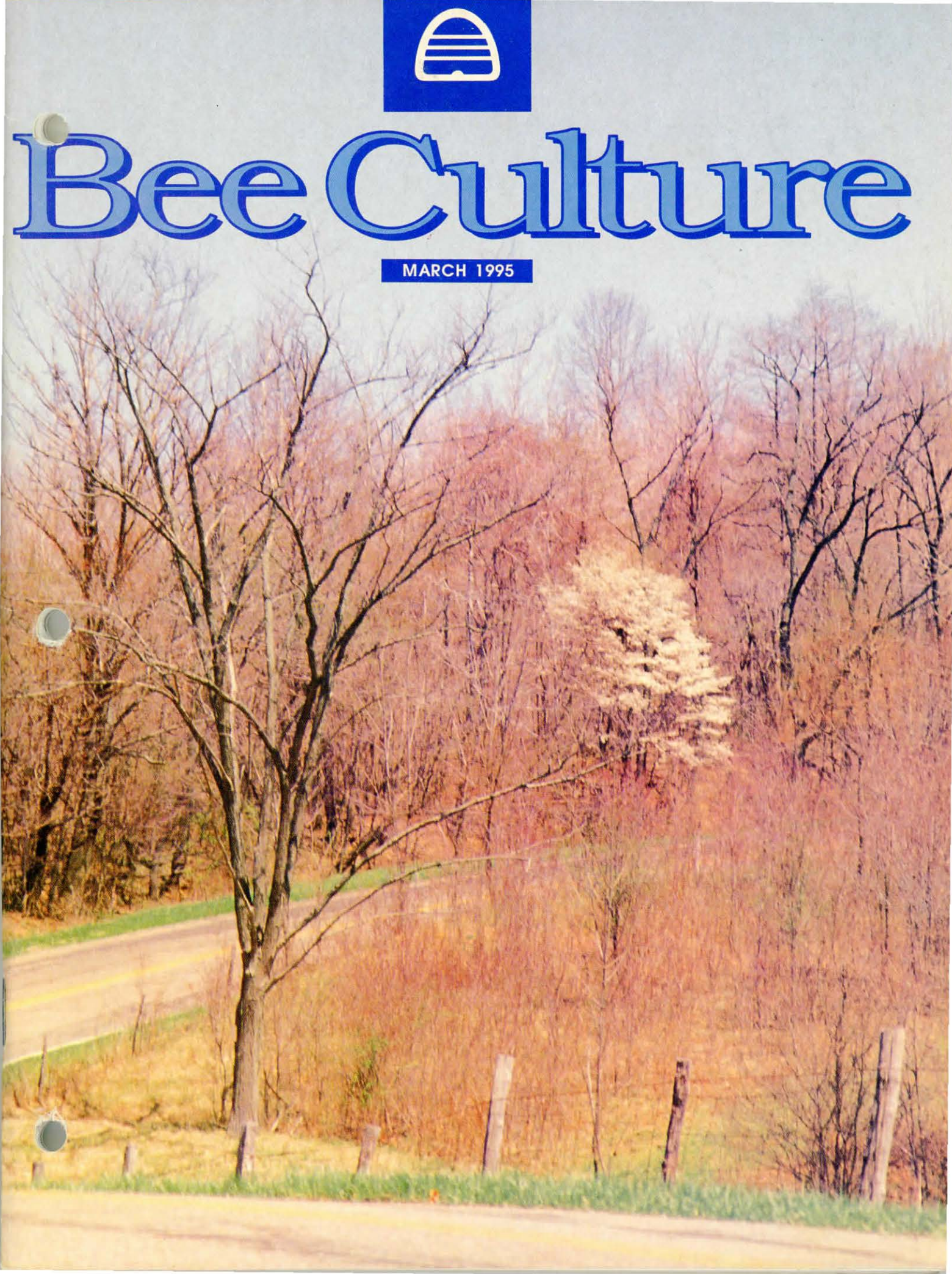
Bee Culture

MARCH 1995



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COLUMNS

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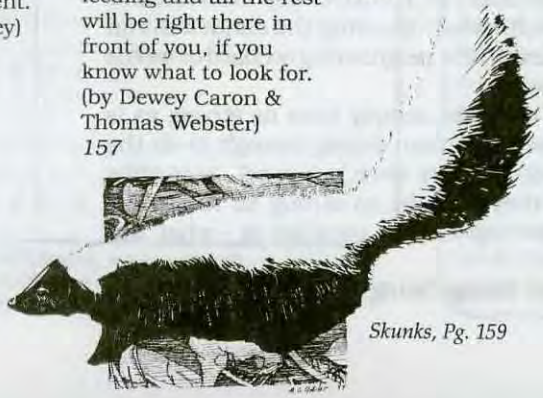
Tax Time, Pg. 146

Tony Jadczak, Pg. 163

FEATURES



Skunks, Pg. 159

Cover
For those of us in the non-tropical north, those first early bloomers are truly a treat. A very early fruit tree stands out like a neon light on this bare and brown hillside in southern Ohio. Every honey bee within five miles can see it, and those lucky enough to harvest this treasure will be one step ahead of all the rest.
photo by Kim Flottum

Beeswax Art, Pg. 169

INNER COVER

The business of renting bees to fruit and vegetable growers for pollination gets a bit more serious every year. The reasons are, or should be obvious. Unfortunately they aren't quite as clear as many think. Let me explain.

There are fewer bees. No surprise, right? There are fewer feral colonies lurking in the trees and weeds and sides of houses. This goes seasonally since there are more in spring (swarm season) than later (*Varroa*), but even at their height there are fewer. Period.

At the same time, keeping 'managed' bees has become more expensive and more difficult. Controlling the pests and disease inherent in the system costs money - more than even two years ago. Costs include labor, chemicals, stricter regulations, reduced margins (read income) from honey and static markets.

So the situation is this. Beekeepers who rent colonies for pollination are making less money and have higher costs. Growers who rent those colonies are making less money (import competition), and have higher costs. Thus, the price of a rental unit is being scrutinized by both sides with ever more attention. What growers need to buy beekeepers need to sell. Each needs the best from each.

And what is 'best'? Let's first look at a grower's point of view.

Producing apples or watermelon costs money. Again, no surprise. But hiring pollination to produce that crop is only one more of the costs. Further, as important as we think pollination is, it plays no greater, or lesser role than most other inputs. Imagine apples without insect control, cantaloupe without weed control, or seed alfalfa without irrigation. Like our oft-heard argument about pollination, these, too, are vitally important to the finished product. And from a growers perspective buying a box of bees is no different than a bag of fertilizer. The bag says its contents are 10-10-10, it gets applied and does its job. Baring too little, or too much rain of course. See the similarity?

And there are all sorts of rules and regulations that monitor that label on the bag of fertilizer. If it says 10-10-10 on the outside somebody, somewhere is making sure that's exactly what's inside.

But who, where, monitors what's inside that colony the grower rented? This is where beekeeper's needs come into play. What's 'best' for the grower may, or may not be best for the beekeeper, right?

Growers need the most bees for the least amount of money possible (though there is some disagreement on just how much that should be). And not only the most bees, those bees must be healthy, have lots of, or very little brood (depending on the crop), be delivered on time and removed on time and, yes, be extremely interested in only the crop to be pollinated - ignoring the dandelions on the orchard floor, plums in the neighboring orchard or weeds on the edge of the field.

Beekeepers, by contrast, supply bees as strong as is possible. This may be more than strong enough to do the job, but not as strong as "they were last year" according to the grower. But they may be as strong as they were promised, or even stronger. This question is - what was promised?

And delivery. All things being equal delivery will be right on schedule providing the bloom comes when the grower said it would (even in the same week would be nice most years). And removal, especially because a spray is about to happen, at, what, 6:00 tomorrow morning?

The potential for conflict, or at least misunderstanding is obvious. But there is equal potential for developing a solid, working business relationship between two agricultural enterprises. What's needed, certainly, are some ground rules.

A pollination contract is one way to lay those ground rules. A good contract that is. One that's fair to both, is easy to read, easy to follow, makes sense and is handled professionally. There are several major considerations a contract should cover. Dates bees move in and out (set by % bloom, dates, etc.); how many colonies; where they are to be placed; how much money changes hands - and when; pesticide sprays; damage to colonies by equipment; access for management; water availability; and injury liability. I'm sure you can add conditions specific to your growers or locations. On the facing page is a sample contract with most everything you need, maybe more than you want, maybe less, but it's a good start. It comes from Penn State, but is very similar to most being used today.

One thing not mentioned is dealing with a broker. That can be much easier, or much harder than direct sales yourself, but shouldn't be neglected. It could save you a lot of grief in the long run.

But there's one aspect of this

Continued on Page 172

Pollination Contracts

Reader Assistance

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Circle Appropriate Months: J F M A M J J A S O N D

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We encourage letters to the editor on any subject whether appearing in the magazine or not. Direct your letters to: Editor, P.O. Box 706, Medina, OH 44258. We reserve the right to edit letters for content and length, but will avoid this if possible.

Next Month

Spring springs at full speed next month, and *Bee Culture* hits the ground running with some of the best Spring How-To's we've ever put together!

Swarms are in the air in April – or will be very soon wherever you live, and we"ll be exploring them in depth. Dick Bonney, in the second part of his swarm overview, looks at control and prevention – definitely important to beekeeping management. But sometimes they do get away, or you find one (or the police call and tell you where one is) and then what? Roger Morse has a well done article on handling those swarms – how to get them into a hive, and keep them there can be an easy, and profitable way to increase your colony numbers.

For the rest of your colonies, April is the month of getting ready for the rest of the season, and a 'good' inspection is what's needed. How to inspect, what to look for, and most important what to do is all explained in our Inspection How-To – look for it in April.

There's more to spring, of course. Package bees are commonly installed, and there are some things to look for when installing them – we'll show you what many miss when Package Time occurs, too.

And, once your bees are installed and have been inspected – we've got a short but concise piece on what to plan for, for the rest of the season. No matter where you are some things hold true and this will give you some great ideas on handling those brand new or overwintered colonies.

And finally, April is our annual Who's Who in Apiculture issue. The only Beekeeping Directory published in the U.S. If you need to know who's who in your state, where there's an association, or who to contact at the national level, it's all right here. Don't miss this one, for sure!

Swarms, packages, equipment, inspections and management, plus our Directory. April – come she will, with the best *Best Culture* has to offer.

KEEP IN TOUCH

Write: Editor, 623 W. Liberty St., Medina, OH 44256
FAX: 216-725-5624
EMAIL: BCULTURE@AOL.COM

MAILBOX

Liked O.B. Wiser

I was introduced to beekeeping by my father in the winter and spring of 1972 with the aim of obtaining a Boy Scout beekeeping merit badge, and continued it as a hobby for the reward of getting honey.

I met O.B. Wiser when he was teaching a beekeeping class at the community college I was attending for my electronics training.

In the course of this class I found out that there was a lot more to beekeeping than I had been led to believe in the past. And in the following seasons of beekeeping with him, learned how to correct many of the mistakes that I had been making in the past, including better recognition of AFB contamination, and how to rescue my equipment from the continuing spread of AFB that had caused the gradual decline and loss of all my colonies, which had at one time numbered 28.

I learned a great deal from O.B. Wiser in the short time I knew him, and would like to say he brought me across the boundary from Beeowner to Beekeeper. And I'm sure I could write another story on that subject.

But remember I learned it from O.B. Wiser so that *I didn't have to learn it the hard way.*

Brent Jackson
West Valley City, UT

Disputes Winston's Goals

Some time ago, in an article to the *American Bee Journal* (August 1992), I argued that much of the attention given to Africanized Honey Bees (AHB's) had been ill-directed and that their progress through the Americas would not be stopped irrespective of the measures adopted against them. I suggested that the American beekeepers should rather learn to work with AHB's and not focus their efforts on stopping them.

Since that time, many articles on AHB's have been published in the American beekeeping literature, but the emphasis on stopping the progress of the bee remains the same. One of the more recent articles was by professor Mark Winston in the July 1994 edition of *Bee Culture* ("Death, where is thy sting?"). I find a number of issues raised in this article (and others) disturbing.

There is a belief that "good beekeeping" will ameliorate the dangers of AHB's; that the negative traits will be reduced to acceptable levels by frequent requeening and isolated breeding apiaries. Certainly, intensive beekeeping efforts could maintain a significant European-bee representation in the honey bee population, but these measures will be exhaustive, and in my opinion, futile. Similar measures were adopted in a number of Central and South American countries but eventually the bee population was overwhelmingly Africanized.

AHB's are intractable and it will not be easy to select among them for less undesirable traits. The very features of AHB's that have propelled their passage through the Americas will make controlled selection almost impossible: the massive feral population; the mass production of drones; the repeated swarming; and the tendency for the strongest colonies (and hence those that issue most drones and swarms) to be the most aggressive. These factors will all combine to result in a well-established, successful and defensive AHB population in the southern U.S., and as a result of the package bee industry, elements of AHB in the northern U.S.

Instead of trying to stop them, what is needed is for the U.S. beekeeper to accept AHB's as a *fait accompli*, and learn how best to deal with them. The tragic deaths that have followed the path of AHB's through the Americas have been mostly a result of ignorance.

This brings me to the second aspect of Professor Winston's article that I found disturbing. He suggests that the public should get more exposed to bees, and should become familiar with them as "life-givers" rather than killers, so that they might overcome their fears. The purpose of the exercise seems to be to reduce the amount of bad publicity that the AHB's are getting.

Like Professor Winston I am all in favor of exposing as many people as possible to the joys and marvels of honey bees, and enlightening them to their value. And bee-beards and the like are quite fun; they can even be done with AHB's, but carefully. But bees in such exhibitions are not the same as those that attack and sting people; the bees might be the same, but the context is very different. Using a bunch of bees hanging from your chin to persuade people that bees are cute and cuddly creates a dangerously false impression.

No matter what is done, stinging accidents will occur, but they can be minimized by accepting AHB's for what they are – dangerous and unpredictable. Beekeepers must adjust their management practices to minimize the risks to themselves and to the public. And the public needs to be taught how best to respond to these bees. AHB's do not hide behind lamp-posts waiting for the next unsuspecting victim; vigorously counter that media impression. But they do defend themselves very effectively. Mess with these bees and they will do their darndest to kill you.

The message to the American public should be the opposite to

Continued on Next Page

MAILBOX

that offered in Professor Winston's article; by all means develop an anti-venom as a matter of urgency, but first learn to respect AHB's at all times, to avoid them whenever possible, and to be afraid. That way fewer mistakes will be made and fewer people will die.

Mike Allsopp
Honeybee Research Division
Agricultural Research Council
Stellenbosch, South Africa

. . . Winston Replies

I certainly agree with a number of Allsopp's points, especially the necessity of American beekeepers accepting the presence of Africanized bees and learning how to deal with them, and also the public becoming aware of a potentially dangerous new pest. However, the experience of South Africa and most of Latin America has been different from what I would expect in the United States, because European-derived bees are much more successful in most of the U.S. in both feral situations and managed ones. Thus, North American beekeepers will be better able to use European bees than has been the case in more subtropical and tropical regions. As to my advocating cute and cuddly bees, I think we need to present a balanced picture. Yes, Africanized bees can be very dangerous, and that was a major point of my article. However, bees also can be manageable, and are vital to agriculture, and we don't want to lose sight of that point, either.

Mark Winston
Simon Fraser University
Burnaby, B.C. V5A 1S6 Canada

Foundation Q's

I know bees will chew holes in drawn combs and try to remove wires and the plastic in Duragilt.

I would like to stop the bees drawing and replacing these damaged spots with drone cells or not at all like they do sometimes with Duragilt.

If I use comb inserts of Plasticell with its deep plastic cell walls, would the bees keep these combs in worker size cells when drawing out or damaged spots from chewing, queen cells and wax moths?

Will bees accept ANP comb inserts well and will they try to alter the cell size for drone or queen cells?

Will wax moths damage ANP combs so the bees will not repair and use them?

John Isenhower
RR5 Box 700
Seaford, DE 19973

AFB Resistance

I can add to the comments by Roger Morse in January on American Foulbrood resistance. The event that galvanized the issue in Iowa was an article by Bruce Lineburg in the November 1925 *Gleanings* describing his experience with resistance of colonies to AFB. In response, editor G.H. Cale revealed in the December issue of the *American Bee Journal* that Lineburg's article released them from an agreement to not give publicity to John M. Bixler's report at the Iowa Beekeeper's Association Convention in 1925 of his similar experience in Iowa since 1912.

A cooperative resistance breeding program in Iowa was established at a conference in September, 1934. This had been Frank C. Pellet's dream since his visit at Herman Rauchfuss' apiary in Colorado 20 years earlier, where he inspected a colony whose AFB infection had disappeared without treatment. In a November 1934 *Country Gentleman* article, Pellet credited Charles Mraz for fostering a belief that breeding a resistant strain was possible.

The annual *Report of the Iowa State Apiarist* recorded the progress of the program, and emphasized the stock was not a cure and could not substitute for continued vigilance to detect and clean up infection. In 1945 11,639 queens were sold to honey producers in 34 states and four provinces, and by 1948 dozens of queen breeders were rearing resistant daughters. The chief complaint was the mean disposition of the colonies, but honey production was equal to commercial stock. In 1950 the program was closed down, since from its inception it was intended that commercial suppliers would take it over. But the mandated testing that had been done by the Extension Service was apparently considered too costly, and the use of antibiotics was becoming a popular preventive measure.

Before frame hives were mandated, the combs in box hives and skeps were harvested at regular intervals and melted up which removed a source of infection. Recent recommendations suggest such a regular renewal of combs in frame hives, but a very expensive practice if wired wax foundation is used; impossible with plastic foundation or combs. But feasible if the once common practice of using one-inch "starters" of foundation, wax sheeting, or comb is revived.

Toge S. K. Johansson
East Berne, NY

Bee Wear Available

In the April, 1994 issue of *Bee Culture*, on page 203 in the "Mailbox" section you printed a letter from John Iannuzzi, Howard Honey Farms, 9772 Old Annapolis Rd., Ellicott City, MD 21042. He was looking for honey bees preserved and embedded in crystal clear plastic and set in 14K gold plated or silver-look settings.

We have and are making bolo ties, money clips, necklaces, resin clocks, and we do special orders (all at the right prices). Anyone interested can drop us a line or call: (702) 623-0807

Ralph and Shirley Poe
P.O. Box 1159
Winnemucca, NV 89446

A Real Bad Sign

Here is a picture of a large "Reader Board" sign that was on a major road near Tacoma, WA. Upon seeing the sign, I immediately called the owner and left a message voicing my objection

MAILBOX

and questioning the value of a negative message such as this. It's a shame to see something like this in that it does a lot of damage to the image of honey as a pure, natural product.

Dennis Level
Graham, WA

Don't Lower Standards!

My *Bee Culture* arrived, as usual on time. Your editorial is the first article I look for. This January issue as always is most interesting and informative.

I am sorry to learn of the increase in paper cost as well as postage. In your editorial you talked of the possibility of a smaller publication or fewer issues as a method of holding the line on costs.

I am hopeful you will choose to raise the cost of the subscription, rather than either of the above. I like *Bee Culture* just as it is. I would not want to miss an issue or have it reduced in pages or size.

Bee Culture is as always the beekeeper's companion. I am convinced all of your subscribers feel the same. If they did not, they would not subscribe.

I look forward to my *Bee Culture* with much anticipation.

I reiterate, a small increase in subscription rate would be much preferred by all.

Arnold A. Bruck
Remington, IN

Waiting To Get Trickled On

It is absurd to expect beekeepers to take advice from segments of the industry whose natural bent is to buy honey for as low as possible and sell for as high as possible. Beekeepers aren't stupid; we know our own best interest and can pursue it adequately without packer or importer advice. But since they offered theirs, we'll offer this response to Wayne Rumball's letter.

The exporter says he'd rather order package bees through the mail than get them in a drum of honey. Considering the low prices the packaging industry offers, it would seem fair if every beekeeper added a half pound of bees to every drum. Removing bees and delivering the honey would be the ONLY real work packers ever have to do to make excessive profits. Contrast that with managing a hive through 12 months, paying an additional 20% in costs for mite treatment, and 63 other cost factors that Dr. Hoopingarner identified which contribute to a honey producer's cost basis. If the packer was getting the product for what it truly cost the beekeeper, he'd be paying about $1.09 wholesale. You economists out there would say, "But beekeepers would be going broke then to sell for less than half that!" Our point exactly.

Packers have been the beneficiaries of the Honey Board work and the price support program. According to figures which surfaced as a result of the anti-dumping suit, the U.S. Commerce Dept. claims that total U.S. consumption has hovered steady right at 300 million pounds for the *last 10 years*. When the Honey Board shows a graph saying retail sales have increased every year since the Honey Board was formed, two questions must be asked. First, who basically benefits from higher retail sales? Obviously, packers, importers, and retailers. Beekeepers are still waiting to get trickled on. Second, one can assert accurately that if total consumption did not increase at all in 10 years, then all that is occurring is a segmenting of the market.

The honey industry lends itself nicely to being horizontally and vertically integrated. If a beekeeper is going to take advantage of the Honey Board's successes at raising the retail price, then he must pack as much of his own honey as he can.

Wayne Rumball did say one thing right. " a packer needs honey to pack and if he doesn't have any he doesn't have much of a business." If a beekeeper cannot pack all the honey he produces, he would be well advised to sell the surplus only to packers who demonstrate a willingness to pay a fair price and a tendency to avoid slandering the hands that feed them.

Paul Hendricks
CO Sunshine Honey Co.

Supports USA Made!

In the January "Mailbox", Richard Taylor wrote "Losing Battle." He says, "This is the age of free trade" My opinion is you cannot have free trade without lowering the standard of living that my father, his father, and the founding fathers of this country – the U.S.A. – worked for, fought for, and died for.

Mr. Taylor, you may know a few things about honey and bees, but you are incorrect about this situation. You lie down and die your way – I will stand up and fight my way.

I live in Alaska where we may be affected by foreign honey in only a few ways. Some of these ways are adulterated honey and shelf prices. I am an American who looks to buy "U.S. Made" products and local Alaska products in order to support my fellow countrymen, his standard of living, and his health and welfare.

I make a modest living. I pay taxes and try to spend my money wisely. I expect everyone to have the same opportunity. They will have this opportunity if our politicians stop exporting our jobs and start using our tax money to create jobs in America. I can hardly find a toy that isn't made in some foreign country by child labor, slave labor, or poverty rate pay. What does all of this have to do with honey and bees? More than meets the mind.

Support free trade with free countries. We can win this battle together. Be a patriot – stand up and fight.

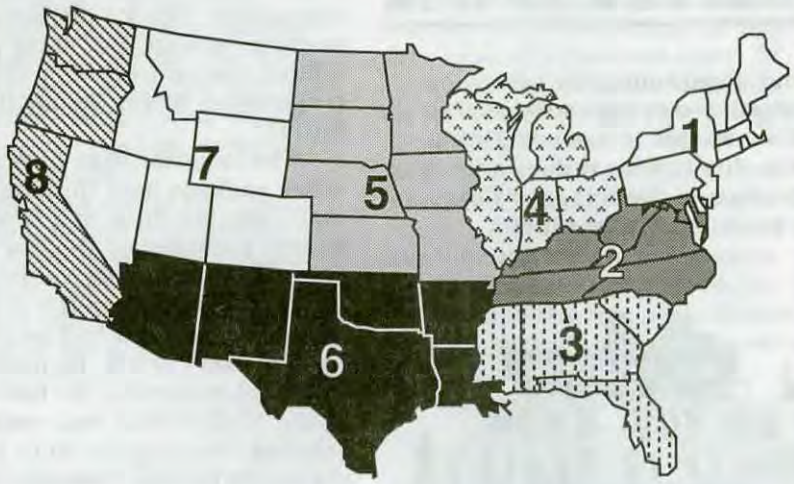
Keith L. Malone
Chgiak, AK

MARCH Honey Report

MARCH 1, 1995

REPORT FEATURES

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



	Reporting Regions								Summary		History	
	1	2	3	4	5	6	7	8			Last	Last
Extracted honey sold bulk to Packers or Processors									Range	Avg.	Month	Yr.
Wholesale Bulk												
60# Light	40.44	43.00	43.78	39.40	35.70	39.83	42.00	41.73	31.20-58.00	42.13	44.90	42.51
60# Amber	38.38	42.50	41.03	35.40	41.20	37.08	40.00	38.07	25.20-58.00	39.90	42.00	41.08
55 gal. Light	0.57	0.52	0.65	0.52	0.54	0.53	0.55	0.60	0.45-0.90	0.59	.595	0.60
55 gal. Amber	0.53	0.53	0.58	0.49	0.52	0.51	0.50	0.54	0.42-0.78	0.55	.543	0.55
Wholesale - Case Lots												
1/2# 24's	19.79	22.73	21.11	18.74	19.00	19.90	22.85	19.60	17.35-25.20	20.78	22.55	21.20
1# 24's	29.43	31.21	30.81	30.52	27.87	31.03	31.25	28.60	24.00-37.90	30.53	30.43	30.58
2# 12's	27.86	29.14	29.83	28.45	26.95	27.12	30.25	32.00	22.80-37.68	29.01	29.99	29.31
12 oz. Plas. 24's	26.38	28.64	29.32	25.20	25.00	24.85	28.75	24.10	22.80-37.90	27.26	27.65	26.61
5# 6's	27.50	30.00	28.39	30.93	28.00	27.30	29.20	29.15	18.00-38.00	29.16	30.32	29.53
Retail Honey Prices												
1/2#	1.35	1.96	1.91	1.04	1.12	1.37	1.18	1.22	0.89-3.50	1.34	1.27	1.33
12 oz. Plastic	1.54	1.77	1.59	1.54	1.43	1.49	1.70	1.57	1.19-2.00	1.59	1.60	1.61
1 lb. Glass	1.77	1.94	1.84	1.69	1.82	1.91	1.90	1.81	1.39-2.29	1.83	1.80	1.90
2 lb. Glass	3.08	3.32	3.18	3.07	3.01	3.06	3.15	3.67	2.39-3.93	3.21	3.12	3.27
3 lb. Glass	4.19	4.80	4.54	4.54	3.94	3.79	4.50	4.10	3.25-5.99	4.37	4.44	4.42
4 lb. Glass	5.53	5.52	6.12	6.12	5.96	5.56	5.25	6.25	5.09-7.40	5.87	5.51	5.74
5 lb. Glass	6.46	7.10	7.19	6.52	6.61	5.96	6.35	6.41	5.89-8.95	6.72	6.61	6.59
1# Cream	2.11	2.26	2.36	1.89	1.97	2.78	2.15	1.73	1.39-3.50	2.18	2.30	2.44
1# Comb	3.11	2.83	3.34	3.25	2.81	3.66	3.75	3.42	2.50-4.25	3.27	3.46	3.23
Round Plastic	2.88	2.75	3.08	3.08	2.69	3.76	3.08	3.31	1.60-4.59	3.05	3.03	3.08
Wax (Light)	1.87	1.41	2.35	1.58	2.73	1.85	1.45	1.45	1.15-4.00	1.89	1.85	1.71
Wax (Dark)	1.41	1.19	1.73	1.48	1.53	1.25	1.30	1.28	1.00-2.75	1.43	1.45	1.35
Poll. Fee/Col.	29.69	25.00	32.88	32.50	27.50	15.75	35.00	34.00	12.50-55.00	31.13	32.63	32.86

MARKET SHARE

Selling honey begins *before* your bees even start to produce this years crop. Attention to labels on pest control products is important – very important. Deciding what your market will be (comb, cut comb, liquid) and having enough of the right equipment on hand is important, as is keeping a keen eye on colony health during the season. But as important as producing and harvesting is, having a market to sell it in is critical. Start now.

Region 1

Prices stable since last month but promise to rise shortly reflecting container and freight increases. Demand, too, should increase but big packers keeping supply steady. Pollination demand up, and bee supply down so prices should rise. Colonies in fair condition generally. Losses higher than expected due to *Varroa*.

Region 2

Prices generally a bit higher, with retail leading the way. Wholesale stable, but at least not shrinking much. Demand, especially at wholesale stable. Retail demand up, and new crop uncertain yet. Pollination prices increasing slightly due to, mostly, fewer bees.

Region 3

Prices generally the same at both levels. Orange crop slowed by cool weather, but should be a better crop because of it. Demand remains strong, but area flooded with out of state suppliers – keeping prices down. Pollination demand steady and bee supplies only down slightly.

Region 4

Prices steady to increasing just a bit as the influx of imported honey slows and is being felt. Demand has been steady, but will start to slow as the weather warms. Big packers still having an influence on wholesale prices. Pollination isn't as critical here as in other places and prices steady. Intense growing areas are feeling the pinch on fewer bees, and prices going up locally.

Region 5

Prices down sharply this month, due primarily to lots of domestic honey available, and reduced, but cheap imports. Colonies in good condition and ready for spring. Fewer losses to tracheal mites, but *Varroa* still a factor. Demand slowing, even with lower prices. Pollination costs and rentals both up, but demand only steady. Fewer colonies in some spots will increase rental fees.

Region 6

Prices steady to decreasing somewhat. Demand only steady, and decreasing as weather warms. Wholesale prices all over the map as producers wait for ITC ruling (true in most regions, actually). Colonies in good to excellent condition, but concern about AHB in the west affecting pollination, and rental fees. Expect them to increase, along with costs for inspections.

Region 7

Prices and demand virtually unchanged since last month, and for quite awhile. Wholesalers, waiting and retail steady. ITC ruling will have an affect, though. Pollination prospects increasing, and depending on what's left after California, may increase dramatically.

Region 8

Little is stable (including the ground) here, and price and demand no exception. Prices holding their own, demand up, but supplies crazy with imports flooding the area in both wholesale and retail. Pollination will be the big story. Lost colonies (floods, fires, quakes and mites) have changed the picture, and will continue to change as time goes on. Stay tuned!

RESEARCH REVIEW

roger morse cornell university ithaca ny

"To sell a product one must satisfy customers, which reminds me of one of my businessman father-in-law's favorite statements to the effect that the customer is always right, no matter how wrong he is."

I visited my youngest daughter recently and started to read a textbook on market management she was studying. Between the textbook and my daughter's know-how of modern marketing I found that much of what I thought was true about food marketing is no longer so.

For several years I have been impressed with the fact that the largest supermarket in our community, one with about 20 checkout stations, always has a good display of quality honey. I have never seen any jars of honey on their shelves that were crystallized but I have noticed jars with partially crystallized honey on the shelves of many of the small stores where I live. I don't think too many beekeepers who market their own honey directly to stores would argue with the thought that customers don't understand and don't want jars of honey that are partially crystallized. They don't make a good appearance and the large crystals in the honey do not taste too good.

Forty and fifty years ago, when my father and I marketed honey in glass jars, we would first pack the honey and then proceed to sell it. Quite often the packed jars would go to a warehouse where they might sit for a month or two before they were moved onto the store's shelves. This was wasted time since most jars of packed honey will start to crystallize in four to six months and while the honey is sitting in a warehouse it is losing shelf life.

What we did years ago is called "pushing" honey onto the market. What I read and am told is that this is an old-fashioned, unacceptable method of marketing food products in big stores today. The modern concept is that products should be "pulled" onto the market as they are needed. Modern marketers believe that warehousing products, waiting for them to be sold, is too expensive. Tying up money in inventory is also a waste.

The philosophy today is that food, such as honey, should be packed only as it is needed (pulled onto the market). It should get to the marketplace just in time (JIT) and not before it will be purchased. Honey, like most food products, changes for the worse over time. During a period of six months or more it will lose aroma and darken in color. Honey stored in barrels in a cool place usually keeps in much better condition than when it is packed in jars and stored in a warehouse, especially a metal building where the temperature fluctuates widely during the year.

The JIT concept, which has been thoroughly researched and studied, works especially well for a large store that checks out food items by computer because at the end of each day the store knows exactly what it has sold and can order according to its needs. The packer and the store have the advantage that honey will arrive on the store shelf in fresher condition. It will have a longer shelf life – that is, a longer time before the customer will notice any granulation in the jar. The packer also benefits because billing and payment can be made faster. This is also one reason the very large supermarkets can sell for less.

Some of the very large food handlers have gone a step further. The store may order a year's supply of a product at one time. Each day the company filling the order receives a printout telling how much of its product was sold that day. It packs new product and delivers it JIT not before.

The person who is at a disadvantage in this system is the beekeeper who is asked to delay delivery and payment until the honey is needed. However, it costs packers money to keep honey in their warehouse, too. Some beekeepers enter into contracts and deliver their honey JIT and have found this to be in their favor. What I read indicates this will be increasingly true in the future.

Where does this leave the small producer-packer? Such beekeepers must understand that they are at a disadvantage and they must govern their packing and sales accordingly. Big stores will become bigger and more efficient – a trend no one will stop. However, there will always be a place for the small packer who supplies convenience stores, farmer's markets and roadside stands. Many people like to shop at such places.

I was interested to read that the textbook I cite below did not leave out small packers. But, it is made clear that even in this case a product has no value until it is in the hands of the consumer. At the same time there is great emphasis in the modern market on customer service. I suppose that has always been a fac-

tor but with increased competition from large stores it makes service more important than ever. To sell a product one must satisfy customers, which reminds me of one of my businessman father-in-law's favorite statements to the effect that the customer is always right, no matter how wrong he is. Beekeepers who sell to small accounts must check the inventory and honey quality in the stores they service frequently. Buyers are fussy and the big stores are competitive. BC

References:
Christopher, M. *Logistics and Supply Chain Management*. Pitman Publishing, London. 1992.

Book Reviews

Forage for bees in an agricultural landscape, published by IBRA, 18 North Road, Cardiff, CF1 3DY UK £15.00 each including postage & handling (UK and Europe) £16.00 or $US26.00 including postage and handling (rest of world).

Beekeeping in many countries is poised to either take advantage of, or miss out on, the greatest opportunity it has had for decades. Land being set aside from production could be the best thing for beekeepers since the invention of the smoker – but you have to start working now. Beekeepers need to act nationally as well as in their own backyards.

Forage for bees in an agricultural landscape gives you the facts:

- What's happening to our nectar and pollen sources?
- How can farmland be made a better habitat for bees?
- Why should we care about anything other than honey bees?
- What do government decisions mean for my bees, and more importantly what can I do about it?

This book is a vital tool for galvanizing people into action. Get one to read, and another to give to a farmer!

How Well Are You Willing To Bee? Written and published by Pat Wagner, 5431 Lucy Drive, Waldorf, MD 20601. 70 pgs. Soft cover. Illustrated. $27.00.

•

Health and the Honeybee by Charles Mraz. Published by Queen City Publications, P.O. Box 4326, Burlington, VT 05406-4326. 93 pgs. Soft cover. Illustrated. $12.95.

The past year has seen a flush of books on the use of products from the hive for the benefit of human health. The first, *Bee Venom: Explore The Healing Power*, by M. Simics is probably the most comprehensive when it comes to health items made from products of the beehive. Propolis was explored in salves, ointments and the like. Bee venom, of course received much exposure, along with implements to ease the application of stings.

Next came Amber Rose's book, *Bee In Balance*. She coupled the technologies of acupuncture and BVT using the best knowledge of both.

Most recently are the two books listed above, similar to the others, but different, and very different from each other. Pat Wagner's book is a short autobiography dealing with her life from the onset of MS, her discovery of BVT and her journey from there to better health. It outlines technique and expectations, but keeps coming back to her experiences. It is a personal account, with a message, in an easy to use package. Because it is self published, has tab dividers between chapters, is spiral bound and comes with a back pocket it is a bit more than a book. It's like a workbook. It's a bit pricey. But for those in the field it should be part of the program.

•

Health and The Honeybee by Charles Mraz has been decades coming. It was worth the wait. Years of writing for the bee journals (this one included) and the touch of an editor with exceptional skill combine to make this the most easy-to-read, enjoyable and thought-provoking book on this subject I have read.

Dealing mostly with his breakthrough experiences over the years the book is primarily about specific

people who have been helped by BVT But the bigger picture is that BVT has a wide range of applications that help real people. There is a solid chapter on applying stings that is basic, fundamental and straight forward.

Charles Mraz has been called the Dean of American Apitherapy. His perseverance in the face of still overwhelming odds is to be admired. I have played some small role in those odds. This book may change that. It certainly should.

Kim Flottum

New For You

Apicom, Inc. announces the release of a Carniolan Hybrid, called Vigor™. Apicom owner Bob Horr, says the line of bees was selected and tested for more than four years for resistance to AFB, EFB and Chalkbrood. Tested in Europe, Canada and the U.S., the line was also tested for hygienic behavior, and susceptibility to *Varroa*.

When compared to regular Italian, ARS-Y-C-1 and Buckfast lines Vigor queens received high marks in honey production, early spring build-up, gentleness, early fall shut down and over wintering.

They display typical Carniolan behaviors, plus the improved disease resistance, according to Apicom. Maintained purity is guaranteed by A.I. breeder queens.

For more information on Vigor™ Bees, contact Apicom at 520 W. 112 St., Suite 9A-9, New York, NY 10025, (212) 662-2829.

? DO YOU KNOW ?

Early Spring Management

clarence collison

With spring rapidly approaching in the more northern areas of the country, internal conditions within the hive will change as the weather allows regular flight activity and fresh pollen and nectar sources become available. Early spring management will be important in determining if optimum conditions are available so that the colonies can build up rapidly into strong, productive units. Please take a few minutes and answer the following questions to determine how well you understand colony development and the factors that affect it.

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. ___ The queen will begin laying eggs as soon as it is warm enough for the bees to break winter cluster and they can begin foraging for nectar and pollen.
2. ___ Early in the spring the majority of bees, brood and food are normally located in the bottom hive body.
3. ___ As soon as the weather permits in the spring the queen goes on a mating flight to replenish her supply of semen.
4. ___ Older worker honey bees have a higher probability of issuing with a primary swarm than younger workers.

T or F – Laying Workers (False Queens)

5. ___ Lay multiple eggs per cell.
6. ___ Lay both fertilized and unfertilized eggs.
7. ___ Produce eggs that are smaller than those produced by the queen caste.
8. ___ Glue their eggs to the sides rather than the bottom of the cell.
9. ___ Are most prevalent in the hive when a colony is hopelessly queenless.

Multiple Choice Questions (1 point each)

10. ___ Once brood rearing resumes in late winter/early spring, the bees maintain broodnest temperatures of approximately ___°F, regardless of the temperature outside the hive.
    A. 93.2° F. (34° C)
    B. 89.6° F (32° C)
    C. 96.8° F (36° C)
    D. 86.0° F (30° C)
    E. 100.4° F (38°C)
11. ___ In the spring many beekeepers often treat their bees for mites and against potential disease problems. If any medications or acaricides are used, it is essential that all treatments stop at least ___ weeks before the beginning of the major nectar flow so that the honey crop is not contaminated.
    A. Six
    B. Four
    C. Two
    D. Three
    E. Five
12. What are the two primary objectives for making the first colony inspection early in the spring? (2 points).
13. What is the primary cause of swarming in a honey bee colony? (1 point).
14. What are two basic disadvantages of supplementing the food stores of colonies within an apiary by using a communal or bulk outdoor feeder (barrels or tanks that are filled with large quantities of sugar syrup)? (2 points).
15. Describe two ways in which afterswarms are different than primary swarms. (2 points).
16. In what way does the age of the queen affect the potential for developing the swarming impulse? (1 point)
17. Name three colony management procedures normally done by the beekeeper in the spring that are effective in preventing swarming. (3 points).
18. Name three food sources/ways in which food stores can be increased in colonies found short of food. (3 points).

ANSWERS ON PAGE 171

MORE THAN MEETS THE EYE

Division of Labor

mark winston

How does a worker bee know what to do when she gets up in the morning? I organize each day with the help of a calendar, a never-ending "to-do" list, and a secretary, but as far as I know bees can't read or write, and "secretary" is not a task I've seen described in any of the bee literature. A bee's work is further complicated because, as for us, each day's required work is different. Sometimes a bee might work on a project for many days in a row, such as foraging on blueberry flowers, while on other days an emergency might erupt like the sudden death of the colony's queen, and the entire work force must rapidly shift its workload to respond. Context is everything to a bee, and the success or failure of workers to respond to the changing contexts of colony work will determine whether the colony thrives or dies.

A worker bee's ability to respond to the unpredictable and complicated nature of colony conditions is limited, however, by the small size of a bee's brain and the complex and difficult nature of most tasks in the colony. Take a job like feeding brood, for example. A worker bee needs to know a few days ahead of time that she will need to do this task, because it takes a few days for her to produce and store brood food in her glands. Then, she has to find the brood, inspect individual cells to discover whether the larva in that cell needs to be fed, determine the age and type of the larva so that it gets fed the proper blend of food, and in a few days "decide" to stop producing brood food and move on to another task. Further each job takes place in the context of the colony, in which the worker is continuously bombarded by stimuli that could distract her from the job at hand. Many of those stimuli are important, and our brood-feeding worker must evaluate the information bombarding her little brain and decide if conditions in the colony require her to change jobs prematurely.

The only way out of this dilemma is for the bee to have simple, underlying rules that allow her to move in an orderly fashion through tasks during her lifetime, but rules that provide enough flexibility so that she can depart from this orderly pattern during unusual circumstances. The solution for the bee is called division of labor, and involves a fairly predictable progression of tasks during a worker's lifetime, but a progression that can be influenced by various signals in the colony that allow bees to shift jobs when necessary.

The task progression followed by workers is based on their age, so that young workers perform work inside the nest and older workers guard and forage. Typically, a newly emerged worker will spend a few days cleaning cells and capping brood while her brood food glands develop. Then, she tends brood and attends the queen for about a week, followed by a period in which her brood food glands shrink and her wax-producing glands enlarge. During this middle-age period, a worker will build comb, handle nectar and pollen within the nest, and do some cleaning. The final phases of her life involve guarding at the nest entrance, and finally foraging before she dies. This orderly progression of jobs is mediated by changing hormone levels within the bee, especially a hormone called juvenile hormone. The level of this hormone is low in young bees, and gradually increases as the bee ages and moves outdoors. Thus, bees have a system of age-based task performance that seems to provide the simple, underlying rules that tell a bee what to do at various stages in her adult life.

But wait. Suppose there is little or no brood in the colony; should a worker bee produce brood food and neurotically feed empty cells? Or conversely perhaps there's a baby boom and the colony needs both brood feeders and pollen collectors; how does a bee decide what to do? What happens if the colony suddenly discovers a nectar bonanza in the field next door; who's going to handle the flow of rich food in the nest? Suppose a colony in a nearby tree finds your nest and starts to rob out your honey; will some of the comb-building bees walk off the construction site and defend the colony's entrance? The age-based task system is not

Continued on Next Page

"Suppose there is little or no brood in the colony; should a worker bee produce brood food and neurotically feed empty cells? Or conversely, perhaps there's a baby boom and the colony needs both brood feeders and pollen collectors; how does a bee decide what to do?"

LABOR ... Cont. From Pg. 143

enough to explain how bees allocate jobs. Workers also need to be able to respond to a few cues in the nest that provide information indicating that a shift from the typical progression of work is necessary.

The ability of workers to change the frequency of tasks they perform, or even the ages at which they do particular jobs, has been well-studied. For example, if you add brood to colonies, foraging workers will shift from nectar collecting to pollen collecting, and individual pollen collectors will bring back larger pollen loads to meet the increased demand for protein that the extra brood requires. Removing comb from colonies produces even more drastic effects; some workers begin foraging at younger ages for nectar to provide fuel to produce more comb, while other workers increase their wax production. Conversely, foraging ages can increase in some circumstances; young workers in colonies newly-founded from packages or swarms will delay foraging until after the first brood emerges, so that the colony will have some foragers available for the second brood cycle.

Although we now understand that these shifts in frequency and age of task performance occur our current research challenge is to determine what stimuli in the nest induce workers to shift their workloads. This type of research may have considerable importance for bee management, because an increased ability on our part to manipulate workers' tasks would enable beekeepers to force colonies to work in ways that might enhance colony productivity. For example, a pollination unit that focussed its foraging on pollen would do a better job of pollinating crops, and should therefore yield a higher rental fee to the beekeeper. Another example is package bee production; tricking a colony to rear too much brood a month or so before package shaking would increase the number of workers that could be shaken from a colony, again yielding more income to the beekeeper. Remember that the stimuli involved in inducing bees to shift tasks need to be simple enough so that the bees can understand the message, meaning that these task-shifting stimuli should also be easy enough for research scientists to discover!

Pheromones, bee-produced odors that effect behavior and/or physiology, are one research area with good potential to provide new management tools that could influence bee labor in economically important ways. This does not mean that other aspects of colony life don't influence worker tasks. On the contrary, much work in the colony is determined by behaviors that are not based on pheromones. Food exchanging between workers is a good example of a non-pheromonal behavior that influences worker tasks. "Requests" by many workers for protein might stimulate more foraging for pollen, while an increase in incoming nectar influences within-colony workers to receive nectar and store it. However these types of task-influencing mechanisms are difficult to manipulate in economically useful ways, whereas the application of synthetic pheromones to colonies is something that might be developed as a management technique to supplement the types of colony manipulations that beekeepers already perform.

There are a number of identified and as-yet unidentified bee pheromones that can influence worker behavior within and outside the nest. One of the most important is the queen mandibular pheromone, produced in her mandibular glands and spread through the nest by workers that attend her. This pheromone has been produced synthetically and can be dispensed in a colony or package of bees or sprayed on crops as an attractant at a fairly low cost. Within the colony this pheromone can delay the age when workers begin to forage, and in some situations may induce workers to forage for pollen rather than nectar. In packages of bulk worker bees, the pheromone can replace the queen, so that bulk bees can be shipped in a queenless state. Outside the colony, when sprayed on blooming crops, the pheromone attracts workers, induces them to visit more flowers, and results in increased recruitment by returning foragers of bees in the hive to the sprayed area.

Another potential pheromone that could be used to manipulate worker behaviors is brood pheromone. Odors from brood can stimulate the development of the worker brood food glands, and possibly could regulate the number of workers engaged in brood rearing. If the identity of this pheromone could be discovered, it could be applied in any situations where brood rearing would be a priority for bee management. Thus, a package producer could stimulate worker production by feeding colonies and applying brood pheromone simultaneously A beekeeper renting colonies for pollination could stimulate brood rearing just before moving units to the crop, thereby providing a colony focussed on pollen collection that would be a better pollinating unit. Finally, brood production could be stimulated in regions where the season is short and rapid colony growth is at a premium, such as the northern beekeeping areas of Canada.

The study of honey bee divi-

"One challenge for researchers today is to use our basic information about division of labor to "construct" better colonies, and to do economic analyses on these improved units to determine whether they are, indeed money-makers."

sion of labor has been in the realm of basic science for some time, without providing any obvious advantages for beekeepers. This type of science, however, is an excellent example of how basic studies may eventually lead to practical applications. We now know enough about division of labor to begin custom-designing colonies for particular management purposes, so that we can artificially focus a colony's work in areas that are beneficial for our purposes. These custom-designed colonies could be focussed on pollen collecting, brood rearing, or unusually rapid growth by manipulating colony conditions and possibly by providing specific pheromone-based stimuli. In the end, a custom-designed colony could provide greater beekeeper income. One challenge for researchers today is to use our basic information about division of labor to "construct" better colonies, and to do economic analyses on these improved units to determine whether they are, indeed, money-makers. After all, if a simple-minded bee can figure out what to do in the nest, we complex-minded humans should be able to trick them into doing work our way rather than their own. BC

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

Form **1040** Department of the Treasury—Internal Revenue Service **U.S. Individual Income Tax Return** (P) **1994**

IRS Use Only—Do not write or staple in this space.

For the year Jan. 1–Dec. 31, 1994, or other tax year beginning , 1994, ending , 19 OMB No. 1545-0074

Label (See instructions on page 12.) **Use the IRS label.** Otherwise, please print or type.

LABEL HERE

Your first name and initial Last name — **Your social security number**

If a joint return, spouse's first name and initial Last name — **Spouse's social security number**

Home address (number and street). If you have a P.O. box, see page 12. Apt. no.

City, town or post office, state, and ZIP code. If you have a foreign address, see page 12.

For Privacy Act and Paperwork Reduction Act Notice, see page 4.

Presidential Election Campaign (See page 12.)

Do you want $3 to go to this fund? Yes No

If a joint return, does your spouse want $3 to go to this fund? Yes No

Note: *Checking "Yes" will not change your tax or reduce your refund.*

Filing Status

1 ☐ Single

2 ☐ Married filing joint return (even if only one had income)

TAX TIME

steve tuttle

If you have a taxable income of over $10,000, you'll save $1,504.00 if you do what I say. So don't stop now.

If I may generalize where taxes are concerned, people fall into two categories. Those who do their own and those who trust that their accountant knows enough to do it for them. I have one question for those who have it done. If you don't know the laws that apply to your special situation, how do you know what to save, how to define it, present it, and how do you know that when you sign the form that makes *you* liable, that it's right? I used to run a tax service, and most people just bring in a few papers and walk out in just 15 minutes. They have the blindest faith I can think of that their taxes will be done correctly.

Now when I say 'correct' I don't just mean does it conform to "generally accepted accounting practices." I mean, have you conformed to the law that requires you to pay " . *no more taxes than you are legally obligated to pay.*" You probably didn't know there was such a law. The IRS has a lot of laws your accountant hasn't told you about and possibly doesn't even understand I'll lay money on it. When you finish this article you'll have some questions for your accountant, and a number you can call to verify what you've read.

Let's understand the forms first, O.K. They're organized in a simple way. The 1040 form asks questions about you on the first six lines – are you single, how do you want to file, children, and the rest. Line seven is the total income you earned working for other people, and those earnings are generally found on the W-2 form your employer provides. Lines eight to 21 lists other income or losses you may have had as general classifications. These may require other forms to be filled out.

As a beekeeper, line 12 is the one you need to know about, and to do that you have the privilege of filling out a schedule C form to identify profit or loss from your bee business. Schedule C is one of the best friends you have.

On Schedule C you have an opportunity to take a one-to-one deduction for every expense you have had relating to keeping bees. Not like on the A-B long forms where you subtract this and divide by that. You generally will be able to reduce your taxable income enough with just the Schedule C so that you can take the general deduction, and come out way ahead.

Furthermore, on both tangible equipment (like a truck) and intangible expenses (like a pre-paid contract) line 13 allows you to depreciate and amortize the devalued amount for several years. What does that mean? Say you paid $2,500.00 for a used truck at the first of the year, and you figure it will last five years. That first year it will have been devalued, or depreciated, $500.00. That's one fifth of the price. Further, the $2,500.00 you paid for the truck was a business expense (this is the part most accountants get messed up on because they think it's a double deduction). So now you have a total of $3,000.00 in tax deductions for that same $2,500.00 truck. Sound too good to be true? No, not really. The government, in section 179 of the tax code, provides an incentive to business owners to invest in their businesses. You simply receive a deduction for what you bought for your business to make more money, and also you receive a deduction as the business asset depreciates, or becomes what is called a *contra-asset*. When an accountant fails to use that extra deduction for his clients he has negated the positive effects of that program. Clients like yourself pay more tax than they need to, ***which is a violation of tax law.***

The IRS even has a form to make it easy to figure out your depreciation and amortization. It's a form 4562. Be sure to send for one or pick one up at a tax office near you, along with the instructions. Spaces are provided to list all types of equipment, machinery, vehicles, anything tangible in parts I to V. In part VI, entitled Amortization, the first two lines are for intangibles to be amortized this

year. Below it is a line for the sum of all of the previous years amounts.

Now if you are like most beekeepers I know your operation isn't big enough to hire a crew to help you work your bees. So, you help a friend and the friend helps you. Right, so put it on paper in the form of a contract. Watch what happens. You say "This date I prepay Joe Beeman, as a private contractor $50,000.00 to work with me on my bees for five years. If he does not perform in any given year I am forfeit the yearly value of $10,000.00. The execution of this contract constitutes payment if full." Now he also writes you a contract of the same type and value. You sign each others contracts *and legal tender has been exchanged.* You both have a contract worth $50,000.00 for services you used to perform for nothing. So what is the value of this. It is true you both earned, and spent, $50,000.00. The end result is that you have gained no income. On the Schedule C you will show an additional income of $50,000.00, and an additional expense of $50,000.00 so you're net is zero.

But you both have a contract that is worth $50,000.00 the first year, $40,000.00 the next, and so on. Each year it amortizes $10,000.00. So if your taxable income was over $10,000.00 in 1994 you would have reduced your tax according to the tables (any of them) by $1,504.00. If you don't believe it, call 1-800-TAX-1040 and then press 1, 1, 6, and that will put you in touch with an expert on "Prepaid Contract Amortization" which is what you want to know about. You may ask them all about what you read here. They will tell you that you must use a 4562 form, and all he rest laid out in this article.

I would advise you to make a copy of your contract letter and attach it to your tax return *every year* you are amortizing that contract. You have a limit for new amortization each year of $17,500.00. So you could amortize a five year contract of $87,500.00 and save up to $2,629.00. In five years at that rate you could save approximately $24,000.00 in taxes.

These are IRS rules, I didn't make them up. Even though I happen to believe that income tax is unconstitutional, I go by their rules. They have a bigger stick than I do. When I ran this article by friends who are accountants I was told, "Don't tell people that, I'll be out of business." The lady at H & R Block said, "Yes, that's how it's done." and I even asked if I could quote her. This year, find out for yourself. BC

Steve Tuttle is a commercial beekeeper, and tax whiz, from Woodland, WA.

Sign Here

Keep a copy of this return for your records.

Under penalties of perjury, I declare that I have examined this return and accompanying schedules and statements, and to the best of my knowledge and belief, they are true, correct, and complete. Declaration of preparer (other than taxpayer) is based on all information of which preparer has any knowledge.

Your signature	Date	Your occupation
Spouse's signature. If a joint return, BOTH must sign.	Date	Spouse's occupation

Barry Wolf's LEAFCUTTER BEES

darlene polachic

Come summer, Carrot River, Saskatchewan farmer Barry Wolf watches the weather more anxiously than most. What he doesn't like to see are cool days or overcast skies. That's because when the sun isn't shining, or the temperature is cooler than 70°F, his leafcutter bees won't fly. And when the leafcutter bees don't fly, the alfalfa doesn't get pollinated and won't produce seed. That's important to Barry because growing alfalfa for seed is half his farm industry. The other half is raising and marketing leafcutter bees.

What makes leafcutter bees different from other bees? Leafcutter bees don't produce honey. Their name comes from their habit of cutting leaf pieces to line their nests. Leafcutter bees don't sting the same way honey bees do, either. They will 'multiple sting, Barry says, they pull their sting out and will sting again. But the result is more like a mosquito bite than a bee sting.

According to Barry, leafcutter bees are the best thing known for pollinating alfalfa. "They're much better than honey bees," he says. "Honey bees will fly as far as 10 miles for food. Leafcutter bees fly only as far as they have to, which means we can keep them close in our alfalfa fields."

Leafcutter bees are native to the wooded parts of North America. They nest in little round tunnels which in the wild would be worm or woodpecker holes in trees.

"There were lots of leafcutter bees in this area of Saskatchewan when my dad homesteaded the property in 1949," Barry says. "But as the land was cleared, the worm and woodpecker holes for nesting were eliminated, and any larval cocoons were destroyed when the wood was burned. Nearly all the native leafcutter bees disappeared."

In 1980, when Barry decided to grow alfalfa for seed on a large scale, he had to buy domestic leafcutter bees from a supplier. Those bees flourished and multiplied and Barry soon found himself with more bees than he needed to pollinate his alfalfa. He decided to market them. That was 14 years ago. Today Barry Wolf Farms is the largest broker of leafcutter bees in Canada.

Barry keeps his bees in polystyrene block 'nest trays' he designed and manufactured himself. Each tray is 48" long, 12" wide, and 3-3/4" thick, and contains 20,000 holes where the female bees make their leaf-lined nests and lay their eggs. Barry invented the machine that makes the holes. He also devised one to extract the spent nests. Everything is set up for production and quality control, he says. He cites the advantages of his nest blocks as acceptability to bees, producing high quality bees, and permitting evaporation of moisture from the nest, thus preventing mold and giving high quality bees. As well, he says, his nest blocks provide excellent parasite control, are precision made to eliminate bee harvester damage, and they make overall bee management much less labor intensive.

The cocooned larvae that develop stay in the nest block over-winter. They are stored in a specially designed heated and air conditioned on-farm warehouse.

"It takes three weeks for the larva to develop into an adult bee," Barry says, "so in spring, three weeks before we want them to hatch, we incubate the nest blocks at 85°F in the warehouse incubator.

"The tricky part is gauging the hatching time to coincide with alfalfa bloom time," he goes on. "In very hot weather blossoms come in about two weeks. When it's very cool, it could take four weeks. You do the best you can. Generally speaking, when buds begin to form on the alfalfa plants, we start incubating the bees.

"Assuming all has gone well,"

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Barry shows his solid block leafcutter bee nest tray.

Lynne and Barry Wolf investigate the bloom potential of their alfalfa crop.

LEAFCUTTER ... Cont. From Pg. 149

Barry says with a rueful grin, "the incubated trays are placed in tent 'domiciles' in the alfalfa fields – 20,000 bees (or one tray) per acre." The domicile structures are placed every 500 feet, and provide protection for the nests as well as a warming-up area for the bees.

Then Barry watches the sky Leafcutter bees will not fly out to collect nectar if the outdoor temperature is lower than 70°F. Some mornings they may not emerge until 10 or 11 o'clock. On overcast days they may not come out at all.

The first thing the adult bees do when they are relocated to the domiciles is mate. "There's no queen/worker hierarchy with this species," Barry says. "Leafcutter bees are just male and female. The female mates only once, but may lay multiple eggs."

When mating is complete, the males will pollinate only the plants they need to feed on. Two weeks later, they're dead.

The females, on the other hand, go about industriously cutting leaf pieces from the alfalfa plants to line their nest tunnels and gathering nectar and pollen to provision them. Eventually they lay their eggs in the prepared cells and cap them off.

The larvae feed for about 10 days on the nectar and pollen, then spin a hard shell of protection (the cocoon) and become dormant until the incubation process begins the following spring.

It is the cocoons that Barry ships all over the world. His markets include Argentina, Chili, Egypt, the former Russia, and particularly the United States.

Barry says his biggest buyer is the United States because a disease problem necessitates American producers buy new stock every year.

"Saskatchewan leafcutter bees are disease free," Barry says, "And therefore preferred stock. As well, the further north in the province bees are produced, the more desirable they are. Northern bees are hardy and conditioned to fly at cooler temperatures. That means in southern climates they'll fly earlier in the morning and later at night, providing greater potential for successful pollination."

Shipping is done in refrigerated storage containers by air freight. "It's a complicated process," Barry says. "A federal veterinarian comes to the farm and quarantines and inspects our product. He takes random larvae samples which are tested to be sure our stock meets the export regulations of Canada *and* the country it's entering."

The approved cocoons are packed in refrigerated containers and put on a plane. "You have to map out the flight plan carefully to make sure all flights connect with no delays," Barry says. "Even a few minutes on the hot tarmac in Miami would increase the temperature inside the container and kill the larvae. We had that happen once with a shipment to Chili. The bees got as far as New York, where they were bumped for a shipment of baby chicks. We lost all the bees."

Prices for leafcutter bees vary with the year from a penny per cocoon to only 1/10 of a cent. "It depends on supply and demand," Barry says. "We store about 4,000 trays every winter. The larva only survives about 14 months, so what we can't sell we have to use ourselves."

Barry's own needs on his 4,000 acre farm is significant, but even so, he says releasing too many bees is a waste.

"Forty thousand bees per acre produces no more alfalfa seed than 20,000 per acre in this climate, anyway. For some reason there are only certain bee levels that work."

In the U.S., he says, it seems to be different. "Farmers will put out 40,000 bees per acre and get 1,000 pounds of seed per acre, but get back only 75% of the bees. Here in Saskatchewan, 20,000 bees means 250 pounds of seed per acre while 40,000 bees may only increase that by 100 pounds per acre with no increase in bees."

Besides producing premium quality leafcutter bees, Barry Wolf Farms manufactures and markets Barry's invention, the solid block nesting tray. He also offers a consulting and information service for people in the bee business.

"We supply information guides and pamphlets for those starting up, or for those having problems in bee management," Barry says. "We also provide information on where producers can buy equipment, materials, and incubation information. We offer our 14 years of expertise on such things as bee management techniques, pollination advice, chemical effects on bees, and related bee disease areas." BC

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For more information on Alfalfa Leafcutter bees, or Barry Wolf's operation, contact: Barrywolf Farms, P.O. Box 6, Carrot River, Saskatchewan, Canada. Ph. (306) 768-3518, FAX (306) 768-2636.

Darlene Polachic is a freelance agricultural writer specializing in the people, and the business of farming. This is her second story on the bee industry.

SWARMING
THE CAUSE

richard bonney

"Hey, there's a swarm!" Do you hear this cry with dismay, or with welcome? It depends, I guess, on the circumstances. Did that swarm came from your hive, or from somewhere else? If from your hive, why? What can you do to prevent it from happening again? If it's from some other source, who cares where it came from? It's an opportunity. Either way, collect that swarm if you can, and use it as the resource that it is. Start a new colony, bolster a weak colony, set it aside in a nuc for future use, but don't ignore it.

But why was that swarm hanging there in the first place? Why does a colony of bees swarm? Basically, to fulfill a primal urge, to propagate the species. That being true, we know that it will be difficult to stop. Not impossible by any means, just difficult. But the more we know about the bees the less difficult it becomes. So let's work on gaining that knowledge, starting with the life of the bee.

Honey bees live on two levels. They live as individuals, and they live as a colony. A worker's life is short and her life is cheap. A worker is easily replaced and the turnover of individuals in a colony is high. The colony, though, has the potential to live indefinitely. In practical terms this doesn't happen. We all sometimes lose colonies–to disease or mites, for instance–and feral colonies die too, from the same causes and more. Feral colonies probably die much more often than we realize. So nature must have a way of replacing these colonies, or eventually the species would die out. Nature's way is the swarm, that natural part of the yearly cycle in which a colony splits to become two colonies. Nature, of course, has no way of distinguishing between kept and feral colonies. Swarming happens with both.

Colonies usually don't swarm every year, though. There is variation among the races and hybrids of *Apis mellifera*, but generally speaking, left to their own devices, a normal colony would probably swarm once every two to three years, and there are more or less fixed periods in the year when this happens. We talk regularly of "the swarm season." Actually, there are two, the primary season when about 80% of the swarms of the year go out, and the secondary season when the other 20% emerge. In the latitude and climate where I live, the primary season runs approximately from mid-May until the first of July. Moving north, the season starts and ends later, and moving south it starts and ends earlier. The actual period for any location is related to the start and intensity of the beekeeping season. If you have any question about the timing of the swarm season in your area, ask an experienced local beekeeper. Ask about the secondary season as well.

Our secondary swarm season here runs from about mid-August until mid-September. Many beekeepers are not aware of this secondary season, and are very surprised at the appearance of so-called late swarms. The reasons for the existence of a secondary period are not well understood, but presumably it relates back to the origin of honey bees in a warmer climate, and is tied closely to queen supersedure. Whatever the reasons, such swarms are unfortunate for both the bees and the beekeepers. It can be very difficult for either the swarm or the parent colony to prepare for and survive winter after this late division of resources.

We have looked at the reason that colonies swarm–propagation of the species–but what causes a particular colony to swarm when it does. A common misconception is that swarming is triggered by crowding - period. Crowding is certainly a large factor, and in given situations *may* be the only factor, but we must go beyond that. Swarming can be caused by just the perception of crowding, and this perception can result from several causes. These causes include colony strength, relative size of the hive, amount of ventilation, and degree of congestion in the brood area or in the stores area. The impact of each of these is affected by the age of the queen and the weather over a specific period of time. Further, each of these factors is something that the beekeeper can and should be monitoring, starting with the first late winter inspection and following through into the spring. Let's look at them more closely.

"If the level of circulating queen substance falls off for any reason, it can lead to a perception of a failing queen and the onset of preparations to swarm."

First, the queen, because she may be considered the trigger in a given swarm situation. For the bees, a measure of well being in the hive is the amount of queen substance that is circulating. Queen substance, of course, is a secretion from glands in the queen's body, and it is the material that attracts young worker bees to the queen

Continued on Next Page

to form her court. A young, healthy queen gives off ample amounts of this substance. An aging queen gives off lesser amounts. The members of the queen's court lick, groom, and feed her, and in the process pick up small amounts of the queen substance. The makeup of this court is constantly changing, and probably no individual bee stays with the queen for more than about twenty seconds. After bees leave the court to continue their other duties in the hive, they pass traces of this queen substance on to other workers with whom they come in contact. The nature of life in the hive, with the constant exchanges of food, the grooming, and the communication between bees as they move about, distributes the queen substance through the hive. As long as a certain level of this substance is in circulation, the colony is content. If the level of circulating queen substance falls off for any reason, it can lead to a perception of a failing queen and the onset of preparations to swarm. We must keep in mind here that swarming is actually more than propagation of the species. For the bees, it is also a way to supersede a failing queen.

As we continue, it is important to remember that any condition in the hive which leads to the bees sensing an apparent diminution in the amount of available queen substance further leads to the possibility of swarming. For instance, a high population, which *usually* is coupled with crowding, dilutes the amount of queen substance per bee and the bees may interpret this as a failing queen. Of course, with a new, young, well-bred queen, this is much less likely to happen. The vitality of such a queen is reflected in her queen substance.

With that background, let's look quickly at some of the other factors, starting with crowding and the perception of crowding. If there are more bees than will comfortably fit in the colony, the bees are crowded. This can come about no matter what the size of the hive (within limits). Too many bees is too many bees. Beyond that is the perception. A colony may swarm while it has ample space for expansion if that space is not readily accessible. They *perceive* themselves to be crowded. We have several examples of this, all of which are generally correctable by the beekeeper.

For instance, in the early spring the cluster is most likely to be found in the top of the hive, having worked its way there over the course of the winter. The bees may have plenty of room in the hive–but all of it below them. Their inclination is to work up, but if they are at the top, there is no up. They feel crowded. Timely reversing of hive bodies, of course, usually corrects this.

If the bees are not at the top, they may still feel crowded if there is a barrier of honey above or next to them which prevents them from moving up or prevents them from expanding the brood area. Even if there is empty space above the honey, they may not move through that layer of honey if it is deep, especially if the population is only average or less. But still, they will feel crowded and may swarm. Remember, the population does not have to be large if the bees feel cramped in the available space. Manipulating frames to redistribute the empties can relieve this type of situation.

Ventilation, or a lack of it, is another factor in bringing about the perception of crowding. The bees are sensitive to a buildup in the hive of CO_2 resulting from their respiration. Excessive amounts can result from too many bees–from crowding–but it also may be brought about by poor ventilation. The bees will interpret this as crowding, too.

We perhaps tend to think of swarming as an impulsive thing on the part of the bees. "Well, it's swarm season and we have all these pressures on us: let's swarm today." It's not that simple. Swarming is planned. The bees react to all of these factors we have been considering well before the swarm season gets underway, and they make preparations. This preparatory period may start weeks before the swarm actually emerges. During

this period, the swarm impulse, an impelling force, is developing.

What is this force? It can be interpreted as a state of mind brought about by the conditions or perceived conditions in the hive, and by resulting physiological changes in the bees themselves. This impulse will not be satisfied until the swarming act is completed–or until the bees come to believe that swarming has been completed.

How do we apply all of this information? The obvious goal should be to prevent the swarm impulse from developing. This means have a long-term swarm control program. Requeen regularly, at least every other year. Relieve or prevent all forms of congestion and crowding. Ensure adequate ventilation. The activities and conditions leading up to development of the impulse start almost with the onset of the season, and signs are visible, once you know what to look for. Be especially observant when winter conditions allow a high population of bees to survive into spring. For instance, the bees went into winter in good strength and health, the winter was easy, and ample stores are on hand in the spring. Be vigilant if spring weather is mild and there is an early nectar flow, allowing for early drone rearing which usually presages a rapid buildup of overall population. Don't delay in getting winter insulation and wrapping off, so the bees don't develop a sense of congestion from that cause. Inspect the hive often enough to know where the bees are, what they are doing, and how the population is building. It can be explosive.

Then, be aware of the impact of your own actions–spring feeding, for instance. Syrup and pollen substitute in the late winter and early spring can have the same effects as an early nectar flow, giving an extra boost to the population. There is nothing wrong with this if you are prepared to cope with it. In fact, you may bring this about deliberately if you wish to make a split. But that's a different story.

Finally, accept that the swarm impulse, once it has become established in the collective mind if the colony, is a near irresistible force. It *must* be satisfied. Satisfaction means that the bees must swarm, or they must be caused to believe they have swarmed.

So far, we have been dealing primarily with causes, with some suggestions for long-term control. Next time we will talk more about satisfying that swarm impulse, and then delve into swarm prevention, those specific measures to take when swarm control didn't work. BC

Richard Bonney is the Extension Apiculturist for the state of MA, author of two books on beekeeping and a regular contributor to Bee Culture.

NEXT MONTH: Swarm Prevention and Control

What Do You Do With An EXTENDED HONEY FLOW

steve taber

If you live where there is an extended honey flow, or where there are several honey flows that come during the course of the summer you are probably missing out on your maximum yield. This happened to me when I lived in Louisiana and was working at the USDA Baton Rouge Bee Lab. The honey flow from white clover started about April 15th every year and usually didn't finish until about the 15th of June. That's two full months of honey.

Now, for the first time since I left Louisiana nearly 30 years ago, I have a similar problem. This time it's caused by three different honey flows. Last year the first flow came from oil seed rape, called "colza" in France, which yielded about 50 pounds in March. This was followed by black locust, or "acacia," which added 50 pounds or more in May. Then, in July there will be sunflowers, or "tournasol" (which translates to "turn with the sun"), which should add another 100 pounds. But it won't because I made the mistake of not being adequately prepared for all this sweet stuff.

Let me show you what happens. When a honey flow starts the bees pack honey right above the brood. Then as the flow continues new honey is placed above and below the first honey, and by below I mean *right in the brood nest*, reducing the space available to the queen to lay eggs. Two weeks after a honey flow of seven pounds a day the queen's egg production was cut by two thirds, to perhaps only 500 eggs per day. But, not only is egg production cut. If you only have one two-deep brood nest, there will be very little room for new honey to be stored. And worse, honey can't come off because it is still not sealed. What to do?

When I first encountered this problem in Louisiana nothing was done but wait until the honey was sealed, remove it and put the now-empty supers back on which caught only a small amount of the tail-end of the clover flow. Since little other honey would come in for the rest of the year, a lot of this clover honey had to stay on to prevent starvation during the rest of the summer, fall and winter.

I'll tell you what I did when I was there. I used three full depth brood chambers instead of one and the bees developed a real nice population with very little attention until April first when I put all sealed brood in the *top* box, put the remaining sealed brood and some young brood in the middle box, and put the remaining young brood in the bottom. To this I added yet another super with no queen excluder, making the stack now four high. Ten days later I reversed the position of box three and one and I continued to reverse the bottom and third box every 10 days until the end of May, when I stopped.

By the 20th of April the colony required an additional super and by the 25th a third. And on the first of May a fourth. The first super couldn't be removed until about the 15th of May. By mid-June when all honey above the three brood chambers was removed, the total exceeded 300 pounds.

What happens when you reverse brood chambers during a long honey flow like that? The bees place the honey above the brood, in their super, then begin putting it into the new super above the brood. The brood chamber, which was in the top position but is now on the bottom and contains honey where it doesn't belong, will have its honey moved *out and up* into the honey super above by the bees.

Since we *know* the honey flow never lasts past the 15th of June, we really don't need to reverse brood chambers after May 15th. But what might happen to mess things up is the bees will decide to swarm. That was the reason I continued reversing brood chambers until the end of May. To discourage the swarming impulse.

The predicament my bees are in now is a bit different. There's lots of pollen and honey stored from oil seed rape in April which reduced the egg laying of queens. Then they had about two weeks to start increasing their brood rearing until they were shut down again by the black locust flow. I am not keeping bees for honey production, I just want to keep them supplied so I never have to feed. Actually, I keep these bees to supply honey, and lots of bees and brood for my nucs, where I raise and breed bees resistant to mites and chalkbrood. I'm writing this at the end of May and I have a major problem on my hands. Yesterday I spent cleaning up this problem by organizing solid frames of honey and putting them on the bottom boards. Since I have already removed honey and brood from most all my colonies this amounted to an average of two full supers of prime honey on the bottom board with two brood chambers that held mostly honey on top of that followed by a box with foundation.

Now my queens can start laying again and in about six weeks the major honey flow will start from the sunflowers. I'll be ready this time. BC

Steve Taber is a retired USDA honey bee researcher now living in France. He contributes to US. beekeeping journals on a regular basis.

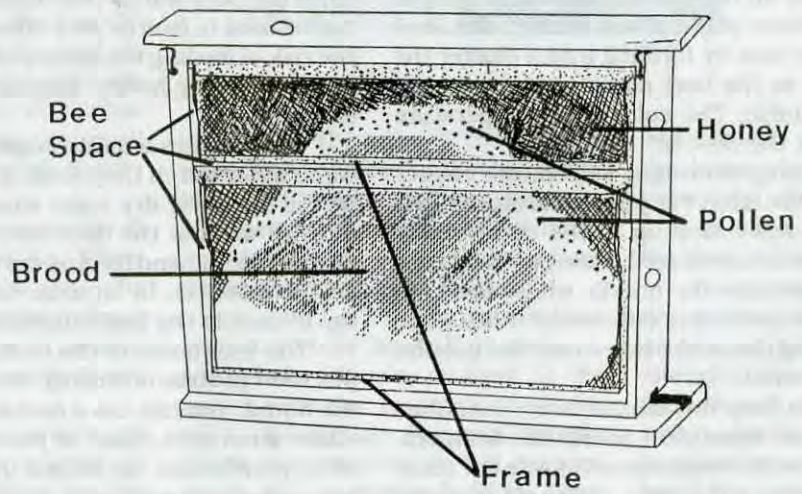
OBSERVATION HIVES

Part III

dewey caron — thomas webster

In the first two parts of this series we talked about establishing and managing an observation hive. We shift emphasis now to talk about activities you can do with your observation hive. In this first activity we'll discuss observing the normal activities that occur and how you can observe how the bees organize their home.

You can begin your activities once your observation hive is established. We recommend you keep your data records simple and organized. Buy a notebook and keep it and a pencil or pen close to where you have the observation hive. Every time you look at the hive write down the date, the time and what you observe. When you are collecting specific information your notes will obviously be more detailed. Your may prefer to take notes with a tape recorder and of course a video camera can be used as well.



Orientation

The bees will organize their hive soon after you establish it. Depending on the temperature outside and inside where you have located the hive, a brood rearing area and food storage section above and to the sides of the brood area will become evident. Can you tell the difference between the cappings over a cell of brood (pupa) and cappings over a cell of honey? They are different. If you are unsure go to your backup colony and look in it. Remove some cappings until you are sure you can tell the difference.

You can start by mapping the brood area. Use a clear sheet of flexible plastic and a wax pencil. Place the plastic on the side of the observation hive and trace the outline of the brood area with the wax pencil. It won't be entirely possible to be sure of the full area but approximate the area of brood the best you can. You can transfer this measurement from plastic to your notebook by taking the largest measurement with a ruler – for example 15 inches high by 12 wide. Be sure to measure both sides of the frame(s) although they are likely to be the same or very similar. You might want to use two separate pieces of plastic – one for each side.

You can remeasure the brood area each week. Keep the measure from the week before and compare as you remeasure each week. Is the brood expanding or is the area decreasing? What reason(s) do you attribute to this growth or reduction?

You can similarly measure the area of capped honey cells. There will not be as dramatic a change from week to week until the weather is good and there are lots of flowering plants. Honey stores are needed by the bees to rear brood, to do work and allow the colony to expand. If there are no honey stores in your observation hive you should be feeding them sugar water.

Organization of their hive into brood and food areas is one of the principle ecologies of honey bees. Another fundamental ecology is the concept of bee space. Within the hive, bees have to move from one comb to another. They are able to do so because they maintain an open area between and around the parallel combs of beeswax which we call bee space. This space, approximately 3/8ths of an inch, permits them to move about and allows for transfer of the essential chemicals with which they communicate.

In our managed hive, bee space is insured by our frame design. If the space is smaller, bees use propolis to fill in the area and if it is too large, they use beeswax to build another comb. They also build ladders and bridge one comb to the next. Spend some time observing how the bees leave the space between the combs open for their movement. Notice how they go around the ends and over the top and bottom of the comb. Do they have superhighways of movement or favorite places to move from one comb to the next?

You can chart their building of bridge comb and places where they may anchor the comb to the glass or

Continued on Next Page

side walls of the observation hive. Diagram, take a photo videotape of what the comb looks like once the observation hive is established and then update it every week or every two weeks. Can you determine why they are doing the modifications you observe? Can you describe the concept of bee space (and brood/food separation) to a visitor to your observation hive?

Clustering behavior

Honey bees are not warm blooded like mammals but they still control the temperature inside their hive. They cluster when the temperature gets colder and air condition when the hive gets too warm. If you establish or conduct observations on your hive in the spring or fall, you will be able to observe some aspects of clustering behavior.

Honey bees heat their hive even in sub-zero temperatures. They must prepare the hive for this and so we see bees organizing their brood rearing area below areas of capped honey as the day length increases and temperatures decrease. This will be a little less obvious in the observation hive due to the heat from the room where you locate your observation unit.

The fuel required to pass the winter is honey. This is one of the reasons honey bees hoard nectar and ripen it into honey. The honey provides energy to fuel muscles which give off heat as the bees move (just as you give off heat when you are very active). The bees help conserve this heat by forming into a cluster the shape of a sphere so the heat doesn't escape as rapidly to the air outside. The colder the temperature the more compact the cluster.

On a cold morning or evening you can see cluster behavior and feel the heat. Put your hand against the side of the observation hive up in the corner away from where the bees are located. Now put it against the plastic or glass near the middle where the bees are clustered. Can you feel a difference? Notice the bees are not heating the entire hive – only the portion where they are located.

It is possible to map this cluster over time. Cluster behavior is most dependent on outside temperature (and to a degree the temperature inside the room where you have located the hive). It is most interesting to compare cluster compactness with outside temperature. For this you will need a thermometer to measure the outside temperature. For a range of outside temperatures, determine the size of the cluster of bees inside the hive. For best results you need a range of 65°F down to freezing, so this will not be a practical observation hive activity during all months of the year.

Can you determine if there is a difference? On colder mornings does the cluster stay intact for a longer time period? What can you see for activity at the more central part of the cluster compared to the outside portion? Can you feel a difference with your hand at the center and outside portions?

Finding out more

We know a lot about normal hive organization and clustering behavior. All general books have sections on these two topics. We recommend you consult these references for more information. A good source for more information on temperatures inside overwintering colonies are USDA studies from Wisconsin. Consult: "The Thermology of Wintering Honey Bee Colonies" USDA, ARS. Technical Bulletin 1429. (Nov. 1971). To explore more concerning normal nest ecology, read the paperback: "Honey bee Ecology" by Tom Seeley from Princeton University Press (1985).

Feeding an observation beehive

The observation beehive is a smaller version of a standard hive. They are most often placed in heated rooms which means the bees will be more active than their sisters outside in a normal beehive. This means you must help the bees by feeding them sugar water to (1) fuel their activity and (2) compensate for the lack of room to store honey reserves.

To prepare a sugar syrup, mix one part sugar to one part water (equal volume or weight). Use any clean sugar source such as table sugar and regular tap water. Sugar sources containing other materials like flavorings (coke syrup, candy from a factory) or sugars with starch or extenders (confectioners sugar, bakery sugar) are not good for the bees when they are confined since they lead to more wastes in the digestive tract of individual bees.

You do not need to feed inverted (high fructose) sugar since the bees will do this digestion themselves. Honey can be used to feed to your observation hive but you run the risk of feeding the spores of American foulbrood disease by feeding honey. Regular table sugar is the best alternative.

We feed bees a dilute sugar source so they also get some water which they need. A sugar syrup is preferred by the bees over dry sugar since the bees can utilize it directly without the need for collecting additional water. We recommend feeding the bees as close to the brood area as possible. In an observation hive feeding at the top is usually the best alternative.

The bees come to the container of sugar water and put their proboscis directly into the feeder and extract the liquid. You can use a container that best suits your observation hive. Glass or plastic jars (honey jars) with holes punched in the lid and inverted over the top of a bee access area work well. A plastic honey bear or other container that narrow to a spout or narrow neck can also be modified. They have the advantage of needing a smaller opening through the material of the observation hive.

You will need to replenish the sugar water feeder so your feeder should be easily accessible and removable. Do not allow the feeder to go dry for more than a few hours or the entire colony might starve, especially if they lack any honey stores. During the very active season, the bees may ignore the feeder. If they do not take the sugar stores you may see mold growing in your feeder. Remove it, wash out the moldy syrup and restock it when this occurs. BC

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SKUNKS

bill & mary weaver

Skunks are a menace to beehives all across the United States. Whether it's the familiar striped skunk, a smaller spotted skunk who has the ability to climb trees and stand on his hands, the hooded skunk, or the hog-nosed skunk of the southwest with its piglike, hairless snout, all these black and white and smelly folks feed at beehives.

Skunks work the hives mostly at dusk and just before dawn. Their *modus operandi* is to scratch at the front of the hive, disturbing those inside. When a bee comes to investigate the skunk neatly swats it and pops it into his mouth.

Skunks generally operate on weaker hives. They prefer to confront a single bee at a time rather than the larger numbers that may emerge from a stronger hive when disturbed. Skunk depredations are of most concern during fall and early spring, when queens are not laying heavily. Skunks have large appetites and can seriously depopulate a hive at a time when few new bees are hatching to swell the ranks.

But even when the queen is laying heavily and its at the height of the honey flow, a determined skunk can eat enough bees, it's said, to make the difference between a honey crop and no honey crop from the victim hive.

Yes, bees sting skunks using bee yards as fast food joints. Skunks have been found with many stings in their mouths, tongues, and throats. But apparently the pain of the sting is more than balanced by the easy, tasty meal that beehives offer, and skunks return nightly to the beeyard to feast. And they are not easily deterred from doing so once they've started.

In fact, a bee-loving mother skunk will take her half dozen or so young, after they're weaned, to the apiary with her to teach them the tricks of the trade. The small skunks follow their mother to the beeyard single file, in parade fashion. Treat these young folks with respect, too. By the time they are two to four weeks old, young skunks can spray their tear gas as effectively as their mother.

One beekeeper we spoke with, who traps nuisance skunks, said that in a short period of time, he had trapped and relocated a full dozen skunks from one apiary. It was a mother and her entire, unusually large, litter.

There are several signs that will alert you to a skunk problem in your yards. First, the grass and weeds at the entrance to one or more hives will be scratched up. Over time, the skunk can leave this area bare of vegetation, and sometimes even excavated a bit.

If the weather is wet, a skunk may leave muddy marks on the fronts of the hives where it operates. Sometimes the skunk's scratching can even remove some of the paint from the front of the hive.

You may also notice long, narrow droppings in the yard. If there is snow on the ground or the soil is muddy enough for tracks, they'll show all five toes on both front and hind feet. (Cat tracks, similar in size, show only four toes, and a possum leaves tracks in a hand-like pattern.)

In addition, bees that receive regular disturbances from a skunk become more aggressive and much harder to work with. They tend to sting in larger than normal numbers without much provocation. Finally, skunks not only eat bees, depopulate the hives, and make them more difficult to manage, in northern areas where hives are packed for the winter, skunks sometimes tear at the covering, undoing all the effort in packing it up in the first place.

Beekeepers over the years have been rather inventive in their efforts to foil skunks. Some have tried to deter skunk feeding by scattering commercial fertilizer in their paths. The fertilizer burns their mostly hairless feet, a concept you will under-

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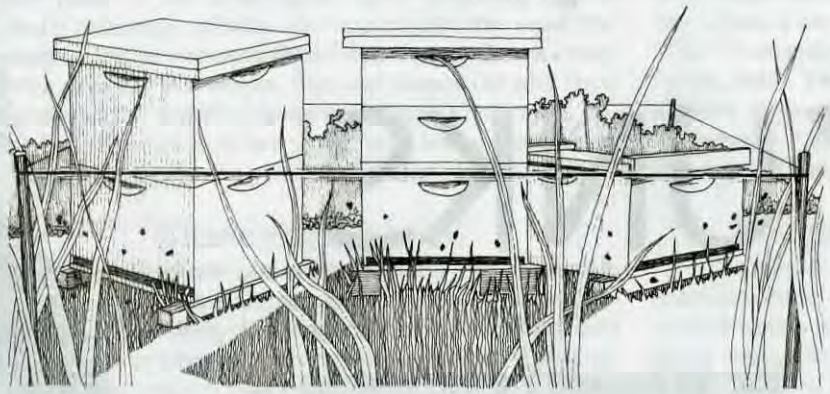


SKUNK FENCE

For the low, one-strand electric skunk fence, 18- to 24-inch posts are long enough. The sales person can show you what sort of insulators go with the posts you choose, and what gauge wire they recommend.

Fence chargers can be found at just about any farm supply store, and your dealer should have no trouble recommending a good one to you. You can get a charger that is powered by a six-volt battery, a 12-volt battery, by solar cells, or one that runs off house current. Although they are more expensive, we like the 12-volt R.V. batteries because they last longer between charges, and if you keep a charge in them over the winter, can last for several years.

Remember though, that to deter a skunk you don't really need a charger that will cut through 25 miles of wet weeds and still knock down a 500-pound gorilla. If you can get a good deal on less powerful equipment, it should do the job.

If you use a charger powered by a six-volt or 12-volt battery you'll need to have a box in the beeyard to keep the battery dry. We like to use an old empty hive body topped with a telescoping cover, resting on a bottom board placed on top of an old tire. Set the battery in the hive body. Put two nails on the outside of the hive body to hang the charger on. With your charger in place, make sure it is well grounded. Your farm supply store can tell you how to properly ground your charger.

String your fence (a two-person job), and connect it to your charger. The last thing you do is connect your charger to your battery.

stand perfectly if you've ever tried to spread high nitrogen fertilizer on your garden with an ungloved hand. Others have tried scattering moth balls around the apiary and using rags soaked in chemical repellents. Unfortunately, to retain their effectiveness, the chemical-soaked rags have to be resoaked after each rain, and the other methods mentioned have their drawbacks, too.

Fencing the skunk out is a time-honored, though usually time-consuming remedy Directions we've read for constructing a skunk fence require buying four-foot high, two-inch mesh (not cheap), and burying the bottom in a trench six to 12 inches deep to keep the skunk from successfully digging under it, a herculean task in a large apiary. In addition, the directions called for a close-fitting gate and a 36-inch wide iron cap around the top of the fence.

This cumbersome fencing idea, though, suggested to us the method that has been 100% effective and not overly expensive and time-consuming for us – a one-strand electric fence with the single wire about three inches off the ground.

You might respond, that sounds both time consuming *and* expensive. Hear me out, however, as I explain. The expense is kept down because we only need one battery and charger for all our yards. The electric fence does not need to be hot for long to discourage your white-striped bandit. It doesn't take many contacts with the electric wire to convince a skunk that it is better off dining somewhere else.

After a week to ten days or so, the battery and charger can usually be safely removed, ready for use as needed at another yard. Your resident skunk, conditioned to expect pain from the strand of wire, will avoid it even if it's not hot.

Once we put up the low fence at a beeyard, we generally leave it up. It's easy to step over to enter the yard, and if another skunk wanders into the area we simply string-trim the weeds under the fence and set up the battery and charger for another week or so.

Although putting up an electric fence can sound like a lot of work, this skunk fence is no big production to erect. Unlike a bear or cattle fence, there's no need to pound the stakes in deep and solid. The skunk is basically a chubby cat and is not difficult to deter. Stakes pounded in minimally, and one strand of wire, after a thorough string trim for the weeds are all that is needed. (See above for more complete directions.)

Although, because of the considerable damage skunks do to an apiary we would kill them if we had to, we like this nonlethal method. Skunks, like most people, have good points as well as bad.

Skunks perform a service for farmers by eating many crop-damaging insects. In fact, skunks are said by some to eat more insects than all other mammals combined. During an outbreak of the damaging range caterpillar in New Mexico a number of years ago, for example, studies showed that skunks included many of these pests in their daily diet. And hops-growing farmers in New York succeeded in getting their state legislature to protect skunks for their value in eating the damaging hop grub. Skunks also devour Japanese beetle larvae, cutworms, grasshoppers, Colorado potato beetles, army worms, tobacco bud worms, squash bugs, and other grubs and caterpillars. Skunks also dig up and devour snapping turtle eggs. The snappers that never develop from these eggs have the potential of spelling death for the young of many kinds of wild waterfowl. In addition, they devour a wide range of small rodents, including voles, mice, and rats. The skunk

you fence out this summer rather than kill may, in fact, help keep down the population of mice and voles that would otherwise damage your hive next winter.

So, without being sappy and sentimental about it, we find it satisfying that we can fence out skunk damage without destroying these sometimes beneficial animals.

Another option is to live-trap a skunk. You'll need a trap of about 32 x 11 inches. These traps can be rented for $12-$15 a week in our area, depending on the type and the dealer.

Place the trap along the trail the skunk follows to your apiary. Be sure it's solid and on level ground. According to trappers we've spoken with, camouflaging the trap is not necessary. Spreading broken eggshells around the trap will attract the skunk's attention. Avoid baits that could attract cats, though. Marshmallows, jelly, or sweet corn will attract a foraging skunk, but not the resident cats. Place the bait in several places leading into the trap. Most states have laws that require frequent checking of these traps. Don't forget.

Once caught, what do you do with the darn thing? First, moving slowly and speaking softly, cover the cage with a drop cloth. A game official said that 90% of the time, in a dark, confined space, a skunk will not spray. (Contrary to what many people think, trapped skunks *are* quite capable of letting you have it with their tear gas bombs.) Then some trappers drown skunks, while others release them a distance away from the apiary.

If you have a mishap, it's nice to know that commercial skunk spray antidotes, with names like "Skunk Off" and "Skunk Stuff," are available from vets and are considerably more effective than the old tomato juice bath remedy.

Another method of discouraging skunk predation consists of a roll of hardware cloth placed over the hive entrance and stapled to the bottom board. The hardware cloth roll makes it hard for the skunk to swat the bees as they appear at the door of the hive.

In the south, skunks are active all year long, and may produce two litters a year to boot. In the north, in the fall, first the young skunks, then the females, and finally the males enter dens lined with up to a bushel of dry grass and leaves for comfort, to sleep during the coldest weather. They frequently waddle into their dens for their winter sleep as hefty as fattened pigs.

The males reemerge first, often around Groundhog Day. So the northern beekeeper doesn't have too long a winter reprieve. When you check your hives early this month, watch for signs of skunk predation, and prepare to take action to prevent your hives from being depopulated. BC

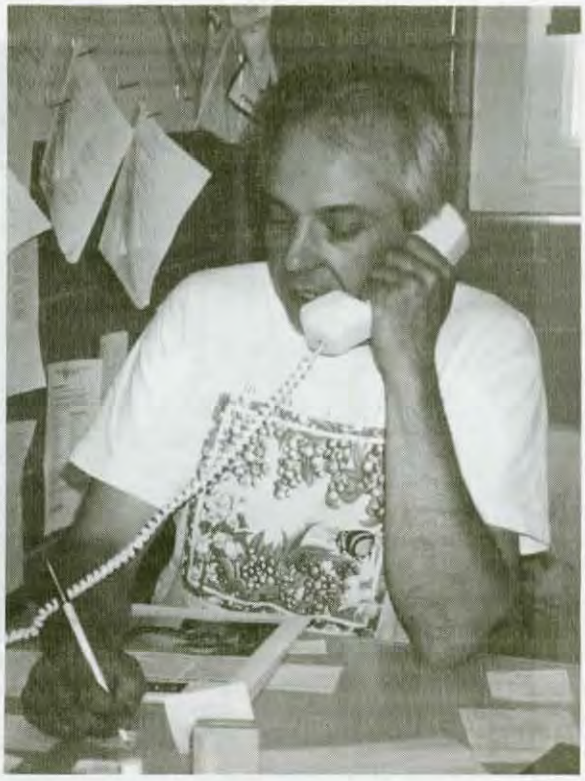
Bill & Mary Weaver raise bees & vegetables, sell honey, & contend with skunks in southern PA.

A Day In The Life

Tony Jadczak

william truesdell

Meet The State Inspector From Maine



At the end of the last ice age, glaciers covered the East Coast as far south as New Jersey. As they melted, their weight lessened and the earth under them rose, leaving behind a flat, barren terrain with acidic soil perfect for wild blueberries. It seems only appropriate that Tony Jadczak, Maine's State Apiary Inspector, followed the glacier's path from New Jersey to Maine.

If you start to feel sorry for yourself handling that deep full of brood and honey, consider that this past year 37,000 hives were brought into Maine for pollination, and Tony inspects about 10% of them. Colonies are inspected to both protect Maine beekeepers and growers and comply with Maine's entry requirements. Plus, Maine has an agreement with several states (including NH, NY FL, PA, and ND) which requires inspections of 5-10% of the hives moving between them. In addition, to be certified, several states require 20% of the hives to be inspected. If American Foulbrood is found in more than one percent them, a closer inspection of all the hives belonging to that owner is necessary to qualify for interstate movement. Hive inspections are also performed if the grower requests it because of questions about the quality of pollination. All this makes for a lot of lifting.

The fumigation chamber is almost ready to operate.

Except for Bob Egan, who works part time and is paid by the Maine Blueberry Commission, Tony is the State's only honey bee representative. He does the work of the State Apiarist, State Bee Inspector, Extension Specialist as well as building and running the State ethylene oxide chamber. He is a key player with the Maine State Beekeeper's Association. In 1993 he was the president of the Eastern Apicultural Society of North America and ran a very successful Annual Meeting in Maine. He is a speaker at the many state MSBA chapter meetings as well as five chapter bee schools. He works closely with the many large Maine honey producers and pollination business' to protect their interests for the benefit of the State. Plus, as I can testify, he is the strong right arm of all the hobby beekeepers in Maine.

How does he manage all this? I decided to find out and spent a day with him and Bob Egan in the blueberry fields.

Tony starts his week by spending Monday in his office in the Agriculture Building, catching up on paper work and lab tests. I visited on Monday since the next day he was going to the blueberry barrens in Down East Maine and would be there full time for three weeks. The pile of "you were called by" notes was about an inch deep. He methodically worked down the pile. Bob told me that after a day of inspecting hives on the blueberry barrens, just to stay even, Tony returns calls from his motel room until 10 or later at night.

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Bob Egan ready to suit up.

TONY JADCZAK ... Cont. From Pg. 163

"The calls can be interesting," Bob commented, "most are fairly straightforward. But last week someone called about bees in their backyard which were the size of hummingbirds. They were sure they were Killer Bees. Tony was nice, took his time with the caller and determined the "bees" were hornets."

On Tony's right is a table filled with jars and vials. "My lab," he points out. This spring he inspected many hobby beekeepers' hives for tracheal mites and the jars are filled with samples he took.

When he finished his calls we were off to the blueberry fields, the three of us in the front seat of Tony's pickup. A half-eaten bag of pretzels sat on the dashboard. Bob gestured toward it. "Lunch," he said. I thought he was kidding but found out later he was not. We shared it and it wasn't bad.

The humor between Bob and Tony made time go by quickly. The day was filled with good natured banter between the three of us, with each alternating between being the straight man and the comedian.

Our first stop was the State ethylene oxide fumigation chamber. It is near completion and should be in operation sometime in 1995. Tony and members of the Maine State Beekeepers Association did most of the work in the state-owned building. Tony ran the New Jersey chamber before he came to Maine. The visit was the only somber note of the day as I stood beside stacks of hives whose bees were killed by American foulbrood.

The overcast sky did not dampen spirits as Tony drove along the gently rolling hills of central Maine. The soil in this area is favorable for "wild" blueberry growing, but not as much as the sandy blueberry barrens of Down East Maine. Here the terrain was a patchwork quilt of farms, woods and blueberry fields, while the barrens stretch around you like a blueberry sea.

The first field was bounded by a State road and farm land. It was a small field with about 40 hives gathered in

Not much escapes this eagle eye.

two parts of the field. Tony and Bob set to work. The back and forth jokes ended as they inspected the hives with speed and efficiency. I was the observer and stayed out of their way, but as they worked they pointed out what they were doing, why they were doing it, and showed me what they found.

Where I would normally lift the outer and then inner cover to check the upper super, they remove the super because their interest is in brood, not honey. Because of stress migratory bees suffer many ailments, especially chalkbrood. European foulbrood is also prevalent in colonies pollinating blueberries, and I saw quite a bit of both. Tony also showed me bees which lost thorax hair and were shiny black. Their appearance might lead to a misdiagnosis of paralysis but it was only due to working the blueberry flower. It was humbling to follow behind them and learn how much I did not know about bee diseases. I also re-affirmed how little the written word or pictures really convey compared to seeing it yourself. I had never seen chalkbrood in its earliest stages nor sacbrood in any stage.

About now you may think disease was rampant in the colonies inspected, but it wasn't. Except for one fairly large infestation of chalkbrood, only one hive with AFB was found and only a scattering of EFB and sacbrood. Except for the AFB, the bees would take care of themselves. After Tony found the AFB he marked the hive with the initials "AFB" and said, "America's Finest Bees." But his face was grim as he took his hive tool, burned it in his smoker, then plunged it into the earth over and over again, as if trying to kill a beast which would not die.

After Tony and Bob check a field they wash their

gloves and equipment in clorox. They carry three sets of bee suits so they do not transmit disease from one operation to another.

Migratory beekeepers, by and large, take good care of their bees. Most disease problems are stress related or coupled with the season and the crop being pollinated. An example is the combination of spring, blueberries and EFB. All the hives showed little or no *Varroa*. Tony and Bob confirmed their observations with many ether rolls, about 200 that day. Plus they take samples to check for Tracheal mites. After the tenth ether roll Bob said, "One more of these and I'll confess to anything."

Migratory beekeepers have what can only be called an interesting mix of equipment. Except for one or two owners who had relatively new equipment, most had a mix of frames and hives from their own and other beekeeping operations. When Tony opened a hive I was treated to a history of east coast beekeeping. He would hold up a frame, the top branded with a name.

"He was one of the best beekeepers on the coast. Every frame had wall to wall bees. No *Varroa*. Ran a great operation out of Florida. He died a few years back."

"This company was a partnership. They never got along. Didn't know enough about bees or business."

Many hives were different colors which indicated either a prior owner's color preference or the present owner's method of making each hive entrance different for his bees. Each hive and its frames became a short story of someone's beekeeping life. Each time a hive was opened, a name was remembered either fondly or with a sad shake of the head. Those frames were a beekeeper's memorial to his trade.

The other fields we visited were surrounded by woods. Each field had a story. The time Bob and Tony stretched out a spool of wire and the wire was struck by lightning. Both were knocked to the ground. Someone said it was punishment because they were working on Father's Day. Tony replied, "If it was punishment we would both be dead." Bob shook his head, "No, it was punishment because we were kept alive."

In another field a migratory beekeeper had trouble with bears raiding his hives and people stealing the batteries he used for electrified fence. So he put the hives on his truck and ran electrified fence around the truck and hives. The next morning he found a bear trapped inside the fence.

The Maine rhythm section on an 'ether' roll.

Then there were the short comments as hives were opened and inspected. "These bees are not working the berries. The pollen is yellow and on their legs, not on their bodies. It is time to move the hives."

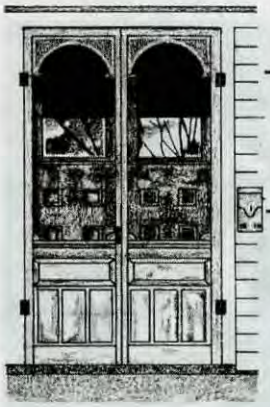
"These hives are too light to go to the cranberry fields. With cranberries, they come out lighter than they go in."

"Wild bees are dying out. Overwintered bees are meaner this year. But these bees are gentle."

The day sped by as I tried to remember everything said. I was an apprentice trying to learn everything in one day and overwhelmed with ideas and information.

Tony and Bob usually work a 10-hour day in southern and central Maine, and a 12-14 hour day on the barrens. With nearly 40,000 hives entering the state for pollination they need every hour. They cut the day short for me and returned to the office to finish up their paper work. I returned home with a better appreciation of the hard work involved in being Maine's State Apiary Inspector. BC

William Truesdell keeps bees, and writes about beekeeping and beekeepers from his home in Bath, Maine.



HOME HARMONY

ann harman

Spring Snacks

Here comes Spring! One of these days you will jump into your truck and go spend a good, long day in the beeyard. There's always so much to do during those first visits of the spring – cleaning up winter debris, deciding on requeening, equalizing colonies, and much more. You'll be lucky to get home before dark. You've been sure to put hive tool and smoker, plus everything else you think you might need in the truck. I'll bet you forgot something – your lunch.

All that nice fresh air after a stuffy winter is going to make you very, very hungry. With a little bit of planning you can make your own carry-out lunch and snacks. True, you can throw a piece of bologna between two pieces of bread at the last minute, but such a lunch is not all that interesting. Take advantage of a rainy day and bake several different kinds of bread and put the loaves in the freezer. Sheet cakes freeze well, too. Various kinds of spreads and dips can be made ahead and will keep well in the refrigerator until needed.

It is best to select recipes that don't depend on refrigeration. A small cooler can be handy but even with that it is safer not to use foods that spoil easily.

Now you have to give some thought to where you will be eating your lunch. Will you be sitting on the back of your pickup eating in a civilized fashion, or will you be driving down the road on the way to the next outyard? If you're driving, the food has to be held in one hand and cannot crumble or dribble. If you are sitting and enjoying the smells and sounds of spring, you can fix just about anything.

FARMHOUSE HONEY BREAD

Sandwiches are one of life's basics, and the bread really is what makes a sandwich truly excellent. Even a boring sandwich stuffing is helped by being stuffed between two slices of a truly good bread. Bread, including regular yeast bread and a sweeter quick bread, freezes so well that you can make several kinds to give your sandwiches variety. Here's a recipe for an honest whole wheat bread. The buckwheat flour gives this bread distinction.

1 package active dry yeast
1 cup warm water (105-115°F)
4 4-1/2 cups bread flour
1 cup whole wheat flour
1 cup buckwheat flour
1 cup milk
1/3 cup honey
1 tablespoon vegetable oil
1 tablespoon salt

In a large bowl, dissolve yeast in warm water. Let stand until foamy, 5 to 10 minutes. Mix together the flours. Stir milk, honey, oil and salt into yeast mixture. Beat flour mixture into yeast mixture, 1/2 cup at a time, until a stiff dough forms. On a floured surface knead dough until smooth and elastic, 5 to 10 minutes, adding more flour to prevent sticking. Place dough in a large greased bowl, turning to coat. Cover loosely with a damp cloth; let rise in a warm place until doubled, about 1-1/2 hours. Grease one large or 2 small baking sheets. Punch down dough. On a floured surface knead dough for 30 seconds. Divide dough in half. Roll each half into a 14-inch rope. Coil each rope around tightly; tuck ends under. Place loaves on baking sheets. Cover loosely with a damp cloth; let rise in a warm, place until almost doubled, about 1 hour. Bake at 375°F about 35 to 40 minutes or until loaves are brown and bottoms sound hollow when tapped. Transfer to wire racks to cool. Makes 2 loaves.

Great American Home Baking

CAJUN HOT TOMATO BREAD

I found this next bread recipe excellent for a sandwich made with one of last-night's leftover hamburgers. It is also quite good with a simple spread of cream cheese. It is a bread with a difference. Try it!

1 cup Bloody Mary mix
1 cup water
1 package active dry yeast
1/3 cup honey
1/4 cup vegetable oil
1/4 cup chopped green onion tops
1/4 cup chopped parsley
1 clove garlic, pressed
1 teaspoon salt
5 to 6 cups all-purpose flour

Combine Bloody Mary mix and water in small saucepan. Cook over low heat until mixture reaches 105°F to 115°F; pour into large, warm bowl. Add yeast; stir until dissolved. Add honey, oil, onion tops, parsley, garlic and salt; mix well. Add 1 cup flour and stir until smooth. Stir in more flour until firm dough is formed. Knead dough on lightly floured board about 5 minutes or until smooth and elastic. Shape dough into a ball. Place in greased large bowl; turn to grease all sides. Cover bowl and set in warm place to rise, about 1 hour or until doubled in bulk. Punch dough down and divide into two equal pieces. Roll each piece on lightly floured surface into rectangle. Roll each piece tightly from short side, jelly-roll style. Pinch seam to seal; place in greased 9x5x3-inch loaf pans. Cover and set in warm place to rise, about 1 hour or until doubled in bulk. Bake in preheated 400°F oven about 30 minutes or until loaves sound hollow when tapped and crust is brown. Remove from pans and cool on wire racks. Makes 2 loaves.

Sweetened With Honey The Natural Way
National Honey Board

APRICOT QUICK BREAD

Perhaps you would prefer a quick bread — one that is made quickly and is a bit sweet. This recipe "makes a

golden, fragrant loaf, a pleasing combination of tartness and sweetness"

1 cup dried apricots
boiling water
1 egg
2/3 cup honey
2 tablespoons melted butter or oil
1 6-ounce can apricot nectar plus enough orange juice to make 1 cup
(if apricot nectar is not available, use all orange juice) grated peel of 1 orange
1 teaspoon vanilla
1/2 cup chopped nuts
2 cups unbleached white flour
2 teaspoons baking powder
1 teaspoon baking soda
1 teaspoon salt
1/4 teaspoon ground ginger

Pour boiling water over apricots, enough to cover them, and let them steep about 10 minutes. Drain and chop the apricots. In a large mixing bowl beat the egg until light and slightly thick, add the honey, melted butter or oil, apricot nectar and orange juice, orange peel and vanilla. Beat well. Stir in the apricots and nuts. Sift together the flour, baking powder, soda, salt and ginger. Fold the flour mixture into the liquids, stirring just enough to mix thoroughly. Pour into greased loaf pan and bake at 350°F for about an hour, or until the top is springy to the touch. Cool loaf in pan for 10 15 minutes before removing to cool on a rack. Makes 1 loaf.

The Garden Way Bread Book

SWEET AND SOUR DIP

Pieces of raw vegetables are a good accompaniment to sandwiches and are easy to bring along for nibbles. Although a dip is not suitable to use while driving, take a break and use this next recipe for your favorite veggies.

1/4 cup honey
2 tablespoons prepared mustard
2 tablespoons white vinegar
1/8 teaspoon onion salt
1/4 cup drained crushed pineapple.

Blend all ingredients until smooth. Makes 3/4 cup.

A Honey Of A Cookbook, Vol. II
Alberta Beekeepers Association

ENERGY BARS

1/2 cup old-fashioned unhomogenized crunchy peanut butter
1/4 cup honey
1/4 cup water
1/2 cup powdered milk
1/2 cup wheat germ
1/2 cup shredded unsweetened coconut
1/2 cup sunflower seeds
1/2 cup chopped cashew nuts
1/2 cup sesame seeds

In a large bowl combine all ingredients, stirring to create a thick, homogenous mass. Press into a small buttered pan or roll into a log. Wrap and chill, then slice into rounds or cut into squares. Wrap pieces individually. Store in airtight containers.

Honey Feast
Gene Opton and Nancie Hughes

ORANGE-N-HONEY TEA

Now for something to drink. The following recipes will give you something hot for cool weather and something cold for hot weather. Spring is very unpredictable!

2 cups water, divided
10 whole cloves
1 stick cinnamon
1/3 cup honey
1 cup orange juice
4 tea bags

Combine 1 cup of water, cloves and broken cinnamon stick. Simmer, covered, for 10 minutes. Add honey, remaining water and orange juice; bring to a boil. Remove from heat and add tea bags. Cover and steep 5 minutes. Remove tea bags and spices. Serves 4-5 in cups but will fit in a 1-quart thermos.

A Honey Of A Cookbook
Texas Department of Agriculture

APPLE-ORANGE PUNCH

1/4 cup honey
1/2 cup lemon juice
1-1/2 cups apple juice
1-1/2 cups orange juice
4 cups ice water
lemon slices (if you are using it as a punch)

Combine honey, juices and water. Stir until well blended. Chill. Add ice and serve garnished with lemon slices. Makes 2 quarts. (So you can fill your thermos and have some left for another day.)

The Honey Kitchen
ed. by Dadant

Your picnic lunch for beeyard work is all set. Just don't forget to put it into your truck! Oh, and by the way, don't forget your smoker.

BEESWAX ART

gwen eisenmann

When I was very small I lived with my grandmother. She was tiny and busy, and I will forever carry with me pictures of her gnarled hands making pie dough, stirring oatmeal, putting wet clothes through the wringer, trowelling in the garden, and mending. I stood beside her while she sewed, and watched.

In her sewing basket was a cake of beeswax. It was sort of round and just big enough to fit in my four-year-old hand. The edges were scalloped, rough where thread had cut grooves as Grandma waxed it for sewing on buttons. It had a wonderful smell, unlike anything else at Grandma's house. I smoothed and smelled the wax, and wondered where it came from. It certainly didn't seem to have any connection to the humming bees on dandelions in the field where we played, making dandelion chains.

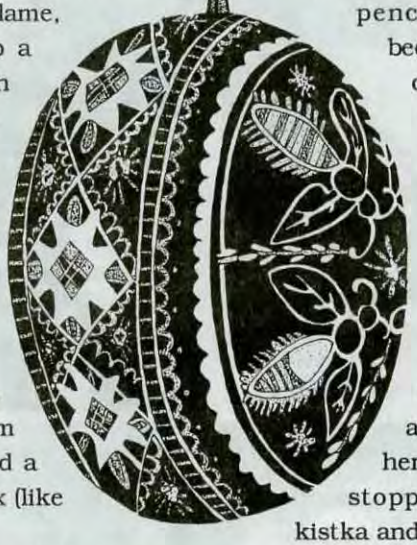
Anyway, somehow the smell of beeswax, Grandma, a sunny spring morning in a field full of huge yellow dandelions and humming black and yellow bees all run together.

Then came Ukrainian Easter eggs. In the April, 1990 *Bee Culture*, Diana Sammataro told how. I was elated. Our two colonies and my own little flock of backyard chickens would make this wonderful craft even more fun. With beeswax involved I knew this was a quality operation. The fragrance would be there when the hot kistka scooped up the wax.

But what was a kistka, and where could I get one? Even though some sources were listed, Easter came and went without Ukrainian Easter eggs. But not this year! I have completed two Ukrainian Easter eggs, and more are on the way.

Just when we thought winter was over we got our first snow, 14 inches. It came silently at dawn, without wind, and snowed all day. It was still snowing when the electric power went off that night at nine. We knew it would happen because this is a wilderness area in a forest, and trees or branches often fall with snow or ice storms. We lit candles and an oil lamp and accepted the fact that it would be 24 to 48 hours, at least, before we'd have power again.

But I had two kistkas and eight jars of brilliant dyes to make Ukrainian Easter eggs, and I could do just fine by candlelight. Anyway, a candle is necessary to heat the kistka, a tiny brass funnel on a handle. It is heated in the candle flame, then used to scoop a little beeswax which melts and runs out the funnel to make a writing tool to trace a design on the egg.



For years I had wanted to try this. I had ordered a kit I saw advertised with two kistkas, medium and heavy, dyes, and a little cake of beeswax (like I needed beeswax!).

The snow was beautiful in the forest, and somehow when we are forced to stop all usual business, coming and going, and doing things with noisy electrical appliances, our own creative beings emerge. Call it romance, call it myth, call it poetry or fairy tale, whatever it is can be written on an egg with beeswax. No one can manufacture an egg, and no one can manufacture beeswax. But put them together with human ingenuity, and the depths of a snowbound winter night suddenly bloom into springtime beauty in color and design that require long hours of candlelight and patience. People, chickens and bees go together nicely, and now I know a lot more about the beeswax in Grandmother's sewing basket.

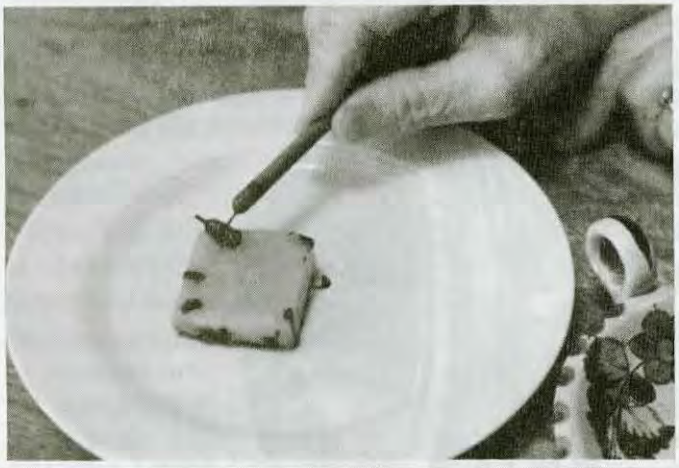
Did you every try to draw a straight line on a curved, bumpy eggshell? I thought it would be easier to start with straight lines in a design rather than birds and flowers, but the squiggles in my "straight" lines looked more like fuzz. The first lines were with pencil. Drawing with beeswax over the pencil line should cover the squiggles. That's what I thought until I discovered it must take a lot of experience to get the beeswax to flow just right. My lines were thick and thin with a blob here and there where I stopped to reheat the kistka and the wax came out too quickly. But there's no erasing.

I lowered the egg into the brilliant yellow dye. While it soaked I started another egg. This time I tried little birds beneath a tree with berries on it. The birds would be yellow, the tree green and the berries red. Except my hand's inten-

Continued on Next Page

The tools – eggs (washed to remove any oils), a candle, a kistka and beeswax.

The kistka is heated in the flame



then used to scoop up a bit of wax.

The wax melts, then runs out the funnel end and is used to make the designs.

tion and the kistka's wax didn't seem to coincide very often. But I kept drawing, waxing and dyeing, going from yellow to orange and red with one egg, and from pink to blue and purple with the other egg. Small figures were dyed with a cotton swab dipped in color, then covered with wax.

Finally it was time to remove the wax and see the design and colors emerge. I held the egg to the side of the candle flame, melted a little wax and wiped it off with a tissue. Little by little both eggs were cleaned of wax. They looked beautiful by candlelight.

The next morning the sun came up, power came on, snow melted, and the temperature soared to 50. As soon as the roads were cleared I invited my two daughters to come and color eggs. The lines are a little crooked and blotched, but the colors make up for these imperfections. We're beginners, but already I hear talk of selling these beauties at craft shows. People will buy them, people who don't know the smell of beeswax and the magic of creating something beautiful by candlelight on a dark snowy night.

The next egg I color will have dandelions and bees on it. My squiggles will only make the bees fuzzier and the flowers fuller. BC

•

Ukrainian Easter Egg Kits can be ordered from The Ukrainian Gift Shop, 2422 Central Ave. NE, Minneapolis, MN 55418, (612) 788-2545. Several sizes of kits are available, with different tools, dyes and more. Credit cards are accepted, but there is a minimum charge.

Gwen Eisenmann keeps bees, gardens and makes Ukrainian Easter Eggs by lamp light in her home in Bixby, Missouri.

?Do You Know? Answers

1. **False** The honey bee queen begins to lay eggs in the winter long before the temperatures get warm enough to break the winter cluster. The queen stays within the cluster and moves with it as it changes position. Colonies that are well supplied with honey and pollen begin to stimulatively feed the queen, and she begins egg laying during late December or early January, even in the northern areas of the United States.
2. **False** As the bee cluster goes through the winter, the bees normally move upward into the uppermost part of the hive. When brood rearing is initiated, it normally occurs in the top hive body as well. The bottom hive body early in the spring may still contain some stored honey and pollen, which is of little value to the bees at that particular time, but it will be basically free of bees and brood.
3. **False** Honey bee queens only mate during the early period of their lives, prior to the commencement of egg laying. The spermatheca can hold up to seven million sperm and it generally takes 2-4 years after mating before all of the sperm are used. She will be superseded and killed by the colony when she runs out of sperm.
4. **False** Worker age is the major factor determining which workers will remain in the nest and which will issue with a primary swarm. Younger workers have a higher probability of issuing with a primary swarm than older workers. The advantage of a higher proportion of young workers issuing with swarms is that it provides more bees with greater potential longevity for the swarm, a factor of critical importance since new workers will not begin emerging until at least 21 days after the swarm has colonized a new nest site.
5. **True** Many worker-laid eggs are often found in a single cell, although each worker only lays one egg per cell.
6. **False** Laying workers have a rudimentary, nonfunctional spermatheca and also lack the various genital structures with which the queen can mate and accept sperm from drones. Therefore laying workers can only lay unfertilized eggs.
7. **True** The eggs of laying workers are smaller than queen-laid eggs.
8. **True** The eggs of laying workers are placed on the sides rather than at the bottoms of cells, since the worker abdomens do not quite reach the bottoms of cells when inserted for egg laying.
9. **True** Laying workers are most prevalent when queens are lost and colonies fail to rear a new queen. The workers with enlarged ovaries begin to lay eggs within a few weeks.
10. A) 93.2° F. (34° C)
11. B) Four
12. To determine if the colony is still alive. Check for adequate food stores and location of food stores within the hive.
13. Congestion within the broodnest is the primary cause of swarming.
14. Weaker colonies do not seem to get nearly as much advantage as the strong colonies when bulk outdoor feeders are used since they will have a much smaller foraging force. Communal feeders may encourage robbing and the weaker colonies will end up the losers. Bulk feeders may also end up supplying food for other colonies in the area not belonging to the beekeeper including feral colonies.
15. Afterswarms are normally headed by one or more virgin queens, whereas, the older mated queen usually leaves with the primary swarm. The size of the worker population in swarms generally decreases with swarm number. Afterswarms contain fewer bees than primary swarms, thus are smaller in size. Workers in afterswarms do not engorge as fully as in prime swarms and fewer young bees issue with afterswarms.
16. One of the most important contributions to swarming is the age and condition of the queen. The age of the queen is related to her production of pheromones and strength of the colony provided conditions are optimal for rearing brood. Research has shown that a colony with a three-year-old queen is about twice as likely to swarm as is a colony with a two-year-old queen. A similar comparison exists between a two-year-old and a one-year-old queen, but the difference is not as great.
17. Equalize the strength of the colonies
    Add honey supers
    Split or divide colonies
    Reverse the brood chambers
    Requeening the colony will also help prevent swarming
18. Feed honey
    Feed dry sugar
    Feed sugar syrup
    Feed sugar candy
    Feed isomerized corn syrup (High fructose corn syrup)

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

INNER ... Cont. From Pg. 128

contract (and most I've seen) that I want to focus on, and that's evaluating the strength of the colonies brought in to do the work. The contract on the right talks about frames with brood, frames covered with bees, pounds of honey and how-many story hives. Let's face it, it would be pretty easy for an unscrupulous beekeeper to take advantage of that general description (not that any would, right?). Likewise, a grower with an axe to grind could do the same thing. This is shaky ground, today. Ten, or even five years ago this wasn't the case (although there were beekeepers and growers who did, I'm told). When a beekeeper brought in a two story colony it was full of bees, had plenty of brood and would do the job. A handshake was all that was usually needed.

Mites have changed that. And, they have changed that once-trusting relationship, and, along with that increased scrutiny I mentioned earlier, they have changed how colonies are measured.

If you haven't yet, you will very soon run into a grower who isn't buying boxes/acre, but is buying frames of bees and frames of brood/acre. And, that is what you should be selling - frames, not boxes. You buy HFCS by the amount of sugar, not the size of the tanker; breakfast cereal by weight, not the size of the box; so pollinating units should be the same, sold by the Active Ingredient, not the container, right? Well, I think so.

This means a bit more, maybe a lot more involvement on your part, making sure your bees come up to par; and on the growers part making sure he gets his money's worth. But exactly what is 'par'?

Well, that's not easy to say, but you can figure it out. Let's say the 'standard' where you are has been to rent a double deep unit. In that unit you generally try to supply 12 - 14 frames of bees, brood, honey and pollen. If you decide that seven of these frames in the bottom should be about three quarters full of brood (in any stage, on both sides), and three frames in the top are about the same, you should have roughly seven and a half frames of brood. Similarly, if you decide the bottom box generally has five solid frames of bees, one bee deep, and the top should have three, you end up with eight frames of bees, for a total of seven and a half brood, eight bees. If you decide this is the 'standard; you need to judge all your colonies compared to that 'standard'

Of course bees don't align themselves neatly in complete frames. You need to figure fractions of frames, on both sides of every frame. And that takes time and work. Looking and figuring and measuring. And the grower needs to know that your colonies really do meet that 'standard'

Standards aren't the same everywhere, either. What's common in Maine for blueberries is not the same as in California for vegetables, or Ohio for apples. But once a buy-by-the-frame formula is understood, differing standards are easily met, and differing sizes of boxes (10 vs. 8 frame) are no longer a problem.

The ground rules have, and are changing. Growers are, or very soon will be requiring frames/acre. A good pollination contract is a start, but the rest is up to you. Make a product ready to sell. And then go out and sell it. Your bees have a value - make sure you get, and give, your money's worth.

Be prepared.

Kim Flottum

Detach or Photo Copy & Return

BEE CULTURE SURVEY - March, 1995

Tell Us What You Think

1. How long have you been a subscriber? _____

2. How many of the past six issues have you read? (Circle one)
   1 2 3 4 5 6

3. Do you like the cover of this magazine?
   ☐Yes ☐ Somewhat ☐ No

4. How interesting were the stories in this issue? (Check one box each.)

	Extremely	very	somewhat	not at all
Inner Cover, Pollination Contracts Flottum	☐	☐	☐	☐
Mailbox Readers	☐	☐	☐	☐
Honey Report - Reporters	☐	☐	☐	☐
Research Review - Morse	☐	☐	☐	☐
Book Reviews & New Product - Staff	☐	☐	☐	☐
Do You Know? - Collison	☐	☐	☐	☐
Division of Labor - Winston	☐	☐	☐	☐
Tax Time - Tuttle	☐	☐	☐	☐
Leafcutter Bees Polachic	☐	☐	☐	☐
Swarming - Bonney	☐	☐	☐	☐
Extended Honey Flow - Taber	☐	☐	☐	☐
Observation Hives - Caron, Webster	☐	☐	☐	☐
Skunks - Weaver	☐	☐	☐	☐
Tony Jadczak - Truesdell	☐	☐	☐	☐
Home Harmony - Harman	☐	☐	☐	☐
Beeswax Art - Eisenmann	☐	☐	☐	☐
Bee Talk - Taylor	☐	☐	☐	☐
Gleanings	☐	☐	☐	☐
Calendar	☐	☐	☐	☐
Classified Corner	☐	☐	☐	☐
Bottom Board - Sobchak	☐	☐	☐	☐

5. Which of the following statements relating to the content in this magazine best describes the way you feel?
   ☐ I got more than my money's worth.
   ☐ There's not enough for my money.
   ☐ It's about right.

Return to: Bee Culture, 623 W. Liberty St., Medina, OH 44256.

Sample Pollination Contract

POLLINATION AGREEMENT

This agreement is made _____, 19___, between _____, and _____.

1. TERM OF AGREEMENT. The term of this agreement shall be for the 19 ___ growing season.

2. RESPONSIBILITIES OF THE BEEKEEPER:

a. The beekeeper shall supply the grower with _____ hives (colonies) of honey bees to be delivered to the _____ as follows:

(Fill in the appropriate line or lines and cross out those that do not apply)

Approximate date of introduction _____. Number of days after written notice from the grower _____.

Time in relation to the following amount of bloom _____

_____

DESCRIPTION OF LOCATION(S): _____
(For additional space attach a separate sheet dated and signed by both parties)
_____

The beekeeper shall locate said bees in accordance with directions of the grower, or, if none are given, according to his judgement in providing the maximum pollination coverage.

b. The beekeeper agrees to provide colonies of the following minimum standards:

Disease-free colonies with a laying queen as evidenced by brood

_____ frames with brood

_____ frames covered with adult bees

_____ pounds of honey stores or other food

_____ story hives

The beekeeper agrees to open and demonstrate the strength of colonies randomly selected by the grower.

c. The beekeeper agrees to maintain the bees in proper pollinating condition by judicious inspection and supering or honey removal as needed.

d. The beekeeper agrees to leave the bees on the crop until:

(Fill in the appropriate line or lines and cross out those that do not apply)

Approximate date of removal _____. Number of days of written notice from grower _____.

Time in relation to amount of crop bloom _____

Other _____

3. RESPONSIBILITIES FOR THE GROWER:

a. The grower agrees to provide a suitable place to locate the hives. The site must be accessible to a truck and/or other vehicles used in handling and servicing the colonies. The grower shall allow the beekeeper entry on the premises whenever necessary to service the bees, and the grower assumes full responsibility for all loss and damage to his fields or crops resulting from the use of trucks or other vehicles in handling and servicing such colonies of honey bees.

b. The grower agrees not to apply pesticides toxic to bees to the crop while the bees are being used as pollinators nor immediately prior to their movement into the field or orchard if the residue would endanger the colonies.

c. The following pesticides, other agricultural chemicals and methods of application are mutually agreed to be suitable while the bees are on the crop:

_____

_____

_____

d. The grower also agrees to properly dispose of all pesticide solutions in such a manner that bees will not be able to contact the material while searching for a water source.

e. The grower agrees to give the beekeeper a 48-hour notice if hazardous materials not listed on this contract need to be applied. The cost of moving the bees away from and back to the crop to prevent damage from toxic materials shall be borne by the grower.

f. The grower agrees to pay for _____ colonies of bees at the rate of $_____ per colony. Payment shall be made to the beekeeper as follows: $_____ per colony on delivery and the balance on or before _____ of said year. Additional moves or settings shall require $ _____ per hive per move.

g. The grower agrees to provide adequate watering facilities for the bees if none are available within one-half mile of each colony used in pollinating the crop.

Signed: _____ Date: _____

Address _____ Phone Day: _____ Night: _____

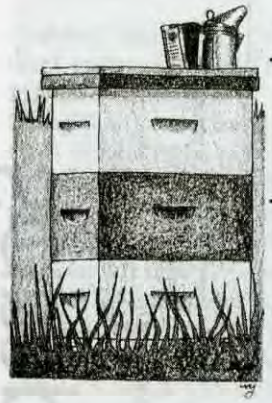
Signed: _____ Date: _____

Address _____ Phone - Day: _____ Night: _____

_____

A Grower's Dozen Do's

Notice unexpected colony removal.
Notice rain water accumulation.
Turn entrances toward the field, away from roads.
Establish flight paths and locations away from dwellings, parking lots, vehicular and foot traffic.
Avoid shady locations and low spots.
Provide "drives" for bee trucks and specific, enlarged "bee drops" in the field.
Inform beekeeper of scheduled irrigations and schedule changes that may occur.
Discourage drifting by marking hives, spacing hives irregularly, or providing landmarks in the field.
Choose "staging" areas carefully. High densities of homes won't tolerate hundreds of hives nearby.
Avoid visibility of hives when possible.
Avoid excessively traveled roads over flight, especially at passenger level (so bees do not get killed).
Avoid pesticide losses to your beneficial pollinators, including honey bees.



BEE TALK

richard taylor

"Here are more suggestions for producing comb honey as easy as possible."

I recently touched on the subject of the Chinese *evodia*, or Bee Bee Tree, in this column, and have been astonished at the response from readers. Many more beekeepers have discovered this great honey plant than I had realized. Several sent me seeds from their trees, and others told me about sources for seeds. Even more important, those who have cultivated this tree wrote to me of their experiences, so I learned a lot. I shall, in due time, devote this page to this subject, drawing on all the information I have received, and acknowledging my indebtedness to those who have supplied it. Meanwhile, I shall be testing lots of seeds under varying conditions. This is a honey plant that has a great future, and can significantly enhance the art of honey getting.

Right now, however, I must continue with the subject I left unfinished last time, namely, comb honey basics. This may take a few more installments. I have dealt with some of the history of this specialized craft, with apiary locations, hive size and apiary size, and now we must get down to some of the finer points.

What we are after is a fairly simple management system for getting comb honey of the very best quality— and what I emphasize here is simplicity. Getting comb honey is not as hard as some writers have made it appear. The one basic rule you have to keep always in mind is to have strong colonies— strong in the fall, and then *still* strong in the spring— and then prevent them from swarming as best you can.

The basic cause of swarming I have mentioned many times, but it is still so insufficiently appreciated that it bears repeating. The one thing which, more than anything else, precipitates swarming is congestion of the BROOD nest. It is not congestion, that is, overpopulation, of the hive itself. When the hive gets so full of brood, pollen and honey that the queen can find no combs in which to lay, then the bees build queen cells, no matter what precautions you have taken. At the same time, there are other factors, such as the age of the queen, so really effective swarm control involves more than just keeping an open brood nest.

Beekeepers know that colony population builds up very fast in the spring. Checking your hives in May, you find them very populous, amazingly so. It is a population explosion. The queen's egg laying has reached its peak and soon after you see the result— hives boiling over with bees. This is what has, quite understandably, led so many beekeepers to suppose that swarming is the result of over-population. But if you look inside those hives you will find that all available comb is filled.

So the most important step, in keeping your colonies strong at this critical time, is to maintain an open brood nest; that is, make sure there are empty combs IN THE BROOD NEST. It does little good to just pile empty combs on top of the hive, that is, to super up, thereby giving the bees more room. What they need is more brood space.

The only way you can keep an open brood nest is to remove combs of brood from the heart of the brood nest, usually three at a time, replacing them with empty combs or foundation.

Now if you have double or triple story hives this is a simple matter. You just swap the combs of brood from below with empty or near empty combs from above. But that won't work in comb honey production, because you are not using double-story hives. A hive for getting comb honey should be only one or one and a half stories, that is, a deep hive body plus a shallow super, and the comb honey supers go on over this small hive. I have explained the reason for this; namely, if you use a two-story hive, then too much of the honey is going to end up in the second story rather then in the supers.

So now you've got a problem. What do you do with the three combs of brood you have removed? That is not a very big problem. You can take the three combs of brood, with plenty of adhering bees (but not the queen) and make a nuc, which you then requeen. Or you can combine nine such combs of brood, with adhering bees (but not the queen) to make up a new colony, which you then requeen. The adhering bees from different hives will not fight. You've got to do one or the other, and if you have all the colonies you want for yourself, then you can sell off the nucs or the new colonies resulting from this procedure. There is always a market for them.

That procedure, of opening up the brood nests, will probably have to be repeated at least once, maybe twice. And when you put the empty combs or frames of foundation into the hive, try to get them right in the center of the brood nest. Bees are reluctant to fly off in a swarm leaving a partly empty brood nest.

My one-and-a-half story hives have the half story— that is, the extracting super— on the bottom, and now you can see why. It is much easier to remove the combs with this arrangement. Even more important, if you are replacing brood combs with frames of foundation, then it is essential that these be in the upper

story, not down below, for otherwise the bees are apt to chew them up instead of drawing them out.

Meanwhile, let it be emphasized that you have long ago supered the hives with at least one comb honey super and more likely two. Supers must go on the hives as soon as the dandelions and fruit bloom appear and, preferably, before. So your open brood nest manipulations will probably be performed well after you have begun supering. A strong hive will make good comb honey from the early fruit bloom, but a weak one will not. If your colonies are not getting surplus honey from the early flows then that means they did not come into spring strong enough. And that usually means they did not go into winter strong enough and with plenty of stores— about which, more later. Right now I am making the point that if you are late supering, then you are going to get swarms, because that nectar is going to go into brood combs and make them unavailable to the queen for egg laying.

I believe this is the commonest error of beginning beekeepers, whether they are trying to get comb honey or not; namely, putting off supering too long. Spring creeps up and, before they know it, their hives are in swarming condition and they don't even have the supers on yet. Don't put it off. If you try to get the supers on early, you'll probably be timing things about right. You can't really get the supers on too soon— at least one comb honey super to begin with.

Now, as I suggested, the congested brood nest is not the only factor precipitating swarming. (Probably one should not speak of the "cause" of swarming, because it is like asking what causes birds to lay eggs. Swarming is a natural method of reproduction— of COLONY reproduction. Bees, being social insects, must reproduce their colonies if they are to survive as a species.)

Another factor is the age of the queen. A colony headed by a two-year old queen is far more likely to swarm than one with a younger queen. So if you have the time it is surely worthwhile to requeen every year. I have to admit that I have never done this much, first because I am usually very pressed for time in the spring, which is when it should be done, and second, because I do not like killing queen bees.

What is time-consuming about requeening is searching out the old queen. Even if, like me, you are good at spotting the queen on a comb covered with bees, still it can take a good part of the day to do this with as few as a dozen colonies. It is very tiring and monotonous.

BUT, there is a fairly reliable way to requeen without having to search out and destroy the old queens. You thus not only greatly simplify the job, you also spare yourself the distaste (if you are like me) of murdering a beautiful queen, who has given you so much and deserves better. You just let the bees do that. This is what I am definitely going to do this spring, at least with one apiary.

Here is how you do it.

We suppose your hives are story-and-a-half; that is, a deep plus a shallow. (The shallow, incidentally, should be on the bottom, for reasons already given.) Okay, so set the part that has the least honey in it, that is, the one that is least heavy with honey, off to one side on a new bottom board. The way to do this, if apiary space permits, is to set that part BEHIND the heavier part, which is left where it is, and facing the other way. And be sure to have at least one super on whichever part stays on the original stand, because that is where all the field bees are going to go. Give the moved part some kind of cover, such as a scrap of plywood, held down with a brick or rock. And restrict the entrance of the moved part by stuffing grass in it. The bees will soon remove enough grass to get in an out, and meanwhile, this will prevent too many bees from leaving.

Then three days later, see which part has eggs. That only takes a few seconds. Now you know where the queen is. Introduce a new queen to the other part— hopefully, this will be the part that you moved, for acceptance is more likely there. Then, in a few days, when the new queen is laying well, reunite the two parts, by putting both on the original stand, facing the way they were originally, and making sure the new queen is in the TOP part. It has been found that a new, laying queen, in the top story of a hive, will *usually* be the victor in the queen fight that follows such a procedure. So you will have requeened your colony without having to search out the old queen and without (directly) bloodying your hands with murder. It is not foolproof, but it is good enough.

Now for two final points.

Why did you leave the part having most of the honey on the original stand? So the bees would not rob it out. That is what they do if you move honey to a new spot. They go get the honey and bring it "home."

And why is it better to requeen the moved part? Because it contains only the younger bees, not the older flying bees, who are hostile to a new queen, but who have flown back to the original stand.

Now I have indicated that, for raising comb honey, you might be better off with a single-story hive— provided it is very heavy with honey in the fall. I'll say more about that later. But if you have single story hives you obviously cannot requeen by the method just described. But now I'm out of space, so I'll pick up there next time. BC

Richard Taylor raises bees, produces comb honey and writes books and articles about beekeeping from his home near Interlaken, NY.

Questions?

Readers, please note: We wish to expand this question and answer department, and so, we urge you to send in questions. Address them to Dr. Richard Taylor, Box 352, Interlaken NY 14847, *not to Medina.* We shall select for each issue a "Question of the Month," with special credit and a five dollar bill to its author. Questions should be brief and to the point and of general interest to readers. Enclose a stamped and addressed envelope for a personal response.

Requeening Don'ts

Q I have a two-story colony with very bad combs that I want to requeen. Suppose I put a new queen in a hive, set this hive on the stand of the original hive and move this original hive off to the side, so the bees will all go in the new hive. Will the original hive then become queenless from losing all its worker bees?

Nathan R. Byler
Hemy, TN

A It is not entirely clear what you have in mind here, but first, a new queen cannot be introduced to a hive that has no bees or brood; and second, no, a hive is never made queenless just by being moved and thus losing its field bees. The young bees will remain with the brood and queen in the moved hive.

Extender Patties

Q What are extender patties?

Fillmore Emerson
Forest Hill, CA

A An extender patty consists of an edible grease mixed with Terramycin, and it is used to combat American foul brood. The idea of introducing the antibiotic mixed with grease is that the time during which it is released into the hive is greatly extended— hence the name. One recipe for making extender patties is:

Mix 3 lbs. Crisco with 6 lbs. granulated (not confectioners) sugar. Add 1/4 cup of TM-50 (or 1/2 cup TM-25), mix thoroughly. If mixture is too stiff, add a small amount of vegetable oil.

A patty is made simply by scooping a couple of scoops of this mixture, with hive tool, onto the top bars of the combs where the brood is. The presence of the non-toxic grease discourages tracheal mites, and the Terra combats any AFB. The patties, if not entirely consumed by the bees when supers are added, should be removed, to prevent possible contamination of the honey.

Mite Resistance

Q What do you think of mite-resistant queens?

Tim Grove
Searsburg, NY

A Reliable beekeepers have told me that the Buckfast bees show reisistance to tracheal mites, but I also understand that these are no longer available to breeders, from England. I believe no queens resistant to Varroa are available, even though some bees, notably Africanized ones, are supposedly resistant. I feel sure that we shall eventually have resistant stock, but for now we must rely on Apistan strips.

Local Conditions

Q You wrote that boxwood is a good honey plant, but I have never seen bees on the boxwood around my property How come?

Hamilton Armstrong
Fayetteville, NY

A This question raises a broader issue of some importance. Boxwood is covered with bees when in bloom in certain areas, such as parts of North Carolina, but of no interest to bees in other places. This is true of many plants. Even such a primary source as sweet clover does not attract bees where the soil tends to be acid, and the sweet clover itself does not flourish there, although patches of it are sometimes found. I have seen alfalfa fields in full bloom without a bee in sight. In addition to soil differences, the plant variety can be critical. Thus some of the goldenrods yield nectar while others, which appear similar, do not. These observations hold for many honey plants, perhaps even most.

Old Comb

Q I was given several abandoned bee hives with drawn comb in them. They had been unattended and beeless for several years. The comb is dry, dark and brittle. Is it of any value as brood comb or should I just scrape it off and salvage the frames?

Doug Wallman
Roscommon, MI

A Usually when dark brood combs are left alone for a long time they become infested with vermin, bugs and wax moths. If they are reasonably free of these, and there is no reason to suspect contamination with Amerucan foul brood, they are valuable and can be reused as brood combs. Bees are remarkably good at restoring old combs and cleaning them up.

Spring Management

Q I'm a hobby beekeeper, and I left two shallow supers full of honey on my single-story hive for the bees to winter on. How and when should these shallow su-

pers, the queen, and the queen excluder be handled this spring to get the best honey crop?

Robert H. Buford
Greenwood, SC

A There is but one basic rule for getting a good crop of honey, and that is to have a strong colony. This will mean trying to prevent your colony from swarming. Come spring you will probably find the bottom story mostly empty and the two shallow supers with lots of brood. Reverse these, come spring; that is, put the two shallow supers below the full depth story to give the queen more room to lay, and then in two or three weeks do this again, getting the shallows back on top. Cross your fingers and hope the bees don't swarm. If you are up to it, as a beginner, you could also requeen, but this is risky with only one hive. You might end up with a queenless colony and lose everything. As for the excluder I wouldn't use it at all, but you can, if you wish, insert it under the supers when swarming season is over.

Mixing Medications?

Q Is it okay to feed Terramycin when Apistan strips are in the hive?

Mose Miller
Hamilton, MS

A Yes. There is no incompatibility between these.

How Many Frames?

Q How many frames should you use in a single-story brood chamber? How many in a double brood chamber? How many in an extracting super— 8, 9, or 10?

John B. Williams
Lakewood, CO

A If the frames have foundation rather than drawn comb, it is always safest to start with 10, for a slight misspacing can result in two combs being built in one frame. Once combs are drawn, it is best to use nine in the hive itself, that is, in the brood chambers, and eight in extracting supers, spacing them with some care so as to avoid burr comb. Frames are then much easier to remove, and extracting combs much easier to uncap.

Answers!

Richard Taylor

Gleanings

MARCH, 1995 • ALL THE NEWS THAT FITS

DADANT'S AWARDED

Nick Dadant (center) of Dadant & Sons, Inc., accepts the "1994 Distributor of the Year" award on behalf of the company from Sandoz representatives Edward Fitz Harris (left) and Oscar Coindreau.

Sandoz Professional Products Apiary Group recently presented their "1994 Distributor of the Year" award to Dadant & Sons, Inc., of Hamilton, IL, in Keokuk, IA. Apistan, a Sandoz product developed for *Varroa* control, has been a "colony saver" for beekeepers, not only in the U.S., but over much of the world.

Dadant & Sons, Inc., along with other U.S. bee supply companies, has sold Apistan to beekeepers for several years. As *Varroa's* range has expanded, this miticide has proven to be a safe and effective control for this serious honey-bee pest.

LOOKING FOR A SPEAKER?

A look at what it costs to bring popular sports celebrities to your meeting. Fees are for a one-day appearance, and do not include transportation, meals or lodging.

1. Joe Montana	Football, Kansas City Chiefs	$50,000
2. George Foreman	Boxer	$50,000
3. Hulk Hogan	Wrestler	$50,000
4. Charles Barkley	Basketball, Phoenix Suns	$35,000
5. Larry Bird	Retired basketball, Boston Celtics	$35,000
6. Joe Namath	Retired football, New York Jets	$25,000
7. Pat Riley	Basketball coach, NY Knicks	$25,000
8. Terry Bradshaw	Retired football, Pitts. Steelers	$15,000

1995 DUTCH GOLD AWARD

On Jan. 21st, at the American Beekeeping Federation's Annual Meeting in Austin, TX, the recipient of the 1995 Dutch Gold Honey Bear was announced. This award is given annually to an individual in the beekeeping industry that has made a long-standing personal contribution to the industry. This year's recipient is Harry J. Rodenberg Jr., of Wolf Point, mT.

Harry's contributions to the beekeeping industry are numerous. A member of the Sioux Honey Association since 1948, Harry was elected to the Board of Directors from 1955-1987. During his tenure on the Board, his knowledge of the industry and his leadership skills were recognized by his peers as he was elected Vice President in 1963 and then President from 1972 until his resignation in 1987. Harry was also Chairman of the Honey Industry Council of America and Vice President of the American Beekeeping Federation.

Upon the formation of the National Honey Board in 1986, the honey industry was in need of a Chairman that could bring together the various opinions of producers, packers and importers with the goal of establishing a Board focused on the needs of the industry as a whole. Harry Rodenberg was the right person for the position.

Harry had a gift that enabled him to encourage board members to see beyond their personal situation and to look at the immediate and long-term needs of the honey industry. He realized how important it would be to a have a National Honey Board that was focused on the industry's needs, not the needs of the members own businesses. Harry's insistence that the industry always be the primary concern at all board meetings has continued and is a key in the success of the National Honey Board.

Harry was born in Montana, in 1923, son of Edna and Harry Rodenberg Sr. Harry Sr. became co-owner of Cloverdale Apiaries in 1922 with 200 colonies. Thus Harry, Jr. grew up in a beekeeping family.

After high school, Harry began his studies at Montana State University. His education was interrupted for two years while he served in the U.S. Army Air Corps in World War II. Harry resumed his education and completed his B.S. in accounting after returning from the armed service. His love for flying continued as Harry holds a commercial pilots license and still flies.

In 1947, Harry moved to Wolf Point, Montana and founded Honeyland Inc. He applied for Sioux Honey Association membership and in September 1948 received Membership Certificate No. 621. (This is one of the oldest active memberships in the Association.) By the late 1950s, Honeyland Inc. was operating 1500 colonies and still growing.

The Dutch Gold Honey Bear is awarded in honor of Luella and Ralph Gamber, the founders of Dutch Gold Honey, Inc. The bronze honey bear on a walnut base, is a replica of the original model created by Woodrow Miller and W. Ralph Gamber in 1957. A $1,000.00 research grant in honor of Mr. Rodenberg will be presented to the university of his choice.

The recipient of this annual award is chosen from nominations submitted by the Publishers and Editors of *The American Bee Journal, Bee Culture* and *Speedy Bee*. Dutch Gold Honey appreciates the time and consideration given by these individuals to the selection process.

Groeb Farms Charged . . .

A federal grand jury in Detroit has returned a 19-count indictment against the owners and employees of a honey processing firm, charging that they blended corn syrup with some of their honey then sold the mixture as USDA Grade A, or "pure," honey, the Department of Justice announced.

This would have enabled Groeb Farms, Inc., a firm with plants in Onsted, Michigan, and Belleview, Florida, to save more than $1 million between 1988 and 1992, according to the indictment. Most of the honey was sold to food product companies for use as an ingredient in various food products.

"In the past the government has won cases against people who adulterated fruit juices, olive oil, and seafood. The indictment sends a clear message that the government is continuing to vigorously pursue those who it believes have deliberately adulterated foods," said Frank Hunger, Assistant Attorney General in charge of the Civil Division.

Brenda J. Holman, Director of the Food and Drug Administration Detroit's district, said, "Adulterated products not only cheat consumers, but also undermine fair competition and impair the integrity of the marketplace."

Named as defendants in the indictment were the owners of Groeb Farms, Ernest L. Groeb, Jr., Ernest L. "Ernie Lee" Groeb, and Troy L. Groeb and two employees, Thomas M. Kalvin and Jeffrey M. Neely. In 1990 Groeb called itself "the largest industrial packager of honey in the U.S.," the indictment said.

According to the indictment, the defendants, between 1984 and 1992, falsely labeled as USDA Grade A Honey, and otherwise falsely represented to be pure honey, Groeb Farms products that were in fact adulterated.

The indictment charged all of the men with conspiring to commit wire fraud and to violate the Federal Food, Drug, and Cosmetic Act. It also charged the Groebs with using interstate wires to further a scheme to defraud buyers of honey.

The Groebs were further charged with shipping adulterated and misbranded honey in interstate commerce, and giving customers false guaranties that the company's honey complied with the requirements of the Federal Food, Drug, and Cosmetic Act. The indictment also charged Kalvin and Neely with one count each of making false statements to a grand jury.

If convicted, each of the Groebs could be sentenced to over 65 years imprisonment and fined not more than $4 million. Kalvin and Neely each face up to 10 years imprisonment and a $500,000 fine.

The case was investigated by the United States Food and Drug Administration and is being prosecuted by the Department's Office of Consumer Litigation.

The public is reminded that an indictment is only a charge and not evidence of guilt. Despite indictment, every defendant is presumed innocent, unless and until found guilty beyond a reasonable doubt following a trial at which the defendants have all of the trial rights guaranteed by the United States Constitution and federal law.

. . . But Charges Denied

On Jan. 26, 1995 Groeb Farms, Inc. was indicted by the FDA for alleged adulteration, wire fraud and conspiracy charges prior to March 24, 1992. Groeb Farms, Inc. denies all charges of wrong doing and will vehemently challenge the false allegations and defend these wrongful charges.

This indictment is a product of a secret one-sided Grand Jury proceeding. A Federal Grand Jury was convened in Detroit, MI, controlled by our accusers, to hear only the prosecution. Under federal law the defense cannot be present. We are aware of prior and current FDA sampling of Groeb Farms, Inc. honey that have shown no adulteration. We are aware of allegations by two past disgruntled employee's with an axe to grind. We are aware that the multiple count indictment deals with ten (10) invoices, seven (7) of which were sent out in 1990 and all of which were sent out prior to March 24, 1992. The amount of product is very minuscule and interestingly the government has no samples at all that they have taken or tested that have corn syrup. We must make it clear that no adulterated samples are present. The FDA has declined to visit our facilities or discuss the investigation prior to indictment.

Obviously with Groeb Farms, Inc. being one of the largest honey packers in the U.S. we maintain that all honey sold by Groeb Farms, Inc. is USDA Grade A Pure Honey and will meet or exceed FDA requirements. Since we have not been able to defend our position, we look forward to proving these allegations to be false! These wrongful charges have in no way affected the day to day or future business of Groeb Farms, Inc.

We assure customers of Groeb Farms, Inc. this indictment deals with historic transactions, most of which are five (5) years old, and none of which have any substance. We want customers and associates to be assured Quality Standards are sound and the resolve of Groeb Farms, Inc. is strong.

As the FDA stated. "The public is reminded an indictment is only a charge and not evidence of guilt. Despite indictment, every defendant is presumed innocent, unless and until found guilty beyond a reasonable doubt following a trial at which the defendants have all of the trial rights guaranteed by the U. S. Constitution and federal law." Groeb Farms, Inc. and it's employees have been wrongly accused and are awaiting their day in court.

Allen S. Early, Robert Harrison
Attorney for Groeb Farms

Canada's Big Meeting

CAPA & CHC MEET IN EDMONTON

Canada's two major beekeeping organizations, the Canadian Association of Professional Apiculturists (CAPA) and the Canadian Honey Council (CHC), completed their annual meetings early in January, in Edmonton, Alberta. CAPA is the research and extension group in Canada, while CHC is composed primarily of beekeepers and packers. These two groups meet jointly each year to exchange information, hear the latest research news, discuss regulatory aspects of bee management, and coordinate policy having to do with the role government plays in beekeeping.

This year's meeting included a day-long Symposium that highlighted bee research in Canada, as well as extensive discussions on border closure and related issues. Speakers in the Symposium presented the results of a three-year, $300,000 grant provided by Agriculture Canada to the beekeepers to address pressing questions in Canadian beekeeping. The 14 projects focussed on mite control, selection for mite-resistant bees, viral analyses, pollination, and honey quality, among other topics. In addition, two guest speakers, Keith Delaplane and Ernesto Guzman, provided perspective from the United States and Mexico on mites and Africanized bees. The Proceedings of this Symposium will be available in March, and can be ordered by sending a cheque for $7.00 to the Canadian Honey Council, Box 1566, Nipawin, Sask. S0E 1E0, Canada. The discussions on border closure revealed continued concern by Canadian beekeepers on the issue of importing bees from the mainland United States. *Varroa* and tracheal mites are still not widespread in Canada, and concerns were expressed about the potential importation of Africanized bees. As a result, the CHC voted to request that Agriculture Canada continue the border closure for two more years, at which time the issue will be reviewed again.

Lost Subsidy, So . . .

SHEEP/WOOL GROWERS WANT THEIR OWN BOARD

USDA is seeking proposals for a national sheep and wool promotion, research, education and information order. An order is authorized by the Sheep Promotion, Research and Information Act of 1994. Lon Hatamiya, Acting Administrator of USDA's Agricultural Marketing Service, said an order would put the sheep and wool program on the same self-funded, sustaining basis as similar commodity promotion, research and information programs. USDA will publish a proposed order in a future issue of the Federal Register based on proposals received.

SEND US YOUR MEETING NOTICES AT LEAST TWO MONTHS IN ADVANCE.

N·A·T·I·O·N·A·L HONEY·BOARD·NEWS

Reduced Reporting At its meeting January 21, the National Honey Board approved a new reduced reporting level that will affect those who pack less than 100,000 pounds of their *own* honey.

"Formerly, reduced reporting only applied to those who packed less than 20,000 pounds in a year. Under the new higher pound limit, many more producer/packers may now qualify for reduced reporting," said Julia Pirnack, compliance coordinator for the National Honey Board.

Those producer/packers who pack less than 100,000 pounds of their own honey for sale at local retail stores, for use in bakeries or for food manufacturers, may qualify. "Purchases of honey from other producers will still be reported monthly," said Pirnack, "however, a producer/packer's own honey that is prepared for sale can be reported only twice a year instead."

If any producer/packer feels that their business qualifies for the reduced reporting schedule, contact Julia Pirnack or Marlys Lloyd at the National Honey Board for further information.

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Recipe Data Base The Honey Board is pleased to announce that its new honey recipe database in on-line!

The Honey Board is committed to the precept that consumer demand drives honey demand in all market segments. To help stimulate consumer demand, the Board continually develops and distributes honey recipes (several hundred in the past few years!).

Having our collection of honey recipes on a computer database offers several advantages: recipes may be located by many means – by name, by ingredient, by meal (breakfast, lunch, dinner) or by category (dessert, appetizer, entree, etc.). In addition, the computer program automatically calculates nutritional values for each recipe – information that is of growing importance to us all. The recipes print in a standard format, which is professional in appearance and easy to read.

The database will be updated regularly as the Board creates new and exciting ways for both consumers and foodservice providers to use honey. Industry members are welcome to call or write with their specific recipe requests – answers are only a few key strokes away!

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Sales Kits The National Honey Board has created two honey sales kits to help honey sellers market their product to either foodservice or industrial users.

The foodservice kit includes honey product information (nutritive composition, storage and handling tips, substitution suggestions, etc.) on the folder and includes six sales sheets with honey use and merchandising tips. The sales sheets focus on honey's use in various applications: breakfast, beverage, sauces and dips, side dishes and desserts. The kit is appropriate for foodservice distributor representatives, honey brokers, packers or producer/packers who want to sell to the foodservice industry.

The industrial honey sales kit is a package of information to help sell honey to the $400 billion food manufacturing industry. The kit includes basic information about honey (flavor, colors, etc.) and the food industry's use of honey.

If you are a seller of honey, or want to sell honey to the foodservice or industrial segments, call the Honey Board for a complimentary copy of one or both of these sales tools.

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Hang Tags The National Honey Board will soon be developing "hang tags" for honey containers.

The full-color, eight-panel hang tags will include honey use and storage information as well as easy, delicious honey recipes. Each tag will fold to 2" x 2" and have an elastic cord for easy attachment to queenline jars and squeeze bears.

The tags will be sold in packs of 500 at a cost to cover the Honey Board's actual printing and shipping costs only – estimated at 3.25 cents per tag.

Plan on "hooking" new customers by adding these attractive and informative tags to your containers in 1995.

BUMBLEBEES STUDIED

There is no lack of studies on the behavior of bees, but one investigation, conducted at the Hebrew Univ. of Jerusalem, is unique in its field. Application of research tools common in behavioral research and game theory, and their adaptation to bees, has allowed researchers to transfer observation away from behavior of colonies in their natural environment, into the lab. This places bees on the same footing as laboratory mice – or even people for that matter!

Game theorist Professor Sergiu Hart and colleagues at the Hebrew University's four-year-old Center for Rationality & Interactive Decision Research, working together with a team of ecologists headed by professor Avi Shmida from the Hebrew University's Dept. of Evolution, Ecology & Systematics, constructed an "artificial field" of electronic flowers, in order to examine models of game theory and interactive decision-making among bees. The interdisciplinary team dubbed their experimental system "beehavior."

The 'beehavioral lab' is one of the first in the world permitting researchers to monitor the behavior of individual 'subjects' of this nature and chart reactions to stimuli and controlled situations, observing and recording behavior of individual bees through the life cycle, from the time the young adult worker bee emerges from its cell to the time of death.

The lab is divided in two sections. The first is a hive containing 200 bees made up of a queen and just-hatched workers. The hive is situated in a 3 x 4 square meter room containing 40 electronic flowers – yellow ones and blue ones – arranged randomly on a fixed matrix. The concentration of nectar and rate at which nectar is replaced after a bee has landed on the flower, can be programmed for each flower, to produce "superior" or "inferior" quality flowers. Researchers can set up different field conditions to test subjects. In the initial studies, newly-hatched workers – with no experience in nectar-gathering in the wild – were released, one at a time, within controlled conditions and their "beehavior" monitored by computer. A researcher assured only one bee, each tagged with a life-long identity number, would be released at a time.

In one trial, yellow flowers were programmed to reward the bee with three times the nectar as blue flowers to determine if a bee learns to recognize "good flowers" by color and how it learns under different field conditions.

Studies showed when the field was rich in nectar and "good flowers," the bees learned faster to distinguish between "good" and "inferior" ones. Bees learn by experience which flowers hold the biggest rewards; in essence, the more positive experiences it has while gathering nectar, the faster the bee learns to identify the source. Once the bee finds an area with a high concentration of nectar, the distance it will fly between flowers diminishes. Bees tend to "stay put" once they locate a good field.

Besides learning about behavior of bees, the new lab offers researchers a new tool to study unanswered questions about the dynamics of evolution. For instance, did flowers adapt in their evolutionary process to particular sizes, shapes or colors to attract bees? How much effort will a bee invest in exploration and how does this change during its lifetime? Do bees, like young persons, have a wanderlust that ebbs with age? The study is still in its early stages.

Cooperation between game theorists and ecologists has presented an opportunity to test abstract theories in an ecological-evolutionary context. They have plans to equip the lab with a capacity to track several bumblebees at once, allowing researchers to examine behavior of bees in an interactive situation.

Display Advertisers Index

I have a friend who is a beekeeper. We have known each other for a number of years, ever since we worked together in a library at a nearby university. Before I met him, I had never known anyone who kept bees, nor had I ever even given it much thought, though I must say I've enjoyed the pleasures of honey my entire life.

Like so much of what we do in the narrow focus of our everyday lives, I used to notice bees only when I noticed gardens; not often and not completely, and only if the noticing happened to be my primary goal that moment. It was a shallow existence, but I was young.

Last summer I was privileged to have my beekeeping friend share a portion of his journal with me. It was full of his activities regarding the bees. The journal pages covered part of the busiest time of his year, the warm months, and the bees required something of him every day. But it was how those requirements seem to have given him an acute awareness of a much wider existence that I noticed.

He knew who was cutting their alfalfa crops on the farms around his home and if it was the right time; he knew what effect a lack of rain would have on how far the bees would have to fly to find a source of nectar; and I read how his bees led him to the discovery of a basswood tree blooming in his neighborhood, something he had hoped for but never imagined existed so close by. He knew when the bees began to prepare for autumn by the sounds they made in the hive; he knew when they began storing up supplies to keep themselves alive over the winter, and if their preparations indicated winter might be harsh.

My friend's journal helped answer a lot of my questions, and it raised many more. I'm now wondering if I could keep a hive in my garden.

I'm not sure I'm in the right territory to keep a hive. The freeway is very close, my small plot of land is just under a quarter of an acre, most of my neighbors have strong pesticidal tendencies, and I lack the confidence I believe is required to just get in there and work with the bees. They seem to work quite well without my interference.

Still, my friend's journal was replete with a feeling of accomplishment, a sense of privilege to be doing what he does, and an awareness of the cycles and seasons that made me ache to be a part of it all. I want to find out if, like my friend, I can also keep something as remarkable as a honey bee.

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My summer garden is always full of bees. Do I really need a hive of my own? One of the gardening magazines I subscribe to suggests that owning my own hive is a dandy way to procure nearly endless supplies of both honey and wax. It also promises that my garden will yield far more than I ever dreamed possible, all for very little effort on my part.

But what about the bees, the tireless workers of all those promised miracles that will occur as soon as I own a hive? Where would I put one and is one enough? Could the bees traverse the highway, so close by and teeming with speeding death? And would the tiny creatures survive the winter, which in my part of the world can be both long and brutal? How would I react if all my bees left, or worse, died of disease or mites?

And what of my neighbors who never hesitate to spray, dust or drench every living thing in their lawns and gardens with evil-smelling concoctions?

Bees do not stay in the yard, as obedient children, but will range for miles. Going to my neighbors with offers of promised honey would not induce them to give up their pesticides – they all think I'm nuts, anyway. Would anyone in her right mind dig up all her lawn?

Last summer I set out to eradicate as much lawn as possible and replace it with trees and shrubs, flowers and vegetables; water-thrifty native varieties better suited to our climate here in the Great Basin. I also grow herbs and clover to attract both bees and beneficial insects. So now I am at war with my conscience, trying to determine the best course of action. Would I be gathering an army of splendid warriors only to send them to certain death?

Then one day when I was out walking, I discovered six white hives in a sloping garden close to the mouth of a nearby canyon, less than two miles from home! The location seemed perfect, and I was immediately filled with envy and many more questions. Do these people have neighbors who forego pesticides for the sake of the bees? How do the bees avoid the highway? Could their workers be the ones who come to my garden? Would these gardeners welcome a myriad of inquiries about their beekeeping?

I knocked on the door. No one answered, and after a moment I turned toward home, but I'll go back and let them know how much I envy them their treasure.

Maybe one day my garden will drone with the sound of its own beehive. I think it would be nice in the herb garden.

Beginning Thoughts . . . and Questions

julie sobchack

FROM MY GARDEN