JUN 1998

Bee Culture

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INSIDE IN JUNE

PLUS

A Free, Special Insert

Protecting Honey Bees From *Varroa jacobsoni*

Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

JUNE 1998 VOLUME 126 NUMBER 6

FEATURES

Pests I Have Known, Pg. 28

COVER

Apistan strips have become a way of life for most beekeepers, and that isn't about to change soon. But change it will, with new products entering the market, resistance developing and the rules of engagement changing. Apistan still rules the day though, and proper use will keep (most) bees alive and producing. See the insert, inside, on protecting your bees from Varroa.

photo by Kim Flottum

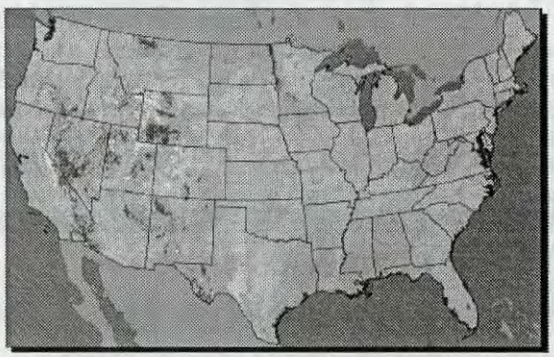
SPECIAL FREE INSERT

Protecting honey bees from Varroa jacobsoni.

American Association of Professional Apiculturists

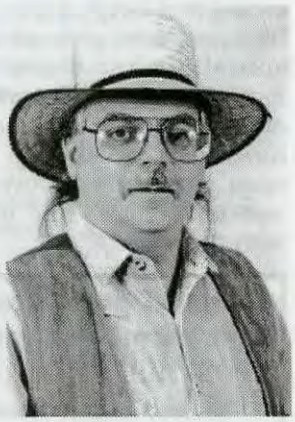
DEPARTMENTS

COLUMNS



Vegetation Maps, Pg. 57

JOHN ROOT
Publisher



KIM FLOTTUM
Editor

INNER COVER

I got a call in late April from an apple grower not far from Medina. A not atypical conversation followed.

"Hello, the county extension guy said I should call you 'cause you might know somebody who can bring some bees out to our orchard. They said you had a list, or a meeting or something coming up. Do you know anybody?"

"How many do you need?", I asked, wondering, kind of, why they were calling when I knew full well their trees were at least at 50% bloom. They'd missed king bloom already, and it was getting real late. Yes, the season was early here too, about three weeks early, but still...

"We called who we know, but they can't come. We can't get anybody. We only need eight or nine. Can you help?"

How much are you paying", I went on, guessing they were offering in the low 20s or so. Another 'Day late and Dollar Short' type.

"We offered the guy last year $50, then $75, but he didn't have any. Nobody does. They're all booked. What are you gonna do?", they (almost, but not quite) demanded. Late, yes, but fairly well in line with the dollars.

I checked my list. No luck. That night I talked with our local group. No takers, and no wonder. For most it's no trucks, no experience, no straps, no moving screens, no entrance screens and no thanks. Those with all the right stuff, and colonies, too, were already signed up with growers with a bit more foresight. No way could I help that grower.

My first reaction to all this was just like the one you are (probably) having right now, "That'll teach that grower to get his act together and plan ahead," right? Yes, that was my first thought. And close behind that was the tendency to get on with other things since there wasn't anything I could do anyway. Case closed. Sorry, guy.

That may not be the best choice though. Things, and times being what they are, and beekeepers, well, maybe it's time they changed some in how we respond to that grower, and lots more like him.

Forever, it seems, our industry's mantra has been 'we're special because our bees pollinate everything that needs pollinating and we shouldn't be picked on and we need protection and, and...'

This has had a grain of truth for nearly ever, and many times those who needed bees, and those who were responsible for governing and funding bees and growers tended to favor beekeeping a bit more than perhaps was absolutely needed. We are, after all, special to some degree. Commercial sized growers have, for the most part always got what they needed in terms of bees, at more or less the price they needed. And hobby, sideline and feral bees have more or less filled the rest of the pollination gaps needed in most environments over the years. We cried 'special', provided 'special' services and often got 'special' treatment. All was well with the world.

Colony Count Confusion

Last month we published U.S. colony counts from 1993-1997. Our program added the year into the total. Actual counts are, x 1,000 – 1993 - 2,868; 1994 - 2,768; 1995 - 2639; 1996 - 2560; 1997 - 2,565.

But then, like I said, the world changed.

Although there has been a spate of new beekeepers entering the show this year, and even last year and the year before, our numbers are not what they were 10 years ago. Hobby, sideline and even commercial numbers are down a notch or two, or three. Couple that with fewer, and in some cases far fewer feral bees and the 'free' bees many growers relied on for years, successfully relied on for years, are gone. Getting eight or 10 colonies of bees for a small operation is becoming more and more difficult for more and more growers. Getting 200 colonies is more expensive, certainly, but actually easier. Right or wrong, the pollination business is becoming specialized and segregated. The big are getting bigger, and the small are disappearing.

The result is the situation that grower found himself in last April. No bees, no plans and nowhere to go to solve the problem. Our pleas of 'special' will be harder to hear from now on because of this grower, and many, many like him who don't seem to see the 'special' when they can't get bees.

Let me take this just a bit further. There are several economically strategic crops that depend on honey bees for pollination. Big crops. Almonds. Apples. Blueberries. Vine crops. You know the list here. What happens when growers, and their respective crop scientists decide that to continue to rely on an inadequate

Continued on Page 44

A Crisis In Pollination? and, Light At The End Of The Tunnel . . .

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Bee Culture

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Publisher ..... **John Root**

Associate Publisher ..... **Robert Stanners**

Editor ..... **Kim Flottum**

Production Coordinator ..... **Kathy Summers**

Circulation & Advertising ..... **Dawn Feagan**

Publications Assistant ..... **Mary Weigley**

Contributors ..... **Richard Bonney**
Roger Morse
Richard Taylor
Mark Winston
Clarence Collison
Ann Harman
B.A. Stringer
James E. Tew

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

No More Pennies!

How can I stop being forced to participate in giving the NHB a penny ($.01) a pound when I wholesale my honey? I don't believe in it.

Joe DeFranco
Sycamore, OH

Editor's Note: *First off, it's the law, created by beekeepers and others and you really have to participate, whether you wholesale bulk, wholesale in cases or even retail yourself. But the real question is what is it that you don't believe in?*

No New Laws

I have been asked by the Washington Professional Beekeepers Association to write and fill you in on what has happened in our legislative attempt to repeal our over restrictive Apiary law.

First off there were actually three Apiary Bills introduced in the 1997-98 State Legislature:

No. 1 was a request by the State Department of Agriculture to change the pollination fee of 50 cents per hive for each set that the beekeeper uses that hive in contract pollination, to be paid by the grower. This was to be changed from the grower to the beekeeper. Then the bill asked for heavy fines or penalties ($100-$500-$1000) to be assets in rules, for any one who was late in paying. This along with a registration fee of from $15 to $300. This bill was killed early in the session by the House of Representative Agriculture Committee.

No. 2 was a bill introduced by Senator Morton, Chairman of the Senate Agriculture and Environment Committee. It in effect repeals the present Apiary Law and sets up an enabling law to allow the beekeepers to form a Honey Commission. Some of the duties of the present Apiary Law would be transferred over to this Honey Commission. This Honey Commission had to be voted in by the beekeeper to become effective. It would then be run by a committee of Beekeepers. This bill passed the full Senate by a vote of 40 to 0.

No. 3 was a bill sponsored by the Washington Professional Beekeepers Association and backed by the Washington Horticulture Association. This was introduced by Representative Chandler, Chairman of the House Agriculture Committee that was simply a repeal of the present Washington State Apiary Law. This bill was passed by the House of Representatives with a vote of 46-0.

Now we have two bills trying to accomplish the same thing that had to be compromised into one Bill by the Rules Committee.

As this was a short session of the Legislature there was not enough time to resolve some 80 such Bills before the end of the Legislative session. So our Bills died in the rules committee as the Legislative session ended.

So now we are back with our old law which makes the growers responsible for paying the fifty cents per hive per set pollination fee. The beekeeper is responsible for paying the registration fee. These combined fees are projected to yield some $85,000.00 a year to the Department of Agriculture. However they have only been able to collect about $70,000.00 per year. The Department of Agriculture claims that the law is so ambiguous that it is not economically enforceable.

It is easy to see that, as the Department of Agriculture claims it costs $25.00 a page for every letter they send out. To keep us advised on the progress of this legislation they sent me a 12-page letter, thus costing $300.00. There were four of them sent to this district, making a total of $1200.00 As there are 13 districts in the State and we assumed that each district received four of those letters. That makes $15,600.00 their cost for just that one mailing. There was not one paragraph in the whole 12 pages that helped a man become a better beekeeper.

Ancel Goolsbey
Spokane, WA

AHB In Brazil

Your article in January 1998, African Honey Bees and Lenard Hines, shows quite right the problem with those bees in America. However I would like to add, we in Brazil, are 40 years ahead on this problem, dealing with AHB.

I suppose this is the first time Brazil is ahead of the U.S. in beekeeping. Of course, we used to be ahead in soccer and coffee crops.

Please remember, those bees are not African Honey Bees anymore, they are Africanized Honey Bees, they are mixed, they are not pure race like everything in Brazil. Thank God.

You should have seen their aggressiveness when they were pure African, 40 years ago, or sometime when they have a special cross with Italian bees. The milder type is the cross with Carnica bees.

I think it would be profitable to any American beekeeper who deals with AHB to go to Brazil and see what's going on there with apiculture.

Rogerio Abreu
Brazil

Do The Math!

In the Inner Cover (April 98), it states that there were half a million colonies, about 120,000,000,000 bees.

It appears there is a mistake or else they have some mighty strong colonies of about 240,000 bees each.

Rufus Payne
Appalashia, VA

Continued on Next Page

MAILBOX

P.O. Fixed It

I ordered a 3# package of bees from Weaver's Apiaries in Navasota, TX. They informed me they would be shipped April 14. I called the Post Office on the 15th and told them the bees would be coming and to call me as soon as they came in, day or night. On the morning of the 17th I just about gave up on them, but our mail route person brought them. They were chilled in a very tight ball, with about a quart of dead bees on the bottom. I warmed them up, sprayed them with sugar water and that afternoon I put them in the hive.

On the address label just above my name it states POSTMASTER CALL ADDRESSEE with the phone number.

I called the Postmaster and told him I was very unhappy with their service since no one called me. She promised an answer referring me to the man in charge of deliveries. He knew nothing about the bees or my call and would check and call me back. He called and wanted to see the address label. I took it in. He said it's the Postmaster's fault they didn't call. He refunded my postage.

It pays to complain.

Virgil Downs

Extension Difficulties

Mark Winston's article titled Extension and Regulation in your March issue was not wholly unexpected after reading "The Inner Cover" article dealing with the Varroa problem in Florida. In a more ideal world or to the uninitiated his article is a good and reasonable approach to one difficult and one not so difficult problem.

The not so difficult problems of ignorance and lack of research are usually resolved by the fear of failure and the opportunities for profit by drug and chemical companies respectively.

And now the difficult problem. Most of us who keep bees for whatever reason are still free to succeed or fail at our endeavors through our own effort or lack thereof. Most beekeepers are pretty bright folks who find mostly good and novel ways to solve problems. There is however a small number of equally bright folks who solve their problems without regard for the consequences to others. These are the people who need to practice the Golden Rule constantly and consistently or feel the heavy hand of bureaucratic rule which will adversely affect all beekeepers.

Generally you can expect a regulatory scenario which would look something like this:

- Some type of state law with public health overtones will be passed governing the sale of honey. A bureaucracy will be formed to implement the law.
- You, along with packers, and others in the industry, right down to the retailer, will be asked to describe your activi-

MAILBOX

ties, your profits and your problems.

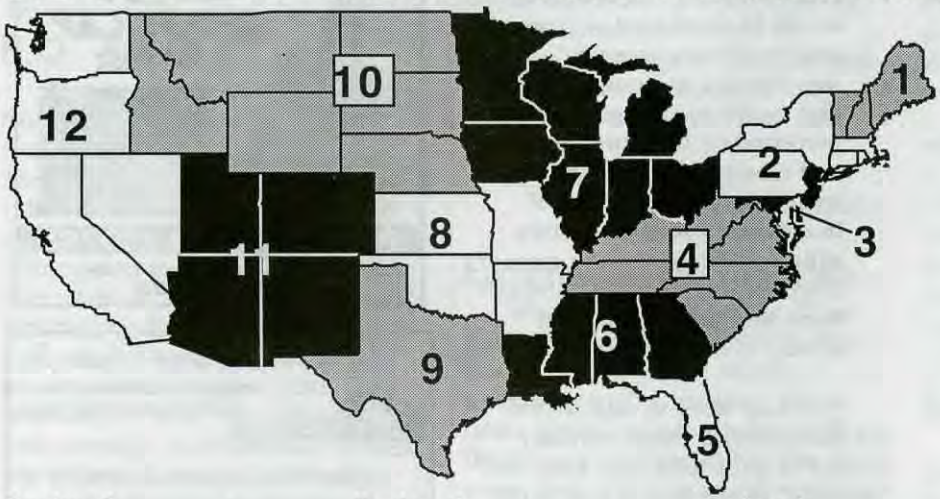
- A set of regulations will be drawn up and put up for public comment.
- Comments from the industry which would not enhance the authority of the bureaucracy will be refuted or ignored.
- The beekeeper will be instructed to list the location and number of his hives and all other equipment associated with his operation.
- Some type of permit will then be issued allowing him to operate his apiary.
- There will be some type of fee for this permit probably based upon the number of hives owned by the beekeeper and the value of his other assets.
- The dollar amount of the permit fee will initially be calculated such that all fees will cover fifty percent of the operating cost of the bureaucracy which will consist of a few administrators and secretaries and a larger number of inspectors.
- Surprise inspections will be conducted and fines levied for any infraction discovered by the inspector. (Most inspectors will know or care little about your operation.)
- Fines and any "excess funds" would be dedicated to research and "public awareness."
- New threats to honey production or it's consumers will be perceived by the bureaucracy and new regulations will be written and the number of bureaucrats and inspectors will grow. There will be more frequent and thorough inspections and permit fees will arise.

You may want to talk with a few farmers and small industry owners in your area who have the "benefits" of regulation and other governmental services. Try to determine why they are regulated and how they cope with it. If you can, learn from their mistakes.

If the organizations which now exist for the benefit for the honey industry do not curb practices which are illegal or threatening to the industry they will be inviting regulation which I believe will make beekeeping less pleasant for all. After a few years of modern day government help and regulation (and yes all agencies compare notes on you) you may long for the bad old days of ignorance and Apistan resistant *Varroa* mites.

John Bartles
Finchville, KY

JUNE – REGIONAL HONEY PRICE REPORT



Region 1

Prices steady but down just a tad at wholesale case level. Retail steady and strong. 15% average colony Winter loss, 90% strong to average, Spring early but swarming slow.

Region 2

Bulk prices and retail prices down, but wholesale case and pails steady. Low Winter losses (average 10%) in most places with over 85% strong into Summer. Early spring helped swarming, but that's mostly under control.

Region 3

Prices at all levels fairly steady, but bulk up just a tiny bit. Very low Winter loss, but only average strength into Spring, which was early, or late, depending on where you were. Swarming about average.

Region 4

Bulk and wholesale prices up, believe it or not, wholesale and retail only steady, with some sizes slipping. Moderate to low Winter losses and an early Spring only resulted in average to just a bit above average swarming.

Region 5

Bulk prices up, wholesale prices steady, retail prices down. Go figure. Either very low, or very high losses – due directly to *Varroa* control, or not. Spring early, but swarming average to down, with some exceptions in orchards.

Region 6

Bulk prices up, wholesale steady, retail down just a bit. Must be same buyers as above. Easy Winter and Spring means strong bees, but only moderate swarming. Good year for queen and package producers.

Region 7

Pails down, bulk up (really), wholesale and retail steady. Winter losses all over the map – from 0-95% loss. Spring conditions about right, with most average, some strong, a few weak. Early Spring here too, but swarming about average.

Region 8

Bulk and pail prices low, but steady. Wholesale case and retail down from last month. Low Winter losses, an 'average' Spring and 'average' colony strength led to 'average' swarming.

Region 9

Prices bouncing around, but bulk hard to sell. Demand steady, but slowing as season progresses. Good early season weather help colonies build, with swarming right on time.

Region 10

Bulk and pails steady, wholesale case and retail down. Moderate losses and quirky Spring weather slowed build up, and swarming just a bit.

Region 11

Bulk and pails steady, wholesale case prices down from last month, but retail store prices increasing. Moderate to severe Winter losses, and a late Spring slowed early growth and swarming.

Region 12

Pail prices up, bulk and wholesale case and retail steady. Low to moderate Winter losses left fairly strong colonies for a bit early Spring. Swarming average, but hot and early, or late and small, depending on location. The weather says it all.

	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	58.57	68.00	59.20	62.25	65.00	57.33	47.82	62.56	64.19	60.00	65.00	66.00	54.00-87.00	57.55	59.76	68.57
60# Amber	56.60	65.94	51.00	62.25	62.00	54.50	42.82	60.00	58.25	59.25	62.00	63.00	51.00-87.50	54.24	55.73	64.06
55 gal. Light	0.69	0.69	0.69	0.69	0.73	0.75	0.70	0.75	0.79	0.74	0.78	0.75	0.66-1.23	0.74	0.72	0.97
55 gal. Amber	0.66	0.65	0.67	0.65	0.65	0.69	0.69	0.70	0.72	0.70	0.72	0.74	0.66-1.15	0.71	0.66	0.91
Wholesale - Case Lots																
1/2# 24's	26.89	25.58	27.83	32.10	20.20	32.00	28.28	28.95	27.83	27.83	25.00	27.83	20.40-48.00	29.11	29.18	30.16
1# 24's	40.88	41.82	43.20	43.16	38.50	41.50	42.75	37.67	40.20	42.00	45.00	45.60	32.40-54.00	43.09	42.49	42.23
2# 12's	37.31	33.63	42.60	43.93	34.60	38.30	39.35	38.53	38.36	36.00	30.00	36.00	29.40-48.00	37.39	38.31	37.35
12 oz. Plas. 24's	35.58	36.98	40.80	37.68	36.22	35.40	36.54	29.44	36.22	38.19	42.00	37.20	15.56-48.00	35.44	35.99	36.03
5# 6's	38.78	39.11	38.00	41.08	42.08	41.04	38.77	34.50	42.08	41.18	30.00	39.00	31.80-52.50	41.22	**42.02**	**38.90**
Retail Honey Prices																
1/2#	1.80	1.49	2.83	2.17	1.07	1.65	1.71	1.82	2.83	1.93	2.25	1.80	1.09-2.96	1.76	1.82	1.78
12 oz. Plastic	2.16	2.20	2.25	2.16	1.69	2.25	2.25	2.13	2.31	2.05	3.00	2.15	1.59-2.99	2.22	2.26	2.21
1 lb. Glass	2.75	2.51	2.55	3.04	2.05	2.68	2.90	2.42	3.54	2.22	2.82	2.87	1.99-3.75	2.67	2.70	2.68
2 lb. Glass	4.59	4.34	4.50	5.06	3.75	4.68	4.97	4.08	5.95	4.15	5.00	4.70	3.29-6.09	4.42	4.40	4.42
3 lb. Glass	6.36	6.35	6.50	6.35	4.79	5.87	6.94	5.56	7.81	5.49	7.50	5.98	4.50-8.00	6.08	6.14	5.93
4 lb. Glass	7.36	7.55	8.25	7.73	8.25	6.70	8.72	8.20	8.25	8.30	8.00	7.95	6.00-10.25	7.74	7.91	7.13
5 lb. Glass	8.84	9.24	9.75	9.31	9.04	8.25	8.45	9.00	9.04	7.89	9.55	10.50	6.69-12.95	9.06	9.38	8.63
1# Cream	3.05	3.15	3.18	3.69	3.18	3.03	2.60	2.97	3.18	2.52	3.62	3.53	2.19-6.00	3.13	3.17	3.24
1# Comb	3.80	4.48	3.65	4.11	3.65	4.38	3.46	3.83	3.65	3.65	5.00	4.27	1.95-6.00	4.19	4.16	4.20
Round Plastic	3.43	3.36	3.50	3.88	3.69	4.50	2.94	3.50	3.69	3.69	4.50	3.88	2.60-7.50	3.86	3.67	3.85
Wax (Light)	2.15	2.13	2.18	1.83	1.60	1.90	1.79	1.75	2.74	2.00	2.20	2.13	1.75-6.00	1.81	1.82	2.90
Wax (Dark)	1.50	1.57	1.38	1.60	1.40	1.46	1.38	1.15	3.41	1.41	2.00	10.75	1.20-6.00	1.62	1.50	2.58
Poll. Fee/Col.	37.39	38.86	31.50	37.86	30.00	39.00	38.64	37.50	41.06	41.06	52.00	32.00	15.00-55.00	34.03	38.34	35.00

Roger Morse

Research Review

"Civil War Bugs."

Soldiers in the Tenth Vermont Regiment stole a beehive and set it down on the stomach of a sleeping captain. It was a practical joke, of course, but it made "business quite lively" in the camp that night. This is just one of several stories about and problems and shenanigans during the Civil War recounted in an interesting article that researches the insect problems during this time. It is also recorded that at the battle of Antietam in September, 1862 that the 132nd Pennsylvania Volunteers found trouble when a Confederate cannon fired a shot into a beeyard as the volunteers were advancing. Union soldiers were "rolling in the grass, running, jumping and ducking." Many dropped their rifles in their haste to get away from the angry bees.

Yellow jackets played a role in the war too. One soldier yanked an apple from a tree and thereby aroused the wasps in a nest that was protected from view by the tree's dense foliage. "The hornets nearly killed him before he could clear the fence." Another soldier, with a broken leg, had the misfortune of falling into a yellow jacket nest and lost his life as a result of the severe stinging he received.

Most of the paper I cite below is concerned with other insect problems. For example, when the Union army went south through The Wilderness they drove with them nearly 10,000 cows that were to supply fresh meat for the troops. The amount of excrement was great as was the left overs from the butchering. These attracted flies in numbers. One soldier wrote that he thought 40 flies appeared at the funeral of every fly he killed. Lice were also a great problem. The best way to rid ones' clothing of these insects was to boil their uniforms. The cook's kettle was often the only suitable receptacle in which to do the job.

Bacteria and their relatives caused more deaths in the Civil War than did bullets. Soldiers writing home recorded several of these problems leaving us with a good record of what took place. Civil War buffs will enjoy this article that covers a wide range of insect problems.

Miller, G.L. 1997. *Historical natural history: insects and the Civil War.* American Entomologist 43: 227-245.

The Honey Bee Shaking Signal

Honey bees are social insects. No honey bee can live alone. No one or two bees direct the activities of others but social order is maintained because bees work together to determine what should be done.

Physical movements that we can see and "read" are commonplace in a beehive. The best known of these actions is the wagtail dance that bees use to indicate the direction and distance to a food source, water, or a new home. However, there are other dances that are just as important but that have been poorly understood.

A new paper examines the shaking signal or shaking dance, sometimes known as the DVAV dance, jerking dance, or vibration dance. The author asks and answers five questions: who shakes, when do they shake, where do they shake, how do shaken bees respond, and what causes shaking?

The shaking signal was first described by professor Haydak of Minnesota in 1927. It is a dance or signal that lasts less than or only about a second. When one bee shakes another, she grasps the bee she is shaking with her front and middle legs and has her hind legs firmly gripping the comb. This suggests that vibrating the comb is an important part of the way in which the message is conveyed.

Answering the questions: **Who shakes?** Most of the shakers, 83 percent, are foragers. **When does shaking take place?** Bees shake other bees early in the morning usually before wag tail dances start. This suggests that shaking may be done in response to the foragers experiences the previous day. However, the paper I cite below also reports late afternoon shaking, something that has not been reported earlier. **Where does shaking take place?** Early in the morning it is on the dance floor, that place near the entrance of the hive where wag tail dances are usually done. Later in the day, when many foragers are busy performing wag tail dances, the shaking is done in the area just above the dance floor though it may take place in other parts of the hive as well. **How do shaken bees respond?** Bees that are shaken move about 75 percent faster than they did before they were shaken. **What causes bees to shake other bees?** One answer is that renewed foraging after a dearth stimulates shaking. The general message is that shaken bees should speed up and "reallocate labor to different activities" – the "signal appears to activate (and perhaps deactivate) colony foraging preparations."

In the paper I review here the researcher used two and three frame observation hives. The bees in these hives could fly only in an outdoor cage attached to the building that

housed the observation hive. Pollen and nectar could be collected from a source in the cage controlled by the investigator. I hasten to point out that studies on honey bees behavior of this nature can be conducted with a minimum of expense. There is still a great deal of research to do with cheap and easy to build equipment that requires only an observer who is careful and patient. BC

Nieh, J.C. *The honey bee shaking signal: function and design of a modulatory communication signal.* Behavioral Ecology and Sociobiology 42: 23-26. 1998.

Mark Winston

Xenophobia

"But of all of these conundrums, none mystifies me more than the lack of interest that most beekeepers have in what's going on outside of their immediate area."

There are many things I don't understand, and that continue to astound me no matter how long I contemplate these great mysteries of life. One, of course, is why my local hockey team the Vancouver Canucks can't seem to win a game, in spite of being top-heavy with high-salary talent. A second enigma is what force of nature induces so many grandmothers to suddenly, unexpectedly, and simultaneously pass away on the same day that my students have their final examinations. Another great puzzle concerns the mysterious forces of global climate that invariably strike our family vacations with the worst and most unusual weather of the century, no matter where and when we go away.

But of all these conundrums, none mystifies me more than the lack of interest that most beekeepers have in what's going on outside of their immediate area. It never ceases to amaze me how little most of our local beekeepers know about what goes on state- or province-wide, and how little the few beekeepers active at state or provincial levels know about what is going on nationally, and how little those infinitesimally few beekeepers active at the national level know about what goes on internationally. In my province of British Columbia, for example, there are about 3,000 registered beekeepers, yet fewer than 50 to 75 generally appear at the annual provincial meeting, and only one or two show themselves at the national Canadian Honey Council meetings. As for internationally, a Canadian beekeeper may occasionally stray south of the border to attend a major U.S. meeting, or an American head north for a Canadian meeting, but that happens with about the frequency of a major earthquake or a volcanic eruption.

I am, of course, exaggerating a bit, but not by much. I imagine that those of you reading this article are among the more informed because you subscribe to *Bee Culture*, but from the questions I get when I travel and the phone calls that come in to my office, I get the distinct impression that there are too many beekeepers out there who are unaware of what goes on outside their own jurisdiction, and who also harbor a deep sense of mistrust for "those guys" at higher organizational levels in the beekeeping community. I would dismiss this as an unimportant beekeeping quirk except for one thing: Our failure to unite as a beekeeping community is a major stumbling block in our ability to achieve the heights to which we should aspire.

Take beekeeping research, for example. I recently received an interesting call from a beekeeper in another province who was responsible for developing guidelines that beekeepers within his own province could use to decide which bee research projects their provincial association wanted to support. He was bemoaning the fact that nobody in his province had set research priorities, or seemed to have any idea about what research was going on elsewhere in Canada.

I was bowled over by what I was hearing; if some of the beekeepers in his province had attended our national meetings, or even were members of the Canadian Honey Council and received the council's excellent newsletter *Hive Lights*, they would have known that we develop a Canada-wide list of research priorities every five years, and update the list annually to keep up with changing needs. He also would have heard or read about research currently being conducted, results from recent research, and new problems and opportunities that were just on the horizon. Finally, if my information-deprived beekeeper had attended a national meeting, he would have had an opportunity to see first-hand how we work together to minimize overlap in research projects and get the maximum impact out of the limited funds available for bee research. Indeed, every concern he expressed in our conversation, including how to raise and administer funds to support bee research, set research priorities, and make funding decisions had been clearly worked out at the national level. Yet, he and his colleagues were only dimly aware that any of this had taken place.

I saw a similar phenomenon at the 1997 Apimondia meetings in Belgium. Here, there were a handful of U.S. and Canadian beekeepers attending, and as I ran into them throughout the meeting I kept getting the same excited response: "Wow, is there a lot to learn here!" A meeting like Apimondia brings together beekeepers, researchers and extension apiculturists from around the world, many of whom have tried things out long ago that we are only beginning to get to in North America.

Continued on Next Page

"It never ceases to amaze me how little most of our local beekeepers know about what goes on state- or province-wide, and how little the few beekeepers active at state or provincial levels know about what is going on nationally, and how little those infinitesimally few beekeepers active at the national level know about what goes on internationally."

Want a few examples? The Europeans are far ahead of us in developing miticides, especially using cultural controls and essential oils, and we are only beginning to catch up. New Zealanders blow North Americans out of the water with their marketing techniques for specialty honeys. As good as American migratory beekeepers are at moving large numbers of bees around the country, there are quite a few things we could learn from the Australians, and some of those Brazilians could teach us quite a bit about how to deal with Africanized bees and *Varroa*.

Of course, it's a two-way street; I am fortunate to receive invitations to lecture to beekeepers around the world, and find they have things to learn about some of the management methods we've developed here in North America. We lead the world today in such beekeeping areas as overwintering management, use of honey bees for crop pollination, and large-scale processing methods for honey. In these areas and more, we have much to contribute to beekeepers in the rest of the world. Perhaps a formal exchange program between beekeepers active in national organizations to attend each other's national meetings would be a useful idea to foster better interactions. The Canadian Association of Professional Apiculturists and our U.S. counterparts (the American Association of Professional Apiculturists and Apiary Inspectors of America) send representatives to each other's meetings each year, and it's astounding how much useful information gets transferred by these exchanges.

Lack of interest in meetings of other states or countries limits exchange of information, but it's not a fatal flaw. However, when an insular perspective degenerates into xenophobia, we have a serious problem. A xenophobe is a person unduly contemptuous of that which is foreign, especially of strangers or foreign peoples, and unfortunately xenophobia is a condition that afflicts our beekeeping community as much as it does the rest of our society. At its most innocuous, our xenophobic tendencies are expressed through snide comments that set the tone for mistrust and lack of cooperation at higher levels. For example, how many times have you heard sarcastic jibes in corrider conversations that demean the activities of our national organizations, overly barbed comments about "government employees" in the U.S. Department of Agriculture, and derogatory statements about individuals in beekeeping who have stuck their necks out by taking an unpopular position on an issue of the day? When those comments set the tone of the day, however, they begin to have negative effects on our ability to function as a forward-moving community.

I think our industry is afflicted by two problems – lack of interest by too many beekeepers and outright xenophobia by a few – that have had serious impact on our ability to build a cohesive, active, and effective national perspective on beekeeping issues. And this situation continues to cause tangible problems. For example, I find it difficult to comprehend why the U.S. beekeeping community is divided into two national organizations. This separation of what should be a single group causes an enormous waste of energy, talent and resources each year by duplicating work in many areas and splitting lobbying efforts, so that legislators have difficulty determining who represents our industry. Yet, in spite of an almost universal agreement among on-the-ground beekeepers that this situation is undesirable, it persists.

Another good example of a tangible and negative impact of xenophobic beekeeping politics is the lack of progress on the levy to fund bee research through the National Honey Board. I can't imagine an issue that is more of a no-brainer than this one; for pennies a hive, the beekeeping community has the option of raising about $500,000 a year for bee research that beekeepers themselves can disperse, providing an incredible degree of control and influence over what research is conducted and who does it. Yet, instead of the excitement and positive community-building potential this initiative should be developing, the broad consensus that would lead to rapid approval of this measure has been missing, and as I'm writing this article, the bill is stalled somewhere in Congress because the legislators are receiving mixed messages from a divided beeekeeping community.

I'm confident that we can do better, and we can start by getting to know each other better. If each of us went to one meeting at a higher level than usual, it wouldn't be long before our xenophobic tendencies matured into familiarity and cooperation. If you never attend bee meetings, try your local club this month. If you're used to local meetings, give the state meeting, or even a national meeting a try. And if national meetings are a regular part of your agenda, elevate your play to an international setting. Try it once; at the worst, you'll learn something useful while having a nice vacation, and more likely you'll find some new friends, renewed excitement about the beekeeping industry, and a broader perspective to bring home to your own beekeeping and local groups. BC

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

?DO YOU KNOW?

Colony Development & Productivity

Clarence Collison
Mississippi State University

Colony development and productivity are indirectly related to the brood rearing capacity of the colony. Necessary components include: a high quality queen capable of laying a large number of eggs, a large force of nurse bees, an adequate food supply and broodnest temperature. In order to understand the life cycle of the honey bee and what is going on in the broodnest, it is essential to be familiar with the characteristics and requirements of the various stages of brood. Please take a few minutes and answer the following questions to determine how well you understand this important topic.

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

1. ___ When a colony begins to whiten the combs along the tops of the frames of the brood chamber or supers with newly secreted wax, it is an indication that the colony is making preparations to swarm.
2. ___ The honey bee life cycle is an example of incomplete metamorphosis.
3. ___ Queen honey bees develop faster than workers and drones.
4. ___ Wax cappings that cover worker brood cells are flatter than the cappings of honey cells.
5. ___ Several house bees are involved in preparing a cell for the queen after a new adult bee emerges from it.
6. ___ A queen with a good brood pattern has laid in almost every cell within the brood area and has brood of a similar age grouped closely together.
7. ___ The larval stage occurs in an uncapped cell.
8. ___ Honey bee larvae are unable to feed themselves, thus require over 3,000 nurse bee visits.
9. ___ During the pupal stage, the larval tissues break down and are transformed into adult tissues.

Multiple Choice Questions (1 point each).

10. ___ The honey bee larva is composed of a head and _____ segments.
    A. 10
    B. 13
    C. 12
    D. 8
    E. 9
11. ___ The silk glands of the larval honey bee are the forerunners of the _____ gland(s) in the adult honey bee.
    A. Wax
    B. Brood- food
    C. Dorsal scent
    D. Mandibular
    E. Thoracic salivary
12. ___ Honey bees molt about every ___ hours during the first four days of larval life.
    A. 16
    B. 8
    C. 32
    D. 24
    E. 48
13. ___ During honey bee development, molting (the skin splits over the head and slips off the posterior end) occurs _____ times.
    A. 6
    B. 2
    C. 8
    D. 4
    E. 9
14. ___ The maximum egg production of a queen is reached when colony populations are at _____ bees.
    A. 20,000
    B. 30,000
    C. 40,000
    D. 50,000
    E. 60,000
15. Describe the actions that worker bees must perform in preparing a cell to have it ready for the queen to lay in following the emergence of a new adult bee. (3 points)
16. Describe the orientation of a worker pupa within a brood cell (1 point).
17. Name three types of food fed to worker larvae. (3 points)
18. Please explain why queens produced in supersedure or swarm cells are normally better than those produced in emergency queen cells. (2 points)
19. Please explain why the cappings over brood cells are colored differently than those placed over cells of honey. (2 points)

ANSWERS ON PAGE 48

DECLINING WORLD HONEY PRODUCTION CONTRIBUTES TO HIGHER PRICES

John Parker

For a while it appeared that world honey production would remain strong despite serious problems for output in some countries of Latin America. Then came another, less publicized reason for declining production. That was the setback in republics of the Former Soviet Union (FSU) as elimination of farm subsidies led to reduced honey output, particularly in Russia and Belarus.

According to statistics published by FAO and some more recent information from special honey reports on selected countries by the Foreign Agricultural Service of the U.S. Department of Agriculture, total world honey production declined in 1996. Some revisions may show a slightly different rate of decline, but it appears that total world honey production in 1996 declined by about 7 percent to less than 1.1 million metric tons. Preliminary estimates indicate that world honey production in 1997 may not have declined but 1 or 2 percent, with much of the decline stemming from a further reduction in FSU and as a result of unusually heavy Summer rain in Europe.

China's Smaller Honey Production Boosting World Prices

China remains the leading world producer of honey, but its 1996 production was down a whopping 17 percent. The estimated 147,000 tons of honey harvested in China in 1996 was a major reason for rising export prices for honey sold by traders in most countries. Honey production had been on a plateau of over 180,000 tons annually during 1992-94. A slight rebound to about 150,000 tons was indicated for China's 1997 honey output in the special honey report from the Beijing post of FAS/USDA.

The 13 percent export bonus was eliminated on July 1, 1995. The combination of the loss of the export subsidy, adverse weather and changes in the rural economy tended to discourage some commercial honey producers in China in 1996. Rising prices and strong domestic demand apparently contributed to the small rebounds in 1997 honey output.

China's role in bolstering world honey prices remained strong in 1997 when total world honey output lagged again. A combination of reduced output and increased domestic demand is likely to cause China's honey export prices to remain high in 1998. China's honey exports declined slightly from 89,991 tons in 1995 to 83,462 tons in 1996. Response to high prices caused greater than expected honey exports by China in 1996. The FAS estimate of only 65,000 tons for China's 1997 honey exports will be revised when official statistics for December 1997 become available.

The big anti-dumping debates following China's peak exports of 10,000 tons of honey to USA in 1993 appear to have been solved in two ways. First came the diplomatic agreement which limited China's honey exports to U.S. importers. Then came the greater than expected reduction in China's honey production, plus a shift to other markets. It now appears that China is not likely to have much extra honey for export again in 1998. Therefore, the agreement to limit honey exports to the United States will be easy to comply with. Because of good demand in Japan and Germany for China's honey exports at high prices, it is unlikely that there will be any need to request an upward revision of the U.S. quota limit for some years to come.

Because of a lower level of honey production in China and high prices, it would appear that beekeepers in some countries would respond by expanding output. Canada and Argentina appear to have increased output for export in response to higher world prices. However, production in many countries either remains steady or shows a slight decline. The biggest decline between 1992 and 1996 was recorded in Belarus, compared with rewarding subsidies prior to 1992.

Former Soviet Union Honey Output Decline Greater Than Elsewhere

Between 1993 and 1996, honey output in the 15 republics of Former Soviet Union (FSU) declined by more than 75,000 metric tons. This accounted for most of the reduction in world production from a peak of 1.215 million tons in 1993 to 1.087 million tons in 1996. When the decline for FSU and China is combined, this is where about 100,000 of the 128,000 ton reduction in honey output occurred.

A lack of subsidies caused a setback for honey output in Russia and some other republics of FSU in the last several years. However, some farmers in countries like Ukraine have continued significant honey output on their private plots. This kept Ukrainian honey output in the range of 62,000 tons annually during 1994-97. Honey was an established source of cash for many rural producers who had their savings wiped out by changes in currency values. Collapse of the Soviet ruble's value after 1992 left many honey producers without much cash. In contrast to the value of $1.70 per ruble in 1991, the Russian ruble had a value of less than an American penny in 1996. While the benefit of subsidies was gone, honey was something which thousands of kiosks and individuals could sell. Also, many of the new private grocery stores provided an interesting display of honey in attractive jars.

Russia shifted from significant exports of honey prior to 1992 to increased imports of honey in attractive containers from Germany during 1993-97. German honey exports to most FSU republics increased considerably in the mid-1990s.

HONEY: WORLD PRODUCTION BY SPECIFIED COUNTRIES 1992-96

Producer	1992	1993	1994	1995	1996
			metric tons		
China	183175	180895	181172	178000	147000
United States	100056	104686	98500	95489	89899
Argentina	56800	60000	67000	64400	66000
Ukraine	57111	62676	62050	62300	61550
Turkey	60319	59207	54117	69000	59600
India	51000	51000	51100	51300	50800
Mexico	63886	61973	62683	49228	47997
Belarus	55000	41000	25000	14000	4400
Russian Federation	47000	52700	43900	44000	43500
Germany	24599	25319	22233	36000	14674
Canada	30339	34245	30353	30575	24895
Kazakhstan	30000	28000	28300	12000	8400
Spain	23958	28393	28000	27700	28000
Kenya	22000	23000	24000	25000	24670
Tanzania	15500	23500	24000	24500	25000
Ethiopia	23730	23700	23900	24200	24000
Australia	18948	22556	26000	19430	19000
Brazil	18841	18367	19000	19200	18000
France	17183	17422	17694	18000	18000
Hungary	10742	15873	23651	16236	16400
Greece	1500	14826	15336	15409	14000
Romania	10410	9936	9820	15000	12000
Cuba	10500	10000	10450	6000	6000
Italy	12500	13200	12500	9700	10300
Poland	12891	10728	9296	9400	10000
New Zealand	9560	7066	12100	8200	9300
Austria	5000	8000	8500	8600	9100
Iran	7840	7980	8150	8500	8000
Czech Republic	7025	7783	7611	7786	7000
Uzbekistan	6800	7000	7000	7200	7000
Uruguay	6000	6450	5500	8000	7000
Chile	5030	5000	5000	5300	5000
Bulgaria	5961	3881	4100	4150	4000
Moldovia	3500	3601	3660	3670	3400
Israel	2125	2150	2050	2450	2300
Other	155399	163098	155671	171077	180815
Total	**1172228**	**1215211**	**1189397**	**1171000**	**1087000**

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

Eventually traders in FSU republics will improve their packaging of honey and their exports will bounce back. However, during 1997 most of the honey on the shelves of grocery stores in Russia and Ukraine was imported from Germany or some other European Union country.

Kazakhstan had been the 11th major world honey producer with a harvest of 30,000 tons in 1992, but by 1996 its harvest was down to an estimated 8,400 tons. Honey output in Kazakhstan suffered from the loss of subsidies provided for large farms. In contrast, republics with more reliance on private plots and smaller farms maintained honey output for the domestic market to a greater degree. This meant relatively stable honey output for Uzbekistan, Azerbaijan, Georgia and Armenia.

Problems for Mexico and Central America Hurt Export Potential

Mexico's honey output reached a peak of 62,683 tons in 1994, but declined 21 percent to 49,228 tons in 1995 and dropped again to 47,997 tons in 1996. Efforts to cope with the Africanized bees helped Mexico to stabilize production in 1997. Some gains occurred in western Mexico, where orchards and pastures provide ample nectar for bees. Africanized bees have brought devastation of honey output in some areas of Mexico and Central America near the Caribbean coast.

The Statistics Division of FAO in Rome, provides honey production statistics compiled after diligent research and receiving hundreds of answers from statistical headquarters for countries around the world through 1996. By July of 1998, a tabulation for world honey production in 1997 should be available.

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PRODUCTION ... Cont. From Pg. 21

Estimates for 1997 honey production in some key countries came from another source of information on honey production – the U.S. Department of Agriculture. It has provided some remarkable reports in recent years about the honey situation in certain countries, particularly China and Germany.

European gains helped offset the declining production in China, Mexico and Central America in 1995, but their drop in 1996 was greater than some observers had expected. The setback in Germany caused a more intense search for extra supplies of honey available in Europe.

U.S. Production Below Earlier Peaks

U.S. honey production has been hurt by the spread of mites which attack bees. NABS reported a decline from 94,889 metric tons in 1995 to 89,883 tons for U.S. honey production in 1996. Efforts to control *Varroa* mites biologically are underway, but success will take time. When China's imports were at a peak in 1993, U.S. honey production also peaked at 104,686 metric tons. It dropped to 98,500 tons in 1994 and continued downward. Following China, the United States is the world's second largest honey producer.

The United States leads the world in honey consumption, and may soon rival Germany to become the leading world net honey importer. Since China exports a large share of its honey supply, its domestic use was less than that in the U.S. during 1993-97. China is expected to eventually surpass Germany for second place in honey consumption.

Three major exporters (China, Argentina and Mexico) accounted for about two-thirds of world honey exports in 1994. By 1995, their combined share had declined to 59 percent, as exports by China and Mexico declined.

Mexico Producing and Exporting Less Honey

Mexico's honey production and exports were hurt in recent years by damage from Africanized bees and mites in various areas. Mexico's honey output declined 21 percent to 49,228 tons in 1995, and fell further to 47,997 tons in 1996. Damage from Africanized bees was reportedly more severe on the Atlantic coast area than along the Pacific.

Mexico's honey exports fell 15 percent in 1994 to 30,279 tons from the peak of 35,998 tons recorded for 1995. Mexico was the third major world exporter of honey in the early 1990s. A shift to the irrigated valleys of western Mexico for the commercial honey business is expected to allow some stability for exports at the lower level.

Mexico's decline had a significant impact on U.S. honey prices. The combination of smaller imports from China and Mexico contributed to higher retail prices for honey in U.S. stores. Mexico exported 58 percent of its 1993 honey harvest, but only 52 percent of the 1995 supply.

Argentina Expands Output for Export

High world prices and the need for ample pollination by an expanding agriculture are likely to result in greater future Argentine honey output. Argentina produced about 70,000 tons of honey in 1997. Further gains have been indicated for 1998 because of good weather. Clo-

HONEY: SHARE OF PRODUCTION EXPORTED BY SPECIFIC COUNTRIES, 1992-95

Exporter	1992	1993	1994	1995
		Percent		
China	50.1	53.4	56.4	48.9
United States	4.8	4.0	3.9	10.6
Argentina	97.1	91.7	93.2	98.6
Ukraine	0.5	1.1	1.9	0.6
Turkey	5.5	5.1	5.1	4.3
India	3.1	1.2	0.8	0.2
Mexico	47.1	58.1	48.3	52.2
Belarus	1.3	2.1	4.8	10.0
Russian Federa	2.4	2.1	2.7	3.0
Germany	49.8	54.5	61.3	40.7
Canada	36.7	24.5	28.0	51.2
Kazakhstan	0.1	0.1	0.1	0.3
Spain	17.2	14.7	19.5	17.4
Kenya	0.1	0.1	0.1	0.0
Tanzania	0.6	0.2	0.3	0.1
Ethiopia	0.7	0.3	0.3	0.0
Australia	47.7	40.4	52.3	55.3
Brazil	3.2	1.1	2.7	0.0
France	26.3	13.0	22.2	26.8
Hungary	70.1	85.5	57.1	74.1
Greece	26.3	2.1	3.8	1.0
Romania	11.1	10.3	17.6	13.7
Cuba	95.2	40.0	28.7	71.7
Italy	2.6	8.6	12.1	11.5
Poland	7.0	7.3	6.1	2.1
New Zealand	19.5	28.0	16.7	26.2
Austria	5.2	6.7	3.0	2.3
Iran	0.8	0.4	6.1	3.5
Czech Republic	35.2	20.0	38.9	52.9
Uzbekistan	0.3	0.3	0.4	0.4
Uruguay	91.7	97.6	87.9	89.3
Chile	9.6	23.5	27.7	31.9
Bulgaria	22.8	96.4	96.1	48.2
Moldova	7.4	6.6	5.4	3.4
Israel	6.1	3.0	3.2	2.7
Other	16.2	9.8	12.5	9.9
Total	**24.6**	**23.8**	**25.9**	**25.4**

Source: FAO Agrostat and calculations from FAO data

ver fields of the rich Pampas provide ample nectar for bees to allow Argentina to produce more honey in the future. The Africanized bees seem to have traveled north from Brazil and have not yet posed a great problem for Argentina and Uruguay. However, during times of dry weather, the honey harvest may decline a little in some years.

From the FAO data it appears that some earlier reports about a setback for 1995 Argentina honey production were exaggerated. The decline appears to have come in the early part of 1996. Argentina exported 97 percent of the 55,165 tons of honey harvested in 1992. That trend continues.

South America Output Expanding

The output of honey in most of South America to the south and west of the Amazon Basin has expanded recently, while suppliers in the path of destruction for Africanized bees declined in northern Brazil and Venezuela. Output in southern Brazil increased enough recently to leave national output steady in a range of 18,000 to 19,200 tons in the mid-1990s. Harvest by beekeepers south of Sao Paulo appears to have remained strong, particularly in the three southern states, where a temperate climate and modern commercial agriculture mean considerable technical help for beekeepers.

Uruguay's honey output rose to 8,000 tons in 1995, compared with only 5,500 tons in 1994. Uruguay exported over 90 percent of its honey harvest during 1991-93, but in 1995, the share had fallen to 89.3 percent.

Chile should have a larger honey output than the 5,000 tons reported annually during 1992-97. Bees are needed for pollination of the orchards which are a major part of Chilean agriculture. Chile's honey exporters responded to higher world prices in recent years. Chile exported about 32 percent of its honey supply in 1995, compared with only a tenth in 1992. High world prices caused Chilean firms to sharply reduce stocks of honey.

Cuba Producing and Exporting Less Honey

Following the December 1991 breakup of the 15 FSU republics, the trade agreements Cuba had with state trading firms in Moscow eventually ended. This meant a different setting and steep reduction for Cuban honey exports, which fell from 10,000 tons in 1992 to about 3,000 tons in 1994. Cuba's honey output declined from 10,500 tons in 1992 to 6,000 tons by 1995. Gain in Cuban honey exports to some European markets caused production to stabilize at about 6,000 tons in 1996 and 1997.

The path of Africanized bees appears to have skipped Cuba so far. Cuba would have ample stocks of honey for export if new export markets were developed. However, with shortages of candy and snack foods, Cuban consumers have been glad to purchase honey when foreign buyers cancelled contracts through trade agreements. It involved mostly trade with FSU and East European countries. It meant that the share of the honey harvest which was exported fell from 95 percent to about 29 percent between 1992 and 1994. With the high prices German and other European importers are paying for honey, it is a puzzle why Cuba's traders were not able to find new customers when the Russians stopped buying from them.

European Honey Output Showing Downward Trend

Honey production in Europe declined considerably in 1996, following unusually good harvests in some countries in 1995, and relative stability during 1992-94. The dramatic rise in 1995 output in Germany and Romania was because of ideal weather conditions. This was followed by difficult weather for bees in 1996. German honey output dropped from a peak of 36,000 tons in 1995 to only 14,674 tons in 1996. Because of Germany's great importance as an importer of bulk honey and exporter of consumer-ready honey, that decline pushed European prices up.

Heavy Summer rains disrupted the normal harvest of honey for some months in 1997 in Poland, Czech Republic and Romania. This caused imports of honey by these countries to rise. While most of the honey imports came from Germany, some interesting gains were recorded for Ukrainian honey. Bulgarian honey production of 4,000 tons in 1996 was a third below the 1992 peak.

Europeans are glad to obtain more honey from local producers or from neighboring countries. The reduction in deliveries of bulk honey for packaging from China and Mexico greatly concerned German traders during 1995-97. Germans working with firms which processed and marketed honey welcomed the bumper 36,000-ton harvest of honey in Germany in 1995. Also, increased output in Hungary and in Austria in the mid-1990s contributed to greater self-reliance on local supplies for honey in central Europe. Czech Republic and Slovakia maintained good harvests and exported about a third of their supply during 1992-95.

Romania's honey production declined in the last two years, following a peak 1995 harvest of 15,000 tons. Romania can export all the extra honey available at attractive prices to the European Union and the Mideast. Romanian honey exports increased about 70 percent to 1,729 tons in 1994 and reached 2,050 tons in 1995. Germany was the leading export destination.

Poland's production of honey declined from 12,891 tons in 1992 to 9,400 tons in 1995. A rebound to 10,000 tons in 1996 was followed by a setback because of wet Summer weather in 1997. Poland's honey exports fell from 903 tons in 1992 to only 201 tons in 1995. During 1997, Poland became a net importer of honey as traders found a flourishing market and made greater deliveries from neighboring countries.

European Union Honey Trade Flourishes

A combination of subsidies and duty-free trade within the European Union (EU) helped maintain their honey output during 1992-95. However, the steep decline of German honey output in 1996 and a poor harvest in 1997 were not offset by greater supplies in other EU countries.

Austria has the best record for an upward trend of any EU member. Honey production in Austria increased from 5,000 tons in 1992 to 9,100 tons in 1996. French honey output was steady in the range of 18,000 tons annually during 1992-97.

German imports of honey have remained high in the range of 91,000 tons annually despite its increased

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PRODUCTION ... Cont. From Pg. 23

domestic output. This is partly because of the profitable business of packaging imported bulk honey in smaller, consumer-ready containers, including a big export business. In addition to flourishing sales of honey to customers in other EU countries, Germany is a major exporter of honey to East Europe and the Mideast.

Following Germany, the second major EU honey producer is Spain. Output of Spanish honey remained steady at about 28,000 tons annually during 1993-96. Spain exports from 15-20% of its honey harvest with the help of duty-free EU sales.

Italy has some of the most productive orchards in the world, particularly in the area between the Alps and Po Valley. Yet, output of Italian honey fell from 13,200 tons in 1993 to only 9,700 tons in 1995. This may have been partly because of rising labor costs and problems with pests. Good weather contributed to a rebound to 10,300 tons for Italy's 1996 harvest.

East Africa's Output Mostly for Domestic Use

Africa is emerging as a more important net importer of honey. New supermarkets in Egypt, Morocco, Tunisia and Nigeria are likely to have displays of imported honey. Kenya, Tanzania, Ethiopia and Angola have significant output of honey, ranging from 20,000 to 25,000 tons annually in each country. Yet, very little of their honey enters the world market. During 1992-96, none of the four countries exported even one percent of their honey output. This means that in times of high world honey prices, traders may explore prospects of beginning purchases in East Africa.

Future plans to create greater trade among countries of Africa may lead to more exports of honey from East Africa to South Africa. Despite South Africa's successful fruit industry, it is expected to import more honey in the future.

Honey Output Fluctuates in Australia and New Zealand

Australia's honey harvest increased from 18,948 tons in 1992 to 26,000 tons in 1994, but fell to 19,400 tons in 1995, partly because of drought. The 1996 harvest remained near the 1995 level. A slight rebound was indicated for 1997. Exports of honey by Australia increased from 9,108 tons in 1993 to 13,595 tons in 1994, but dropped to 10,754 tons in 1995. New Zealand's honey production reached a peak of 12,100 tons in 1994, declined a third in 1995, and rebounded to 9,300 tons in 1996. Exports of New Zealand honey rose to 2,145 tons in 1995. BC

John Parker is a retired commodity statistician and researcher. He supplies us with exclusive annual updates on the global honey market.

IS SMALLER BETTER?

The cell size debate may soon be over.

Ed & Dee Lusby

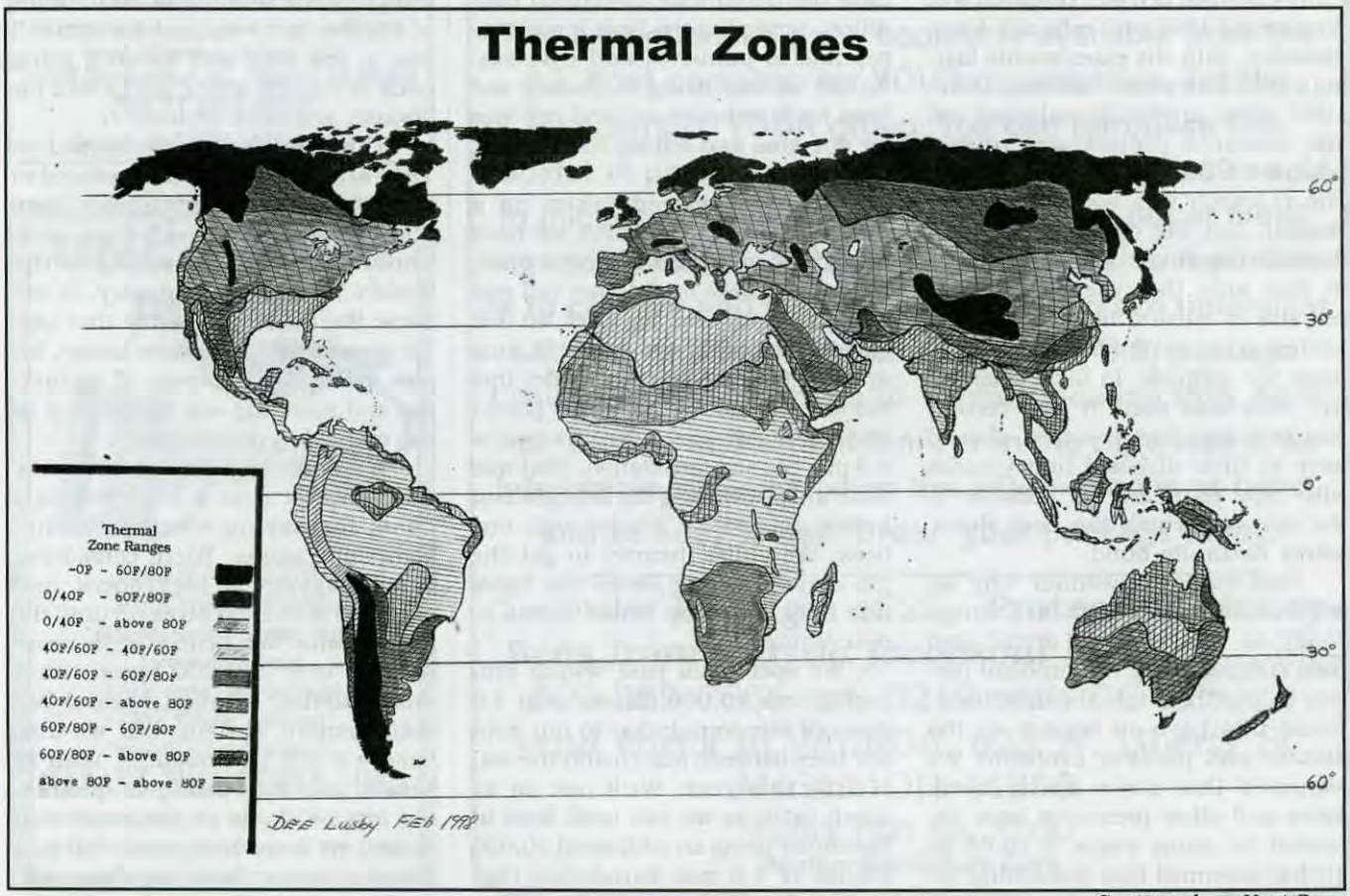
We have been trying to figure out the best brood comb cell-size for some years for our area (Tucson, AZ). It started locally, but then beekeepers in other parts of the United States, and even overseas wanted to know what we thought their best natural brood comb cell size should be also. Eventually we constructed a world map showing thermal zones and corresponding cell size.

To create the map we combined many pieces of information relative to history and world environment, such as: 1) What was the actual recorded cell size prior to the use of artificially enlarged foundation and how was it measured? 2) Where were honey bees capable of living when looking at natural zones of heat and cold during a full year? 3) Were there naturally occurring variables that could change cell size or bee habitat? 4) Would it all fit together – that is, recorded cell sizes compared to the environment they were in?

This map based on atlas composites of hot and cold land area maps accurately reflects the history of recorded cell sizes in published records prior to the use of artificially enlarged foundation. Climate and rainfall were variables allowing habitat transition into and out of recorded zones. Cell sizes are recorded in general for the zones and, where altitude dictates Humboldt's law, should be used in higher mountainous areas and areas of higher latitude.

Every thermal/cell size zone has a small, medium, and large range to allow for bees to transition into and out of habitat areas as vegetation and rainfall vary throughout the yearly cycle. With smaller cell sizes you gain variability, and with larger cell sizes you have less. We found this published many times.

It seems logical that as you go up the hill bees get bigger to match the colder, higher altitudes, but also, they encounter less habitat to live and breed in. Therefore, when they reach the top of the mountain they have to go down again to regain variability or suffer extinction.



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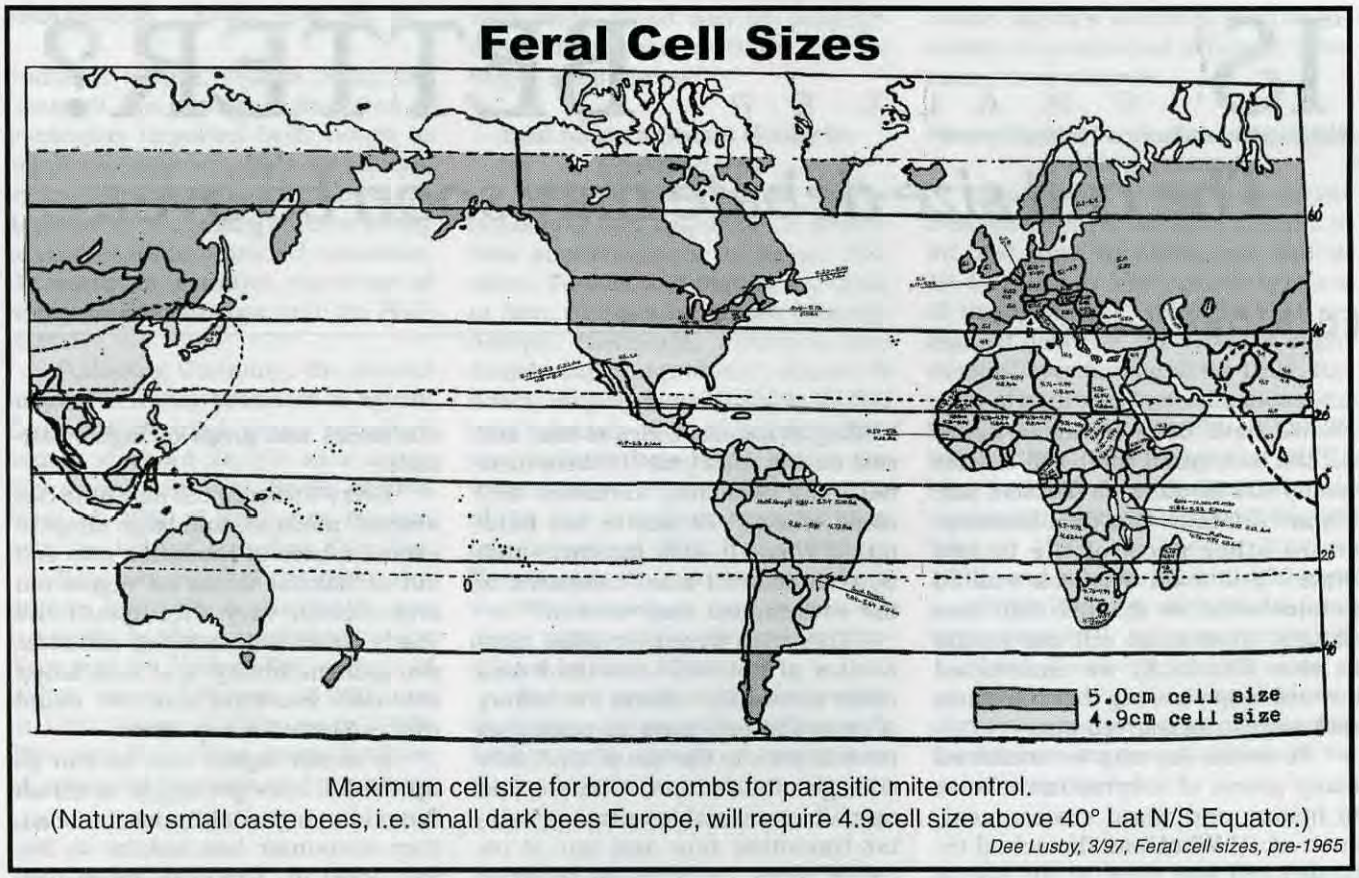

Maximum cell size for brood combs for parasitic mite control.
(Naturaly small caste bees, i.e. small dark bees Europe, will require 4.9 cell size above 40° Lat N/S Equator.)
Dee Lusby, 3/97, Feral cell sizes, pre-1965

SMALLER ... Cont. From Pg. 25

Some of the last of the artificially-enlarged cell size research was done round 1941 with cells of 5.4 mm diameter, with the experiments lasting a good four years. Between 1957-1963 other artificially-enlarged cell size research project was undertaken with 5.65 mm diameter cells. The research was considered successful, but the experiments were done in the Romanian mountains. In that area the research showed cell size of natural honeycomb presented great variability, depending upon the altitude. In fact, when all the work was done it was recommended that bee colonies should have at their disposal honeycombs with cells as nearly as possible to the size cell which the bees themselves naturally build.

This made us wonder why we were using "high altitude honeycomb" in "low altitude areas" and then compounding the problem further by placing it into the broodnest. Could this have an impact on the disease and parasite problem? We assumed that since honey bees, mites and other pressures have coexisted for many years, it could be further assumed that something artificial – like oversized cell size – may have disrupted that co-evolved condition, rendering the bees more susceptible to parasites and diseases. So, all we are doing is placing our bees back onto the natural cell size for our area and letting Nature take her course.

We have indeed taken on a puzzle. However, we think we have now found many of the pieces. First, we put our bees on 5.0 mm cell size foundation by making over 40,000 sheets for our brood nests. A long drought forced us to reconsider this cell size though. We have now placed into the field over 4,000 frames of 4.9 mm cell size foundation. That was done in 1997 during the drought and before going into Winter with our bees. We culled heavily to get the job done, shaking down our hives into only 1-2 deep brood boxes to over-Winter.

We spent this past Winter preparing over 10,000 frames with 4.9 mm cell size foundation to put onto our bees between March and the end of July this year. We'll put on as much extra as we can until frost in November using an additional 10,000 frames of 4.9 mm foundation that will be ready by mid-Summer. That will give us a total of 24,000 frames of smaller, more natural 4.9 mm cell size to use once and for all if going back to natural sizing works well for disease and mite control.

The experiments performed in 1941 and 1957-1963 that pointed to the "bigger is better" theory were done with an average of 5-6 colonies. Those experiments changed the world's beekeeping industry. It became the belief of the day that bigger was better – for more honey, for less swarming, for ease of extracting and spinning out honey. But in the end, what did we gain?

We don't experiment with only 10 frames or even a few hives as a basis for saying whether or not something works. We're considered small commercial beekeepers, and averaged 900-1100 hives up until the mites came. We believe we'll never manage over 700-800 hives with a more intense, smaller, natural bee management system, but we also believe it will be profitable. With El Niño's help this past year producing lots of plants in the southwest desert, we'll see how much 4.9 mm foundation our bees can draw out.

We can only come back now as fast as we can draw comb. We've been sitting under a mesquite tree now for nearly three years waiting for the chance to draw a large amount of comb. We're ready. It will be a challenge to see if we can retool all our combs, with the goal of running 700-800 hives, by the end of 1999, all in 4-5 deeps, but if we make it so can everyone else.

Look at the thermal/cell size zone map. So far everything is pretty much matching up. The trouble is, now the questions start. What have we lost by having too-big bees relative to crop pollination? Is there an upper cell size limit for controlling mites relative to altitude and cooler latitudes? What's the relationship of cell size to disease, chemical contamination, pesticide sprays, inbreeding, pollen and propolis for human cures? Are there limits to taking bees out of one zone and placing them into other zones? If so, is it beneficial, or detrimental? BC

The Lusby's are commercial beekeepers in Tucson. You can reach them at 3832 East Golf Links Rd., Tucson, AZ 85713.

Pests I Have Known

And Some I Still Do

Larry Goltz

Fortunate is the beekeeper who has seldom or never had to contend with any serious enemies of bees, particularly those as pervasive as wax moths, mites and bacteria. Mites and bacteria may be lesser pests in the strictest sense than moths, bears, skunks and the like. Bacterial infections – the foulbroods, for example – are less pests and predators than diseases or afflictions and should be discussed in greater detail and by better authorities. I will merely try to lighten your day by relating some experiences that, for good and obvious reasons, as you will see, have come my way in some 50 years of intermittent beekeeping.

Aside from the occasional talkative visitor at my honey stand at the farmer's market I have come to terms with most of the pests and predators, forgiving their trespass and perdition. I try to listen patiently to customers (or noncustomers) who launch periodically into detailed discourses, sometimes on the subject of bees that usually begin, "I once had me a box of bees . . ." I sometimes attempt to persuade such guests to lavish their sagas on the person in the next booth who, I hint, is writing an anthology of just such nostalgic reminiscences. Cowardice probably dictates that I'd best confine my commentary to those pests that do not have access to retribution through the written word or otherwise.

Pests of bees vary widely in form and destructiveness, ranging from relatively minor disturbances by skunks and mice to the often severe destruction by bears, for example. I can truthfully relate only to those pests that at present or in the past have been a problem to me. I have

never been troubled by hive thieves but once: One hive was spirited away by someone who thoughtfully left the other 14 colonies undisturbed. I have never been plagued by some of the pests and predators found in climates and geographical regions dissimilar to our own. We here in northern California have not as yet been invaded by the Africanized bees. We do not have bee-eating toads, and to the best of my knowledge, few birds that prey on flying bees. Skunks and bears, however, are plentiful.

Ants share a disrepute with other predators, but from my experience they enter a hive in numbers only when the colony population is low or the bees are nonexistent. I understand that in some areas of the southeastern United States and in the tropics they can be a pest most any time, even invading populated hives. Ants may sometimes be erroneously blamed for decimating a colony, but experience is likely to show that in most instances they only move into a hive when the colony becomes weak or dies out, no longer providing an effective barrier to their entry.

I have had my share of wax moth pests and I must confess that these loathsome intruders caused their damage only because of my carelessness in storing brood combs or not immediately tending to the death of a colony, particularly during the Summer months. A full hive of bees is the best protection against wax moth damage to combs. Treatment will effectively prevent damage to stored combs, but the remaining few chemicals used for this purpose must be applied in the manner prescribed by the instructions or other reliable guidelines.

Mice have been pests over the years. Here again my carelessness has allowed a few of these to demonstrate how nefarious these little rodents can be once they gain entrance to a hive with the intent to make a nest and overwinter. A simple strip of wire mesh over the entrance and other openings will prevent mice from squeezing their way into the hive, which they can do in their desperation to seek shelter and perhaps food. I thought placing my colonies on a trailer bed about three feet high would take care of the mouse problem, therefore neglecting to screen the entrances as I usually did when the hives were on the ground. I was surprised to find that this was no barrier to the several mice who came and went via the way of the dual wheels carrying the usual amount of nesting material into the hive interior. Use the right size hardware mesh, allowing the bees through and keeping the mice out, and you can leave the screens on the year around.

"Mice and skunks and bears are customary. It's the unexpected pests that are, well, the most unexpected."

For skunks I once had a tolerance. A good, nearly black skunk pelt taken on my trap line was worth a couple of bucks as we farm kids reckoned. Only trouble was the aftereffects persisted, clinging to my very meager wardrobe, which usually consisted of one pair of shoes and a couple of sets of bib overalls and blue work shirts. I usually sat by myself on the school bus during hunting season and wondered why the girls shunned me at school. A kid could get some kind of neurosis – from having been exposed to such social rejection, any psychologist will tell you. Rather than packing a weapon to school to attempt to right social injustices I merely kept in mind my goal to earn those coveted dollars for my ultimate desire, a new 16-guage shotgun. I was taught, and quickly learned, by example, that guns were for sport, not a means to gain peer respect or quick monetary reward. Some may now question whether the "sport" of using guns should also include using them to hunt game. They may have a good point of argument.

Come to think of it, my goals have not changed all that much over the years.

Evidence of the activities of skunks that molest beehives is usually clearly evident. Muddy paw prints on the front of the hives and shallow excavations under the entrances are unmistakable signs of skunk presense. In their persistance to get at the bees, the skunk will scratch at the hive entrance, usually during the night hours, deftly devouring the defending bees that come out to investigate the disturbance. Any dead bees at the entrance are welcome fare for these omnivorous scavengers. The control I found most effective was simply to string an 18- to 24-inch high poultry netting around the apiary. It may be necessary to set the lower edge of the netting several inches below ground level to prevent the skunks from squeezing under the fence. Other devices I have tried have been less effective. Boards with projecting metal points are as apt to pinion the beekeeper's foot as the skunk's. I tried scattering a mildly caustic substance such as ammonium nitrate fertilizer in front of the hives, but the only effect that I observed was to make the weeds grow more luxuriant than before the treatment. I do admit to using more radical means than above for eliminating skunks that seemed to subsist totally on my bees. In several instances the colonies were becoming depopulated and intolerably hostile because of nightly raids by skunks. I do not normally advocate or use such measures because populations of wildlife tend to become stabilized at certain sustainable levels; gaps in habitat populations are quickly filled by usually mobile members that quickly adapt the predatory habits of residents forcefully removed. Getting my colonies high enough off the ground on trailers has helped and may work well for you.

If skunks are not the primary predator in northern California apiaries, certainly bears more than make up for them in nuisance value. Bears can cause pandemonium in an apiary, destroying and devouring bees, honey, brood, splintered frame wood, and, from appearances, frame wire. On occasion I have had a whole apiary torn apart, including one instance where only the day before I

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PESTS ... Cont. From Pg. 29

had installed a dozen or so packages. Since installing my hives on trailers I have had only one loss of two hives; not that this system is bearproof, but because I can move the bees about often and hopefully away from areas where bear raids are most likely, choosing instead locations near habitations with dogs. Electrified fences would probably provide security, but with my small operation it would be a major expense.

A pair of raiding bears can virtually destroy up to or more than a dozen colonies in a single night. Other times only a hive or two is upset. Much must depend upon the age or experience of the raider and how hungry it is.

If only we had a welfare program for our local bear population provide them with (honey) stamps entitling them to all they can consume of cheap, imported honey. Perhaps we could petition the legislators in Sacramento to pass such a bill leaving the activists in Southern California and unsuspecting taxpayers in the East to pay for the honey. Most likely should such a plan become a reality the bears would come to regard this as an easy way of life and accept this as their right, allowing them to proliferate even faster than at present. Never underestimate the cleverness of bears.

I have had brushes with other apiary visitors that were less of a threat to the bees but somewhat of an annoyance, and in one case a threat to myself. The most noteworthy was a very close call with being struck by a rattlesnake that had been lurking under a hive. As I was clipping weeds with a hand shears, the snake, in a lightning-quick movement, struck and just grazed but did not touch my thumb. I do not remember hearing the warning rattle as I had in other encounters. I have yet to kill either a rattlesnake or a bear – but mice beware! I long ago came to the conclusion that we will never be able to eliminate all of our bees' enemies so we may as well adopt a reasonable tolerance of certain destructive elements with which we cannot cope without interfering in nature's wisdom.

Few farm animals have molested my hives, except once or twice a cow may have tipped a hive askew by rubbing against or bumping it. At one apiary in a farm pasture I was invariably harassed by an over-friendly horse. Its favorite prank was to snatch bee brushes, smoker fuel, gloves and other items from my carrying box and whisk them away while I was working the bees. It totally destroyed a new baseball cap I had removed after donning my veil and shredded my favorite T-shirt on another occasion. The pesky horse was hard to dissuade from nosing around in the pickup bed, knocking over supers and nibbling at frames of honey. Bees completely ignored the animal.

My latest candidates for pests of the year are a pair of ostriches. I have two trailer loads of bees on an ostrich ranch near my home. This ranch is located in a prime yellow star thistle territory. You cannot imagine the havoc those two big birds can wreak in the bed of my pickup, dragging tools, smoker fuel and anything else not fastened down and dropping them on the ground. With their long necks nothing can be put out of their reach. Perhaps of doubtful intelligence, at least they are apparently harmless to me or the bees.

The greatest predator and pest of bees could be man with our ill-conceived ideas of what is best for the bees and our destructive or disruptive influence on their natural environment. Our characteristic human tendency to attempt to transport or adapt organisms to foreign environments has led to all kinds of problems for both man and the affected creatures, including bees. The spread of Africanized bees and the mites are examples. The process of introduction and propagation of introduced genetic stock or species has not been completely in vain or without benefit, having been a boon to mankind in many instances. The whole beekeeping industry in America owes its origin to the introduction of "European" bees to this continent. It is only the introductions that may possibly become rogues or pests that we must be careful with, and that is a distinction that is impossible, or nearly so, to determine even by experts until the effects become apparent.

Due to the rapid growth of the human population and ever increasing demand for natural resources, including agricultural land, the options for placing apiaries in protected and favorable locations are becoming fewer. At some point, there must surely occur the need for controls on the expansion of urban development. What other socially acceptable modifications to our human affairs are needed remains to be seen, but be assured that whatever is proposed will likely not be to the advantage of beekeeping.

The greatest justification for maintaining a viable bee industry, and it is a powerful argument, is our part in sustaining and increasing food production through bee pollination of a variety of crops. One of our most valued exports (not American movies) essential to reestablishing a foreign balance of trade is American agricultural products. The sooner the public can be brought to the realization that honey bees are an integral and essential part of agricultural production the better the nation and the world will fare in any coming food crisis. BC

Larry Goltz, Editor, Gleanings In Bee Culture, retired, battles horses and ostriches in his beeyards near his home in Redding, CA.

A New Type Of MAKING MEAD

Robert Berthold

About five years ago, I devised a different way of making mead. For four years previous to that I had entered the Eastern Apiculture Society (EAS) mead competition. The first year my entry was marked down due to yeast sediment, and I took second place. Then I learned about racking, which allows the dead yeast cells to settle out, and the yeast-free liquid can be siphoned off the top. An old-timer told me that to produce clean mead it needed to be racked three times. I followed his advice and made a large batch, letting it settle (rack) for many months, then repeated the racking two more times.

At the next EAS conference competition I scored perfect on sediment, but lost points for cloudiness and again got second place. Roger Morse's book on mead mentions that some, but not all, honeys contain protein which produce a cloudy-colored mead. To eliminate this, the honey/water mix has to be boiled for 10 minutes to an hour. I went the 10-minute route with success. The next year I scored almost perfect in every category, except acidity, and again I got second place.

All the recipes for mead, except my new one, have citric acid as one of the ingredients. A brewing expert in our food industry department said that adding two grams (about a quarter teaspoon) of tartaric acid would solve the acidity problem. I am sure that citric acid would have worked just as well. This is the mead that I entered in this year's show and which finally won the grand prize.

The first time I made mead I took the worst flavored honey I had, diluted it with some water, added some baker's yeast I got from my mother, and put this alchemist's brew in an open crock. There was some fermentation, and a superior growth of mold on the surface of the liquid. The resultant "material" was ultimately thrown out.

Not being one to give up, I tried the USDA's instructions on making mead. After reading these, my next batch of mead included nutrients, precise dilution of the honey with water and the use of a fermentation lock. I used burned honey and baker's yeast again, though. When the fermentative process had ended, the finished product had the bouquet of burned bread – burned honey and baker's yeast.

We bottled this batch of poor tasting mead and moved it from grad school apartment to grad school apartment, then on to Doylestown, when I began teaching here. When we moved into our first home we thought about throwing away the well-traveled mix, but we decided to open a bottle and give it another taste. Important lesson number three in mead making (numbers one and two being use table-grade honey and yeast designed for making mead) is that mead improves with age.

Over the years two things have caused me concern when making mead. The first was obtaining the nutrients used in most mead recipes, specifically ammonium phosphate, urea, cream of tartar, tartaric and citric acids. Some wine supply stores carry these, and certain winemaking nutrient tablets work fairly well. The second was putting these chemicals into a beverage that I would be drinking.

A few years ago, however, a new concept in mead nutrients "dawned" upon me at a presentation by Dr. Fred Beam. He mentioned how the social structure in Kenya was deteriorating because the government passed new, stringent hunting laws. Men could no longer hunt, and so they spent their time at home. As a result, alcoholism became a serious problem. The primary alcoholic drink in Kenya is homemade mead, made by simply crushing combs containing honey, brood and pollen, and mixing this with water. The mixture is then allowed to ferment.

After hearing Dr. Beam's comments, I wondered if we could make mead using pollen, rather than the

TYPES

In the strictest sense the term mead refers to an alcoholic beverage made exclusively from honey, water, yeast, and nutrients.

A dry (not sweet) mead can be produced by using less honey – usually about three pounds of honey per gallon. A sweet mead, sometimes called sack mead, can be made by using more honey – usually about four pounds of honey per gallon.

Hydromel is a mixture of water and honey, sometimes made by boiling the two together, with or without fermentation.

Melomel generally includes fruit juices other than apple juice or grape juice.

Pymeat includes the use of grape juice or the addition of honey to grape wine.

Cyser includes the use of apple juice or fresh pressed apple cider to which no preservatives had been added.

Metheglins are made with herbs and/or spices.

Hippocras, named after the Greek physician Hypocrites, are made using medicinal herbs.

Bracket (braggot) is made from beer or ale with honey and sometimes spices.

chemicals mentioned above for our nutrient source. Our first experiment seemed successful, but we wanted to put our product to the acid test.

A potential problem with nutrients derived from pollen is that they vary appreciably, depending on source. However, we have made 30 different batches of mead, using pollen from a variety of sources, and we've found all to be quite acceptable. We have not experimented extensively with the quantity of pollen used in a batch but have used about five tablespoons per gallon each time.

General Procedures All containers used for fermenting and bottling mead should be clean. Eliminate foreign yeasts. Often, directions suggest sterilizing the initial water/honey mixture with sulfur dioxide (camphden or bisulfate) to kill all foreign yeasts. We have never done this and have not had any major problems.

Records Insignificant differences – the water used to dilute the honey, a five degree difference in the temperature at which the fermentation occurs – can play a major role in the final product. Keep a diary of what you do for each batch of mead that you make. Label the final product so you have a record of what you did to produce that bottle.

Honey The importance of the quality of honey you choose to make your mead can not be overemphasized. Non-table grades, such as those from the capping melter, make a product with a "robust" flavor. Also, I have twice encountered honey that had enzyme activity which prevented the growth of yeast (hence no fermentation) unless the honey/water mixture was first boiled.

The sweetness of your mead depends on the type and the concentration of honey you use. Some honeys, due to their sugar makeup, are sweeter than others. Generally, three pounds of honey mixed with three quarts of water produces a dry (not sweet) mead. Four pounds of honey with enough water to make a gallon produces a sweet mead.

Water Water is an often overlooked factor when making mead. Water quality can vary appreciably, which can influence the action of the yeasts as well as the final flavor of the mead. Some mead makers use wellwater or bottled water from a supermarket.

Decanting from old, yeast-laden bottle to sterile, new bottle.

Yeast Avoid using bakery yeasts. We have found that the acid-tolerant champagne yeasts lend themselves best to mead making.

In Summary

- **Keep a record of all ingredients and steps used.**
- **Try replacing standard nutrients with pollen.**
- **Use an electric beater to blend honey and warm water.**
- **Place mixture in fermentation vessel.**
- **Add sulfur dioxide producing materials to sterilize solution.**
- **Use acid-tolerant champagne yeast.**
- **Exclude oxygen and foreign yeast by using a fermentation lock.**
- **Ferment at 65°F.**
- **Store between 65° and 70°F.**
- **When fermentation ends, treat with sulfur dioxide and rack into a new sterilized container using a sterilized siphon. Repeat this two or three times during the remainder of the year before bottling.**
- **Ideally, store mead for at least 18 months for maximum flavor improvement.**

Dissolving the Honey For many years I dissolved the honey in the water by shaking the container. My wife suggested using warm water and an electric beater. Problem solved.

Non-Pollen Methods of Mead Making Most research on mead making has involved non-pollen nutrients. Since honey is composed primarily of sugars and water (with traces of vitamins, minerals and other substances), it is necessary to add nutrients, available from wine supply stores, to sustain the growth of the yeast. Those usually recommended are urea, ammonium phosphate, cream of tartar, tartaric acid and citric acid. Even though honey is highly acidic the actual amount of acid is low. Therefore to enhance both the fermentative process and the keeping properties of the resulting mead, tartaric acid and citric acid are generally added to the initial mixture. A general recipe for mead is as follows:

3 to 4 lbs honey (dry or sweet mead)

3 quarts of water

5 grams (about ¾ teaspoon) cream of tartar

5 grams (about ¾ teaspoon) ammonium phosphate

5 grams (about ¾ teaspoon) urea

2 grams (about 1/3 teaspoon) tartaric acid

2 grams (about 1/3 teaspoon) citric acid

Proper yeast (champagne yeast recommended)

Containers Mead can be made in just about any type of container, but I prefer to use glass containers with narrow necks. Old cider or vinegar jugs work fine for small batches, and five-gallon jugs obtained from companies supplying bottled water can be used for larger batches. These bottled water companies often have jugs with slightly chipped tops available at reduced costs. Check your local Yellow Pages under "Bottled Water."

Fermentation Lock Once the fermentative process has started in your fermentation container, it is important to exclude any foreign yeasts which could contaminate your ferment and produce a substandard mead. Oxygen must also be excluded, because if it is present during the later stages of the fermen-

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MEAD ... Cont. From Pg. 33

tative process vinegar will result.

In addition to commercially available fermentation locks, the same effect can be accomplished by inserting a plug of cotton in the mouth of the fermentation container, or covering the mouth of the container with a balloon in which a small hole has been pierced.

Temperature Although not absolutely critical, the ideal temperature for mead fermentation is between 65° and 70°F. This temperature range is also ideal for storing the mead later. The lower the temperature the longer the fermentation will take. This increases the likelihood of unwanted yeasts getting into the container and adversely affecting the end product. If the temperature drops too low, the fermentation process will stop. As the temperature increases above 70°F, fermentation proceeds more rapidly. This generally results in a proportionate decrease in the amount of alcohol produced. When all factors are ideal, it is possible to produce a mead with up to 15 percent (30 proof) alcohol content.

Fermentation Time At the 65° to 70°F temperature, fermentation will usually be complete within 21 days, when the mead should be treated with sulfur dioxide and racked (decanted) into a new container leaving the dead yeast cells (mother) behind. Every few months the sulfur dioxide racking procedure should be followed, and after a year the mead is ready for bottling.

Racking Racking is the technical term used for the separation of the mead from the dead yeast cells which accumulate during the process of fermentation. Synonymous terms are siphoning and decanting. Most books on mead making suggest letting the fermentation vessel stand for a period of months after fermentation is complete to allow the dead yeast cells to settle to the bottom of the vessel. Often the mead will pick up the bitter flavor of the dead yeast cells though. To avoid this, after fermentation is complete (21 days), siphon off the mead from the initial container into a second container which has been sterilized using one of the sulfur dioxide products. This leaves behind the bulk of the dead yeast cells and reduces the bitterness of the final mead.

Aging Mead's bouquet (flavor) greatly improves with age. The maximum benefit is achieved after about three years. It should be aged at least 18 months before it is used though most of us are not that patient. We suggest that every time you make a batch of mead you date and set aside one bottle, not to be sampled until *at least* its third anniversary. Doing this has converted many of us to making larger batches of mead and putting more and more bottles away for future use after proper aging.

Mead Shows Show mead should be bottled in clear glass containers with sloped shoulders and a slightly punted bottom. The bottle should be sterilized with sulfur dioxide solution. A new, clean, perfect cork should be used, and the level of mead in the neck of the bottle should be adjusted so that the distance between it and the bottom of the cork conforms to the show criteria. We generally overfill our bottle, hold the cork on the outside, measure down the side of the bottle's neck using a ruler, and put an elastic band around the neck indicating where the mead level should be. We use a straw to remove the excess mead from the bottle's neck. BC

Bob Berthold is Professor of Biology, Delaware Valley College in PA.

Richard Bonney

Perhaps you have been mulling over some idea for a new piece of equipment, or a new hive management technique. Perhaps you are intrigued by some aspect of the bees' activities or biology. Perhaps it is time to do something with that idea.

After reading an article in which specific items of beekeeping equipment are evaluated, have you ever wondered just where or how the evaluation process took place? For instance, in recent years there have been at least two articles in *Bee Culture* in which woodenware was acquired, assembled, and evaluated (Wooden World, February 1992, and Woodenworld II, January 1996). There has been one article on plastic comb, foundation, and frames (June 1997), and a promise of a later report on the actual use and acceptance of these items by bees. The editor has commented in passing on an ongoing evaluation of different types of paint and wood preservers for hive bodies and other woodenware. Where does all this happen? We would *like* to say it happens in the *Bee Culture* Testing Laboratory. However, no such laboratory exists, nor is one foreseen.

Generally speaking, testing and evaluation happens wherever the author of the article can make it happen – often a home workshop or a backyard apiary, occasionally in a more formal research facility. Usually, once the article is written, that is the end of it; the facility or equipment reverts to its earlier use. Occasionally something different happens, though.

After assembling and evaluating the equipment for the Woodenworld II article, we found ourselves with a substantial number of hive bodies, supers, and frames. What to do with them? Use them of course, but how? The *magazine* has no bee yards dedicated to pure research; the author (me) wanted no more hives. While we were looking for a good home for the equipment we decided to paint the hive bodies and evaluate the durability of some different types of finish. So paint we did, and that evaluation is underway.

Then, an article assignment came along to assemble, compare, and evaluate the different types of plastic foundation and comb available (June 1997). This in itself is a worthwhile thing to do but it does leave out the obvious – how do the bees like these various products? So another article was assigned. Get these plastic items into some hives and report on the results. We will have that report before long.

Since we had evaluated at least twelve different plastic products, we needed that many hives. We had a good start on that with the painted hive bodies just mentioned, and we also had a local beekeeper, Tim Black of Hadley, Massachusetts, a sideliner who was interested

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TESTING LAB ... Cont. From Pg. 35

in expanding his operation. He agreed to establish an experimental beeyard at one of his sites and provided such equipment as was needed to supplement our painted and now plastic-equipped hive bodies. This yard was set up in the early summer of 1997, and we immediately had two studies in progress – the comparison of our different wood finishes, and the evaluation of the bees acceptance of plastic comb and foundation. We will be reporting on both of these studies in future articles.

Of course, problems do arise. The new yard was an outyard, although not a particularly remote one, in the town of Hadley where Tim has lived and kept bees for several years. The owner of the property called one day to report that a bear had just visited the bee yard. As it turned out, the damage was small. One hive was overturned and the frames mostly destroyed; the other hives weren't touched. We assume from the minimal damage that it was a young bear, easily deterred on its first encounter with bees. Fortunately, the damaged hive was one of the two "control" hives we had set up for comparison. It contained no plastic, just conventional wooden frames and wired foundation, easily replaced. The painted bodies were intact so we were able to continue using them.

The property on which this yard was located is a farm, and the 70 year old owner was born and has lived there all his life. He said that this was the first bear he knew of ever to be seen on the farm or anywhere in the neighborhood. This is the story in western Massachusetts and in many other parts of the country, too – an ever increasing number of black bears appearing in places where they have not been seen in modern times. The bee yard was immediately moved to a more secure area – although no area is truly secure. The number of bears in Massachusetts has increased from perhaps 400 in 1980 to at least 1,500 today, mostly in the western third of the state, and the bears are bolder than ever before.

Well, this is all very interesting (I think), but where does it lead? First, we will have reports on the ongoing studies as mentioned. No doubt we will think of other studies we can undertake. Perhaps you, our readers, have some ideas. If so, let's hear them. But beyond that, you too may wish to do some studies. Perhaps you have been mulling over some idea for a new piece of equipment, or a new hive management technique. Perhaps you are intrigued by some aspect of the bees' activities or biology. Perhaps it is time to do something with that idea.

Looking back at the evolution of beekeeping over the last two hundred or more years – as a craft, as a business, as a hobby – we can see that individual beekeepers have played a huge role in that evolution as they have observed, thought, experimented, and commented. Most specific discoveries, concepts, or innovations in equipment and management techniques can be traced to specific individuals; Huber, Quinby, Langstroth, Hrushka, Miller, Porter, and Doolittle, are just a few of them. Other names could be identified from more modern times. Some of these individuals were backyard beekeepers, others were sideline or commercial operators.

In more recent years scientific research has made many discoveries and has added greatly to the body of information about bees as insects and as organisms, but unfortunately, much of what the scientific community has discovered lies hidden in difficult to read scientific journals, sources that are not readily available to most beekeepers, or if available, not readily understood. Even when understood, the information is seldom easily translated into the principles and practices of hive management.

Individual beekeepers still have a large, large role to play in the continuing accumulation of knowledge and understanding of bees, and we do see that happening to an extent. Often though, individuals have no idea how they might contribute. In fact, many don't believe that they can make a contribution to the greater body of knowledge. Each of you can, though.

Do it by establishing your own study site, your own beekeeping laboratory. It doesn't need to be large, complex, or formal. Perhaps it will be as simple as a single observation hive in an out-of-the-way place in or about your home. Perhaps it will be a single hive, or even a nucleus hive. For a few it may be a bee yard – large or small. Whatever you choose, its role will be to serve as a place where you can feel free to observe and experiment without undue concern about the hive or the yard as a production unit. Make your choice, set it up and start to observe, to ponder, to dabble. Have some order to your activities, however. Make a list of possible activities that interest you, and have a fair idea where you are going as you start. Perhaps you will deviate from your plan but that's fine. It is only a plan.

To help you get started, here are some possibilities. Expand or modify them to suit your interests and beliefs. You can no doubt think of many more, and for

those of you with access, the Internet abounds with beekeeping questions and ideas that can be converted to experiments.

- Color some sugar syrup with food dye and feed it to a colony. Periodically, observe the storage pattern in the comb as outlined by the color. Feed two colors in separate feeders simultaneously (or perhaps sequentially) and again observe the storage pattern. Keep in mind that nectar will be coming in as well. Try this experiment in different parts of the season. A suggestion to anyone doing this – use new, light comb and plenty of dye so the patterns will be clearly visible.
- As an extension of the foregoing, feed colored syrup to a newly installed package colony or swarm that has been hived on foundation.
- We read a lot about bee orientation and how well or not well a colony can do in finding its home if the hive is moved a short distance. Move a hive 10 or 20 feet and watch the results as the foragers come home. Do they find the hive? How quickly? What happens if you move the hive forward or backward? What happens if you move it sideways? What happens if you move the hive a greater distance, or behind a visual obstruction?
- Change the orientation of a hive. That is, turn the hive end for end. How long before the bees are reoriented to the new entrance location? Turn it again in a few days, and again in a few more days. Do they reorient any faster? Does this ongoing action do anything to their behavior?
- Set up two new colonies side by side, one started from a package, one from a nuc. Observe and compare their progress over the season.
- There is some indication that taking a nuc from a colony can be beneficial to that colony. Select two overwintered colonies that seem equal in strength and potential. Take a four or five frame nuc from one but not the other. Observe comparative progress as the season progresses.
- Simulate a colony in a hollow tree. That is, make an observation hive in the form of an empty cube about 10 to 12 inches on a side, with two or three glass sides. Stock this hive with one to two cups of bees and a queen. Observe.
- Set up a two queen colony. Keep in mind that there are many ways to establish and maintain such a colony, and opinions on the worth of this management technique vary. Negative opinions abound, but we hear success stories as well.

"Unfortunately, much of what the scientific community has discovered lies hidden in difficult to read scientific journals, sources that are not readily available to most beekeepers, or if available, not readily understood."

Most of these activities will take place over a period of time. As you proceed, keep notes. You may wish to report on your findings, or redo your original work with variations. Memory is fallible; do not depend on it. Write it down.

Then, what if you do want to report on your findings? How should you do that? Start talking. Tell other beekeepers. Get others interested and exchange information. Give a presentation at your local bee club. Talk about it on the Internet. Write a letter-to-the-editor. Write an article; newsletters and magazines are always looking for new material.

There is no telling how important some little scrap of information may be that you have gleaned from your observations. Put it out there for all to see. BC

Richard Bonney is the retired Extension Educator for the State of Massachusetts, and a regular contributor to these pages.

NOT IN ANY BOOK

Honey Flows are work, but it's good work.

James E. Tew

This is the season for the payoff. The nectar flow is at hand. The past winter's challenges are only faint memories now. As you stand in your bee yard, it seems impossible that just a few months ago, Winter winds howled and you worried for the welfare of your colony.

In the perfect bee world everything is at the ready. Queens are productive, the spring has been mild, supers are painted. You are even ahead of the grass-cutting in all your yards and the skies are always blue. Poppycock! This is the stuff of beekeeping daydreams - little more than mind wandering. Rare is the beekeeper who can allocate so much preparation to the bees and their needs - even though we all wish for the perfect world. In the real bee world, competent beekeeping seems to be more "response" rather than "anticipation". Sometimes things just get away from you and your bees.

What do you mean the nectar flow has already started?

Well, the best you can do is about all you can do, but once the flow is underway, your bee clock is running. Putting supers on late is like trying to sell a bus ticket for a trip that took off last week. It cannot be recovered. The signs of a colony about to be supered too late, or have been supered too little are unmistakable. You'll have obvious difficulty getting the outer cover and inner cover off the colony. The bees will have soundly stuck the tops down with heavy burr comb filled with honey. Frames are difficult to remove. Everywhere you crush bees and string honey all over. It's just a general, sticky mess.

You, too, can make this much honey, but you've got to avoid the mistakes, and focus on the right things to do.

What to do. Well, this situation is rather simple. If there is any of the flow left, put supers on. If the flow is ending, you missed it. Nothing you can do now. I suggest you use what time remains to clean up the burr comb and make the colony manageable again. Letting this go until "another time" will only continue to make this colony difficult to manipulate. It's a good idea to always have the top super empty. Bees need space to spread nectar in order to evaporate moisture from it. If the top super is nice and full, you probably lost some part of the honey crop.

I got the supers on before the flow started, but still no honey crop. The bees didn't use any of the supers. Now what?

A common reason for a seemingly strong colony not to produce a crop is a long-gone swarm. Most experienced beekeepers think they can tell when a colony has swarmed - even if they have not been in the colony in several weeks, but it's more difficult than you think. A common scenario goes something like this. After working a good colony several weeks ago, you noted that the future looked good for this unit. After all, you gave it a good mite treatment late last winter, it has a good queen, and is building up very well. Several weeks later, you quickly revisited the yard and put supers on. You didn't go into the brood nest, but entrance activity looked good and you had miles to go before you could sleep. Now that

you are taking off empty supers, everything is disappointing, isn't it? You return to a colony that had promise in the spring only to find all your supers empty and the colony actually a bit run down. In many cases this is due to that lost swarm.

Of course, there are several other common problems that can cause a colony not to produce a crop. The main ones are diseases, such as the Foulbroods or predaceous mites. Additionally, sometimes the queen's offspring are just not good producers. It is not always easy to tell what causes a crop failure when other colonies made one.

I bought some bee equipment at an auction and now that the nectar flow is on, the bees seem to be putting burr comb everywhere and sticking things together throughout the hive.

I'll bet you that there is a problem with the equipment not being exactly compatible. We've all been told that equipment is this country is "standardized" so why would this cause a problem? In fact, most equipment pieces from different manufacturers will interchange reasonably well, but it is not *completely* interchangeable. It doesn't take much variation for the bee space to be off enough for the bees to put excessive amounts of burr comb in the supers. Then both you and the hive are stuck.

What to do? Honestly? Most of the time beekeepers continue to use the faulty equipment until it wears out. Of course, everything depends on how badly the equipment is out of whack. Equipment that is not exactly standard is never a bargain - *no matter how cheap.*

Another variation on this theme is a sneaky little assembly error that can cause equipment not to be compatible. The ledge on which the frames hang in the super is called a rabbet (or rebate) and must be 5/8" deep in order for the frames to hang correctly. A super having a 5/8" rabbet uses a "flat tin" to protect the wooden edge that the frame sits on. In reality, no metal is actually required, but a metal edge protects the wood surface when propolis is scraped from the rabbet. Some rabbets are cut at 7/8" in order for special, metal rabbets or frame spacers, to be installed that will change the height from 7/8" to the required 5/8". Here's the problem, if the metal rabbets are interchanged (a metal rabbet intended for a 7/8" is used in a 5/8" rabbit and vice versa), the bee space will be off by 1/8" - either high or low depending on the error. Either error will cause the common problems of heavy burr comb production and accumulation.

What to do? Rip out the faulty tin or spacer and install the correct one. If the super was manufactured incorrectly and the rabbet in the box is less than 5/8" deep, it's probably not worth repairing. Use as is or toss it.

How did my queen get a brood nest established above the excluder and into the supers?

In general, I recommend using queen excluders. (There....., I just offended at least 50% of the beekeepers in this country.) Though not practical for commercial honey production operations, hobby or sideline beekeepers can make good use of the devices. They allow for increased speed-of-operation later in the season when the honey crop is removed. However, it's common knowledge that many beekeepers say that excluders inhibit honey storage in the supers. Be all that as it may, the situation now is that the queen is *above* the excluder and she has a brood nest there in the supers. This situation is especially common when excluders are not used.

What to do? Unless you are in an area with a long flow, you can pretty well forget a honey crop from this hive this year. Essentially, your hive was crowded for space, and one of two things happened. Either you unknowingly trapped the queen above when you put the excluder on the hive or the excluder is damaged and has allowed the queen to sneak through, which is not real hard to do. There is no easy way to tell what happened. I suggest you attempt to find the queen and put her back down below a different excluder and allow the brood to emerge above that excluder. Obviously, this will take a few weeks. It would be helpful to put a frame of uncapped brood in the brood chamber if there is no brood at all in the brood chambers. Later in the season, remove the supers after all the brood has emerged.

This colony will tip over soon. The pallet isn't stable, and another super will put the weight over 300 pounds.

I left a division board feeder in the colony during the nectar flow. Now it's filled with comb and honey . . .

I'm not sure if this is a problem or an inconvenience. It's common for crowded bees to fill division board feeders with comb and honey when space is limited. In many instances, the bees will clean it out and either use the honey or move it to other locations within the colony. Either way, the honey within the feeder is lost as part of the surplus crop. But many beekeepers like to have pieces of comb within division board feeders for to serve as ladders for the bees to use when taking sugar syrup from the feeder. Though it's just one more thing to do, internal feeders should be removed before the nectar flow starts.

I've got my colonies supered up and a good flow is on, but I've been told I have to move the yard. How do you move a colony with supers on it?

In beekeeping, nothing is for sure. Just when you think a yard is in place something changes and the yard has to go. The colonies are supered and are tall and heavy.

What to do? Though it could be done in a pinch, for two obvious reasons - weight and height - you probably don't move a colony with supers on in place. Extra bottom boards and

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ANY BOOK ... Cont. From Pg. 39

tops will be needed to split the supers off from the brood chambers along with the bees they contain. Just treat the supers as a colony. When the new location is reached, put the appropriate set of supers back on the brood chambers from which they were removed. Recombining the bees and equipment will not be a problem if they are separated for only a few hours. Nylon ratchet straps do a great job of holding colonies together for a move and are reasonably priced.

Though not the same problem, but in the same arena, beekeepers should expect the colonies to be very heavy when the full crop is on. This weight gain occurs slowly and is not immediately noticeable. Frequently, what appears to be a great hive stand will either sink into soft ground or will shift in such a way that your tall colonies look like the "Tower of Pisa" as the top-heavy colonies shift their weight. Just remember, a colony with two deep brood chambers and two full medium honey supers will weigh between 200 and 300 pounds. More, when more honey is made. Select a good spot first, so you don't have a problem later. It will be tempting to jam a stick or stone under a corner, but that will put stress on that corner of the bottom board. It will be much better to use a flat board or a flat brick that will give more support to a greater load-bearing surface of the bottom board.

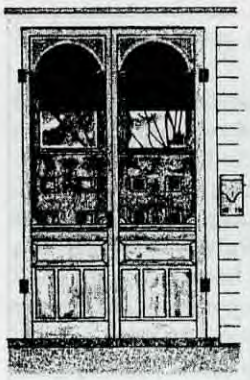
I tried to make some splits early last spring, but the splits are too small and are not building up well. I put new queens in the colonies. How can I add bees to these colonies now and not get the new queens killed?

Just as there are no clear-cut procedures for making splits, there are no clear-cut procedures for increasing the strength of a split after the queen has been introduced and accepted. Everything is estimated. Why did the splits not built up? Frequently the reason is that too many of the adult bees drifted back to the parent colony.

What to do? Population can be added either quickly or slowly. Adding bees slowly is a bit less work and risk, but takes more time for the split to build up. An occasional frame of capped brood can be added to the weak split along with a few adult bees that are clinging to the combs. Alternatively, the adult bee population could be increased much more quickly just by interchanging the split with a stronger colony, but the queen would need to be re-caged and then re-released. There would be no way to safely add so many adult bees without jeopardizing the queen's welfare.

During the Spring and early Summer, honey bees are generally in a good frame of mind. There's plenty of forage and a high percentage of the hive's population is out forging. It's a good time to make necessary changes. Getting rid of old frames, clearing out burr comb, cleaning up the yard, painting equipment, or leveling colonies, are tasks that the colony will tolerate better when a good flow is on. Though falling behind is common, don't stop trying to stay ahead of things. They only get worse. BC

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



Ann Harman

Home Harmony

Biscotti, Biscotti, Biscotti And More Biscotti

Although we don't normally think of foods as being fashionable or a fad, certain foods rise in popularity and then diminish, but never really disappear. Presently biscotti seem to be popular. They have been around since the 13th century, so I guess one could say they never really disappeared. This tasty, cookielike treat is crispy-crunchy, some not overly sweet, and is designed to be dunked - in your choice of hot coffee or a glass of cool milk.

Biscotti means "cookies" or "baked twice." Many of the recipes for biscotti call for baking dough shaped like a loaf, then slicing it and baking again until crisp. Some recipes call for making a log shape, baking it, then slicing, but not baking it again. Still other recipes treat the dough just like you would a cookie.

Whatever shape or method of baking, Italians dunk biscotti in coffee, perhaps at breakfast, or in wine. Biscotti make a super midmorning or midafternoon snack to renew your thoughts or while you are deciding what needs to be done next.

Some recipes for biscotti call for honey, while others use small amounts of sugar. In these recipes honey can be substituted for the sugar. However, recipes for biscotti that call for large quantities of sugar, say one or more cups, may not be successful if honey is substituted. Honey gives a soft consistency to baked cookies, but biscotti are supposed to be crisp in order to withstand dunking.

BISCOTTI WITH SESAME

Almonds are the most common addition to the biscotti dough, but you can use other nuts and seeds. Revise and individualize the recipes to suit your taste. Since these recipes use honey, keep the biscotti in a tin to keep crisp for dunking.

1/2 cup butter OR nearly 1/2 cup oil
1/4 cup honey
2 tablespoons light cream
3 large eggs
3 cups unbleached white flour
2 teaspoons baking powder
freshly grated rind of 1 orange
2 tablespoons fresh orange juice
1-1/2 cups (approx.) toasted sesame seeds
milk

Cream butter or oil and honey; add cream and eggs; beat thoroughly. Gradually add dry ingredients, orange rind and juice. Turn out onto floured pastry board. Add enough flour to make a smooth dough. Form into long rolls about 1 inch in diameter. Sprinkle area generously with sesame seeds; roll each length through seeds, pressing them into dough. Roll several times, if necessary. When finished, rolls should be 1/2-inch in diameter. Slice diagonally into 4-inch lengths. Brush with milk. Place on greased cookie sheet. Bake in 375° oven until golden brown. Yields about 5 dozen

HONEY ALMOND BISCOTTI

This next recipe contains the traditional almonds but also includes some fruit for a delightful variation.

1/2 cup butter or margarine
3/4 cup honey
2 eggs
1 teaspoon vanilla
3-1/2 cups all-purpose flour
2 teaspoons ground cinnamon
2 teaspoons anise seed
1/2 teaspoon salt
1/2 teaspoon baking powder
1/4 teaspoon baking soda
1 cup dried cranberries or candied cherries
3/4 cup slivered almonds

Cream butter in large bowl with electric mixer; beat in honey, eggs and vanilla. Combine flour, cinnamon, anise seeds, salt, baking powder and baking soda in small bowl; mix well. Stir into butter mixture. Stir in cranberries and nuts. Shape dough into two 10x3x1-inch logs on greased baking sheet. Bake in 350°F oven about 20 minutes or until lightly browned. Remove from oven; cool 5 minutes. Remove to cutting board. Reduce oven temperature to 300°F. Cut each log into 1/2-inch strips; place on baking sheet. Bake about 20 minutes more or until crisp throughout. Cool completely on wire racks. Makes 3 dozen cookies.

Sweetened Naturally With Honey
National Honey Board

ALMOND BISCOTTI

This almond biscotti is decorated with chocolate. Dunk it in a steaming-hot cup of coffee for a real treat.

1/3 cup margarine or butter
2 cups flour
2/3 cup honey
2 eggs
2 teaspoons baking powder
1 teaspoon vanilla
1-1/2 cups slivered almonds or hazelnuts, finely chopped
1 beaten egg yolk
1 tablespoon milk or water
1 cup milk chocolate or semisweet chocolate pieces
2 tablespoons shortening

In a large mixing bowl, beat the margarine or butter with an electric mixer on medium to high speed about 30 seconds or until softened. Add about half of the flour to the margarine. Then add the honey, whole eggs, baking powder and vanilla. Beat until thoroughly combined, scraping sides of the bowl occasionally. Then beat or stir in the remaining flour and nuts. Divide dough in half. Shape each portion into 9x2x1-1/2-inch loaf. Place loaves about 4 inches apart on lightly greased cookie sheet. Stir together the egg yolk and milk or water. Brush mixture over loaves. Bake at 375° for 25 minutes. Cool on the cookie sheet for 30 minutes. Cut each loaf diagonally into 1/2-inch thick slices. Lay slices, cut side down, on an ungreased cookie sheet. Bake at 325° for 8 minutes. Turn slices over. Bake for 8 or 10 minutes more or till dry and crisp. Remove and cool on wire racks. In a small saucepan, melt chocolate pieces and shortening, stirring occasionally. Place cooled cookies flat side up on waxed paper. With

a spoon, drizzle chocolate atop cookies or dip cookies into melted chocolate. For a design, run a fork or the tip of a knife through the chocolate while still soft. Let chocolate set up before serving. Makes about 30.

Cookies, Cookies, Cookies
Better Homes and Gardens

HONEY OAT BISCOTTI

1/2 cup butter or margarine
3/4 cup honey
2 eggs
1 teaspoon vanilla
2 cups flour
3 teaspoons cinnamon
1 teaspoon baking powder
1/2 teaspoon baking soda
1/2 teaspoon salt
2 cups quick-cooking rolled oats
1/2 cup chopped nuts

Cream butter in large bowl with electric mixer; beat in honey, eggs and vanilla. Combine flour, cinnamon, baking powder, baking soda and salt in small bowl; mix well. Stir into butter mixture. Stir in oats and nuts. Shape dough into two 10x3x1-inch logs on greased baking sheet. Bake in 375° oven 12 to 15 minutes or until lightly browned. Remove from oven; cool 5 minutes. Remove to cutting board. Reduce temperature to 300°. Cut each log into 1/2-inch strips; place on cookie sheet. Bake 25 to 30 minutes or until crisp through. Cool completely on wire racks. Makes 3 dozen cookies.

Sweetened With Honey
National Honey Board

ALMOND HONEY CAKES

This next recipe is the log-style biscotti. It makes quite a large quantity which can be useful. You can certainly store some in the freezer to dunk at a later date. Or perhaps you would like to make some for gifts. This would be a wonderful recipe to use for celebrating National Honey Month later this year. You need 2 pounds of honey. The recipe calls for dark. If you have a nice flavorful honey, use that, even if it is not too dark.

8 cups flour
1/2 cup sliced toasted almonds
freshly grated rind of 1 orange
1/2 teaspoon cinnamon
1 egg
one 2-pound jar dark honey

In a large bowl mix flour, almonds, orange rind and cinnamon. Form a well in the center. In a small bowl mix egg and honey; then pour mixture into the well in the dry ingredients. Gradually draw in the flour and mix thoroughly. Dough should be smooth. If sticky, add more flour as necessary. Take a piece of dough and, with floured hands, roll into a rope 8 inches long, 2 inches thick. Make 24 ropes in all. Flatten slightly and put on cookie sheets. Bake at 375° for 20 minutes. Cool on racks. Wrap individually and store in refrigerator or freezer. Slice each rope in 1-inch-wide pieces before serving. These are hard when freshly made but soften after some time. Makes 8 dozen.

Festa
Helen Bardini

BISCOTTINI WITH HONEY

This next recipe will make a cookie, but it will be a traditional Italian cookie, suitable for dunking. Use a flavorful honey.

2 cups flour
1/4 cup honey
2 tablespoons butter or margarine
1 egg
salt
2 teaspoons baking powder
milk
butter and flour for baking sheet

Sift flour into a bowl. Make a well in the center. Heat honey and butter together, stirring until well-blended. Beat the egg with a pinch of salt. Dissolve baking powder in 2 or 3 tablespoons of milk. Pour the honey mixture, the egg mixture and the dissolved baking powder into the well in the flour. Cover with the flour and mix to a smooth dough. Roll on floured board to about 1/8 inch. Cut into shapes. Rub baking sheet with butter, sprinkle with flour. Arrange shapes well apart. Brush with milk. Bake at 375° for about 10 minutes or until light brown. Cool. These will keep in a tin for a long time.

Italian Regional Cooking
Ada Boni

Now all you need is that cup of hot coffee or a glass of nice Italian red wine for dunking your biscotti.

INNER ... Cont. From Pg. 6

and unpredictable supply of honey bees for any aspect of crop production is not only foolish, but unsafe. I'll tell you what happens. With the advances in genetics, gene manipulation and the like, some ambitious grad student will devise a plant that is completely independent of pollinating agents – honey bees. It will start small, probably with small, fast growing crops. Like vegetables, both for food and seed. Then forage crops like alfalfa. Then bigger crops. Then finally the really big crops. It will take a decade or so to turn around, but it isn't hard to imagine a honey bee-free production schedule for some, or even most of these crops.

And it will spread, fast. Once the technology is fixed on the first crops the rest will follow. Look at herbicide resistant soybeans, and insect resistant corn and canola. And pretty soon, apple orchards won't need bees. Vegetable growers won't need bees. Seed producers won't need bees. Almond growers won't need bees. Nobody will need bees. Nobody. In fact, even honey producers will be at risk here because honey producers have always said that was the income part of the job, while pollination was the service part of the job. Who will listen when we can import all the honey we need, and nobody needs pollination. Who?

If our bees and feral bees aren't doing the pollinating job we say they are, why should anybody treat us any different than, say, dog owners, or fish farmers. Then they simply become a stinging insect that may, or may not be allowed inside city limits, on trucks and near homes or farms. The 'special' will be mostly gone, and we may be mostly gone.

You may think this is nuts. That the need for bees will never be gone, and that we will continue to be 'special' because we make honey and provide pollination for whatever needs pollination. Well, maybe. And, up to the time when scientists began manipulating genes and custom designing plants I would have agreed with you. No more.

What to do? If you believe there is no problem, that I'm wrong, then do nothing. Sit back and smirk at that unprepared grower, smug in the knowledge that your bees are doing something important, for someone else.

Or, perhaps it's time that we reassess the situation. Perhaps it's time we figured out how to give this unprepared grower a hand (for a reasonable, and profitable fee certainly). Perhaps it's time we put our bees where our propaganda has been all these years. Perhaps it's time we got off our collective duff and earned the image we have been proclaiming all these years.

If we don't, if we ignore this grower and the thousands like him, that ambitious grad student will figure this out. And that grad student will be famous for freeing growers from the unreliable and inconsistent honey bee. A New Johnny Appleseed will be born. And that instant-star Johnny Appleseed will succeed at *our* expense because *we* couldn't figure out how to get eight colonies of bees out to that orchard. What a waste. What a shame. What a mistake.

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In the center of the magazine this month is a gift. Produced by the American Association of Professional Apiculturists, this information-packed eight page booklet has gathered and explained all that is important in understanding and controlling *Varroa* mites in your colonies. I suggest that you read this booklet. Then read it again. Rather than a 'regular' article on these pages, we choose to give you this booklet so that you could isolate it, keep it separate from the rest of the stuff that arrives daily and weekly and monthly and find it when you need it. And you need it, as a reference for your bees, to answer questions from others and to remind yourself that *Varroa* is, was and will continue to be a situation that needs to be monitored, measured and controlled.

There are, at the moment, few alternatives available to most of us if we run into those mites. Essential oils have been bandied about as the cure-all for mites, and some appear to offer a level of control. The numbers are shaky, and the best I've seen with good numbers still hover around 70%, similar to formic acid control. Now 70% isn't bad when there are no alternatives, and that certainly is better than losing a colony. Even if you need to treat more often, at (probably) more cost.

Similar claims have been made about mineral oil. Again, answers to what level of control and for how long that control lasts are harder to find, but seem similar to the other oils.

Maybe all of these are better than that but I haven't seen the hard numbers, and their legal use is, at best, still in question.

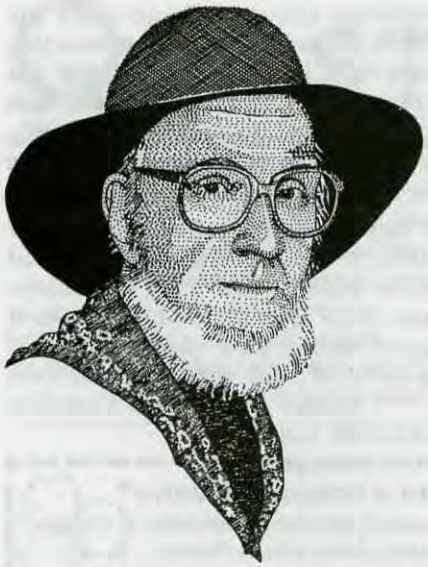
Nevertheless, the booklet in the center of this issue is full of information, regardless of what treatment is being, will be or might be used. It's all in the timing. In fact, the timing is critical. Miss the window and your bees will be missing. Simple as that.

Which brings me to another, somewhat related subject. Last month I discussed my visit to the EPA offices in Washington with representatives from Bayer Inc. We went to ask for a ruling on a new product Bayer has to control *Varroa*. The chemical in question works, but because it is an organophosphate there seemed little chance that anything positive would happen, relative to registration, because of the mandate from congress on food and quality production. We left the meeting with the 'don't call us, we'll call you' feeling from the EPA officials.

That has changed. Shortly after we left those same EPA folks received a memo from Vice President Al Gore to, essentially, lighten up and let farmers be farmers until there were more answers than questions. So EPA lightened up, a bit anyway, and asked Bayer to come back and talk about protocol tests for their new product. Early indications are that this new product, and perhaps others will soon join Apistan and formic acid in the arsenal of weapons we have against *Varroa*. Some doors have been opened that weren't open before. This is good news. But, and there is always a but, it means yet another chemical in our beehives. One more that we have to use safely. One more we have to beware of. One more cost.

Whatever your feelings on this, the booklet in the center will be an aid in controlling *Varroa* mites in your colonies. Read it. Use it. And if you want, we'll get you some more, for those in your association that don't get this magazine, at very low cost.

Kim Flottum



Richard Taylor

Bee Talk

"There is really no excuse for letting your colonies get AFB, especially in an area like mine, where it is not a constantly recurring problem."

I have often noted in these pages how every season is different with the bees. Every year brings surprises, some of them pleasant, some not. Well, this year got off to a very bad start for me. On my first visit to one of my apiaries, when it was still too early to be opening hives, but warm enough to check for any Winter loss, I discovered that half the colonies appeared to be dead. Very discouraging, when they seemed to be in such good condition for Winter when I did my final check in the Fall. I went on to the next apiary, a small one of only a dozen or so hives, and it looked like only two had survived, compounding my depression. The worst, however, was yet to come. When it turned nice and warm a week or so later, I went to that first apiary and opened one of the dead colonies. It had a bad smell. I took out a couple of combs, and saw that the brood had clearly died of disease – broken cappings, dead brood in various stages, and that distinctive smell; not just the decaying odor of a Winter-killed colony, but something else. So I took a look at the hive next to it, also dead, and found exactly the same thing. Oh dear, what a way to start the new season.

American foulbrood has never been a significant problem in my beeyards. The last time I found a case of it, many years ago, it was the result of my own carelessness. I needed a super, so I picked up an old, used one from a friend, who warned me that it had come from a hive with AFB and had never been sterilized. I went ahead and used it anyway, and sure enough, the colony came down with AFB. I should have known better. Live and learn. But other than that, I hadn't seen the disease in my yards for decades, and had never found it in my yards in this area, with the sole exception just mentioned.

So, even though these combs looked like AFB, I had trouble believing that this was what it was. A few years ago, when I was visiting beekeepers up in Maine, Mr. Tony Jadczak, the leading bee expert in that state, had shown me two diseased brood combs which looked almost exactly alike, one of which was a sample of AFB, but the other was a sample of a virus associated with *Varroa*. So naturally I thought that maybe the latter was what was wrong with my bees. I went right home and telephoned Mr. Jadczak, who was on his way out to a meeting of berry growers; but he took the time to describe all the tiny, subtle differences in the diagnosis of these two diseases. It was too subtle for me; one minute the combs looked like one thing, then as I looked closer they looked like the other. But I began, more and more, to suspect AFB. If it was the virus, then I wouldn't have much to worry about; I could go ahead and restock the hives. But if it was AFB, then I'd have to burn them. All very depressing.

I hadn't checked the other dead colonies yet, only these two. Was I going to find that they all had AFB? And what about the colonies that had survived? Maybe I would find they all had it, too! Darkness settled over my spirits, and I didn't sleep very well for a couple of days.

The next warm day I went back to check the rest of the hives in that yard and, as I did my spirits were lifted. Only three of the dead colonies – those I mentioned earlier and one other – were diseased. The others were okay, so far as any possible AFB was concerned. So then I went over to the other apiary, to check every one of those hives. And not only were they all free of disease, there was almost no Winter loss there at all, contrary to what I had surmised on my first visit.

But it still wasn't clear in my mind whether those three hives had died of AFB, or of the virus. So I took one of the combs to one of my beekeeper friends, who has had a lot more experience with AFB than I have, and we probed the cells with pieces of straw. Pretty soon, sure enough, we found a couple that produced a stringy, ropelike strand as we withdrew the straws. That is diagnostic of AFB.

Now a strong and vigorous colony of bees can, if it gets a few cells of AFB, clean them out, but when you've got a whole set of diseased combs, and a dead colony, then you've got to burn those combs and scorch out the inside of the hive. There is no other way to deal with AFB.

So that is what I did. I dug a shallow pit, put a few diseased combs in it, poured a bit of kerosene over them, and got them to burning, adding more combs as the fire grew.

Continued on Next Page

BEE TALK ... Cont. From Pg. 45

It is dispiriting work, seeing once valuable equipment go up in flames, and my labor invested in it lost. And the job is not overwith quickly. Beeswax burns for a long time, and when there is honey oozing from the combs it takes even longer. And I had to be careful, that the fire did not spread to the dry grass, threatening farm buildings nearby.

I think that what has bothered me as much as anything else in this whole experience is a sense of humiliation. Here I am, a lifelong beekeeper, with decades of experience, someone who should know all about bees by this time, and I get tripped up by something like this. It made me feel like a fraud and a fool. I was going around to people who had not been born yet at the time I started keeping bees, to to ask their help with something so elementary as the diagnosis of AFB. I have, to be sure, done the routine dusting with terra each Spring, but I have not been methodical about it. Some years my hives got only one dusting, and this was done in a halfhearted way. Not this year! I have already treated each colony twice, doing a thorough job, and I'll do it one more time. There is really no excuse for letting your colonies get AFB, especially in an area like mine, where it is not a constantly recurring problem. BC

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

Questions?

Swarming - Again!

One of my hives swarmed and I hived the swarm in a new hive about 10 feet away with nine frames of foundation and one comb of honey and pollen from another hive. Two days later they swarmed again. How come?

Burt Millette
Hampstead, NC

Contrary to what one might suppose, a comb of honey has no attraction whatsoever to bees *except* to provide something (honey) to cart back to their hive. Your bees had no hive to cart it back to, and the fact that you had induced them to enter a new hive did not mean they thought of it as theirs; it was just another place to cluster while the scouts continued their search for a new nesting site. To make a swarm stay put in a new hive you sometimes need to give them a comb of brood, which they are very reluctant to abandon.

High Voltage Affect

Are bees affected, in their navigational system or otherwise, by the proximity of high-voltage lines?

James M. Mews
Two Rivers, WI

I have never heard that this has any effect upon bees, and find it difficult to believe that it could. Any reader with clear evidence to the contrary is urged to let me know.

Heat vs. Lye

I don't like the idea of boiling frames in lye water to kill AFB spores. A book I consulted stated that the spores are killed at 100°C in 10 minutes. If I put the frame in an oven at 250°F for 15 minutes, would that work? And if I use a small propane torch on the insides of the hives, is that sufficient to decontaminate them?

Name Withheld

The figure the book gave, in centigrade, is equal to 212°F, which is the boiling point of water. So boiling water should be sufficient to kill AFB spores. The purpose of adding lye to hot water is to dissolve the wax, and it does this very effectively. The oven idea would work, except that the wax would melt and drip into the oven, creating a fire hazard, as well as a mess. As for the propane torch and the hives, this is okay provided you get heat into every crack and crevice. It is simpler and quicker to use a bit of kerosene, drop in burning newspaper, creating a chimney effect, then smother the flames before the hives catch fire. Lye is safe enough for treating frames, provided you use good sense, adding the lye slowly before the mix begins to boil. It should be done in an outbuilding or-out-of-doors; and wear goggles, just in case.

Comb Honey Production

I want to produce comb honey using your system of one-and-a-half-story hives with the shallow part on the bottom. When is the best time to switch the two stories around so as to have the full-depth one on top? Also, you have written that the shallow story will serve as a queen excluder by having honey stored in it. But if the deep is on top, will the bees store honey in the top of that to get the same result? Is the medium-size, Illinois super too large to serve as the half-story? And finally, what do you think of using the special 7-11 comb honey foundation to discourage the queen from laying in the comb supers?

Dale Toniolo
Grapeville, PA

The reason for using a story-and-a-half hive for comb honey production is that a single-story hive is apt to be too small for Wintering the colony, and a Fall two-story hive is too large, for the bees are then too slow to get to work in the supers. It does not make a bit of difference to the bees which part is on top, but I like the deep one on top to simplify making splits and nucs. Under either arrangement the bees will store some honey in the very top, just under the supers, even before the late flows, and that honey barrier serves perfectly as a queen excluder, since the queen does not cross over honey to create brood above it. There is thus no need at all to use any special foundation for comb honey. And yes, the Illinois super, although a bit too large, is okay for the bottom story, in case that is what you have on hand.

Dislikes Excluders

I started a colony with a nuc of Carniolans last Spring and they did well, filling the food chamber completely, but when I put a queen excluder and super on, they would not move up. After a week I removed the excluder, and one week later the super was full of bees drawing foundation. Why did they not like the excluder?

Kent Stienburg
Kingston, Ontario

Your observation suggests why some beekeepers refer to excluders as "honey excluders." They inhibit, without preventing, movement of bees into the supers. It has been my experience that bees will store as much honey as they can beneath a queen excluder before they begin storing above it. I consider excluders not to be necessary. It does not hurt to get brood in honey supers from time to time, as the brood hatches out and the cells are replaced with honey, which is in no way contaminated by prior presence of brood there. Actually, the best queen excluder, I think, is honey itself. If there is honey in the top of the food chamber, as there was in your case, then the queen will never cross over it to lay eggs above the honey. It in no way inhibits the movement of the other bees, of course.

Questions are eagerly solicited. Send them to Dr. Richard Taylor, Box 352, Interlaken, New York 14847 (not Medina) and enclose a stamped envelope for direct response.

Answers!

Richard Taylor

?Do You Know? Answers

1. **False** The whitening of combs along the tops of frames in the brood chamber and honey supers it is an indication that additional honey supers should be added to the colony.
2. **False** Honey bees undergo complete metamorphosis, a life cycle that involves four developmental stages. The four stages are egg, larva, pupa and adult.
3. **True** The length of the egg stage is the same for all three castes, but the larval and pupal stages are shortest for the queen, intermediate for workers and longest for the drone. Queen development normally takes approximately 16 days, workers 21 days and drones 24 days.
4. **False** Cappings on honey cells are much flatter than worker brood cappings. Worker cells are sealed with a low domed capping with some variation in the exact shape, a characteristic which is considered to be under genetic control. The flat wax cappings over honey are often wrinkled, the wrinkles extending across several cells.
5. **True** The average time spent on cell preparation before a queen lays an egg in a cell following the emergence of a previous occupant is approximately 40 minutes and involves from 16 to 29 different bees.
6. **True** Good queens lay solid brood patterns with brood of a similar age grouped closely together. Old or failing queens neglect to lay eggs in many of the cells.
7. **True** The principal function of the larval stage is feeding. During this stage the larva gains an enormous amount of weight and grows tremendously in size. These two changes occur while the cell is uncapped.
8. **False** Larvae have simple mouthparts which lap up large quantities of food placed in the larval containing cells by adult nurse bees. The larvae are even able to rotate within the cells to get to food not placed directly next to their mouths. The 3,000+ nurse bee visits are necessary to supply adequate supplies of food.
9. **True** During the pupal period, the larval body is reorganized to form that of the adult, using the stores of the fat body and larval tissues to provide the materials and energy required for the change. During this change, all of the larval tissues are replaced by those of the adult.
10. B) 13
11. E) Thoracic salivary
12. D) 24
13. A) 6
14. C) 40,000
15. Removing remains of capping
    Smoothing the cell edge
    Cleaning the cell walls
    Cleaning the cell bottom
16. The pupa lies on its back in a brood cell with its head end pointed toward the capping.
17. Royal Jelly- brood food produced by the hypopharyngeal (60-80%) and mandibular (20-40%) glands of nurse bees during the first two days of larval life.
    Worker Jelly- On the third day the amount of mandibular gland secretion fed to developing larvae decreases and the brood food originates mostly from the hypopharyngeal glands.
    Pollen and Honey- some pollen and honey are fed directly to larvae on the fourth and fifth day of larval development.
18. Queens produced in preparation for swarming or supersedure of the old queen are normally higher in quality than queens produced in emergency queen cells. Quality differences are related to the selection of older larvae and consumption of less royal jelly in the emergency situation.
19. Cappings placed over honey cells are generally 100% new wax, those over brood are only partly wax. Old wax is used in capping brood cells and often contains pollen, propolis and bits of cocoons.

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.

Gleanings

JUNE, 1998 • ALL THE NEWS THAT FITS

USDA CHANGES REVISED RULES ON ORGANIC STANDARDS

Agriculture Secretary Dan Glickman announced on May 8, that the USDA will make fundamental revisions to its proposed national organic standards as a result of the 200,000 comments USDA received on the initial proposal.

"USDA is committed to developing national organic standards that organic farmers and consumers will embrace," Glickman said. "Thousands of commenters requested that USDA issue revised proposed standards, and we intend to do so. Most importantly, the revised proposal will contain fundamental changes from our initial draft."

The earlier draft, published on December 16, 1997, proposed standards for growing, processing, labeling, importing, and certifying organically grown food. But it did not take a position on certain controversial issues; instead, the proposal asked for public comment on these items. The bulk of the extraordinary number of comments opposed including the products of biotechnology, the use of irradiation in food processing, and the application of biosolids (municipal sludge) in organic food production.

"Biotechnology, irradiation, and biosolids are safe and have important roles to play in agriculture, but they neither fit current organic practices nor meet current consumer expectations about organics, as the comments made clear," said Glickman. "Therefore, these products and practices will not be included in our revised proposal, and food produced with these products and practices will not be allowed to bear the organic label."

Similarly, many of the comments asserted that national organic standards must be rigorous and credible. Otherwise, commenters expressed concern that consumers will lose faith in the organic label.

Before publishing the revised proposal, USDA will evaluate

Better Than Ever
ARGENTINA'S AG PRODUCTION

A combination of dramatic economic reforms and strong price incentives in Argentina during this decade have set the country on course to reach its full agricultural production and trade potential. The reforms have reined in inflation, reduced or rescinded agricultural export taxes and input tariffs, and privatized much of the transport infrastructure, leading to lower marketing costs and greater investment. As a result, Argentine farmers were able in 1996/97 to respond to strong world crop prices with a substantial increase in harvested acreage and in use of inputs such as fertilizer and specialized farm equipment. Total grain and oilseed production reached 53 million tons, eclipsing the previous record by nearly eight million.

Preliminary indications for 1997/98 favor a second recordbreaking harvest. Extremely favorable weather is expected to put total grain production at 36 million tons and total oilseed output at 23 million tons – both records. USDA's 1998 baseline projects modest growth in Argentina's grain, honey and oilseed output during 1997/98 – 2007/08.

Into Nevada, More In California
AFRICAN BEES ON THE MOVE

After an unexpectedly slow spread since their 1994 arrival in the state, Africanized honey bees (AHB) may have recently quintupled their numbers in southeastern California.

UC Davis graduate student David Nielsen and UC Davis entomologist Robert Page have been charting the AHB's progress since 1995. In the news section of the March-April issue of *California Agriculture,* they report that in 1997, 7% of 502 captured bees were Africanized. That figure is up almost five-fold from 1996, when 1.5% of foraging bees captured were Africanized.

"These were all foraging bees, separated from their colonies," Nielsen notes, "so each one could represent a separate colony."

The scientists sampled in a core area bounded by Palm Springs on the west, Highway 10 on the north, The Colorado River (Arizona border) on the east and the Mexican border on the south. In 1995, the researchers brought back 75 bees and none were AHB. In 1996, they brought back 196 bees and 3 were AHB. In 1997, they brought back 502 bees and 34 were AHB, Nielsen said. After capturing foraging bees in sweep nets, the scientists used UC Davis-developed DNA tests to rapidly identify AHBs, which appear identical to European honey bees.

Nielsen believes the AHB's slow initial progress could be related to several factors, one being the *Varroa* mite, which has parasitized honey bee colonies statewide and wiped out 85% of feral bees. *Varroa* mites can kill off a bee colony in six to 18 months. The mites lay eggs on the bee larvae, then the developing mites suck fluids and nutrients out of the bee during its larval and pupal stages.

There is some evidence that Africanized bees possess some resistance to *Varroa* mites. "We know that Africanized bee populations are stable in many areas and increasing within the state," Nielsen says. "On the other hand, our feral honey bee population is down to 10% or possibly less of its original strength.

"I think the Africanized bee's slow advancement in the U.S. is also a function of climate," Nielsen says. "The AHB's current distribution in the U.S. includes strictly the dry, arid climates of the Southwest, but bees in these regions require urban or irrigated areas to obtain enough food and a constant supply of water to flourish. They currently have survival problems in those areas with high humidity or harsh Winters."

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Meanwhile africanized bees migrating north from South America since the 1950s have been found in Nevada, their northernmost point. Two swarms were discovered near Laughlin in the state's southern tip, state Agriculture Commission official Paul Iverson said. Wetter, cooler weather linked to El Niño, which has increased the growth of nectar- and pollen-producing plants, may have caused the bees to head north.

Review of Beekeeping Activities

4-H ESSAY CONTEST WINNERS

A review of beekeeping activities across TN won the 1998 ABF 4-H Essay Contest for Richard Johnson of Sevierville, TN. He gets $250 cash.

A 16-year-old junior at Sevier County High School, Richard is a member of the Sevier County 4-H Honor Club, where his main projects are entomology, leadership, and citizenship. In his essay, he tells of the devastation of TN honey bees by parasitic mites and the need for bees to pollinate the state's crops – upholding the "agriculture" portion of the state's motto: "Agriculture and Commerce." He concludes, "The beekeeping activities in TN are in full swing, and it is our plan to keep the honey bees buzzing."

Second place essayist and winner of a $100 prize was Aaron Nice, 13, of Tillamook, OR. He wrote of the variety of crops OR bees pollinate: "You can see a direct relationship between many of the types of agricultural crops and the beekeeping industry. Bees are indeed a vital part of the growth and prosperity of these OR crops."

Using the title, "NC's BEEsness," third place essayist Elan Bustin, 14, of Lenoir, NC, tells of the variety of beekeeping in the state, from bee supply houses to bee breeders. He, too, relates the value of bees to other agriculture, saying "it is not hard to see that honey bees are indispensable to NC's crop production."

The three top writers and all other state winners (16 total) will receive a copy of *The New Complete Guide to Beekeeping* by Roger Morse.

For the 1999 Essay Contest, 4-H'ers are asked to create a lesson plan and activity sheet to teach 3rd Grade students about bees and beekeeping. The lesson plan should cover the roles of the three castes of honey bees in the colony and one other aspect of bees and beekeeping, such as, pollination, honey production, uses of honey, or apitherapy. The activity sheet could be in the form of a crossword puzzle, a word-search, a drawing on which students label a bee's body parts, a connect-the-dots puzzle, etc.

Complete rules and details on entering the essay contest are available from local 4-H agents.

ROLLER COASTER 5 YEARS

Events affecting U.S. honey industry

1993	Last price support loans with subsidy
1994	Anti-dumping action initiated against China
1995	Last price support loans available
1995	Anti-dumping action effects noted in imports, domestic prices begin to rise
1996	Domestic price escalation continues, Argentina becomes major source of lower-cost imported honey
1997	Imports continue growth, domestic price begins decline
1997	Imports for the year total 169.7 million pounds, U.S. produces 192 million pounds

WINNERS IN CALIFORNIA

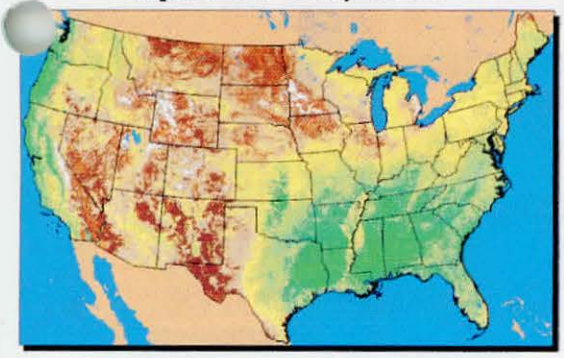
The California State Beekeepers Assn. is proud to announce the names of the award recipients honored at the CSBA convention held in November in Ventura, CA. Recipients are from left to right: Special Recognition , Gene Brandi; Presidents Award, Troy Bunch; Honorary Beekeeper, Cliff Thomas; Young Beekeeper of the Year, Jackie Park-Burris; Beekeeper of the Year, Alan Mikolich. Not pictured - Distinguished Service Award, AnnMaria (Ria) de Grassi.

Display Advertisers

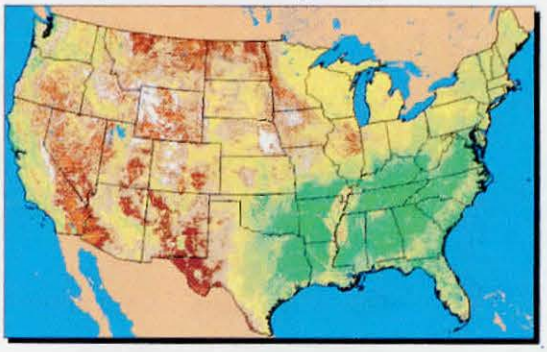
"I just keep putting money into that one!"

Spring Was Early

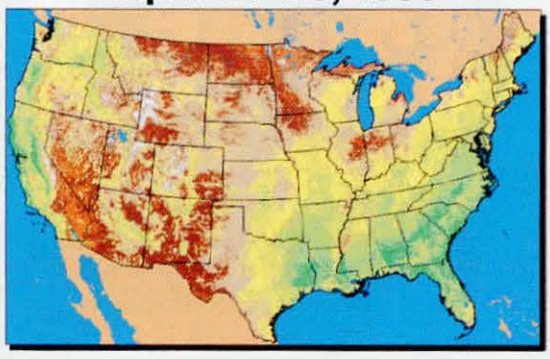
April 14 - 27, 1995



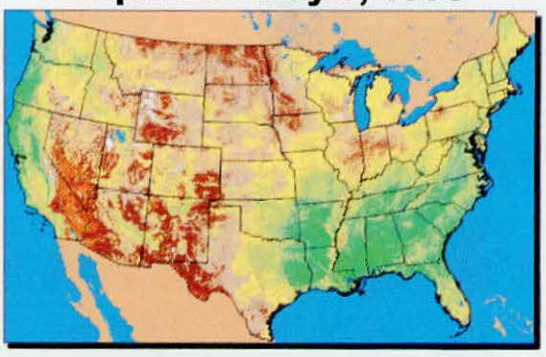
April 28 - May 11, 1995



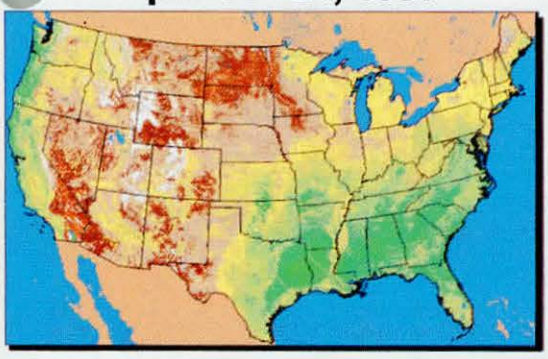
April 12 - 25, 1996



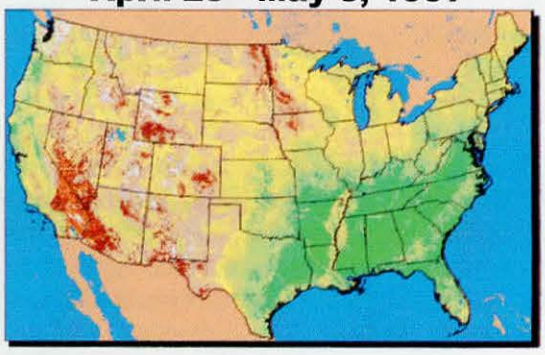
April 26 - May 9, 1996



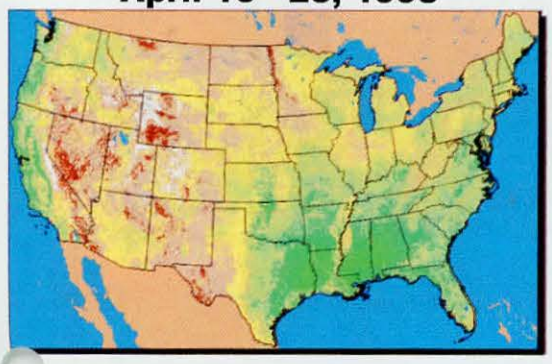
April 11 - 24, 1997



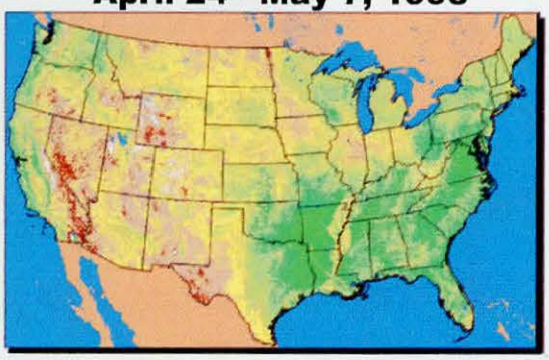
April 25 - May 8, 1997



April 10 - 23, 1998



April 24 - May 7, 1998



Vegetation Index

- .66 < High
- .60 - .66
- .53- .59
- .48 - .52
- .41 - .47
- .34 - .40
- .26 - .33
- .16 - .25
- .11 - .15
- .05 - .10
- < .05 Low
- Water
- Cloud Covered

USDA

How early was Spring? Compared to what? Here are USDA vegetation maps from 1995, 96, 97 and 98 for dates listed. The greener the earlier. This year was Green. The question is, what's *next* year going to be like?