NOV 1999

Bee Culture

Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

NOVEMBER 1999 VOLUME 127 NUMBER 11

FEATURES

JOHN ROOT
Publisher

KIM FLOTTUM
Editor

COVER

Varroa mites cost money. No doubt about it. And, generally much more than the dime this one is sitting on. But by using IPM, you can reduce some of those costs. Dr. Nick Calderone presents, on page 20, the latest in Varroa IPM. This is a keeper.

photo by Kim Flottum

Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

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CORRECTION

The phone number for Bernard's Apiaries, who is selling the new USDA Russian Breeder Queen was incorrectly listed in the October issue. The correct phone number is 318.228.7535.

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INNER COVER

The USDA is convening a one-and-a-half-day workshop later this month (November 19) on Bees and Pollination as part of their national program on crop production. The program has components besides bees – crop management and production efficiency, agroengineering and related technology, and models and other decision aids.

The Bees and Pollination unit will develop new technologies, including germ plasm enhancement and preservation and genetic improvement, leading to sustainable strategies for using bees as pollinators to increase crop production. At the same time, these technologies will help maintain the profitability for providers of bees used for pollination and honey production. Included in this is developing technology for the rapid detection and control of mites and diseases to enhance efficiency and production.

The workshop is designed to gather input and suggestions for the future direction of this program, and to develop an action plan to address high-priority research needs. They assure us (stakeholders, customers, partners and scientists) that our input is critical so the program remains relevant and forward-looking.

I'm told about 125 people were invited (I was one, but a travel conflict precludes my attendance), including ARS administrators and other industry (both bee and crop) representatives. About a dozen commercial beekeepers were invited to speak (about 10 minutes each) from the ABF, the AHPA, the U.S. Beekeepers and a university scientist. Another half-dozen people – from the Farm Bureau, alternative pollinators, apple, cranberry and alfalfa growers – and five ARS scientists were asked to speak, and all have the same time on the floor.

When they are done, the group (all 125 or so) will break into three subcomponent groups – non-*apis* bee management, pollination and honey bee pests, parasites and diseases. All this happens the first day. On day two, each group will give a half-hour report on their list of priority issues and research needs.

Upon completion of the workshop, an ARS scientist will be assigned a comprehensive list of priority issues with which to develop an action plan.

Well, since I was invited, I just can't help but wade in here with some thoughts on the business of pollination, the science of that topic and some things that are on the top of my priority list.

First off, this sounds like a pretty good idea, doesn't it? People with problems and people with answers sitting down and actually solving the problems.

Let's ask some questions first, though. Questions I hope those who attend (at their own expense) will ask, and get answers for.

Timeline When will the "action plans" be developed? And then, when will the actual action occur? And when, and how, will the results be made known to the stakeholders, customers and partners.

Funding Who's paying for this? The industry? USDA? Both? University funding? Is this spelled out upfront?

Priorities Who finally decides which projects are chosen, and funded? USDA? The industry? Individual scientists? And, will those decisions, and the reasoning behind them be made known to . . . the participants? The industry? The scientists and cooperators (Will there be industry cooperators?)? Anybody?

Outside Input Will researchers outside the USDA be asked to participate, and if so, funded? And, will their work be taken into consideration *before* priorities are assigned and funded?

Ongoing Projects What projects are under way right now at universities (U.S. and worldwide) that are already answering the questions being considered? Who knows? Who will find out? If there are projects already under way, will funding be made available to continue or advance these studies so duplication doesn't occur?

Yes, I have some projects that I would add to the list of priorities, though I'm not sure they'd make the final cut. First off, at least the major crops (those that use the most bees) need to be evaluated relative to "the recommended number of colonies (or frames if necessary) per acre for optimum production" For instance, do trellised, dwarf apples require the same number of colonies/frames per acre as standard trees? If so, who says so? If not, who knows for sure?

This question comes about because the standard references, McGregor and Free, are, at best, dated. Cultural practices of most crops have evolved, since they were published, and Keith Delaplane's book isn't out yet, so recommendations are spotty. This is fundamen-

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Pondering Pollination; And Slotting Scandals?

KEEP IN TOUCH

Write: Editor, 623 W. Liberty St., Medina, OH 44256
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MAILBOX

Varroa In Bahamas

I have been keeping bees in the Bahamas for 30 years. We always considered that we were free of bee diseases and pests found on the mainland of North America. During this past year we suffered severe losses of hives in our main island of New Providence and also Andros. I sent samples of brood comb and then bees to the United States Department of Agriculture Bee Research Laboratory in Beltsville, MD. They reported the presence of Varroa mites. I would like to put this information on file.

Mal Evans
Nassau, Bahamas

Supply & Demand?

I have read Dave Hackenberg's article "A Lesson in World Honey Supply and Demand," which appeared in the October issue of this magazine. In fact, I received an advance copy of his letter prior to publication, so have had ample opportunity to digest the questions it raises.

This allowed me sufficient time to get a copy of Professor Gary Fairchild's study, as Mr. Hackenberg suggested, and I must say that I find some of Mr. Hackenberg's statements and conclusions a little disturbing.

Mr. Hackenberg states that "There have been estimates that the volume of this product (adulterated honey) could be in the 15 - 20% range." This is a serious allegation which puts all of us under a dark cloud, and it should not be made carelessly. Who made these estimates, and what is the evidence for such a statement?

Mr. Hackenberg implies that the source is Professor Fairchild's study, however the study shows that adulteration as a percent of total volume purchased was 2.6% in 1996, 1.9% in 1997 and 0.8% in 1998. Even more interesting and unsettling is the fact that in 1996 and 1997, 100% of the adulterated honey found was of foreign origin, and in 1998 represented 95% of the total. If we rely on professor Fairchild's study, in 1998 domestic honey represented only 5% of adulterated honey, or .0004 (.04%) of the total product volume.

Through the National Honey Board, American beekeepers have helped fund the generic promotion of honey, on the theory that an expanding market would improve their lot. Correct me if I'm wrong, but I believe that over the life of the NHB the *per capita* consumption of honey in the U.S. has declined slightly (although consumption *has* increased - ed.) while the expanding market has been filled by foreign honey. Today imports have captured 51% of the U.S. market.

The pressure of imports has kept U.S. honey prices at poverty levels for U.S. beekeepers. Through the NHB beekeepers have paid for promotion, which is legitimately a responsibility of the packers. Now, apparently, the packing industry would like U.S. beekeepers to pay to assure the purity of imported honey. To what end? So packers can import even more honey and drive the price lower still?

Generic honey promotion has not improved the economic climate for U.S. beekeepers. Instead it has made it worse. I do not, however, agree with many of my friends who feel it is time to end the National Honey Board. My experience is that the staff is composed of sincere, talented people who honestly want to help U.S. beekeeping. The flaw rests with the enabling legislation, which requires that promotion be done without regard to country of origin.

Before we throw the baby out with the bathwater, I think beekeepers should pursue two things which could save the NHB and the value they have to offer U.S. beekeepers. The first is a strict and specific "country of origin" labeling requirement, and the second is a change in the enabling legislation which would *limit* promotion to U.S. honey.

I realize that there are many critics who would say that this is unrealistic in a world honey market, but what do beekeepers have to lose? The current course of generic promotion has clearly failed.

Tom Theobald
Niwot, CO

Let's Work Together

I would like to commend Mr. Flottum on his comments regarding Apistan® and CheckMite+™ in the *Inner Cover* section of the September issue of *Bee Culture*. While the *other* bee supplier prints its own magazine and can publish a monthly biased view of CheckMite+™ based solely on hard feelings and not scientific data, it is refreshing to see the opposite view published by *Bee Culture*.

The beekeeping industry is a small one and I find it sad that the companies who all have the common goal of helping, educating and supplying the beekeeper regardless of size, cannot seem to work together. The olive branch is extended, I will wait to see the result.

Brenda Tharp Bray
Dealer Coordinator,
Mann Lake Ltd.
Hackensack, MN

Southern Stroll In AL

I enjoyed meeting with you at the Eastern Apicultural Society meeting in Tennessee, and reading your article, "Southern Stroll" in the September issue; however, I must correct you on a couple of points.

Our State Flower is the Camellia (not Canola). The Camellia is a Winter-blooming shrub with some varieties producing copious amounts of pollen, and it

Continued on Next Page

MAILBOX

plays an important part in our ability to raise quality queens early in the Spring. Our first feral swarm in 1999 in the southern part of the state was on January 17.

While it is true that several years ago, our queen breeding industry looked anorexic, under the leadership of Jim Smith (President of Alabama Beekeepers Assn. Inc.) it is growing and has all the potential of returning to its former status. People do not put their time and money into investments destined for failure. This past year, three Alabama beekeepers moved from hobby status to the ranks of professional queen breeders. While cheap bees are available all over the country, these new breeders have chosen their breeder stock from Alabama Queen genetics. They want to sell the most desirable product, and are always looking for quality queens to improve their stock. One of our breeders has already signed up to order the new mite-resistant Russian queens from the Baton Rouge Genetics Research Laboratory. Alabama queen breeders believe you get what you pay for.

Controversies about our closed borders have been mostly contrived and manipulated by out-of-state beekeepers attempting to move into Alabama. The Alabama Department of Revenue has also taken an interest in out-of-state beekeepers. The closed borders benefit our beekeepers by giving us time to evaluate diseases, pests and treatments so we are better prepared when we encounter them. Closed borders preserve and protect our genetic stock of breeder queens developed by our queen and package producers.

Alabama has been the victim of some malicious and false rumors in the past year, deliberately designed to damage our queen breeding industry. One such rumor – spread all across the nation via the internet – was that Alabama queen breeders were heavily infested with American Foulbrood. There were even some malcontent Alabama beekeepers involved. If they could damage our queen breeding industry, it would be easier to break our borders down. (Our queen breeders must pass stiff inspections for their entire apiary before they are given a healthy certificate to ship bees across state lines – and we continue to ship bees to several foreign countries. You can only imagine the inspections required for international shipment of bees!)

While large-scale commercial pollination is relatively new to Alabama, Jim Smith (president of Alabama Beekeepers Assn.) has brought the hobby, sideliner and commercial beekeepers together on several occasions to provide pollination services to Alabama farmers. With this new industry, we have several beekeepers who are building up their colonies strictly for pollination. No request for pollination by Alabama farmers has gone unanswered by Alabama beekeepers in recent months – much to the chagrin of those who are attempting to break our borders.

Alabama has some interesting terrain; the beginning of the Appalachian mountains; the prairie; plenty of rivers and swamps draining into the delta; and we also have micro-climates that produce bananas and citrus as if they were in southern Florida.

I have heard beekeepers from other states complaining no young folks are coming behind them. Here is Alabama, we have young people making the decision to become commercial beekeepers because they see opportunity and hope for the future.

Thank you for your continued positive support of Alabama beekeepers and queen breeders.

Margie Smith
Chunchula, AL

Don't Sell Singles!

I just had to tell you of an experience I just went through. I sell Apistan strips in my store in Asheboro, NC. Because many people don't have but one hive, I, to help them out, sold them two or more strips at a time. I obviously wasn't getting rich doing this but the state thinks I was. They fined me $500 for being nice to people. Just thought you might warn everyone that if anyone asks to buy a few strips from you, DON'T DO IT. It seems the Department of Agriculture in NC is run by idiots. Half of the department is trying desperately to save the honey bees while the other half is going to punish anyone who helps. Who appoints these nuts anyway? Their excuse for robbing me was that I was selling them out of the original package. Sounds terrible doesn't it? I even gave them a copy of the directions and verbally told them how to use it.

I guess they don't want to eat anymore cause they are sure trying to make sure your bees die.

Well, you have been warned. It just proves that anyone who is in the government in a supervisory capacity is a nut.

Frank Chamberlain
Asheboro, NC

Smoker Know-How

I am relatively new at beekeeping (May 1998) and have spent much time since then trying to properly light a smoker and keep it smoldering.

I have tried a large variety of fuels and ignition boosters with little success. While working the bees, it wouldn't smoke; after I was finished, it would happily puff away for an hour.

At wit's end, I was down to searching for affordable napalm or a propane adapter for the bellows.

This year has been easier thanks to the *Bottom Board* article on proper lighting techniques (June 1999).

I was doing it right all along!

James Emmerling
Hugo, CO

They're Out There!

Recently, about the middle of September, I experienced a strange encounter. Not a UFO sighting, but one that has me thinking. A practice that can get out of control, I am told.

Anyhow, while preparing an article about nearby Lassen Volcanic National Park for a travel publication, I unexpectedly en-

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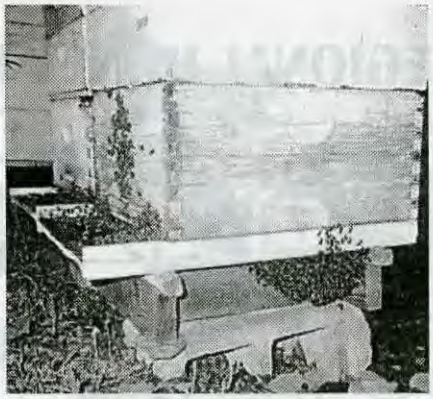
countered foraging honey bees in comparative abundance. I like to lighten the texts of my featured subjects, mostly outdoor themes, by interviews with visitors to northern California. Standing beside a parked RV talking to two tourists, I noticed a loud buzzing that I recognized as foraging bees on a roadside stand of rabbit brush (*Chrysothamnus nauseosus*).

This occurrence was at about 8,000 feet altitude and as far as I could see was probably many miles from any apiary, this being several miles within the boarders of a National park in high mountain terrain. So where were the bees coming from?

The only conclusion is that they were feral bees from colonies in the trees, a parse forest with old growth suitable for nesting sites. The species are mostly stunted fir (*Abies*). The Winter snows here are deep, often with 14 to 18 foot accumulations and many sub-zero periods from November to March. Yet, there was an abundance of foragers, many with pollen loads, on this fairly warm, sunny day.

I would be interested in any reader commentary on any such similar experiences. I recall another such occurrence, seeing honey bees foraging on lupine at the summit of Mount Revelstoke in British Columbia, Canada, a rarity here in northern California.

Larry Goltz
3020 Harlan Drive
Redding, CA 96003



A New Spot

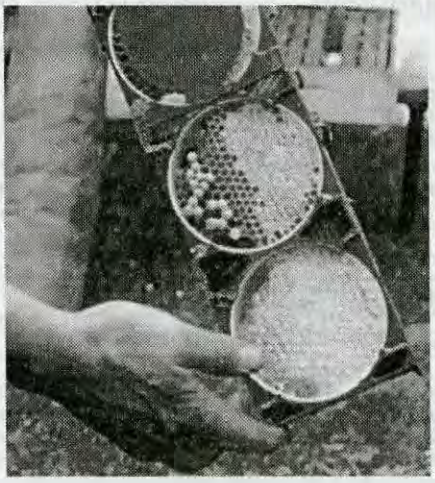
In 21 years of beekeeping 70-90 hives of bees, I've never seen a swarm build comb on the bottom of a bottom board. Most unusual.

Cliff Williams
Bryson City, NC

Comb Honey - Drones

Here is a photo of a round section comb honey with drone brood. No excluder was used and this is the result. Bees don't read the books.

Donald Young
Converse, IN



Reader Input Wanted

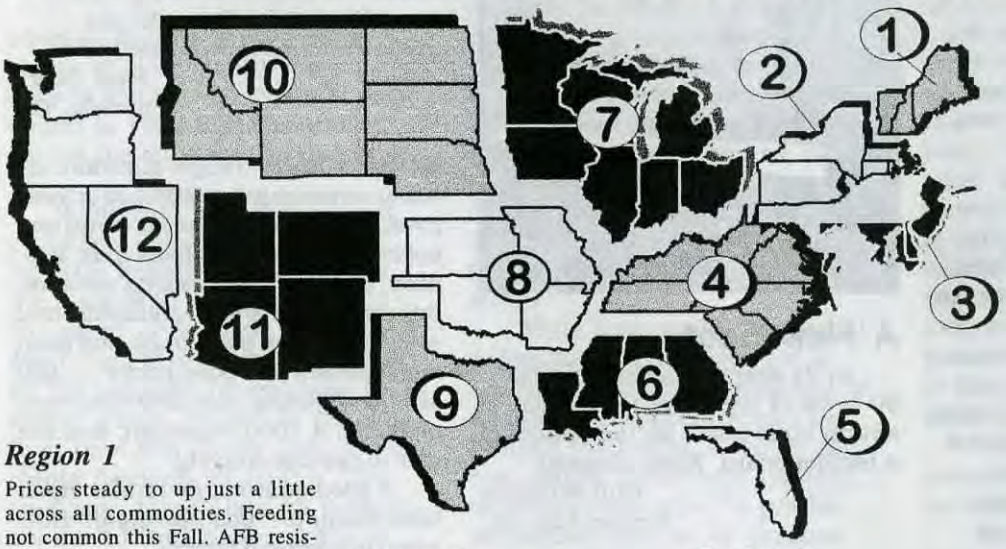
Recently a letter writer said that 25 hives was a family business. How many hives do you think would support a family?

Paul Doerr
Fairfield, CA

Editor's Note: *Tough question, as many variables enter. With two or three family members contributing, honey and pollination for income (plus wax, supplies, queens, nucs), selling some retail direct and some wholesale and some bulk, plus good crops and good management and good prices . . . you see the difficulty. But, 500 minimum, probably. A 1000 maximum, and still able to manage properly.*

A good question for reader input. How many are you operating? How many to support a family?

NOVEMBER– REGIONAL HONEY PRICE REPORT



Region 1

Prices steady to up just a little across all commodities. Feeding not common this Fall. AFB resistance showing up. *Varroa* light.

Region 2

Prices for all products up this month, especially for retail pails. Though dry, most didn't Fall feed. Some AFB, *Varroa* hard to find.

Region 3

Bulk, wholesale and retail up, and pails way up this month. Little Fall feeding, but very dry. *Varroa* hard to find.

Region 4

Bulk prices up, the rest up just a very little. Drought has led to more feeding than normal, but *Varroa* very hard to find. Tracheal mites and AFB more common.

Region 5

Bulk, pails and retail prices rising, wholesale steady. Tough year – feeding required, hive beetle, resistant AFB and lots of *Varroa.*

Region 6

Pail prices up, bulk and retail steady, wholesale dropping. Dry Fall for some, feeding required. *Varroa* and tracheal mites still hurting.

Region 7

Bulk prices down, but the rest steady to increasing a tiny bit. Feeding by more beekeepers this Fall, *Varroa* mite pressure increasing and small hive beetle showing up.

Region 8

All prices receding, some fast, others slowly. Bulk the fastest. Dry Fall means lots of feeding and stronger *Varroa* mite pressure. AFB showing up.

Region 9

Bulk and pail prices steady but wholesale and retail down. Lots of feeding to combat the drought. *Varroa* pressure steady and AFB more common than usual.

Region 10

Pail prices up a bit, all the rest unchanged since last month. Feeding common every year here, *Varroa* steady to stronger than usual.

Region 11

Retail pries increasing a bit, but the rest steady since last month. Some feeding, but not a lot. *Varroa* pressure mixed, but AFB and Tracheal mite pressure higher than usual.

Region 12

Pail prices steady but the rest dropping slowly, especially wholesale. Feeding common for some, but not for many who will need to this year due to dry weather. *Varroa* pressure steady but under control.

	Reporting Regions												Summary		History	
	1	2	3	4	5	6	7	8	9	10	11	12			Last	Last
Extracted honey sold bulk to Packers or Processors													**Range**	**Avg.**	**Month**	**Yr.**
Wholesale Bulk																
60# Light (retail)	72.90	73.50	74.00	76.67	86.96	60.00	68.25	58.80	77.00	77.50	102.50	67.67	42.00-145.00	73.89	71.23	61.70
60# Amber (retail)	68.80	64.63	68.00	70.40	38.40	57.00	66.67	75.00	86.67	62.00	92.50	66.00	38.40-125.00	70.28	69.86	57.57
55 gal. Light	0.66	0.70	0.65	0.68	0.63	0.60	0.59	0.63	0.69	0.60	0.67	0.50	0.53-1.50	0.67	0.62	0.70
55 gal. Amber	0.58	0.68	0.57	0.69	0.52	0.55	0.56	0.57	0.59	0.57	0.60	0.50	0.42-1.50	0.60	0.58	0.66
Wholesale - Case Lots																
1/2# 24's	27.50	29.39	26.64	32.07	26.64	23.65	22.32	26.64	30.04	26.64	24.00	25.00	12.24-38.50	29.17	28.65	31.50
1# 24's	41.33	43.54	46.80	44.32	30.50	20.50	42.73	38.88	44.17	42.00	46.00	45.00	15.50-62.40	42.57	42.84	44.47
2# 12's	38.03	36.15	45.60	42.52	40.42	36.60	38.90	40.00	39.04	37.50	34.00	37.00	29.40-52.80	39.06	38.14	40.56
12 oz. Plas. 24's	36.02	37.56	43.20	35.34	37.76	32.80	35.78	32.88	35.77	34.80	43.00	36.53	26.40-50.00	36.87	37.36	37.94
5# 6's	42.00	42.91	44.00	48.00	47.17	47.16	39.25	39.00	44.02	45.00	40.00	37.75	31.50-67.00	43.01	42.28	**43.37**
Retail Honey Prices																
1/2#	1.89	1.66	2.83	2.17	2.83	1.63	1.93	1.76	2.52	1.59	3.00	1.72	1.19-4.00	1.91	1.78	2.01
12 oz. Plastic	2.19	2.16	2.75	2.27	2.27	2.11	2.08	2.13	2.18	2.26	3.10	2.14	1.39-3.20	2.23	2.26	2.30
1 lb. Glass	2.75	2.62	2.95	3.00	2.88	3.02	2.46	2.57	3.20	2.35	3.65	2.74	1.58-4.25	2.81	2.73	2.84
2 lb. Glass	4.59	4.10	4.80	5.11	5.28	4.87	4.51	4.41	5.10	4.26	4.75	4.15	3.19-8.00	4.65	4.52	4.65
3 lb. Glass	6.42	7.41	7.50	6.26	7.25	6.99	5.76	6.37	6.84	5.77	6.87	5.77	4.70-10.50	6.55	6.20	6.66
4 lb. Glass	7.43	6.73	8.08	7.76	8.08	6.05	8.72	8.00	7.24	8.50	7.99	8.19	6.00-10.50	7.73	7.77	8.03
5 lb. Glass	9.05	9.61	11.00	9.18	8.68	8.15	9.65	11.12	8.68	10.00	10.10	8.30	1.30-15.35	9.38	9.19	9.49
1# Cream	3.25	3.21	3.69	3.61	3.69	2.70	2.34	3.22	3.96	4.78	4.12	2.94	2.25-5.50	3.32	3.46	3.35
1# Comb	3.88	3.70	3.50	3.91	4.00	4.25	3.96	3.25	5.00	4.00	5.00	4.18	1.95-6.00	4.04	4.20	4.17
Round Plastic	3.75	3.11	3.50	3.87	4.13	4.00	3.00	4.00	6.00	4.13	5.12	4.00	2.50-6.00	3.89	3.83	3.72
Wax (Light)	1.76	1.71	1.30	1.60	1.40	1.63	1.25	1.88	1.83	1.83	1.25	1.31	1.25-2.50	1.75	2.46	2.72
Wax (Dark)	1.49	1.26	1.08	1.20	1.20	1.60	0.95	1.15	1.63	1.15	1.13	1.06	0.95-2.00	1.51	2.15	2.44
Poll. Fee/Col.	38.10	42.00	31.50	33.38	30.00	32.50	42.57	39.00	27.50	39.71	50.00	41.50	20.00-60.00	39.14	36.90	37.39

THE WISE GUY

Communication! What does it mean to you? To me it is power and strength. The more lines of communication I develop, the more information I can acquire, and the more power I have. There are so many ways to communicate today – you're not limited to just one way. The Internet is the most talked about and used today and the one that enables truly worldwide communication.

You can, because of this, communicate in different languages. I have a friend in Switzerland, and he sends me translated letters over the Internet.

Where am I going with this? You must communicate with more people today than ever before. Also, you must communicate with confidence when dealing with potential customers, honey dealers and other people you do business with. Get information on the subject you are going to deal with. Anticipate questions and be ready for them when asked. Don't act surprised when that tough question comes. Stay away from questions that paint you into a corner, when the answer can only hurt you. If you get one of those questions, answer it with a question. Most of these questions have an obvious answer that will work against you. Most of their questions start with "Can you tell me . . ." or "Isn't it true that . . ." or one of a number of phrases that you learn with experience.

The ability to communicate effectively will take you as far as a 100-pound honey crop will today. If you produce only a 30-pound-per-hive crop, you need to communicate that to whoever is buying your product. I have only "x" amount of crystal-clear, water-white clover-nectar and with the shortage I need "x" dollars because of the shortage. Now, how much do you need? There is a winery in California that produces a certain wine from a grape that doesn't produce each year. The winery has made it a selling point and gets orders each year. They may not have any to sell, but when they do they get an excellent price. Maybe you should try it.

To show you how strong communication is – an American beekeeper had had enough with the low prices coming out of South America. He called an exporter there and asked why they sold their product so cheap? He was told that they were informed by the American purchaser that as late as the second quarter of 1999, 25 percent of the 55 million pounds of the 1998 crop of United States honey were still unsold, and they used that as a lever to reduce the price. I believe we could document that only eight million pounds were unsold, and that dropped in the second quarter. So as you can see, lack of communication hurt the U.S. producers at that point. Now producers have a direct line of communication to Argentina, and they will receive the current status of unsold product, plus they will be furnished with the U.S. retail price. Communication is power. Use it.

Wise Guy

?DO YOU KNOW?

Honey Quality

Clarence Collison
Mississippi State University

In many parts of the United States, the beekeeping year is rapidly coming to a close. Extraction of the honey crop has been completed, and the colonies have been prepared for Winter. Now it is time to clean up the extraction area, render the wax cappings, and finish marketing your honey crop, all while making making preparations for the new year. Marketing the honey crop is something that many beekeepers find to be a difficult task and an area that they are really unprepared for. To be effective in developing new markets, it is important to know your product and produce high-quality honey. In order to produce a high-quality product, it is important for the beekeeper to handle the honey crop properly and be familiar with the factors that affect honey quality.

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

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

1. ____ Comb honey exposed to high humidity will pick up moisture and ferment.
2. ____ The primary reason for killing yeast cells in honey by heating is to delay granulation.
3. ____ Honey is a supersaturated solution.
4. ____ Froth on the honey surface when you open a jar of honey is the first indication of fermentation.
5. ____ The moisture content of honey will influence keeping quality, granulation and density (weight).
6. ____ Honey darkens as it is heated or stored.
7. ____ Creamed honey stored under warm conditions may revert to a liquid state.
8. ____ Honey processed with the use of extractors and honey pumps granulates faster than comb honey of the same origin.
9. ____ A refractometer is used to determine the primary floral nectar source that the honey sample is produced from.

(Multiple Choice Questions, 1 point each).

10. ____ When honey crystallizes, a _____ lattice forms within the honey.
    A. Sucrose
    B. Glucose
    C. Maltose
    D. Fructose
    E. Ribose
11. ____ Form of honey that is consumed in the largest quantity in the world.
    A. Liquid extracted
    B. Cut-comb
    C. Section-comb
    D. Creamed or finely crystallized
    E. Chunk honey
12. ____ Ideal temperature for producing creamed or finely crystallized honey.
    A. 45° F
    B. 57° F
    C. 63° F
    D. 71° F
    E. 80° F
13. Please explain how you would keep cut-comb and section-comb honey from granulating after it is removed from the hive. (1 point)
14. Explain why the wax particles incorporated into the honey during the extraction process should be removed immediately following extraction. (1 point).
15. Compare naturally granulated honey and creamed honey and explain how they differ in texture and crystal size. (2 points)
16. Name one way of protecting section-comb honey from wax moth damage. (1 point)
17. What information is required on the honey label of a three-pound jar of domestic honey? (Question is worth 5 points)
18. Describe three ways to re-liquefy crystallized honey. (3 points)

ANSWERS ON PAGE 47

Roger Morse

Research Review

"Some thoughts on why six sides; and pollination, and pollen."

According to one mathematician, honeycomb is made up of six-sided cells because with this construction the cell walls have the shortest total length of any system that divides a surface into any kind of cells. This allows bees to store honey in comb while using the least amount of beeswax to separate the cells.

Maybe so. Economy is important, but is this the sole reason cells have six sides? In the evolution of things, other factors come into play. A six-sided cell is certainly better designed to hold a growing larva than is a square cell, while an eight-sided cell would not improve the situation. We know that honey bees control the temperature of their brood nest (not the whole hive). When the larvae are in a compact group, they no doubt generate much of the heat needed to maintain this temperature, and the six-sided cell certainly helps by keeping the brood nest compact. Strength and economy are both important, but the controlled brood nest temperature affects the overall health of the community. Perhaps comb contains six-sided cells for more than one evolutionary reason. I suggest that the fact that honeycomb has hexagonal cells may be nothing more than a fortuitous bringing together of mathematics (economy), physics (strength) and biology (temperature control).

Mackenzie, D. *Proving the perfection of the honeycomb.* Science 285: 1338-1339. 1999.

Improving Pollination

In many plants, pollen cannot be used to fertilize the same variety. For example, pollen from a Yellow Delicious apple will not grow and fertilize another of the same variety – pollen from a different apple variety must be used. As a result, apple growers interplant varieties.

However, once in a while a grower makes a mistake, and a solid block of the same apple variety is planted. This is a desperate situation, for without pollen from another variety and cross-pollination, there will be no crop. When solid blocks are planted, there are hive-entrance pollen transfer devices, usually homemade, that can be placed in a colony entrance to help correct the situation. These usually consist of a group of side-by-side tunnels and are designed so that the worker bees are forced to walk through them. If hand-collected apple pollen is dusted into the tunnels, then it will be picked up by the bees and carried by them into the field where they will presumably deposit some of the pollen on the varieties where it is needed. (These transfer devices may have other uses. We have sometimes dusted them with fluorescent powders to observe where the bees flew and what they were visiting.)

A study was conducted recently in England that compared the effectiveness of woolen fabric, felt fabric and bristles as linings for the pollen transfer devices. The chief concern, of course, was in increasing the quantity of pollen on a bee's body. All three materials were effective, but felt fabric performed better than the other materials.

Proper interplanting, together with the use of bees, is the most practical way of pollinating apples. When there is a pollen incompatibility problem, replanting some trees is the best long-range situation. I think while pollen transfer devices may work, they are too time-consuming and expensive for long-term use.

I am interested, however, in the fact that every Spring, and for many years, two companies in Washington state have advertised hand-collected pollen for sale for pollination in the fruit journals. There must be some demand for this pollen for these companies to continue to advertise. The pollen is collected, frozen, and sold the following year. The idea of using pollen transfer devices was born in the 1920s, and a great number of papers have been written about using them, several of which are listed in the paper below.

Hatjina, F., J. B. Free & R. J. Paxton. *Hive-entrance pollen transfer devices to increase the cross-pollination potential of honey bees.* II. Examination of three materials & pollen viability. Jour. of Apicultural Research 38: 3-10. 1999.

Effect of Pollen on Larval size

In a recent study it was shown that during bad weather, the size of the worker honey bee larvae decreases. During this time, in these experiments, there was always ample honey but significantly less pollen. It was concluded that a lack of pollen could alter the brood-feeding behavior of nurse bees in the hive, and when there was less pollen, the larvae would be underfed and, therefore, smaller. Observations were made on queen behavior at the same time, and it was found that the number of eggs laid during bad weather was about the same as those laid during good weather.

The weakness of this study is that it involved only one eight-frame observation hive. Furthermore, it had been reported earlier that larval size also decreases during the Fall months because of the colder weather. Of course, bees have more difficulty controlling the brood rearing temperature in an observation hive where the brood nest is not as compact as it is in a normal hive where frames of brood are adjacent to other frames of brood and the brood nest takes the shape of a basketball or football.

Still, the conclusions of this study are logical. The lesson is what we already know, that apiaries should be in full sunlight and bottomboards off the ground on some kind of hive stand and kept dry. A good apiary forces bees to fly earlier, which presumably means they will gather more pollen. BC

Blaschon, B., H. Guttenberger, N. Hrassnigg & K. Crailsheim. *Impact of bad weather on the development of the brood nest & pollen stores in a honey bee colony.* Entomolgia Generalis 24: 49-60. 1999.

Guest Editorial

PROVIDING SUBSIDIES FOR BEEKEEPERS

Joe Traynor

In appealing for government assistance, the bee industry (and bee researchers) emphasize the "billions of dollars" in value that honey bees are worth to agriculture – that without subsidies, bee colony numbers will continue to decline, causing severe economic consequences for the production of many agricultural crops.

Certainly the bee industry is undergoing major problems, most notably from parasitic mites, but the "billions of dollars benefit to agriculture" argument should be abandoned. Here's why:

Over the past 20 years, CA's almond acreage has increased to the point where one million bee colonies are now required for February pollination (at the rate of two colonies per acre). Because almonds bloom in February and because bees are released from almond orchards by mid-March, the one million colonies coming out of almond orchards represent a pool of bees that can be transported to any area of the U.S. for crop pollination purposes – provided the growers of such crops are willing to pay for transportation and related costs.

Almond growers pay dearly for their bees – rental fees are up to $50/colony and rising as new acreage goes in. Almond pollination has completely changed the face of the U.S. beekeeping industry – without almond pollination income, many U.S. beekeepers would be out of business. Indeed, some beekeepers are increasing their colony numbers solely to supply bees for CA's increasing almond acreage.

In essence, CA's almond industry is subsidizing the U.S. bee industry to the tune of millions of dollars a year. Any government subsidy would be dwarfed by the infusion of money that the bee industry has already received and continues to receive from the almond industry. By creating and maintaining a viable pool of one million bee colonies – a pool of bees that becomes available to any U.S. ag producer by mid-March – the almond industry is indirectly subsidizing growers of any other crop that requires bees (apple pollination fees in the western U.S. have dropped significantly due to this million-colony pool). With current low almond prices, almond growers could make a much better case for government subsidies than could beekeepers.

As long as beekeepers continue to supply CA's almond acreage with bees – and there is no indication that they won't – then there is no justification for concern about the "billions of dollars" worth of value that honey bees supply to other U.S. crops. The "billion-dollar benefit" argument is a horse that died several years ago; beekeepers should dismount before the smell becomes unbearable.

Besides paying top dollar for bee rentals, the almond industry, aware of the importance of a healthy bee industry, has provided nearly a million dollars for bee research over the years. Beekeepers should consider matching almond industry contributions to bee research, perhaps using funds obtained from almond pollination fees.

As for diminished numbers of feral honey bees (due to *Varroa*) causing problems for backyard and small-plot pollination, there are indications that *Varroa*-resistant feral colonies are making a comeback. If not, there are alternative methods of pollinating small-acreage crops.

On a related matter, it might also be prudent to retire the slogan, "You can import honey, but you can't import pollination." As TX and AZ melon growers look at bee supply in Mexico and as apple and blueberry growers in the northern border states eye bee supply in Canada (and CA almond growers become aware of bee supply in both countries), it is certainly possible pollination will be imported in the future. BC

Joe Traynor is a crop advisor and pollination broker in Bakersfield, CA.

Mark Winston

Apitherapy

"The use of bees and bee products for medical treatments certainly has a long history, legions of advocates, innumerable organizations and societies and even some evidence of utility."

I look back at my old columns occasionally to see what it is I've been harping on lately. Scanning back, I see columns on almost any subject you can imagine having even remotely to do with bees. I've written on honey, pollen, diseases, urban beekeeping, rural beekeeping, stores in France, markets in Australia, teaching my students, what my students have taught me, research, pollination, money, the lack of money and everything in between, over, under and around those topics. There has been a conspicuous gap, however, in one major beekeeping subject that I avoid writing about with the same intensity that I use to tune out students complaining about their grades: apitherapy.

The use of bees and bee products for medical treatments certainly has a long history, legions of advocates, innumerable organizations and societies and even some evidence of utility. Honey, for example, does have anti-bacterial properties, as does propolis, and there's no question that royal jelly is full of . . . stuff that might rejuvenate the weak and restore the impotent. Bee stings similarly contain heavy-duty proteins that could alleviate the symptoms of arthritis, and who am I to say that the connection between the venom of a bee and the symptoms of multiple sclerosis is remote?

No, although I may be skeptical about the low level of proof required by some apitherapy true believers, many practitioners of apitherapy are rigorous in their approach, and there is some good science out there in between the folklore that supports some of the ways in which bees and their products are used in human health. If you want to know how apitherapy science can be done at its best, take a look at the classic studies by Dr. Peter Molan from New Zealand, landmark research establishing the value of manuka honey in treating bacterial stomach ulcers, which stimulated the highly lucrative export of manuka honey to Asian and other markets.

My avoidance of writing about apitherapy comes not from skepticism but from an innate hesitancy to buy into the concept that because bees are interesting they also should be good for us. Plants and naturopathic medicine provide a useful analogy. There are many plants that contain substances useful for human health, and ethnobotanists have traveled to the most distant reaches of our planet to bring back obscure plants containing previously unknown substances that have turned out to have major impact on treating many human diseases. Sometimes, the plant produces a bright, showy flower or stands out because of its unusual leaf shape or sharp spines, but as often as not it's the bland, unshowy plant that yields the most significant medical harvest.

So, why don't we prospect in a similar way for medicinal products from animals less sexy than bees? Why are there no Slug-o-Therapy Institutes, or Cockroach-a-therapists, or Lightning bug-ists? There's no apparent reason to believe that honey has more medicinal properties than "tobacco juice" regurgitated by a grasshopper, a bee sting greater curative powers than a spider bite, or royal jelly more nutritive punch than the chewed-up caterpillar pulp from a predatory wasp. Bees may be more interesting and fascinating to most of us than the sow bugs curled up in the corners of a wet basement, but I can't find a good scientific reason to attribute mythical curative properties to the bee. Yes, bees do produce some products for their own purposes that do by chance have utility for us, but we've certainly extended what bee products do for bees more broadly and deeply into human medicine than might be obvious from the bee's point of view.

Take the bee's sting, for example. A cleverly designed weapon, with vicious barbs to embed it, powerful muscles to pump its venom, and a complex blend of poisons within its venom sac designed to induce immediate pain, long-term swelling and itching, and sometimes an excruciating death to its insect and vertebrate victims. Why would we choose to deliberately inject ourselves with this poison, repeatedly, and where might the speculations about its healthful properties have come from?

Or let's take another bee product, royal jelly. A bitter-tasting substance, certainly powerful in its ability to transform workers into queens,

Continued on Next Page

"My avoidance of writing about apitherapy comes not from skepticism but from an innate hesitancy to buy into the concept that because bees are interesting they also should be good for us."

but where is its allure as an energy-providing treatment for lethargy? Why eat royal jelly after surgery instead of, say . . . banana-flavored Jell-O or delicious chocolate pudding?

Or how about propolis, those gooey plant resins collected by bees and smeared in the far corners and comb bases of the nest? These resins do a great job of plugging holes and anchoring comb, but an anesthetic for dental surgery? An ointment for hemorrhoids? A poultice for chest congestion? The connection between the way the bee uses propolis and how we use it certainly is a bit of a stretch.

Yes, there is considerable anecdotal evidence, extensive folk tradition and even some good science that supports the use of sting therapy in arthritis treatments, the value of royal jelly post-surgically, and the functions of propolis as a pain-deadening and congestion-relieving treatment. However, I'll leave the arguments about whether apitherapy is based on solid fact or want-it-to-be-so speculation to others. What fascinates me about apitherapy is why we humans thought of these nonobvious uses for bee products in the first place.

Perhaps one part of the answer is proximity. Beekeepers from the earliest honey hunters to today's mobile commercial beekeepers have gotten up close and comfortable with their bees, immersing their hands and arms, receiving stings, licking off honey (OK, maybe you wipe it off), and getting a nice, sticky coat of propolis after just a few minutes in the hive. It wouldn't take much of a witch doctor to notice that the cut accidentally coated with honey didn't get infected, the old beekeepers in the village never seemed to get arthritis, or the hunter who chewed on some propolis didn't have much pain from the tooth that was kicked out during the mastodon hunt.

Another rational reason to consider bees as sources of human medicine is that we share the common organismal need for defense against bacteria, fungi, yeasts, etc. Social insects have to defend considerable resources within their immense colonies, and it makes sense that they would develop an array of mechanisms to guard colony members and stored resources from microbial attack. That still doesn't explain why there is apitherapy and not wasp-itherapy, termite-itherapy, or ant-itherapy, though.

Nest accessibility could be another reason for the development of honey bees as sources of medicinal products. Wasp, termite and ant nests are pretty tough to get into, certainly on a regular basis, but bee colonies are relatively simple to access, and the addition of a sweet reward certainly would have made it more likely that our ancestors would stick their noses into a beehive rather than the nest of any old social insect.

These rational explanations for the development of apitherapy make some sense, but like most rational-only explanations they're not really satisfying. I think there is a more profound underlying reason that apitherapy is such a compelling draw for people around the world, from the most primitive cultures to the most sophisticated. Bees themselves are compelling, and there is a subliminal human connection between us and them that provides us with an entry into their world and an attention to their lives that leads easily to speculation about connections between the bees' world and ours.

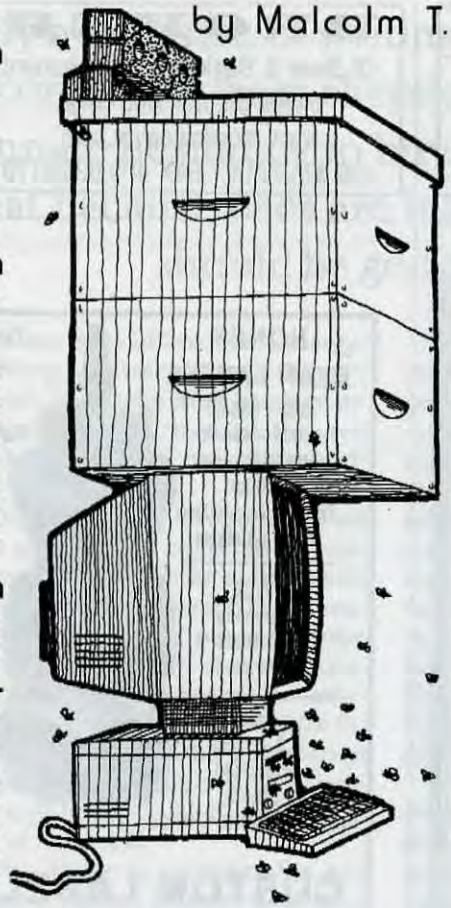
My daughter, for example, was born in a hospital, and although her birth was medically uneventful it did take place in a high-technology zone, surrounded by beeping machines, a sterile environment and lots of highly trained personnel. Her birth was in a humans-only area, and it certainly took place far from the sights, sounds and smells of a beehive. Yet, she had a full head of hair when born, and when her damp head first emerged, she immediately reminded my wife and me of a young bee emerging from its cell. Now I really don't care if you want to call me flaky, sentimental, weepy or wimpy, but it's still a fact: From then on, I have felt profound gratitude toward bees for taking that medical experience and reminding me that my daughter's birth really was an act of nature and not the product of medical science.

The experience also left me with a subliminal belief that bees are good for you. I have no scientific backup for this one, and I do find at least some of the claims made for apitherapy a bit hard to swallow. Yet, I also hold a core belief that there is a connection between bees and medicine, and that I'm a healthier person because of the time I've spent in beehives. Bees help to take us out of our increasingly urban and cacophonous world, and remind us that we, too, are part of nature. I figure that connection to nature has got to be good for us. Medicinal or not, scientific or folkloric, proven fact or true belief, that's pretty good therapy, any way you look at it. BC

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

Beekeeping In The Digital Age

by Malcolm T. Sanford



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

Andy Nachbaur: Virtually Present

My ***APIS*** Website has a **guest book function**, where visitors to the site can enter information about themselves and how they arrived at the site. A recent entry said the source was "the old drone's home page." In general, if a person dies, the traditional concept is that such an individual could live on in limited ways. These might be through the thoughts of those who were influenced either by personal contact or by writings. That the person after death, however, could still be present in some immediate way, was inconceivable before the digital age. Andy Nachbaur died March 17, 1999 in Los Banos, California. Many who read this magazine may not have heard the name before. He was an influential beekeeper who retired from beekeeping in 1992. By that time he had amassed an enormous amount of beekeeping information as member and past president of the California State Beekeepers Association as well as being affiliated with the American Beekeeping Federation and Sioux Honey Association.

Although Andy left active beekeeping, like many apiculturists before him, he sought to preserve and disseminate his knowledge of the craft. This he accomplished through digital technology. He was the first beekeeper to run a computer bulletin board, called Wild Bees BBS. In an obituary, Mr. Troy Fore of The Speedy Bee (Vol. 28, No. 3, p. 2, March, 1999) described this and also summed up Andy's other electronic accomplishments: "Then came the Internet, a whole new world for Andy. He created a cutting-edge website, which included his selection of beekeeping news, gleaned from the websites of newspapers, magazines, and government agencies. He became a regular contributor to the Internet discussion mailing list, BEE-L, and the discussion forum, sci.agriculture.beekeeping. In these venues, Andy was at his best, offering wit, wisdom, and advice in all aspects of bee-dom. He developed a wide following, admirers who had never had the privilege of meeting him in person. In his final Internet posting, as he battled cancer and pneumonia, Andy told his cyber-friends that he was 'fighting with the 4 horsemen and am not good for long even at the keyboard.'"

In my tribute to Andy, who called himself the "old drone," which I sent to the **BEE-L list**, I suggested that even in death he would be around to stir the pot with his pithy prose. At the time, I was thinking of his posts to the Bee-L mailing list. Selected ones are available **off the beenet site**. But the recent guest book entry on the APIS site shows he continues to be virtually present through his World Wide Web site at **http://beenet.com/.** The first page shows Andy's expertise that he picked up on his own, revealing his penchant for this kind of technology. It takes time to load as it is full of graphics, java scripting and other innovations. Once loaded, however, it is worth the effort. A **compilation** of news, with some stories directly linked to the home page was one of Andy's wrinkles; he used these as the starting points of his own commentary on the state of beekeeping as he saw it. Unfortunately, with Andy's passing this section no longer is being kept current. To my knowledge, nowhere else is a similar resource available on the World Wide Web. Andy's worm journal, which wends it way from bottom to top, the latter being most current, contains some real gems. This includes commentary on a story on bee rustling in Pasco County, Florida and one on a killer bee attack in Mexico City. Again, all that remains of most of these is a small summary by Andy. Originally the articles were available from news sources, but many such stories stay on the Web only for short periods. A **history** of Andy's Web efforts reveals how the site developed subsequent to beginning his efforts on March 9, 1998.

Andy used the Web in other creative ways, taking advantage of its powerful capabilities. His Beenet home page is chock-a-block full of graphics and ads. Different pages have interesting graphics from honey bees doing circles to actively following the cursor on the screen. His version of a **honey moon** shows a montage of three bees on a moon and below an even greater assemblage of individual bees, which looks like a swarm. One can also hear **sound files** on the site. They include two versions of both "Flight of the Bumble Bee" and "Honey," as well as "A Taste of Honey," a tune called "Hwang Bee" and others. As the site says, "Try this music it will play in both major browsers if you have the latest and greatest updates AND you can take it with you as you enjoy the Old Drone's web site OR move to other web sites." He developed an **almond pollination** mailing list with the following goal: "For almond growers looking for bees and beekeepers with bees to rent. No pollination pimps need apply." It is possible to send a **post**

card from Andy's site with a specialized message. His beecam page shows a cryptic swarm of drones following a queen. Also linked to this are other cameras showing honey bees, including the one at the **University of Montana**. A raft of photos taken by **Brian Ferguson** are also available on Andy's site. These include Mr. Ferguson along with his two brothers and several dozen employees keeping busy looking after 12,000+ hives kept for the production of premium California orange, sage, and wild buckwheat honey. Andy also installed an **ICQ page** so that people could communicate almost real time using a form that could be downloaded onto any page. Finally, a trip to Andy's **back page** is a real eye-opener and only for the liberal minded, although I believe he considered himself a political conservative.

Besides a front and back page, Andy put up a **second page** on his Web site. From here are linked his treatise on **SAD and BAD** bees and a **Pollen Collectors Notebook**. The former is the full version of his remarks about experiences with colony decline since the 1960s in California. I saw Andy deliver an address on this subject at the American Beekeeping Federation and was so impressed by both his delivery and deliberations that I produced an edited version for my **July 1990** issue of APIS. Full justice cannot be done here, but the crux of his thesis is found in the first part of the document: "It is my opinion, based on my own experience with bees, that all of the above and every other natural and unnatural condition that afflicts bees, that can be identified as stressful can be made scape goat for SAD or BAD bees. {Including weather; hot, cold, wet or dry; pesticides; and management; good or bad.} Most of this speculation only leads to SAD BEEKEEPERS. No workable solutions are forthcoming from the speculators and much time and money is wasted on popular cures. {redistributing beekeepers wealth} Leaving beekeepers to face the realities of a silent spring, when fifty per cent or more of their hives are quiet of humming bees, after treatment, or no treatments. And I add, much to the disappointment of Almond growers who expected more, and in some cases were guaranteed more than SAD bees can deliver, which at times make them MAD. I have chosen to call this malady of my bees, SAD or BAD, as I believe that best describes the condition of the bees and the way I feel when I have to work with them. And I have not been alone in this work. The SAD or BAD condition of bees is a world wide problem and has been reported in all areas of the world that bees can be kept in large numbers. It is not restricted to any one area, and appears without warning. It can affect beekeepers large or small without regards to experience, or politics. Because it may not reappear in the same region season after season, it is hard to study and much is not known of its cause or circumstances which lead to its appearance."

The Pollen Collector's Notebook is a rare find, full of applied information on collecting and marketing pollen. It also discusses many other aspects of pollen and fits well with Andy's philosophy as described in his SAD and BAD document. Also here one discovers an interesting fact. The old drone was often quite critical about the value of scientist Ph.D.'s and their efforts at applied bee research. However, he dedicates his pollen collector's notebook to one in those ranks, Dr. Frank Todd, (former) Chief, Bee Culture Branch, United States Department of Agriculture.

Although some may quibble about careless errors in Andy's printed works, no one can doubt his experience in beekeeping or passion for his insect charges. The SAD and BAD document still makes remarkable reading as it is not only a poignant description of the situation the bees find themselves in as the 1990s draw to a close, but of the beekeeper's plight as well. It was his often problematic prose, like a diamond in the rough, that was the strength of Andy Nachbaur, something many on the bee-l list said they would miss, along with his prominent signoff disclaimer: "Permission is granted to copy this document in any form, or to print for any use./(w)Opinions are not necessarily facts. USE AT OWN RISK!". Fear not fellow beeliners, the old drone is still virtually there through the miracle of the World Wide Web. How long this might be, however, is not known. Thus, those who would like to see Andy's unedited commentary and other works as originally published, should visit **http://beenet.com**, before it one day simply vanishes into **cyberspace**. BC

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Integrated Pest Management

VARROA MITES

A Seasonal Plan For Managing This Pest

Nick Calderone

INTRODUCTION

New beekeepers must confront one overriding reality right from the start - MITES! The *Varroa* mite (*Varroa jacobsoni*) and the tracheal mite (*Acarapis woodi*) are major risk factors in beekeeping, and both mites will continue to be serious problems in the next century. You can enjoy and profit from beekeeping, but only if you incorporate effective mite-control practices into your management program. Of course, that assumes you have a management program. So, before you ever put hammer to nail on your first hive body, put together a seasonal plan for managing your bees, and make mite control a key feature of that plan. Remember! Healthy bees, large honey crops and successful Wintering don't just happen. You have to make them happen.

BASIC BIOLOGY

In order to put together an effective mite management program, you must understand the basics of the pest's biology. *Varroa jacobsoni* is an external parasite that feeds on the hemolymph (= blood) of adult and immature bees. *Varroa* mites reproduce solely on the immature stage of the bee, in the capped cells, where they are well-protected from miticides. Mite reproduction is much higher on drone brood because it is capped for a longer period of time than worker brood. This allows time for more offspring to mature. Not surprisingly, *Varroa* mites exhibit a clear preference for drone brood. *Varroa* mites Winter with the colony, although reproduction is greatly reduced when brood rearing is low.

Varroa *mites are reddish-brown and easily seen adhering to the sides of a jar after an ether roll.*

Identification and detection

Viewed from the top, the adult female is elliptical in shape, measuring 1.6 mm (= 1/16"), side to side, and 1.1 mm, front to rear. Mature mites are dark brown or reddish-brown in color, while the immature stages are light brown or off-white. Male *Varroa* mites die in the capped cells and are not seen on adult bees. Unlike their close relatives, the six-legged insects, adult mites have four pairs of legs.

There are several ways to detect *Varroa* mites (reviewed in Morse 1999). These include the ether roll, shaking bees in soapy water, the cappings scratcher and the sticky-board insert. For the ether roll (Burgett et al. 1987), approximately 250 bees are collected from two or three brood nest combs and placed in a quart glass jar. A one to two second burst of automotive starting fluid is sprayed into the jar, which is covered, shaken vigorously for 30 seconds, then, gently rolled two or three times along its long axis. Mites, if present, will be seen adhering to the side of the jar. Mite levels are about twice as high on combs with brood as on combs with only honey (Calderone and Turcotte 1999), so, you increase the chance of detecting mites in your colonies by collecting bees from brood combs. The ether roll removes about half of the mites from the bees. The soapy water method (De Jong et al. 1982) is similar to the ether roll, except that you place the bees in a jar with soapy water and shake it for 30 seconds. This method removes nearly all of the mites from the bees, which are then separated and counted. You can use a bee brush or a plastic

laundry scoop to collect the bees, but a portable vacuum device will greatly speed up the process and make it easy to collect samples of the same size. Remember! In order to use the information you get from the ether roll, or any other method, it is essential that you always collect samples of the same size.

The sticky board is a passive method for monitoring mite levels. A sticky board with a screen covering is placed on the bottomboard for a set period of time, usually 24 hours. The board is then removed, and the mites adhering to the board are counted. A sticky board in conjunction with Apistan strips can also be used to detect mites. The cappings scratcher involves removing some capped pupae, preferably drone pupae, and examining them for mites. It is good for a 'presence-absence' determination, but is not very good for comparison purposes. Mites can sometimes be seen on the adult bees or walking on the comb, but this is more common when infestation rates are high and should not be relied on as a detection method.

Symptoms

The three most obvious symptoms of *Varroa* are bees with deformed wings walking on combs, crawling bees at the entrance and the presence of atypical brood diseases. These symptoms comprise the key features of 'parasitic mite syndrome' (Shimanuki et al. 1994). Bees with damaged wings are almost always associated with *Varroa* mites. Crawling bees at the entrance may indicate a number of conditions, including *Varroa* mites or tracheal mites. The presence of atypical brood diseases is associated with *Varroa* mites and generally is seen as mite levels rise to moderate and high levels. Atypical brood diseases indicate the end stage of the *Varroa* mite infestation. From the time a colony first exhibits symptoms of brood deterioration until the total collapse of the colony can be as little as two to three weeks. However, if caught at the earliest stages, an effective miticide can save your colony. Beginning beekeepers will have difficulty distinguishing between American foulbrood (AFB) and atypical brood diseases. Therefore, if you observe this symptom, ask an experienced beekeeper to help you determine whether AFB is present. Unfortunately, all of these symptoms are most apparent when the mite levels have become dangerously high.

Transmission and re-infestation

Varroa infests colonies in several ways. Moving capped brood among colonies for the purpose of strengthening or equalizing colonies is a common practice among beekeepers and can be a major source of transmission of both mites and disease. Robbing is also a significant source of transmission. Colonies weakened by mites or disease are unable to defend themselves and are usually robbed by stronger colonies. In the process, the robber bees take home more than just a free load of honey. Swarms from infested colonies establish new nests with mites already present and are not likely to survive more than a year or two. This makes feral colonies a prime source of re-infestation for managed colonies because your bees may rob them when they become too weak to defend themselves. Swarms that you capture are also likely to be infested with mites. Bees often drift among colonies within an apiary, especially when colonies are kept close together in regular patterns. Drifting can spread mites among colonies.

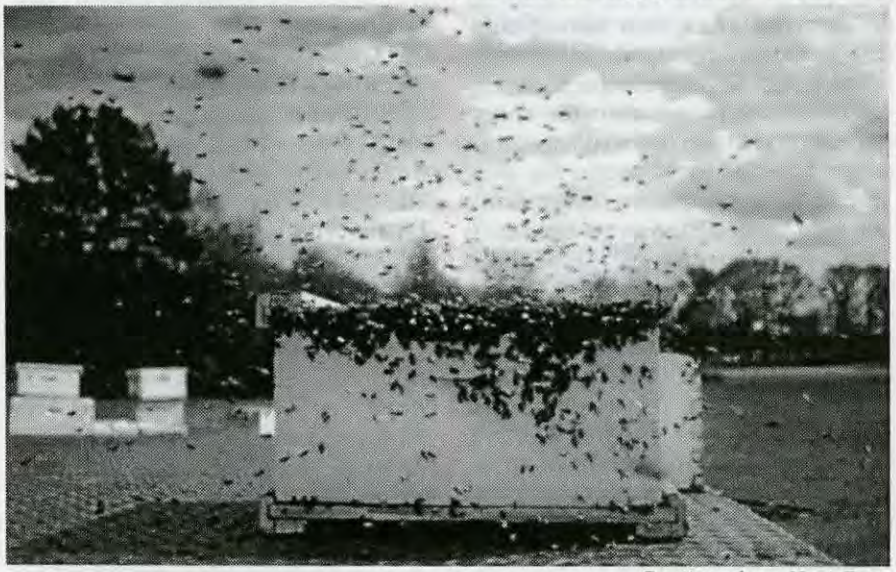
AN IPM PROTOCOL

The goal of an effective mite control program is to impose a cycle on the mite population such that the mite population density is always below the economic injury level. A single Spring, late-Summer or early-Fall treatment might provide adequate control if you had to worry only about your own bees. However, feral colonies are constantly dying, and other beekeepers may not always pay adequate attention to their bees. You must assume that mite levels in your colonies are augmented by mites from nearby infested colonies that are robbed by your bees, especially when there is a dearth of nectar. Mite levels also seem to be higher in years when there is a strong and sustained nectar flow. Therefore, I recommend you treat twice each year, as spelled out below, unless you determine that the mite levels in your colonies are at a safe level. Check with your local apiculture extension specialist to obtain more information on treatment thresholds and optimal treatment dates from your specific region.

Monitoring mite levels

A key feature of an IPM program is pest monitoring. IPM principles dictate that you treat only when you need to treat. Not only does this reduce pesticide residue levels in hive products, it reduces the rate at which the mites become resistant to the pesticide you are using. Sampling each colony prior to treatment allows you to determine whether or not you need to treat. Treatment should be applied only if the pest population density has reached a level known as the economic threshold. If the mite levels are below the

Avoid situations that lend to robbing. Weak colonies are happy to share their mites.



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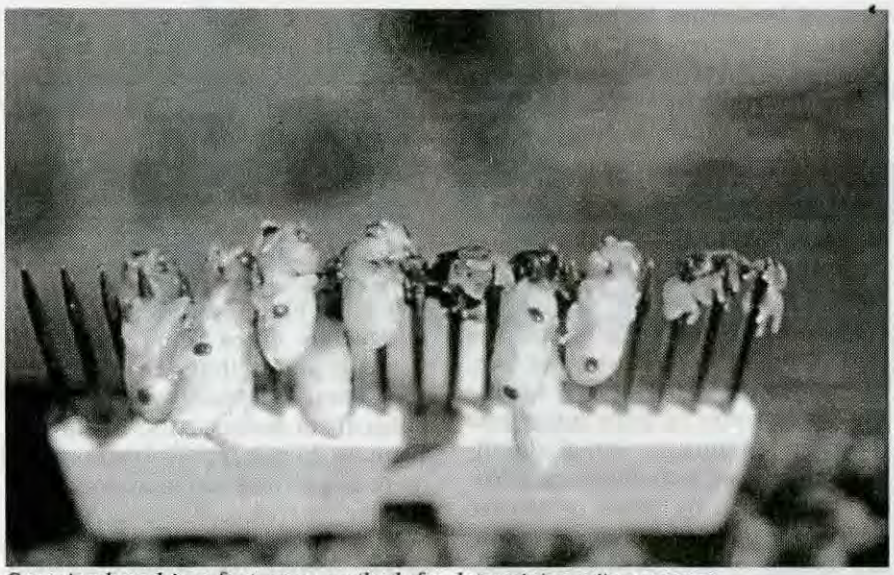


Spearing brood is a fast, easy method, for determining mite presence.

threshold, you do not need to treat. Monitoring involves more work – I figure it takes an additional seven minutes to perform an ether roll during your normal Fall inspection – but, you save between $3 and $4.50 for each colony not treated.

Unfortunately, the development of economic thresholds is in its infancy. Thresholds will vary among geographic regions and on the time of year when you measure the pest population density (Delaplane and Hood 1997). Thresholds may even vary from beekeeper to beekeeper within the same region. Nonetheless, there are mite levels at which it makes no sense to treat. I take a conservative approach. If I obtain an ether roll count of zero during the last week of September - that's right when our Fall flow is ending - I do not treat for *Varroa* that Fall.

Determine your own thresholds

Determining threshold levels is something many beekeepers, or beekeeping groups, can do for themselves. You must adhere to a consistent method of monitoring mite levels. This means that you monitor mite levels at the same time each year, and you monitor all colonies exactly the same way. For the ether roll, this means collecting your sample from the same place in each colony (two to three brood nest combs), collecting the same number or volume of bees in each sample, applying the same amount of ether, and shaking the jar in the same manner. For the sticky board, it means leaving each board in for exactly the same length of time.

A few colonies set aside for evaluation each year will be a wise investment in the long run. In the Fall, place 10 or more colonies with similar populations of bees and the same mite levels – say two on an ether roll – in the same apiary. Treat half the colonies with Apistan, and let the others go without treatment. If the untreated colonies are as strong as the treated colonies the following Spring, you will not have to treat colonies with ether roll counts of two or less the following Fall. Now, you can raise your threshold to three for the next test. Continue this process until you start seeing some reduction in the productivity of your untreated colonies. Of course, you must maintain meticulous records and be prepared to lose a few colonies.

Late-Spring and Summer protocol

Come springtime, you need to kill off ALL of the mites in your colonies. Fumigants will not do this. You need to use Apistan, or CheckMite+ if you have Apistan-resistant mites. The reason for this is simple. The further you get from a 100 percent kill, the more rapidly the mite population will build up over the Summer, and the greater the chance that your bees will succumb before the Fall treatment window – which opens when the fall crop if removed. Late Summer and early-Fall colony meltdown is probably the biggest problem associated with mite management in the northeast. Spring treatments should be put on six weeks prior to supering for honey production and removed when you place supers on the colonies. Delay putting on supers until the last possible moment.

Fall protocol

Apply your late-Summer or early-Fall treatment when you harvest your honey crop. In the Northeast, the ideal target period is between August 15 and October 15, depending on when the nectar flow ends in your area. The goal is to treat your colonies while there are still a few weeks of brood rearing left, but after the honey crop is harvested. This will ensure that your colonies have lots of healthy bees for the Winter. The earlier in the target period that you harvest your honey crop and begin treatment the better. Leave your late-Summer or early-Fall Apistan treatment in your colonies for eight weeks, then remove the strips.

If you are going to use thresholds as a decision-making tool in the Northeast, I recommend monitoring your mite levels when the goldenrod is about 80 percent done. If your mite levels exceed your economic threshold, remove your Fall crop and begin treating for *Varroa* mites. Even if you choose not to use economic thresholds, I recommend that you remove your crop and start to treat at this time. The advantage to removing your crop early is that you move the treatment date up, thereby reducing the chance of colony collapse. You will also have fewer problems with robbing if you remove your crop while the flow is still on. Remember! The risk of colony collapse increases steadily from mid-August through mid-October. The earlier you can treat during that period, the better. Treat as late as possible in the Spring and as early as possible in the Fall. This will minimize the time between treatments and reduce the chance of a late-Summer collapse.

Special case – parasitic mite syndrome

Any time you notice the development of parasitic mite syndrome, you should immediately sample your colony for mites. If mites are present, remove all marketable honey and begin treatment at once. Procrastination at this stage en-

sures the loss of your colony and poses a serious threat to your neighbor's bees. After the proper treatment period, remove the strips and resume honey production.

CHEMICAL TREATMENTS
Apistan (fluvalinate) and
CheckMite+ (coumpahos)

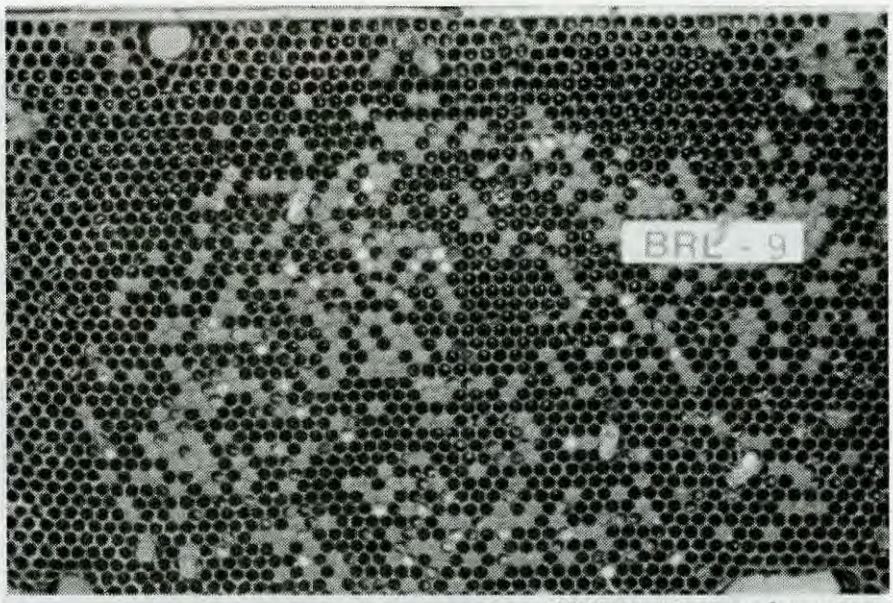
Apistan and CheckMite+ are the two products registered for control of *Varroa* mites in the U.S. Unless you have mites that are resistant to Apistan, that is your safest and most effective treatment. Use one new Apistan strip for every five full-depth combs of bees in the brood nest. For most colonies, that means one strip in the Spring and two to three strips in the late-Summer or early-Fall. Place strips so that they will be in contact with the bees when they cluster. Always read the label for the latest instructions.

Resistance to Apistan is becoming common throughout the U.S., especially in migratory operations. You should be monitoring for resistance by checking the effectiveness of your Apistan treatments. This can be difficult because you do not know if Apistan is working until after the treatment period is over. Partial resistance can add to this problem. Nonetheless, if you find mites in your colonies after the six to eight week treatment period, assume that you have Apistan resistant mites and switch to CheckMite+. You can also check your mites for Apistan resistance before treating them using the methods developed by Pettis et al. (1998a, b). Then, if you have resistance, you can start treatment with CheckMite+. Always read the label for the latest instructions.

Formic acid

Formic acid has been approved for control of tracheal mites and for suppression of varroa mites. This is because formic acid treatments generally results in 50% to 80% mortality of varroa mites, which is not generally thought to be sufficient as a stand alone treatment. I believe this will soon change, as the delivery methods and dosage for formic acid treatments are optimized. Always read the label for the latest instructions.

NEVER APPLY APISTAN, CHECKMITE+ OR FORMIC ACID DURING A NECTAR FLOW OR WHILE HONEY SUPERS ARE ON YOUR COLONIES.



BPMS has a variety of symptoms.

MANAGEMENT PRACTICES

There are a number of management techniques that you can employ that will help in your efforts to keep *Varroa* mites under control. Most of these methods will not protect your colonies by themselves, but they will help slow the rate at which the *Varroa* population grows. This can be very important during the late Summer and early Fall when mite populations may soar and you are caught in between legal treatment windows. You can obtain more details on many of these methods from the references listed below.

Brood nest management – maintain high-quality combs

Cull combs with more than a fist-sized patch of drone cells. This may reduce the rate at which the mite population grows by reducing the amount of drone brood in the colony. Regular culling of older, poor-quality combs will also reduce the incidence of pathogens in the brood nest and will reduce the chance of contaminating your hive products with pesticides. You can maintain high-quality combs by using plastic foundation or crimp-wire foundation that has been properly wired in the frame. Culled combs can be rendered or sold to a wax processor. There are two ways to maintain high-quality combs:

1. Draw foundation in the bottom honey super, then move combs from the honey supers to the brood nest on an "as-needed" basis. Cull combs from the brood nest when they are no longer fit for service.

2. Draw out your brood nest combs in the second story of the brood nest (do not put foundation in the bottom story, as the bees will usually neglect it) and your honey storage combs in the honey supers. Cull from each area independently.

Remember! Always draw foundation during a strong nectar flow. Never move combs from the brood nest to the honey supers. This will increase the chance of pesticide contamination and will darken your honey.

Isolation

Isolation is a standard practice in many IPM programs. If you can locate apiaries three to five miles from other beekeepers' apiaries, you stand a good chance of avoiding contact with a number of problems, including Apistan-resistant mites, as well as mites and diseases from other beekeepers' colonies.

Swarm prevention

Swarms issuing from your colonies are likely to serve as reservoirs for mites. Eventually, they will weaken and may be robbed by your bees. This will result in an increase in mite levels in your colonies. Follow an effective swarm prevention program to reduce the number of feral colonies in the vicinity of your apiaries.

Continued on Next Page

Apistan strips need to be applied safely, and correctly.

Prevent robbing

Do not accept robbing at any time as an inevitable consequence of keeping bees. Robbing can result in the transfer of mites and disease among your colonies and can also weaken or kill the colony being robbed. Robbing bees also pose a danger to people and livestock in the area because they are aggressive and tend to sting. If you keep bees on someone else's land, you will wear out your welcome very quickly if you allow robbing to develop.

Like most problems, robbing is best prevented, as "curing" it is difficult. Adopt anti-robbing practices as core components of your management system. Keep the size of colony entrances proportional to their strength. From mid-Fall through early Spring, colonies are weak and should have entrance reducers in place. In the late Spring, Summer and early Fall, colonies are strong and need ventilation. Remove the reducers during those times. Replace reducers as the Fall flow wanes, temperatures drop, and the bees become snoopy. Always start packages, splits and nucs with reducers in place. Maintain your equipment in good condition. Repair damaged areas that allow bees to enter the supers. Do not bore holes in your hive bodies. If you want an upper entrance in the Fall, slide your top super back about three-eighths of an inch.

Minimize the time you spend inside your colonies during a nectar dearth. If you must work a colony at that time, keep all of your equipment tightly stacked together and keep all of the combs covered. Use an anti-robbing cage whenever the bees are snoopy. Never leave combs or bits of burr comb in the apiary. Carry a feeder pail with a lid with you when working bees and use it to store all of your burr comb and scrapings. You can accumulate quite a bit of this over a few years and then sell it to a wax buyer. When removing honey, especially during a dearth, crack your supers apart, then set them back in place and let the bees clean up the honey released from the burr comb. Stack supers on pallets and keep each stack tightly covered. Feeding bees can start bees robbing. Syrup should be fed in the evening, as it is likely to promote robbing. Capped honey can generally be fed at any time without getting robbing started. It is never a good idea to let bees rob out extracted supers. Not only can this start robbing when done near an apiary, it contributes to the spread of disease and mites.

If robbing gets started, close all colonies in the yard, tape off all cracks and holes in the hive bodies, and place loose grass over the entrances. Make sure that there are no combs or pieces of comb in the yard to excite the bees. Never smoke entrances during a dearth, as this reduces a colony's ability to defend itself. A colony that cannot defend itself should be moved to a separate yard and allowed to rebuild.

Mite-resistant stocks of bees

The most desirable solution to the mite problem is the development of mite resistance in the bee population. Resistance to the tracheal mite is now common, although certainly not universal. Resistance to the *Varroa* mite has been more elusive. There are, however, several encouraging developments in this area. The USDA-ARS Honey Bee Breeding, Genetics and Physiology Lab in Baton Rouge, LA has two ongoing projects. One involves selection for resistance in bees already in North America. The other involves the importation of bees from Russia that are believed to be somewhat resistant to *Varroa*. The USDA-ARS Carl Hayden Bee Research Lab in Tucson, AZ has also made progress in this area. Researchers at the University of Minnesota are examining the role of hygienic behavior in mite resistance. Even a modest level of resistance would be a welcome development. Partially resistant stocks of bees would reduce the occurrence of late-Summer and Fall colony collapse, allowing beekeepers to treat healthy colonies after the honey flow is over for the year. They may also allow beekeepers to use fewer chemical treatments. Try resistant stocks when they become available and decide for yourself if they work.

Trap comb methods

There is good evidence from Europe that trapping *Varroa* mites with drone combs can keep mite levels below the economic injury level. The method involves the use of several drone combs per colony in conjunction with other colony manipulations. You can learn more about this by reading one or more of the articles listed below. You may want to try a modified trap method in which you provide colonies with drone combs throughout the Spring and Summer, removing them whenever they are filled with capped drone brood. This may reduce the chance of late-Summer colony collapse. Be sure to remove drone combs before the drones emerge; otherwise, you will actually be increasing your mite populations. You can make drone combs simply by cutting out the center portions of your low-quality

combs and letting the bees repair them with drone comb.

Screen inserts, dusts and smokes

A number of observers have noted that a considerable number of *Varroa* mites fall to the bottom of the hive, even when there is no treatment being applied. Dusts and certain smoke treatments have been shown to increase the rate at which mites fall from adult bees. These observations have led to the idea that natural mite drop, or natural drop augmented by some other means, might provide some protection from the *Varroa* mite. So far, this has not proven to be the case. At Dyce Laboratory in Ithaca, NY, we have tried this method in conjunction with periodic smoke treatments, but we have not found it to be effective. However, additional research needs to be done in this area.

Splits

It has been my experience that colonies that are split in the Spring have lower mite levels in the Fall than colonies that are not split. Of course, if you follow this method, you will fill the known universe with beehives within 64 years.

Start new every year

You can remove all of the honey from your bees in the Fall and sell the bees to another beekeeper. This way you are not Wintering any bees, and you will not ever need to treat your bees for mites. Use the money from the extra honey to purchase a nuc or package in the Spring.

Special plastic combs (ANP)

Don't confuse these with plastic frames and foundation. ANP combs are entirely plastic with plastic cell walls. Evidence on the benefits of these combs as a mite control technique is sparse and mixed. One problem is that they have only about half the number of cells per comb as regular wax combs. However, plastic comb has not been the subject of extensive research.

Hyperthermia

There is not a lot of information on this either. Mites can be treated with heat, but the method is time-consuming, requiring separation of adult bees and brood and a special heating apparatus.

USE PESTICIDES PROPERLY – WORKER SAFETY AND CONTAMINATION

Apistan, CheckMite+ and formic acid work because they are highly toxic substances. You must prevent any contact with any of these pesticides. Wear latex gloves (or, for better protection, nitrile rubber) whenever you handle Apistan or CheckMite+ strips. When you finish handling strips or gel packs, throw the gloves away. You may reuse nitrile rubber gloves of at least 14 mils thickness. First, wash the gloves with soap and water while they are still on your hands, then, rinse well, remove and store for future use – BUT ONLY FOR PESTICIDES! You can obtain nitrile rubber gloves from your bee supply store - buy some! If you employ people to apply pesticides, be sure that you are in compliance with all relevant worker safety regulations. You may be financially liable for pesticide related injuries to employees.

Do not leave strips in your colonies for more than or less than the time indicated on the label. Not only does this practice increase the risk of contamination of hive products, it also increases the chance of the mite population developing resistance to the pesticide. When removing strips, collect them into a group and dispose of them according to label instructions - DO NOT REUSE STRIPS! Never use formulations of fluvalinate or other pesticides that are not registered for use against *Varroa*. Always refer to the current label to obtain the latest instructions for proper use. BC

Nick Calderone is a professor in Apicultural Extension and Research at Cornell University, Ithaca, NY.

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Join a local beekeeping group. Beekeeping groups often have libraries for members, which is a great, low-cost way to share information. If your group doesn't have a library, organize one. The references below should be in every beekeeping library.

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You can obtain copies of the Calis et al. 1999 JAR article on the drone trap method by logging on to IBRA's Web site at http://www.cf.ac.uk/ibra/photo-fm.shtml. Copies are a bit expensive, but it's the best way to get all the details. The cost excluding delivery is £0.60/$US1.08 per page, but with a minimum charge of £6/$US10.80 per item. Delivery by post to rest of the world (i.e., not the UK) is £0.20/$US0.36 per page, £2 $US3.60 minimum charge. IBRA members receive 50 percent discount on these charges. You can e-mail your order to IBRA@cardiff.ac.uk.

Order a suitable vacuum device for sampling your colonies from BIOQUIP Products, INC., 17803 LaSalle Ave., Gardena, CA 90248 (310-324-0620). Ask for DC INSECT VAC Model 2820B (designed for 12vdc). Ask about spare parts when ordering.

Apimondia '99
GLEANINGS FROM THE EXPERTS
African Honey Bees

No aspect of beekeeping was left unexplored during the hundreds of sessions at Apimondia '99. In the October issue we looked at comments made by various speakers on American Foulbrood and some nutritional aspects of pollen.

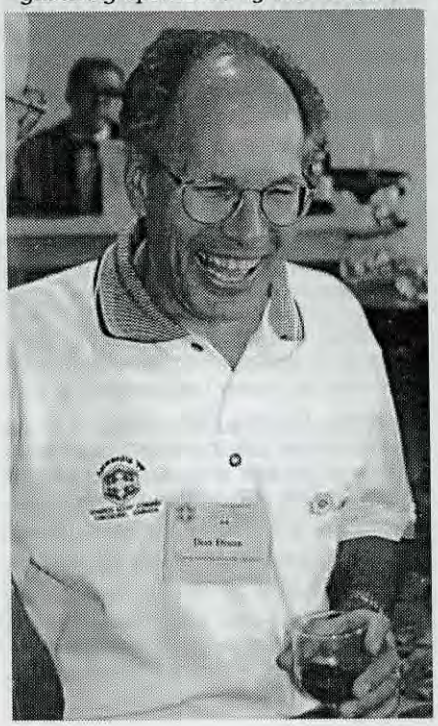
This month, taken from the Proceedings, we offer several views of the African Honey Bee. With the significant losses to U.S. beekeepers caused by *Varroa*, and most recently the Small Hive Beetle (ironically, that, too from South Africa), attention to the AHB in most quarters has waned.

Although to some degree the acute danger, and media attention toward this particular honey bee has subsided, the potential for problems from several fronts has not diminished. People still blunder into feral nests; people still try to eliminate feral colonies with a variety of unskilled techniques; public areas need to be kept free of swarms; pollination for essential foods is still required; honey production, queen and package production and everyday beekeeping is still ongoing in areas not-yet-occupied by AHB.

How Brazil managed to cope with this bee has produced valuable information for others to use. The interaction of AHB and *Varroa* in Texas has been insightful to what others in the U.S. can anticipate. And finally, those in the business of removing AHB from areas (reactive), or keeping them out of areas (proactive or preventative) have experienced phenomenal growth. And they, too, have something to share.

AHB IMPACT IN BRAZIL Lionel Segui Gonçalves, University Sao Paulo, Brazil The impact caused by the introduction of the African bee, *Apis mellifera scutellata*, and the establishment of the resulting hybrid, the Africanized honey bee (AHB), from the cross with the previously established European honey bees, has been discussed for more than 40 years in Brazil. The most publicized biological characteristics of the African bee were its swarming behavior and the tendency to sting, which were a cause for alarm to the public. Sensational reports and a lack of adequate methods for handling these new bees put tremendous pressure on the beekeepers and led many of them to abandon their apiaries. After the introduction of African bees in the country in 1956, the main questions for beekeepers and technical personnel concerned how to control and how to improve these bees. The African bees were known as being good honey producers. That is why they were initially brought for testing. However no one seemed to know how to make them produce instead of merely reproducing and stinging. No type of bee has been as polemic on an international level due to the negative and positive impacts on beekeeping and the communities where they have become established. For a long time they were improperly labeled as "killer bees" and for this reason they also served as a theme for terror films. Beekeeping in Brazil was started about 160 years ago with the introduction of European bees, but this activity did not develop much until 1956. The national honey production in that decade was about 5,000 metric tons/year and beekeeping was considered mainly as a hobby. However, from the time of arrival of the African bees until today, beekeeping has changed considerably in our country. The first 10 years of Africanization were very difficult. However, from 1970 on, beekeeping has steadily progressed. This growth phase in Brazil has been characterized by an effective adaptation and improvement of bee handling methods, an increase in the number of beekeepers and associations, increased honey production (now about 45,000 tons/year) and other bee products, development of beekeeping equipment, improvement of packing methods, new laboratories for research, new technical courses and a significant increase in the number of scientific and technical publications on apiculture. In Brazil beekeeping with the AHB is now considered a good investment opportunity. Beekeepers prefer to work with the AHB. In fact, all commercial beekeepers work only with AHB. The biology of this bee is now better understood, the aggressiveness has been reduced and the swarming behavior is less vigorous. These bees have a high capacity for adaptation and are more resistant to diseases than are European bees. One very important biological characteristic of these bees is their tolerance to varroatosis, which explains, in part, the low infestation levels we find: less than 2% in almost all regions of Brazil. Brazilian

Don Dixon, Congress Organizer, enjoys a moment off at the Speaker/Media gathering sponsored by Bee Culture.



beekeepers do not need to treat their colonies with acaricides or drugs and, as a consequence, the honey and wax have no chemical residues. Therefore, I believe that there is a good and prosperous future for beekeeping in Brazil, thanks to the AHB.

INVADING SUBSPECIES Orley Taylor, Kansas African bees reached the United States in 1990 and genetically they are little changed from those in South Africa. Throughout the Americas virtually all genetic traces of European bees have disappeared in areas occupied by African bees for 10 years or more. There appears to have been complete genetic displacement of the European by the African biotype. This pattern has been evident for 20 years and begs the question: Why do all traces of the European genome disappear after the arrival of African bees and why, if hybridization is common, are African bees unchanged by hybridization – in other words, why weren't the African bees becoming Europeanized?

African and European bees are supposed to be the same species and should therefore be genetically compatible. Our studies show that there are a number of barriers to gene flow from European bees into the African bee population but that the converse is not true, European bees are vulnerable to hybridization with African bees. This asymmetry in hybridization, combined with low survival of the hybrid bees, evidently leads to a rapid elimination of European bees and their genetic traits. If this pattern remains unchanged, it will define the nature and dynamics of the zone of contact, or hybrid zone, formed by these populations at the northern limits of the African biotype in the United States.

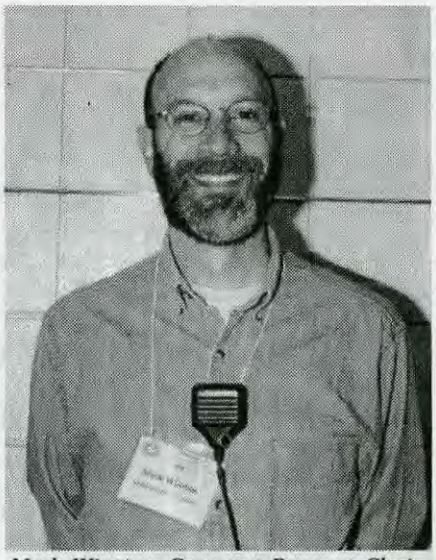
William Rubink, USDA, Texas *Varroa jacobsoni* and Africanized bees came close on the heels of one another in North America. *Varroa* mites were first discovered in the USA in 1987 in Florida, and by 1990 were found in coastal southern Texas, from which in the course of three years they spread through all of southern Texas' Rio Grande Valley. Africanized bees were also first detected in southern Texas in 1990, but their dispersal in Texas has been considerably slower than during their three-decade long northward march from Brazil. *Varroa* arrived independently of Africanized bees to southern Texas; the mites found infesting bees in Texas in 1991 were most likely of the same origin as mites found earlier in the state of Florida. In Mexico *Varroa* mites were first found in Veracruz, after the arrival of Africanized bees, and probably as a result of queen introductions to the area from the USA.

Using biochemical and morphometric techniques we monitored the Africanization process in swarms and/or feral colonies at three latitudes in northeastern Mexico and southern Texas. Prior to the arrival of both *Varroa* mites and Africanized honey bees, large feral European bee populations existed at least as far south as the Tropic of Cancer in Tamaulipas state, Mexico.

When the first *Varroa* arrived in Mexico and southern Texas, the feral bee populations had already undergone some Africanization. However, further northward in coastal Texas, where we have monitored feral bee colonies, *Varroa* arrived prior to Africanization. This situation has allowed us to assess the effects of *Varroa* mites in naturally-existing populations of Africanized and European bees.

We found that in areas where Africanization preceded the introduction of *Varroa*, feral populations, based on swarm capture rates, remained relatively unaffected by the parasite. However, in areas where the introduction of *Varroa* preceded Africanization, feral European honey bee populations declined drastically soon after the introduction of *Varroa*. These colonies were then replaced by Africanized bees, but at lower population density levels.

Steven Thoenes, Tucson, Arizona During the decade of the 1990s, the range of Africanized honey bees (AHB) has expanded to include five states in the southwestern part of the United States. AHB are now found in Texas, Arizona, New Mexico, California, and Nevada. No human created control measure has stopped or slowed the expansion of AHB which should continue unabated through the California coastal areas. The United States

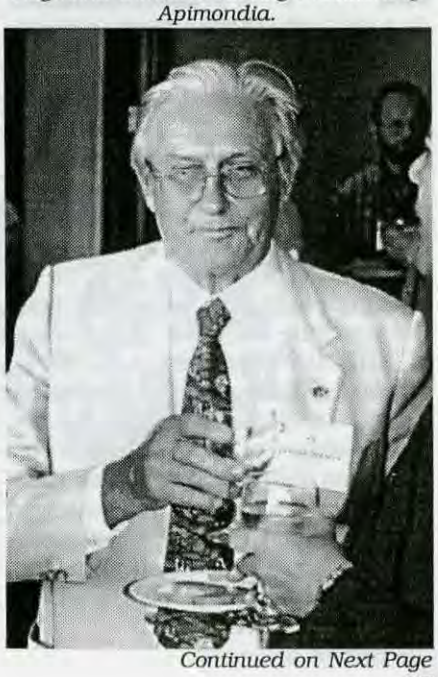


Mark Winston, Congress Program Chair.

government does not have an AHB control program and the state governments have focused only on monitoring range expansion and educational programs. The lack of governmental programs has created a huge market for bee control within the private sector. This is a discussion on the evolution of honey bee control methods driven by the increasing AHB prevalence, with a special emphasis on new technologies which aid in AHB control.

In Arizona, high concentrations of AHB are found in the urban areas. In Tucson, the first AHB were found in June 1993, after a small dog was stung to death. FABIS tests showed AHB concentrations of 15%

Raymond Borneck, retiring President of Apimondia.



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Steve Conlon, National Honey Board Chairman, at the reception.

Richard Adee and Jim Tew relaxing and watching the festivities.

Jack and Betty Thomas, Mann Lake Ltd., won a blue ribbon for their booth.

in 1994, 57% in 1995, 95% in 1996, 94% in 1997, and 98% in 1998. Historical records of swarm occurrence for European bees from 1982 through 1991 show a mean of 365 swarms per year with 70% of the swarms occurring from March 26 through May 27. Since the invasion of AHB in 1994, the number of swarms and the timing of swarming activity have changed dramatically. The number of bee problems has increased ten-fold from 1994 to 1998. Timing of the swarms has changed from seasonal to year-round activity with heavier concentration during the Spring and Fall periods of high floral abundance.

Bee control involves three groups; beekeepers, bee removal specialists and pest control companies. Before AHB, control was mainly by beekeepers working for little or no compensation to gain additional bees for use in hives. Pest control companies typically did not deal with bees, referring bee exterminations to specialists who were former beekeepers willing to poison bees. In 1994, there were four companies in the Tucson yellow pages under "bee removal." In 1999, there are 32 companies advertising bee removal services. Five of these are bee specialists and the rest are all pest control companies. Bee control can be broken down into two categories; reactive and preventive. Reactive bee control is when a bee problem exists and the client calls a responder to have the problem solved. Typical fees for the reactive bee control range from $100 to $200 to kill bees. With AHB, the live removal of bees for use by beekeepers is rare. The majority of reactive control involves bee extermination with either surfactant agents (to suffocate the bees) or pesticides (to affect the nervous system). "Clean-up traps" using queen pheromone are used to capture and eliminate bees left over after reactive bee control jobs. Preventive control utilizes traps containing Nassonov gland pheromone to capture invading swarms. When placed in specific arrays, these "swarm traps" will actually prevent infestations from occurring within any designated area. The traps are serviced on a regular schedule and the bees removed before they become dangerous. Properly designed "swarm trap systems" exceed 95% efficiency in preventing bee problems within the protected area. BC

What About This?

MIGRANT LABOR

Mary & Bill Weaver

There's lots of paper work involved, but if good help can't be found, this can' t be beat.

Getting migrant labor is a complicated proposition, with many regulations that must be followed. "There are probably more rules and regulations dealing with migrant agricultural workers than with any other labor group in the U.S.," said Tom Sachs, Ohio State University Extension farm labor specialist. But it can be done. Let's look first at how one beekeeper, Buzz Wilson, with 15,000 colonies in South Dakota, is doing it.

Buzz Wilson has used migrant labor for the past eight years – "successfully for the past six years," he added. "We got our first migrants from an employment agency," he continued. "Some were superb, some were adequate, and some were marginal. Then we were fortunate to hire, through the employment agency, an excellent fellow from deep down in Mexico. He speaks decent English, and is well-educated. He has two brothers who are veterinarians, and he owns 800 acres in Mexico, where he raises corn, beans and cattle. His family takes care of his farm when he's working up here.

"He has secured more help for us from his hometown in Mexico, and now we have three generations of that family working for us, in addition to other relatives and friends. He found out what we needed, and he helped us to procure the workers. They like to work as a family unit."

Buzz has six Mexicans on his crew this year. "I would be out of the bee business," he asserted, "if it weren't for these workers. I can't find local workers to do the work. These fellows are willing to do whatever I ask them to do. They're making good wages for the area, and live in nice houses." (Buzz owns several well kept houses in town that the workers use.) In addition, they get a year-end bonus based on profits.

"Last year," he continued, "one worker lost one day of work, and that was all. They know they're here to work. It's a two-way street, though. We're extremely good to them, and they're extremely good to us. The lead Mexican has become a citizen, and his son is ready to sign citizenship papers."

The first step in getting migrant workers is to establish that there are no local workers available to do the job. This is a requirement that must be met in all states. For Buzz, it meant notifying Job Service in Sioux Falls. "I have a standing order there," said Buzz, "but the workers they send don't last. Then when they see I can't cover the work with Americans, they sign a form and send it to me."

Buzz sends that form to Denver, then sends the names, addresses and Social Security numbers of the workers he's requesting to the INS in Sioux Falls. They send the list to their office in Lincoln, Nebraska, where they run checks on the people, and they eventually give their approval.

Then they send the permits to the American consul in Laredo. Finally, the consul issues the work permits. "I start the paperwork for March in August," said Buzz.

Once the workers have their work permits, the next step is to advance their bus fare to them. "Then, when they finally get here, they're broke," Buzz continued, "and I have to advance them money, which I gradually deduct back from their paychecks. Then the contract guarantees that if they stay the season, I'll pay their bus fare back."

To beekeepers looking to hire Mexican migrants, Buzz recommends the employment agency in Texas that he worked with, Amigos Labor Solutions (214.634.0500.) His contact person is Robert Winfield.

"You sign a contract with the employment agency," said Buzz. "Then at the time of hiring, you pay a $375 per person finder's fee, and the agency guarantees to you that the workers are legal and have valid green cards. Then it costs me $130 apiece for bus tickets from Dallas

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MIGRANT LABOR ... Cont. From Pg. 29

to Sioux Falls.

"If you try to hire Mexicans on your own rather than through an agency," he cautioned, "it can be risky." There are rumors of organizations that have print shops, and can supply legal-looking, but fraudulent, Social Security cards and green cards.

One of the most important things to know if you're hoping to find migrant labor is to start early, according to Gerald Deer, Assistant Monitor Advocate in the Michigan Department of Career Development/Employment Service Agency. "Close to half the migrants in Michigan this year are brand-new," said Mr. Deer. "The turnaround is heavy. There are more job openings than job seekers, and we're competing with Wal-Mart and K-Mart and businesses on the border. Employers know that ag workers are good workers.

But a lot want to stay working in agriculture.

"Growers start recruiting in Texas in November," he continued. "Most migrants have commitments by the first of the year. A large grower in the Holland, Michigan area sends a crew leader down in January, and he interviews and hires on the spot. He gives a contract to sign and a cash advance for transportation to Michigan. "In Michigan, we send interstate clearance orders to the Texas Workforce Commission. We notify them, and they start recruiting on the order right away."

According to Tom Sachs, Ohio State University Extension farm labor specialist, a lot of ag employers in Ohio are responding to the current labor shortage by personally recruiting in Mexico. "Some start at Christmas," he said, "with cards and phone contacts, and they touch base frequently throughout the Winter."

For Sachs' own vegetable operation, he says, "We have gone down to the Rio Grande Valley about every year since 1966 to recruit labor. I always go to see my workers at their homes. I check out their plans, find out how the family is doing, and ask them if they know anyone else looking for work in the area. You have to take a long-term view to recruitment," said Sachs. "How you treat workers this year will impact your recruiting next year. It's important that you establish a reputation for fair dealings."

Beekeepers with operations that spend part of the year in Texas can often find migrant labor more easily. Colorado beekeeper John Hafly said of his recruiting efforts, "Mexicans come to my shop in Texas, which is only a mile from the Rio Grande, looking for work. I teach them how to keep bees." Now, many of his migrant workers are related – brothers and cousins, for example.

Lyle Johnston, with 3,500 colonies in Colorado, also has an operation right next to the Mexican border, and picks up a lot of potential migrants there who come looking for work. "Many have worked bees before," he said.

"Right now," he continued, "my crew is just about all Mexican, with some part-time local kids in the Summer. American workers consider $11 and $12 an hour an insult," he added.

Getting an early start on recruitment isn't all that's required, however. As with Buzz Wilson, you must show that no American workers are available who want the jobs. You saw how he took care of that problem. This must be done no matter what state you live in.

Gary Fitch of Ag Affiliates in New York explained how this works out in practice in New York state.

In New York, according to Mr. Fitch, before the agricultural employer can hire migrants, he must have proof that he advertised in Hispanic papers and local papers for workers, and he must obtain a letter from the Department of Labor showing that he really tried to get local people to do the work.

In addition to using employment agencies, as Buzz did, to locate potential workers, some ag employers go through crew leaders. Crew leaders must be licensed as Farm Labor Contractors through a state employment agency, and will be regulated by the U.S. Department of Labor. The employer makes arrangements for the labor contractor to sign up a certain number of workers. However, this approach has some hidden potential pitfalls.

Craig Anderson, manager of the Regulatory Compliance Assistance Program in Michigan, advises caution when using a crew leader as an independent contractor unless you have legal counsel experienced in this field.

Crew leaders are in many cases paid directly by the ag employer, and theoretically, they then make all the required payroll deductions and issue checks to each worker. Problems can arise, though, with the occasional unscrupulous crew leader who simply pockets the money, or who pays the workers, but fails to send in the required deductions for workers for Social Security, etc., or who makes illegal or unauthorized deductions. Crew leaders may also fail to carry the required worker's comp or vehicle insurance.

Under the Migrant and Seasonal Agricultural Workers' Protection Act, if a crew leader fails to live up to his responsibility, the ag employer has a joint responsibility and/or liability and is responsible financially for pay, payroll deductions not sent in, and insurance claims.

"Plus, if you assume an independent contracting relationship exists," Craig said, "you are going to need to give up substantially all control over how the work is done to maintain the independent contractor status, or you can get hauled into court. Even if you win the case in court," he continued, "you've lost financially, even if

you ultimately win. Agricultural employers see the independent contractor as cutting paperwork for them, but in the long term, using a crew leader as an independent contractor can cause many problems."

"In New York state," Fitch said, "when dealing with crew leaders, most ag employers now make out individual checks for each worker with all the required deductions taken out, rather than giving the contractor a lump sum and letting him do the paperwork. That way they will have no unpleasant surprises."

If you go through your state employment service to locate labor (you can do this in any state, according to Deer), you need to fill out a job order, which can run to 15 to 16 pages. "The Migrant and Seasonal Agricultural Worker's Protection Act is very specific," said Sachs. "When you recruit migrant workers, they have to know all the terms and conditions of employment and housing before they leave their homes or places of recruitment. That's really common sense. Don't promise the moon and then change your mind after the workers arrive. This law is a response to this sort of problem happening to migrants over the last 50 years.

"Putting everything in writing, which the workers also sign, can protect the employer, too," said New York vegetable grower Maureen Torrey, who hires more than 200 migrants. "Workers can tell Legal Services you made promises in recruiting them that you did not make, and this can put you in legal trouble." Now Torrey does all of her hiring through the New York Department of Labor. "In going through the DOL, all our terms and conditions of employment are in writing, so there can be no misunderstandings. The state labor department is a good ally to have. They do not charge a fee. We started doing this six or seven years ago, and it's the best thing we ever did. The state also certifies that the workers they refer to us are legal."

What kinds of information need to be on this job order? For migrants crossing state lines, the job order must include details of the housing (the employer must provide state-licensed housing sufficient for the number of workers at no cost to the worker). "The first thing migrants thinking of going north want to know is about the housing – how big is it?" said Deer.

You will be covered by both state and federal regulations, and details of housing construction requirements vary from state to state. "The regulations provide for standards of basic construction, health and sanitation," said Anderson, "and in many states, the rules apply to any provider of housing for seasonal or migrant agricultural workers."

Regulations determine, for example, the number of square feet per occupant, absence of debris and noxious weeds, adequate water supply, showers and sanitary facilities, electric service, heating, ventilation – even how high a threshold has to be before steps must be constructed, and the amount of hanging space and shelf space in closets.

Most beekeepers we spoke with who use migrant labor house their workers in nice homes or apartments, which in some states would have to come under the above sorts of regulations. Lyle Johnston, for example, rents very nice apartments, with several migrants in each apartment, and he pays a hefty tab to do this.

Besides spelling out details of housing provided,

what else goes in this voluminous job order that must be filled out? Here is a partial listing: the type of work; the duration of the harvest season; the number of workers employed last year and the average wages earned per worker last year; the number of hours of work per day; the number of days of work per week; work rules; who will supervise; when they will be paid; working conditions; what clothing and equipment will be provided and what they would be expected to purchase; daily meal allowance if a place for cooking is not provided; transportation provided (as to the grocery store, since H2A workers or foreign migrants are not allowed to drive in this country); and rules at the migrant housing, such as whether smoking is permitted and when the camp has to be quiet at night. And this is just a partial listing.

In Michigan, according to Deer, the employer must then notify the state employment service staff at least 10 days in advance if the need for workers changes. All working conditions must comply with federal and state laws, and the wage and benefit package must come to the higher of the federal or state minimum wage.

Beekeepers can file such a job offer in any state employment service. According to Deer, "Ohio's Web site has a tristate labor bulletin for Ohio, Michigan and Indiana. Every week we send in what is being harvested and the job orders given. A graphic map shows counties served with bilingual, Spanish-speaking staffs. We're working on employer profiles and pictures of farm operations. We're also distributing job information to day-care centers, school centers, and at highway rest stops, with weekly updates. Other states are watching." For H2As (foreign workers), salaries must be considerably higher than the minimum wage. They must be paid what is called the "adverse effect wage rate," the rate the USDOL says must be paid so American labor is not adversely affected, which varies by state. The adverse effect wage rate in Michigan this year is $7.34 and hour, according to Deer, and in Ohio, it's $7.53 an hour. "Every year, the rate changes and goes up," Deer commented. If employees are paid by piece rate, the pay must still average out to that figure over each pay period.

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In New York, the "adverse effect wage rate" is currently $7.18 per hour, according to Fitch. "Quite frankly," said Mr. Fitch, "many American workers aren't fast enough to justify $7.18 an hour. The farmers from the hills of Mexico know what work is," he continued. "They take us back 50 to 60 years when people wanted to put in a good day's work. When they get here, employers sigh with relief. They try to do the job right."

Another potential wrinkle, according to Mr. Fitch, is that, even after the ag employer has paid the transportation for the foreign workers to come to work for him, and the employer has enough workers, if an agency should refer American workers to him – such as welfare recipients who want to pick apples, for example – the employer must take the American workers and let the foreign migrants go, until halfway through the contract period.

According to Fitch, the employer must also meet the "three quarters guarantee." If you hire foreign migrants (H2As) and the contract specifies they will have 48 hours of work per week, you must guarantee they will be paid for three-quarters of that, or 36 hours per week, even if unforeseen conditions limit the work to less than that.

"With H2As, though," said Mr. Fitch, "workers are supposed to be committed to the agricultural employer. They must stay until the season is over."

Commercial beekeeper David Green, of South Carolina, suggests a way of getting migrant help for your operation without having to provide the required housing. "With the growers' permission," he suggested, "let the word out at some of the migrant camps that you have work available, and hire workers during their off-work time, or when they are between crops.

"The growers will be glad to see them working," he continued, "because the workers are always glad for the extra income. If you get a good worker, try to hire him back next year. More and more, labor contractors will bring in a lot of migrant workers and house them, and then they are available to area ag employers.

"You could also try contacting pastors of churches with Spanish-speaking congregations," David continued. "They may be able to link you up with Hispanics who are living locally and looking for agricultural work. If they are ambitious, you may be able to hire the husband full time and the wife part time. Our country has to import ambition," he chuckled.

If you're serious about hiring long-term migrant help, David advised, you should learn some Spanish. He has traveled to several Spanish-speaking countries, in addition to taking some Spanish in college. "I'm not fluent, but I get by," he said, "and it's been a big help in dealing with Hispanic workers."

John Hafly of Colorado has also gone to the trouble of learning some Spanish so he can communicate better with his migrant workers – "enough to get by," as he puts it.

In the hiring process, it is illegal to discriminate, and this can work in ways you may not expect, according to Anderson. "For example," he said, "if you hire both migrants and local workers, do not ask only the Hispanics to complete the INS Form I-9, or you can be accused of discrimination and penalized. You must have Form I-9's on file for all your employees, even, for example, your nieces and nephews (although you may be exempt from having them on your own children)." Anderson recommends having one on file for every current worker receiving a paycheck. You must maintain the I-9's in your files for three years, or one year after the date of termination, whichever is longer.

Craig Anderson's office has been hired to do articles on labor and regulations for quite a few agricultural groups, looking into potential and real problem areas for the agriculture industry. "In beekeeping, for example," he said, "it is possible that honey processing could put you outside the definition of agriculture, so you would become a commercial entity like McDonald's or Burger King, and you might fall under labor regulations that do not apply to agricultural workers in general."

In the studies he did for the Christmas tree growers, for example, Craig found that those with fewer than eight employees can be considered agricultural employers, but those with more than eight employees were not so considered, making overtime and other regulations apply to their employees.

So, you may be wondering, why go through the hassle of jumping through all these hoops to bring in out-of-state migrant workers? Because they can be a source of trustworthy, hard-working labor, a rare commodity these days.

As Scott Price puts it, "We started hiring migrants when the supply of high-school and college students looking for work just dried up. His migrant workers, he said, don't like getting stung so much, but they do like the steady paycheck beekeeping provides. In construction, the work is not so steady.

The Prices' migrant workers have done very well for them. "They're about like family," Scott commented.

What's for the future? Congress began debating H2A reform on September 30, according to Fitch, and some of the reforms being debated could cut red tape associated with using the H2As program. The new reforms could alleviate a great many headaches and make a lot of employers shift to H2A, he believes. So if you're considering using foreign migrants, keep abreast of any changes that Congress might pass. BC

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

NOSEMA

Silent Killer? Stress Disease? No problem? Probably all of the above, sometimes.

James Bach

Nosema disease – scientific name *Nosema apis* Zander, an adult bee disease, is often mentioned as a potential cause when bee colonies do not perform up to expectations. This is especially true in northern states, wet climates and in the Spring. At other times it is referred to as a stress disease, but I'm not sure what bees consider stressful. In beekeeper discussions, nosema is often said, and sometimes presumed to be linked with dysentery. It would be more accurate to say that nosema may be correlated with dysentery. While there are no specific clinical symptoms of nosema, that doesn't mean that it doesn't or can't cause an economic and real impact to colonies of bees and to the queens, in them.

This article is intended to discuss the practical side of dealing with nosema and will make some specific recommendations in the interest of successful bee management. For the technical side of the disease I refer you to: *Honey Bee Pests, Predators & Diseases*, Third Edition, by Morse and Flottum, Chapter 4, Pg. 59-73. *The Hive and the Honey Bee*, 1992 Edition, Pg. 1097-1104. *Honey Bee Diseases & Pests*, Second Edition, Canadian Association of Professional Apiculturists.

Nosema is a protozoan or single-cell animal, and a parasite that infects the ventriculus and midgut of the honey bee, where most of the food digestion and absorption occur. In a honey bee, the mouth parts are connected to the esophagus which connects with the crop (honey sac), the ventriculus, the midgut, the hindgut and the rectum. The spores of the parasite pass from the ventriculus to the midgut and finally are passed out in fecal matter. This may occur in the hive during prolonged Winters and cold, wet Spring weather when the bees can't take cleansing flights. Worker bees become infected during hive-cleaning activities.

Infected worker bees have a shortened life span, reducing nectar gathering; hence nosema is said to reduce honey production. The disease is reported to affect the development of glands that produce brood food and to cause negative physiological effects in adult bees. When a queen becomes infected, her egg-laying capacity is reduced as her ovary degenerates, and she may be superceded or replaced by the bees.

In my early years of beekeeping, I heard stories about all the damage nosema could do to bee colonies. During the observation of thousands of bee hives as a county inspector in western Washington, I often wondered how I would recognize nosema in colonies or hives. If it causes such damage to bees, surely we should be able to recognize it in our colonies and hives.

Field Test: Capture a worker near the entrance, you want an older bee. First, remove the head, then grasp the sting segment with a fine forceps and, holding the bee over a white piece of paper, pull straight out . . .

So how do we know our bees have Nosema? The literature describes a field test in which the beekeeper removes the midgut from the bee and examines it to see if it is it's normal tan color, and if the constrictions (wrinkles, rings) around it can be easily seen. If it is white and bloated and the constrictions are not obvious, the presence of nosema is indicated.

Another method is to dissect the midgut from a number of bees, macerate them in water, filter out the residue, and count the disease spores using a hemocytometer and a microscope.

We have dissected thousands of bees for nosema in our state laboratory. When we put midguts into a petri dish, we observe the differences between the color and distension or swelling of the midguts. We have seen only one or two midguts that were so swollen that we couldn't see the rings, or that were whitish in color. The rest have been light tan to light brown in color. When we were running 250 or more samples of bees for honey bee tracheal mites (HBTM) in the lab in June 1985, we checked all samples for nosema. The samples contained between 4,000 spores (the lowest detectable number) and 150,000 spores per bee, though one sample had 3,500,000 spores per bee. None of the midguts were whitish in color. The high nosema sample came from four hives on Vashon Island in Puget Sound in western Washington. They were managed in an excellent manner, were five deep supers high, and full of bees. They each produced a 125-pound crop that year. Was I surprised after all the stories I'd heard about the impact of nosema!

Only three of the samples from commercial colonies in dry eastern Washington showed nosema. When I visited the locations from which they came, I found:

- one apiary sitting below the surrounding grade level in a gravel pit. All brood nest combs I examined contained hundreds of chalkbrood mummies.
- another was placed up against a southerly exposed granite rock bluff, subjected to high temperatures day and night, and
- the third was in the bottom of a long, narrow canyon which had a stream flowing through it and a high concentration of brush and trees.

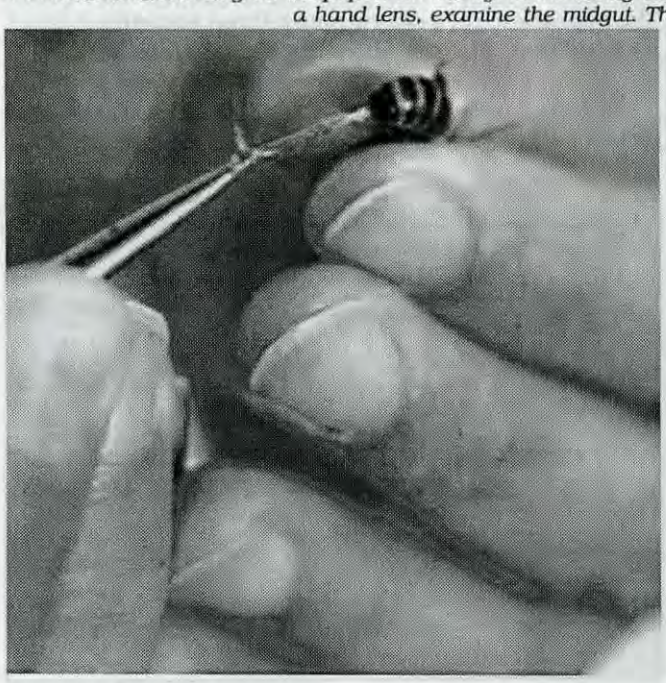
I suggested to the beekeeper that he move the apiary out of the gravel pit. He did so, and the bees removed the chalkbrood in two days! The observed conditions of the colonies – vitality, temperament and brood survival improved rapidly. From the human perspective, one could say that the bees had been under stress. When the stress was removed, disease symptoms were apparently reduced. (I wish I had taken another bee sample and checked again for nosema to see if its level had been reduced as well.) Perhaps this is why feral colonies usually select hive sites well above the ground.

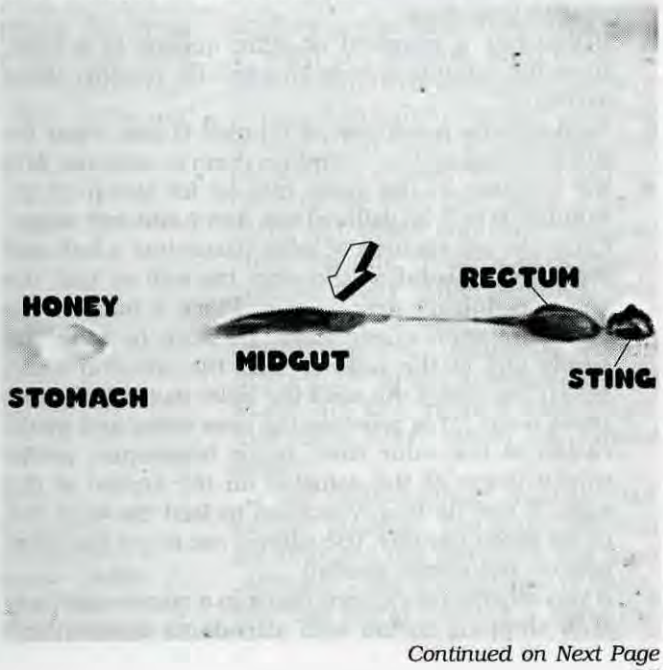
Several times I sampled hives in the early Spring that showed symptoms of dysentery, and tested the bees for nosema. On only one occasion did I find nosema, and then only 6,000 spores per bee.

In my experience, nosema appears to have the most negative impact on queens and package bees following shipment, and on the vitality of colonies in the Spring if one or more other maladies are affecting them. Nosema was highest in those colonies that appear slow to build up in the Spring, though HBTM cause the same symptoms nowadays. But it is also true that reduced brood survivability, poor nutrition and unattractive queens may all occur at the same time in the hive in the Spring, resulting in a slow building colony. So we now have to measure several things before we can determine the cause(s) of our observation of a colony that builds up slowly. See how complicated the evaluation of colony health can become?

For years I have fed queens and their attendants in shipping cages a solution of Fumidil-B and water for two days prior to introducing them to colonies or splits. When I moved to eastern Washington, I heard commercial beekeepers talking about losing up to 50 percent of

. . . until removed. Lay on the paper. On the left is the honey stomach, center the midgut, on the right the rectum and sting. Using a hand lens, examine the midgut. This test isn't definitive, but it is a start.





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NOSEMA ... Cont. From Pg. 35

the queens they were introducing! I suggested my feeding remedy to a beekeeper who had introduced 400 queens to splits and overwintered colonies and lost close to 50 percent. He tried the Fumidil-B/water solution on his next batch of 300 queens. His introduction success went to 95 percent!

One year I introduced Fumidil-B-fed queens to top nucs in setting up my two queen colonies. I wondered why the top nucs didn't build up as fast as I was used to seeing. I did a brood survivability test and found that only 35 to 50 percent of the eggs reached the black-eye stage in 14 days. I regret now that I didn't also test for nosema. I just gorged the bees four times with Fumidil-B syrup. Three weeks later (one brood cycle), I rechecked the brood survivability and found it to be 85 to 95 percent. Even with the 35 to 50 percent survival, I did not see any spotty brood pattern, only excellent combs of brood.

Dr. Shimanuki said years ago that he tested queen attendant source colonies for nosema and found it to be below detectable levels. He put some queens and attendants into queen cages and shipped them to Europe. Upon arrival two days later, the attendants were removed from the cages and tested for nosema. High levels were found. That is the source of the idea that shipping stresses queens and bees, resulting in higher levels of nosema, and perhaps other organisms.

Dr. Marla Spivak told the ABF queen symposium attendees in January 1998 that nosema control is critically important in queen mating nuclei. She indicated that less stress on the queens allows for faster sperm migration into the queen's spermatheca. (Taken from ABF news release, May 8, 1998.) Many other citations of the impact of nosema on bees can be found in the literature.

Recommendations:

1. Have your bee colonies tested for nosema early every Spring (late February or early March) for several years to determine the disease levels you can expect in your area.
2. If you buy a hundred or more queens at a time, have the attendant bees checked for nosema upon arrival.
3. Feed queens a solution of Fumidil-B and water for *two days* before you introduce them to colonies. Mix the solution at the same rate as for syrup (.5 gr. Fumidil-B to 5.26 gallons) **but don't add any sugar**. Crumple two squares of toilet tissue into a ball and dip it in the solution. Squeeze the ball so that the solution doesn't drip or run. Place a ball on the screen of each queen cage. Be sure to raise the candy end of the cage so that the solution won't soften the candy. Re-soak the toilet tissue ball three times a day. This provides the bees water and medication at the same time. Some beekeepers prefer to put drops of the solution on the screen of the cage. If you do this, you need to feed the bees five or six times per day. (Be careful not to get the solution on the queen candy!)
4. If you receive your queen cages in a communal (battery) shipping carton with attendants surrounding the cages, feed them the same solution, or you can add sugar to make syrup. Feeding can be done by inverting a honey squeeze bear containing the solution into a hole in the top of the shipping carton. Remove only a small part of the tip of the spout, or drill a 1/16-inch hole in the tip.
5. If you use full-size colonies as queen banks to hold queens after their arrival, feed a Fumidil-B/sugar/water solution to the colony prior to adding the queens. A quick and simple way is to pour the warm solution over the bees (called gorging) so as to get the bees wet so they will clean up each other and the hive. A lot of bees will ingest the solution. Repeat this three times over successive days. Also feed the queens as in number 3 above before you introduce them into the treated colony. Of course you can only use the gorging method on a warm afternoon (>60°F). Gorging gets more medication to more bees than does using a feeder. It is also important that queen banks are provided with several frames of emerging bees and large amounts of pollen or pollen supplement so that the nurse bees can properly feed *the queens*.
6. If you make up five-frame queen banks to hold queens, or to transport them to your apiaries, feed the solution to the source colonies from which you take the bees you will put in the bank. Also feed the bank after you add the queen cages.
7. Treat your overwintered colonies by gorging them with Fumidil-B syrup three times, seven days apart. Dribble the syrup down between the frames in each brood box. Use only the amount of syrup needed to get the bees wet (three to four cups for 15 combs of bees). Don't waste the syrup by letting it run out of the hives; use less syrup.

It is important to remember that you can't determine the presence or level of nosema in your colonies by looking at the bees. You must sample for it and measure the level of infection. This is also true for mites, brood survivability and other aspects of colony health. The appearance of a colony may tell you something about its condition, but not about its actual state. BC

Jim Bach is the state Apiarist for Washington, and an experienced beekeeper in both the commercial and hobby industry.

James E. Tew

Bee Culture's Beeyard

In The Dark, A Beeyard Is Nearly Surreal

It is now early October and though I long ago selected autumn as my favorite season of the year, I do like the lazy days of summer also. All summer, I have had a large population of insects – mostly good ones – on the flowe around my home. They were abruptly gone about the third week in September. I don't recall their departure being so fast in years past. No bumbles, no leaf cutters, no hummingbirds (I know . . . hummingbirds are not insects), no butterflies. Only a few Hymenopterous stragglers I couldn't identify and a few honey bees were all that was that was left this week. Everything became so quiet. My flower garden reminded me of a bountiful Thanksgiving Day dinner table after the guests had eaten their fill and left.

September was a spectacular month for bee meetings. I found that I was able to justify, once again, decreased hive management activities in lieu of going to meetings where I would learn more about managing the colonies I was neglecting in order to be at the meeting. A bit more on some of these meetings will follow later in this piece.

Beekeeping After Hours During early September, while the weather was hot and dry, I was returning a small nucleus hive to the bee yard and did not get there until hard dark had fallen. Having spent all-too-many hours in an "after dark" yard, this was a familiar place to me. It's a different bee world, not so much because of anything the bees do, but simply because it is so dark. The night insects were making their noises while the common shapes of trees and shrubs were cloaked in mystery and vagueness. An occasional distant car would pass along the road. The bees were "quietly roaring" as they cooled their hives and processed nectar. Using a flashlight, I was interested to see how many bees were bearded out in front of the colony. On this hot evening, most hive fronts were covered by a thick mat of bees. Down on the bottom board and on the left side of the entrance, there was a distinct opening through which the bees were pushing air into the colony. In most cases, the hole was about three to four inches long where bees were fanning furiously.

Working bees after dark is pretty much a miserable assignment. It is as though a truce is called between beekeeper and bees after dark and for a beekeeper to intrude upon the darkness is just asking for trouble. The one obvious exception being when hives are moved at night. The primary problems with working bees at night are obvious. Bees crawl all over you and everything else and are attracted to lights. Another problem is that I fall more – and I am not particularly clumsy. Even so, as I sat there in the yard that night, I wondered if I could somehow squeeze more "bee time" into the dark phase. Like so many other people, I just don't seem to have all the time I need. I am even behind on writing this article. Do you miss the old days where life was simpler and people had more time? *When were those days?*

My Grandmother recently had her 98th birthday. Years ago, she told me that she did **not** miss the *good ole' days* – not a single one of them. She told me of starting a wood fire

For some beekeepers, soybean plants are a major source of nectar.

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BEEYARD ... Cont. From Pg. 37

in a cold kitchen before dawn, of going shopping only once a month, and she loved indoor plumbing and modern restrooms. That single conversation put a permanent pallor on my mental image of the mellowness of times past. Today, craftsmanship, when it can be found, is very nearly unaffordable. Whereas when I was a kid, I could repair my lawnmower (my income generator), but as an adult, I find it cheaper to buy a new one rather than have the old one repaired. I just hate that. At one time, I had my shoes resoled when they were worn, but not any more. I put 20,000 miles on my pickup one year while my Granddad put 3000 per year on his in his day. We have clearly changed a lot and we do accomplish more in an hour than our Grandparents accomplished in one of their hours, though I seriously doubt that we work as hard in one of our hours as they had to. But, we ***are*** busier. If you want to see this, just ask for volunteers for anything at your next local bee meeting. Volunteers are rapidly becoming an endangered species. Our time is clearly more pressed.

For all these reasons, I had the passing thought that working bees after dark would press yet more time into production. But it really wouldn't work well for most bee applications because the bees become so disoriented when separated from the hive after dark. While moving bees after dark would be okay, finding the queen in a packed hive after dark would be miserable. But I wonder if I could do selected jobs like hive painting or filling feeders. Yes, I probably could, but it seems compulsive on my part. Though we use electric lighting to extend every day of our lives, it appears that the bees' evening hours are fairly safe from our intrusion. I do enjoy occasionally going to the yard during deep darkness though. In the colors of black and white, the yard seems abstract, even surreal. It is a time of truce and reflection. Of resting and feeling good about bees. Plus the skunks need their time, too.

Speaking of Skunks Whoa.... Did you folks ever have creative solutions involving skunk control!! As I reflect on the various control procedures you told me about, about the only one that was not recommended was harnessing small thermonuclear devices. You made it clear that skunks are annoying. Many of the recommendations involved chicken eggs that had various kinds of toxic things done to them. Do be careful when using control methods such as poisoned eggs. As most of you said, there is a risk of killing non-target animals, not to mention violating various state regulations. Of all the communications I got, not one of you defended skunks. They truly were not welcomed in your bee yard.

Thanks to the Lusby's from Arizona who sent along their skunk experience that I have included here for all to review.

In your September 1999 article you were almost there. Go back to your cement blocks and double check. We had bad problems with skunks during the three year drought in Southern Arizona as well as some problems with raccoons, coyotes, and 'possums. We finally solved the problem in several of our isolated yards. The natural biological solution is large flat rocks, big rocks or flat pavers. Ideally, these rocks should be placed on the ground around the entrance, including the first six inches of each side near the front. You will find that if the skunks cannot roll the bees in dust and dirt and then eat them, they will not bother the hives. Apparently, they don't want to dull or file away their toenails....If you rock pave the front of every hive in the yard, such animals will leave the yard, and this includes all pawing critters so far as we have observed. (The Lusbys, Arizona)

Placing paving stones in front of the colonies seems like a solid idea. For many of us, such paving would also suppress weed growth. Thanks to the Lusbys for the input.

Integrated Pest Management for *Varroa* At Apimondia, the international meeting that was held during September in Vancouver, BC Canada (an excellent meeting, I might add), a good deal of discussion was directed toward modifying our concepts of *Varroa* control. The concepts of Integrated Pest Management (IPM) are becoming much more acceptable within beekeeping. Ironically, I have recently spoken with Ohio State's new IPM specialist, Dr. Joe Kovach. He bluntly said that IPM principles are normally more difficult to implement than just standard insecticide applications. In an amalgamation of points made in several Apimondia presentations, using alternatives to Apistan and resistant stock would probably be the control paradigm of the near future. Many other commodity groups within modern agriculture have long since stopped trying to get nearly complete control of specific pests and are now much more comfortable with procedures that yield 60-75% control. Yet, my feelings change slowly. When I see several *Varroa* mites within my hives, I immediately wonder if I applied Apistan correctly. Am I seeing resistance for the first time? Should I put on more strips? Though using IPM principles makes total sense, it will put more responsibility on the individual beekeeper. Surveying populations before miticide application will be more important. Drs. Delaplane and Hood from the University of Georgia and Clemson, respectively, have reported that newly installed packages of bees should be given a fall treatment if a mid-August inspection yields 15 *Varroa* mites in an ether-roll of 300 bees or if 117 mites were found on a "sticky board" after the board was left in the colony overnight. If either of these numbers are approached, fall treatments should be implemented. However, if *Varroa* numbers are significantly lower than the 15/117 numbers, treatment could possibly be delayed until next February. The researchers also clearly stated that such treatment thresholds should not be assumed outside the region for which they were developed. Just because these numbers were appropriate for the Piedmont area of South Carolina and Georgia does not necessarily infer that they will be sound thresholds for the rest of us. But this is the kind of information and recommendations that beekeepers will be needing in order to decide when to treat and when not to treat.

In my bee yard for this fall, I plan to treat in the standard way. Why would I support IPM concepts and then apply insecticides in established traditional ways? Time restraints. It is already October. I was required to travel quite a bit during August and September and honestly

did not have time to explore alternative treatment procedures. The colonies are in good shape and I would rather risk providing a needless treatment rather than having colonies die in their first winter. But.....I will continue to explore more sophisticated treatment schemes throughout the Winter and be better prepared next Spring.

Twenty Consecutive Years of Soybean Honey Mr. D. Jester, from Arkansas gave me a phone call with his experience producing soybean honey. Mr. Jester said that in Southern Missouri he has gotten honey crops for twenty consecutive years. No particular variety of soybeans seemed important. In fact, through the years, the varieties planted have changed many times. Mr. Jester has observed that for soybeans to produce nectar they need steady high temperatures. Several days in the upper seventies or low eighties are required to start the plants producing. Temperatures as high as ninety degrees are even okay. Alternatively, overnight temperatures need to stay in the seventies. If temperature drops to the low sixties, nectar secretion will drop even if daytime temperatures are high enough. Soybean honey is light in color, but soybean plants seem to be a minor pollen source. I was intrigued to hear that producing fields have such a high bee population that Mr. Jester described them as, "fields that roar!". Here in Ohio, a soybean field can frequently seem like an insect desert. The absence of any insect pollinators is painfully obvious.

So the soybean saga continues. Some areas get high production while the same varieties in different locations seem to do nothing. Mr. Jester's temperature idea is interesting, but discouraging. If he is correct, many of us will not be getting soybean honey unless we have exceptionally warm seasons. Who knows? Many people think the average annual temperature is rising. Thanks to Mr. Jester for his time and energy in sharing his experience.

The Truth? The truth is that I was required to be away from the bees for much of August and September. I doubt my bees missed me very much. I should have had Apistan on the colonies already but I don't. It is not too late and I will put the strips in later this week. By the time I write to you again, I will have installed entrance reducers and flipped inner covers. I am also splitting firewood and making plans for the inevitable winter season. That is my plan. BC

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Y2K Almost The Millennium

Kim Flottum

By now the Y2K bug may seem less threatening than even that single, pesky mosquito determined to get a free midnight meal last Summer. Annoying then, only a faint whiny memory today. Not only has the media (this one included) milked the subject nearly dry, but the people who anticipate problems have moved to solve many of them. Attention has waned and gone elsewhere. But like those disease-laden mosquitoes in New York this Fall, that whiny memory can return, and bring with it a bite that will get attention. Lots of attention.

And as noted, many of the most visible and most vulnerable industries have moved to repair, replace or remove sensitive systems. However, those without the resources, ignorant of the problem, or are as-of-yet unaware of a potential failure have not moved. While most of these are not critical to survival, they will be noticed.

Under close scrutiny however, the road past 12/31/99 may not be as smooth as you have been led to believe. This was brought home to me very recently when talking to a friend in the credit card processing business. His job is to solve problems credit card companies have with accounts. Researching purchases on stolen cards is one of his least favorite activities, but something he spends time doing. When asked about the Y2K thing he told of the amount of time, energy and money his company had already spent making sure they were in good shape. They had been running a parallel program for nearly two years, looking for, and finding, problems. But it was working just fine and there didn't seem to be any bugs left in the system. He's working on New Year's Eve, though . . . just in case. So if a company that's responsible for tens of millions of credit card transactions isn't absolutely sure everything will go as planned – after two years of work – how can any other computer-assisted resource be absolutely certain it will be business as usual on 1/1/00, or, I guess, I should be saying 1/1/2000?

Some examples I've stumbled across as of 10/12/99 . . .

• Brand new IBM computers being sold are not Y2K ready. The Windows 98 version you just installed can be fixed for a $19.98 CD, plus S&H. You can download some fixes but plan on a quarter to a half *day* to accomplish. Microsoft does have upgrades for Windows 98, 95, NT, CE, 3.11, 3.1 (but with problems), some MS-DOS, and its MSOffice and Office Professional. Visit their web site.

• AT&T has spent $650 million, fixing 3000 applications, and checking some 380 million lines of code to try and make sure it works. They operate under the auspices of the FCC (www.nric.org) so you can check them out. A spokesman said, however, that there are 17 time zones they operate in, so it will take awhile to see if problems exist.

But by and large, local and long-distance service providers in economically developed countries say they're ready, says the head of the Year 2000 Program at GTE, who is also President of Technology Programs for Telco 2000 Forum, a consortium of major U.S. service providers.

The cost? NRIC (Network Reliability and Interoperability Council) says Telcos have already spent $3.5 billion. Bell Atlantic has spent $450 million, Bell South $223 million.

Approximately 75% of the rural telco market is ready, but fully 2.0% won't be, says the Gartner Group, from CT.

• The Transportation Department has a web site for travelers for over 90 countries (www.fly2k.gov). It's a clearing house for information if you are adventurous enough to want to fly to any of those covered. That, however is the problem – many, a great many countries do not have adequate information.

• The FAA assures everybody that both U.S. and Canadian airlines are completely, 100%, absolutely compliant. They don't make the same guarantee for the airports those compliant planes need to land on though.

"The road past 12/31/99 may not be as smooth as you have been led to believe."

• In a related issue, an October 4, 1999 (10/04/99), a Gallup poll found that 43% of Americans will avoid air travel on, or around, 1/01/2000. 35% believe that air traffic control systems will fail (but that's down from 46% last December).

48% believe some aspect of the banks will fail (down from 63% from last December).

And in September this year Computerworld magazine asked Y2K Professionals in 345 companies this question: What incentives is your company providing for making sure your company's systems make the transition? The most repeated answer – You get to keep your job, come Monday, January 3. That's incentive!

• The Social Security Administration has, since 1972, short

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Be Prepared

If you're really paranoid about this – a not unwise direction – here are some things to consider.

- **What do you need to make the following work:**
  - + Heat - electricity, gas, oil, coal, wood
  - + Water Heater - electricity, gas, oil
  - + Clothes Dryer - electricity, gas
  - + Stove - Electricity, gas, wood
  - + Sewage - septic tank, public sewer system

- **Thing to do:**
  - + Have at least two battery powered radios
  - + Have one flashlight for every room in the house, and the honey house
  - + Have propane camp lantern, and cartridges
  - + Lots of candles
  - + Batteries, lots of batteries
  - + Water. A week's worth/person (one gallon/day) stored in clean containers. Add two *drops* bleach/gallon to keep safe.
  - + A car phone, or other phone that does not require power
  - + Trash bags

- **Consider These, Too:**
  - + Purchase equipment using C-cell batteries – more common and cheaper. Buy them in bulk.
  - + Test everything you buy before you need it.

- **And Remember . . .**
  - + Pets, and all the things they need
  - + Kids (and babies), and all the things they need – entertainment especially
  - + Blankets, matches, food storage bags, manual can opener, warm clothes
  - + Food that doesn't need refrigeration

changed 700,000 Americans some $850 million because of computer malfunctions. It assures us that checks will be out on time after 1/1/2000 though. However, to make sure all else works (a precedent has been set), you are advised to get a Social Security Statement *before* the end of the year. You can write or call, but the www.ssa.gov is faster. Go to the TOP 10 SERVICES area, request a SOCIAL SECURITY STATEMENT and follow directions. Do not rely on the new annual abbreviated statement you may get this year. It leaves out some information.

• Three of the 10 largest public school systems – Philadelphia, Houston and Las Vegas are not yet compliant. Mostly facilities, heating, security, lighting, phone systems and elevators are the problems. Payroll and grades were all fixed at least two years ago. First things first.

• In Russia, Gazprom, the world's largest natural gas provider, and largest supplier to western Europe has problems. Of its 28,000 computers, 9,000 are vulnerable, but only 3,300 will be replaced in time. They are assuring everyone they'll be done in time. Right.

• Already from across the country come reports of Y2K scams . . . the bank's not secure, give me your account number; or, your credit card's not been updated, give me your number; or, a big investment in a Y2K compliant deal, send me money . . . get the picture? Don't give out numbers. Ever.

• Lessons? Technology is everything; must know technology; document everything; plan for failure; what's mission critical; there will be a sequel, of some kind.

So what does all this have to do with beekeeping? Well, your bees don't know, or care that the calendar changed and your computer failed. They won't be aware of a temporary power or phone failure. And they won't care much if your travel plans go awry. Most of the things that can go wrong, may go wrong, won't affect them. For awhile anyway. Especially if they affect you.

Common sense reigns here. Have hard copies of the bills and invoices you'll need. Be aware of your bank balance, loan situations and savings accounts. Expect billing problems from some businesses, and payment problems from others – especially small companies.

Expect phone and power interruptions on an infrequent but annoying basis for six to 12 weeks. And get your personal PC upgraded or replaced, and check *your* billing and bill paying systems, before you can't find the invoice files. Be ready for some tax snafus come quarterly time or in April, and be able to get a hard copy of all paperwork needed to complete those forms.

Make sure all your record keeping data is hard copy or accessible, so you can access it when planning your season. And, make sure you have contracts for pollination assured on paper, so everybody is on the same page come Spring.

From your family's point of view, protecting the homestead as it were, common sense comes again. Food, water, medicine, all will probably not have problems. Some say have a six week supply on hand. My guess, just a full cupboard, just in case you need a few day's worth.

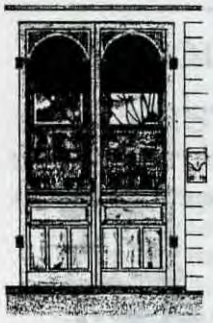
But a few days without heat in Wisconsin in January can be a challenge. Alternative heat, or lots and lots of warm clothes, just in case.

Most large retailers are in pretty good shape, but small stores may have problems – have cash, not credit cards, ready.

What esle? Just imagine an extensive natural disaster? What do you need? Well, that's what you need. The stuff of emergencies.

If you're mostly prepared, physically, mentally and financially, you won't have surprises. And that's what you need when you need everything you've got to get your bee work done.

So, if we here have done what we proposed you do, we'll all be here in January, and beyond. Happy Thanksgiving, and have a safe New Year. BC



Ann Harman

Home Harmony

World Class Recipes

Bon jour! Dobre den! Buenos dias! And so the languages were heard around the Congress of Apimondia in Vancouver, British Columbia. The vendors' area was continually busy – a very popular place. I enjoyed stopping when I saw a sign that said "Nepal" or "Bulgaria" or "Poland" or some other country. One could have a geographical tour of beekeeping in other lands by spending a few minutes a day among the exhibitors.

I knew that in many countries honey is not used for cooking as much as in the United States. However, I thought I would ask for recipes – even if they were in a language other than English – to see how some other countries use their honey. Well, at some booths I received a polite but blank stare. At other booths they were nice but said "no recipes." But at the Swiss booth I was able to obtain a beautiful book entitled *HONIG*. The title should give you a clue that it is written in German. The first half of the book gives the story of bees – some history of beekeeping, how bees live and produce honey, pollination, ecology, products of the hive; the last half of the book gives numerous recipes for salads, beverages, main dishes, desserts. Throughout the book are the most beautiful photographs! Wonderful close-ups of bees, and the photos of the recipes look good enough to eat right off the page. The book is a delight.

Next I looked through a sample of a French magazine of apiculture. It is a very nice publication with many color photos. In the back, there is a page labeled gastronomie with two recipes. To my surprise, neither one uses honey. However, honey can be substituted for sugar in one of the recipes. So that is what I did. Now you can have a French recipe.

I walked and talked, but the only other recipes I found were a nice assortment from British Columbia. Various leaflets featured vegetables and fruits grown there. Here I found two recipes calling for honey.

So we here in the United States can consider ourselves quite lucky. Honey is an ingredient that enhances so many foods that we can serve.

Are you ready for a quick trip around the exhibitors' booths? Let's go.

WARM CABBAGE AND CARROT SLAW

2 tablespoons (30 ml) lemon juice
2 tablespoons (30 ml) soy sauce
2 tablespoons (30 ml) liquid honey
2 tablespoons (30 ml) grated ginger root
1 tablespoon (15 ml) vegetable oil
1 teaspoon (5 ml) sesame oil
2 garlic cloves, crushed
3 cups (750 ml) shredded red cabbage
3 cups (750 ml) shredded green cabbage
2 cups (500 ml) grated carrots

In a large wok, whisk together lemon juice, soy sauce, honey, ginger root, vegetable oil, sesame oil and garlic; bring to a boil. Add cabbage and carrots; stir-fry over high heat for 5 minutes or until vegetables are hot and tender-crisp. Taste and drizzle another tablespoon (15 ml) lemon juice over top if you wish. Makes 6 servings.

Province of British Columbia

This next recipe is delicious. You can substitute peaches for the nectarines if you wish. The result is just as good.

SOUPE DE NECTARINES AU GINGEMBRE

Préparation: 15 mn Pas de cuisson

Ingrédients pour 4 personnes
4 nectarines
1 litre de jus d'orange
150 g miel
1 sachet de sucre vanillé
1 citron
1 morceau de gingembre frais

Laver les nectarines puis les éplucher (la nectarine peut cependant se passer d'épluchage, au choix!). Les émincer très finement. Faire chauffer le jus d'orange dans une casserole à feu doux. Y râper du gingembre frais (la valeur d'une cuillère à café) et quelques zestes de citron à l'aide d'une râpe à fromage. Ajouter le miel et le sucre vanillé. Bien mélanger. Disposer les nectarines dan des assiettes à soupe puis y verser le jus d'orange aromatisé chaud. Servir accompagné de gâteaux chinois aus amandes.

ABEILLES & FLEURS Revue Française D'APICULTURE

This next recipe is a truly delicious way to serve fruits and is a wonderful way to use small quantities of fruits. You can vary the combinations depending on what is in season.

FRÜCHTE-KALTSCHALE

3 Kiwis
500 g Beeren, z.B. Erdbeeren, Himbeeren, Heidelbeeren, je nach Saisonangebot
2 EL neutraler Honig, z.B. Lindenblüten, Klee- oder Akazienhonig
Saft einer halben Zitrone

400 g Saisonfrüchte, z.B. Äpfel, Birnen, Mangos, Kiwis, Bananen
1 EL fein gehackte Zitronenmelisse oder Pfefferminze

1. Die Kiwis schälen und zerkleinern.

2. Kiwis, Beeren, Honig und Zitronensaft pürieren. Je nach Beerensorte durch ein Sieb (Chromstahlsieb) streichen.

3. Die Früchte schälen, entkernen und klein schneiden.

4. Das Beerenpüree in Glasschalen füllen. Die Früchte dazugeben. Mit der Melisse garnieren.

Tipp: Ein Gedicht an heissen Sommertagen!

HONIG
Erica Bänziger

Bon appetit!

Well, if you would like to make these two delicious recipes, here are your answers.

Continued on Next Page

HOME ... Cont. From Pg. 45

NECTARINE SOUP WITH GINGER

Preparation time: 15 minutes. No cooking.

Ingredients for 4 people
4 nectarines
1 quart orange juice
a scant 1/2 cup honey
1 packet vanilla sugar
1 lemon
1 piece fresh ginger

Wash nectarines. You may peel them or not – your choice. Slice thinly. Heat the orange juice gently. Grate the fresh ginger and measure about 1/2 teaspoon. Grate the lemon rind. Add the grated ginger and lemon rind to the orange juice. Mix in the honey and the vanilla sugar. Blend well. Put the sliced nectarines into four soup bowls and pour the flavored orange juice over. Serve with Chinese almond cookies.

Bees & Flowers
French Review of Apiculture

COLD FRUIT DESSERT

3 kiwis
1 pound berries: strawberries, raspberries, blueberries
2 tablespoons mild honey (basswood, clover, locust)
juice of 1/2 lemon
1 pound fruits in season: apple, pear, mango, kiwi, banana
1 tablespoon chopped fresh lemon balm or peppermint

Peel the kiwis and cut into pieces. Purée the kiwis, berries, honey and lemon juice. Put the mixture through a sieve. Peel and core the fruit. Cut into small, bite-size pieces. Fill shallow plates with the berry purée. Add the fruit pieces. Garnish with lemon balm or peppermint.

Tip: A "poem" on a hot Summer day!

Honey
Erica Bänziger

Bon appetit! Guten appetit!

BAD BACK?

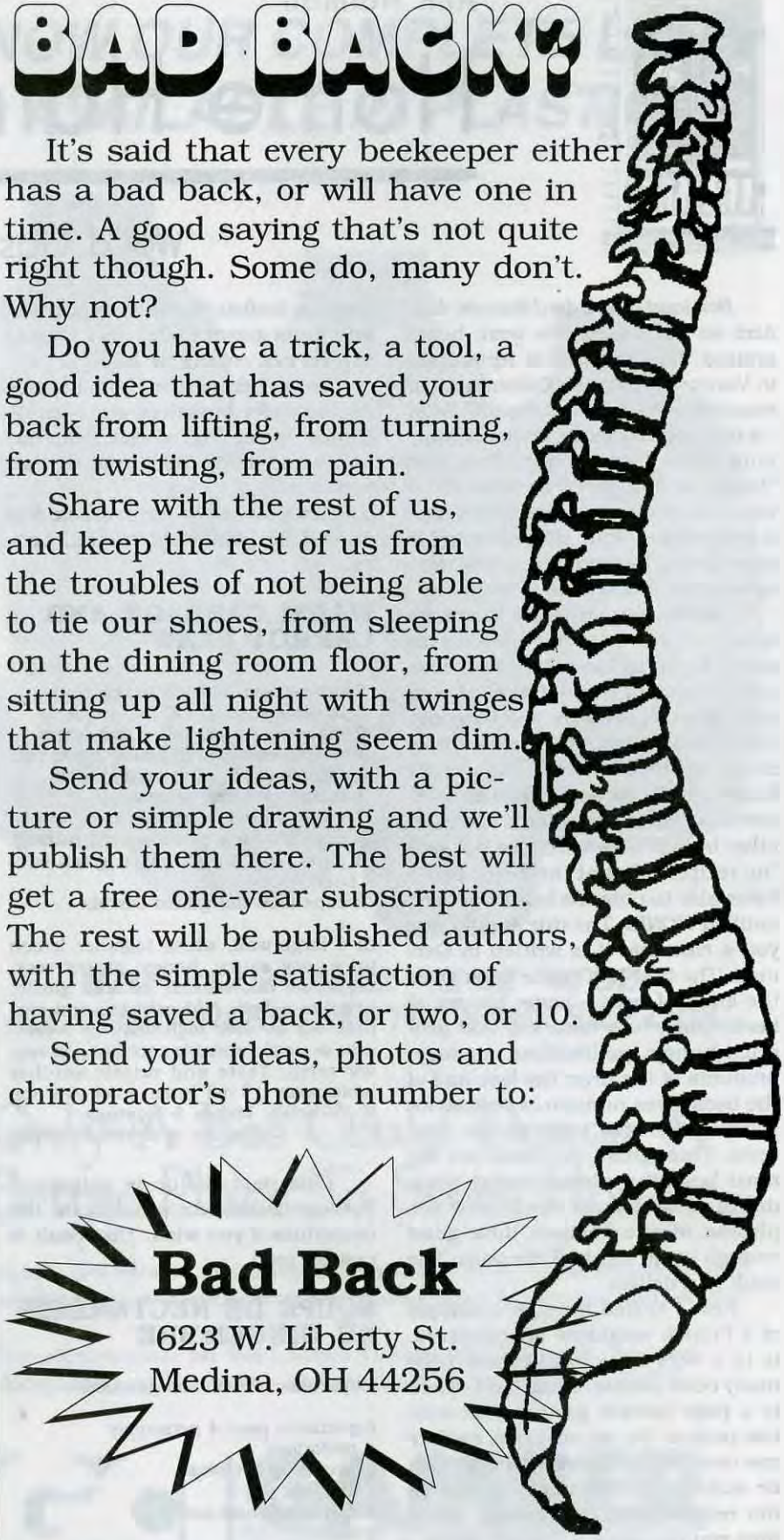
It's said that every beekeeper either has a bad back, or will have one in time. A good saying that's not quite right though. Some do, many don't. Why not?

Do you have a trick, a tool, a good idea that has saved your back from lifting, from turning, from twisting, from pain.

Share with the rest of us, and keep the rest of us from the troubles of not being able to tie our shoes, from sleeping on the dining room floor, from sitting up all night with twinges that make lightening seem dim.

Send your ideas, with a picture or simple drawing and we'll publish them here. The best will get a free one-year subscription. The rest will be published authors, with the simple satisfaction of having saved a back, or two, or 10.

Send your ideas, photos and chiropractor's phone number to:



P.S. You in the back, stand up straight!

?Do You Know? Answers

1. **True** Honey is hygroscopic, which means it will pick up moisture if stored in a humid environment and lose moisture if in a dry situation. Even comb honey will pick up moisture and possibly ferment if stored in a moist environment. The wax cappings over cells are not perfect seals. Water can move through the cappings with ease.
2. **False** The primary reason for heating honey to kill the yeast cells is to prevent fermentation. Heating honey to 145°F for 30 minutes, or its equivalent, will destroy honey yeast and thus prevent fermentation.
3. **True** Honey is a supersaturated solution, which means that it contains more dissolved material than can normally remain in solution. Such solutions are more or less unstable and in time will return to the stable, saturated condition with the excess material coming out of solution. As a result, nearly all kinds of liquid honey will crystallize in time.
4. **False** Froth on the honey surface is not an indication of fermentation; rather, it is the result of the incorporation of air during the extraction process and filling of containers. Honey should never be allowed to fall any distance or honey pumps allowed to suck air.
5. **True** Moisture content is one of the most important characteristics of honey since it influences keeping quality (fermentation), granulation and density (weight). Low-moisture honeys granulate more slowly than high-moisture honeys and have a lower probability of fermentation. The variation of density with moisture content is sufficiently large that a low-moisture honey will tend to layer under a higher-moisture honey unless special care is taken to mix them.
6. **True** Honeys change in color, becoming darker if heated too much or for too long a period of time. A similar change in color also occurs with honey in storage, only at a slower rate. This color change can be avoided by storing honey at low temperatures.
7. **True** Creamed honey does not need to be refrigerated, but it may revert to a liquid state after being stored under warm conditions for an extended period of time. It cannot be brought back to a creamed state unless the complete granulation process is repeated.
8. **True** In order for honey to crystallize, there must be some form of particulate matter present on which the crystal can grow (honey crystallization nuclei). Dust, pollen, wax particles, small pieces of propolis and even air bubbles all can serve as honey crystallization nuclei. Since these materials are added during the extraction process, and air is added with a honey pump, the granulation process is sped up.
9. **False** A refractometer is used to measure the moisture content or soluble solids (sugars) of honey, not the primary floral source from which the honey is produced.
10. B) Glucose
11. D) Creamed or finely crystallized
12. B) 57°F.
13. The best way to keep cut-comb and section-comb honey from granulating after it is removed from the hive is to place it in a freezer until you are ready to sell it.
14. Wax particles incorporated into the honey during the extraction process should be removed before the honey is stored or processed. Otherwise, the honey's flavor may be impaired during packing since the honey is likely to be heated beyond the melting point of wax.
15. Naturally crystallized honey has a gritty texture, like sand particles, due to large, coarse crystals, whereas creamed honey has the texture of butter or margarine because the crystals are extremely small.
16. Freezing section-comb honey or placing it in an atmosphere of carbon dioxide.
17. The word "Honey" must appear in bold type. (1 point). Name and address including *zip code* of producer or packer. (2 points). Net weight in both pounds and ounces. (2 points).
18. Crystallized honey is normally re-liquefied by placing the containers in either a hot, dry chamber or a hot-water bath until all crystals are dissolved. Small quantities of honey can be reliquified in a microwave oven.

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

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

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

INNER ... Cont. From Pg. 6

tal, applied, counting-bees-in-the-field and measuring yield research. It needs to be done.

What about the realistic benefits of hiring bees?

For instance, is a $50 rental fee for a colony of some given strength worth $50 to the grower, or is it only what the market will bear? Who knows for sure?

What non-use crops would benefit from the addition of honey bees for pollination? Cotton? Canola? Soybeans? And how much? And at what cost? And for what profit to the grower?

Almond growers have pretty well figured out the optimum placement of colonies in orchards for maximum bee dispersal, but what other crops have that advantage? Is one pallet for every four rows of apples best? Can half the bees be placed at one corner, and half at the other corner for optimal coverage in a small orchard? For what crops? Is this true in the South, and in the North?

What's the *real* cost to a beekeeper for this activity? Queen loss, on average, per move? Equipment costs, depreciation and loss?

Realistically, what are the advantages and disadvantages of alternative pollinators? How can a honey bee pollination business incorporate other bees into a program? Why would they? When could they? What are the costs, and what profits are possible from using other bees?

When Africanized honey bees become established in an area that produces crops requiring honey bee pollination, what will the legal ramifications be for beekeepers and for growers if a stinging incident occurs? Who will be the beekeeper's advocate, or the growers?

What crops are being grown now that weren't being grown 20, or even 10 years ago that have pollination requirements? What are the requirements? Similarly, what crops have been so genetically manipulated for some particular aspect (seed size, for instance) that the attractiveness of the flowers has disappeared? Is this a new crop? A lost cause?

What research is ongoing to produce honey bee-less pollination? Almond growers, are working on it. So are pickle growers. What others? What is the progress on this front? Who knows? What impact will this work have on the crop, the pollination industry, and in what time frame will this occur?

What will the impact be on bees, on weeds, on marketable crops of genetically modified organisms? Will bees be injured by these man-made crops? Will public opinion affect pollination requirements? And, will saleable honey made from these organisms be affected – by public opinion? By export regulations? By honey packers?

I'm sure there are other fundamental questions that can be, and will be asked by the panel of experts who will be attending this meeting. And maybe some of my questions will actually be asked. I hope so. Moreover, I hope some will be answered.

You'll notice I have not addressed the pests, parasites and diseases issue. Certainly, without healthy bees there is no pollination. That's a given. And ongoing and continuing research into solving these problems is critical. It is an end unto itself.

However, the issues I've raised, and others I hope the invited guests will raise, are paramount to the success of the pollination industry. Ask these questions, and get the answers needed, and we will be better. Avoid these now, and all the healthy bees in the United States won't matter a whit.

•

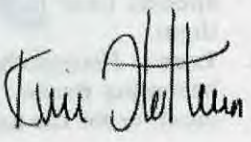
Not many, but some, honey sellers are in markets large enough to have to contend with slotting fees in grocery stores. Slotting, if you're unfamiliar with the concept, is a fee grocery stores, or sometimes store chains, charge individual product sellers to place their products on the shelf. Usually the reason the fee is charged by the store or chain is to cover their costs in entering the products in the scanning system, the ordering and invoicing system, the warehousing system and the like. Moreover, most of these products are monitored by the store for sales, and those that don't meet minimal volume criteria are removed to make way for a more profitable product. The fees aren't refunded, either.

Sometimes the stores, or warehouses the stores receive their products from add an extra tidbit . . . discounts. So, a seller pays a fee, then has to discount the product to the retailers just to keep the space. The discount may be in a reduced price, free goods, peripheral goods at no cost and other benefits. Playing with the big guys gives honey sellers the outlets for the huge volume they have. But it is necessary to produce products at margins sliced so slim that the deli department would be jealous.

Now, it looks like some of those retailers are getting even tougher. A Senate committee hearing last month heard tales of slotting abuse by retailers in terms of higher prices and unfair bidding practices. Though not yet proven, hints of extortion also were heard, according to sources close to Senator Kit Bond (R, MO). The tales, again not yet proven, tell of 'suggestions' made to smaller outfits that to get (and keep) shelf space, besides the money and the discounts, goods, services – just plain more money may influence the decision makers. In any other language – Bribes. Again, according to the Senate Investigatory Committee, not yet proven. Those who testified, however, had their identities disguised out of fear of retribution. You decide.

Slotting fees in these markets are a given, and large stores do have legitimate costs when installing new products. But that some people may be personally profiting at the expense of product sellers is unconscionable. Individual store managers, and even large retail chain managers need to look closely at their operations and make certain the playing field stays even. And, if you, or someone you know has had the opportunity to contribute to someone's personal retirement fund, you need to notify Senator Bond. Big Brother is watching. You can help.

So, until next month, keep your eyes and ears open, get your equipment cleaned up and sharpen those marketing skills. And plan on attending a meeting or two, now that the slow time has arrived. I guarantee you'll pick up something new.



Glean ings

NOVEMBER, 1999 • ALL THE NEWS THAT FITS

Burleson's & Brady's Tours

FEDERATION MEETS IN FORT WORTH

Plans are firming up for the American Beekeeping Federation's 2000 convention, which is set for January 12-15 in Fort Worth.

The site of the convention will be the historic Radisson Plaza Hotel, the place where President John Kennedy spent the night before his fateful trip to Dallas. The hotel is located on the edge of downtown Fort Worth, within an easy walk of Historic Sundance Square, a revitalized, 20-block entertainment and shopping district, and the Fort Worth Outlet Center, an urban outlet mall.

The convention will open Wednesday, January 12. After the opening ceremonies and the keynote address, the schedule of the day will include sessions of the ABF's Special Interest Groups and the "Welcome to Fort Worth" Reception.

Thursday morning, the ABF Auxiliary will have its annual breakfast meeting. After a half-day of formal sessions, the beekeepers grab a quick lunch before heading out to Waxahachie for tours of Burleson's honey plant and Mark Brady's new extracting house, followed by a western hoe-down complete with a barbecue dinner. And, for those who may be interested, arrangements will be made to stop by some of Waxahachie's many quaint shops and antique stores.

Friday's schedule will see more of the industry's pressing issues addressed by the most-informed speakers. The country's largest beekeeping trade show will continue through Saturday noon, providing attendees an opportunity to meet those who manufacture and sell the goods beekeepers use every day. On Friday evening, the convention-goers can join an ABF group at Billy Bob's Texas, which is billed as the World's Largest Honky-Tonk; or they can enjoy an evening in Fort Worth on their own.

Saturday will be the day for the ABF's popular educational workshops, which allow the attendees to choose subjects of particular interest and get more involved in a small-group setting. Saturday afternoon will be devoted to the ABF business meeting. The Annual ABF Awards Banquet and Honey Queen Coronation will cap off the day and the convention.

Timely announcements related to the convention will be sent to ABF members. Others can obtain more information from ABF, P.O. Box 1038, Jesup, GA 31598; ph 912.427.4233; fax 912.427.8447, email: info@abfnet.org; or internet http://www.afbnet.org.

YOU KNOW A COMPUTER BELONGS TO A BEEKEEPER WHEN . . .

The extra RAM slots have Dodge truck parts installed in them.
The mouse is referred to as a "pest".
The monitor is up on a pallet.
The screen saver shows a beeyard from Spring to Fall.
The only thing bookmarked is the weather forecast.
There's a hive tool mounted on the CPU.
The keyboard is the same color as ELA.
His hard drive has 12 gears forward and 12 back.

adapted from California Grange News

Management Companies Nixed

HONEY BOARD BACK TO CEO

In August, the National Honey Board (NHB) published a request for proposal (RFP) outlining the qualifications a management company would need to possess to adequately serve the NHB. Ten management companies submitted proposals. These proposals were reviewed by the Board in early September. During the review process, one company withdrew its proposal.

This thorough review revealed that none of the remaining management companies offered the combination of expertise and cost savings which would justify changing from our current system. Therefore, the search for a new CEO is currently in process.

Realizing the CEO search process is time consuming and to preserve continuity into next year, the NHB will be contracting with Bob Smith to perform executive duties and to assist in the training of his replacement through the first quarter of 2000.

Sherry Jennings, Executive Vice President of the NHB, has resigned effective January 3, 2000. After 9-1/2 years with the NHB, Sherry will be pursuing opportunities.

The National Honey Board is committed to driving the demand for honey. This goal will be paramount as we search for energetic and qualified leadership that shares our commitment to the honey industry.

APIMONDIA WINNERS

Winners in the Apimondia '99 contest are as follows:

Technical Inventions: Joseph Latshaw, OH - 2nd place; Geoff Lomas, South Africa - 3rd place.

New Products: Marnys-Martinez Nieto SA, Spain - 1st place; Hermann Krischer, Germany - 2nd place; Bryan Clements (Walkato Honey Products), New Zealand - 3rd place.

Videos: IC Waring, UK - 1st place; Diana Sammataro, PA - 2nd place; **Bee Culture Magazine, OH - 3rd place.**

Photographs: Karl Rainer Koch, Russia - 1st place; Mazzocchi Luca, Italy - 2nd place; Franc Slvic, Slovenia - 3rd place.

Books: Bee Culture Magazine, OH - 1st place; Giancario Recciardelli D'Albore, Italy - 2nd place; Clive de Bruyn, England - 3rd place.

Journals: International Bee Research Association, Wales - 1st place; Janez Mihelic, Slovenia - 2nd place; Rodolfo Fabian Ceci, Argentina - 3rd place.

Promotional: Boznar-Cebelarstvo d.o.o., Slovenia - 1st place; Laboratoires Apiphyt (546), France - 2nd place; Tentorium, Russia - 3rd place.

Collections: Diana Sammataro, PA - 3rd place.

Exhibits-Large Booths: Mann Lake Ltd. - 1st place; Canadian Honey Council - 2nd place; Fritz/Swienty - 3rd place.

Exhibits-Small Booths: University of Guelph - 1st place; E.H. Thorne - 2nd place; Bee Guard - 3rd place.

ABF ADDS CANDLES

The Honey Show Committee has made two changes to the rules for the 2000 American Honey Show to broaden the show's appeal. The show will be a part of the American Beekeeping Federation's Fort Worth Convention, which will run January 12-15.

A class has been added for Beeswax Candles, recognizing the number of beekeepers who are involved in making candles from their surplus beeswax. The candles may be dipped, molded, or rolled of sheets – as long as they are 100% beeswax. As with the other beeswax entries, no non-beeswax enhancement is permitted.

The entry may consist of a single candle, a pair of candles, or a group of candles. The minimum weight of the entry is 0.5 lb., the maximum is 2 lbs. The entry will be judged on cleanliness of wax, design and appearance, finishing details and originality.

To make room for the new class, the committee has eliminated the Half Comb Cassette class. There was insufficient interest to maintain that class.

The Honey Show Committee reminds potential entrants that the "wigwam" straight cylinder chunk honey jars formerly required for the "chunk honey" and "creamed honey" classes are no longer available for purchase. Available stock of the "wigwam" jar may be used. Alternatively, round chunk honey jars with small shoulders may be used.

The Committee also reminds entrants that they should contact the ABF Office at P.O. Box 1038, Jesup, GA 31598 for a complete set of rules, including an entry form and an official score sheet.

IRISH VARROA

Two more instances of the bee disease, varroasis, have been identified, again in Co Carlow. Some experts are concerned that the outbreak could ultimately have a devastating effect on the Irish bee population.

The disease was first identified here in June of Last year in honey beehives in the northwest and over six million bees were destroyed in an attempt to prevent it spreading.

Ireland had been the last place in western Europe to avoid what is known as the "scourge of the beekeeper." First identified in North America, it spread quickly to the whole continent and was found in Africa in the 1970s. Department of Agriculture and Food inspectors are conducting a survey to discover the extent of the disease, which is not harmful to humans. There are 2,000 Irish beekeepers who can produce up to 50 pounds of honey each year from their hives which normally contain up to 60,000 bees.

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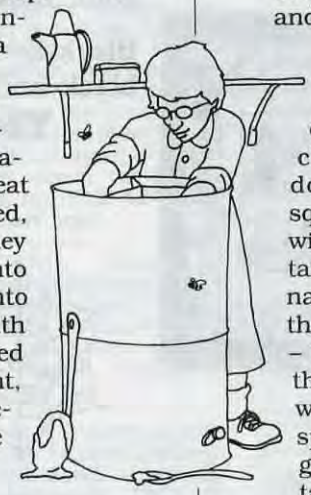
I Earn Every Penny

Lois Dupuis

Although I am 20 years older than when I started beekeeping, there are times when I realize I'm not 20 minutes smarter. This incident proved to be one of them.

As I removed the heavy coil of black wire from the cardboard shipping box, I thought, "What a great idea to purchase a heating unit for my honey extractor. When I use this, the honey will flow beautifully, and the job will be done in nothing flat." Eagerly, I attempted to wrap the wire around the drum and met with a slight problem. The wire kept sliding downward with each wrap. Nonplused, I fetched my roll of masking tape and whenever the wire proceeded to slip, I anchored it with a strip of tape. Although the many patches resulted in a startling appearance, the result satisfied me. With all in place, I plugged the wire into the outlet. Carefully following the instructions printed on the accompanying pamphlet, I waited a half-hour to let the unit heat up and proceeded with the spinning. The motor whirred, the drum spun smoothly, and a stream of golden honey poured from the 'gate' at the bottom of the drum, into the strainer on top of the bucket below, and finally into the bucket itself. I continued happily and smugly with my task until the last of the frames had been completed and I peered into the drum. With the use of a flashlight, I double-checked the inside. Realizing that, in its lifetime one bee labors industriously to produce only one tablespoon of honey, I wanted to gather every drop. With this thought in mind, I mused, "There are just too many tablespoons of honey remaining. I will be very thorough in my part of the work." Leaving the heating coil still in place and the 'gate' open, I was hopeful that all the honey would drain while I proceeded with various household tasks.



Several hours later, I remembered that everything had been left in that situation and hurried to put things to right. Once more, I peered into the darkness of the drum and again used the flashlight in order to be sure of what I thought I had seen. Not only had all the honey drained from the frames, but the melted foundation wax had followed. In the bottom I could see gobs of wax molded together by dregs of honey. I unplugged the wire and surveyed the situation. Hanging in my kitchen for purposes of decoration only, I had a large metal spoon with a handle 18 inches in length. Just the thing! Using this I was able to reach the bottom of the drum. I scooped some of the dregs, but not enough to make this method feasible. The attempt left spatters of honey up the inner parts of my arms ending in a goodly supply in each armpit.

I recalled conversations overheard throughout my years of contact with other beekeepers. Some of the men had hoisted their extractors into the back of a pickup truck, driven to a carwash, and power-hosed the vat with hot water. It seemed a good plan to me, but I had several reasons for not following this method. My extracting operation takes place in my garage, and first of all, the weight of the extractor posed a problem for me. Then, if I were able to maneuver it out of my garage, I would have to roll the device into the trunk of my Toyota since I don't own a pickup. The drum is bolted to the top of a sturdy wooden table, adding to the unwieldy size and thus presenting a further complication. Discarding the 'carwash' solution, I decided to pour boiling water into the depths and use some kind of long-handled brush to remove wax and honey residue. I quickly climbed into my car for a trip to town, hoping to purchase something to serve as a proper brush. In my haste, I neglected to close the garage door. It didn't take long to complete my errand, but any beekeeper will know that it took less time than that for my bees to discover the open doorway of my workplace. I returned to find the garage swarming with my hundreds of bees and all their friends as well.

Many of them clustered around the light way up in the ceiling, which led me to decide on a clever course of action. I closed the overhead door and doused the light. This left the square window of the 'walk-in' door, with its covering of sheer white curtain, as the only source of illumination to the garage. Sure enough, the bees headed for the lighted area – the curtain over the window in the door. The rest of my free time was spent herding bees. As a respectable number of the creatures gathered on the curtain, I would take it outside, quickly closing the door behind me, you may be sure. These bees were going one way only, and it wasn't back into my garage. I would shake and brush the curtain briskly and hurry back to gather another load. Gather – rush outside – CLOSE THE DOOR – shake and brush, and rehang the curtain. Ponderous method, but it worked.

I am now surveying my extractor, holding a brush primarily designed to clean toilet bowls. I plan to heat a supply of water, pour it into the vat, and scrub at the gooey accumulation. Maybe it will work. I might have to devise an extension for the handle of the brush, but the worst that can happen is another armpit full of honey as I reach deep into the depths of my extractor. At $2.50 a jar, my honey is in great demand, and in recalling the catastrophe, I realize I earn every penny of it.