. They just try to escape. And, wonderfully, a bee trapped in your bee veil, as soon as it discovers that it is trapped, loses all inclination to sting. It just beats against the mesh, trying to get out. So sometimes, when I've been working with a hive, and have my hands full, and discover that there is a bee in my veil, I have gone ahead and finished what I was doing before stepping aside to let the bee out. But it is nerve wracking, having that bee in there.

You are apt to get some stings if you try moving hives at night, and these are especially hard to deal with because the bees are apt to crawl into your clothing. It is much easier to deal with angry flying bees then crawling ones, because you at least know where the bee is. If one gets up your pant leg then you are apt to discover this the hard way.

Bees have moods, just like people. This may seem hard to believe, but it is true, unmistakably. In the spring, when the colony is building up fast and nectar and pollen are pouring into the hives you can stroll about the apiary without veil or bee suit and without fear. If you then stand right in front of a hive the bees swirl around you, puzzled by the sudden obstruction, but they do not attack you. Then you step aside and into the hive they all go, as if nothing had happened. Their spirits are high.

Conversely, when there is stress on the colony, the bees become irritable, even ready to make you pay for the most harmless intrusion into their domain. Thus, when the nectar sources dry up – usually mid-August around here – the bees become testy. They do not have much to do, and nothing is moving forward. You approach the apiary, in your usual casual way, and bingo! You've got a sting on the nose, and the bees chase you right out of the yard. Moral: that is not a good time to be harvesting honey. I learned that the hard way, years ago, when my back got plastered with stings, right through the fabric of my shirt, and my poor dog, I thought she had been stung to death.

Other forms of stress have the same effect; for instance, nightly visits by a skunk. The skunk stands in front of the hive and apparently creates a disturbance, scratching the hive, and as bees emerge to find out

Continued on Next Page

BEE TALK ... Cont. From Pg. 45

what's going on the skunk swats them and eats them. This puts the bees in a bad mood, which they will take out on their owner the next day.

A really good beekeeper, whose spirit is in tune with the bees and with nature herself, not only knows the mood of the apiary and the individual hives, but has an immediate awareness of even a single bee that is buzzing around. The beekeeper knows whether it is an angry buzz, and that the bee means business, or is only bluffing. If the latter, then the beekeeper may not even bother to put on a veil. I don't know how one can tell the difference, but I got pretty good at it after a lifetime with the bees.

This is what provides one of the deepest pleasures of beekeeping – to watch someone who really is in tune with the bees or to be that person yourself, going about the work of the apiary. Movement is both casual and deliberate, no movement wasted, the work moves right along with efficiency, the beekeeper being aware of the mood of the bees at every moment, and responding accordingly. Sometimes the mood will indicate that no gloves are needed, or even, no veil, but at other times you sense a difference, and reach for these. Some beekeepers never arrive at this stage of awareness, but just routinely cover themselves with protective clothing, gloves, and veil and then, more or less clumsily (as it seems to me), go about their work, almost as if they were dealing with inanimate but nevertheless threatening beings. They get their honey crops, and do indeed avoid stings, but they also miss something of almost mystical worth, which is the sense of kinship with the bees and with the whole of nature. BC

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

Questions?

Frozen Honey Comb?

How long can you leave comb honey in a freezer? And does putting extracted combs in a freezer help to prevent wax moth damage?

Frank Greenlee
Rutledge, TN

Putting comb honey or honey combs in a freezer that goes down to at least 4°F kills any wax moth life that is in them, including eggs. It does not, of course, protect the comb against a new invasion of wax worms once they are removed. The combs should be left in the freezer for several days, enclosed in a plastic bag, and left bagged after being removed until back to room temperature, to prevent moisture condensation. You can leave comb honey in a freezer indefinitely and the low temperature will retard granulation. It is a good way to save comb honey from one season to the next, if you have freezer space, but it must be bagged to prevent frost accumulation.

Raising Their Own

I have good strong hives and try to requeen every year but of course it does not always work. So what would be wrong with just killing the old queens and letting the bees raise their own? Would this eventually result in an inferior line of bees?

Russell Willey
Sebring, FL

The only problem with that, I think, is that you get a virgin queen who will not get around to laying for maybe three weeks or more after you destroy the old queen. I do not think this would result in an inferior line of bees, even if done year after year. Of course you could wait until after the honey flow to remove the old queen, but that would defeat the purpose of swarm control, which is the main reason for requeening.

Pollen In The Honey

I have a problem of the bees storing pollen in the supers. I tried using queen excluders but still find plugs of pollen in the honey supers some years. I have scoured the literature and can find nothing on this problem.

Dale Lesser
Dexter, MI

This sometimes happens when the honey supers are too close to the brood nest down below. It is a common problem with shook swarming. Bees store pollen right above, and around, the brood. A queen excluder sometimes results in a honey barrier between brood and supers, but not always. The solution is to make sure the supers are not so close to the brood. I do not think that pollen in extracting supers is a problem, as not much of it gets extracted with the honey, which will be strained anyway, but it can be a real problem with comb honey. If you find that the bees are storing pollen in a comb honey super, move the super up.

Honey Expiration Date

I have a pail of honey from last August. It is tightly sealed. How long can I keep it? Is there a "good until" time limit for honey?

Maureen Schweiker
New Gretna, NJ

Honey that is thick, that is, low in moisture content, can be kept almost indefinitely, although it does darken with time and slowly loses its good flavor. Well-ripened (thick) honey that has been properly stored can be kept over for at least a year with no detectable loss. Most honey, of course, will granulate, but that is nature. The enemy of honey is moisture, which leads to fermentation. Even if tightly sealed, it must not be stored where there is any dampness, such as a basement.

Washboard Info

What does the washboard effect do to the bees? The only thing I can find about it is to requeen immediately, but every time I put a queen in that hive they killed her.

Arthur Reed
Cassville, MO

I do not know what you mean by the washboard effect. There is a so-called washerwoman dance that the bees do on the front of the hive in late Summer, but this has nothing to do with queenlessness. The reason your bees kept rejecting new queen is that they had some kind of queen – virgin, queen cell, something.

Back and Forth

What is the meaning of the bees rhythmic rocking back and forth at the entrance to the hive in Summer?

Charles F. Byram
Oak Ridge, TN

This question comes up every Summer, usually from several beekeepers. The behavior is called the "washer woman dance," it occurs in late Summer, and no one has yet figured out why the bees do it.

Questions are welcomed. Address: Dr. Richard Taylor, Box 352, Interlaken, New York 14847 enclosing a stamped envelope for response.

Answers!

Richard Taylor

?Do You Know? Answers

1. **False** The forager loaded with nectar enters the hive and moves to a place among other workers on the comb. If the nectar flow is weak she walks about until she meets a house bee to which she gives part of her load. Occasionally she gives her entire load to a single house bee, but more often it is distributed among three or more. If the nectar source is bountiful, the loaded nectar gatherer usually performs a communicative dance. At irregular intervals, the dancer pauses and offers a taste of the nectar to one or more of the near-by workers. But soon she meets a house bee to which she gives a considerable portion of her load. Her entire load is distributed to house bees.
2. **True** The ability of honey bees to share information about feeding sites greatly helps colonies achieve high efficiency in foraging. Whenever a bee discovers a new rich food source, she promptly recruits nestmates to it and so helps ensure that her colony's foraging force stays focused on the richest available food sources. In order to maximize their returns for the amount of energy expended, they forage on the floral sources nearest the hive that provide the greatest rewards.
3. **False** Loads of pollen are usually collected more quickly than those of nectar. Thus nectar gatherers make approximately 5-8 trips and pollen collectors 7-13 trips per day.
4. **True** Strong colonies are more effective honey producers than weak colonies because the stronger colony has a larger percentage of adult bees available for nectar collection. As a colony increases in size, the number of bees required to take care of the household duties in the hive does not increase accordingly. Stronger colonies not only produce more honey than the weaker colonies; they also produce more honey per bee.
5. **False** Honey bee workers forage for food not according to their own needs, but in response to the needs of the colony.
6. **True** The number of foragers dancing in the hive is related to the quantity and richness of the food source. The sweeter the sugar content of the food source, the more vigorous are the dances. In this way the activity of foraging bees from a colony is adjusted to the relative abundance and richness of nectar of various flower species.
7. **True** Bees collecting either nectar or pollen from a plant which furnishes these materials only part of the day, will return to the hive when the food supply is exhausted. Most of these bees remain quietly in the hive for the remainder of the day. They do not respond to the dances of other bees which may have found other good food sources. Some individual foragers, however, learn to work two species of flowers at different times of the day as pollen and or nectar become available.
8. **True** Colonies in the same location may differ greatly in the flower species they are working. When a honey bee begins to forage, it is nearly always recruited to a floral source with abundant nectar and pollen by a successful forager and seldom search for forage on their own. Differences in the forage discovered by individual bees partly explains the differences in the foraging behavior of individual colonies. Although bees remain faithful to a species, they will search for alternative sources of forage, if the one they are working becomes depleted or less attractive. This behavior allows the colony to exploit the most favorable food sources available at any one time.
9. **True** Honey bees are able to see the sun directly through the clouds even when it is not visible to our eyes. They use ultraviolet light waves rather than those in the visible spectrum to sense the position of the sun. Ultraviolet waves penetrate through overcast skies and workers use these waves to locate the position of the sun.
10. A) Invertase or E) Sucrase
11. E) 54-58° F
12. D) Odor and physical configuration of the pollen grains
13. Honey is fully ripened when the cells of honey are covered with a wax capping.
14. Cooling the hive
    Dehydrating nectar during the ripening process.
    Distribution of Nassanoff pheromone at the hive entrance
    Regulating hive humidity
15. Robbing
    Colony Issuing A Swarm
    Approaching thunder storm, field bees sense it and quickly return to hive
16. Nectar, Water
17. Visual (location of the sun, polarization of light waves, and landmarks)
    Olfactory (odors associated with food sources)
    Magnetic (orientation to the earth's magnetic field)
18. 3- Shape or floral pattern
    1- Odor or fragrance
    2- Color markings

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

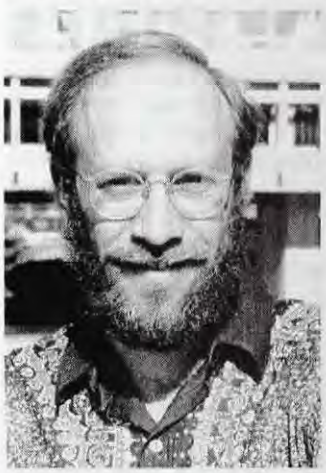
Number Of Points Correct
25-18 Excellent
17-15 Good
14-12 Fair

Clarence Collison is a Professor of Entomology and Head of the Department of Entomology and Plant Pathology at Mississippi State University, Mississippi State, MS.

Gleanings

AUGUST, 1999 • ALL THE NEWS THAT FITS

SFU LAUNCHES ENDOWMENT PROFESSORSHIP



As an acclaimed expert in the field of bee research, Dr. Mark Winston is poised to hold the first endowed professorship in environmental biology at Simon Fraser University, B.C. – Canada's leading comprehensive university.

A professor of biological sciences at SFU's centre for pest management, Winston is the esteemed author of four books, more than 115 published research papers, and a monthly column in *Bee Culture*. His research has earned him international attention and honors that include: the Sterling prize for controversy (1998); the Manning award for innovation (1997); an NSERC senior industrial fellowship (1995); the gold medal of the Science Council of British Columbia (1992); and a Fulbright fellowship (1986).

Recently, Winston received the prestigious Killam fellowship (1999-2001) which he will be using to continue his ongoing investigation of bee pheromones. In 1988, Winston and Keith Slessor released their research on the pheromones that are produced by the honey bee queen to maintain social order within the hive. As a result of their collaboration, Winston and Slessor were able to develop two commercial products: Fruit Boost and Bee Boost. The products increase the pollination effectiveness of bees, as well as allow beekeepers to control bee behavior.

Presently, Winston is searching for a biologically-based method of controlling infestations of the devastating *Varroa* mites in honey bee colonies throughout the world. His research fulfills a critical void in the study of how to manage rather than to damage the environment. Winston is dedicated to finding ecologically-based and sustainable pest management strategies.

Simon Fraser University is embarking on a human resource capital campaign to support and advance such innovative research. by establishing a $1 million endowed professorship in environmental biology, SFU will enable Winston to take his important research, writing, and public communication programs to new heights. He also will attract long-term research fellows and world-renowned visiting professors, host high-level symposia on key issues, and promote a collaborative research approach with industry and community agencies that will ultimately help to address some of today's most pressing environmental problems.

If you are interested in participating or contributing to this important endowment at Simon Fraser university, please contact: Christine Arnet, University Advancement, SFU, 2118 Strand Hall, 8888 University Drive, Burnaby, B.C., V5A 1S6; phone: 604.291.5304; FAX: 604.291.4958; email: arnet@sfu.ca; web: www.sfu.ca/advancement/

BEES, BERRIES, CANCER CURE?

Berry farmers could some day become "pharmers" by growing berries for medical uses, said Winston Bash, director of OH State University's Food Industries Center.

Ellagic acid, a substance found in high amounts in the seeds of raspberries, strawberries and blackberries, is just one natural food source scientists have proven to inhibit the development of cancer.

"It's great ellagic acid is found in the seeds because they are the one part of a berry that is usually discarded," Bash said. "If a product can be developed from ellagic acid that helps prevent cancer, then growers can sell the pulp and skin of their berries for juice or other traditional products and sell the seeds for ellagic acid use."

Growers would get a higher value out of their berries, he said.

Bash has been studying ellagic acid in berries for three years. He first determined what part of a berry produced ellagic acid and at what stage of growth. Now, he is looking at which berries have the strongest ellagic acid content.

In addition, Bash and Ohio State University horticulturist Dick Funt are raising, harvesting and processing berries for use in ongoing ellagic acid studies being conducted by Ohio State University cancer researcher Dr. Gary Stoner. The ellagic acid preparation involves removing berry seeds, then grinding and freeze-drying them into a form that is fed to laboratory rats.

Stoner began studying ellagic acid as a possible cancer inhibitor in 1984. His need for product to study is what got Bash and Funt involved in growing and processing the various types of berries.

Stoner has found that ellagic acid prevents some forms of cancer in laboratory rats and is interested in developing pure compounds for use with people at high risk of getting cancer. High-risk individuals include people from families with a history of cancer, those with a high exposure to carcinogens such as smokers, people with precancerous lesions that could lead to cancer, and those previously treated for cancer.

"There are other substances within berries involved in the cancer prevention process in addition to ellagic acid, and we're trying to find out what they are and isolate them right now," Bash said. "If all goes well, we should have some pretty good information within two years."

The 1999 Fruit and Vegetable Growers Congress is being held in conjunction with the Roadside Marketing Conference and the Ohio Grape-Wine Short Course. More than 1,600 growers and industry-affiliated personnel are expected to attend the joint conferences and trade show.

For more registration information on the Ohio Fruit and Vegetable Growers Congress and Roadside Marketing Conference, contact the Ohio Fruit Growers Society at 614.249.2424. For information on the Ohio Grape-Wine Short Course, contact the Ohio Wine Producers Association at 800.227.6972.

OBITUARIES

Louise W. Thurber, wife of Roy F. Thurber, died February 24 at home of heart complications. She was 81. Her husband preceded her in death, September 16, 1984.

She was born in Omaha, NE in 1917. As the daughter of a contractor, her early years were spent in Nebraska, Michigan, and Washington. She graduated from the University of Washington in 1939 with a degree in biology and was married to Roy Thurber in 1940 in Coeur d'Alene, Idaho. She spent the war years raising two daughters while her husband was on active duty.

In 1954 she and her husband bought the first lot in a new subdivision adjacent to Bridle Trails State park in Kirkland, Washington. Their initial love was horses. Shortly after this, Louise became interested in bees and kept several hives for years. Only later did her husband participate.

She and her husband were active in the Puget Sound Beekeepers Association for many years. In 1968 her husband started writing the monthly newsletter and for 16 years Louise edited, typed, reproduced and mailed the newsletter to over 250 members. Many of those articles were published in the *American Bee Journal* and *Bee Culture* magazines. Her silent interest in beekeeping led her to donate a considerable portion of their estate to Washington State University. This established the Thurber Chair and a full time Professorship in the field of Entomology, specifically directed at honey bee research.

After her husband's death, Louise compiled and published a book, *Bee Chats, Tips and Gadgets*, containing all of Roy's numerous research and published bee articles. This magnanimous effort consumed several years of her life and will be appreciated by many future generations of beekeepers.

David K. McGinnis, 83, 2801 N. Peninsula Dr., New Smyrna Beach, Florida died Tuesday, May 18, 1999, after a long illness.

Born August 2, 1915, in Wellsburg, West Virginia, he moved to this area in 1937 and established Tropical Blossom Honey Co., Inc., Edgewater, FL in 1940.

McGinnis was a veteran of the Office of Strategic Services and served in Atlanta and the China-Burma-India Theater in WWII. After the war he was a contract investigator for the Central Intelligence Agency in East Florida until 1964.

He invented the globe honey jar that is used widely in the honey and gourmet food industry today. McGinnis was a pioneer in developing international markets for Florida honey. He served as secretary for the National Honey packers and Dealers Association and was active in state and national beekeeping organizations.

He is survived by two sons, David J. of Edgewater and Douglas of Samsula, and one daughter, Patricia, of Edgewater, six grandchildren and five great-grandchildren. He was preceded in death by his wife, Helen, in 1989.

NZ TOUR SET

New Zealand beekeeper Trevor Bryant is organizing a millennium tour of New Zealand for U.S. beekeepers designed to be a cross between scenic highlights and the country's beekeeping activities. Cynics could say there's enough beekeeping activity to qualify the trip as a tax-deductible business expense.

The tour departs Los Angeles on Jan. 25 with arrival in New Zealand on Jan. 27 thanks to a lost day crossing the international date line. The tour covers both the North and South Islands.

It ends Feb. 9 with a flight from Christchurch to Auckland and a return flight to Los Angeles.

Costs are US$4,098 a person twin share with a single supplement of US$582. A deposit of US$500 is required by Sept 30 with balance paid by Dec. 1.

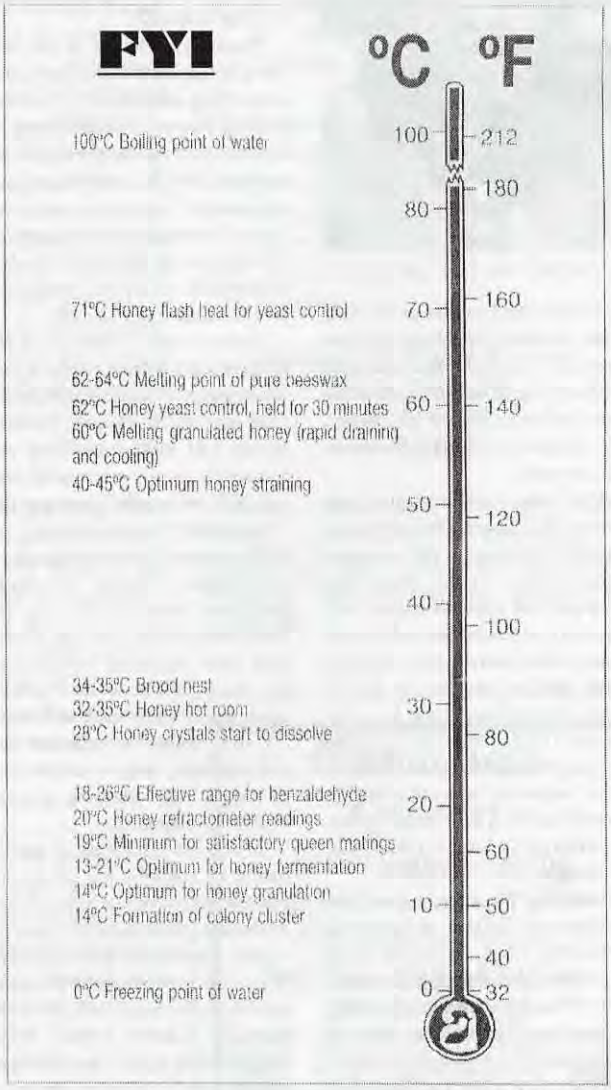
Any readers interested should contact: Trevor G. Bryant, Alpha Bees Limited, P.O. Box 486, TE PUKE 3071 NEW ZEALAND, Telephone/Fax: 0064-7 573 6885, Email: ; or Jo Page - UNITED TRAVEL, P.O. Box 271, Te Puke, Telephone: 64-7 573 7805; or Lois Bauer, Highway 32 North, Fertile, Minnesota 56540 U.S.A Telephone: 218 945 6898, Email: bhoney@mean.net

MICHIGAN QUEEN

The 1999 Michigan Honey Queen is Melissa Bisson. Melissa is the daughter of Terry and Janice Bisson of Rogers City, Michigan. She will spend the year representing the beekeepers of Michigan by promoting honey and educating the public of the value of bees in agriculture.

KENTUCKY HIRES

Kentucky hired Phillip Craft from Wilmore, KY to be the new State Apiarist. You can reach him at KY Dept. of Agriculture, Office of the State Apiarist, 106 West 2nd Street, Frankfort, KY 40601, 270.564.4870, FAX 270.564.5669, email Phil.Craft@kyagr.com.



From NZ Beekeeper

INNER ... Cont. From Pg. 6

on board than to outsource the same services.

I've been in business too long to take that argument at face value, however.

Granted, losing a six figure salary CEO will save money, but the question remains – if a CEO is worth that much money, what leadership will the Board get for less money? And, if a management company is hired to replace the present staff, for less money, what more could a staff do for less money?

Add to this the statement, made many times by the Board, the staff and the new chairman, that . . . "We have to do more with the same money." Which goes back to what was said here several paragraphs back. Mainly, the National Honey Board's goal is to increase the consumption of honey in the U.S. Even considering that both domestic and imported honey is in this formula . . . seems not to have worked.

I firmly believe this industry needs a representative body to deal with image, advertising and promotion. If it was my money being spent (but it's not), I'd want to make sure that it was going to a good cause. Right now it seems that every penny-a-pound is being spent for office staff salaries and bonuses, office space and equipment, advertising and promotion, but questionable increases in honey sold.

Will a management company change this? Only if directed to by the Board. Will the amendment of who pays for what change this? Only if directed by the Board. So, the fundamental question remains . . . the National Honey Board as it now stands has barely increased honey consumption, has not, by itself, increased honey prices to producers, (but that's not its job), and has increased operating costs without increasing income. Anyone in business, absolutely anyone in business knows that things as they are must change.

My father had a rule . . . if sales remain unchanged, increase prices or cut costs. He *always* lived by that rule and he supported several employees and his family. It worked for him.

The Honey board, it seems, has done neither. The challenge then is to either increase prices (raise income with costs remaining the same), or cut costs. Hiring a management company seems a way to cut costs. Hiring the same management team that has done neither seems questionable. It's time to adjust, but not eliminate, what is still a good idea. For those who must decide . . . choose wisely.

So, before you change CEOs, or management teams, make sure your smoker's lit and your hive tool's sharp. It'll cost you if someone else does.

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To Bee Or Not To Bee

Ed Hughes

My mother called me the other day to say that she got stung by a bee while visiting my brother. My first thought was not for my dear mother's well-being. No, I have been keeping bees too long not to know that my first duty was and always is toward the public image of honey bees themselves. If somebody says he or she got stung, I want to know who done it.

"Are you quite sure," I asked, choosing my words carefully, "that it was a honey bee?"

"Well, no," she said, "but it stung me right on the forehead."

"Calm down. I just want the facts. Now, try to remember: Did the so-called bee leave a stinger in your forehead?"

"Well, no, I guess it didn't."

"Then it wasn't a honey bee."

"But it hurt. I was outraged. A woman of my age getting stung by a stupid bee. Don't you even care?"

"Mom, I'll have to ask you not to use the word "bee" in describing the incident. It wasn't a bee. More likely it was a wasp, hornet or yellow jacket."

Under further interrogation, the subject admitted that my brother Chris was raising yellow jackets in his attic. This came as no great surprise. He had a record. He once sold me a compound bow that missed a nice four-point buck three times.

Almost a year ago, my sister had a similar story.

"I hate bees," she told me last Christmas just to see if she could work me up into an un-Christmaslike frenzy. I took the bait. I had to. It's my duty as a beekeeper.

"What do you mean exactly when you say 'bees'?" I asked.

"Anything that stings: bumblebees, wasps, hornets."

"But not honey bees?"

"Sure, honey bees, too. They sting, don't they?"

"Have you ever been stung by a honey bee?"

"They're all bees."

"No, they're not. Now think carefully. Do I give you a bunch of honey for Christmas?"

"Yes."

"Do you like honey?"

"Yes."

"So," I said, pausing to let the facts sink in, "you actually like honey bees."

Maybe I was tough on her. But sister or not, I wasn't going to let her go around blithely condemning honey bees.

Even I am sometimes confused by the rhetoric of non-beekeepers. My grandmother called me and wanted me to come get some bees that had built a nest under her siding. I inquired about the usual suspects, but she insisted they were honey bees.

Anxious to earn some points with Grandma, I told her I would be right over.

It took me five seconds after being shown their entrance to identify them as yellow jackets.

"How can you be so sure?" she wanted to know.

"Because I know honey bees, and these aren't honey bees."

"You mean you don't want them?"

"No," I said, "as a general rule I don't try to raise yellow jackets, but my brother does."

"Chris? Why does he do that?"

I told her that he raised them so that when our mother and I went to visit him, we would get a nasty sting.

"Why that's mean. I might just take the both of you off my Christmas list this year."

"Both?"

"You were the one who gave him that jar of wax last year telling him it was honey. That poor boy. Almost burnt his house down trying to make it liquid on his stove."

"If he had tried to taste it first, he would have known."

"He couldn't get a spoon in it. Now this year, you give him real honey or you will be off my list. And don't try that stunt again with jalapeño flavored honey. That wasn't nice either."

"What about the so-called empty paper wasp nest with the dormant wasps that he gave me?"

"He thought you liked bees."

"But Grandma, they aren't—"

"No 'buts' or you'll find yourself off the list."

"But wasps aren't—"

"I'm warning you."

"Okay, you win." I don't win every battle, but no one can fault me for trying.

BOTTOM BOARD