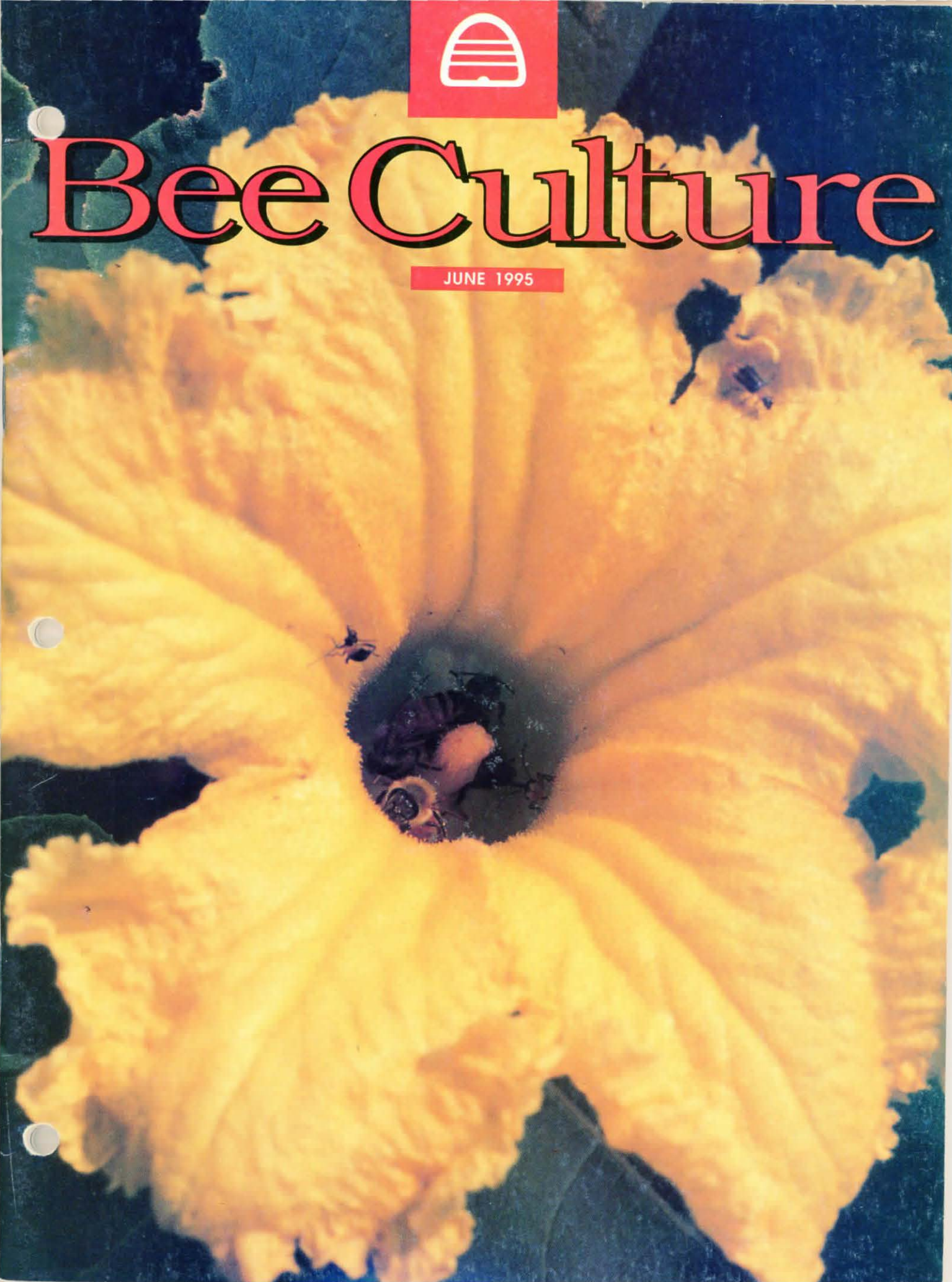
Bee Culture

JUNE 1995



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COLUMNS

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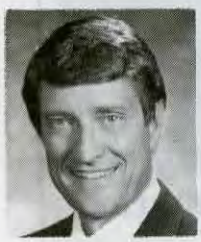
DEPARTMENTS



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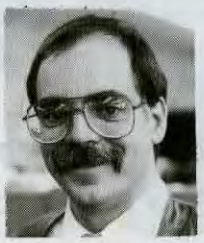

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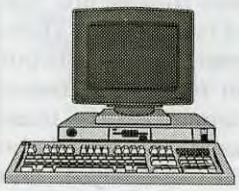

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FEATURES

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Squash Dreams, Pg. 342

Cover
Squash blossoms are attractive to honey bees for their pollen and nectar, but they need bees to transfer pollen from male flowers to female flowers (like this one). This is a Hungarian Squash blossom. Check out the article on squash on page 342.

Flottum photo

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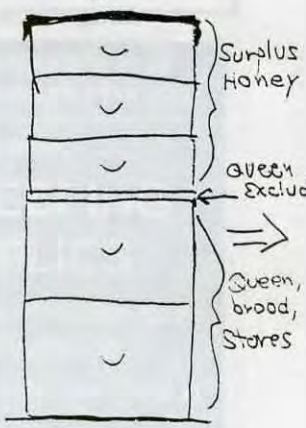

INNER COVER

The Beast Within

Every spring, for at least the past couple of decades, something strange overcomes me. Well, even stranger than the other things that occasionally overtake me. And that's going some.

Every spring, you see, I get this stronger-than-usual urge to get back on the road. It comes, I suppose, from years and years of having to get busy, real busy, at the precise moment winter turns to spring. Real busy, 20 years ago, was getting several thousand garden transplants ready in a greenhouse, and preparing a small apple orchard for seasonal production.

The greenhouse meant getting out of the office a couple hours every morning and evening, and the apple orchard meant whole days away from the desk, the phone the 'inside' part of my job. And even though the greenhouse was only six blocks from my office the apple orchard was a 30-mile, 45-minute drive through the awakening Wisconsin countryside. So spring meant getting away. Getting out. Freedom. The chance to see it all start all over again. Whether it was the first blush of green across the fields and hills, the birth of thousands and thousands of soon-to-be flowers and veggies, or the dandelion explosion on the southside of anything. There is, as you well know, nothing like it.

But I don't have that apple-orchard excuse anymore. No good reason to hop in a truck and drive for an hour or so to take in this annual grand opening and I pass by. At least not one my boss easily understands.

So, every spring I have to find some legitimate reason to get back on the road. There's this primeval urge that must be satisfied. I think most people who have bees in their lives share that drive, at least to some degree.

Just getting out on a Saturday afternoon may be all that's needed to satisfy this beast within. A chance to see what's going on outside, to see what's blooming, to see how the bees are doing, to witness again the growth of this living thing in those boxes out there.

That urge, at least for me, wanes as summer progresses. In April it's a white hot, blinding, making-me-crazy sort of thing, a beast with no thought of compromise. In May it has tempered some in its demands, and by June we live comfortably with each other – a sort of truce that keeps us both happy.

From July through September it's quiet, satiated to some degree I suppose, making no serious demands, but still alive, still active, still in the shadows. And by October it has once again receded to some quiet place, pacified for yet another year, but preparing for the next.

•

I sometimes get hungry for things. You know, one day about three in the afternoon this vision floats across that part of your brain that deals with food and stays there the rest of the day. So at supper no matter what somebody else has spent hours preparing and no matter what you had planned, it's gotta be that vision. Nothing else suits. It's just gotta be, and that's that.

The other day a bacon, tomato and mayo on toast sandwich floated by that part of my brain. I don't do lettuce on these. Sorry. So when I got home, hungry, it had to be a BMT

For me, making these is sort of a ballet, a well choreographed, well timed dance of construction and consumption. I start by slicing the tomatoes. The bacon goes in the pan. While that gets going I get out the mayo, the bread, a plate, silverware and something to read while I eat. This takes the time to cook one side of the bacon, so I turn it over. Then, the toast goes down, the rest gets put together and I'm ready. The bacon finishes at the same time the toast comes up. The bacon gets pulled, the grease poured, the toast mayoed and

Continued on Page 366

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MAILBOX

Frame Fixer

Here's a photo of a simple benchtop jig that I made for building frames. Nothing fancy, but it does the job. It is simply three strips of 3/4" thick wood screwed to the bench top. The width between strips one and two is the width of the side piece at the BOTTOM of the frame. The width between strips two and three is the width of the top piece.

I put down #3 first, then added a shim the thickness of a matchbook cover on one side so that there would be a little "play," which allows me to slide the top piece one way, (clear of the end of the strip) insert an end piece, then slide it the other way to insert the other one.

Nail the bottom piece on, turn the frame over, stick it between the other two strips, and nail the top on. It sure speeds up the process.

I very much enjoy your magazine, and have been reading it for close onto four years now. I get the other bee magazines but *Bee Culture* seems to be more "folksy" and user friendly. Keep up the good work.

Dan Brown
Port Angeles, WA

Observation Hive Observations

Regarding observation hives (2-95 issue, p. 91): It is easy to feed sugar syrup in any quantities over any time period but it is difficult to feed pollen. Pollen patties can be placed on the frame top bar(s) when setting up the hive but they are a nuisance to replenish. This is only a problem when the hive is set up with frames of brood from a full sized hive.

It is much easier to start with a swarm or a package so the bees will collect pollen as the brood begins to emerge. Install the swarm or package in a full sized hive located very close to the observation hive's outside entrance. Use only the number of frames in the outside hive as are to be in the observation hive, or maybe one more if there are too many bees. Drawn comb or foundation work equally well. The next day the frames will be covered with bees, including the queen. (If using a package, wait until the queen is released.) Catch the queen – a queen catcher makes this easy – mark her. Move one frame of bees from the hive body into the observation hive and, just before lowering the top bar into it – an eye screw makes this easy – release the queen just below the top bar so as not to squash her.

Install the observation hive "super" housing and a second frame of bees. Move the hive inside and connect it up. Enough bees from the outside hive ought to move in through the observation hive entrance in the next day or so to fill it, perhaps overfill it. Eleven days after the first brood is sealed, move the hive outside near the entrance, remove the frame with the sealed brood while keeping the queen where she belongs, shake or brush the bees off, put the frame in a full sized hive and replace it with an empty one. Repeat as many times as required to prevent the emerging bees from overcrowding the hive. This works much better than trying to shake bees into the Observation Hive.

Dan Hendricks
Mercer Island, WA

P.S. Monte Abbott wanted readers to report on drone laying queens (Apr. '95, p. 198) so here goes: I have bought queens from Strachan, Weaver Apiaries, Howard Weaver, York, Kona, Russell, Heitkams, Bee Bob, Taber and Park over a period of seven years and have never had a drone layer.

Killer Bee Movie Comment

After reading your April Inner Cover (about the Killer Bee Movie) I just felt I had to write and give you my thoughts about your article. The "Killer Bee" movie you talked about was just like one made years ago and the best part was that the "Scientific Advisor" was the same. I have known him for some time as he as been a speaker at Texas Beekeeper meetings.

After the first movie he made, he gave the excuse that he did not write the movie but only "tried" to help keep some of their facts straight. We thought at that time he should have left them in their own mud and he should have this time too.

What I am writing about though is why do people of such qualification allow their name to be used in such a way? They cause untold damage to the beekeeping industry. He allowed his own name to be dragged down but he is certainly not the only one.
In Texas we are having a bad case of slandering the bee industry by trying to handle the AHB problem.

Just the other day a newspaper reporter for the Houston Chronicle had an article about the AHB coming to Houston this year. I was sure he was going to raise more fear about the bees but also was dragging down the beekeepers as a whole.

Basically he said that the beekeeping industry was doomed in Texas, as the African bees were just going to take over and we would be unable to handle them, along with the Public. I asked him how he felt beekeepers had handled inferior or mean bees of any kind all these years?

I also asked him if he felt I would need an inspector to inspect my bees to see if they had any AHB

Continued on Next Page

MAILBOX

blood in them, or if maybe I would know myself that they were mean. I also asked him why I could not place a queen excluder under the brood chamber until I had time to check the temperament of a new swarm. I did not care much if the African bees did come into Texas and even Houston as I could get new queens produced where it was too cold for them to survive. I did not feel I have lost a bit of control over my bee stock than I ever had.

Of course if just boils down to one thing. As long as beekeepers do not show and tell the politicians to just stop the money for those (inspectors, researchers, etc.) to keep up that bull, things like that movie will continue.

I enjoy your articles and of course *Bee Culture*, too. I think I have almost every issue since about 1936 or '37 when I was in high school. Maybe I am not a whole lot smarter than I was then, but I can still write to those idiots that are trying to tell me that Texas will be overcome, and also the bigger idiots that are supporting *them* with my tax money.

You keep up the good work.

Frank B. Gallaher
Highlands, TX

Recipe For Club Success

I'm sending three new subscriptions from our beekeeping organization as the direct result of one member bringing in the March issue of *Bee Culture* and reading excerpts and commenting on the article about "Swarming, The Cause." The subject of swarming was the previously chosen topic for discussion at our March 23rd meeting and your magazine article fit right into the format.

In the same issue other articles that might be of special interest to members were also flagged and briefly mentioned and then a reminder to all members was given regarding the 25% discount on subscription prices if ordered through the bee club.

In this era of declining membership in bee organizations and declining numbers of bees and beekeepers, I thought you might be interested to know that the Mt. Diablo Beekeepers Assn. of Walnut Creek, CA is thriving and growing in membership as never before.

I attribute much of this growth to two new officers in the club, President and Vice President for 1995. They are Daniel Purinton, President, and Steve Gentry, Vice President. They have brought new blood to the leadership and new vitality to the membership, as well as many new members, through their innovative ideas and most of all the *follow-through* that is so essential to make all the good ideas *actually work*!

The following are some of the ideas that have been put in place and are making this organization an exciting, interesting group to be a part of:

1. Publicity – Our Vice President, has had interviews and articles (with pictures) published in newspapers, has our club's calendar of events published in a local magazine, and also has had a television spot. This has brought in at least 10 new members so far this year! He is also planning to put up posters advertising the club at community colleges, high schools, libraries and community centers in Contra Costa County. Publicity works!
2. A "Buddy System" to pair new beekeepers with a more experienced (volunteer) beekeeper so the newcomer can see and learn with "hands on" experience to get over those first jitters.
3. A beekeeping calendar for our special area, which helps members know *when* to do certain beekeeping jobs throughout the year – geared especially to our climate, forage, etc.
4. Group orders for such things as medications, equipment, bees and queens.
5. A table at each meeting with beekeeping magazines, catalogs and any special articles on beekeeping are displayed.
6. A beekeeping video library is being set up.
7. We have a beautiful portable observation hive for use by the members if anyone is giving a talk to a school or club.
8. A monthly display by one member of the current bee forage plants blooming in our area.
9. A timely topic for discussion is announced in the newsletter received by each member about one week before the meeting.
10. At least once each year we invite a major speaker to the meeting. This is usually Eric Mussen, Extension Apiculturist from the University of CA, Davis.
11. Each April we have a field trip workshop at one member's bee yard where anyone interested can come and learn how to locate queens, re-queen a hive, checking a hive for general health, determining good, mediocre, and poor brood patterns, pick up swarms, etc.
12. Once each year we participate as a group at the Contra Costa County fair where we have a display booth with our observation hive, beekeeping equipment, educational materials to hand out to visitors and a wide assortment of honey, beeswax products, sometimes local pollen and usually some comb honey, all produced by our members and displayed attractively and for sale.
13. Our monthly newsletter has the minutes of the past meeting printed in full. This way anyone who missed the meeting can stay informed. Also, we don't *read* the minutes at the next meeting (saves time), we simply approve or correct the minutes as published in the newsletter.
14. We end our year in October with a nice pot-luck Bar-B-Q, (steaks and chicken are purchased from a very healthy club treasury).

I got a bit carried away with this letter but this club and its present leadership create a spirit of enthusiasm that's contagious. I think this is what beekeeping needs, clubs that can give beekeepers an optimistic outlook in their chosen hobby or sideline business. It is not easy to keep an upbeat outlook these days when confronted with all the challenges beekeepers have had to deal with in the past few years. Being an active member in this club has certainly helped me through some very stormy times in my beekeeping life and I've made a great many wonderful friends. Thanks for listening to our "testimonial."

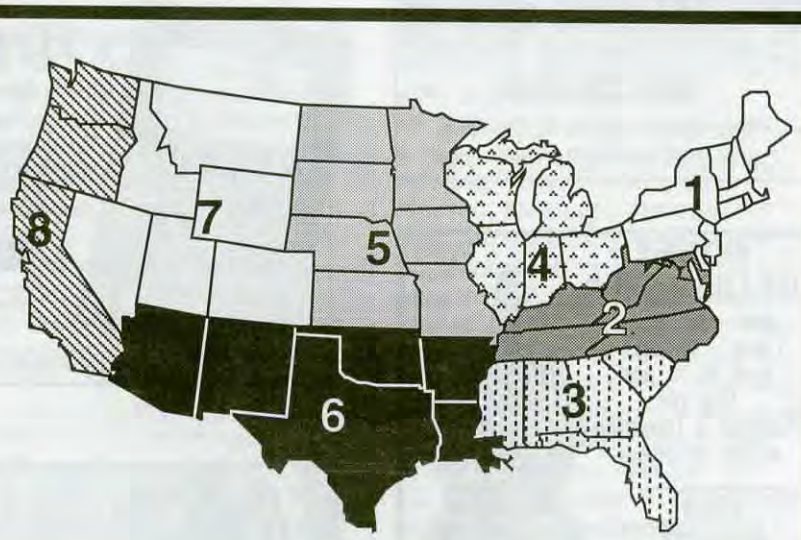
Marilyn Mangle, Treas
1331 Fourth St.
Rodeo, CA 94572

JUNE Honey Report

JUNE 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	40.40	41.13	33.58	47.50	33.58	37.00	42.00	48.50	29.40-56.00	41.49	41.55	44.06
60# Amber	39.96	41.63	40.65	40.50	50.00	37.25	40.00	45.25	26.40-54.00	39.97	39.93	42.93
55 gal. Light	0.56	0.53	0.59	0.60	0.56	0.51	0.54	0.54	0.47-0.90	0.57	0.56	0.60
55 gal. Amber	0.52	0.55	0.57	0.57	0.57	0.46	0.50	0.53	0.44-0.78	0.53	0.53	0.55
Wholesale - Case Lots												
1/2# 24's	21.78	26.58	18.81	20.23	19.00	19.78	23.43	21.20	14.39-25.20	20.14	21.69	21.71
1# 24's	31.27	30.55	32.14	33.81	30.40	35.83	31.83	31.20	24.00-37.90	30.10	31.32	30.49
2# 12's	29.04	28.86	26.67	29.35	26.95	34.08	29.23	30.00	22.80-33.60	28.25	28.71	29.25
12 oz. Plas. 24's	27.20	27.96	31.00	28.02	25.00	25.82	28.79	25.10	22.56-37.90	26.95	26.49	28.24
5# 6's	28.41	28.75	28.18	30.55	33.00	27.15	27.50	29.30	25.00-36.00	30.16	29.77	30.14
Retail Honey Prices												
1/2#	1.42	1.96	1.50	1.04	1.29	1.37	1.22	1.16	0.89-3.50	1.33	1.38	1.26
12 oz. Plastic	1.61	1.68	2.75	1.54	1.39	1.49	1.70	1.59	1.19-2.00	1.60	1.62	1.66
1 lb. Glass	1.80	1.90	2.17	1.69	1.78	1.97	1.83	1.78	1.39-2.25	1.79	1.86	1.82
2 lb. Glass	3.16	3.40	3.20	3.09	2.96	3.77	2.95	3.48	2.39-3.89	3.08	3.19	3.39
3 lb. Glass	4.27	4.87	4.50	3.99	3.65	3.87	3.88	5.26	3.68-5.70	4.45	4.46	4.24
4 lb. Glass	4.85	5.32	5.50	5.39	5.39	5.19	5.25	5.49	4.85-6.99	5.54	5.66	5.64
5 lb. Glass	6.15	6.57	6.50	6.57	6.59	5.99	5.55	6.31	5.49-8.95	6.62	6.73	6.31
1# Cream	2.42	2.88	2.89	1.84	1.99	3.83	2.55	1.86	1.49-3.50	2.19	2.50	2.20
1# Comb	3.33	2.90	2.75	3.25	2.96	4.48	3.75	3.78	2.50-4.00	3.24	3.20	2.86
Round Plastic	3.17	3.00	3.50	3.50	3.50	4.35	3.73	3.43	1.75-4.50	3.04	3.01	2.86
Wax (Light)	1.61	1.33	2.00	1.58	1.35	1.35	1.45	1.46	1.25-3.50	1.66	1.75	1.73
Wax (Dark)	1.55	1.18	1.75	1.43	4.00	0.83	1.30	1.30	1.00-2.75	1.35	1.39	1.76
Poll. Fee/Col.	28.00	25.00	40.00	32.50	32.07	12.25	35.00	28.33	12.50-55.00	30.86	28.94	30.77

MARKET SHARE

The wholesale scramble continues, as imported honey sources either dry up or increase in price dramatically This should be reflected in every honey market – industrial, bakery, wholesale, retail and home sales. With a $.65/lb. wholesale price the probable bottom of the ceiling ($.75/lb. in some places for immediate demand), the eventual retail shelf price should end-up by mid-summer at *at least* $2.00/lb.

Region 1

Prices steady, but wholesale not increasing, while retail inching up. Demand a bit stronger than expected due to cool weather. Colonies in strong to average condition for a somewhat late flow. Mite treatments increasing to prevent last fall's significant loss.

Region 2

Prices only steady, wholesale not increasing rapidly, but retail moving up fairly fast. Pollination prices up a bit due to shortage of colonies. Winter losses averaging 15-18%, a bit above pre-mite normals. Strong to average colonies at about 30% average, but well treated colonies at 75-90% strong. Cool and rain have slowed flows a bit to a lot, but good moisture portends good summer.

Region 3

Wholesale prices steady, but retail gaining. Demand steady, which has helped sales. Colony conditions good for early flows and strong for main summer crop. Pesticides on blooming citrus have caused some significant losses, though. Treated colonies doing well. Dry in northern areas have slowed some crops.

Region 4

Both wholesale and retail prices climbing rapidly as shortages at packer's docks begins to be felt. Higher prices expected as summer deepens. Though late, spring flows were strong and good for build-up. Adequate moisture means good main flows. Treated colonies doing well, untreated weak or gone.

Region 5

Prices at both wholesale and retail rising rapidly and are expected to continue to increase. Demand for wholesale strong in most areas as shortages becoming critical for some suppliers. Colony loss higher than expected due to cold, wet spring. Flows late, feeding (if possible) required. Summer moisture should help crops.

Region 6

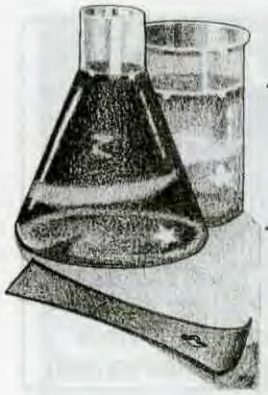
Prices at wholesale steady, but retail picking up a bit, with increases in both expected soon. Colonies in good condition for strong early flows in all but the driest and coldest areas. Mites still a problem in untreated colonies, but those using smaller-cell foundation reporting good control without chemicals.

Region 7

Prices only steady at wholesale, but increasing slowly at retail. Both are slated to increase later in the season. Colonies in good condition coming out of winter, but spring has been cold, cold, wet, wet and feeding required nearly everywhere. Spring flows slowed by bad weather, but good soil moisture should help summer crops – if the weather ever breaks.

Region 8

Prices already increase (in May) with promises of $.60 wholesale by midspring, early summer. Retail climbing too. This is needed because early crops have been hard hit with cool, rainy weather, with lots of feeding needed. Colony strength generally good, to a bit above average, at least for those treated. Some crops strong due to moisture – sage, buckwheat, citrus – but others a bust.



RESEARCH REVIEW

roger morse cornell university ithaca ny

"Major changes in the beekeeping industry have taken place in the last six years. More will occur."

The use of walk-in (approximately six-foot-high) plastic tunnels for the production of fruits, vegetables and flowers is becoming increasingly popular around the world. Both large and small growers are involved. The study I have before me comes from Florida, which is the leading state in indoor and outdoor vegetable production in the United States. This report suggests there will be more plastic tunnels used. You may sometime have an opportunity to rent bees for pollination in such a confined situation.

In this paper, the results of tests on plastic greenhouses that have neither an electric-powered ventilation system nor a permanent heating system are reported. The temperature in the greenhouses is controlled by placing approximately 10-inch diameter, long plastic tubes filled with water between the rows of plants. The water contains chlorine in sufficient quantity to prevent the growth of algae. The large tubes of water help to warm the greenhouse by giving off heat at night and by absorbing heat during the day. In the tests reported here, cucumbers and squash were grown.

There is no mention of pollination in this report, but since using plastic greenhouses is becoming increasingly popular, I thought I might write about our experiences using honey bee colonies for pollination in greenhouses at Cornell. For a number of years, we have used several colonies to pollinate alfalfa that is being grown in greenhouses to develop new varieties. There have been very few studies on practical beekeeping in greenhouses.

Our experience is that colonies used for greenhouse pollination need not contain more than a pound of bees (4,000 to 4,500 bees). Four or five-frame nucleus colonies work very well. The colonies should contain one frame of honey. There is no need to feed additional honey or sugar syrup to stimulate the bees in colonies used for pollination. However, pollen is a problem, and we have found that feeding a heavily medicated pollen cake is helpful and will lengthen the time the bees in a colony will remain effective. We want the bees in a greenhouse to grow at least a small amount of brood so as to stimulate pollen collection. Feeding a pollen cake will not stop or slow the bees foraging for pollen under these conditions.

We have found that feeding both tetracycline and fumagillin is helpful, even though the colonies appear healthy at the outset. The humidity in a greenhouse is high, and conditions are stressful and can cause disease to develop rapidly. This past year, we have placed colonies on stands about four feet off the ground to help reduce the humidity in their immediate environment. Colonies that are used for greenhouse pollination rarely survive, and in the event they do, they must be requeened. We have also found that colonies are rarely effective after two to three months. What I report here are observations, not the results of controlled experiments.

Young Queens are Best

Colonies with young queens produce more honey than do colonies with older queens. There is nothing new in that statement, but there is a new paper from a subtropical area, where this question has not been studied, that verifies the fact and adds another new and interesting twist. Most of the studies on the effect of queen age on productivity have been done in temperate climates.

These experiments were undertaken in Israel "where most of the plants flower between March and May and peak in April." Italian queens were used. The chief honey flow in that part of the world is from irrigated citrus. In this area, egg laying and brood production "continues all the year around," but there is a decline during the fall and winter.

The study was conducted over two seasons. The young queens tested were seven to 10 months old while the older queens were 20 months old. The colonies with younger queens produced more honey, 34 percent more in the first test year and 30 percent more in the second. The colonies with younger queens produced fewer queen cups, fewer queen cells and had a greater worker population at the time of the honey flow. These data are consistent with most of the other studies that have been done in temperate climates.

What is new is that colonies with queens six to seven months old produced more honey that did those with 10 to 12-month-old queens. In their discussion, the authors point out that some beekeepers in tropical areas, who produce royal jelly nearly all year, requeen twice a year. The authors conclude that requeening colonies in the fall rather than immediately after the honey flow is best.

One note I found interesting was that the stock used to grow the queens in these tests was imported from California. A number of European countries allow the importation of queens from the United States, but we are super-cautious about bringing

in queens from Europe.

The Future for Agriculture and Beekeeping

A census of United States agriculture is taken every five years. The last agricultural statistics were gathered in 1992, and the final figures have just been published. The trend is for larger farms to become larger. And, like the rest, the tendency is for beekeepers to own more colonies and produce more honey per person.

The following data are taken from Volume 1, Part 51, United States Summary and State Data, 1992 Census of Agriculture, Geographic Area Series, Tables 1 and 40.

	1992	1987
Number of farms*	1,925,300	2,087,769
Land in farms (acres)	945,531,506	964,470,625
Average farm size	491 acres	462 acres
Farms reporting bees	25,305	38,625
Number of colonies	2,633,338	2,835,043
Total honey crop (lbs.)	183,389,292	190,295,568

*The federal government states that "a farm is any place from which $1,000 or more of agricultural products were produced and sold, or normally would be sold, during the census year."

During the five years between 1987 and 1992 the number of farms selling less than $2,500 worth of produce fell by 14 percent from 490,296 to 422,767 What is more impressive at the other end of the spectrum, is that the number of farms producing more than half a million dollars worth of produce rose by 47 percent from 32,023 to 46,914. The data show that farms producing less than $100,000 worth of products declined in the last five years.

Of special interest to beekeepers is the fact that the amount of land in orchards increased by 4.6 percent though the number of farms with orchards decreased by 3.5 percent. The number of vegetable farms increased by 1.9 percent, bucking the trends, but acreage was up by 9.1 percent. All this, of course, means that more bees are needed for pollination.

Family Farms Dominate

Families still own 85.9 percent of the farms in the country. Corporate farms, while large, represent only 3.8 percent of the total number. Partnerships account for the rest.

Changes For Beekeepers

Thinking beyond the census figures, a number of people have pointed out to me that major changes in the beekeeping industry have taken place in recent years. We now have two beekeepers in the United States who own 65,000 colonies each. This year, an estimated 25,000 colonies were moved from Florida to California for almond pollination in January. Last year, there were 10,000 moved for this purpose, while only 5,000 were moved the year before, with none taking this long trip in earlier years.

Almonds Still The Big User

I understand that this year, about 800,000 colonies of bees were rented for almond pollination in California. Only five years ago, we estimated the number at 650,000. In 1989, we estimated the total number of colonies being rented for pollination across the United States was about one million; most of these colonies were rented twice and for use on two crops. The increased use of bees in California for almonds, as well as other increases that have been called to my attention, makes me think that about 1.2 million colonies are being rented annually for pollination, again, with each colony being rented for use on two crops.

Commentary: The Future

To my mind, these data make the picture clear, and I see little pressure for change. Big farms will get bigger. We are better fed, and pay less for our food, than at any time in history, and people like that. What I see in the future of beekeeping is emphasis on three things regarding equipment: standardization, mechanization and simplification. For example migratory beekeepers now use pallets as bottom boards.

There is still room for small and part-time beekeepers. However, to remain competitive they too must standardize and simplify their equipment. The key to success is still management, but it must be supplemented with good equipment. The trends for the future are clear. BC

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? DO YOU KNOW ?

What Do You Know About Honey Plants

clarence collison

Colony development and productivity are tied directly to the flowering plants found in the area surrounding the apiary. While only a small number of species of plants are present in high enough densities to produce large quantities of surplus honey, many species of flowering plants contribute to colony maintenance throughout the year.

How familiar are you with the flowering plants and the factors that affect nectar and pollen production? Please take a few minutes and answer the following questions to determine how well you understand these important topics.

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

1. ___ A flowering plant will have either floral or extra-floral nectaries, but not both.
2. ___ Nectar is a solution of sugars in water with minor amounts of amino acids, organic acids, proteins, fats, minerals and enzymes.
3. ___ The potential nectar yield of a particular plant species is determined by heredity, whereas, the extent to which the potential is realized depends on environmental conditions of weather and soil.
4. ___ In herbaceous plants, shrubs and trees, the sugars found in the nectar supply are produced from stored carbohydrates found within the plant.
5. ___ All flowering plants are attractive to honey bees.
6. ___ Relative humidity has a direct effect on the volume of nectar produced within a flower.
7. ___ Nectar secretion in a flower normally ceases after pollination and fertilization.
8. ___ Pollens differ greatly in both nutritive value and attractiveness to bees.
9. ___ The amount of quality bee forage in the United States has been declining for many years.

Multiple Choice Questions (1 point each).

10. ___ Nectaries are glands found on plants that are specialized for the transport of:
    - A. Salt
    - B. Resins
    - C. Sugars
    - D. Waxes
    - E. Amino Acids
11. ___ The principle chemical component of pollen is:
    - A. Protein
    - B. Carbohydrates
    - C. Minerals
    - D. Fats (Lipids)
    - E. Vitamins
12. What two environmental factors have the greatest impact on nectar secretion? (2 points)
13. What are the three primary sugars found in nectar? (3 points)
14. How are pollen grains that are transported by insects different from pollen grains transported by the wind? (4 points).

Many species of trees and shrubs are extremely important in providing colonies with pollen and surplus nectar. Please match the following tree species with the correct information.

A) Black Locust
B) Gallberry
C) Tupelo Gum
D) Eucalyptus
E) Maples
F) Basswood
G) Tulip-Poplar
H) Willows
I) Sourwood
J) Orange
K) Honey Locust
L) Sumac

15. ___ Flowers are referred to as catkins and male and female catkins are found on separate trees; either a male or female tree.
16. ___ Small evergreen shrub with small dark leaves and is considered to be an excellent honey plant in the southeastern United States, especially in Georgia and the Carolinas.
17. ___ The tree reaches a height of 20-40 feet, white flowers grow in racemes, appear in July, and many people regard it as one of the finest honeys produced in the southeastern United States.
18. ___ There are about 150 different species of this tree, most of which are native to Australia and Tasmania. Many of them are good honey yielders and they have been widely introduced into California, Florida, Texas and other southern states.
19. ___ Extremely large trees with very large flowers, producing abundant supplies of dark amber honey, blooming in April and May.

ANSWERS ON PAGE 361

NOT WHAT THEY'RE ALL CRACKED UP TO BE

Hybrid Bees

mark winston

I'm sure it's no accident that the words "entomology" and "etymology" are so similar to each other, and easily confused. Entomology, of course, is the study of insects, while etymology is the study of the origin of words. We entomologists are great wordsmiths, and our meetings percolate with long descriptive terms about the insects we study. Heaven for an entomologist is discovering a new insect species and getting to name it because we can then search the dictionaries and our memories for Latin words that in some way capture some quality of our new insect. You're all familiar with one such name that was given to the honey bee centuries ago, *Apis mellifera*, which means honey-bearing or honey-producing bee in Latin.

Thus, it's not surprising that the first thing I did before writing this column on hybrid bees was look up the term "hybrid" in the dictionary. The current definition is "offspring of the union of a male of one race or variety with the female of another," or "derived from unlike sources." However, the Latin origin of the word hybrid is "hybrida," with a much more descriptive definition: "the offspring of a tame sow and a wild boar." The more poetic Latin version captures the essence of the hybrid dilemma for queen breeders, which is to mix two varieties of bee in such a way that the offspring queen has the best characteristics of the tame sow and the wild boar, rather than the worst of each. That is, you want a hybrid exhibiting characteristics of the tame bee, but with some of the "vigor" associated with the wild one. What you don't want to produce is a wild bee whose aggressive characteristics overwhelm the beneficial traits of the tame one.

The positive aspects of hybrid bees have given them a good reputation among U.S. and Canadian beekeepers. For example, one of North America's foremost queen rearing companies advertises its bees as "the result of crossing three to five different lines, increasing hybrid vigor," and "having the advantage of hybrid vigor." The company produces a premier line of queens that are not only hybrid, but double hybrid bees, "a combination of the best of both lines." Indeed, the term "hybrid vigor" is a valid scientific concept that describes a phenomenon where hybrid organisms can be superior to either of the original types. The meaning of "vigor" is difficult to pin down, and the genetic basis for hybrid vigor is not well-explained. Nevertheless, "vigor" is a good description of what can happen when two unlike types are mixed. Whatever may be behind the idea of hybrid vigor, the continued popularity of hybrid bees among beekeepers offers some evidence that hybrid vigor is a useful concept in bee breeding.

A good, tangible example of how hybridization can produce bees that may be commercially superior to their parent stock is mite resistance. There is a number of studies that have found poor tracheal mite resistance in two different lines of bees, but, for some reason, interbreeding between the non-resistant bees produces hybrid bees that show improved resistance over their parents. This phenomenon is unexplained, but appears to result from combining traits of the parents in new ways that yield an improved offspring.

Hybrid vigor can be a double-edged sword, however. The most significant type of hybridization taking place today is between African and European bees, yielding an Africanized hybrid bee that has created numerous real as well as political problems for beekeepers throughout the New World. The Africanized bee originated from an attempt to capitalize on the concept of hybrid vigor by mixing the traits of bees from Europe and from Africa to produce a hybridized bee that would be more "vigorous" in tropical regions. Honey bees are not native to either North or South America, and the bees being used throughout the New World up until the 1950s came from Europe. These European bees, although fairly gentle, were not good honey producers in tropical climates and were particularly poor for beekeeping in the Amazon Basin. Brazilian geneticists reasoned that they could import more aggressive bees from Africa that supposedly had better honey-producing characteristics, breed them with the European bees and end up with a gentle bee that was a good tropical honey producer.

Continued on Next Page

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HYBRID BEES ... Cont. From Pg. 333

The rest, as they say, is history, and we now are forced to deal with a number of interesting problems that have resulted from creating these hybrid bees. The original African type is still predominant in most of Latin America, and it is interesting that there has been so little hybridization of African and European bees in feral colonies throughout the tropical regions of the New World. However, beekeepers in tropical countries, and certainly our North American beekeepers, attempt to maintain European colonies and often end up with Africanized, hybrid bees through mating. Unfortunately, these hybrid bees seem to maintain more of the African than the European traits. That is, the characteristics of the "wild boar," the African drone from feral colonies, overwhelm those of the "tame sow," a virgin European queen in a managed colony.

One very obvious problem caused by the hybrid bees is that they manifest more pronounced defensive behavior at the hive. The increased defensiveness of Africanized bees comes from two sources: the individual bees themselves and the mixed colony that contains both Africanized and European bees. For the individual bee, feistiness is genetically dominant, so that the Africanized offspring of a European queen and an African drone will maintain the aggressive traits of the African father rather than the gentler, more recessive traits of the European mother.

However, the colony also provides an additional level of hybridization that has been thoroughly studied by the team of Ernesto Guzman and Rob Page. Since queens mate with a number of drones, a colony may be a mixture of European (European drone mated with an European queen) and Africanized (Africanized drone mated with a European queen) workers. Unfortunately, a minority of Africanized bees in a colony will dominate behaviorally, so that a colony with only 25 percent Africanized workers will behave more like an aggressive African colony than a gentle European one. The European workers appear to have poorly developed self images and, much like inner city gang members, are easily swayed to misbehave by a few aggressive leaders. In psychological etymology, the Africanized bees are "inner-directed," following their own genetic background, while the European bees are "outer-directed," taking on the traits of the bees around them rather than staying true to their own gentler nature.

These hybrid bees may be creating a real political mess in North American beekeeping, in addition to being difficult to handle. Many states are developing certification programs that require bees to be tested for Africanization, and Canada is unlikely to permit importation of bees from the mainland United States without such certification. However, although the European bees themselves seem to do a good job of detecting the presence of Africanized workers in colonies, our scientific detection methods are not proving as reliable. Again, the team of Guzman and Page, with the addition of their ace inseminator Kim Fondrk, have recently shown that the Africanized-European hybrid bees are difficult to detect with currently used methodology.

There are many methods of certification that could be employed, but the dominant and least costly method to date has been morphology, or measuring body parts of bees. There is a shortcut system that primarily involves wing measurements and a longer, more expensive system that uses up to 26 different body measurements to confirm the shortcut diagnosis. The other methods involve various types of chemical identification, including cuticle type, proteins and DNA analysis. These methods are more reliable, but also more expensive and technically difficult to conduct. The Guzman study found that the morphological method was accurate for pure African and European bees, but hybrid bees were frequently misdiagnosed. In fact, up to 50 percent of the hybrids were classified in the wrong categories. This is a serious problem for certification since most "problem" bees would be hybrids rather than pure African. Since the hybrid bees tend to be close to or as aggressive as pure African bees, mis- diagnosis could cause serious problems for beekeepers depending on an accurate certification procedure and for a public that may not tolerate mistakes in identification.

The Guzman article made another interesting point about Africanized bee detection. In one sense, it's not actually that important to diagnose a bee as Africanized or not, but rather it is colony behavior that we need to examine more than genetics. Would a gentle Africanized bee cause a problem, or should we simply be screening against the extreme defensive behavior that some colonies exhibit, no matter what the genetic origin? Unfortunately, it would be impossible to screen defensive behavior for the progeny of all queens before moving bees, leaving us with the possibly unreliable method of morphology or the overly expensive chemical methods as certification

"In one sense, it's not actually that important to diagnose a bee as Africanized or not, but rather it is colony behavior that we need to examine more than genetics. Would a gentle Africanized bee cause a problem, or should we simply be screening against the extreme defensive behavior that some colonies exhibit, no matter what the genetic origin?"

techniques.

These findings do not bode well for those interested in freely moving bees in the United States or eventually exporting bees to Canada. It is unlikely that Canada will open its borders to U.S. bees without inexpensive and unambiguous certification methods to determine the extent of Africanization, and at the moment, there do not appear to be appropriate, commercially usable techniques to determine Africanization accurately and economically. Guzman's work and conclusions undoubtedly will come under considerable scrutiny over the next few years because of these significant economic implications, not only for Canadian importation, but also for required certification purposes within the United States.

The arcane "tame sow" and "wild boar" of ancient Latin origin turns out to have a very contemporary relevance for today's beekeeping, and the term "hybrid" may no longer have the same positive connotation for commercial beekeepers. We're undoubtedly going to hear much more about hybrid bees in the future. Buckle your seat belts; it's going to be an exciting entomological and etyological ride! BC

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KEYSTROKE KNOWLEDGE?

larry goltz

Perhaps because I know so little about the new computer Information Superhighway, I naively believe that it is being created to benefit society in general. Past experience with telecommunications, however, leads me to suspect that it may turn out to be just another commercial channel for advertising. I hope not.

The idea of having a continuously updated source of information available to beekeepers on demand is an intriguing thought. Such a service was inefficient (or insufficient) in the past and is largely ignored at present. Two conditions necessary for the implementation of this form of "hot line" have been lacking: one, a widely accessible line of communication and two, a network information center that has the capability of collecting, evaluating and transmitting information vital to the beekeeping industry. The first condition has apparently been met (see *Bees and Bytes*, July, 1994 *Bee Culture* by Stan Kain). The second prerequisite is another matter. Traditionally, beekeepers have been individualists, not an undesirable characteristic when conditions demand independent, timely and forceful action. However, surrendering some autonomy may be necessary if beekeeping is to remain a competitive industry in today's business world. Sharing information may be foreign to the average beekeeper who has vested interests in exclusive markets, reserved apiary sites and individualized operational territories and procedures. There have been good reasons for such exclusiveness, but perhaps the time has come to reevaluate our thinking with respect to traditional and sometimes intransigent ideas about information sharing.

Local and federal governments apparently can no longer or will not assume leadership in the dispersal of information to beekeepers. This creates a void that the private sector must fill if information vital to the bee industry is to be disseminated. Entomological research, wedded to the bee industry, I suspect, by an unwilling alliance may be going the way of government information services. Government regulatory functions are being phased out after once being so pervasive. This may be a mixed blessing. Whether the bee industry can assume the responsibility of self-regulation and effect ties with entomological research remains to be seen.

To function in an integrated economy, an individual must maintain contact with a center of information. The bee industry is so fragmented that only dribbles of information have reached individuals who are able to utilize it before it becomes outdated. Beekeepers should know immediately when honey markets fluctuate and be informed as to when and where pollination opportunities exist and when significant technological advances in equipment and management are introduced. New procedures and equipment should be honestly evaluated by responsible and qualified persons or organizations before news of their existence is released through information channels. Advice on market conditions for apicultural products, current regional conditions relative to pollination activity, bee movements, forage conditions and alerts as to potential problems and suggested safeguards can only come from informed sources through the information center.

Does all this sound like some utopian dream?

The means are available for instantaneous transmission, but is the beekeeping industry ready? Not if past history is any indication of the industry's record of receptivity to changes. If beekeepers are to survive and prosper in America, we must utilize all of the tools available to modern businesses, not the least of which is the prompt and liberal distribution of information. Will we ever learn that altruism, not egoism, is the bond that can lift an ailing sector of agriculture from its morass of economic insecurity? At the present time, most beekeepers, rugged individualists that they are, are not closely coordinated with the industry as a whole, highly efficient and relatively free of competition. However, surrendering some autonomy does not necessarily lead to a collective society. American industry has been a model for the world because of its productivity, as has American agriculture. Ours and that of other industrialized nations are balanced combinations of individual aggressiveness and cooperative action. At the base of such economic achievement is information sharing. This the ideal toward which a free world economy is aimed.

"The means are available for instantaneous transmission but is the beekeeping industry ready? Not if past history is any indication of the industry's record of receptivity to changes."

More specifically, what should a beekeeper's information center be like should it become a reality?

For one thing, it will most certainly be electronically transmitted and universally available through receivers of modest cost. Information sent out must be reliable, topical and practical, presented in a manner comprehensible to all with basic educational skills.

Several issues must be settled before an information center becomes universally accepted by bee-

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KEYSTROKE ... Cont. From Pg. 337

keepers. As always, with projects of this nature, financing is a major consideration. The burden may fall entirely on the beekeeping industry or may be all or partially paid from tax revenues, which means government intervention (or assistance, depending upon what you choose to call it). Another issue is that of the logistics of establishing and operating an information center, staffing, collecting and editing information and transmission of that information. To be of value, the information must be factual, up-to-date, useful and specific to the bee industry. Wide coverage is needed, considering our needs include those involved in honey production, pollination, queen and package bee production, packing and marketing honey and other apiary products, equipment manufacture and distribution. The target groups are likely to include amateur and commercial beekeepers and others directly or indirectly involved with beekeeping.

"How will an information center affect the present periodicals? No one can predict how much, if any, of the functions of the beekeeping publications would be affected.

How will an information center affect the present periodicals? No one can predict how much, if at all, the functions of the beekeeping publications would be affected. Certainly, the marketing news in the monthlies could be replaced by daily or weekly reports. In addition, an information center could expand coverage to include import-export data, pollination contracting rates, crop acreages, numbers of colonies in place and in

Today, On The Net

Several 'exchanges' already exist, at least in some form, that can be used by beekeepers. One such resource is the "Bee List."

To tap this resource, you need access to the internet – America OnLine, Compuserve, Prodigy or the like. Any local 'net' will probably work. Once you've established an internet connection you can join Bee List, send, and receive, beekeeping information.

To join, send a message to the 'listserve' computer at listserv@vacsc2.albany.edu for an internet connection; for a bitnet connection send to listserv@ALBNYVM1.BITNET. The message should read – Subscribe Bee-L<your full name>.

Once joined, a wealth of information is already available, just for the asking. Simply send a message to the listserver (again) with the word HELP in it. You will be overwhelmed. For more, send a message with the word INFO in it. You'll be overwhelmed again.

If you want to communicate with the hundreds of people who are already on BEE-L, bring up your EMail program, prepare to 'send' a message and use the address BEE-L@vacs2.Albany.edu (note the difference from the address above). Send your message, or question, and sit back. You will be amazed at the response.

One often heard criticism of this 'electronics' beekeeping is that the topics are "too advanced," or *not really* beekeeping. We recently monitored the Bee-L for a few days to see what was being discussed. Read on, and be prepared for some pretty basic, pretty elementary stuff.

One topic was on smokers and smoker fuel: suggested fuels were dehydrated alfalfa pellets; weathered sacking (burlap); hay; cedar bark; dried artemisia plants; ground corn cobs; activated charcoal pellets; corrugated cardboard; dried pine needles; incense pellets; cypress tree leaves; and, believe it or not, donkey manure.

Another topic was feeders, and feeding: Comments and discussion revolved on common feeders in a beeyard, and why this shouldn't be done. Strong hives get the most; weak hives fare poorly; robbing may occur; wild bees will also get fed; disease may be transferred; and drifting will take place. Also, the strength of solution to feed (1:1, 2:1, 1:2) and why; kinds of interior feeders to use and cleanliness.

Another discussion revolved around 'Frugal' beekeeping: This topic covered where to get cheap paint; Crisco patties; how to use 15 lb. roofing felt; where to get free or cheap barrels and pails; inexpensive covers and bottom boards; pallets; uses for duct tape; cheap and quick feeders (plastic bags!); and repairing supers.

See, this is pretty basic stuff, and any beekeeper could learn a thing or two by tuning in. Caution, though, because, just like any other information source, that which you read may only work in some areas, or with some kinds of equipment. Or, it may be just plain wrong. Nobody's perfect, but, the net is free, and, like the information above, you *will* gain something for your effort and time.

transit and notification of immediate or projected colony needs or opportunities in specific locations or crops. By having this type of information on hand, crop pollination may become much more efficiently managed by both beekeepers and orchardists than at present. Honey producers at present receive relatively meager information, often outdated, about crop predictions, nectar yields and honey stocks on hand with packers; in other words, supply and demand information at regularly scheduled times. Honey packers may have their own network of market information, but no source is so good that it cannot be improved.

Beekeeping journals are less likely to yield their traditional role of bringing to beekeepers detailed articles on bee management, research and news in general, including biographical and other material relating to people active in the bee industry. Meetings and other activities of beekeepers, from local to national events, could be reported easily via an information network transmitted electronically.

Much more could be said regarding the possibilities of an information center and its function, but first, a philosophical note. One obstacle must be overcome, and that is the inherent tendency of beekeepers to jealously guard information relating to their business. Trust must be earned by showing individuals that information sharing is greatly superior as a management technique to some of the guess and by-gosh methods used today. Revolutionary communication systems are available today to those who are wise enough to realize their potential.

Unfortunately, I cannot tell you how such communication systems work. In nearly every community, there are persons knowledgeable about the state of the art and are usually available for consultation when it comes to tapping into such a system.

The quandary at present, as stated above, is how to overcome reluctance on the part of individuals to release information pertinent to the overall functioning of the American beekeeping industry. This obstacle, I suspect, will be much more difficult to solve than the technical problems involved in the gathering and transmission of information. On the other hand, some very good reasons can be advanced as to why some very successful beekeepers are reluctant to reveal all or even some of their exclusive information. Unfortunately, there are always a few unprincipled or greedy persons who would misuse information, forcing more honest and open-handed individuals to take precautions to protect their own interests. We may be well-advised to heed the warnings of people in the bee industry who caution against forcing any kind of non-voluntary compliance, either by legislation or by threats to nonconformists.

In summary, we apparently have the technology to transmit information of unprecedented value to the commerce of the world; we must, in our own beekeeping industry, prepare to cope with the human element if we are not to be left behind the rest of the agricultural community. BC

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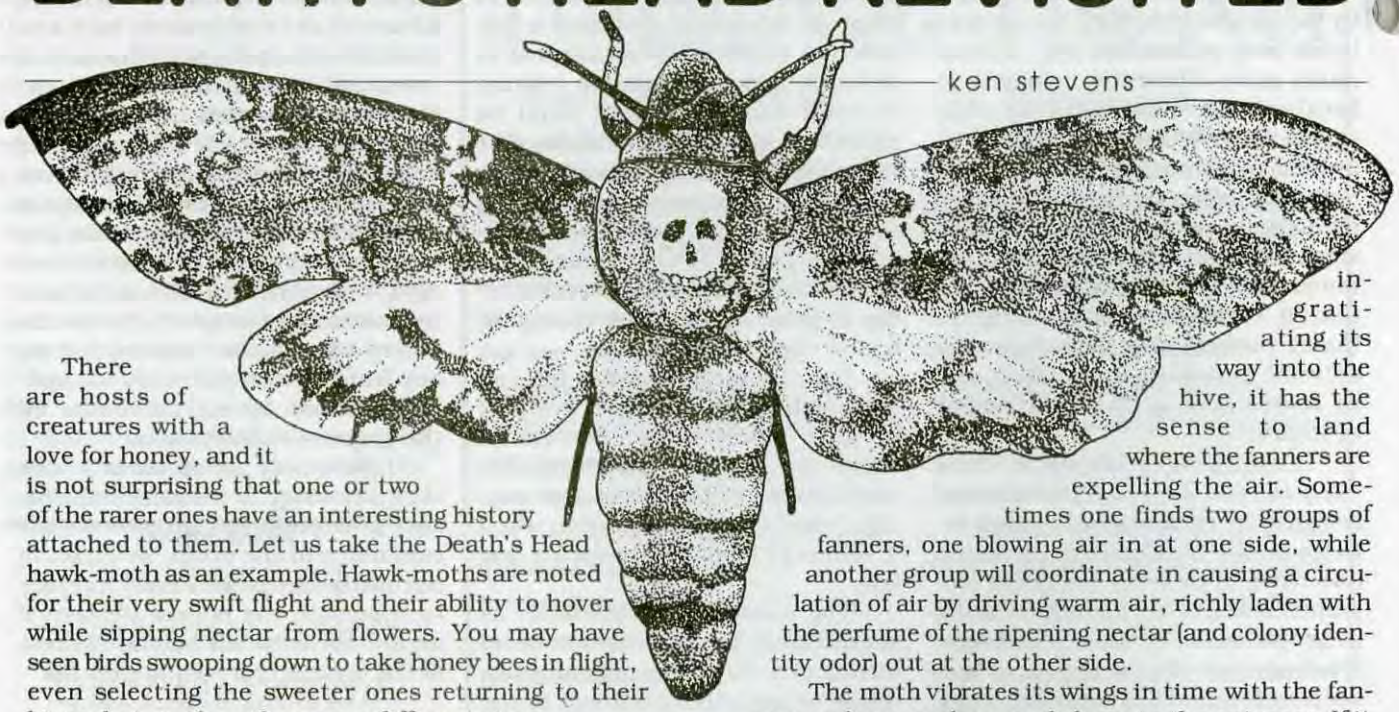
DEATH'S HEAD REVISITED

ken stevens



There are hosts of creatures with a love for honey, and it is not surprising that one or two of the rarer ones have an interesting history attached to them. Let us take the Death's Head hawk-moth as an example. Hawk-moths are noted for their very swift flight and their ability to hover while sipping nectar from flowers. You may have seen birds swooping down to take honey bees in flight, even selecting the sweeter ones returning to their hives, but moths – they are a different story.

Acherontia atropos, to give it its official title, is a huge European moth with a fat body, visible claws and a death's head pattern on its thorax. It was this awesome sight that doubtless led to its getting its scientific name from the Greek goddess, Atropos, who determined life or death. The moth lays its eggs on the leaves of potatoes, and although it poses no danger to us, it was said to frighten potato pickers before mechanical harvesting and insecticides were widely used.

No, it does not eat bees; it is their honey it's after, and with this in view, it has developed some remarkable characteristics. Its strong wings cover most of its vulnerable parts when it is not in flight, and these same wings that might have been used for hovering, can also be used to create the impression that it is one of the ventilators when it settles amongst the fanners.

Notice – amongst the *fanners*, not amongst the guards. Guards would waste no time driving it away, but for some reason, the fanners seem to be "programmed" to carry on fanning, come what may. Push them with your finger and they will just move aside and carry on fanning as before.

Although these moths are most common around the Mediterranean region, they are regular visitors to Northern Europe between May and October and have even been attracted to the lights on oil platforms in the North Sea. In Maltese apiaries, where hive entrances are usually kept small, presumably to deter such creatures as these, handfuls of dead moths are picked up by beekeepers. When I asked for some of these moths to be sent to me for identification, I received a parcel containing as many Convolvulus hawk-moths as Death's Heads. The two are similar in appearance, apart from the skull pattern. As regards its potential for success as a robber though the Death's Head is streets ahead.

When it lands amongst the fanners, with a view to ingratiating its way into the hive, it has the sense to land where the fanners are expelling the air. Sometimes one finds two groups of fanners, one blowing air in at one side, while another group will coordinate in causing a circulation of air by driving warm air, richly laden with the perfume of the ripening nectar (and colony identity odor) out at the other side.

The moth vibrates its wings in time with the fanners and creeps closer and closer to the entrance. If it gets away with this ruse and picks up sufficient smell to help fool some of the bees, it is well on its way to success. However, it has another proverbial *trick-up-its sleeve*. It also has the ability to squeak, imitating the sound of a piping queen. Incidentally, this insect is able to squeak when it is in the caterpillar stage, and going back to our potato pickers, they, too, must have been put off by this aspect of its behavior.

The squeak would doubtless be held in reserve because, having a tongue that is unusually short for a moth, but ideal for lapping honey from a cell, it moves stealthily into position and begins to load up. You may have noticed that when wasps and even bumble bees that have gained admittance to a hive, tuck into the sweeties, they imbibe earnestly, making no visible sign of moving, and this technique works reasonably well until their exodus becomes necessary.

This is where the squeak probably comes in mighty handy in the case of our hawk-moth. After all, it is a sound that completely dominates the bees. Try rubbing a damp piece of rag firmly across the glass of an observation hive. The resultant squeak resembles the piping of a queen, and while the vibrations last, every bee in sight will "freeze." One supposes that this is how a virgin queen can pick its way through the crowd either to mate or to seek out any rivals, or on its way to mate.

A. atropos does not only swoop and dive and fly thousands of miles in a few days, but it also has features that make it a formidable robber of beehives. So we can see that this clever robbing ploy must have succeeded through millions of years during which it learned these tricks. That a few don't make it merely shows that there are always exceptions to every rule. BC

Ken Stevens is a retired commercial beekeeper, from the UK. with experience in several countries. This is his first contribution to Bee Culture.

Squash Dreams

bill & mary weaver

The honey bee is the heroine of the squash patch. All squash plants have two kinds of flowers, male and female. The male flower contains three anthers that carry the large pollen grains, and the female flower contains the structures that produce the fruit. Squash pollen is too heavy and sticky to be carried from the male to the female flowers by the wind, as corn pollen is. Insects are needed to carry the pollen from flower to flower. Cucumber beetles, ants, flies and a few other insects can transfer some pollen, but without the honey bee, America's gardens and fields would not produce nearly the bounty of squash that we have come to expect.

Squash flowers open about dawn. In the warm summer, the bees are out early, working the flowers for pollen and nectar, busily moving from flower to flower. In a sizable squash patch, you can hear the steady, gentle humming of the bees hard at work, one of the most pleasant sounds imaginable.

To pollinate squash properly, more than one bee visit per flower is needed. We understand that a properly formed zucchini will have had at least eight bee visits. Winter squash also need multiple visits. A winter squash has quite a few seeds in its seed cavity. Each of these seeds requires one pollen grain. If not enough pollen is carried to the female flower, the fruit will abort. Studies have shown that the fruit weight in winter squash is increased in proportion to the amount of pollen deposited on the stigma of the female flower.

For *this* season's fruit, it doesn't matter if the bees carry zucchini pollen to acorn squash flowers or vice versa. The cells that make up the squash fruit are developed entirely from the ovary of the female flower. These cells are formed even before the flower opens, and are not in any way influenced by the source of the pollen brought to that flower.

What gets interesting, though, is saving seeds for the next year's crop. If, for example, your zucchini flower is pollinated with pollen from a New England Pie pumpkin plant, the squash you grow next year from the seed you save is not likely to be a nice, slim zucchini. It will probably combine zucchini and pumpkin traits in some unusual mixture.

Many gardeners like to save their own seed. The feeling of independence from the seed industry is nice, and you can save some money besides. But if you or your neighbors grow more than one kind of squash, pumpkin, or gourd, there are some things you'll need to know to make your squash seed breed true. This is because some kinds of squash, pumpkins and gourds can interbreed, producing some truly unusual offspring.

You do not, however, have to worry about cucumbers or cantaloupes or melons interbreeding with your squash. That doesn't happen.

Squash, pumpkins and small gourds are all in the genus *Cucurbita*. In that genus, there are three common species, *C. pepo*, *C. maxima*, and *C. moschata*. There is also one less-common species, *C. mixta*. Members of each species will easily cross with one another if pollen from one is carried to the female flower of another. There is little chance of crossing between species occurring natu-

rally. Even professionals can make such crosses only with considerable difficulty, and then the progeny are usually sterile.

So, if you want to save squash seed, you need to know what species the squash, pumpkins and gourds you are growing belong to so you'll know if they could cross with each other.

In the species *C. pepo* are all summer squash, including all zucchinis, all yellow straight-necks and crooknecks and all patty pan types. The small ornamental gourds are *C. pepo*, as are the acorn squash, the spaghetti squash, the Connecticut Field pumpkin, the Small Sugar pumpkin, the Howden pumpkin, the New England Pie pumpkin and the pumpkins Jackpot, Spirit and Triple Treat. All these *C. pepo* types have scratchy leaves and stems and smooth, flat, white seeds with white margins, and their stems or peduncles are sharply ridged and deeply grooved. (A lot of the identification of *Cucurbita* species centers around the characteristics of the stem.)

In the *C. moschata* group are the well-known butternut squash, the large cheese pumpkins, the Kentucky Field pumpkin, the melon squash and the Golden Cushaw. All of these squash and pumpkins can interbreed, but it is highly unlikely that they will cross with the *C. pepos* mentioned earlier. The sweetest-flavored squash belong to this group, with deep orange flesh that is high in beta carotene, and most are excellent keepers. *C. moschata* squash and pumpkins have brownish seeds with a darker edge. The stem or peduncle of all of them is narrow and hard and has a button-like knob on the end near the fruit.

The squash and pumpkins belonging to the *C. maxima* species include the enormous show pumpkins that can top 600 pounds, the Blue Hubbard, the Gold Nugget, the Golden Delicious, the Boston Narrows, the Red Kouri, the pink and blue bananas, the buttercup and the multi-colored Turk's Turban. Colors in this species include pink, blue, gray, yellow, orange, white and green, but not tan. The seeds are plump and tan with a lighter margin. The leaves are very large, roundish and soft.

It is the peduncles or stems that make *C. maximas* very easy to distinguish, however. Their stems are thick and corky and cylindrical, with lines of soft cork running lengthwise. Once you've seen the stem of a *C. maxima* (a roadside stand might be a good source), you'll be able to identify all *maximas* very easily.

There is a less-common fourth species of *Cucurbita* occasionally represented in American gardens, particularly in the South, the *C. mixta* group. Not very many varieties are commonly grown. Green Striped Cushaw, White Cushaw and Tennessee Sweet Potato are three *mixta* varieties for which seed can be obtained. *Mixta* stems are thick and corky with a warted texture.

So, if you want to save your own seed, and the squash and pumpkins you and your neighbors grow are all of different species, you can let the bees do your pollinating. But if there are two or more varieties of one species growing within a quarter-mile of your garden, you have your work cut out for you. You must foil the bees that could cross-pollinate the plants to make sure only the right pollen gets to the flowers from which you'll be saving seed.

To foil the bees, go into your squash patch in the evening, before the dew falls, and look for male and female flower buds ready to open the next day. These flowers buds will be firm, but showing yellow color. Male flowers are attached to the vine with a straight stem. Female flowers grow atop a tiny already-formed squash that will develop further if the flower is pollinated.

Take a three-inch piece of 3/4-inch masking tape and tape shut just the tip of at least one male and one female flower of each variety you hope to save seed from. You need to tape them shut so that energetic bees and other insects flying early in the morning don't bring pollen to them from flowers of other types of squash.

The next morning, get up fairly early and proceed, as soon as the dew has dried, to the squash patch, a beautiful place to be early in the morning with the humming of the bees and the delicate beauty of newly opened yellow squash blossoms bursting with nectar and pollen.

Pick a male flower with the stem attached that you had taped shut. Strip off the petals. What you'll have left is a handy "paintbrush" with the stem for a handle for "painting" the pollen onto the stigma of the female flower.

Next, carefully tear off the tip of a female flower just below the tape so that it can open and paint the pollen onto the central portion, rubbing the pollen on each of the stigma's different sections. Then carefully retape the flower closed, taping up cracks and tears, too, so that not even an enterprising cucumber beetle can get inside to bring in alien pollen.

Then tie a piece of colored yarn or plastic surveyor's ribbon loosely to the stem of the flower you pollinated to identify it at harvest time. You'll know whether your pollination "took" when you see the tiny squash that was at the base of the flower begin to grow and develop, truly a miracle when you think about it. You should do this to several female flowers to insure success at harvest.

Wait to harvest the squash you pollinated until the skin is too hard to pierce with a fingernail. Then, after harvest, wait another three weeks to give the seed time to mature. Studies at the University of Arizona show that the seed actually plumps up and gains strength during this period.

After the three weeks are up, you can cut open the squash and remove the seeds. Wash them lightly to remove the stringy material. Then put the seeds to dry on a paper plate in a place that has good air circulation. When the seeds are thoroughly dry, store them in a cool, dry place and enjoy the feeling of independence that growing your own seed gives – when you control the whole process from start to finish.

By saving your own seed from year to year, you can, by careful observation and selection, develop a strain of squash that has characteristics that particularly matter to you. An old-order Mennonite farmer we know did just that with crooked neck pumpkins (really a squash). By careful seed selection over 20 years or so, he developed a strain of truly behemoth squash with huge thick necks that made excellent pies.

Trying to make your own hybrids can be interesting,

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SQUASH DREAMS ... Cont. From Pg. 343

too, particularly for kids. You never know what unusual squash/pumpkins you're going to come up with the next year.

Don't bother to save seed from any hybrid variety, though, unless you're just curious. Saving seed from hybrids usually results in a hodgepodge of inferior specimens.

As the growing season winds down, consider making use of the small winter squash that begin to develop too close to the first frost to mature in time for harvest. We understand Hmong refugees from Indochina pick these tiny squash, slice them thinly and stir-fry them in a little oil.

The Hmong also stir-fry the vine tips. Twist off about an eight-inch vine tip just before a leaf. Chop and stir-fry the stem, small leaves, flower buds and tendrils until they're tender but slightly crunchy. Their flavor may remind you of asparagus. The vine will soon send out a new tip, and you can harvest that, too.

Waste not, want not, is a good motto for gardeners, as well as for beekeepers. By making use of plant parts that would normally go to waste, you can treat your family to some mighty good eating. Tiny butternut squash are particularly delicious sliced and stir-fried. They taste, we think, somewhat like corn on the cob.

Squash flowers, too, are a gourmet treat for the gardener. Chop the petals into soups or omelets. Batter-dip and fry the whole flower. Or stuff the blossoms with soft cheeses and bake them until the cheese just begins to melt.

Harvest the mature squash you plan to store on a dry day before the first frost. Although winter squash are quite edible after they've been touched by frost, they don't store as well. Cut them with at least an inch of stem – we use pruners for this. Handle them gently to avoid bruises that could shorten their storage life. Put them in a sunny place or near a wood stove to cure for 10 days.

Then, store your garden's bounty between 50 and 60°. Winter squash become sweeter, as starch turns to sugar, and higher in vitamin A when stored at these temperatures. Acorn squash will store for a maximum of six to eight weeks. They become bleached out and stringy with time. Spaghettis and buttercups have kept until after Christmas for us. And butternuts, the heroes of the bunch, have remained in good condition for us into the next May.

Many gardeners aren't aware that the pumpkins, squash, and gourds they grow are American natives that were cultivated for thousands of years by Native Americans.

C. pepo and *C. moschata* varieties are believed to have originated in Mexico. Archaeologists have found evidence of squash cultivation in Southwestern U.S. and Mexico dating back to 4000 B.C. At first, it is believed, the Indians grew the squash for the seeds, which are high in protein and oil, and very nourishing. This is because the earliest squash had thin, very bitter flesh.

The Indian gardeners who grew the squash over the centuries, primarily the women, saved seed from year to year from the best of the squash. Gradually, over a long period of time, they developed squash varieties with thick, sweet, highly edible flesh. American gardeners today should pause occasionally to give thanks to the long line of unsung Indian gardeners of centuries past whose careful observation and seed-saving have made possible the wide variety of squash, pumpkins and gourds we enjoy today.

During the final quarter of the 13th century, there was a severe drought in the American Southwest, and squash-growing tribes were forced to move eastward, carrying their precious squash seed with them. By the time the first Europeans arrived in America, squash was being grown all across the country wherever corn was cultivated.

So, by saving your own squash seed, you stand in a long line of Indian gardeners of centuries past, patiently selecting, year after year, the seed for the next year's crop. Some of the finest pleasures in life are the simple ones. What more could one ask than to play a small part in providing seed for one's future garden? What finer way to provide for one's family than with home-grown squash, baked and drizzled with honey from one's own hives? BC

Bill and Mary Weaver grow squash, save seeds, and raise bees near their home in Pennsylvania.

ALL ABOUT POLLEN

b.a stringer

One of the delights of beekeeping is watching the fascinating procession of pollen-laden bees at the hive entrance. Sometimes you can guess the origin of the incoming pollen from its color, when you know which flowers are blooming in the vicinity of the hive. Colors range from bright oranges and yellows, through reds, browns and even greens. Some distinctively colored pollen loads come from the horse chestnut (brick red), scilla (bright blue), poppy (purplish-black), heather (grey), blackberry (white) and red deadnettle (bright orange).

Honey bees obtain most of their protein and mineral requirements from pollen, as well as vitamins, fats, sugars and enzymes. Pollen protein content varies from about 10 percent to 30 percent, offering different nutritional rewards to bees, but pollen seems to be collected without much regard for its food value. A range of vitamins, including vitamins A, C, D and E, and many B vitamins, are supplied by pollen. Minerals such as calcium, phosphorus, potassium, sulphur, magnesium and iron are present, along with fructose, glucose and sucrose sugars and also about five percent vegetable oils. Dandelion and sainfoin have an even higher oil content. No wonder pollen is popularly referred to as bee bread!

Pollen, the powder-like substance on the anther of a flower, contains the male sex cells of the flower. Pollination is the transfer of pollen grains to a receptive stigma of the same kind of flower. As long as it is viable and compatible, the pollen grain then grows a tube down the inside of the flower's style to an ovule in the ovary. When the male germ cells move down the pollen tube and unite with the ovule cells, fertilization occurs. This pollinated flower may then develop seeds from the fertilized ovules.

The honey bee's body is covered with branched hairs upon which she can carry millions of pollen grains, rather like a miniature dustmop. Pollen grains vary widely in size – 1/100 inch to 1/3000 inch – and shape – spherical, pyramidal, dumbbell-shaped, ovoid, with bumps or spikes, pores, grooves, striations or "tails." The bee brushes and sweeps adhering grains from her body, mixing them with honey or nectar for packing, and this binding moisture may change the color of the pollen over time. In some cases, especially in tiny flowers or those producing little pollen, bees also use their mandibles to bite and scrape flower anthers to get out the pollen grains. The bee quickly transfers moistened pollen "patties" from her mouth to her middle legs, then to the corbiculae, or pollen baskets, on her hind legs. It is the color of these pollen pellets packed in the corbiculae of foraging worker bees that is so eye-catching at the hive entrance.

While an average colony uses about 45 pounds of pollen a year, quantitites over 70 pounds have been trapped from a single colony. It takes about 10 worker-loads of pollen to produce one bee, and some say "1 cell of honey + 1 cell of pollen = 1 bee." In the process of collecting pollen from flowers, bees transfer pollen grains to other individual flowers of the same species, ensuring cross-pollination. Freshly gathered pollen from plants such as crocus and willow stimulates queen egg-laying in the spring, so the early pollen-producing plants are very important to the colony buildup.

Many plants are designed to attract insects for the purpose of pollen transfer and propagation of the plant. These are collectively called *entomophilous*, or insect-loving, plants (*entomo* = insect) and generally produce a relatively high-quality pollen. Examples of entomophilous plants with excellent pollen include horse chestnut, heath, poppy, crocus and mustards. Poppy and hollyhock pollens seem to be exceptionally attractive to honey bees for some reason. It is not unusual to see three or four bees in a single flower, revelling in the pollen. Dandelions produce good-quality pollen quite early in the season, and high-sugar nectar as well.

Honey bees will also collect pollen from plants which depend primarily on the wind for pollen transfer. These are called *anemophilous*, or wind-loving, plants (*anemo* = wind). Anemophilous plants tend to produce lower-qual-

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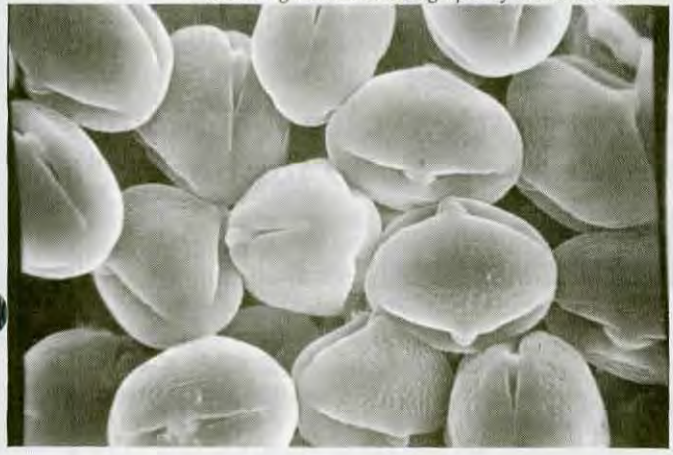
Scanning Electron Micrographs of White Clover and Sumac Pollen.



POLLEN ... Cont. From Pg. 345

ity pollen (nutritionally speaking), and vastly more of it. Willow pollen supplies excellent nutrition early in the beekeeping year, and elm pollen is also good. However, some of the early blooming trees such as alder, poplar and hazels, produce copious quantities of comparatively poor pollen, which is collected by bees despite its quality. Beekeepers have reported good brooding-up of bees, but subsequent failure to build up bee numbers, after the early anemophilous pollen flows. Bees will collect available pollen regardless of its nutritional value, even bringing in the very poor-quality fir, pine and cedar pollens. In early spring, they collect almost anything of powdery consistency and may be seen loading their corbiculae (pollen basket) with sawdust or flour. Later in the year, when most floral bloom diminishes, bees may collect pollen from corn and other grasses.

Most plants yield pollen from their anthers (or *dehisce*) throughout the day in favorable weather. However, roses and grasses (including sweet corn) dehisce only in the morning and stop around midday.

There is an excellent book on pollen for those beekeepers who follow the bee forage year. It was written by Dorothy Hodges, an English artist and beekeeper, who catalogued the colors and grain shapes of pollen types in her area. *The Pollen Loads of the Honey Bee* is a very readable and practical book, with watercolor charts of pollens from the flower and from the bee. Published by IBRA, this book should be available from them or BES/Wicwas Press. BC

B.A. Stringer, who lives in Oregon, has returned to writing after taking some time off to be with her brand new daughter. She writes about honey plants and using them in the home landscape. We have missed her contributions.

OBSERVATION HIVES

thomas webster — dewey caron

Part VI

MAINTAINING A HEALTHY NEST

A nest of honey bees has many enemies: larger animals, bees from other hives nearby, parasites like tracheal and *Varroa* mites and a wide assortment of diseases caused by the tiniest microbes. For this reason, the bee colony has developed a remarkable collection of traits to defend itself. In general, two types of bee behavior are devoted to nest protection. These are guarding against intruders and nest hygiene to control diseases and perhaps parasites. Some of this activity can be seen in your observation hive.

Guard bees

A few of the bees in the hive specialize in guarding the entrance of the hive against intruders, including bees from other hives which may try to rob honey. Watch the runway of the observation hive where the bees are entering and leaving. (See Part II of this series for a description of the runway.) Guard bees can be seen in the runway if it has a transparent top.

The guard bee's behavior is easy to recognize. A guard will face the outside and often approach an incoming bee. Occasionally, the guard will lift up her first pair of legs challenging the other bee. If the incoming bee belongs to the hive, the guard will recognize her quickly because she carries the hive's odor, and let her pass. A bee with a foreign hive's odor will be challenged and attacked. Often a real tussle ensues, as the guard grabs the intruder and attempts to sting her. If the intruder is stung, the guard may be able to withdraw her barbed sting because insect tissue is softer than human skin. Hence, the guard does not necessarily put her life on the line by attacking another bee.

What can we learn from watching guard bees? The guards can tell us several important things about the way the hive works. After you learn to identify the guards, you can note when the hive has bees on guard duty and when it does not.

In what months of the year do the most guards appear to be on duty? Guards will most often be at their post when there is no honey flow. This is the time when bees from nearby hives attempt to rob. In most locations, this will be late summer and fall.

Guards are much more likely to be on the watch in large hives. A weak observation hive may not have enough worker bees to spare a few for guard duty. Bolster a weak hive by adding bees or capped brood and watch to see whether guard bees eventually come on duty.

Unfortunately, chalkbrood is a familiar sight to most beekeepers. The diseased larvae will turn into dry, chalk-like "mummies" which are white or charcoal gray in color. The worker bees will usually remove the mummies from a strong hive. But an observation hive contains a relatively small colony, and it often lets the mummies accumulate on the bottom.

Hygienic behavior

The colony hygiene activities that are easiest to observe are grooming and the removal of dead bees. If your hive has a little brood disease, you may also see workers remove dead larvae or pupae from their cells. The uncapping and removal of dead brood is known to be a significant part of disease resistance. However, we don't recommend that you deliberately keep a diseased observation hive!

Grooming behavior: Honey bees will inspect and groom each other. Scan the bees in the hive carefully. You may see a bee pulling and biting at the hairs of

another bee, especially at the bases of her wings. This is probably a grooming bee cleaning the other bee. Look for bees sitting quietly with their wings outstretched. Frequently, these bees are "asking" to be groomed.

Several researchers have recently found evidence suggesting that this behavior may reduce parasitic mites in the hive. More study on this subject is needed to see whether this could be a significant part of mite resistance in bees.

Undertaker bees: In a large colony, a few of the worker bees will specialize as "undertakers." These bees are particularly inclined to find any dead nest mates and carry them out of the hive.

You may want to watch this behavior in your observation hive by putting several dead bees inside it. This will require a small hole at the top of the hive. If your hive has a screened hole opening at the top for ventilation or a sugar syrup feeder, remove the screen briefly and drop a few dead bees inside. One of the worker bees may then grab a dead bee and carry her out of the hive. Sometimes the undertaker will not carry the bee directly to the hive entrance, but rather, she will run around in an apparently random fashion. This is probably because she is confused by the lights in the room in her attempt to find the hive entrance. In this case, turn out the lights and draw the curtains to keep the room as dark as possible. Then only the hive entrance will be a bright light source. After the undertaker carries the little corpse out of the hive, she will fly with it and then drop it, often quite a distance from the hive.

Propolis: Propolis is the sticky material you find in your outdoor hives, between the hive bodies and in many little cracks and crevices. It comes from plant resins, and bees bring it to the hive in their pollen baskets. One big value of propolis is as an antibiotic. It probably has substantial value in reducing bee diseases.

When you install the bees in your observation hive, all the hive parts fit together without any of this "bee glue" But soon the cracks will be filled with propolis. This is especially evident where the transparent walls of the hive join the wooden sides. You may want to make notes on just how quickly the bees propolize their new home.

Chalkbrood: Hygienic behavior may be interesting to watch, but a diseased hive is probably not what you really want. The observation hive is especially vulnerable to chalkbrood. This is because the relatively small population of bees in the observation hive may not be able to keep the brood nest temperature high enough. Chalkbrood is a fungal disease, and fungi love cool, wet conditions.

How do we help the bees avoid or recover from this malady? First, a large population of worker bees is very important. They will help to generate heat, and some of the workers will be busy as housecleaners, removing dead brood. In addition, the temperature of the room is very important. The observation hive loses a lot of heat through its transparent sides because it is so narrow. Warm the room a little, if possible. It may also help to cover the sides with an insulating material such as plastic foam when you don't need to watch the bees. If the chalkbrood gets very bad, it will be necessary to take the hive outdoors, open it and replace the frames with clean comb or new foundation. When doing so, you may wish to add more bees, or healthy capped brood, to bolster the worker bee population. BC

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NOTES

20 GREAT IDEAS FOR BEE CLUBS

howard scott

Bee clubs are the social outlet for beekeepers. Whatever bee clubs can do to strengthen their effectiveness will help the beekeeping community. Unfortunately, over the last four or five years, due to mites and other stresses, bee clubs have suffered, declining from both memberships and a leadership crises. As a new club member (Plymouth County Beekeepers Association) and a researcher of other clubs and organizations several of whose meetings I attended, I offer these 20 ideas. Some might seem common sense, but believe me, many bee clubs' agendas do not include these basics

1 Have new members stand up and introduce themselves. New members come to a meeting and don't know what's going on. They sit in a corner, look inconspicuous, and stare. Six months down the line, when they become more comfortable, they *may* begin to contribute. But by that time, they may have tired of attending meetings where they felt unwelcome. Club leaders should first introduce themselves, then welcome new members. Each newcomer should stand up, state his name, place of residence, occupation, beekeeping activity, why he decided to join the club and what he hopes to receive from membership. This provides an opening which allows the individual to express himself and often leads to a discussion of how the new member can contribute to the organization.

2 Pass out an information packet to new members. This could be a one-page sheet or a booklet. It should contain a list of the officers and their phone numbers, club objectives, basic information and a schedule of the yearly events. Again, this info sheet gives new members something to focus on.

3 Have a formal Q & A session. Of course, every meeting is for questions, but often, if the president doesn't say, "Now, it's time for Q & A," the questions never get asked. On the other hand, when the president asks for questions, hands typically go up in bunches. So, formalize the Q & A session. Set aside a time slot for Q & A at every meeting and encourage questions by asking the members what's going on in their hives. Suggest that new members write down their questions in advance. Come to meetings with your own list of prepared questions. Nothing stimulates discussion like good questions.

Alden Abbott, past president and current director of Worcester County Beekeeper's Association, claims the key to his club being the oldest active beekeepers' club in the nation – it began in 1901 – is its excellent Q & A period, "where knowledge really gets out."

4 Hand out a phone listing of all members. A phone listing encourages networking. This is of enormous benefit to the beekeeper. He will have, at his fingertips, a wealth of advice, opinion, and if necessary, help. In addition, it will take the pressure off club officers and the two or three members who are most verbal, from fielding all the calls. Besides, new members do not like bothering busy people and may not make the call that could save their hives. But if an individual met someone at the meeting, and remembered the name, he or she could call that person. The phone listing can be given out with the original packet or at a later time.

5 Organize beekeepers to go into schools and talk to classes. Most of the time, this is left to the individual members, and typically, beekeepers go to their own children's classes. But it's an excellent learning experience for both teacher and student and gives beekeepers another activity. Appoint an education head, who calls teachers and makes appointments and coordinates the effort. Possibly, the education head might arrange a visit a week during the school year and try to get as many club members involved as possible.

After all, one of the best things a bee club can do is have its members talk to school children. Children have a great deal of curiosity, and these discussions can be a great learning opportunity. There's much to talk about. Who knows from that early exposure how many beekeepers might evolve?

Jeff Burdick, past president of North Berkshire Beekeepers Association, says his club's school presentations always go over well. Burdick says, "We go to preschools and first and second grades, and the kids are really eager. I give out honey sticks, my wife makes honey cookies, I bring in my observation hive, and we really have a ball."

6 Gather statistics. One of the poorest-kept areas in beekeeping is data gathering. Remedy that by keeping good statistics for your club. Keep track of number of hives, percentage of surviving hives, reasons for hive loss, honey production and revenue earned from honey sales. Post results on charts at meetings. For instance, it would be interesting to all beekeepers to know that 70 percent of club member's hives survived and that the

Continued on Next Page

Bee Clubs today need to be easily accessible, informal and most of all – friendly!

BEE CLUBS ... Cont. From Pg. 349

average hive yielded 35 pounds of honey.

7 Once a year, sponsor a non-bee event. How about a 10K road race? Or an adult spelling bee? Or a cookie bake-off? Or even a dance? Why? Because it will give your club a local identity that goes beyond its core mission. At the same time, it can be a money-raising effort. Make a connection – the spelling *bee*, *honey*-baked cookies, *bee* the fastest runner – that sort of thing. Done over time, these activities build up good will, and a good reputation will pay off. People will support your bee activities, the communities will cooperate when asked, and you'll become known as an organization that does good.

Stan Sample, president of Essex County Beekeeper's Association, reports that his club has run spaghetti dinners, where individuals have brought in their own homemade spaghetti sauce, and a prize was given for the best sauce.

8 Enter a bee float in a local parade. Why not? Have some fun! How about a giant bee sucking nectar from a flower? Or a beekeeper working a hive that's enclosed in a screened cage? Or a group of beekeepers sitting on empty hives playing musical instruments? Or a suited-up beekeeper walking with his smoker, carrying a sign that states the name of the club? Again, put your club on the map.

9 Become a public information center. Create an information hot line phone number that's available to the public. Anyone can call with a bee or bee-related question. The problem is always who should take the calls. One way is to alternate the call-taker every three months. Another method is for one person to direct calls to the beekeeper in the same locale as the caller. Post the number in all public centers, including libraries, police departments, fire departments and municipal buildings. Put up the number on community bulletin boards. Have local newspapers print the number. Have radio stations make public service announcements, giving out the number. When a new person takes over, and the phone is changed, notify these agencies of the new number. Because the organization is providing a public service, possibly the towns can kick in some money to support this offering.

Frank Lagrant, president of the Hampshire County Beekeeper's Association, forwards calls to area members. Lagrant says, "This way, a lot more people get involved. Plus, the member is in the same town as the caller, which makes it easier for visiting."

10 Have written bee quizzes. Write up a dozen questions and hand them out for members to answer. These quizzes should be short, taking no more than five to seven minutes. Then, go over the answers, and for sure, you'll get a great deal of discussion. This is a good way for members to become better educated.

11 Pass out *Bee Culture*. Many new members don't yet know of its existence. At the very least, pass out copies for people to look at during meetings. Even better, arrange for a magazine to route to four or five members each month. Perhaps the club might buy two or three subscriptions and circulate them. This is a good way to disseminate knowledge.

12 Stay abreast of new bee books. Assign an individual to read some of the bee literature coming out and to make periodic reports (at meetings or in a newsletter) on what he liked and what he didn't like. Possibly assign him a $50 budget each year to make book purchases, and the selected books can be passed around to members. Ultimately, they'll wind up in the bee library, which all good clubs should have.

13 Do things with other bee clubs. Have get-togethers with other clubs. Have a joint picnic in the summer. Do a combined meeting in the winter. Arrange a spring field trip with one or more other clubs. Invite a member of another club to speak to your club. Start a harvest get-together to discuss honey production.

Jeff Burdick, of North Berkshire Beekeeper's Association, reports his club has had several successful events with other clubs. He says, "We had a picnic last year and invited all the other clubs. We've made new friends that way."

14 Consider group health insurance as a benefit to offer members. One of the stickiest problems for many individuals is their health insurance. Either companies aren't offering adequate insurance or individuals aren't eligible. Come up with a group health insurance program where beekeepers could join and pay their own premiums. As a group, you can probably find a plan that is supe-

rior to individual plans. The key is to do research. There are all sorts of policies out there, with varying provisions on payments, coverage, deductibles, co-insurance, etc. Appoint a club member who's willing to do the legwork and who understands the basic parameters of health insurance. Offer the group insurance package to other clubs.

15 Run a new member drive by offering a $50 gift certificate for new bee equipment to the member who brings in the most new prospects. Numbers strengthen organizations. Talk up the drive at meetings. Encourage members to prod their beekeeping friends into joining.

16 Have a publicist put blurbs in the newspaper. Appoint someone as publicist to send in notices of bee research, production figures, bee tales and bee events. Most newspapers are eager for all the local news that comes their way. Of course, submissions must be neatly typed, factual and spelled correctly. Again, a public awareness can only help your organization.

17 Sell bee T-shirts as a fundraiser. Anyone would be proud to own a nifty T-shirt, emblazoned with your club logo and a bee caricature. Of course, the shirt must be yellow. Give each member five shirts, and if he sells four, he can keep the fifth.

Claire Desilets, secretary of Barnstable County Beekeepers Association, says her group sold yellow T-shirts with the club's logo embossed on a map of Cape Cod for $8 with good results. She says, "We sold the shirts in our booth at fairs, but most sales were by word-of-mouth."

18 With some money, do good deeds. Create a $500 college scholarship. Give a $100 check to every family in town who suffers a serious fire. Give $1,000 to a needy family. Win the appreciation of the local community.

Rick Burnet, president of the Plymouth County Beekeeper's Association, says his organization gives a $500 scholarship each year to a needy student because "It makes us feel good."

19 Donate money to an established scientist at your state college or university for ongoing bee research or come up with some ideas of your own. How about artificially breeding queens, determining the best methods of preventing swarms, doing studies on why hives die or predicting what kind of honey will result by the area. Go to nearby universities and seek out entomologists who can take on these projects. Or perhaps someone in the club is interested in conducting research. This is an excellent use of money because beekeepers stand to gain from any additional knowledge and understanding.

20 Have a bulletin board where people can put up notices. This might include bee information about equipment sales, services offered for hire, items for sale, business cards, objects wanted, swap proposals, whatever. If the club meets at an impermanent location, then someone can carry the board to each meeting. Encourage bee members to do more with each other, both having to do with their hobby and outside it. This is the strength of a club – through numbers, there's more possibility of mutual benefit.

Any help?

Howard Scott keeps bees, and attends meetings near his home in Pembroke, MA. He has just had his first book on Business Management published.

A June Affair

ohn peter

Most beekeepers worry about three things at this time of the year – feeding, queen excluders and having too many bees go into the fall.

First of all, feeding is expensive at any time, especially if you're using sugar. If you figure that you will use 250 pounds of sugar, at 35 cents to 40 cents per pound, to fee 20 colonies, you will spend between $90 and $100 twice a year.

Queen excluders are regarded by many as honey excluders because some colonies, no matter how strong, never go through the excluders and up into the honey supers above. And, although a super of capped honey will keep the queen down, it inevitably gets some brood in it, resulting in darkened comb.

Finally, colonies can go into winter with too many bees. The surplus bees, often called welfare bees, eat and eat and eat, depleting, early in the fall, the honey stores meant for overwintering. This puts the colony in jeopardy the following spring, especially if the weather is cool and new crops are slow to come in. Also, a queen that has two deeps to lay in May may actually fill all that space with brood, creating too many bees and limiting the amount of space to store overwintering honey.

Where I live is in Southern New York, just west of Connecticut. The following procedures are based on my location, so you'll have to adjust the timing to where you live – a bit earlier if you are south of me, about the same time to just a bit later if you live north of me.

A queen laying worker eggs on July 1 produces a forager six weeks later, in mid-August (three weeks to emerge and three weeks as a house bee). There is not a lot to forage on in mid-August! A large field force in August and September is an exercise in futility. And a good queen won't stop laying in July but will continue into August as well. Too many bees and not enough honey!

In late June, I head out to my yards with an empty hive body, another one with extra frames of good comb, a queen excluder, a bottle of whiteout, a smoker, a hive tool and a push-in queen cage.

At this time one of my typical colonies reads like this from bottom board up: two deeps, a queen excluder and above that, the surplus supers.

The empty hive body is placed conveniently with a queen excluder on it. The supers are placed on the upturned cover, and I'm always looking for brood and the queen. The original queen excluder is removed. (The queen is often found here. Be careful.)

The upper hive body is now placed carefully over the queen excluder that sits on the empty hive body. A quick check now often tells me which hive body to check for the queen first (I may have to go through 20 frames to find her). When I find the queen, I'll isolate and protect her with a push-in cage while I finish working.

With a minimum of disturbance to the brood nest, I'll shift empty frames and capped brood to the bottom hive body and frames of honey to the top hive body. Any frames that need replacement can be removed now, using those extras I brought along.

I'll mark the queen if she has not previously been marked and physically place her in the lower hive body where I have provided her with ready and almost-ready cells to lay in.

Then, I put the original queen excluder over the lower hive body. The upper body comes next, then the surplus supers and finally, the covers.

Continued on Next Page

This is the way my colonies look before I start in June. Note there's two deeps below the excluder.

All the equipment needed.

Me, and the finished product, ready for the rest of the season.

JUNE ... Cont. From Pg. 353

Whether or not the original placement of the queen excluder has, indeed, curbed their interest in going through it, now, suddenly there are lots of bees going through with honey and pollen. During the rest of the summer, and until harvest time, the queen is restricted to the bottom deep, her laying space. Any brood remaining in the upper body will emerge and be replaced with honey. The supers now have no queen excluder to frustrate the bees!

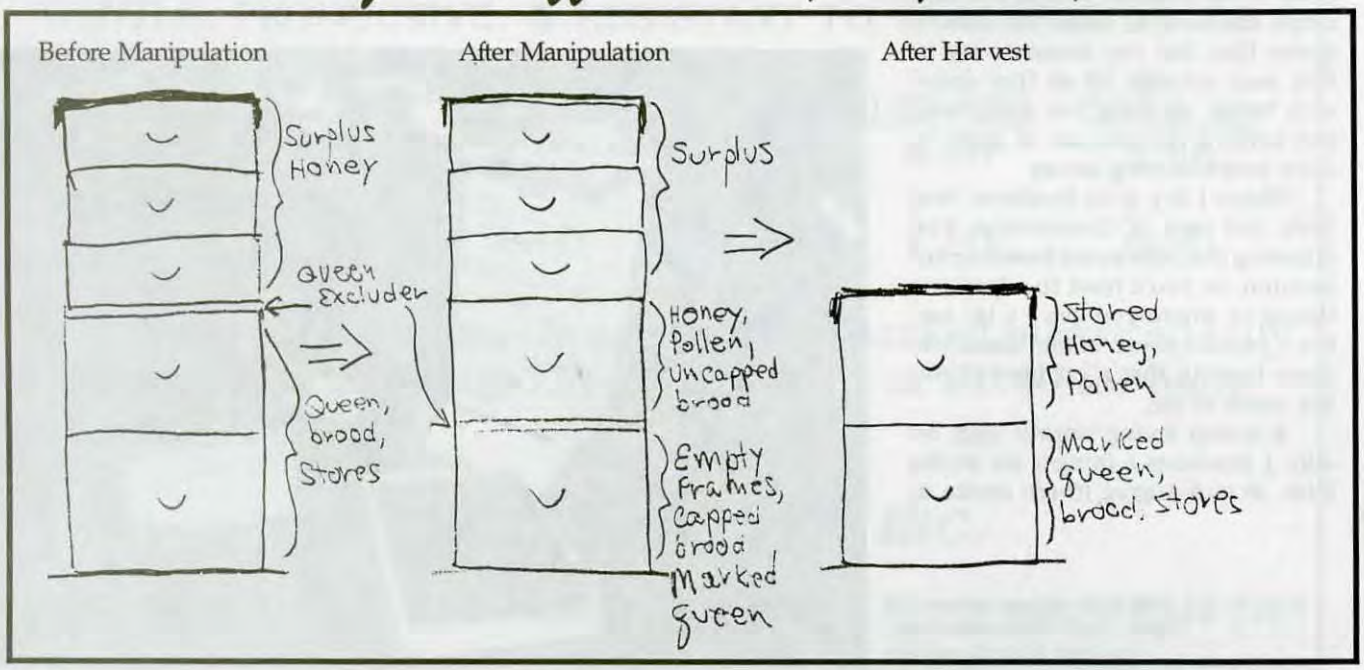
At harvest time, I pull the queen excluder, place Apistan® strips, dust some Terra-brood mix and feed medicated syrup.

A hive body full of honey over the brood with no queen excluder impeding the upward movement of the queen later in the winter is what you want. Also, a smaller population is a sure-fire way to successful overwintering. This reduces, and usually eliminates emergency spring feeding.

The "horrible" queen excluder problem has been circumvented, and all the queens are marked. Next spring, I'll determine if there is a vital queen in the hive, but I don't have to see her to do that. Later, when *I am* looking for her, an unmarked queen will be new, and I will record that information. BC

John Peter keeps bees, sells honey and candles near his home in North Salem, NY.

The June Affair, Step-by-Step



SHINGLE IT

roger morse

The shingle cover-bottom board is a homemade device first built by migratory beekeepers to reduce weight and space on their trucks. However others have found that these combination units are effective in permanent locations as well. They are relatively cheap and easy to make and have a long life. They serve equally well as covers and as bottom boards and are interchangeable at any time. Inner covers are not used.

Shingle cover-bottom boards were a favorite of Archie Coggshall, lifelong beekeeper in the Finger Lakes area of New York State, who introduced them to me. I have no idea who first invented them. Coggshall made an iron framework to hold the pieces for nailing and could produce a number of these cover-bottom boards in a day.

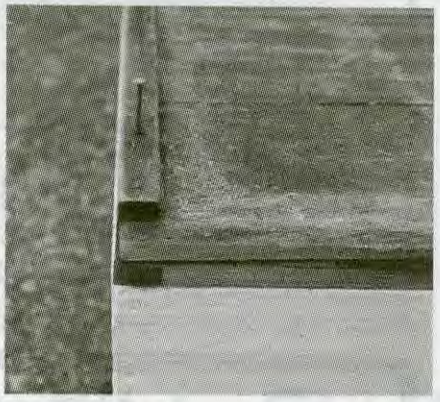
The bees add propolis to the cover-bottom boards, which acts like a wood preservative and helps to stick them in place when they are used as covers. Some beekeepers put bricks or stones on top of their hives to hold the covers in place, but usually the propolis is sufficient to do the job.

As I work colonies, I usually place the hive covers upside down on the ground and stack the supers I remove on them as I examine the lower hive boxes. I have found that one of the virtues of shingle cover-bottom boards is their flexibility when placed on the ground. They bend easily if there is a stone underneath or if the ground is uneven.

Making Them

Dimensions are important, especially to migratory beekeepers, but even to those who move their bees only short distances. The single cover-bottom board is made one-eighth of an inch short on two sides so that it will not project beyond the supers and interfere with stacking and placing the colonies immediately next to each other on a truck. The proper outside dimensions for a shingle cover-bottom board are 16-1/8 inches by 19-7/8 inches. Standard supers are 16-1/4 inches by 20 inches. Measure yours to make sure.

Wooden shingles of pine or cedar are used. The individual shingles must first be cut to length by cutting off the thin ends. The pieces of shingle are placed opposite each other with a piece of tar paper between them. The tar paper should be plain, without stones and should not project beyond the edges of the shingles. The tops and bottom rims for the combination cover-bottom boards are usually made using 3/8-inch thick white pine that nails easily and will not split.



A view of a shingle cover-bottomboard with the shingles running in opposite directions with a piece of tarpaper between.

Using 3/8-inch thick rims on the underside, when they're used as covers, poses a small problem since this usually makes a greater than normal bee space and bees are likely to build burr comb there. Most supers are designed so that there is one-eighth of an inch of space above the top bars of the frames in the super. For this reason, I prefer to use 1/4-inch thick rims on the underside. Cover-bottom boards should be nailed using box nails that have a small diameter and are less likely to split the wood.

Pre-drilling Nail Holes

One trick I learned from Archie Coggshall was to pre-drill four nail holes in cover-bottom boards. The nail holes should have a diameter that is slightly larger than the 8d box nails that are used to hold the boards in place. In this way, the nails will pop up when the cover-bottom boards are removed with a hive tool. 8d box nails have a smaller diameter than common or galvanized nails and will hold just as well.

Painting

At one time, beekeepers used wood preservatives more liberally than they do today. No wood preservatives that come in direct contact with honey bees are approved for use today by the Environmental Protection Agency. For this reason, I prefer to paint the tops and edges of the cover-bottom boards. It is not necessary and probably not even desirable to paint the undersides as they will be propolized, and propolis gives even better and longer-lasting protection to wood than does paint.

Archie Coggshall always used queen excluders. When they were removed at the end of the first honey flow, he placed them on top of the covers, where the sun would usually melt off the beeswax. The melted beeswax serves to protect both metal and wooden covers far better than paint but will add protection to a painted surface as well.

Wintering Colonies

During winter, bees in colonies eat honey and give off great quantities of metabolic water that may condense in the hive. In warm climates, this is no problem as bees ventilate their hives to rid themselves of excess water. However, in cold climates, too much water can be a disaster. One fault of the combination cover-bottom board in winter is that the top of the hive is sealed shut. If colonies are wrapped for winter in building paper, place a nail under one corner of the cover at the time the packing is done so as to raise it slightly and allow a space for moisture to escape. If the colonies are not wrapped for winter, a ventilation hole, usually about an inch in diameter, can be drilled under the handhold of the upper super. This provides a winter entrance and will allow the bees to remove moisture easily. BC

Roger Morse is the Professor and Extension Entomologist on Apiculture at Cornell University in Ithaca, NY.

HOME HARMONY

ann harman

A Little Liquid Refreshment

June is the entrance to summer. The grill has been dusted off, plans for a grand Fourth of July picnic have been made, everyone is coming to the family reunion in August and the Labor Day weekend promises to be relaxing. June is also the month of silvery moons, brides and wedding receptions and gala graduations. June is the time to use up last year's honey harvest so you have room for the bumper crop of this year.

Whether you are planning a large party or a simple outdoor supper, something to drink (made with honey, of course) must be on the menu. Honey has so many good qualities as a beverage ingredient. First of all, honey mixes quickly and smoothly, leaving no gritty sugar floating around or sitting on the bottom of a glass. Honey contributes its own flavor, especially enhancing fruit drinks. A mild-flavored honey is usually the best for a beverage, although some with distinctive flavors, such as orange blossom honey, add a special taste.

Plan ahead a little if you are making a giant bowl of punch. Decorative ice to float on the punch adds a festive note. Be creative – select one of your salad molds to make a large ice "cube."

Ring molds are nice, of course, but do you have one in the shape of a star? Look around in your kitchen cupboards to see what you have that would make an attractive ice mold. If you fill the mold half full of water and freeze it, you can add all sorts of decorations on top of the ice then complete filling the mold and freeze. Be certain that you know which side of the mold will be up when it's floating in the punch bowl; otherwise, you may be looking at the bottom sides of flowers the whole evening. The decorations are seen suspended in the ice. Yes, eventually the ice will all melt, leaving the decorations to drift around in what is left of the punch. Mint leaves and strawberries are frequently used in molds. However, don't stop with these. Try some small edible flowers: violets, pansies, violas, marigolds, nasturtiums, hibiscus, borage and citrus, for example. Use only flowers known to be edible. You can also use thinly sliced citrus fruits.

Honey Ice Cubes

While we are on the subject of ice cubes, make some with honey. Here's the recipe:

Blend 1/2 cup honey with 2 cups very hot water and 2 tablespoons fresh lemon juice. Pour into ice cube trays and freeze at once. These can be floated in punch or crushed and served in ice tea.

Treasured Honey Recipes
California Honey Advisory Board

Vineyard Pitcher Punch

Recipes for beverages made with honey seem to be as numerous as honey bees themselves. So, for our special summer selection, the recipes will all contain wine or other alcoholic ingredient. Choose the punch recipe carefully, keeping in mind the foods that will be served. The beverage should complement the main course. Here is a punch that will go quite well with steaks, hamburgers or kebobs.

1 bottle (750 ml) burgundy or red table wine
2 cups apple juice
1/2 cup mild-flavored honey
1 lime or lemon, cut into cartwheels
1 cup whole strawberries (fresh or frozen)
2 cans (11-oz) ginger ale or lemon-lime beverage
ice cubes

Mix wine, apple juice and honey in large pitcher. Add lime or lemon slices and strawberries. Chill one hour or longer. Just before serving, add ginger ale and pour over ice cubes in tall glasses. Garnish each glass with some of the fruit. Makes about 10 to 12 six-ounce servings.

Honey...Any Time
CA Honey Advisory Board

Champagne Punch

Although a bottle of plain champagne is festive, try this champagne punch to celebrate a wedding, graduation or birthday. You can increase the quantities as you need, but since champagne will lose its bubbles after a time, you might want to mix up a fresh batch from time to time. I prefer to mix the honey with the Grand Marnier and bitters first, then add the champagne. For a large quantity, you can mix up several batches of the honey, Grand Marnier and Angostura to have them ready for the addition of cold champagne.

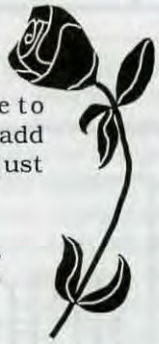
1 tablespoon orange peel, cut in very fine strips
1/4 cup honey
1/4 cup Grand Marnier
2 dashes Angostura bitters
2 25-oz bottles champagne, cold

Combine ingredients in a punch bowl. Makes 16 servings of 1/2 cup each.

Honey Of A Cookbook
Alberta Beekeepers Association

Rose Punch

Rosé wine is popular, and many prefer it to the heavier reds, especially for a summer picnic. You can mix up these ingredients ahead of time to take to a picnic, but add the sparkling water just before serving.



2 10-oz packages frozen, sliced strawberries, thawed or the equivalent of fresh
1/2 cup honey
2 24-oz bottles rosé wine
2 6-oz cans frozen lemonade concentrate (do not dilute!)
1 quart bottle sparkling water, chilled

Combine the strawberries, honey and 1 bottle of the wine in a punch bowl. Cover and let stand at room temperature 1 hour. Add the frozen lemonade concentrate and stir until completely thawed. Add the remaining wine and sparkling water. Then add ice and serve immediately. Serves 12 to 15.

Cook With Honey
Beverly Kees

Honey Sangria

Everyone has a favorite recipe for Sangria, and the list of ingredients varies widely. Try this one – it's a bit different, but it celebrates summer with the addition of fresh peaches.

1 bottle burgundy (750 ml)
2 tablespoons apricot brandy
1 cup orange juice (use fresh!)
1 lemon, unpeeled and thinly sliced
1/2 cup fresh lemon juice
1/4 cup honey
1 orange, peeled and thinly sliced
1 lime, unpeeled and thinly sliced
2 fresh peaches, peeled and thinly sliced
1 apple, diced
1/2 cup strawberries, sliced
1 bottle (7 oz) club soda, chilled

Combine all the ingredients except the club soda in a serving bowl. Blend well and chill. Add the club soda just before serving. Makes 6 cups.

The Book Of Honey
Claude Francis & Fernande Gontier

Strawberry Cocktail

Here's a quickly made drink that uses your fresh strawberries.

5 ice cubes
juice of 1 lemon
3 fluid oz rum or dry mead
2 teaspoons honey
4 oz strawberries

Put in blender and blend until thick and well combined.

More Honey In The Kitchen
Joyce White

Fruited Wine Bowl

You will want to serve this punch with both punch cups and toothpicks (maybe even forks!). It's a wonderful recipe that uses the fresh fruits of summer. You can choose the fruits and vary their proportions according to what you have available.

4 cups fresh fruit, such as nectarines, peaches, apricots, strawberries, plums
2 tablespoons honey
1 cup brandy
2 bottles dry white wine, chilled
1 bottle champagne, chilled

Peel fruits such as apricots and peaches. Slice or cut into chunks. Mix fruit and honey. Pour brandy over. Let marinate 24 hours or more. Place fruit and brandy into large punch bowl. Add wine and champagne and mix. Remove fruit from punch. Serve fruits in a separate dish with toothpicks. Ladle the punch into cups. Keep chilled. Yield: about 14 6-oz punch-cup servings.

Encyclopedia Of Creative Cooking
ed by Charlotte Turgeon

Margaritas

You may already have a favorite punch recipe. If it calls for sugar, simply substitute honey in equal amounts as the sugar. If you put sliced fruits in your punch, marinate the slices in a small quantity of honey for an hour or so before adding to the punch.

Margaritas are popular. It's very possible to make them with honey. Try this version.

1/2 cup lime or lemon juice
1/2 cup tequila
1/3 cup mild honey
1/4 cup orange liqueur
ice cubes

Stir together the lime or lemon juice, tequila, sugar, orange liqueur and 1 cup **cold** water until honey dissolves. Serve over ice. Makes 4 (about 4-oz) servings.

Blended Margaritas: Prepare as above except place juice, tequila, honey and orange liqueur in blender. Blend until well-mixed. With blender running add 3 cups ice cubes, one at a time. Blend till slushy. Makes 7 (about 4-oz) servings.

Frozen Margaritas: Prepare as above, except use 2 cups cold water. Transfer mixture to 8X4X2-inch or 9X5X3-inch pan. Freeze several hours or till firm. To serve, scrape a large spoon across surface of frozen mixture. Spoon into glasses. Makes 7 (about 4-oz) servings.

Better Homes & Gardens New Cookbook

The Bees' Knees

These recipes would not be complete without a recipe for Bees' Knees

1 jigger honey
1 jigger gin
1 jigger lemon juice

Pour over ice. Shake. Strain into glasses. Serves 1.

The Honey Cookbook
Juliette Elkon

Enjoy the summer. Even if a sudden thunderstorm chases the party indoors, the honey drinks will still taste good.

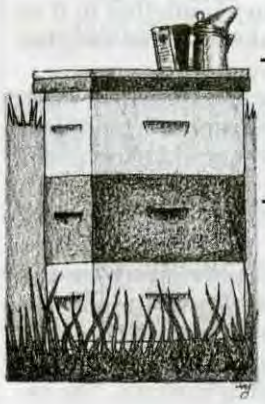
"You make honey?
Are you part bee?"

?Do You Know? Answers

1. **False** While some species of plants may have only floral nectaries, others may have both floral and extra-floral nectaries on the same plant.
2. **True** Nectar is primarily a solution of sugars in water which is the raw product of honey. In addition to the two primary components, there are numerous minor constituents which include amino acids, organic acids, proteins, fats, minerals etc. These materials are responsible for giving honey a distinctive flavor, aroma and color for each floral source or mixture of sources.
3. **True** The potential nectar yield of a particular floral source is determined by heredity and is related to the size of the flowers, potential number of flowers produced by the plant and capacity of the nectary tissue. The extent to which this potential is realized, however, is determined by environmental conditions at the time of secretion as well as environmental conditions the plant has been exposed to throughout its development. The physiological condition of the plant is related to soil type and weather conditions. These conditions regulate the amount of sugar produced during photosynthesis and its transport to the nectary. Competition for sugar from other internal processes also help determine the amount of sugar available for secretion.
4. **False** In shrubs and trees the sugars found in the nectar supply are often derived from stored carbohydrates found within the plant. In herbaceous plants, however, nectar sugar is likely to be of recent origin. Following synthesis, the sugars are transported to the nectary tissue rather than being placed in long-term storage.
5. **False** Not all flowering plants are attractive to honey bees. Flowers that are brightly colored, sweet smelling and offering a supply of nectar are likely to be attractive to honey bees. There are some flowers with these characteristics where flower structure will not allow honey bees access to the nectar supply, thus they can only be visited by long tongued bees, butterflies, humming birds etc. There are other types of flowering plants that are not attractive to honey bees in that they have floral odors similar to carrion in order to attract flies, beetles etc.
6. **False** Relative humidity does not effect nectar secretion directly. The most important effect of humidity on nectar production is manifested as an inverse relationship with sugar concentration. Except when atmospheric humidity is very high, nectar after it is secreted begins to lose water molecules through evaporation to the environment which increases the sugar concentration of the nectar supply.
7. **True** The primary purpose for a flower in providing a supply of nectar is to attract and reward a potential pollinator. Once pollination and fertilization have been achieved nectar production ceases to be of any consequence and the energy allotted to it at the beginning of flowering is now directed to other uses.
8. **True** Pollens differ greatly in both nutritive value and attractiveness to bees. The amount of protein and amino acid composition seems to be the major determinants of the nutritional value of pollen. Both pollen attractiveness and chemical composition vary significantly between different plant species.
9. **True** Changing agricultural practices over the years have resulted in a steady decline in the amount of quality bee forage. Because of crop specialization, farmers are less likely to rotate legumes such as alfalfa and clover into their cropping systems. The reduction of pasturing in the dairy industry and cutting of alfalfa just prior to flowering has had a detrimental effect on honey bee forage. Modern herbicides have greatly improved weed control but have also negatively impacted bee forage.
10. C) Sugars
11. A) Protein
12. Solar Radiation, Soil Moisture
13. Sucrose, Fructose (Levulose), Glucose (Dextrose)
14. Wind-borne pollen grains tend to be comparatively light, dry, and drab in color. Pollen dispersed by insects is commonly heavier, somewhat moist and sticky and colored in various shades of yellow, brown, orange or red.
15. H) Willows
16. B) Gallberry
17. I) Sourwood
18. D) Eucalyptus
19. G) Tulip-Poplar

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



BEE TALK

richard taylor

"I worry about comb honey quality. It's as easy to make poor quality comb honey as it is to make a top quality product."

Yesterday (April 20) was the annual turning point for me: I got my first good look at my bees. Not all of them; just one apiary. I'll get to the others this weekend. Now my mood has shifted into high gear again as another beekeeping season begins. What joy! The wonderful smell of the smoker revived all the happy hours in the bee yards over the many years and it was good being back in my old bee suit, which I found I had the good sense to get laundered in the Fall. A few holes here and there were patched up with some duct tape. The smoker is a super deluxe model – a big, all-copper one that was presented to me by some beekeepers 19 years ago. Until now it had seemed too good to put to use, but I'm getting no younger, and it is time to enjoy little luxuries like this. And I can show it to my beekeeper friends and inspire their envy!

Now as for the bees, I have never, never seen them come through so strong. With but one exception, they looked like colonies at the peak of the season. What a year this will be! I'm going to go all out for the biggest crop of comb honey I have ever had.

Looking at these powerful colonies got me to thinking, and to rejoicing, and I felt vindicated in my basic principle of beekeeping. I was thinking that, in spite of the problems nature has been throwing at us – mites and all – we are, year after year, getting bumper honey crops. And as for my basic principle, I was hearing some of my beekeeper friends saying weeks ago how they were doing their Spring feeding, even emergency feeding of dry sugar to get the bees through, and so on. I do not feed my bees at all, either Spring or Fall, and here they are, the hives boiling over with bees! I didn't need to rush to my yards early on this Spring. I could wait until late April, confident that the bees had plenty of stores, and I was dead right. How come? Readers of this page know the answer: I left the Fall honey on the hives for wintering and they went into winter as heavy as lead. *That* is why they are so strong now, before they have gathered any nectar at all, and that is why I can expect a big crop in the weeks ahead, gathered from the earliest nectar flows which make for the most beautiful comb honey.

Now I'm going to wind up my thoughts and suggestions about getting comb honey, which is what I have been talking about since January, and then, finally, change the subject.

I worry about comb honey quality so I want to say something about that again. It is not hard to produce good comb honey if you are in an area of fast, early nectar flows – basswood, clovers, alfalfa, etc. – but it is also very easy to get comb honey of poor quality; that is, sections that are dark, waxy, not properly filled, and so on. If you get sections like this, do not market them. Or sell them *only* to someone you can explain to that they are "seconds," and half-priced, without labels. A lot of people are just discovering comb honey and if what they discover is something that is off-grade, then they will never want to get it again. It's like if you try a new restaurant and the food is not very good – you just don't ever go there again. It is terribly easy to mess up with comb honey. Please be on guard and keep your standard high.

Back in April I said I would write something about cleaning up the circular section equipment and then I forgot. A nice thing about the plastic rings is that they can be recycled. You always get some unfinished or otherwise defective sections. I stack supers of these out in the yard in late Summer, or September, on a warm day, and let the bees clean them out dry. This is the best way to get all the stickiness out of your equipment, frames and everything. Then the rings can just be scraped with a pocket knife and reused. You don't have to get every bit of the residual beeswax off, but you must scrape off any darkened wax or propolis so that the rings go back into the super nice and white. Do not try to clean them by putting them in boiling water. They will come out looking like pretzels.

As for the plastic frames, I just give each of these a scrape, top and bottom, with my hive tool, as I am putting in the rings and foundation to begin the new season. It does not matter if there is some accumulation of wax and propolis on the frames so long as the rings will still fit in nicely, as they almost always will. But if you don't give the tops and bottoms a scrape, the supers might not set down well on the hives, leaving a gap around the sides, which is not good.

Unfinished sections that are nice and white and of good quality can, as noted earlier, be returned to the bees to finish, putting those most nearly filled towards the sides of the supers.

And now, finally, some suggestions about marketing. The market for comb honey is limited, but it is there, and it is growing. The single best step in selling comb honey is to put an explanatory sticker on the back of each section saying what it is and how to use it. Most people,

though attracted by its beauty, just do not know what it is so you have to tell them. They are especially puzzled about the wax. Some even imagine that, before they can use it, they will have to melt the whole thing down somehow to separate the honey from the wax. I'll be glad to send my explanatory sticker to anyone who sends me a stamped envelope and you can make 20 or so at a time on a photo copier. Or I can tell you where you can buy rolls of peel-off stickers having essentially the same message. These are a big timesaver.

As for outlets, your best bet is roadside stands. I have never had much luck marketing through grocery stores. If the roadside stands are where tourists pass, then you have it made.

But you've got to have the comb honey conspicuously displayed there. Keep at least 20 or 30 there in plain sight all the time. Let the owner of the stand pay you for them after he has sold them if he wants it that way, then he can't lose. But if you have only a few there – two or three – then they just do not move.

Now there are people who use comb honey all the time, year 'round. When they hear about you they will get in touch every Summer for their annual supply of 50 or a 100. Sometimes these regular users are very happy to get seconds at half price and that is a good way to sell them. The buyer knows exactly what he or she is getting.

Of course the best arrangement of all is to sell the comb honey right at your house, at a stand. I have described my own self-serve honey stand and its spectacular success, so I won't go into that again. But here, for this to really work, you need to be on a well traveled road. It is my good luck to be on such a road where tourists come by in great numbers, admiring the beauty of the huge lakes here, and with lots of money in their pockets, always looking for something new and different.

Ah! A new season begins, there is a new sense of life in me after the long winter, some surprises await me, as always, and I rejoice! BC

Richard Taylor riases bees, and comb honey, writes beekeeping books and sells what he raises and writes from his home near Interlaken, NY.

Questions?

Renew Now

Q I recently acquired two colonies of bees that had been neglected for years. They are very strong but everything is glued together with propolis and the hives are in poor condition. They seem healthy. Should I try to transfer them to new hives or just super them as they are? There are nine frames per hive body. Also, the bees are very cross. Should I requeen with a gentle strain?

Bill Price
Levelland, TX

A You would probably not find it as difficult as it looks to transfer the bees to new equipment, especially since there are only 9 frames per hive. Once you got the first frame out, the rest would come quite easily and would probably be in much better condition than you would expect. On the other hand, it would certainly be easier just to super them up as they are. Strong colonies make lots of honey and the condition of the equipment doesn't make much difference. I never recommend that beginners try requeening, for they are more likely to lose the queen and then the whole colony, especially if working with cross bees and defective equipment.

You & The Law

Q I am a hobby beekeeper and have advertised to catch or trap bees from buildings. Now I have been told that this is illegal unless I have a license. Is that true? And where would I get a license?

James Thomas
Alma, GA

A Laws differ from one state to another but I cannot believe that you would be in violation of any law simply by removing bees so long as no pesticides are used, or if you used only such pesticides as are available from the store without special permit. If there are ordinances that could be interpreted to prohibit the removal of bees, wasps, ants or whatnot, then I do not believe they would be enforced with respect to what you have in mind. Some years ago a law was enacted in Connecticut which, strictly interpreted, would prohibit gathering a stray swarm without a permit. Needless to say, no one is going to enforce anything so foolish as this. I suspect that some would-be competitor is trying to scare you off, and I would ignore it.

Editor's Note: Some states do have very strict laws requiring permits, training, etc. to collect bees from buildings – with or without pesticide use. And, these rules are becoming more and more prevelent. Like Richard, however I believe many of these states do not realize what silliness they have enacted, and common sense will prevail. However, check before you remove bees, and be aware of the laws and regulations before the long arm of the law taps you.

Clipped?

Q I want to do all I can to reduce swarming this Spring, so I am going to requeen my hives. I understand that most swarms are led out by the queen, so if I introduce clipped queens, will this help keep the bees in the hives?

Mike Clayman
Austingubr, OH

A No. A swarm is not led out by the queen. She usually does not leave the hive until a good many of the bees are already in the air, and if you see a swarm emerging, you can quite often, by watching the entrance, see the queen come out and, sometimes, catch her. (I once grabbed her in mid-air - a feat about which I shall never tire of boasting.) If a queen is clipped, then she falls into the grass, of course, and the bees all return, but not for long. In a day or so the swarm comes out again, bigger than ever, with a virgin queen (or several) and off they go. So it doesn't do much good to clip the queen. Swarming is reduced, however, by having young queens and making sure they have plenty of room in the brood chamber to lay eggs. Merely adding supers above the brood chamber does little good.

Spring Switch

Q Each Spring I switch my two brood boxes for no reason other than that the person who sold me the hives told me to. Is it important to do that?

Dana V. Eoles
Uniontown, OH

A It is not of crucial importance, but it is a good idea, if you have time for it. It enlarges the brood nest enabling the queen to move up into partly empty combs for brood rearing and thus to some extent inhibits swarming. But it rarely prevents swarming entirely.

TM Amounts

Q What is the exact amount of Terramycin (TM-25) that one should mix with each pound of powdered sugar?

Bob Brossia
Pemberville, OH

A Mix one 6.4 oz. packet of terra with two pounds of confectioners (powdered) sugar. Ladle about a tablespoon of this (using your hive tool) onto the top bars of the brood nest (that is, where most of the brood is, which will vary according to the time of year). Repeat in 7 to 10 days. It is well to do this both Spring and Fall,

I found Janelle Delicata's question highly entertaining as I believe other readers will, and will be happy to send her the five dollar bill for the "Question of the Month" if she will kindly send me her full address.

Hourly Wage

Q **This is a wacky question, but it gets asked at fairs, etc. If you paid bees minimum wage – currently $4.25 an hour – how much would it cost in wages to produce a pound of honey?**

Janelle Delicate
Stockton Springs, ME

A I once read that it is the life work of a bee to gather nectar for "a few drops" of honey If we take this to be about a half teaspoon, and assume that a bee forages ten hours per day for two weeks, then, if my figuring is correct the answer is $76,160.00.

but especially important in the Spring, but well before any honey supers are on the hives.

Selection

Q **Do we not retard the natural selection of mite-resistant bees by using artificial controls such as Apistan?**

Bob Smith
Perrysburg, OH

A No doubt we do, to some extent, and this is why it is desirable to gather and hive stray swarms which, if from feral colonies, may have some resistance. But until breeders are able to develop resistant strains, which will come about in time, we have little choice but to use artificial controls.

Peaceful Hum?

Q I recently read that bees set up a certain vibration frequency when all is peaceful and there is no threat to the colony, and that they set up a different vibration when preparing to swarm. It was further stated that a device exists to mimic the peaceful vibrations, and can thus be used to keep the bees quiet while the beekeeper works on the hive, and that another device has been invented to monitor the vibrations and thus give warning when a colony is preparing to swarm. Do such devices exist?

L. T Williams
Belfast, ME

A Beekeepers have long known that a colony of bees makes certain characteristic sounds that sometimes disclose certain conditions in the hive. Thus there is a characteristic hum when the hive is made suddenly queenless, a different one when the bees are evaporating nectar at night, and so on. These are easily recognized by beekeepers. There is probably a sound characteristic of a hive peacefully working gathering nectar, but I do not believe a hive could be kept calm by mimicing such a sound, and know of no device for producing it. Several years ago a British beekeeper invented a device with headphones which he claimed would pick up a signal that the bees were preparing to swarm, thus warning the beekeeper. I believe he called it the "Apidicter." It was advertised for awhile in *Gleanings*, but I have not heard anything of it for years. It was, in any case, totally impractical, requiring the beekeeper to be listening in on every colony he might suspect of swarming. There are simpler ways of predicting a swarm for instance, checking under the top story for queen cells, etc. And it is, in any case, much smarter to prevent swarming than trying to be on hand to gather the swarm.

Plastic Problem

Q **I hived a swarm in a regular hive with frames of plastic foundation and a few days later found that the bees had all left. How come?**

Benjamin Beller
Stark City, MO

A A swarm, which marches right into a new hive and seems happy to be there, can by no means be expected to stay there, especially on a hot day Scouts are still returning to the swarm with news of other possible sites. The way to make the swarm stay put is to include in the hive a comb with some brood in it. This works every time.

How Thick?

Q **I bought some foundation for comb honey and, even though it was labeled for use in comb honey production, it is quite thick and heavy. Don't you need to have extremely thin foundation to get good comb honey?**

Bruce John
Ithaca, NY

A No, it does not need to be very thin, nor does it matter if it is not pure white. Foundation that is very white has, perhaps, been chemically bleached, which is perfectly okay, but if the it is a pale yellow, the comb honey will still be as light as it would if bleached foundation had been used. As for thickness, that is okay too. The bees literally draw this out to a delicate thinness, at least if the weather is reasonably warm, so there is even some advantage in using the heavier foundation, within reason. If foundation is dyed and given to the bees, it is found the color appears in the sides of the cells as well as the bottom of them, indicating the foundation was not merely built upon, but drawn out to create the cells.

Answers! Richard Taylor

The response to our appeal for questions has been good. Keep them coming! Address questions to Dr. Richard Taylor, Box 352, Interlaken, NY 14847, enclosing a stamped envelope for a prompt reply.

INNER ... Cont. From Pg. 322

the sandwich made in a well-rehearsed and efficient manner. This delicacy then consists of hot bacon, cold tomatoes and warm toast. The first sandwich is ready.

I sit down and enjoy the first half of that sandwich, and begin it all, all over again, for the second half of that three o'clock vision.

This second act goes like this: Big bite, pan drained, bacon in, sit back down. Another big bite, turn the bacon, push down the toast, sit down. Last bite, drain the bacon, mayo the toast, make the sandwich, finish the article and supper is over.

This meal isn't a cook-for-awhile, then eat. It's a work-in-progress that keeps you busy, but ends up a great work of art. It satisfies that vision.

Lots of things work kinda like making those sandwiches, I think. Right now, maintaining a normal stream of commerce in the honey industry is like that. It's a dance, but, at the moment not well choreographed, not well timed, not a work of art.

With the (perhaps temporary) reduction in imported honey, that stream of commerce has some white water ahead. Maybe troubled waters is a better term. A readjustment is necessary to keep honey in bakeries, in industrial tanks, on grocer's shelves. It's a dance, don't you see?

Producers, packers, handlers and users absolutely must act in concert to maintain existing markets, to keep the pipeline full, to keep honey in its finally-earned position as a value-added sweetener.

Wounds must heal, business must be carried out, past differences resolved, ignored or finalized. Honey *must* stay in those bakeries, those industrial tanks, on those grocery shelves. If not, if pride or greed or personal feelings get in the way, mess up the choreography, disrupt the dance – honey sales will suffer. Excuses will be made, recipes will change, industrial users will substitute corn syrup, and nobody wins this battle of who has what, and when.

Business is business and profit is king. But without honey, the people who produce it, and the people who put it in bottles, the *industry*, the *image*, and the *future* of beekeeping is in jeopardy. Let's talk.

Kim Flottum

Gleanings

JUNE, 1995 • ALL THE NEWS THAT FITS

Made In China
ADULTERATED BEESWAX IN AUSTRALIA

Pender Beekeeping Supplies and John L. Guilfoyle Pty. Ltd. acting in co-operation and with the support of Dussek Campbell, Asia Pacific have to advise the beekeeping industry of Australia that; supplies of adulterated foundation have been offered to the Australian market.

The foundation is of Chinese origin and presented as being made from 100% natural beeswax. Dussek Campbell's Senior Development Chemist, Mr. Lindsay Hill, has submitted the foundation to gas chromatograph tests and determined that the foundation contains paraffin wax probably 60/62 melt point and there is probably 30% of this material in the foundation.

The sample said to be of Chinese origin has been found to be adulterated with 30% paraffin wax. The use of this foundation should be discouraged in Australian beekeeping industry in order to maintain the internationally high quality of crude beeswax in this country, and prevent the potential for disease to be introduced.

USDA GOES ONLINE

Information on the genetic engineering of plants and animals, food safety, human nutrition, soil erosion and other research of USDA's Agricultural Research Service is now available on the Internet.

Users can access the information, compiled in the ARS Quarterly Report of Selected Research Projects, on the National Agricultural Library's Gopher server.

The library is part of ARS, chief scientific research agency of the USDA. ARS issues the Quarterly Report each Jan., Apr., July and Oct.

The report contains about 60 research briefs, each about 100 to 200 words. Each brief describes the research accomplishment and lists ARS scientists to contact, along with their phone numbers.

The briefs are grouped by subjects such as human nutrition, crops, animals and new products. One section, "Into the Marketplace," highlights patent licenses and cooperative research agreements between ARS scientists and private industry.

Press releases and other ARS news and information will be placed on the NAL Gopher server at a later date.

To view or download any section of the report via the Internet, point your Gopher client to: gopher.nalusda.gov

From the initial main menu, choose "Other Agricultural Publications," then pick "USDA, ARS, Quarterly Report of Selected Research Projects."

A gopher bookmark that will take you directly to the report:

#
Type =1+
Name=USDA, ARS, Quarterly Report of Selected Research Projects
Path=1/ag_pubs/usda_ars_qr
Host=gopher.nalusda.gov
Port=70

Those using a World Wide Web browser may wish to use the URL:

URL:gopher://gopher.nalusda.gov:70/11/ag_pubs/usda_ars_qr

Send Us Your Meeting Notices At Least Two Months In Advance For Publication.

Mite Research Benefits
TRAYNOR MAKES DONATION

Joe Traynor recently sent a check for $5,000 to Dr. Bill Wilson, USDA Weslaco, TX for mite research. The money was from the sale of 1250 *Almond Pollination Handbooks;* 550 to beekeepers and 700 to growers.

Mites remain the biggest threat to beekeepers. If they can raise $200,000 pro-subsidy money at the drop of a hat and another $200,000 for anti-dumping at the drop of another hat, why can't they raise funds for mites?

NATURE'S KICK MOVES EAST

Nature's Kick Honeystix owner Glenn Peters has set up an east coast distribution center for customers in that region. "This will save on shipping charges, reduce production time, and not cost any more money," Peters said in a recent news release.

The distribution center is Endless Mountain Apiaries, RR 2, Box 171A, in New Milford, PA. They will carry all flavors, have wholesale discounts available and be able to service all Honeystix Accounts, Peters added.

For more information, contact Endless Mountain at (717) 465-3232, or Fax at (717) 465-3241.

3,000 YEAR OLD BEE STUDIED

Museum curators hovered as a USDA scientist removed pieces of 3,000-year-old honey bees imbedded in beeswax. The beeswax was among the priceless artifacts at the Egyptian Museum in Torino, Italy. USDA scientist Steve Sheppard brought fragments back from the museum to the Agricultural Research Service Laboratory in Beltsville, Maryland, hoping they will help shed light on the honey bee's evolution. The goal is to see if a genetic fingerprint is there in the form of DNA, or deoxyribonucleic acid. If it is found, Sheppard will then compare that centuries old sequence with that of the same honey bee races today. That could help scientists determine the rate of genetic material change and how the honey bee diversified into the 25 known races.

12 Largest Environmental Organizations
(Annual Budget In Millions)

1.	The Nature Conservancy	$216.0
2.	National Wildlife Federation	$87.8
3.	World Wildlife Fund	$55.9
4.	National Audubon Society	$43.4
5.	Sierra Club	$43.2
6.	Greenpeace USA	$40.7
7.	Environmental Defense Fund	$21.9
8.	National Resource Defense Council	$17.0
9.	The Wilderness Society	$16.5
10.	Conservation International	$11.2
11.	Sierra Club Legal Defense Fund	$10.5
12.	Defenders Of Wildlife	$5.4

– Drovers Journal

HONEY BOARD NEWS

Your favorite summertime honey recipe may be worth up to $2,000! Beekeepers and their families are encouraged to submit their honey recipes for "A Honey of a Recipe Contest" sponsored by the National Honey Board, *Family Circle* magazine and Weber-Stephens (maker of Weber barbecue grills).

Contest winners will receive cash prizes of up to $2,000 and gas grills for original honey recipes in three categories: Entrees on the Grill, Great Salads or Side Dishes and Easy Desserts.

To enter, type or print your favorite original honey recipe on one or two pages of 8-1/2"x11" paper (if two pages, the pages must be stapled together.) On each recipe submitted, you must type or print the following: your name, address, telephone number, recipe name and contest category, the number of servings or recipe yield, ingredients and instructions. Contest entrants must be at least 18 years of age. There is no limit to the number of entries per person, but there will be only one winner per household. Entries must be postmarked by July 15, 1995. National Honey Board members, alternate board members and staff are prohibited from entering the contest.

For complete rules, look at the "A Honey of a Recipe Contest" announcement in the June 6, 1995 issue of *Family Circle* magazine.

Mail entries to National Honey Board Recipe Contest, 190 Queen Anne Avenue North, Seattle, WA 98109. All recipes become the property of *Family Circle* and the National Honey Board.

The National Honey Board has strengthened its food technology, product research and crisis management programs by hiring a director of food technology/product research. Marcia Cardetti was hired in December 1994 to oversee the development and implementation of the Board's food technology and product research programs.

Cardetti graduated from Perdue University with a B.S. in Food Science and obtained a graduate degree in Food Science from the University of Missouri – Columbia. For the past 10 years, Cardetti worked with Celestial Seasonings in Boulder as a product developer and manager of the company's quality laboratory.

The Board values the experience and skills of Thomas J. Payne Market Development and will continue an ongoing working relationship with the firm. Some work that was contracted with outside vendors will be brought in-house due to Marcia Cardetti's strengths and capabilities. The food technology and product research programs will benefit from this collaborative effort.

EMO BOY

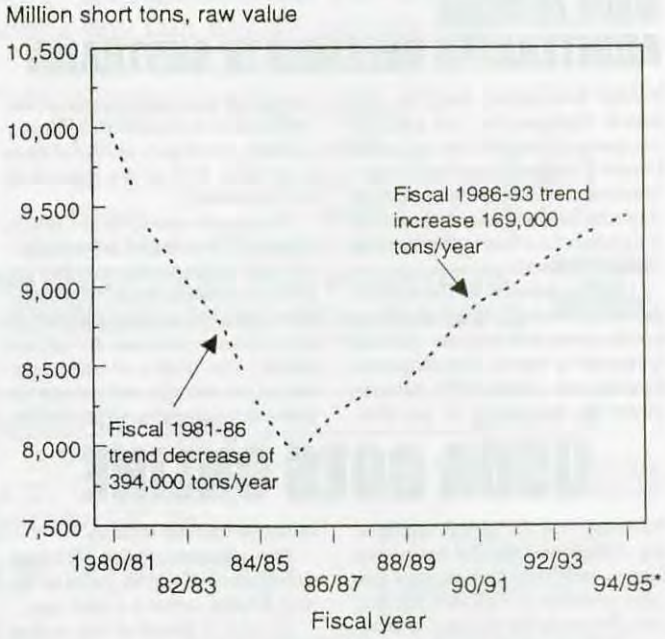
Eastern MO Beekeepers named a beekeeper from Valley Park as 1994 Beekeeper of the Year. The recipient was Robert Cantrell, who owns a beekeeping supply business and also a lawn service business in Valley Park. Robert received the plaque from Pres. Sharon Gibbons. He has been a beekeeper since he was a teenager, and spends hours promoting beekeeping and helping new beekeepers get started.

SUGAR USE, PRICE UP

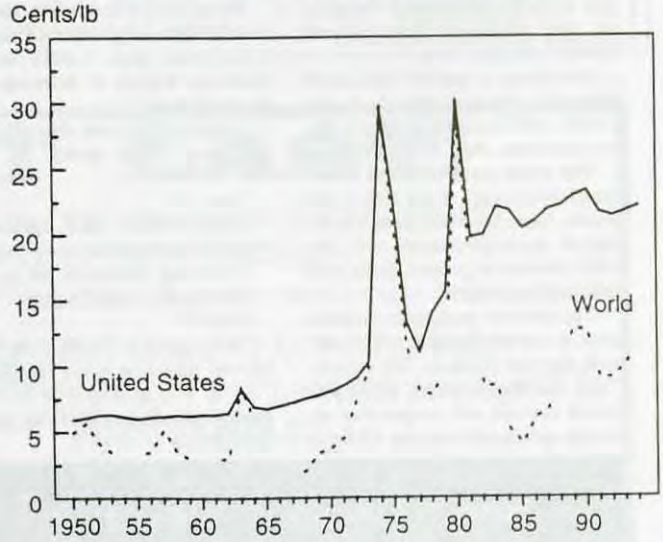
Sugar beets are grown in 14 states and sugarcane in four states. Since sugar beets and sugarcane deteriorate rapidly, they are grown only in proximity to a processor and generally only under contract. Technological progress continues to improve efficiency on sugar beet and sugarcane farms and in sugar processing facilities. The U.S. cost of producing sugar is falling both in absolute terms and relative to other countries.

U.S. sugar prices, as supported by Federal farm policy, have stimulated production. By providing a price umbrella, the higher prices stimulated production of alternative sweeteners, such as HFCS, and lowered sugar consumption. Refined sugar is processed and sold in the U.S. by 11 companies, with the 3 largest controlling over half the market. Industry concentration has increased dramatically over the last three decades.

U.S. sugar consumption



World and U.S. raw sugar prices, 1950-94



Source: USDA, Economic Research Service.

More Gleanings, Pg. 370

Display Index

Don't You Get Stung?

larry krengel

I'm kind of new to beekeeping, or at least new by comparison. I acquired my first colony about 10 years ago, arriving in the field just about the same time as the *Varroa* mites, the tracheal mites, and roughly the same time as the Mexican picket lines were trying to fend off the Africanized honey bee. I have accepted all the tribulations of beekeeping as paying my dues to enter a unique fraternity. I am a beekeeper with all the rights and privileges that include consuming significant quantities of honey. But more than that there is a part of beekeeping that common man fails to understand. It's awesome. Well, that's not quite true. Some of my friends think of it as awesome – but a different kind of awesome than I think of.

"Don't you get stung?" You are not a true beekeeper until you have answered this simple question 1000 times. Early in my beetending career I found that question objectionable. It seemed to carry with it an accusation – "You are a masochist, aren't you? Your kind goes out looking for pain." But those feelings were imprudent and today I have come to enjoy this question that must be as old as the skep. When asked about getting stung, I take pleasure in sizing up the questioner and planning carefully my response.

For those I suspect to have low ego strength, I play it straight. "I avoid it if I possibly can," is a strictly honest retort. If I sense an appreciation for sardonic humor I might say, "It is the price of the honey," or something foolish like, "That is a painful question to answer."

For the neophyte who seems to have an existential bent, I explain that the sting helps one understand the true meaning of nature and that it puts you at one with the primitive forces of the world. But most civilians I meet in conversation would not understand the significance of satisfying existential anxiety.

For the youngster who hungers for being grossed out, I pause dramatically to get his undivided attention and then proceed to describe how the sting stays in you and how the pulsating venom sac remains pumping poison into you while the disemboweled bee flies away to die. However, when the youngster sports horn-rimmed glasses and doesn't blink while awaiting a response, I play it more mainstream saying something like – "Sometimes I do, but I have noticed that after having been stung quite a number of times, it doesn't bother me as much."

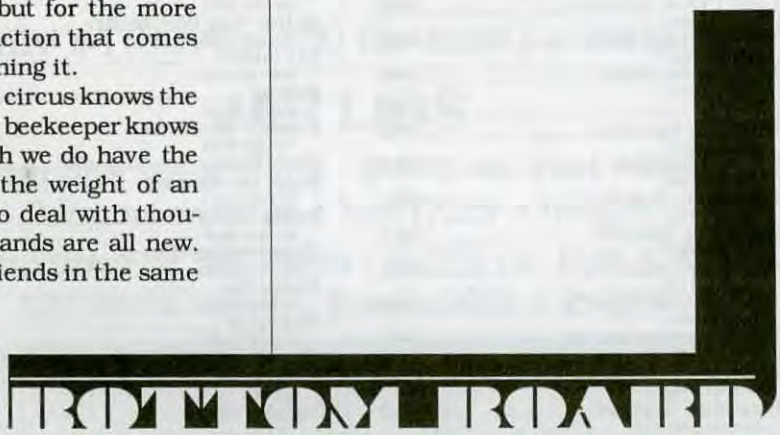
All kidding aside, the underlying motivation in this question is the real essence of beekeeping. What draws one to a preoccupation with an endeavor that has such potentially painful consequences? The answer is simple – It's awesome. But I am not sure I can tell you exactly what that means or why that is so. The people who fail to ask, "Don't you get stung?" are other beekeepers, because, even though they can't explain it, they know keeping bees is awesome.

About the best attempt at explaining this is Richard Taylor's book *The Joys Of Beekeeping* (a book every beekeeper deserves to own). Reading the first few pages of it exposes him as a true romantic who keeps bees not for money or prestige, but for the more important reason – he enjoys it. There is a satisfaction that comes from joining in with nature – not taming it ... joining it.

In the same way that an animal trainer in the circus knows the elephant and the tiger are never domesticated, the beekeeper knows his or her bees are never domesticated. Although we do have the advantage that our wild associates don't have the weight of an elephant, we have the disadvantage of having to deal with thousands at a time and every few weeks the thousands are all new. Because of that, we can't get to know our feral friends in the same way a lion trainer learns the moods of his cat. I suspect circus animal trainers would not ask "Don't you get stung?" I suspect they understand. Taming those untamable animals must be awesome.

Am I right? Standing under the veil holding a frame of brood up to the sun as the queen runs across looking for cover – shaking the branch and dropping a five-pound swarm into a waiting hive body and listening to the sudden roar of wings – well, its awesome.

So, how do you feel about being asked, "Don't you get stung?" I'm curious about how you feel and how you reply. Drop me a note and let me know. My Fax number is 708-617-2336 or drop a note to the Editor and he'll pass it on.



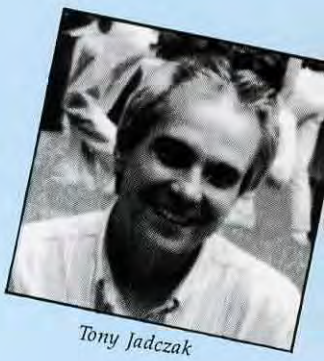
EAS' 95 • WOOSTER, OHIO
JULY 31 ~ AUG. 4, 1995


Sherry Jennings

SCHEDULE

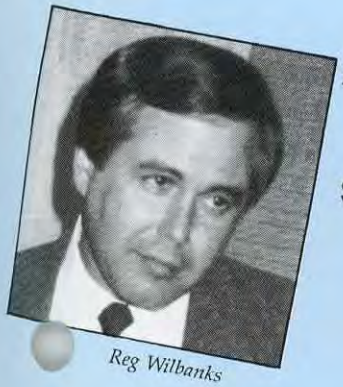
Mon -Wed 2-Level Short Course
- Fewer than 5 (Beginners' *Level*)
- Advanced Topics (Experienced *Level*)

plus Candle Making Workshop
A.I. Root Tour

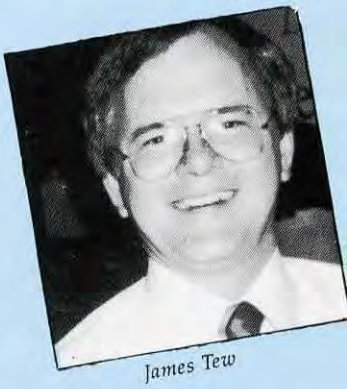

Tony Jadczak

Wed. A.M. – AAS Sponsored Apitherapy Workshop
National Speakers, How-To's


Roger Morse

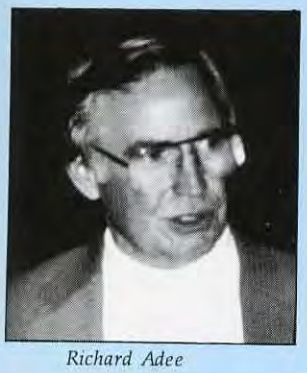

Reg Wilbanks

Wed-Fri Speakers, Speakers, **Hands-on**
All these shown here, plus Tom Sanford, Maryann Frazier, Marla Spivak, Joe Graham, Dick Bonney, Jerry Hayes, Sue Cobey, John Skinner, Fred Rossman, Diana Sammataro, Richard Taylor, Ed Weiss, more, more, more!

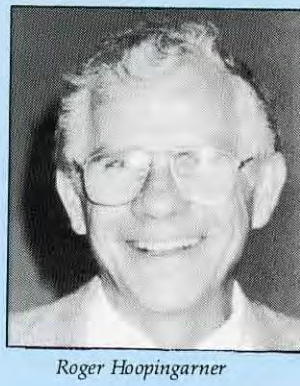

James Tew

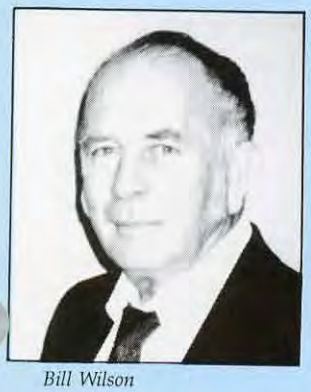
Plus • Wed. Night Social, with Cliff Sunflower & Dancin' With The Bees

And All These Extras
- *Master Beekeeper Program •*
- *Children's Program (6-12 yr. old) •*
- *Amish Country Tours • A.I. Root Co. Tour •*
- *BBQ Chicken & Roast Pig BBQ • Beer Tent •*
- *Wooster Sightseeing Tour •*
- *Over 30 vendors •*
- *Fantastic Dorms • Bus Service • Volunteers •*
- *Great Food • Hundreds & Hundreds & Hundreds of Friends, Beekeepers and Bee Friends!*


Richard Adee

Call Today – Register Now!


Roger Hoopingarner


Bill Wilson


Anita Collins


Troy Fore

Register *NOW*– Call (216) 725-6677 Ext. 3214 (D) or (216) 722-2021 (E)