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AUG 2002

# Bee Culture



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# Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

AUGUST 2002 VOLUME 130 NUMBER 8

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*A Bee's Eye View. Water color by Susan Show, Creston, B.C. Susan's father is Lew Truscott, now 77, a long-time commercial beekeeper and past president of the Canadian Honey Council, from B.C. If you are interested in a 10" x 14" print, contact Susan at [www.SusanSnow.homestead.com](http://www.SusanSnow.homestead.com) or at [snowz@shaw.ca](mailto:snowz@shaw.ca)*

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BEE CULTURE



## KEEP IN TOUCH

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## Monitoring Mites

"Oh my," I thought as I read the article *Why Should I Monitor For Varroa Mites & What Is The Best Way To Do It?*, "what should I tell our bees?" The article indicates a threshold of 27 to 210 mites of natural mite drop as being acceptable. You see, our bees are accustomed to getting "de-loused" when the natural mite fall exceeds one mite per day, Spring, Fall and Winter. In our experience, counting mites which fall beneath a full-size *Varroa* screen onto a tray placed beneath to catch them, each mite that falls naturally represents 500 living mites in the colony. We have not yet needed to treat during the Summer months and have not established the same relationship of fallen mites to living mites for this season. It would be a daunting task to attempt treatment at that time unless one did not need to make a honey crop, move bees, pack honey or retrieve swarms. In other words we simply do not have the time or inclination to treat hives of 70,000 bees for *Varroa* mites with many of them clinging to the outside of the hive during hot weather.

Ted Scheuneman and I have successfully used full size bottom screens for many years to monitor mite levels in our outfits. The ability to constantly monitor mite levels was a prime requirement

# MAILBOX

during our four years of experiments to develop a modern, reliable treatment system which leaves no harmful residues in the hive to contaminate hive products, wooden ware or suppress brood production. We have been successful (patents pending) and are working to make this equipment available to beekeepers who want a system that kills tracheal and *Varroa* mites in all stages with a treatment time of three to four days.

Because we have been able to kill and count virtually all of the mites within the colony we are confident that our estimates of one fallen mite (per day) represents 500 mites living within the colony.

Why the large apparent discrepancy between the use of sticky boards or natural mite fall onto a tray placed beneath a *Varroa* screen? We have not done any

work on this but have noted that sticky boards are made using a variety of viscous materials. I, personally, have used lard, various kinds of vegetable oil and extractor grease. These chemicals have one thing in common, they stick mites to the observation boards. What they may not have in common are the compounds which they contain. We know that mites don't like oily products. Is it possible that mites are becoming disoriented and dislodged when a chemical glue or oily product is introduced within the hive?

We have used bottom screens, with observation trays, exclusively, for many years because of the tremendous advantages which they offer. They take mites out of production for 12 months of the year and in addition they provide a

*Continued on Next Page*

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# MAILBOX

moving picture of the conditions within the hive instead of a snapshot. They double as moving screens and can provide double the amount of ventilation for the Summer. Monitoring for *Varroa* mites can be done easily on each visit to a beeyard without disturbing the bees in any way as the observation trays are removed from the rear.

Ron Rudiak &  
Ted Scheuneman

## Lye - Again!

Wanted to write to you about making the soap using hot water. I had written saying I had never heard of it.

Was looking through some old recipes for soap making and one called for putting the lye in boiling water. So it used to be done that way. Haven't tried it but next time I will, just to see how it works.

I know you got letters against it, but it used to be done that way.

Keep up the good work. I enjoy *Bee Culture* very much.

Joe Reed  
Cassville, MO

## Welcome Back

With pleasure I renew my subscription after so many years. Some 40 years ago I wrote some articles for your magazine.

Having left beekeeping for umpteen years, mainly to make money, I'm back into it. Things have certainly changed - many more types of bees, and many more diseases.

Tom Jankowski  
Ohancock, VA

## More On The EpiPen

I am a beekeeper and a nurse. When I read your article about use of an EpiPen in the June 2002 issue, I was concerned that the author implied that an EpiPen should be used if one receives a large number of stings, such as with Africanized bees, while in an outlying yard. Not only is this not

advised, it could be quite dangerous. Epinephrine is NOT an antidote to bee venom. It's only function is to temporarily reverse cardiovascular collapse and airway obstruction caused by an anaphylactic allergic reaction, regardless of the allergen (honey bee venom being just one of thousands). In fact, epinephrine might increase the risk of heart attack, renal failure if given to someone who is not allergic to honey bee stings, but has received a toxic dose of venom. The author does quote an emergency room physician, but does not go on to distinguish different treatments recommended for these 2 very different emergencies. The author's examples both in the introduction and conclusion refer to having an EpiPen to treat venom toxicity. EpiPens can save lives, but only when used in the right circumstances. It is not like a fire extinguisher. I am disappointed that your editors did not get some other expert advice before publishing this misleading information.

Dawn Corl, RN,  
MN

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# INNER COVER

**I**n next month's issue we plan on having two stories examining the USDA Bee Lab situation. If the USDA ARS budget wonks take the recently completed Facilities Proposal seriously, Weslaco Texas will be all there is for federal honey bee research in the U.S. starting October 1, 2002. The proposal, if you haven't already heard, calls for closing the Beltsville, Baton Rouge and Tucson bee labs, and transferring all of the projects

and people from those closed labs to the Weslaco lab in Texas.

The monumental stupidity of this proposal – bad science, bad resource management, and abuse of good people – can, if you look closely, be traced to those who ordered the task force, and those who made the proposal...all with ties to, would you believe – Texas? And this is a state, we all know, that at the moment is significantly challenged by both political and business ethics. But that is a story for other venues.

If these closings occur, USDA honey bee research for the entire country will be centered in a place that's absolutely, completely buried in African honey bees, that has a subtropical environment and isn't large enough to accommodate a third of the people expected to move there. Even the dimmest bulb in USDA management should not miss the vacuum of wisdom behind this decision. But even dim bulbs often have faulty wiring and someone, somewhere is probably pulling their chains too.

Don't get me wrong. We need a lab in Weslaco to study those very things just mentioned. But I don't have AHB here in Ohio. Maine has winter. California raises queens. South Dakota makes honey...and Weslaco doesn't do any of these, and can't do what needs to be done for the rest of us. The value of pollination in this country is well documented....and sorghum wasn't even on the list...a favorite crop in Weslaco. Putting the only honey bee research lab in Weslaco is as smart as putting a dairy lab on the moon to study the production of green cheese.

A phenomenal amount of energy was expended when word of this myopic, demented decision first became known. Congressmen and Senators and the USDA were contacted by hundreds of beekeepers, fruit and vegetable and crop growers and other smart people, carefully explaining the necessity of maintaining honey bee research (or better, expanding honey bee research) as it is now. An amendment attached to the Homeland Security Bill forwarding the required funds (rightfully) didn't fly, but rumors of the appropriations committee going over USDA's head abound. But, as of late June, the head of ARS still said that the proposal would be followed to streamline honey bee research and trim the budget. Continuing to follow this blockheaded idea ignores the mountain of common sense that has been heaped upon ARS by hundreds and hundreds and hundreds of their stakeholders.

A couple of years ago I printed here the results of an OMB (Office of Management and Budget) audit of all of the Federal agencies. The USDA was, by a long stretch, the worst run agency in the entire federal government. Missing funds, corruption, ex-

traordinary mismanagement of resources and people...all were common throughout the agency, though a few parts of USDA earned the praise of OMB. The facilities study as I understand it that led to the bee lab closing proposal was initiated partially as a result of this OMB audit, which was certainly a good thing. However, the committee that was commissioned has ties to Texas, and the proposal clumped all the remaining bee science in Texas, along with their USDA funds, staff, outside funds, and other benefits. To me, and maybe it's only me, that stinks. It all may be legal, but it shouldn't be if it is. And probably nothing will be done about any of the questionable choices made. But Enron, Halliburton, Xerox, WorldCom, USDA and Martha all have the same distinctive, disgusting odor. Can you smell it too?

You've probably had a colony that had a collective, vengeful, evil, destructive memory. You know, guards in your face before you got within 50 feet; and always two or three in your face the whole time you're working the yard.

If you do bees for a living it's a fact of life. If you have a few out back it's annoying, but makes being a good neighbor a challenge. Requeening is usually the best choice. Case in point.

The day after July 4<sup>th</sup> the weather broke and the temperature dropped below 90° Like golfers, I shoot for the low 80s. I removed a full super to extract, checked two splits, moving one to a 10-frame box from its five-frame home, and put the escape on another so I could get that super the next day. I added a second deep to that polystyrene hive I'd started that was building nicely, and checked the swarm caught earlier that's been slow all season.

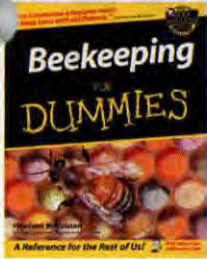
*Continued on Page 54*

## Closing USDA Labs; A Mean Colony



# NEW READING

*Beekeeping For Dummies*, Howland Blackiston. Published by Hungry Minds Press. 303 pages, color & B&W. 3764554190. Soft Cover. \$21.00 A.I. Root Company.



In case you haven't noticed, there is a 'Dummies' book on just about everything you can imagine, and some you don't even want to imagine. This Spring, *Beekeeping For Dummies* was released. Written by a long-time hobby beekeeper from Connecticut, Howland Blackiston has gathered the information needed to get started, and keep you going for the first, most difficult year.

The basic content isn't terribly different from many other beginner's books. There are the necessary chapters on bee biology, getting started, inspections, problems encountered and harvesting. But the Dummy people have created a template that each of their books follows, and part of this is all the little extras that get added. Things like cartoons, the icons found in the margins that denote special types

of information, and the multitude of short, information-packed side-bars that aren't needed, but great to have.

The information on making mead, candles, propolis tincture, cooking with honey is brief, but its value in that it opens the door to so much more to do with bees, and beekeeping.

The long list of references at the end open that door even further.

If there's a caveat with all of this, it's that Mr. Blackiston also is involved with a bee supply company, Bee-Commerce.com. To his credit he not only doesn't disguise that fact, but rather exposes it early, and often. He also lists other supply companies in the references. And, here too, I must expose a bit of shameless commercial exploitation. I was involved in some of the early work on this project and provided some technical information. As a result I was invited to write the forward for the book, and, there's an ad for this magazine in the back.

Nevertheless, if you're just starting out this book belongs on your bookshelf. You will, however, return to it again and again.

Kim Flottum

*Honey. The Gourmet Medicine*. Joe Traynor. ISBN 0960470417 107 pages. Soft cover. Black & white. Published by Kovak Books, Bakersfield, CA. Available from *Bee Culture's* Book Store and other outlets.



Joe Traynor knows a lot about plant nutrition, and crop pollination. That's what he does as a grower's consultant in southern California, and a bee-hive broker in the same region. I've listened to him speak at length on the subject of pollination, particularly but not limited to almonds. He knows bees, and probably more importantly, beekeepers. He gets good bees for his grower customers, and gets his beekeepers paid.

When he told me he was writing a book on the medicinal aspects of honey I was, frankly, surprised. And amused. What could he know? Then he sent me his manuscript.

Joe's on a mission I think. He's gathered all the latest data, relying heavily on Peter Molan's work, to get what has largely been beekeeper information out to the rest of the world. This book isn't for beekeepers, but for beekeepers to use to educate, inform and inspire honey buyers, and not-yet buyers to use and think of honey in a very different light. And, just to get the word out.

This is an easy to read, and extremely well referenced book. You'll use it, and should have extra copies to share. (Consider having it on display at your stand, or at that health food store you sell to.)

Kim Flottum

*Proceedings Of The 2<sup>nd</sup> International Conference on Africanized Honey Bees & Bee Mites*. ISBN 0936028257 379 pages. B&W. Soft Cover. Edited by Eric Erickson, Robert Page and Anita Hanna. \$18.99 from The A.I. Root. Co.



This was the proceedings that almost wasn't. A whole series of events, some natural, some not, kept getting in the way of finishing this book. Determination kept it going though. The final product was worth the effort.

Held in April 2000 in Tucson, Eric Erickson and Rob Page (who co-hosted the first event in 1987) brought together 90 some attendees, who related the absolute cutting edge of knowledge on Africanized Honey Bees, bee mites, the small hive beetle, and new problems on the horizon.

Even with the delay in publishing, much of this material has not been published elsewhere, or only in obscure journals. And it makes for interesting, information packed reading. But if you have mites (and who doesn't), or live in or near areas with AHB, the information here will help you understand what's going on better than any other current source.

There are not thousands of copies of this book printed, so if you are interested we suggest you order early. They will go fast.

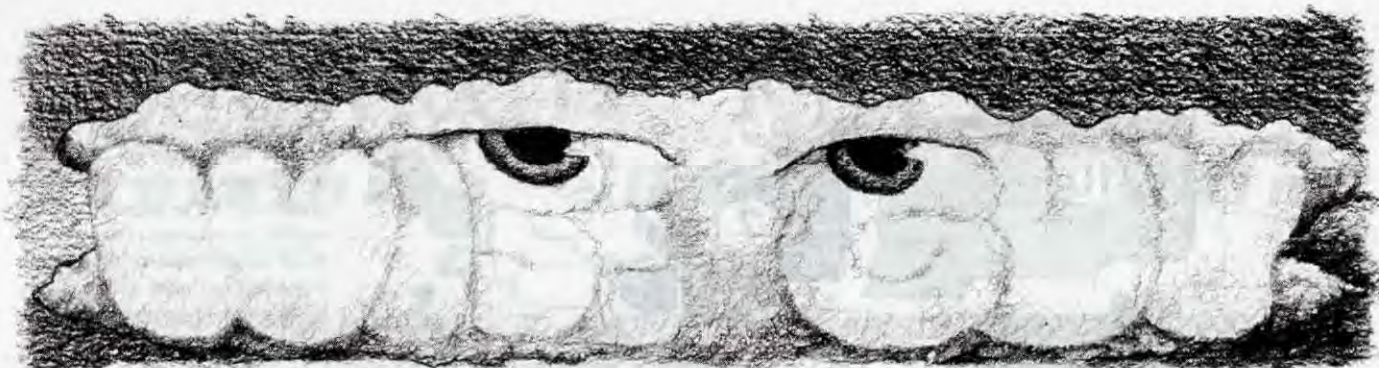


*Honey Bees Make Honey*, and *Las Abejas de Miel* Producen la Miel. Boty by Ruth Haag. Published by Haag Press, Bowling Green, OH.

These two children's books are about honey bees, beekeeping, harvesting honey, and honey. The line art inside is just as simple as that on the cover, and the copy is easily read. The unique thing about these two books is that, though identical in appearance, one is in English, one in Spanish. Priced at only \$6 each, having both of these would be easy and you can practice your second language. Haag Press can be reached at 419.299.3902.

Kim Flottum





Demand and supply. Supply and demand. Chicken or the egg. Egg or the chicken. Which one comes first? Does supply drive demand or does demand drive supply? Which or what or who drives these? Is weather a driving force in these areas? Does the price of the product effect the supply or demand? Should quality of the product effect the supply or demand? Do we want an increase in demand or increase in supply? Who in our chain of production and marketing wants increases or decreases in supply or demand?

By the time this appears in print we will know if the drought of "02" will either be over or worse. As of now the dry weather has taken a terrible toll in agriculture in the west and Midwest. If the current trend continues we will see a severe shortage in domestic honey production. A prediction of the shortage would only be a guess at this point and would be a guess based upon information available in June of 2002. My guess is a total domestic production of 173,000,000 pounds. Of that total the white honey will be affected the most. The plants that produce white honey will not be available to produce white honey. A larger portion of the domestic crop will be darker in color which will effect the supply of white honey. Will this effect the demand or the price or anything? Who or what moves supply or creates demand? Do you believe that if the supply goes down the price goes up? I do! I believe that the price of honey is going to rise to a level that will make producing honey a profitable business. Will demand change? Yes. I listen to our current marketing arm (packers) and they tell me how their clients will change formulations in their products that use honey due to the increasing price of honey. That tells me that due to the higher price of our product the demand will decrease. Now, wonder-

ing out loud, will the name honey disappear from the package if honey disappears or will honey (the name) be in smaller letters if the volume is reduced. Is this demand important to the industry? At the producer level, low price/high volume uses reduce the price of honey overall. According to ITC (International Trade Commission) testimony the price of bulk honey has a bearing on the price of shelf or other quality honeys. So an informed producer knows that high volume/low price bulk honey hurts the producer, not the packer or marketer.

Should the domestic producer be concerned with low price/high volume uses? Yes. In fact, he should be scared to death this account will run him out of business due to low prices paid for that product. Most of the honey used in the high volume/low price area is not domestic and appears to come from China. So the drought, antidumping action and now the problem with contaminated Chinese honey will enable our marketing arm (packers) to raise their prices and educate their clients on honey. They can tell them, and teach them, that the supply of quality honey may be short but the demand is still high, allowing an increase in price. Is this a reason for the client to quit using honey? Let us be realistic. Honey in most cases is not the primary sweetener in any given product. The client only wants the name "HONEY" on the package. Why didn't that client put "Corn Syrup" on the label? That's the primary sweetener. In fact according to a discussion held at a Honey Board meeting in Minneapolis, an industry user of bulk honey in cereal said increased pricing in bulk honey would lead to removing honey from their cereal. Then, a question was asked about the value of honey in a single package of cereal and \$.05 was said to be close to correct. Another person asked the retail value

of the package the honey was in and \$4 was the answer. We have been told that honey adds a value to a product. In fact this product has a trade name that contains honey plus a sister product offered without honey. If the cost of honey in that product went from \$.05 to \$.15 per package would it still be a good buy for the client? Especially if the word honey is used in the description of the product and is key to advertising this product?

Demand and supply. Supply and demand. There should be differing demands for different types of honey. If white honey is short the difference in price between other colors should be dramatic. For as long as I can remember there has and is an 8% to 10% difference in the price of different colors, no matter how short one color of honey is. The reason supply is not a key for us today is that our marketing people have made a generic product out of honey and there is not a footprint for different types of honey. Blending honey has caused this.

With the shorter supply of domestic honey due to drought we will see more non-domestic honey from countries that just happen to border Argentina and China. We need to establish true supply and demand for honey and honey products that are valued by something other than name only. We need a true demand for certain grades of honey. Without doubt, those who crafted the regulations for the original Honey Board are responsible for the generic branding of our product. Either they didn't see it coming, or were seeking, like most TV producers, the lowest common denominator in quality.

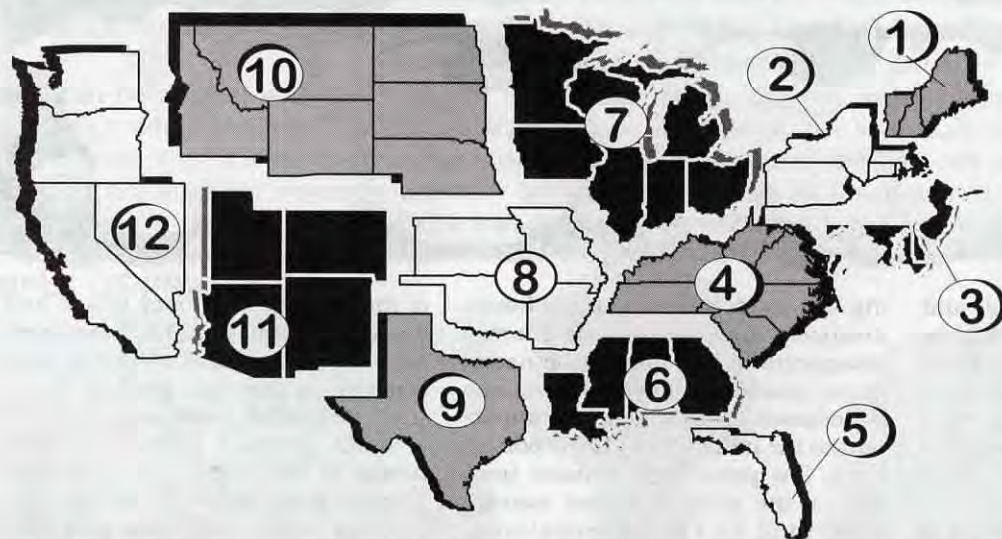
Supply and demand. We need to create a demand for *quality* products and let the supply fill that need.

*Wise Guy*

*P.S. I predict \$1.20/lb. by Nov 1, 2002.*



# AUGUST - REGIONAL HONEY PRICE REPORT



Overall, reporters' crops are not promising. Only 41% have a crop that's average or greater, while the rest are below or way below average. Generally, retail prices are increasing in just over 60% of the stores surveyed, and just over 56% of the reporters are raising their prices this season. 55% of our reporters say they are selling less honey now than at this time last year, but that reflects exactly the amount of honey being sold generally, which seems to be down the same amount. Only a third report requests for different varieties of honey to sell and just over 15% report request for different sizes. It seems everybody is happy with what they have.

**Region 1.** About an average crop so far, Pails and bulk prices steady, while wholesale and retail prices increasing.

**Region 2.** Crop seems to be down quite a bit so far, and honey sales are increasing. Pail prices way up, bulk high but steady, and both retail and wholesale prices have increased.

**Region 3.** About an average crop so far, with more reporters having an average crop than not. Some movement on both variety and size requests, but pail, bulk and retail prices steady, but wholesale up a bit.

**Region 4.** Not a promising crop so far, with 6 times as many problems and good crops reported. Few to no changes requested by buyers. Prices steady at all levels so far.

**Region 5.** Crop mixed so far, with some areas doing well, and some doing very well. Prices steady except for wholesale which is up.

**Region 6.** Crop is down, quite a bit in some places. And, shelf prices are rising to accommodate this. Wholesale especially, but retail moving up a notch.

**Region 7.** More good than bad reports as far as crops are concerned, but definitely a mixed bag. Shelf prices reported to be going up, but reporter are reluctant to move so far. Some variety requests being heard. Wholesale and retail prices moving up, but bulk so far unchanged from last month.

**Region 8.** Crop average to down quite a bit so far. Retail prices moving up, but all the rest are steady. Reporters note pretty steady prices across all venues.

**Region 9.** Is it wet enough yet? Recent deluges will affect crops, or not. But before the flood, the crop was down anyway. Bulk prices going up, but steady for all the rest, so far.

**Region 10.** Ouch. Crop reports are dismal so far, with only 10% of the reporters noting anything approaching average. Pail prices dropping a bit since last month, but all the rest steady.

**Region 11.** Crop about average so far, but just. Prices on shelves are pretty steady too. However, retail moving up. Reporters not moving much though.

**Region 12.** What crop? Northern areas are having some luck, but not much in the south. Shelf prices moving up, and requests for different varieties increasing.

	Reporting Regions												Summary		History	
	1	2	3	4	5	6	7	8	9	10	11	12	Range	Avg.	Last Month	Last Yr.
<b>Extracted honey sold bulk to Packers or Processors</b>																
<b>Wholesale Bulk</b>																
60# Light (retail)	85.00	81.16	74.00	68.00	75.00	75.00	65.00	77.06	110.00	84.25	105.00	62.50	62.50-110.00	78.50	79.44	67.29
60# Amber (retail)	89.00	74.55	70.00	65.83	60.00	74.00	64.00	66.50	86.67	82.00	102.50	55.00	55.00-102.50	71.67	73.55	66.60
55 gal. Light	0.85	1.05	0.90	0.79	0.95	0.94	0.83	0.85	0.85	0.97	0.87	0.85	0.69-1.05	0.87	0.89	0.65
55 gal. Amber	0.64	0.78	0.80	0.70	0.83	0.92	0.77	0.80	0.90	0.82	0.83	0.80	0.60-0.92	0.78	0.79	0.61
<b>Wholesale - Case Lots</b>																
1/2# 24's	36.06	28.69	44.01	31.56	44.01	29.93	36.97	44.01	30.00	30.44	34.00	25.00	24.00-44.01	33.72	29.00	28.59
1# 24's	53.17	42.59	48.00	46.36	56.93	53.00	55.56	43.92	43.60	47.72	44.00	49.20	34.00-66.93	47.84	43.08	43.04
2# 12's	46.67	38.06	47.40	45.38	43.70	40.00	38.94	41.00	40.63	38.60	45.00	43.33	38.06-47.40	42.39	41.98	39.02
12 oz. Plas. 24's	59.19	36.36	48.00	34.94	61.98	40.80	35.01	35.88	38.80	33.32	33.50	39.87	33.50-61.98	40.64	39.85	35.17
5# 6's	51.92	43.94	57.00	45.51	73.06	45.00	54.79	39.00	42.40	40.98	50.00	36.00	36.00-73.06	48.30	42.17	40.63
<b>Retail Honey Prices</b>																
1/2#	2.19	1.75	2.28	2.21	1.39	1.91	1.99	1.68	3.00	2.01	3.50	1.99	1.39-3.50	2.16	2.09	1.69
12 oz. Plastic	2.63	2.34	2.95	2.48	1.83	2.38	2.17	2.30	2.86	2.83	2.75	2.44	1.83-2.95	2.50	2.56	2.20
1 lb. Glass	3.15	2.64	3.00	3.11	2.58	2.85	2.94	2.80	3.50	3.14	3.82	3.09	2.58-3.82	3.05	2.80	2.65
2 lb. Glass	5.50	4.28	4.80	5.32	3.99	4.23	4.15	4.73	4.81	6.50	4.67	5.15	3.99-6.50	4.84	4.49	4.46
3 lb. Glass	7.25	6.82	7.80	7.10	6.99	6.25	7.00	6.71	8.00	9.02	6.45	7.14	5.99-9.02	7.04	6.64	6.29
4 lb. Glass	10.25	6.42	13.08	9.09	13.08	7.03	8.07	8.59	8.00	13.50	18.00	13.08	8.42-18.00	10.68	8.08	7.63
5 lb. Glass	11.10	10.07	11.00	10.59	14.19	10.00	11.48	10.24	14.19	12.29	9.40	9.00	8.75-14.19	10.96	10.00	9.38
1# Cream	3.85	3.16	4.36	3.33	4.36	2.91	3.58	2.98	5.00	3.85	5.00	3.24	2.91-5.00	3.80	4.22	3.30
1# Comb	4.17	3.85	3.60	4.13	4.91	4.17	4.13	3.96	5.00	4.91	8.00	4.50	3.60-8.00	4.61	4.38	4.15
Round Plastic	3.35	3.25	3.60	4.26	3.94	3.75	4.85	3.66	3.94	4.50	6.00	3.50	3.25-6.00	4.05	3.94	3.67
Wax (Light)	2.10	2.28	3.00	1.95	2.00	2.25	2.01	1.63	2.83	2.50	1.72	2.25	1.72-4.00	1.96	2.06	2.59
Wax (Dark)	1.17	1.57	2.75	1.81	1.80	1.13	1.76	1.25	1.83	0.95	1.98	1.79	0.95-3.83	1.40	1.47	2.47
Poll. Fee/Col.	47.50	39.83	36.00	38.20	39.99	38.50	40.56	35.00	20.00	40.00	47.00	39.00	20.00-47.50	38.47	35.54	38.07



# RESEARCH REVIEWED

## Explaining • Defining • Using

Steve Sheppard

*"Beekeepers and growers can compensate for the relative inefficiency of the individual honey bee forager on low bush blueberries."*

When considering the pollination of an agricultural crop, the effectiveness of pollinators can be compared both at the level of an individual pollinator and as a group. Researchers working with lowbush blueberry and pollinators in Nova Scotia recently published a paper that compared the effectiveness of various species of pollinators, including the honey bee *Apis mellifera* (Javorek et al. 2002). The results of their research provide insight into the value of indigenous pollinators and also suggest that current stocking levels of honey bees (number of honey bee colonies/unit area) appear to be below that needed for optimal blueberry production.

Lowbush blueberry (often called wild blueberry) is shrub native to North America that is typically pollinated by a diverse group of bees. The authors list seven bee genera that have been reported to exhibit behavioral adaptations to vibrate or sonicate blueberry flowers. This process, known as buzz-pollination, results in the release of pollen and facilitates pollen transfer to the receptive stigma. Two introduced bee species were included also in the study: the honey bee and the alfalfa leaf-cutter bee. Although neither of these species uses buzz-pollination adaptations to release pollen, they are sometimes used to supplement blueberry pollination.

The researchers set up experiments in three commercial blueberry fields located in Nova Scotia. All the fields had "abundant" populations of indigenous bee species and each was supplemented with one of three different managed bee populations: a 9 ha (20 acre) field with 10 honey bee colonies, a 7 ha (15 acre) field with 150,000 leaf cutting bees and a 12 ha (26 acre) field with 25 honey bee colonies and 150,000 leaf cutting bees. During the 3 year study, floral visitation rates, pollination percentages (percentage of floral visits resulting in pollen deposition) and "stigmatic


loading" (number of pollen tetrads on stigmatic surfaces) were measured for the 8 major bee taxa that were present. The measurements were conducted over a 5-8 day period each year during the bloom period in early June.

The authors reported that floral visitors could be divided into two groups: nectar collectors and pollen collectors. Most of the indigenous bee species foraged for pollen (or pollen and nectar simultaneously), while honey bee foragers and male and newly released female leafcutter bees foraged for nectar. Pollination percentages differed between the two groups. Thus a floral visit by a pollen foraging bee resulted in the deposition of pollen on the stigma about 92% of the time, while a visit by a nectar foraging bee resulted in pollen transfer to the stigma only 19% of the time. The researchers also found that when pollen was transferred, there were differences in the amount of pollen deposited by species on a single visit. While the typical pollen foraging bees deposited from 26-51 pollen tetrads (each tetrad is a group of 4 pollen grains) per visit, nectar foraging bees (such as the honey bee) deposited about 12 tetrads per visit.

The researchers found that bumble bees foraged the "fastest" (visited the most flowers/minute), while honey bees and the other species had slower rates. From the floral visitation data, the researchers were able to calculate the "pollination rate" for each bee species (blueberry flowers pollinated/minute). For example, bumble bee workers pollinated an average of 10.3 flowers/minute, honey bee workers 1.9 flowers/minute and leafcutter bee workers 0.8 flowers/minute). Javorek and colleagues also calculated a set of "pollinator equivalencies" referenced to the honey bee. For example, a bumble bee worker pollinated 5.4 blueberry flowers in the amount of time that it took a

honey bee worker to pollinate a single flower.

The authors found that individually, pollen foragers of the genus *Bombus* (bumble bees) and the solitary bee genus *Andrena* were the most effective lowbush blueberry pollinators, depositing over 45 tetrads per floral visit. The authors conclude that individual pollinator efficiency is important (e.g. a single floral visit by a bumble bee deposits adequate pollen for fruit set). Based on the equivalency of pollen deposition, they point out that blueberry flowers would require multiple visits by honey bees to receive an amount of pollen equivalent to that "deposited by a single visit by indigenous genera or pollen-harvesting *M. rotundata*" (leafcutter bees).

Other research has demonstrated that fruit set, seed number and fruit weight in blueberries is positively correlated with increasing pollen tetrad deposition. The potential relevance of the pollen deposition issue is made clear when the authors discuss unpublished data from 17 commercial blueberry fields showing that "34% of pollinated flowers receive less than 15 tetrads per stigma over their period of receptivity" They conclude that the high percentage of flowers with less than 15 tetrads is "characteristic of single visits by relatively poor pollinators". The authors argue that the current stocking rate for honey bees (number of colonies per unit area) used in blueberry pollination may be too low. By providing larger numbers of colonies during the bloom period, thereby increasing the likelihood of multiple visits by honey bees, beekeepers and growers can compensate for the relative inefficiency of the individual forager. 

Javorek, S.K., K.E. Mackenzie & S.P. Vander Kloet. 2002. Comparative pollination effectiveness among bees (Hymenoptera: Apoidea) on lowbush blueberry (Ericaceae: Vaccinium angustifolium) *Annals of the Entomological Society of America* 95:345-351.



Mark Winston



## Metaphorically Speaking

“Those of you with the patience and time to wade through this academic tome will learn much about how classical writers and deep thinkers have used bees to symbolize and interpret the human experience.”

**W**hen is a bee not just a bee? A bee becomes more than a bee when we choose to interpret their bee lives as complex parables about human behavior. We beekeepers relate to our bees as honey producers, floral pollinators, and occasionally temperamental stingers. For students of human literature, however, there is a rich history of metaphors in which queens, workers, swarms, and hives mean more than our straightforward beekeeping experiences might suggest.

There are enough of these metaphors about bees to make up a book, in fact a 300 page book that explores insects, metaphors, and the concept of “hive” down through the ages. “Poetics of the Hive: The Insect Metaphor in Literature,” by Christopher Hollingsworth (University of Iowa Press, 2001) is not for the faint of heart. This is a dense, dense book filled with more big thoughts and long words than you’ll find in your typical beekeeping library.

It does, however, illuminate the fascinating concepts that we humans have chosen to read into the lives of bees. “Poetics of the Hive” approaches the bee as symbol for other things, for important thoughts and telling truths about nature and human society. Those of you with the patience and time to wade through this academic tome will learn much about how classical writ-

ers and deep thinkers have used bees to symbolize and interpret the human experience.

One recurrent theme that Hollingsworth explores is how “the bee’s home, the beehive, singularly embodies the Western fantasy of a just and happy order.” He reaches back to the Roman poet Virgil for this description of how bees provide the model for an ideal human republic in which each citizen has a particular role: “Some watch over the gathering of food, and under fixed covenant labour in the fields; some within the confines of their homes lay down the narcissus’ tears and gluey gum from tree-bark as the first foundation of the comb, then hang aloft clinging wax; others pack purest honey and swell the cells with liquid nectar. To some it has fallen by lot to be sentries at the gates All aglow is the work, and the fragrant honey is sweet with thyme.”

Virgil goes on to point out that the lazy (meaning drones) get ejected from the hive, and also proudly tells us that it is the Roman bees, not the Greek ones, that reach the highest perfection of social order. Hollingsworth turns a nice phrase in summarizing Virgil’s polemic writing about social order, describing his writing as “weaving anthropomorphic conceit.”

Virgil was only one of many classical writers who equated the bee experience with social order, and the dictatorial command of the queen as an ideal to which human society should subscribe. Our con-

temporary interpretation of this extreme social order is not nearly as positive as Virgil’s. Subsequent scribes such as Aldous Huxley in “Brave New World” provide a more chilling perspective on dictatorial social order, such as this description of a human baby factory set up like a brood nest to produce offspring with preordained destinies: “This hive of industry was in the full buzz of work. Every one was busy, everything in ordered motion. From the Social Predestination Room the escalators went rumbling down into the basement Buzz, buzz! The hive was humming, busily, joyfully. Blithe was the singing of the young girls over their test-tubes, the Predestinators whistled as they worked.”

Virgil’s interpretation of the perfect bee republic with its preordained roles strikes us today as oppressive, and Huxley’s sarcastic description of human baby factories with its metaphorical link to brood nests is frightening. Fortunately for metaphor mavens, scientific studies have indicated that Virgil and others who ascribe lessons for humans from the lives of bees had it wrong, and that Huxley’s metaphor of predestination breaks down in the lives of real bees.

Worker bees have considerably more flexibility and choice than Virgil would have wanted or Huxley described. A typical bee goes through many jobs in her lifetime, and her choice of work is less determined and more flexible than the ancients believed. Worker bees respond more

*Continued on Next Page*



# "Images of bees in literature often describe them as pastoral, industrious, and organized, but there is a darker side to the metaphorical bee that preys on human fears about a more terrifying side to the animal spirit."

to colony need than to predetermined tasks, and switch readily between jobs as they interpret signals from the colony and their fellow bees concerning what jobs need to be done. Choices, flexibility, freedom from oppression, these are the values of contemporary democratic societies, and we can choose to read those values into the hive as easily as Virgil chose to exalt the hive for its perfect social order.

Images of bees in literature often describe them as pastoral, industrious, and organized, but there is a darker side to the metaphorical bee that preys on human fears about a more terrifying side to the animal spirit. Joseph Conrad, for example, uses bees in his book "Heart of Darkness" to place the reader into the desolate oblivion faced by his deathly ill character Kurtz: "The monotonous beating of a big drum filled the air with muffled shocks and a lingering vibration. A steady droning sound of many men chanting each to himself some weird incantation came out from the black flat wall of the woods as the humming of bees comes out of a hive, and had a strange narcotic effect upon my half awake senses."

Hollingsworth compares this passage and other heavy language by Conrad ("monotonous, muffled, droning, incantation, humming, narcotic") to the earlier writing by Virgil and others to exemplify opposing human tendencies to both extol and damn our poor bees. On the one hand we read into their existence an order and purpose that represent the presumed values of organization and sublimation of individual needs to the common good. In contrast, we also use bees to illustrate our darkest and most terrifying fears about the evil essence of animal natures.

We can look to the greatest

wordsmith of them all, William Shakespeare, for the definitive metaphors about bees and humans. The Bard himself transcended the use of bees to make political points, and with his characteristic blend of sting and honey best articulated the diverse qualities that we read into bees.

Shakespeare saw bees as informing us about order in society, as did many other writers, describing them this way in his play "Henry V":

*Honey-bees as creatures that  
by a rule in nature teach  
The act of order to a peopled  
kingdom.*

But he also saw the erotic and sensual in the lives of these well-ordered creatures. Witness his poetic description of a besotted lover in these shortened passages from "Where the Bee Sucks, There Suck I":

*Where the bee sucks, there  
suck I;  
In a cowslip's bell I lie;  
Merrily, merrily shall I live now  
Under the blossom that hangs  
on the bough.*

Shakespeare's sharp sense of humor also used bee metaphors, as in this description from "Henry VI" in which two characters Dick and

Cade talk about how sealing a smoothly worded legal document with beeswax can be more deadly than a bee's sting:

DICK: The first thing we do, let's kill all the lawyers.

CADE: Is not this a lamentable thing, that of the skin of an innocent lamb should be made parchment? that parchment, being scribbled o'er, should undo a man? Some say the bee stings: but I say, 'tis the bee's wax.

My take-home lesson from Hollingsworth's book and Shakespeare's writing is: don't read too much into the lives of animals. Bees have been used in analogies about almost every point of view, to support and condemn social order, to rhapsodize about love, and to sarcastically nail lawyers to the wall.

Methinks we read too much into their lives. Bees are bees, and while stunning in their social structure, inspiring in the complexity of their magnificent behaviors, and productive in their enterprises, they are not us. Metaphors may help us to make points about ourselves, but they do the poor bee an injustice in couching our perceptions about them in human terms.

Issues of democracy vs. dictatorship, good vs. evil, and honey-tinged flattery vs. sting-led violence don't concern the bees. If bees have any worries, they revolve more around where their next load of pollen will come from than the eternal questions about what it means to be a bee. **EC**

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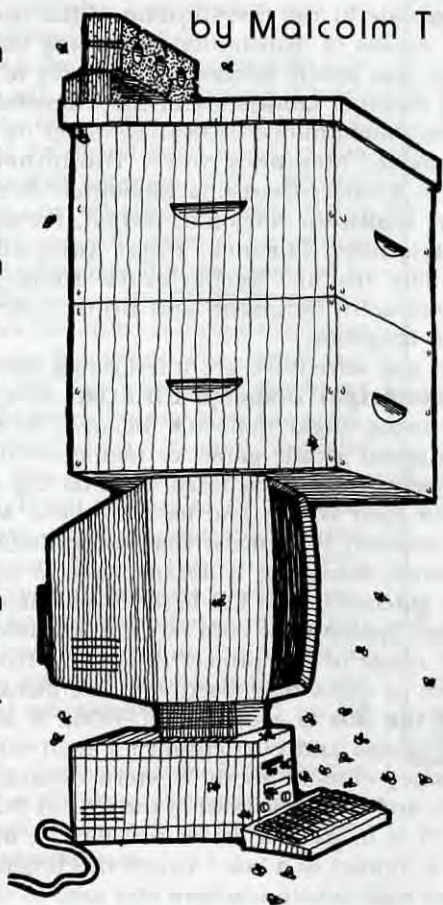
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by Malcolm T Sanford



I attended the 13th Brazilian Apicultural Congress in Florianópolis, Brazil in the state of Santa Catarina in November of the year 2000. This was an exciting event and my second invitation to the fifth largest country in the world. My first was to the 11th Congress far to the north in Teresina, deep in the heart of the sertão. At that meeting, I had been issued a thick paper book, the proceedings or annals (*Anais* in Portuguese), from which I was able to compile a comprehensive **report**. This was not to be the case in Florianópolis. Instead I was given a plastic disc in its own box and told that the proceedings would only be distributed in this format, a CD-ROM. I didn't have much experience with CD-ROMs then, but did know that it took a computer to read them. When I asked about whether beekeepers in the field had computers to access the information on the CD-ROM that was being distributed, I was told that many did, and that in any case, the expenses of issuing a paper proceedings were simply too prohibitive. It was CD-ROM or nothing.

At the same conference, I picked up another CD-ROM. It is called "Vida das Abelhas," produced by Prof. Breno M. Freitas of the University of Ceará, and advertised as an attempt to produce a database of information about indigenous bees in Brazil and the honey bee. The advertising proclaims the CD-ROM contains over 400 photographs. Introducing this CD-ROM into a computer results in a picture on the screen, the cursor turning into an animated bee, images of bees and flowers along with text flashing up on the screen and literally, music playing. The melodious tones of "Copa Ca-

## The CD-ROM

**bana**," made famous by Barry Manilow, emanate from the speaker. The flexibility and possibilities of this technology are immediately apparent.

The CD-ROM (Compact Disc, Read-Only-Memory) it turns out is an adaptation of the Compact Disc. According to the **Whatis.com** web site: "It is designed to store computer data in the form of text and graphics, as well as hi-fi stereo sound. A compact disc [sometimes spelled *disk*] (**CD**) is a small, portable, round medium made of molded polymer (close in size to the floppy disk) for electronically recording, storing, and playing back audio, video, text, and other information in digital form. **Digital** describes electronic technology that generates, stores, and processes data as either positive and non-positive. Positive is expressed or represented by the number 1 and non-positive by the number 0. Thus, data transmitted or stored with digital technology is expressed as a string of 0's and 1's. Each of these state digits is referred to as a **bit** (and a string of bits that a computer can address individually as a group is a **byte**)." Digital, of course, is the basis for this column's name and is the technology by which modern computers work.

According to a World Wide Web site called "**How Stuff Works.com**," "a CD can store huge amounts of digital information (783 MB) on a very small surface that is incredibly inexpensive to manufacture. The design that makes this possible is a simple one: The CD surface is a mirror covered with billions of tiny bumps that are arranged in a long, tightly wound spiral. The CD player reads the bumps with a precise laser and interprets the information as bits of data. The spiral of bumps on a CD starts in the center. CD tracks are so small that they have to be measured in microns (millionths of a meter). The CD track is approximately 0.5 microns wide, with 1.6 microns separating one track from the next. The elongated bumps are each 0.5 microns wide, a minimum of 0.83 microns long and 125 nanometers (billionths of a meter) high."

Like the CD, the CD-ROM is really nothing more than a storage device that cannot be written to, but is designed to be read by computers. Whereas computer memory can store large amounts of bits and, thus bytes, and so can other storage devices called discs (floppy and hard), the CD-ROM is a step up. Again, according to the **Whatis.com** site, "It is **capable of storing** huge amounts of **data** - up to 1 gigabyte (1000 megabytes), although the most common size is 650MB (**megabytes**). A single CD-ROM has the **storage** capacity of 700 **floppy disks** or enough **memory** to store about 300,000 **text** pages."

Information being published on CD-ROM continues. For example, the Apimondia 2001 proceedings were produced in this format. Besides the large number of papers presented, the disc also plays an opening video sequence showing the flags of all the member countries. Perhaps the most ambitious project that I am aware of is the **Apitherapy CD-ROM** published by Apimondia in three languages (Spanish, French, English). It also features an opening video with the presi-

Continued on Next Page



dent of the Apimondia Standing Commission on Apitherapy and the **American Apitherapy Society**, Dr. Theo Cherbuliez, talking about the possibilities inherent in this therapy. Another CD-ROM entitled "All About Bees," is produced by **Bernard Leclercq** and sold through the **Apiservices** web site.

Development of CD-ROM technology is clearly an inexpensive way to distribute the continuing deluge of information that characterizes the digital age. One example is Tulane University's **Payson** Center for International Development and Technology Transfer. It publishes the **Humanity CD-ROM libraries**. These include:

1) "The Humanity Development Library 2.0 contains more than 1,230 publications (160,000 pages) to help **solve poverty**, to increase human potential, and to provide education to all. We invite your organization to **become a partner** of this **Humanity Libraries Project**. We welcome your **editorial cooperation** and/or your **contribution as a local distributor**. In co-operation with GTZ-GATE this HDL 2.0 also contains the **Environmental Handbook**, and the French and Spanish versions: **Manuel sur l'environnement** and **Guia de proteccion ambiental**. A beginning of the Spanish version of the HDL 2.0 can be accessed through **El comienzo de la versión en Español de esta biblioteca**." Incredibly, the Payson project is **selling** this CD-ROM for US \$1.80 or two EUROS. It is also available **online** with a robust search engine. Searching for the word "beekeeping" returned 79 documents.

2) "The Medical and Health Library 1.1 contains 300 publications (35,000 pages) in the field of Medicine and Health. The objective of this project is to provide all persons involved in health care with most solutions and know-how they need to help other people. The final goal is to gather ca. 2,000 essential medical and health publications on a set of 2 to 3 CD-ROMs. These can then be provided free or at very low-cost to most doctors and health centers in developing countries, similar to a 'vaccination' campaign against lack of knowledge."

3) "The Food and Nutrition CD-ROM library 1.1 contains 310 publications (30,000 pages) in the field of food and nutrition. This special edition also contains the complete **IFPRI website**. The objective of this cooperative project is to provide those involved in the areas of food, nutrition, and basic needs with a comprehensive library of multidisciplinary insights and solutions to help solve poverty and malnutrition."

4) "The Collection on Critical Global Issues 2.0 was developed in 1999 by United Nations University Press. It contains 210 publications (32,000 pages) in the fields of Agriculture and Land Management, Development, Environment and Sustainability, Food and Nutrition, Natural Resource Development, Science and Technology."

5) "The World Environmental Library 1.1 contains more than 400 publications (45,000 pages). The objective of this cooperative project is to provide those involved in the areas of environment with access to most multidisciplinary solutions they need to help tackle the pressing global problems."

The **National Libraries Project** on CD-ROM involves a Consortium of seven European national libraries who

agreed to co-operate in the investigation of the use of CD-ROM as a means of distributing and using bibliographic data. It was jointly funded by members of the Consortium of National Libraries and the Commission of the European Communities (DGXIII/E) under its IMPACT programme. Members were: Bibliothèque Nationale, Paris, France; Deutsche Bibliothek, Frankfurt, Germany; Biblioteca Nacional, Lisbon, Portugal; Biblioteca Nazionale, Florence, Italy; Koninklijke Bibliotheek, The Hague, Netherlands; Kongelige Bibliotek, Copenhagen, Denmark; and British Library, London, United Kingdom.

"Education and adventure are interlocking components of the **Starbright Diabetes CD-ROM**. At every turn, whether using sugar molecule 'blasters' to feed cells in a high speed arcade game, or taking a tour of the body's digestive tract, kids learn what having diabetes means for their bodies and for their lives. Most importantly, however, they learn that while diabetes cannot be ignored, managing it doesn't have to mean sitting on the sidelines. The CD-ROM is narrated in both English and Spanish, for both PCs and Macintosh; the target age range of the project is 5-18." This is distributed Free to teens diagnosed with the disease.


"**Voices of the 30s** is a unique CD-ROM. It is an educational database and curriculum for high-school English or History classes about Western expansion, the Depression, and the Dust Bowl in the United States in the 1930s. It is in part, a set of activities, a living database, and a "library in a box." Voices was originally designed by two high-school teachers and used in their classrooms for almost five years before being turned into a commercial product. The goal was to keep the rich content and activities, but reshape the product's organization and presentation so that others could understand how to use it and so that it met or exceeded the current levels of presentation quality of other interactive multimedia products. It has many features that make it a special tool for classrooms and allow it to "grow" more valuable over time with use by both teachers and students. Both are encouraged to add new materials and commentary throughout the database and there are creation tools that allow students to assemble custom "multimedia book reports" to present to the class, using the materials in the database"

"The highly anticipated follow-up to Rocky Mountain Institute's Green Developments **CD-ROM** is now available. This new version contains over 200 case studies of green buildings and projects from around the world. The resource describes an exciting field of creating fundamentally better buildings and communities—more comfortable, more efficient, more appealing, and ultimately more profitable. *Green Developments* features more than 400 photographs, plans, and other images, 30 minutes of video and audio clips (including voiceover by Robert Redford), resources, and web links."

Because of the way it's designed, CD-ROM can come in different sizes. An application that may see more use is the **CD-ROM business card**. An example is the Airport bus card, which features ground transportation to south California's tourist destinations (Disneyland, Universal Studios). It has a link to the International airport World Wide Web site. Another is the Price Waterhouse Coopers card that enables clients to ac-



cess exclusive e-commerce and international web sites.

It is not known how long the CD-ROM will be around. Indeed it looks just to be another cast-off technology of the digital age, being replaced by another acronym, DVD. According to the **Whatis.com** site, "DVD (digital versatile disc) is an optical disc technology that is expected to rapidly replace the **CD-ROM** disc (as well as the audio compact disc) over the next few years. The digital versatile disc (DVD) holds 4.7 **gigabytes** of information on one of its two sides, or enough for a 133-minute movie. With two layers on each of its two sides, it will hold up to 17 gigabytes of video, audio, or other information. (Compare this to the current CD-ROM disc of the same physical size, holding 600 **megabytes**. The DVD can hold more than 28 times as much information!). Stay tuned; the digital age continues to heat up. 

*Dr. Sanford is former Extension Specialist in Apiculture, University of Florida. He publishes the APIS newsletter: <http://apis.shorturl.com>*

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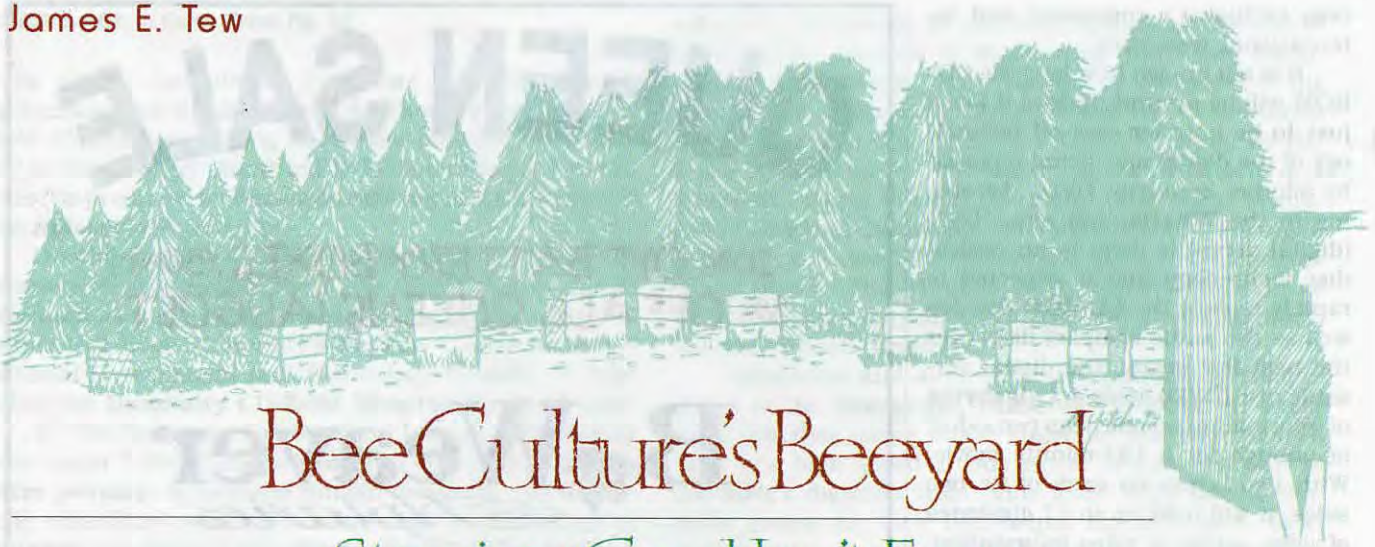
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# Bee Culture's Beeyard

## Staying Cool Isn't Easy

Do you know of an instance when a healthy hive was actually damaged – much less killed – by high daytime temperatures? Well, I don't know of one either. But, how can we, as we sweat and try to avoid the noonday heat, not feel that somehow our hives are as hot as we? I spent a great deal of print space discussing hot beekeeping in a past article entitled *The Overheated Beekeeper*<sup>1</sup> in July of 1997. Here, I would like to discuss what we can do and what we should do to make our hives more comfortable during hot weather.

### A shaded yard

The *Bee Culture* Yard is shaded – for the most part. That's good in that I avoid the hot sun, but the evergreen trees that shade my yard also restrict air movement. So I, as the beekeeper am out of the sun, but am still quite hot. I suspect the bees can withstand the heat better than we can. Whenever possible, put your yard in the shade for the comfort of both you and your beehives. But since the world is not perfect, remember that your shaded yard will also probably be mostly protected from the sun during Winter months. A cooler yard in the Summer can readily be a colder yard during the Winter.

### From last month

In last month's article, I spent quite a bit of time bemoaning the condition of my yard. Grass needed cutting and general yard maintenance had been left undone. You know all my excuses. I am happy to report that I am reasonably well caught up and situations such as the one shown in the photo are not so common now. Even so, bees in some colonies will still beard-out on the hive fronts on hot days.

The bearding behavior is not particularly bad – akin to me sitting on my front porch on a hot day. It would seem to be a logical way to reduce internal hive temperature.

"Everyone who has no business here, get out." But masses of bees on the front of the hive can, occasionally, be a problem for neighbors or you as you mow the grass. I suppose "out-of-sight, out-of-mind" could apply here. In fact, bees frequently beard on the front of a colony after dark. It's cooler and you don't see it happening. Though it could be a indicator of under-supering, I generally don't concern myself too much with the behavior.

### Stagger equipment to provide ventilation openings

If you think that your hives are particularly hot, stagger your equip-



A couple of hot crowded hives in the Bee Culture yard.

<sup>1</sup> Tew, James E. 1997. *The Overheated Beekeeper*, July, 1997 <http://bee.airoot.com/beeculture/months/97jul/97jul3.htm>



ment. This is commonly done in hot climates and I suspect it helps colonies mitigate high temperatures, but I cannot readily cite any instances of that being shown scientifically.

How much to stagger? Push equipment approximately one-inch "out-of-square." Normally, only upper supers are staggered but you may elect to stagger the bottom brood box also. Staggering equipment is a simple procedure and doesn't require any special restructuring of your equipment. Will robbing become a problem? It shouldn't if you maintain strong colonies and take general robbing precautions. If, for whatever reason, the hive will have to be moved, you would want to close up the staggered entrances before getting to the yard at the time of the move.

### Commercially manufactured ventilators

Solar-powered ventilators for cooling the hive are available from bee supply companies. These devices use solar power to drive a small fan that ventilates the hive. Literature cited in some of the advertisements report that egg laying was increased and that swarming was reduced. I have no personal experience with these devices, but they are available for you to explore should you desire.

### Water

Bee colonies must have water, which they creatively find. Several years ago, my neighbor came over to tell me that my bees were driving birds from her bird waterer. I thought, "Yeah, yeah, a few bees and here you come." I sauntered over with her to have a look and could barely contain my shock upon seeing approximately 2000 bees ringing the water line of her bird feeder. No bird in its right mind would come close to that water source. I told her the bees would move out once rain showers came, but until then, I was not sure what could be done. Thankfully, rain did come and the problem went away. I really had no other solution (short of moving my hives).

If the situation had persisted, or you have this problem, convince the neighbor to let the waterer go dry for a few days. The bees will find another source in the mean time.

What to provide for a water source? Let a faucet trickle, provide

*The back of a colony having staggered entrances in a shaded yard in a hot climate.*



Upper and lower staggered entrance

your own birdbath type waterer, or even put on a feeder having nothing but water in it. Honestly? Your chances of letting it run dry are great and then the bees will move on to other dependable sources. Sometimes dependable sources are the swimming pools of your neighbors. I recently communicated, via email, with a homeowner in Phoenix, AZ who reported that 30-50 bees were collecting water at the edge of his pool. He didn't know of any nearby beekeepers and had been told that these were Killer Bees. He was in a quandary.

*He said, "Starting about 6 am*

*or so, until dusk, I have about 30-50 honey bees hanging around. They are not aggressive but sure are annoying. I have had a "bee company" at my home and they are pretty sure they are African. Anyway, we have tried everything. Such as boosting the chlorine from 5 PPM to 50 PPM. Didn't work. ... adding vinegar. Nope no good. I've even doused them in pool acid and yes that killed the ones it hit but didn't have an effect from the residual acid on the pool walls. What I am told that will work is a salt water con-*

*Bees collecting water from a source offensive to people.*



*Continued on Next Page*





Two "fire-survivors" that were later supered.

A hive that got far too hot.



version ... this will bring the pool salt content to 5000 PPM... This is a good thing for us as we would use less chlorine."

Now here's a tough one. In dry conditions of Arizona, especially with the recent excessively dry weather, hoping for rain is a long shot. Even if it rains, that will not be a solution for the long haul. He did follow through, at considerable expense, with increasing the salt content to "that of the average human tear." As a desperate measure, I suggested that he drain the pool for a couple of weeks and force the bees to find another source (probably the pool of a nearby neighbor.) I gently asked if he could just live with the bees and their water collecting behavior if it came to it. He said that he could but would rather not. He promised to tell me if increasing the salt content of the water helped, but I am pessimistic.

In past articles, I have asked if we should be "salting" our hives. Bee books of 50-100 years ago actually had instructions on how to provide salt for the hive. Two - three times a year, someone will phone me asking why bees are collecting the brine from cattle saltlicks. I don't know. Either it's the only water available, the bees want salt (and trace elements) or they want both water and minerals. So in reference to the writer above with the pool problem, I suspect that adding salt to the pool

water will only make the pool more attractive. I didn't tell him that.

#### Undesirable Water Sources

How much truth can you stand? Bees must have water and at times, they will gather it from some disgusting places - like the runoff from a cattle feedlot. What does this say for the quality of our honey? Probably - nothing. I don't know if anything that goes into cattle rations could be passed along to our bees in runoff. So far, there have been no reported problems. (Reference my companion article in this issue on our ability to jump to solutions greater than the problem.) The biggest problem is the appearance of bees gathering water from such sources. I assume the bees need the water to cool the hive rather than process honey, but none-the-less they are taking such water into the hive. It should be clearly reported that honey has natural antibiotic systems that admirably control extraneous bacterial contamination.

Ironically, bees would seem to have a greater problem finding clean, pure water. It has practically no odor and or taste. Hypothetically, it would seem easier for bees to find water that has taste and odor and possibly trace elements and minerals.

#### How much of a source is needed?

I have observed bees collecting water from the edge of a pond, by a flowing stream and from the wet mud in a drying puddle. To the bees,

water seems to be water. I would assume that the closer the source, the better. And water sources - of any size - need to be dependable. Otherwise, the bees will move on to other sources.

#### Hot as Fire

Jimmy C. in Birmingham, AL had a fire, of unfortunate questionable origin, in his beeyard. This kind of heat supercedes all weather heat. I have been told the occasional yard-fire story over the years containing the details of miraculous survival of hives after a fire passed through. In Jimmy's case, some were survivors while others burned to ashes.

Jimmy had the strange fire stories to tell and show. Some hive bodies badly seared while the bottom board was nearly untouched. Other colonies were totally destroyed. Many of the plastic frames warped. To look at some of the equipment, I would have thought it impossible for it to all have been part of one hive.

I don't know of anything a colony can do when exposed to fire. No amount of water collecting by foragers would do any good. I suppose some effort could be made to control internal temperature, but a fire in the apiary is generally a bad thing. I'm happy Jimmy was able to salvage as much as possible and not all of his equipment was destroyed. **BC**

Dr. James E. Tew, State Specialist, Beekeeping, The OH State Univ., Wooster, OH 44691, 330.263.3684, Tew.1@osu.edu



# Blowin' Smoke

James Fischer

Really, don't let the smoke get in your eyes, it's nasty stuff.

No, let's not compare different smoker fuels. It just doesn't matter. Macbeth worried about Birnam wood coming to Dunsinane, but he was the only person with a valid reason to care about one fuel versus another.

Heresy? Not at all. In fact, there really is very little difference between smoker fuels. No matter if you use pine needles, tree bark, dried grasses, dried leaves, pine cones, cotton waste, or burlap, you are burning much the same thing. To get technical, cellulose, hemicellulose, and lignin make up the bulk of plants that grow on Earth. Under identical conditions, they should burn nearly identically.

But what goes on in a smoker?

What makes smoke?

Just what IS smoke, anyway?

Burning wood is familiar to just about everyone, so let's burn some wood, and watch what happens.

We were all told in school that wood, if burned efficiently by complete combustion, breaks down into its basic chemical structure of Carbon, Hydrogen and Oxygen, just as decaying trees do in a forest. But "efficient, complete combustion" is very difficult to achieve, and absolutely impossible in a bee smoker.

Wood, like any plant, contains a number of things:

**Water** Freshly cut wood is about half water, by weight. "Seasoned" wood that has been left to sit for a year or two contains a lot less water. Kiln-dried wood contains about 15% moisture.

**Volatile Organic Compounds** When plants are alive, they contain sap and a wide variety of volatile hydrocarbons in their cells. Cellulose, the chief component of plants, is a carbohydrate, meaning it is made of glucose.

A compound is "volatile" if it evaporates when heated. These compounds are all combustible.

**Ash** Ash is the non-combustible minerals in the tree's cells, including calcium, potassium and magnesium. We don't call it "ash" until after burning, but anything that won't burn will be left as "ash"

Efficient burning happens only at temperatures well above 1200°F. The usual fire in a fireplace or woodstove never gets that hot

(they typically reach about 900°F at the hottest), thus burning some volatiles, but releasing most of them into the air as pollution and smoke. Bee smokers burn at much lower temperatures than fireplaces, and the lack of oxygen in a smoker assures "smoldering" rather than burning. So, a smoker uses a multi-stage, low-temperature process to break down smoker fuel.

## First, Let's Blow Off Some Steam

All plant material contains water. The water must be evaporated out of the wood before the remaining fibers will be heated any further. The temperature of the wood will not rise above 212°F until the water is gone. The steam is also 212°F to start. Steam can scald your bees to death, and it is not going to cool off very much in the mere inches between your smoker and the bees. Even though "green stuff" appears to make great smoke when added to a burning fire, much of the "smoke" you see may be steam. The point here is that you don't want to use green stuff in your smoker.

## News Flash - Wood Does Not Burn!

Let's assume you are using well-dried materials, or have waited long enough for the moisture to boil out of your fuel. The temperature rises to about 450°F, as we all remember from Ray Bradbury's book *Fahrenheit 451*.

But even then, wood still does not burn! Here's a secret - wood never really burns. Next time you set a fire in the fireplace or make a campfire, watch what goes on. If you look closely, you will see that the flames never actually touch the wood. What is burning is a small fraction of the volatile gasses evaporated out of the wood. If you look closer still, you can see fingers of smoke arising from the wood well away from any flames. These are gasses evaporating at temperatures below that of combustion. On a scale of inches, the phrase "where there's smoke, there's fire" is very untrue.

When heat is applied, wood undergoes a process of thermal degradation called "Pyrolysis" in which the wood breaks down into volatile





gasses and solid carbonaceous char (charcoal). The cellulose and hemicellulose form the volatiles, and the lignin becomes the char.

### Up In Smoke

The substances created by pyrolysis are very complex. They consist of a gas fraction (carbon monoxide and carbon dioxide, hydrocarbons, and free elemental hydrogen), a condensed fraction (water, aldehydes, acids, ketones, and alcohols), a tar fraction (sugar residues from the breakdown of cellulose, furan derivatives, phenolic compounds), and some charred material.

This chemistry set of compounds is what we call "smoke". The mix is different depending upon temperature, amount of oxygen available, and so on. The same material, burned in your smoker on two different days, is sure to produce a slightly different mix of chemicals.

If enough oxygen is present and the temperature is sufficiently high, the volatiles can burn. This only happens to a small fraction of the volatiles in a smoker, more are burned in a fireplace or woodstove.

The result is less smoke from a fireplace than a smoker, due to a more complete oxidation of the pyrolysis products in the fireplace.

When temperatures are low, or when there is insufficient oxygen for complete combustion of the volatiles, smoldering occurs. This is "smoking," which is the emission of unoxidized pyrolysis products.

After the volatiles are gone, the remaining lignin char (charcoal) burns in the presence of oxygen in glowing combustion. These are the beloved coals that yield the thin blue smoke that makes for a great barbecue, and the reason why you want to cook food over coals rather than flaming wood the nasty volatiles are long gone, and will not make your steak taste bad.

### Smoke Gets In Your Eyes

Let's go back to what our teachers told us - "Burning wood is an exothermic chemical reaction of oxygen (O) with cellulose (C<sub>6</sub>H<sub>10</sub>O<sub>5</sub>), the major component of wood, to produce carbon dioxide (CO<sub>2</sub>), steam (H<sub>2</sub>O) and heat. The chemical reaction describing the process is: C<sub>6</sub>H<sub>10</sub>O<sub>5</sub> + 6O<sub>2</sub> = 6CO<sub>2</sub> + 5H<sub>2</sub>O + Δ."

Lies! All lies! It is never that simple. In fact, a fire

is a small-scale petroleum refinery and charcoal factory. We are dealing with hydrocarbons, and the more Carbons and Hydrogens we link together by letting the fire smolder, the more complex the chemicals we get.

Here's a list of the hydrocarbons, starting with the simplest. Your smoker can make all of these, and burn a small percentage of each.

Name	Carbon Atoms	Molecular Formula
methane	1	CH <sub>4</sub>
ethane	2	C <sub>2</sub> H <sub>6</sub>
propane	3	C <sub>3</sub> H <sub>8</sub>
butane	4	C <sub>4</sub> H <sub>10</sub>
pentane	5	C <sub>5</sub> H <sub>12</sub>
hexane	6	C <sub>6</sub> H <sub>14</sub>
heptane	7	C <sub>7</sub> H <sub>16</sub>
octane	8	C <sub>8</sub> H <sub>18</sub>

Propane? Yes, just like the gas company delivers.

Butane? Yes, same as in a disposable lighter.

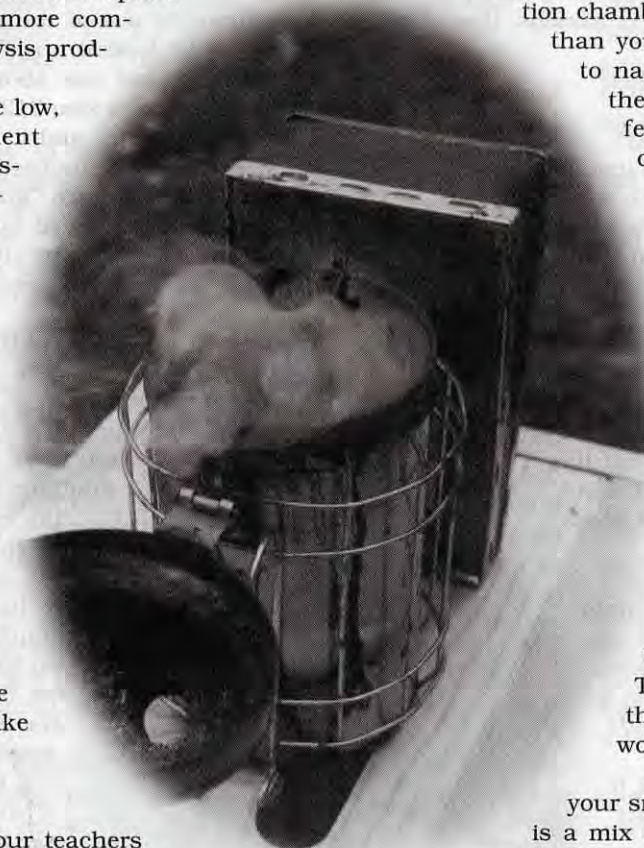
Octane? Yes, octane. You are making and burning gasoline in your smoker. Your super-high-efficiency wood stove with dual-stage combustion chambers burns much more gasoline than your smoker. (So much for "back to nature.") Every time you squeeze the bellows of a smoker, you are feeding air into a combustion chamber that lacked air, and the result is partial combustion of a wide assortment of chemicals.

Back in the 1970s, the magazine "Mother Earth News" published an article on how to run a car with wood smoke. The bed of a pickup truck held a sealed steel container full of wood, and outside the container, a wood fire heated the wood in the container. The heat drove off the volatiles from the wood in the container, and this smoke was fed to the carburetor and burned in the truck's engine. They never said how many miles they got to a cord of wood, but it worked.

So, no matter what you burn in your smoker, your "clean, cool smoke" is a mix of superheated toxic chemicals and carcinogens that cannot possibly be good for you, your bees, or your honey if used in excessive amounts.

Bottom line, easy on the smoke. It's nasty stuff. **BC**

*James Fischer made his money in computers, so he has significant experience with smoke and mirrors.*





# Lessons . . .

Evelyn Bence

Two weeks before my 84-year-old father unexpectedly garaged his car for the last time, I took him to the Department of Motor Vehicles. At the court house, about 12 miles from his rural retirement home, I asked questions of the woman behind the counter. She listened to me but showed more interest in my silent father. "You're the honey man?"

He perked up at the attention. "Yes, I am."

Suddenly conversation was easy. She never bought a jar of honey from his roadside stand. But on her daily commute she'd seen him carting the sweet cargo across his yard. This had happened before: People he didn't know would come up to him: "Hey, you the beekeeper on Route 21?"

This makes me a child of a honey man. And this identity defines me and my siblings almost as much as a more obvious common bond — the preacher's kids.

From Dad the holy man we learned not to cheat, steal, and lie. From Dad the honey man we learned lessons of a different sort that have made our lives and relationships easier.

The first lesson came early, when we were very young: *When you walk in the grass, wear shoes.* With no other explanation (who thinks these things up?), the Washington Post Kids' said that July 10 was "Don't Step on a Bee Day." I first assumed that the concern was for bee preservation, but it makes more sense for it to be about the well-being of bare feet. I vaguely remember as a child stepping on a wayfaring honey bee. My foot stung and turned red and swollen. I limped for hours.

My family poll indicates that a majority of my six siblings has the exact same memory. Assuming each was a discrete event, and not a phe-

nomenon of collective sympathy, the foot sting was the price paid for playing in our clover-covered yard and being foolish enough not to wear shoes. Most of us are sure we stepped on a bee only once. If we stepped on a bee twice, we didn't get *any* parental sympathy. We'd been warned to take precautions: Don't go out there without something on your feet.

Since before I was born, Dad's bees had been part of the family landscape. In the yard, the garage, the bee house (a storage and work room on an adjoining property), and too often dazed and buzzing in the car. But we learned to ignore them. This is the second lesson: *Leave them alone and they'll leave you alone.* Don't shoo them away or draw attention to yourself by dancing a jig. Just sit or stand still. Live and let live.

But (another lesson) *don't have unrealistic expectations.* Sometimes you will get stung. Even those of us who tried to keep our distance occasionally winced or wailed with a sting. Sometimes, when feeling threatened, the critters lash out. Don't expect this, but, we were told, don't let it throw you. (We were fortunate that none of us was seriously allergic to bee stings.)

If we got stung, Dad showed us how to dislodge the stinger. There was a right and wrong way to do this. Do not grab and pull, say with tweezers or fingernails; that only squirts and spreads more poison below your skin. Do take a dull edge, maybe a table knife or a fingernail, and *flick off the stinger, so it falls away, lost, back to the clover.*

If stung, we ran to Mother, who plastered the red skin with a white paste made of baking soda and water. The point was clear: *It's okay to soothe the pain with a poultice.*

We siblings learned one more



important lesson, from Dad the preacher or Dad the beekeeper, I'm not sure, because it was taught only on Sundays, the one breakfast of the week when Mom served hot oatmeal. We watched Dad make his dull bowlful edible: a wide slick of honey that melted down through the gruel. *A spoonful of honey turns pale oatmeal into a treat.*

*Previously published in the Washington Post. Used with permission of the author*



# Home Again . . .

Peter Sieling



The retired Reverend Bence kept a self serve honey stand across the road from his house. Over the years he sold a lot of honey from that stand. He occasionally bought buckets of honey from me as it became harder to manage his own hives. I helped him bottle honey af-

ter several of his operations – two hernias, two carpal tunnels and a pacemaker. We often worked late into the evening and I would collect the unsold honey jars and cash from the stand before returning home.

The stand was neatly maintained in a Depression era style. Painted with odds and ends of old house paint, I counted five colors. The signs were neatly lettered on the back of salvaged paneling and the side of an old hive super. "Recycle Jars Here. U may take 20c per jar from the can." The cash accumulated in a rusty coffee can weighted with a rock. I often thought a honey stand would be a good addition to my operation but there was never enough time to build one.

Reverend Bence's last operation, a pacemaker implant, didn't go well. I sneaked a jar of bees into the hospital under a vase of flowers and placed it on the bed stand. He grinned and gave me a sly wink.

"I'm taking care of Agway for you," I told him. "One of your daughters gave them my number."

"The prices are on the...wall...by the...phone," he gasped.

"I'm selling them my honey at your prices. You take over again when they let you out of here." But a week later he was gone.

The honey stand stood empty except for a few recycled jars left by old customers who never got their twenty cents. The Bence "kids" swept in for a big house cleaning. They asked me to put a sign on the stand directing honey buyers to my place. For awhile I continued to pick up empties and an occasional "Get well soon" card as they accumulated on the stand. After a few weeks the stand, with my sign, disappeared. The old house across the street stood neat and empty.

For several weeks new honey

customers trickled in. They had taken my phone number or address from the old stand. "Hope he's doing well." "Did you buy him out?" "I never met the man, but I've bought honey from him for twelve years." "I live 80 miles north and nobody around here has honey like that Bence honey."

One day the phone rang. "Hi. This is Jim. I understand you sell honey."

"Yes, I do." I thought it was an old Bence customer.

"I have an old fruit stand. We used to sell grapes and grape pies on it. I thought you might be interested in using it for a honey stand. It's free if you want it."

"Well..." I hesitated. I had no way of transporting it.

"It's been sitting on my trailer for a month. I would deliver it."

"Sure." How many beekeepers get a free honey stand out of nowhere?

Half an hour later a car backed into the driveway, a familiar stand strapped to the trailer. Jim and I unloaded Rev. Bence's old honey stand in my driveway.

"Pastor Bence borrowed this from my in-laws years ago. One of his daughters told us to come get it, but we don't need it anymore. I saw your phone number on the sign and figured maybe you could use it. It was easier to drop it off here than to put it in the back field to rot."

Like a faithful dog left behind by its owner, the stand found the closest thing to its master's home. I pressure washed and spray painted the old stand before the Winter snows. New paint for its new life.







A food grinder and a mortar and pestle can be found at almost any kitchen supply store. (photos by James R. Linden)

A number of years ago (in the late 60s) we were sitting around discussing what could be done to raise the per capita consumption of honey in the United States. The conclusions we came to were very similar to those of many others over the years. The uninformed consumer's three major objections to honey were 1) Honey is too sweet; 2) Honey is messy to use; and 3) Honey lacks flavor variety. These objections have developed in this country because our average consumer seldom has the opportunity of sampling honey from various nectar sources other than clover and alfalfa, and also never has been exposed to finely crystallized honey.

During our discussions, we came up with the idea of incorporating dried fruit with finely crystallized honey in order to overcome these objections. We ruled out the use of fresh fruits because their high mois-

ture content would tend to raise that of the honey used above the 18.6% moisture level with the resultant product then being likely to ferment.

In order to produce the finely crystallized honey, we used the method patented by Dr. Elton Dyce. His method is still used worldwide today and consists of pasteurizing liquid honey in order to kill any foreign yeast present as well as liquefying any crystals that might be present. This pasteurized liquid honey is then cooled to room temperature. Into this liquid honey is then blended about 10% by weight an already finely crystallized honey, commonly called "seed" honey. If commercially produced finely crystallized honey is not readily available, acceptable "seed" honey can be produced by finely grinding any crystallized honey in a mortar with a pestle. Blending can be done in many ways from hand stirring, to using a hand-cranked meat grinder, to an electric meat grinder, to a food blender, to various types of commercial mixers. Watch that you don't burn out the motor on the blender. Once the mixture is uniform in appearance, it should be placed in containers and stored for three to five days at as close to 57°F as possible. In the lab, we use an incubator with other options being a root cellar, springhouse, and during the cooler months of the year even placing the newly made spread in the attic often produces acceptable results. When Dutch Gold used to make the spreads and before they got an incubator they used to move their drums of honey inside and outside

during the colder months.

The first fruit that we experimented with was high quality sundried apricots that we purchased in the supermarket. Using alfalfa honey, which has a natural tendency to crystallize readily with a very fine crystal, we found that incorporating about 5% by weight of the apricots produced a product with a very nice honey-apricot flavor balance. Next, we obtained freeze-dried strawberries from a commercial food vendor. We found that by using about 2% freeze-dried strawberries, a pleasant fruit-honey flavored spread could be produced.

Over the years, we have experimented with the following additional additives. We produced oven-dried cranberries and produced a very acceptable spread. At this writing, however, we have not been able to locate a consistent commercial source of dried cranberries. Dried bananas and freeze-dried raspberries also produced excellent spreads. Dried peaches, dried coconut, and dried blueberries did not have enough flavor definition to balance the sweetness of the honey, and therefore did not produce marketable products. We tried raisins and came up with a product that tasted like rusty razor blades! Powdered cinnamon, obtainable in most supermarkets, produced an excellent product.

As soon as we had developed the apricot and the strawberry spreads, we sought the co-operation of Mr. Ralph Gamber of Dutch Gold Honey, in Lancaster, PA, to determine if these products would be economi-

# Making Honey Fruit Spreads

Robert Berthold



cally feasible to make on a commercial basis. When we were producing our first batch of honey apricot spread at Dutch Gold, I could hear Mr. Gamber talking to one of his purchasers about this crazy graduate student from Penn State, and his putting apricots into finely crystallized honey. His purchaser wanted to see what was going on, and when he sampled the honey apricot spread he said, "When can I get 50 cases." After that, Mr. Gamber called me son and wanted me to work for him after I graduated from graduate school. The ease by which the fruit products could be added into Dutch Gold's finely crystallized honey manufacturing encouraged Mr. Gamber to add the fruit spreads to his product line.

We then conducted a consumer test using the honey-apricot spread at the Pennsylvania State University store during the Summer when there was a general cross section of visitors on the campus. We encouraged everyone to sample and to complete a questionnaire. We strongly urged those who said that they didn't like honey to please assist us in our study, and just about everyone cooperated. Of the hundreds of people participating in our study, approximately 25% said that they didn't like honey. Of this 25%, over 80% said that the spreads were great, and that they would use honey in that form. Many of the remaining 20% of the non-honey likers said that if a different fruit was used, that they would probably use the product.

Once the honey-fruit apricot and strawberry spreads were commercially available, we started test marketing them at the Penn State Dairy Store. The store manager allowed us to put up a large sign explaining what the new products were. From the time they were introduced, they outsold similar sized containers of liquid and non-fruit honey spread. Our beekeeping club and our horticulture stand here at Delaware Valley College, have also been marketing these spreads for almost 30 years with similar results to the Penn State sales.


From the standpoint of marketing these honey-fruit spreads, we strongly feel that they are a means of increasing honey sales in the United States. The spreads overcome

the three major consumer objections to honey, those being it is messy to use, it is too sweet, and its lacking flavor variety. In addition to Dutch Gold Honey, a number of other commercial honey packers in the United States and overseas are producing this product. As with all finely crystallized honey, these products should be stored in a cool place. If they are exposed to too much heat for too long a period of time, the product will start to reliquefy. If they are stored in a refrigerator they become too stiff to use.

A nice thing about this product is that a small-scale packer or even a hobby beekeeper can produce these products at a very reasonable cost. Each Spring, each student in my apiculture course gets to make a jar of honey apricot spread during one of our lab classes. We use the best variety of sun-dried apricots available, since they produce the most tasty spreads. We use pasteurized alfalfa honey for the liquid part of the blend. We use hand-cranked meat grinders with the fine grinding heads attached to grind the apricots. Since apricots alone are very sticky, we grind them along with the 10% seed (already crystallized) honey plus some of the liquid honey. We have found that to produce a final product with a good flavor balance vs. good eye appeal is achieved by grinding the mix a second time. The doubly ground apricot-seed-some-liquid honey is then blended thoroughly with the remainder of the pasteurized liquid honey, bottled

in wide mouth containers, and stored in a cool place for at least five days.

Once Penn State University became aware of the commercial possibilities for these honey-fruit spreads, they investigated the possibility of obtaining a patent on them. The patent search revealed that Philip Crane, in 1933, received a United States Patent for blending many things with finely crystallized honey including dried fruits and nuts. Since this patent has now expired, the process has become public domain, and anyone can make these products without any royalty fee. We have often wondered why the Crane products were not marketed commercially, and one thought that we have had is that his patent came at the time of the Great Depression, and very few companies at the time were willing to develop markets for new products.

When we published our original article, we had requests from around the world for reprints, and I am sure that some one else has followed in Dutch Gold's footsteps. After I started teaching at Delaware Valley College, Everett Wright of Fruitwood orchards in New Jersey asked for information on making the honey fruit spreads, and I went to New Jersey to help him set up. He gets his dried fruits from a number of sources including National Bulk Distributors, 7620 Telegraph Rd., Taylor, Michigan 48180. 

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# WINTERING

Don't squander this year's profits replacing lost bees next year.  
Successful wintering makes you money now, *and* next year.

Allen Dick

When considered together with the mess and additional work it produces, the cost of rearing or buying replacement bees, and loss of crop income, Winter loss can easily be the largest expense of the year for a beekeeper.

If you never lose over 10% of your colonies over winter, and your surviving hives are always strong every Spring, you can skip this article. It is not for you. If you don't experience any Winter in your region, with snow, cold weather, absence of honey flows and long confinement periods for the bees, this might not interest you either. For the rest of us, improving wintering success offers the largest, and possibly easiest, opportunity for significantly increasing our profit and enjoyment from beekeeping.

Almost everywhere in North America – from the Mexican border on the south, to the Arctic Circle in the north, honey bees have demonstrated that – barring serious mite problems – they can Winter on their own with good success.

Before tracheal and *Varroa* mites became a problem, bees commonly survived for many years in trees, in walls, under floors, and in the many other cavities they choose to occupy when they escape from managed apiaries and go wild. Even now – in spite of mites – managed bees often escape and make it on their own through a Winter or more in many parts of the country. Of course we generally notice only those that survive. The dead don't tell many tales.

In managed hives, however, beekeepers often have bad luck when keeping bees over Winter. Many suffer heavy losses, even when they devote time, money and effort to the task, and follow the advice of experts. Anywhere bees can be kept profitably, bee wintering successes approaching one hundred percent, and nearly total failures can often be found within a few miles of one another.

If bees can survive Winter in the wild, and some

beekeepers in nearly any region consistently Winter their bees without much fuss or loss, why do so many other beekeepers have trouble wintering bees? What explains the successes? What causes the failures?

There is seldom one simple answer to these questions. Many unrelated things must go right for wintering bees to live and thrive, but if only one vital thing goes wrong, *even for a short while*, a colony or an entire apiary may be permanently damaged at some point during the Winter and be discovered dead or seriously weakened in the Spring inspections. Losses may occur quickly, in a matter of minutes or hours, or slowly over weeks and months, depending on the nature of the stress.

**“Mite management problems are only a small, albeit very important part of the wintering puzzle.”**

Bees can be wintered either indoors or outdoors, and either method can work very well or fail miserably. In either approach, the basic preparations are similar. The main differences are that when bees are stored indoors the environment is the responsibility of the beekeeper and that the bees must be kept in complete darkness until they are taken out and set down in spring. Thus, indoors, they have no flight opportunities all winter. Otherwise, there is not a lot of difference.

For every hive death, whether in Summer or Winter, there is always a reason, or a combination of reasons. However, identifying *all* the causes of abnormal hive losses over Winter, or weak hives in Spring is not always simple or easy. Often, by the time that the beekeeper arrives to do a post mortem, weeks or months have passed. As often as not, multiple factors are involved. Conditions in a beehive range drastically during Fall, Winter and early Spring. Many inter-related



factors come into play over a long Winter, and many lethal transient and one-time conditions or events may not leave obvious clues behind.

Finding the real causes behind weak or dead colonies is the key to preventing similar losses in the future. Human nature being what it is, there is always a popular scapegoat at the ready to explain away deaths beyond the normal range. Many of us are happy to accept any convenient answer, but accepting the handiest explanation may delay learning the real causes, and lead to more failures. Careful study and perhaps some experimentation, or a visit to a successful neighbour may be necessary to break out of a losing pattern.

These days, mites are the first to be blamed whenever things go wrong. To be sure, mites can cause big problems with wintering; bees that are heavily parasitized, either by *Varroa* externally and in the brood, or tracheal mites internally, are not going to be in prime condition to Winter well no matter how many other things we get right.

If bees are also suffering from the virus conditions that often accompany mite infestations, they are even less likely to Winter well, but mite management – like disease control, nutrition, breeding, and population management – is a separate topic, and mite management problems are only a small – albeit important – part of the wintering puzzle.

For the most part – assuming mites are well controlled, and that the treatments are correctly applied so that the bees are not damaged or poisoned by the ‘cure’ – mites should not be a very large factor, one way or the other.

Optimal wintering requires strong hives with lots of young, healthy, well-managed, well-fed bees. That doesn't mean that less ideal hives aren't worth a try, but it means that colony losses will be greater – possibly much greater. Where bees go into Winter in bad shape, any survivors can be expected to come out in bad shape too. Garbage in, garbage out.

If the hives to be wintered are heavily mite infested, riddled with AFB, malnourished, have been crowded or starved recently, are recovering from a pesticide kill or badly administered mite treatments', have a queen that is failing or inferior, have small populations of old or

worn-out bees, been allowed to plug up with honey before fall, or are otherwise in less than great shape, the odds are already stacked against them for their Winter ordeal. If several of these factors apply, the odds are even worse.

At some point any beekeeper who plans to Winter must get the bees into top condition and make it a priority to keep them in that state at all times. The best time to start is right now. It takes months for bees to get into good condition after being run-down and bees don't usually recover well late in the year – or improve over Winter. If this means medicating, treating, feeding or giving pollen supplement, re-queening, combining, moving to a better location, giving up a pollination job – or whatever, do it now.

When beekeepers estimate Winter loss, the number of hives that are completely dead by a certain date, are usually counted up and declared as the loss. Sometimes the weakest colonies – those with only a handful



of bees – are included in the dead count. This loss is undeniably the most obvious part of the problem, but loss of entire colonies is usually only half the picture. We must also consider the condition of the bees in the surviving colonies. In these survivors are the bees that must carry on to produce more bees to fill the empty hives, make the crop, and go into Winter the next

year. Will they be up to the task?

Colonies that aren't dead outright, those surviving hives can be weak and vulnerable to nosema and vague 'dwindling' problems arising from stress, poor nutrition, viruses or environmental factors. The bees that make it through Winter in such colonies may be living on dirty comb, under continual stress, and subject to heavy workloads with little support in foraging or rearing young, due to small populations. They may be also lacking assistance in regulating temperature and humidity, have only poor quality food, be malnourished – and old. That's a major reason why colonies that look reasonably good in early Spring often don't stay good-looking until Summer without some help from the beekeeper.

Just as the percentage of hives surviving in each apiary can vary, the number and condition of the bees

*Continued on Next Page*



# The best time to start a successful wintering program is *RIGHT NOW*. It takes time to get weak colonies healthy, and colonies don't respond as fast in the Fall as in the Spring.

surviving Winter in each remaining hive can vary widely too. Some wintering and early Spring stresses are cumulative; the adverse effects will last the entire (albeit short) life of each remaining bee, reducing its lifespan and ability to forage and to feed brood. Some of these effects will continue to afflict even the next generation of young bees, since the young will be raised under less than ideal conditions, and tended by bees that may be unhealthy and functioning poorly.

When considered together, colony survival and colony condition in Spring will determine to a very large measure the success of the following beekeeping year and ultimately, over the course of years, the profitability of any bee enterprise. Success leads to more success. Failure leads to more failure. Every little thing

that tips the balance towards better survival rates and healthier bees will accrue in our favour and thus contribute to success upon success.

Good wintering is the cornerstone of successful beekeeping, and good wintering is affected by *everything* a beekeeper does all year. This is a circle. Good bees lead to good wintering. Good wintering leads to good bees. There are many more reasons than simply money to strive to achieve a high level of wintering success. Recovering from bad winter losses can use up all a beekeeper's time and resources, slow down the bees, and cost the honey crop as well. **EC**

*Allen Dick is a part time commercial beekeeper from Swalwell, Alberta, Canada. He is a frequent contributor to these pages.*

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# WHEN IS A BAD QUEEN JUST A BAD QUEEN?

James E. Tew

*Probably more often than we think.*

I recently returned from a 1200 mile "walk-about" through much of Alabama. On the circuit, I visited approximately ten beekeepers whose hive numbers ranged from a single hive to nearly 2000 hives. I looked, listened, and learned. This article is not intended to review that trip, but rather to contemplate some of the issues and comments that were expressed on that trip and on many other similar bee rides.

**"Beekeeping isn't easy any more!"**

I don't quite know how to respond to this frequent comment. Actually, I often feel the need to express the same opinion. Though it would be easy to rush to embrace this concept, I'm not sure it's true. Yes, while we

stainless steel or food-grade plastic processing equipment. While I still read magazines and go to meetings, I access the web – at the speed of light – to stay informed and use a digital camera to show me instant photos of my beehives. In 2002, am I in better shape or worse shape than I was in 1970? I would argue that I am simply in a different shape – not particularly better or worse.

**"I don't know. Bees don't act the same way any more."**

Compared to what? The hot, defensive little German bees that we hived in the 17 and 1800s? Who remembers those? None of us because we have developed remarkably gentle, productive bees and no longer

## "When was beekeeping easier?"

have mites, Africanized bees, questionable queens, fearful neighbors, and use chemicals excessively, I sense that we have done nothing more than exchange one problem for another.

In order to be objective, when I hear the *beekeeping-isn't-easy-anymore* comment, I try to gently and respectfully ask the person saying it, "When did they think beekeeping was easier?" During the 1600s? The 1800s or maybe our somewhat recent pre-mite days? It's human nature to mollify our past feelings. Our memories of good times become even better while our feelings of bad times become increasingly foggy. Thirty years ago, I couldn't even spell *Varroa* – much less have a working understanding of what these mites could do. So, in 1970 (the good old days), I assembled wood frames by hand, averaging 20 minutes per completed frame and worried about pesticide kills. I got my information from bee magazines and by going to meetings. I used a galvanized extractor with questionable soldered joints. In 2002, I put in plastic frames (in about 30 seconds), never have pesticide kills, and I worry about mites. I use either

tolerate intolerant bee strains. Modern beekeepers who now come across hot, defensive bees immediately think they have Killer Bees and in some cases, maybe they do. Did beekeepers past ever have a queen rejected – even after she had started laying? Yes. Did beekeepers past ever have a swarm that would not stay in the hive box – even though there was open brood in the box? Yes. Were some hives productive while others were not? Yes. Are we guilty of jumping to complex explanations and hypotheses when much simpler explanations are at hand? Bees have never performed with absolute predictability – at any time in our history. So when our new \$15.00 queen is superceded, we think that something new is transpiring. Something that is a recent problem and that is new to beekeeping – I suspect not. I am guessing that it is nothing any more novel that a hive not accepting a \$1.75 queen thirty years ago and the long ago beekeeper wondering, "What's going on here?"

*Continued on Next Page*





# "Blame it on the mite *Varroa*"

(with apologies to the Bosa Nova)

## "Queen quality has declined."

(Give me a minute to scratch my head.) We recently ordered 28 queens from a host of producers.<sup>1</sup> Two came in dead. Five others were either not accepted or are presently being superceded. So we averaged about 75% successful queen replacement. So far as we could, we did things right. It would be easy to say that all the chemicals we have been using are causing queen failure. Some of you have told me that you think chemical use is causing drone impotence which leads secondarily to queen failure and there are some scientific studies to support this thought. That's pretty advanced stuff and it may be true – or not. Either way, a quarter of our queens were not successful this past spring. Is that number that far off from queen acceptance rates, of say, 1970? I don't know, but I need to know before I draw conclusions.

Maybe we can blame the postal system. They handle the queens roughly. They left the queens in the heat. Maybe they X-rayed them. I don't know. Maybe the Postal System didn't do anything. Maybe the queen was perfect by beekeeper standards but completely unacceptable by bee standards. Queens never developed in queen cages in the wild. In nature, queens were never abruptly taken from a colony, put in confinement for some time period and then abruptly released into a strange hive either. I suppose that we should be pleased that queens survive in shipping cages at all – never mind those that don't.

Runner cartoon funny?" Wiley Coyote is constantly being run down, smashed, bombed and bedazzled in these cartoonic episodes. Why is this amusing? I can't recall what I wrote, but it was several pages long and it successfully got me out of the class, but I have never forgotten the basic tenet of that class. It was, "When presented with a problem, explore the simplest hypothesis first."

Why did my queens die? I have no idea. But I find it easy to think that the hive was too hot, the weather too wet, that the cage accumulated foreign odors in shipping or that the queen never recovered from the physiological shock of being put in a cage. I find it more difficult to believe that the queen was vectoring a new, virulent virus particle that the bees were sensing and consequently rejected her. I find it easier to accept the possibility that the rejected queen's pheromone output was abnormal (I don't have to know why), causing her failure more easy to accept than the hypothesis that hive chemical residues in the parent hive somehow mysteriously made her unacceptable.

## *Blame it on the mite Varroa*

If to this point I have left you with the impression that all our problems are simple and direct, that should not be the case. The establishment of *Varroa* in our U.S. bee population has unquestionably been the pinnacle event in beekeeping history. *Varroa*, single-

# "Is that hot hive full of Killer Bees?"

How about the new bee virus rumor – brought in on new bee stock or brought in on mites. There's always the comment that queens are too inbred. I have no idea, but I personally want to move slowly on these advanced, new concepts of quality decline. In fact, I can cite no science that such a decline is present at all. That does not mean that quality is not declining, but just not documented. We don't know.

## **Logical Thinking**

Many years ago, in an effort to satisfy undergraduate class requirements, I survived a class in logical thinking. At the time, it seemed like a dud of a class. The final exam was one question – "Why is the Road

handedly, restructured our beekeeping thinking and management schemes. *Varroa* predation was so drastic that it now seems logical to think that all our problems are somehow new, or at least related to *Varroa* or to our attempts to control *Varroa*.

*Varroa* made beekeepers chemical users rather than avoiders. *Varroa* destroyed – or changed – our bee gene pool, thereby reducing sources of genetic variation. *Varroa* made the public look at bees in a positive light rather than constantly being fearful about dying from Killer Bee stings. *Varroa* (and tracheal mites) caused the Canadian border to be closed to U.S. bees seriously damaging the U.S. package and queen industry. And, *Varroa* made us broaden our perspective of bee problems – maybe to such an extent that any problem we now encounter is immediately thought to be new and difficult. Admittedly some problems are new and differ-

<sup>1</sup> See last month's Bee Culture for a more complete discussion of queen purchasing.



# "Queens never developed in queen cages in the wild"

ent, but many of our problems are just plain problems not requiring expansive, novel solutions.

(I'm struggling for words.) Residually, the *Varroa* event now colors much of our modern problem-solving procedures in beekeeping. It is as though we are still *Varroa*-shocked. If *Varroa* had never existed, we would still have some queens be unacceptable to some colonies. We would still have some colonies that would not build up and we would still have some swarms that acted squirrely. Yet, in large part due to *Varroa* infestations and its subsequent trauma, we now commonly feel that all bee problems are new, mysterious, and serious. This leads to comments like "beekeeping isn't easy, queen quality has declined, and bees didn't used to act this way." Sometimes things just happen.

## *Another classroom memory*

In a plant pathology class I was in many years ago, the professor put a photo of an oak tree on the screen. The tree was clearly sick – even dying. He went around the class asking for possible reasons for the tree's fail-

ing health. We, as young, newly educated students, suggested all known diseases, fungal problems, herbicide toxicity, and root damage. No, no, and no. In fact, the tree was struck by lightning. The solution would have been much more dramatic if it had been some exotic new pathogen. Being hit by lightning is such an everyday occurrence as to be disappointing. My old professor admonished the class, when problem-solving, to always consider all options – even the common and unexciting ones.

## *So, why is the Road Runner funny?*

Because he constantly employs complex, contorted schemes to accomplish something as simple as catching a bird. He always fails. Is there a comparison to beekeepers, scheming complex, advanced solutions to everyday bee problems? Maybe. Maybe not. Sometimes a bad queen is just a bad queen. Nothing more. **EC**

*Dr. James E. Tew, State Specialist, Beekeeping, The Ohio State University, Wooster, OH 44691, 330.263.3684, Tew.1@osu.edu*

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# Fresh Fresh Fresh

Ann Harman

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## *It's tough to beat New Crop Honey*

You need to just stroll through a big supermarket every once in a while. It should be an educational visit, not a shopping trip. In our usual trips to the grocery so many of us have list in hand, a tight time schedule, and a wish to beat the crowd to the checkout. However, your educational visit should be designed to teach you something about marketing. So – *NO SHOPPING!*

There is competition for almost all the foods we buy. Take cereals, for example. Look how many brands and flavors we are offered. Each promises wonderful taste, texture, health and maybe a prize inside. Often we end up buying several different kinds to satisfy several different urges. And, whenever a new one appears we'll try that one, too, just to see what it's like.

Now look for buzz words – those words that the food industry feels will sell a product. One example is the “no fat” or “low fat” approach. Various foods will feature these words to attract our attention and encourage purchase. One word that is now featured in different ways is “*fresh*.”

Packages are sealed for “*freshness*.” (Just try to get one open without a knife, scissors or dynamite.) A big sign hanging over the fruits and vegetables proclaims “*fresh produce*.” (Would anyone buy tired, wilted produce?) “*Freshness sealed in*” is another term you may recognize. So as you walk up and down the aisles note the various ways the word “*fresh*” is used and the various foods it is used on.

What has all this to do with honey? Well, honey, in some ways, is really rather fragile. True, honey with the proper water content will not ferment; bacteria cannot grow in it; and, crystallized or not, honey will last many years on the shelf.

Watch a beekeeper sometime, digging a finger into a newly capped frame of honey. The aroma and taste are truly wonderful. That's *fresh* honey. Honey that has been sealed with wax by the bees – “*freshness sealed in*.”

When we uncapped the honey, spin it out in an extractor, settle and bottle, many of the delicate aromas and even some of the delicate flavors just disappear. However, enough are left to make this year's crop of honey delicious. We can do a few things to preserve the *freshness* of our honey. Uncapping and extracting should take place as rapidly as possible. When the honey is in the settling tank it is not being exposed to the air, so little, if any, of the delicate flavors and aromas will be lost there. The next place for loss of flavor is during bottling. Here you should try to cap the jars quickly, not letting them stand open to air.

Storage in a warm place will destroy delicate honey aromas and flavors. We can stop those chemical changes only with proper storage. Long-term storage is best done in cold temperatures, even freezer temperatures of 0°F. Short-term storage should be around room temperature: 68-72°F. Storage areas should be dark. Light causes changes within the honey, darkening it. Yes, the flavor is still good but some of the “*freshness*” is being lost.

Section honey and cut comb are really wonderful ways to present honey. Here the customer is being offered honey that has never been exposed to air or heat. Truly this year's crop of honey is being presented at its best.

One thing to consider is that your customers *are not* beekeepers. You need to continually educate them into the joys (and value) of using honey. Customers

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BEE CULTURE



need to know that honey is versatile – comb honey for table use, liquid honey for cooking, creamed honey for the peanut butter sandwich. In addition to that, customers can be introduced to the fact that this year's new crop of honey is superior in aroma and flavor – it's *fresh!*

However, what can we do to promote *this year's* honey? Perhaps it is time to consider some new labels. However you do not want your jar to be stuck with too many tiny labels that make the appearance cluttered. Many beekeepers find that a label for the lid is effective. A colorful lid makes an attractive display at craft fairs, roadside stands and even on shelves in shops.

How about a lid label that says "*fresh* from the hive," "new crop of honey," "the freshness of flowers captured by honey bees," or whatever words you can think of that illustrate that the honey is *fresh*, this year's crop.

For honey in the comb, a small label could say "*freshness* sealed in by my honey bees," "so *fresh* you can hear the hum of the hive." I am certain you can think of other (probably better) words to convey that *freshness* is sealed in. And it is important for the customer to know that the bees sealed it!

For a jar you can do a hangtag giving information that your new crop of honey, sealed by the bees and brought quickly from hive to table, is the very best honey that money can buy. Straight from the happy hive (or busy hive) to your table – *freshness* assured. A hangtag can explain that the bees captured the season's *fresh* nectar and sealed it in the hive for your eating pleasure.

For comb, liquid, or even creamed honey, you can have your customers recapture the fields of bloom they so admired during the warm summer months by buying some honey and experiencing the *freshness* of this year's crop.

All those phrases should give you some ideas for posters, table tents, labels and tags. You can make a small brochure, threefold is nice, explaining how the bees put a beeswax cap over their honey to insure *freshness*, as well as cleanliness. Do not put too much to read in your brochure and have plenty of white

# It's tough to beat New Crop Honey

space so your brochure is inviting to read.

Another approach to help advertise the advantages of this year's honey crop is to use a jar different from your usual one. You may wish to use this jar up until December, then return to your usual jar for the following year. A wonderful collection of unusual and effective jars can be had from Mid-Con Agrimarketing in Olathe, Kansas, 1-800-547-1392. Here you can choose a specialty jar shape used only to help your customers identify and choose the *freshest* honey. Certainly there are other sources available choose one.

Yes, you can command a premium price for your new crop of honey simply because you are promoting it as being available for only a short time each year. Will people continue to buy your honey during the rest of the honey year? Certainly. Their honey gets used up and they need to come back for more. It would be nice to have people buy all of your new crop at a premium price.

Once your customers have learned of the pleasures of new crop honey they will return each Sum-

mer for that. Think about asparagus – it is available for a short Spring season and when available, everyone is buying it. Price does not really enter into asparagus purchases. Asparagus lovers want to eat as much of it as possible before the season is over. With some education your honey lovers can look upon the new honey crop with as much anticipation. However, keep in mind that asparagus advertises itself. You have to do the advertising for your new honey crop.

Another crop that uses the idea of a *fresh* new crop is the new potato – *fresh* from the field, thin-skinned and tasty. The term "new potatoes" has been around for a long time and is understood by customers. So you can see the idea of a new crop is not really new!

If you are selling at a craft fair, farmer's market or roadside stand, think about having an eye-catching poster proclaiming that this year's honey crop is now available. Here again consumer education is essential. Many non-beekeepers do not understand honey harvest times – when the beekeeper can remove honey from the hive. I am certain some think from time to time you just open a faucet stuck in the hive and out comes honey. Everything we can do to educate the customer increases sales and makes the customer receptive to buying your honey.

Maybe after reading this it is time for another stroll through the supermarket. Take note of "*fresh*." See how it is being used for other foods and think of ways to adapt those thoughts to your new crop of honey. And think of ways to educate your customers so that they can appreciate what you experience when you dig a finger into that *freshly*-filled honeycomb. ☐


Ann Harman is a sideline beekeeper and international marketing consultant.

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# SAVE - ALL?

Rick Green

## Frugal Is As Frugal Does.

Can you guess what a save-all is? It looks like an oversized corn cob holder. As my tale unfolds I will share how I use the save-all and provide clues about its original purpose.

Honey on shelves in the supermarket, or "anyone's honey" as being promoted by the NHB, is a commodity. So naturally price is the principle common denominator since there are few other points of comparisons. I sell more than honey. I attempt to wrap myself around the product. I have a cute label. I stress local honey. I tell interesting stories. I give school presentations. And I am filled with endless facts about the beekeeper's craft.

The save-all is another strand of the web I construct to inextricably associate my honey in the consumer's mind with something of value. It is easy to say no to honey on a shelf without these associations and simply buy the cheapest honey. At Farmer's market I tell stories about beekeeping. And having recently discovered the save-all gadget I will certainly incorporate it into my 2002 repartee. When the consumer sees my honey I want their mind to make associations with "Ballston Lake Apiaries - the home of those tireless Saratoga area bees!" Having established these associations it becomes harder to say no to my honey.

In the late 1700s the oil lamp became more widely used. Oils became more available, the light from candles

blew out quickly, and candles were feeble illuminators. But candles before and since were still widely used.

The save-all probably originated in England during the 1700's. These were frugal times that bore frugal men. Waste not, want not. The Shaker tradition evidenced the economy of thought and design so characteristic of this time.

Burning candles was not rocket science but it had its


pitfalls. A candle unattended, accidentally tipping over could burn a house to the ground. Candle sockets were deep and secure.

Once the candle had burned down, nothing remained except a 1-2" stub. What to do with these stubs.

Melting stubs in a pot saved the wax or tallow but the leftover wick was lost. Enter the save-all.

The save-all held a candle stub in the prongs and the tapered base could be inserted into a candle

holder socket. In this way every last bit of the candle could be burned. All was saved.

If you can't bear to live without a save-all then send \$50 to me. A neighbor and friend, Walt Fleming, who happens to be an accomplished tinsmith, will make you one. Be patient. Quality takes time. Happy selling. 

*Rick Green is a sideline beekeeper, who burns all of his candles in Balston Lake, NY.*





# ? DO YOU KNOW ?

*Winter Preparation*  
Clarence Collison  
Mississippi State University

With the Summer season winding down and fall approaching, emphasis changes from having the colonies in peak condition for maximum honey production to having colonies prepared for the up-coming Winter. The management of honey bees in the Fall generally includes two primary functions; completion of the work associated with the active honey-producing season, and evaluation of colonies to determine if optimal condi-

tions are available for Winter survival. Emphasis is placed on having a young productive queen, a large population of young bees and sufficient food stores. Colony health is also another important consideration.

How well do you understand the basic principles of Fall management and other Fall related activities? Please take a few minutes and answer the following questions on these important topics.

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

1. \_\_\_ Yellow jackets in the Fall are a serious menace to the colony since they rob the hive of honey and brood.
2. \_\_\_ Tiny perforations in the cappings of section comb honey are a result of wax moth feeding.
3. \_\_\_ Peak drone production occurs in the temperate region in mid-Summer.
4. \_\_\_ The quantity and arrangement of pollen stores in the colony is important in the Fall since spring brood rearing begins several weeks before an adequate supply of fresh pollen is available.
5. \_\_\_ In the Fall the broodnest should be located in the lower part of the hive.
6. \_\_\_ Strong colonies more reluctantly accept a new queen than weaker colonies.
7. \_\_\_ It is easier to introduce a new queen during a nectar dearth than during a heavy honey flow.
8. \_\_\_ Queen excluders and frames with undrawn foundation should be removed from the hive in preparation for wintering.
9. \_\_\_ It is important to reduce the hive space provided for wintering since the Winter cluster heats the inside of the hive.
10. Name two advantages of requeening colonies in late Summer. (2 points)
11. Why is it recommended that a beekeeper should under-super their colonies in late Summer and early Fall? (1 point)
12. Give two reasons why it is often important to remove honey from the hive when it is fully ripened. (2 points)
13. How can you tell when honey is fully-ripened and ready to extract from the comb? (1 point)
14. Name four primary criteria used in judging liquid extracted honey. (4 points)
15. Name two situations that result in the death of a drone. (2 points)
16. Describe two ways in which automatic uncapping machines remove the capping from the comb. (2 points)
17. Name two types of moth larvae that can damage stored beekeeping combs. (2 points)

ANSWERS ON NEXT PAGE

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# ?Do You Know?

## Answers

1. **False** Yellow jackets in the temperate regions cease brood rearing in late Summer/early Fall, therefore they no longer need a source of protein derived from insects/animals to feed their young. Adult foraging behavior switches to a carbohydrate diet, thus yellow jackets often become a menace around honey bee hives, as they attempt to steal honey.
2. **False** Even though wax moth larvae can damage the cappings on section comb honey, the damage would not be described as a series of tiny perforations in the cappings. Tiny perforations result from smoking bees when you are removing sections from the colony. When bees are smoked, they normally engorge on honey. If there are no open cells in the area to get honey from, the bees quickly make openings in the cappings large enough to insert their proboscis. Robber bees will also perforate cappings quickly.
3. **False** Peak drone rearing in the temperate regions precedes the emergence of virgin queens in Spring, about four weeks before swarming. Colonies produce fewer drones in Summer when few virgin queens are produced.
4. **True** Pollen must be available in adequate amounts and in a position readily available to a Winter cluster. A wintering colony must replace its Fall population with young bees and have a large, active brood nest by the time natural pollen is available in late Winter or early Spring.
5. **True** In the Fall, the broodnest of the colony should be located in the lower area of the hive, since the Winter cluster will slowly eat its way upward during the Winter. If the cluster does not start at the bottom of the food stores, then it will reach the top of the hive before the end of Winter and starve to death.
6. **True** The greater the population of the colony, the more difficult the introduction of a new queen.
7. **False** Queens are most readily accepted during a nectar flow because the old worker bees are occupied with other duties. Also with a honey flow there are fewer guard bees and bees alert to changes of any kind. In the absence of a honey flow, the colony should be fed a light syrup a few days before and after a new queen is introduced.
8. **True** Colonies should not be wintered on foundation, and all queen excluders should be removed. These two items will interfere with the formation of the Winter cluster and movement of the cluster upwards as the Winter progresses.
9. **False** The Winter cluster plays a role in regulating the temperature in the brood nest and does not attempt to heat the inside of the hive. When forming a cluster, honey bees on the surface establish an insulating shell which varies in thickness from 1-3 inches. Heat is produced within the cluster and generated to the cluster surface. Only the immediate area of the cluster is heated.
10. Queens are likely to be of higher quality than what can be obtained early in the Spring due to better rearing conditions and a larger population of drones to mate with. The price of queens will be cheaper since there is a large supply available. Fall is considered by many to be the best time to requeen colonies since a new queen will lay later into the Fall, providing a higher proportion of young bees to survive the Winter.
11. Under-swarming the colonies in the Fall causes the bees to consolidate their Winter stores and forces the bees into the lower part of the hive.
12. At times it is important to remove the new honey crop from the hive when it is fully ripened as quickly as possible for several reasons: 1) some honeys crystallize rapidly so it is important to extract them from the combs before they crystallize; 2) if multiple flows are a characteristic of the apiary site, prompt removal will prevent the mixing of floral sources; and 3) prevents the bees from tracking across the new, white wax cappings and darkening them with pollen and propolis residues.
13. Honey is considered to be fully ripened when the bees seal it in cells with beeswax caps.
14. Moisture content of the honey  
No signs of crystallization  
Absence of impurities (bits of wax, lint, dirt)  
Clarity  
Lack of froth (air incorporated during extraction and packing)  
No off-flavors (over heating, fermentation, undesirable floral source)
15. Mating with a queen  
Ejection of drones from a colony due to a nectar dearth or approaching Fall/Winter.
16. Automatic uncappers use several different techniques to remove the wax cappings: 1) horizontally mounted pair of heated, serrated knives that saw through the honey cappings on each side of the frame as it passes between the reciprocating knives; 2) series of small short chains attached on one end to a rotating drum; 3) combs are placed horizontally on a stainless steel wire conveyor that moves the combs through two stainless steel flails, one above the combs and one below the combs and 4) a rotary knife uncapper similar to the "chain flail" models.
17. Greater wax moth, lesser wax moth, dried fruit moth, Indianmeal moth, Mediterranean flour moth


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

Number Of Points Correct  
28-18 Excellent  
17-15 Good  
14-12 F

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



# HONEY THINGS



## *Useful Things To Do With Honey - Nutrition*

Elizabeth Cole

Honey is extremely nutritious as well as tasty. Here are some simple suggestions for adding it to your diet.

Bake with it! Honey adds a sweet, smooth, and distinctive taste to recipes, plus extra nutrients. It also has excellent preservative qualities due to its ability to absorb and retain moisture, keeping baked products fresh and moist. How to substitute honey for sugar in bakery items: Simply substitute honey cup for cup in place of sugar. As a rule reduce the liquid by a quarter cup for every cup of honey used. In baked goods add 1/2 teaspoon of baking soda for every cup of honey used and bake at a temperature of 25 degrees lower than instructions call for. In cookie recipes using eggs and no additional liquid, increase the flour by 2 tablespoons per cup of honey or enough flour to give the desired consistency. Chill before shaping and baking. **Hint:** Honey can be measured easily by using the same cup used for measuring oil in a recipe or by coating a cup or spoon with non-stick vegetable spray.

### **Quick Snacks and Treats**

#### **Baked Honey Apples**

Core 4 apples, peel a ring of skin away from around the middle of each apple. In the center of each, place 1 Tbsp. chopped nuts and drizzle with honey. Bake uncovered for 45 minutes at 350°F.

#### **Honey Spiced Nuts**

In a large, heavy saucepan, melt 3 Tbsp. butter or margarine and 1/2 cup honey. Add 3 cups of any of nuts, 2 Tsp. grated orange peel zest and 1/2 tsp. cinnamon. Stir over low heat for 5 minutes. Remove from heat, spread in single layer on foil to cool. Store in airtight container.

#### **Candied Citrus Peel**

Use lemons, limes, oranges and grapefruits, one at a time or in any combination desired. Ensure that the fruit is either organically grown, or very carefully washed. Use 1 pound of citrus fruit peels, cut in strips. Cover with water, bring to a boil, cover and simmer until tender. Drain and taste. If a bitter taste remains, repeat cooking process. After peels are drained, toss in 2 cups of honey until completely coated. Spread in a thin layer on wax paper or foil, place in a very low temperature oven (200°F) until dry.

#### **Glazed Bananas**

Peel and slice lengthwise 2 bananas. Place flat side down on greased cookie sheet. Brush with warmed honey, bake 15 minutes at 350°F.

#### **Simple Sesame Seed Bites**

For a nutritious and easy to make snack, grind 1 cup of sesame seeds in food processor, empty into medium size bowl. Add enough honey to make a stiff paste. Shape into thick ropes, cut into bite size pieces, roll in whole sesame seeds.

#### **Children's Sweet Milk**

(for children over a year old)

Stir in 1 to 2 tsp. honey into an 8 oz glass of dairy or non-dairy milk. It is reported that children who are given this honey-fortified milk suffer less colic and digestive upsets. In addition, the honey contains potassium vital for growth, and it provides both "quick-release" and "slow-release" energy. This helps maintain blood sugar levels and avoid extreme energy level swings

#### **Hot Honey Nog**

Beat together one egg and 1

Tbsp. honey. Heat 1 cup of milk to just below boiling, add to honey and egg mixture. Top with nutmeg.

#### **Sweet Honey Butters**

These are great on toast, waffles, pancakes, muffins, etc. With an electric mixer, beat together 1/2 cup honey and 1/2 cup butter until creamy. Beat in one of the following ingredients, or dream up your own variation!

For Banana Butter, add 2 mashed bananas

For a zesty Lemon Butter, add 2 tsp. freshly grated lemon zest

For Apple Cinnamon Butter, add 1 tsp cinnamon and 1/4 applesauce or apple pie filling

For Berry Butter, add 1/2 cup mashed strawberries, raspberries or blueberries

For Maple Butter, add 1 Tbsp. pure maple syrup.

#### **Simple Liqueur Sauces**

Use one of the following ideas to add something special to ice-cream, waffles, pancakes or muffins. No need to refrigerate.

#### **Orange Honey**

Gently heat 1 cup of honey and 2 tsp. orange zest. Add 1/4 cup of Grande Marnier and swirl until combined.

#### **Brandy Sauce**

Gently heat 1 cup of honey and 1/3 cup finely chopped walnuts. Remove from heat, blend in 1/4 cup brandy.

#### **Rum n' Raisin**

Gently heat 1 cup of honey and 1/3 cup raisins or currants. Remove from heat, blend in 1/4 cup rum.

*Tip: These make much appreciated gourmet gifts as well.*



# GLEANNINGS

AUGUST, 2002 • ALL THE NEWS THAT FITS

## No GMO Free Zones GUARANTEED GMO FREE?

Australian honey producers and packers are being required to give signed forms to their customers certifying that their bees have not been knowingly placed in or near a genetically modified crop.

"By and large we will try and deliver on GM-free produce," Australian Honey bee Industry Council executive director Steve Ware said. "But if you put bees down somewhere and you find out later that they come down on GM crops, what can you do?" "You don't find the GMO in the honey, it is in the pollen in the honey and it would only be minor contamination. But those issues are of concern. We are between a rock and a hard place."

The Canberra-based Commonwealth Scientific and Industrial Research Organization has begun one of the first studies of its kind into the possible side-effects and environmental threats posed by GM crops, including the transportation of GMOs by bees from GM crops to conven-

tional ones.

The CSIRO's division of entomology is undertaking a risk assessment to ensure that a strict set of guidelines are in place for governments to ensure that negative impact issues, such as GM contamination of conventional crops, are minimized.

The development came as the New South Wales state government said there would be no areas of the state kept free of genetically engineered crops. It said it was unrealistic to think GM-free zones could insure identity preservation because transport, handling and processing systems are all involved in the production of food which would likely result in cross contamination anyway.

The N.S.W. decision came as the federal gene technology regulator Sue Meek said she had received an application by U.S. agribusiness giant Monsanto for the first license to grow genetically modified canola on a commercial basis. — Alan Harman

## U.S. Lags Behind Everybody NEW ZEALAND GETS FORMIC

The New Zealand government is spending NZ\$589,000 on new research into *Varroa* control strategies.

*Varroa* was first found in New Zealand in April 2000 and Biosecurity Minister Jim Sutton said the funding should help the beekeeping industry as it moved into the next phase of the management of *Varroa*.

National Beekeepers Association president Don Bell said the research will help to overcome a lack of data about *Varroa* in New Zealand.

"We have to remember that *Varroa* is a new pest in New Zealand and development of strategies to cope with it have been hampered by a lack of information in key areas," he said. "Given the severity of the current and future economic impact of *varroa* to our industry and to the primary pro-

duction sector, research into how *Varroa* behaves in New Zealand will be money well spent."

Four projects are already underway and have received a further year of funding. This will allow continuation of research into *Varroa* population dynamics, treatment thresholds, development of an integrated pest management program and organic treatment application methods.

Ministry of Agriculture *Varroa* program coordinator Paul Bolger said other research will cover topics such as measuring resistance of the *varroa* to chemical controls and initiating a breeding program for *Varroa*-tolerant bees.

"We expect this research to make a definite contribution to assist

*Continued on Page 51*

## FEDERATION PONDERES HONEY BOARD'S FATE

Concerned that the interests of the domestic honey producers are not being protected in the proposal for the packer-importer-controlled honey board, the American Beekeeping Federation is crafting an alternative proposal that will better serve the entire U.S. honey industry.

The packer-importer proposal, with minor modifications, was endorsed by representatives of most of the industry during a National Honey Board-sponsored Industry Roundtable in Chicago, May 17-18. Approving the new concept were American Honey Producers Assn., Mid-U.S. Honey Producers Marketing Assn., National Honey Packers and Dealers Assn., Sioux Honey Assn., and Western States Honey Packers and Dealers Assn. Only the ABF delegation reserved judgment to allow time to study the proposal. That study has resulted in a conviction on behalf of the ABF Directors that it is critical that U.S. honey producer interests be protected by a politically meaningful producer voice on any restructured honey board.

The packer-importer proposal has significant differences from the current National Honey Board:

- Only importers and handlers are assessed; there is no direct producer assessment.
- The assessment threshold is 250,000 pounds of honey handled and/or imported.
- The proposed new board would have nine seats — four handlers, two importers, one representative of the honey marketing cooperative and two honey producers.
- The proposed board would set aside 5% of its revenue for production research, but the allocation would revert to the general fund if no research projects were approved by the board.

In preparation for its initial meeting the study committee contacted a cross-section of the industry to take a "pulse of the industry" on this issue. In contacts with both ABF members and others, the committee mem-

bers found no one wholeheartedly in support of the packer-importer proposal. Those who did support the idea did so only grudgingly — "if we can't have anything better."

The ABF study committee is looking at the issues which have been raised about the current Honey Board and is seeking to develop alternatives to satisfy those complaints while preserving the interest of the American producer in promoting his product and protecting its image.

Among the issues initially identified were:

- who is responsible for paying the assessment,
- the appropriate assessment level,
- the constraints on honey production (beekeeping) research expenditures,
- the nominations process,
- the threshold for assessments,
- the allocation of board seats among the industry segments, and
- the constraints on promotion of domestic honey.

"Achieving these changes expeditiously will require the support of all segments of the industry," said Mr. Heitkam. "We believe we will be able to craft a proposal which will earn that support — a proposal which will ensure that honey is protected and promoted and all segments of the industry are treated fairly."

## BLACK BEAR FACTS

Found coast-to-coast throughout North America

Weight ranges from 150 - 300 pounds  
Can live up to 20 years or more in the wild  
Highly mobile creatures whose habitats include, mature forests, woodlands with dense understory, swamps, forested river corridors

Omnivorous (plant & meat eaters) — diet changes with seasonal availability to include nuts, berries, grasses, leaves, fish, carrion and insects

Hibernates from early October and emerges mid-March - mid-April

Peak breeding occurs mid-June through mid-July

Females produce one to three cubs every other year, in winter dens



## BEEF CHECKOFF STRUCK DOWN

The U.S. government cannot force cattle producers to put dollars into a beef promotion program that says things producers don't like, a judge ruled in June in Aberdeen, SD.

The nationwide beef checkoff program violates producers' freedom of speech, federal Judge Charles Kornmann said in a 21-page decision handed down in June. He ordered the collection of checkoff dollars, which come to about \$86 million a year nationwide, to cease July 15. Money already collected will not be returned.

Kornmann's decision is expected to be appealed, perhaps all the way to the U.S. Supreme Court.

The program has boosted beef consumption throughout the United States, and the promotion must continue to keep consumption up. Surveys show that more than 60% of producers support the checkoff.

Herreid cattle producer Bob Thullner, one of the plaintiffs, is not among them.

"I can't believe it. This is great," Thullner said after learning of Kornmann's decision. "When we initiated checkoff dollars, everybody thought we were going to get better prices. But it never helped the U.S. producer."

The producer-funded promotions have helped meat-processing corporations keep retail sales up, but have also helped the big companies put small processing plants out of business and keep prices low for farmers and ranchers, Thullner said.

The checkoff funds are used to promote beef in general — not U.S. beef specifically. Thullner and others argued before Kornmann in January that they were being forced to support a viewpoint with which they disagree. Their products, they pointed out, compete with imported beef.

A producer pays \$1 into the program for every head of cattle he or she sells. Importers pay into the fund, too, and their contributions come to about \$8 million annually. The checkoff began as a voluntary program in the 1970s. Congress made it mandatory in 1985.

In 1999, cattlemen opposing the checkoff submitted thousands of signatures to the U.S. Department of Agriculture requesting a referendum on whether the fee should die. No vote was ever scheduled. The federal court case ensued and was held in South Dakota because it had the highest percentage of livestock producers who supported a referendum.

Defendants in the case are USDA, Agriculture Secretary Ann Veneman and the Cattlemen's Beef Promotion and Research Board. About half of the checkoff funds go to the beef board, which has a contract with the National Cattlemen's Beef Association. The groups came up with the popular "Beef: It's what's for dinner" slogan.

Sharp of Bath sits on the executive committee of the beef board, USDA must approve every project the beef board undertakes. The other half of the checkoff funds go to authorized beef agencies on state levels.

Those who support the checkoff program argued in court in January that the ads and educational materials put out by the national beef board constitute free speech by the government, which also has a right to say whatever it wants.

Kornmann had precedents to consider. The U.S. Supreme Court ruled in an earlier case that a similar checkoff program for mushrooms was unconstitutional because it touted mushrooms in general; producers argued some mushrooms are superior to others. On the other hand, the high court has upheld a checkoff program for fruit trees.

Herman Schumacher of Herreid was another opponent of the checkoff heard in Aberdeen's federal court.

"I am both elated and saddened," he said. "I am not against a checkoff and I am not against promotion, and the program has done one hell of a job of promotion beef."

But the program has hurt ordinary farmers and ranchers, while it has helped the operators of large feedlots and processing plants since the checkoff began in 1985, Schumacher said.

"In 1985, our cattle prices were higher than they are today," he said.

*Reprinted from Aberdeen News*

NZ ... Cont. From Pg. 49

beekeepers manage the impact of *Varroa* in New Zealand," he said. "Investigating the potential for tolerance to *Varroa* through selective breeding is a particularly exciting prospect and one we will be following closely."

Beekeepers are also debating the possible benefits of sourcing genetic material from breeding program in other countries. New Zealand has had closed borders for bee imports for over 30 years.

Meanwhile, two new options are being made available to beekeepers for control of the *Varroa* bee mite after the approval of Acting Agriculture Minister Paul Swain recently.

The products are formic acid 85% and oxalic acid dihydrate. The products are cheaper than synthetic chemicals and are also acceptable to organic certification agencies.

Mr. Swain said the approval provided a breakthrough for beekeepers in their battle with *Varroa*.

"Every effort has been taken to ensure beekeepers have these options

available as part of their arsenal and the ministry of agriculture and forestry will continue to work with beekeepers to assist them to develop new management and control strategies."

Approval was granted by Ag Minister Jim Sutton and supported by MAF, the Animal Remedies Board and the Pesticides Board, after a successful technical assessment.

Both formic acid and oxalic acid dihydrate are naturally occurring in honey at low levels.

At this time use of either product is conditional on compliance with a code of practice provided by MAF's Ag Compounds and Veterinary Medicines Group. A key requirement is that neither product should be applied when honey boxes are on beehives.

In addition MAF has published a guidebook for control of *Varroa* with detailed instructions on use of the products. The guidebook has been distributed to beekeepers throughout New Zealand. Copies are available from: Paul Bolger, *Varroa* programme coordinator, MAF Biosecurity Authority, P.O. Box 2526, Wellington.

*Alan Harman*

## OBITUARIES

**Alice Marie Strachan**, 71, wife of Don Strachan of Strachan Apiaries, died May 19.

She was a life-long resident of Yuba City, CA. She was co-owner of the Strachan Apiaries Inc. and a member of the Gray Avenue Church for 60 years, the California Scholarship Federation and Inner-Wheel in Yuba City.

Survivors include her husband Donald J. Strachan, Yuba City; three daughters, Debbie Strachan and Valeri Severson, both of Yuba City and Donna Haile of Dixon; a brother, George Echols of Concord; a sister, Shirley Sonnier of Yuba City; nine grandchildren and a great-grandson.

**Charles Herbert Robson**, 71 of Wickenburg, Arizona passed away June 29. Charles was born March 23, 1931. He will long be remembered as one of the largest beekeepers and hive product manufacturers in Arizona, as well as an inventor who held numerous patents.

Charles was a renowned lecturer on Nutritional and Medical uses of hive products. In 1988, Charles wrote and published a book entitled *Seven Health Secrets From the Hive*, which has been sold worldwide and is currently in its third publication.

Charles who was born in Phoenix, grew up with an acute sensitivity to the history of early Arizona settlers. He loved to share his stories of Arizona history and as a result, spent his lifetime collecting anything related to "Old Arizona." Among his collections is Robson's *Arizona Mining World*, a mining museum, with the world's largest collection of antique mining equipment, which was a passion he shared with his wife and loving companion, Jeri. His broad range of interests ranged from mining equipment of "Offy engines" antique cars and carriages.

### Holleman Leaves

## NEW NHB CEO

Nathan Holleman, CEO of the National Honey Board since February 2000, submitted his resignation on June 22, 2002 at the Board's annual meeting in Dallas, Texas. The resignation was effective immediately. Mr. Holleman stated in his resignation that he was leaving the Board for personal reasons and to explore other career opportunities. National Honey

Board Chairman Gene Brandi said, "We appreciate Nathan's contributions to the Board over the last two years and wish him well in his future endeavors." The Board has appointed Bruce Boynton as acting CEO. Prior to his appointment as acting CEO, Mr. Boynton served as the Board's Chief Financial Officer.



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THE NEW ZEALAND BEEKEEPER. National Beekeeper's Association of NZ. Write for rates & indicate whether airmail or surface. NZ BEEKEEPER, Box 3079, Napier, NZ.

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## INNER ... Cont. From Pg. 8

That left the evil one for last. It's a five-frame nuc, five medium stories high. It has brood solid in the bottom two boxes, and almost full in the third. The next was full of honey and the top had a couple frames nearly full, a couple nearly drawn and one still empty. I'm out of boxes, so I moved frames to equalize room in the top two boxes. By now there were more bees in the air than in the box. Bouncing off my veil, flying everywhere, boiling out between frames in spite of the clouds of smoke, stinging my suit and gloves (I'm no dummy) which I wear for these guys, and literally spitting venom through my veil, causing my eyes to burn (combined with sweat made seeing nearly impossible).

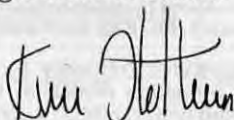
Anyway, I finished, closed it up and beat a hasty retreat going around the far side of the garage, the house and onto the porch on the other side of the house. Slipped off my suit, gloves, T-shirt and boots, and went inside for a drink.

Twenty minutes later, out on the deck in the back of the house, BANG, on the arm. BANG on top of my head. And BANG on my foot. I never saw them coming, but I did retrieve their mangled, crushed bodies.

O.K. they were from that hive. How do I know? I have one (remaining) hive of dark bees. These were black. Russians. An hour later they still were on me if I went outside. The deck isn't in line of sight from the hive. It's six feet high and in the shade. They had a plan.

These bees have done well. Few mites, good brood pattern and lots of it. but boy, do they have an attitude.

I did an interview this Spring on these very bees and the reporter wanted a photo of *those* bees. The photographer said tomorrow, after lunch or not at all. The time came - it was about 60° it was windy and spitting rain. Not a good time. No choice. Put on the armor and send the camera guy a long way back with a telephoto lens. He got buzzed, I got stung, but the story worked. Now, if I could just get them to behave.



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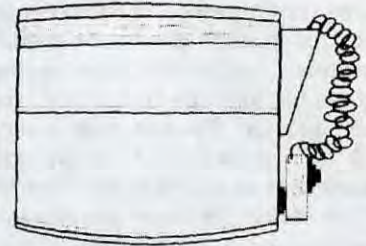
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**W**e sell several hundred queens a year here at our business. One of the most frequently asked questions we hear from customers when they go to requeen their colonies is, "What do I do with the old queen?" Well, we've given this a lot of serious consideration here at Queen Right Apiaries (that's the name of our business, not necessarily the state of all of our hives), and we're trying to take a more sensitive approach to beekeeping and queen care during the whole of your queen's life. In the past, many in our position would have callously suggested, "Just squeeze her head and toss her in the grass for the ants to eat." Or, you would sometimes hear, "Smear her guts on the new cage's screen, spreading her royal essence all over, passing it from one generation to the next." Often, the answer was to "Give her the hive tool test." I'll leave that horrible vision for your imagination. We're sure the animal rights people would not be amused.

But, like I said, we're sensitive here at Queen Right Apiaries, and we want to help you find the right solution for both you and your retired queen. So, rather than the crude and abrupt retirement plan others are offering, we are now making available an assisted living facility for your retired queens. Depending on the level of service you choose and can afford, your queen will be able to select any of several luxurious queen bank colonies in which to wile away her waning days. She may be sharing some of these fine accommodations with up to several hundred queens from other colonies, or be able to live simply and comfortably in a small but well appointed 5, 8 or 10 frame colony all by herself. Shared accommodations are, of course, less expensive.

Excellent nutritional and medical services will be available on an as needed basis, and only domestic Royal Jelly is served in our dining rooms. Weekly, or more often inspections are routinely carried out by our highly trained and certified EAS Master Beekeeper staff to insure the health and well-being of your retired royalty. We know the cost for this superior service can be a concern for beekeepers on a restricted budget. In light of this we have based our fees for this exceptional care on the level of service, length of care, and (most importantly) the amount of assistance you can personally provide during your queen's retirement stay at Queen Right Royal Care.

But as we all know, nature takes her course and our Royal charges eventually pass on. When that sad time comes, Queen Right Royal Care has available many services fitting this occasion. Our most often requested service includes softly placing her in an elegant eight ounce Queen Line jar with a gold top nestled in a bed of mint and clover blossoms as her final resting place. However, we also offer several types of smaller, less ostentatious queen cages. Those made of plastic will certainly last longer and better protect your queen from the elements. But the traditional wood cages (pine, oak and cypress available) are pleasing to the eye and the beekeeper. For the sentimentalists in the crowd, you might want to consider an eternal 100% beeswax encasement to preserve this lady in waiting so you can keep her on your mantle, desk or kitchen table.

Your queen's final resting place could be in one of our selected plots, deep in the woods surrounded by Black Locust and Honeysuckle. We call it "Honey Acres" (no connection to that Wisconsin place). Here we can place your queen six inches deep while a Master Beekeeper reads selections from *Bee Culture*. Premade, wood-burned markers, made from number 1 grade split

bottom bar frame material (commercial grades with knots available for a reduced cost) include: "She Did Brother Adam Proud," "Hygienic She Came," "Swarmed Into My Life," "Good Old #75," "Italian Bomb," "A Real Honey." They would also include specific information such as "Emerged Died", and "Bought From", and "Mated With" if you choose. These are priced by the letter.

At the service, veils and beesuits are proper attire, smokers are out, and hive tools are in the back pocket, signifying completed work, a job well done. After the ceremony we will pass a sample of her life's work, savor the aromas and squeeze the bear in her memory. And at the end we will release a flight of workers, recalling the last swarm.

For a slightly lower cost, we can have your queen cremated in a stainless steel smoker and we'll return her ashes in an urn (a queen cell cup) of plastic (honey amber, light yellow or white) or wood (only pure Georgia cypress). Or, if that final service would be too painful for you to bear, we can spread the ashes in an apiary of your choice.

No matter your final selection, a copy of the death certificate will be issued with the original being kept on file here for all eternity.

These services, as far as we know, are not available anywhere else in the world. So we make our proposal to the readers of *Bee Culture Magazine* only. I know there are those of you who will poo-poo this idea, but when you think of the hundreds, and hundreds of pounds of honey this queen has put in your honey house, we feel it is only right to show the proper care, respect and admiration for such a faithful insect. After all, how often do we really get to meet royalty?

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