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MARCH 1985

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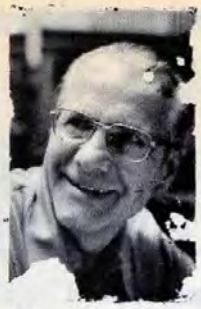

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GLEANINGS IN BEE CULTURE

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COVER STORY

Self portrait by Gary Veale, 830 5th Ave., Lake Odessa, MI 48849.

NOTES FROM THE BEEYARD

by Mark Bruner

ACARAPIS WOODI: THE PERIL OF PANIC AND PASSIVITY

I've spent a good share of the past three months traveling to conferences and meetings at which acarine infestation has been THE topic of conversation. It is interesting to me how polarized this discussion has become; one camp declaring steadfastly that the severity of the entire situation has been blown way out of proportion. Those folks will likely tell you that we've probably had the mite longer than we realize, that's its more widely distributed than suspected, and that the experience of others in living with the mite suggests that we have very little to worry about. The contrary opinion, though seemingly growing less pronounced, is that it remains essential to keep tight controls over known infestations; that the past experience of others has not been documented in enough detail to know the true effect of these mites on bee and honey operations, especially those in northern regions.

In short, within a matter of several months, the bee industry has become populated with five acarologists for every one plain old fashioned beekeeper, and if there is one certainty about the opinions of experts, it is that expert opinions do not always agree with other expert opinions. So, where does that leave the practical-minded beekeeper?

1. There certainly is no cause for panic. The situation has been and is being responded to by many individuals and organizations. As in all such cases, that response is not acceptable to some and others have reservations about specifics having to do with identification, quarrantine, eradication, movement of bees and so on. It does seem, however, that perhaps the most immediate economic danger posed by the presence of this mite, has to do with panic reaction. It's difficult to imagine that such a pest would actually cause beekeepers to scale back operations or would keep new beekeepers out of the business, but it does seem to be causing folks to hold back on their buying of package bees and queens until last minute information is available. That's fine, except that none of us would like this to cause so much last minute chaos that hardship on both packagers, breeders and beekeepers results. Furthermore, the details relative to infested areas is readily available. We sincerely hope that beekeepers will not avoid package bee and queen companies in states where certain counties or parishes have had infestations. There is no reason for that, and the reliable suppliers in those states deserve to remain, in the customers' minds, viable, competing sources for stock.

2. The problem with predicting that something will be of little harm, is that, unlike predicting gloom and doom, it can leave you somewhat unprepared if your prediction is wrong. There does, indeed, SEEM to be evidence to the fact that the mite will not cause much long term harm to our industry. The other part of any possible scenario is that there still is much we don't know. I don't intend to argue quarrantine regulations or sampling methods with anyone, but I would like to suggest that, regardless of how correct the prediction of minimal harm might be, we not forget how terribly unprepared we were to deal with this problem to begin with. I'm afraid that if we become complacent about the presence of *Acarapis woodi,* we will also forget that our contention with it is simply a prelude to the coming of a much more dangerous creature: the varroa mite. If only as an extension of our preperation for the varroa and the Africanized bee, we should remain diligent in our efforts to understand and analyze acarosis. There is an old maxim, applying to beekeeping and life in general, that when you think you have no problems you'll soon have more problems than you'll know what to do with.

The peril of panic and passivity is, of course, that we can afford neither.

LATE NEWS FROM WASHINGTON MONDAY, FEBRUARY 4, 1985 - 1:30p.m.

From the "Background On Major Spending Reform of the 1986 Budget:" *HONEY PRICE SUPPORT PROGRAM WOULD BE ELIMINATED.* Beekeeping industry lobbyists and representatives are currently reacting to the above statement and reports will be forthcoming as to speculation about the status and possible impact, on the U.S. beekeeping industry, of the proposed support program elimination.

Guest Editorial:
Decreasing Honey Consumption in the 1980's

by BARRY SEMEGRAN Dacula, GA 30211

Charles Mraz' "Siftings" from Dec. 1984 is a real thought provoker. He beautifully lays out some of the arguments for the healthfulness and inherent goodness of honey. Then why, we may ask along with Mraz, is honey consumption down in America in the 1980's? Among the reasons Mraz finds are bad publicity from studies concerning infant botulism and a change in attitude from the more nature-oriented 1960's when Dr. Jarvis' *Folk Medicine* sold millions.

Mraz goes on to explain another positive aspect of honey, namely its property of being a protective food through its slow release of the super oxide hydrogen peroxide. Then, he calls for more scientific research to prove this to the consumer. It is here that I must add a totally different angle and concern to the problem of decreased honey consumption.

The main problem it seems to me is "abusive capitalism". The honey industry is a rather small part of America's economy and in fact it is not even a very significant direct portion of the food economy. The majority of US honey is produced by small operations (small in agri-business terms), and as we all know, other types of small agricultural operations are experiencing foreclosure in record-breaking numbers. This is just another sign of the times; in general, the move is to bigness and to control by a few. This is taking place both down on the farm and in the factories. There have been in the past few years huge conglomerations formed and larges businesses merged.

The abusive capitalism that ensues sees that as much food production as possible rests in the hands of a powerful few. The abusive part is the singlemindedness of their greedy purpose; considerations of health and naturalness are forgotten or even denied so as to ensure enormous profits. Gone are the days when food appreciation included joy over the variety, color variation and texture differences so common to more natural foods. This is so true of honey. But, through manipulative advertising and packaging, America now demands uniformity so that bread eaten in Atlanta will be as tasteless, colorless, and odorless as bread available in Seattle. The point is profits do not encompass much concern for health or goodness.

There is no reason in the world why so many Americans need to drink artificially (chemically) sweetened soft drinks, but our diets are so poor and unbalanced due to our consumption of fast foods and the addition of sugar to so many factory produced and processed foods that there is little tolerance left in our bodies for the additional sugars in the soft drinks. Interestingly, there is a move on by the cyclmate producers and their scientific cohorts to get their chemical sweetener back on the market. Their chances are greater to accomplish this than for the honey industry to increase honey consumption because cyclamate manufacturers not only have more money at their disposal but the consumer has been convinced that honey is as bad, or at least no better than sugar as far as blood sugar levels go.

Let me not make it sound as if the problems we face all rest on the side of the corporations. Abusive capitalists can only make money by selling us what we want (even though, if we don't want it he'll try to convince us we do). Incidentally, part of the cyclamate move is to sue Uncle Sam (us) for the damages when the FDA ruled to remove cyclamates from the market. If they win their case, all of us, beekeepers included, will pay for trying to stop abusive capitalists merely because of our concerns over health and safety. When the dust settles and the truth comes out, perhaps the beekeepers should sue Uncle Sam over the botulism scare and its attendant financial harm to beekeepers and the consumer.

I'm not suggesting here that the scientists are directly in on the abusive capitalism, although a good bit of today's research comes right from corporate quarters or is indirectly supported by monies from big business including agri-business. Another problem is with the interpretation of the scientific evidence including manipulations in its promulgation. The infant botulism scare is a perfect example. Publicity alone has turned moot research into public knowledge (opinion).

We can and do often marvel at the wonders and immediate benefits deriving from modern scientific research. *Gleanings* often devotes pages to explaining research which is of concern to beekeepers, and with each new "advance" or discovery a part of our lives can often become less troublesome or more productive. But take a look, for example, at a short history of agriculture. Economics of farming encourages specialization and monoculture (and we have here already entered the realm of the unnatural, but at least it's "cost effective"). Monoculture encourages pest problems but science stays one step ahead with a more potent pesticide. That is, until something like citrus canker or tracheal mites temporarily stumps science. Our lives today have become enmeshed in the cogs of a machine that always stands in need of one more complicated scientific-technological solution to keep the gears running.

What we need is more forethought and more concern for the larger view and the broader picture than modern science cares to deal with. This had traditionally been the realm of the philosopher and free thinker. Any regular reader of *Gleanings* will know what is meant when I praise both

Continued on page 121

The Monthly Honey Report

February 10, 1985

The following figures represent the current prices reported by beekeepers and packers over the country. They are based on reports from many states averaged out for each region. Where insufficient information is received no price is shown. The retail prices represent the price of each size jar.

Wholesale Extracted — **Reporting Regions**

Sales of extracted, unprocessed honey to Packers, F.O.B. Producer. Containers Exchanged	1	2	3	4	5	6	7	8	9
60 lbs. (per can) White	45.00	42.00	42.00	40.00	42.00	40.00	33.00	36.50	42.50
60 lbs. (per can) Amber	42.00	40.00	40.00	36.00	33.00	37.00	30.00	34.50	37.80
55 gal. drum (per lb.) White	.52	.53	.52	.57	.64	.60	.55	.56	58
55 gal. drum (per lb.) Amber		.50	.45		.53	.52	.50	.51	.54
Case lots — Wholesale									
1 lb. jar (case of 24)	30.50	24.00	23.95	23.00	25.00	25.00	24.00	25.00	25.20
2 lb. jar (case of 12)	32.50	23.40	23.00	22.80	26.20	23.50	24.00	24.50	
5 lb. jar (case of 6)	32.00	28.50	24.25	23.04	28.50	23.75	26.00	26.00	24.60
Retail Honey Prices									
½ lb.	1.00	.90	.75	.95	.90	.90	.89	.88	.89
12 oz. Squeeze Bottle	1.50	1.25	1.35	1.25	1.25	1.30	1.50	1.30	1.19
1 lb.	1.65	1.50	1.35	1.39	1.50	1.40	2.00	1.56	1.40
2 lb.	2.50	2.60	2.50	2.25	2.50	2.60	3.00	2.64	
2½ lb.	3.55			3.50	3.55	3.50	3.20	3.20	
3 lb.	4.00	3.75	3.40	4.45	4.60	4.30	4.00	3.75	3.40
4 lb.	5.00	4.97		5.00	4.98	4.80	4.75	4.60	
5 lb.	6.50	6.00	5.25	5.50	5.75	5.50	5.50	5.70	5.25
1 lb. Creamed			1.45			1.39	1.50	1.55	1.50
1 lb. Comb	2.25	2.25	2.25		2.00	1.85	2.00	1.60	2.25
Round Plastic Comb	1.75	1.75	1.85			2.00	1.75	1.50	1.75
Beeswax (Light)	1.35	1.35	1.35	1.40	1.25	1.25	1.10	1.20	1.50
Beeswax (Dark)	1.30	.1.17	1.10	1.25	1.12	1.05	.95	1.07	1.25
Pollination Fee (Ave. Per Colony)	29.00	20.00	27.50	20.00	20.00	21.00	22.00	17.00	25.00

MISCELLANEOUS COMMENTS

REGION ONE

Connecticut bees in good shape but March feeding likely. More native queens will be used this year. Pollination fees probably higher due to greater demand. Honey sales still unchanged; bad publicity about feeding honey to children hurts sales.

REGION TWO

West Virginia warm December weather hard on stores. Sales of honey slow. N.Y. store prices holding steady. Bees apparently in good condition. N.Y. honey sales fair. Moderate weather there has made for many flight days but might cause excessive honey consumption.

REGION THREE

Illinois reports anticipation of early spring feeding and hesistancy to buy queens and packages due to mite scare. Indiana sales slow, feeding will be required. Little colony number increase expected this year.

REGION FOUR

Minnesota winter mild with good breaks for flights. Lack of snow cover in some parts could damage legumes. Sales of honey slow. Missouri weather has been quite cold. Sales are fair but little left in hands of beekeepers because of short crop this past year.

REGION FIVE

Florida cold snap causes more problems for the citrus industry. Entire state now on Federal quarantine because of the tracheal mite. Cold also a factor in N.C., with the need of spring feeding likely.

REGION SIX

An unusually warm December in Louisiana caused brood rearing. Cold records in January injured blooming maple trees. Kentucky also worried by excessive cold weather. Honey market being kept going there primarily by sales to bakeries, restaurants and in gift packs. Hesitancy to buy queens and packages because of the mite. Alabama mite survey is complete --

Continued on page 159

Gleanings Mail Box

Protect Your Health

Dear Editor:

I am writing to you in regards to Richard Taylor's answer to the gentleman who wrote to him about cleaning old super frames, *Gleanings*, Jan. 1985.

If they cannot be cleaned, scraped good enough with a hive tool, burn them and buy new ones. Never use lye for anything, it is too dangerous and is not worth the risk. Frames are very reasonable in price and since you're putting foundation in anyway, protect your health.

Wm. Fertenbaugh, 1620 S. York St., Mechanicsburg, PA 17055

Comment on Botulism

Dear Editor:

In response to Dr. Forrest Hawkins thoughts on botulism.

Dr. Hawkins raises a valid issue on Mr. Mraz prescribing honey to prevent botulism, although Mr. Mraz's experience of 60 years cannot be dismissed as of no account.

Decidedly, medical science has the advantage in research. However, Dr. Hawkins, I believe, respectively, you're missing the point.

Both sides have tended to over react, I believe, especially the scientific community. The danger of infant botulism cannot be ignored and should not be played down. I personally would be very uncomfortable prescribing something to someone that may harm them, even though the evidence indicates the danger is very minimal.

The issue, Dr. Hawkins, is medicine's attack on a known healthy substance, honey, with an irrefutable record of doing good for mankind. What about statistics Dr.? How many die each year from DPT shots or blood transfusions or aspirin, or penicillin? Shall we outlaw them also? You continue, I assume, to prescribe them even though possibly, just possibly, one in thousands may be harmed. You do it, not because you're an uncaring homicidal maniac, but because of the tremendous good it does the very vast majority.

What of the great benefit served millions of infants by natural products? Should we not give them equal time? **Kent Teller, R 2, Osceola, IA 50213**

Pesticides

Dear Editor:

In the January, 1985 edition there was a letter from R. Douglas Williams of Moreland, Ga., inquiring into a pesticide that would not be toxic to his bees.

Some years back I saw in one of the mail order seed and plant catalogs the spores of a form of nosema which gives the disease to grasshoppers. At the time I was concerned if it was harmful to honeybees. One of the experts in one of the magazines wrote and told me this type of nosema was only toxic to grasshoppers.

I have not been getting seed catalogs for the past couple of years and I don't know if this item is still on sale, but perhaps Mr. Williams could make some inquiries on its availability, effectiveness and whether it would be economically feasible. **George T. Cole, Jr., 19205 W. Culver, Buckeye, AZ 85326**

Mixed Feelings

Dear Editor:

I was a premature baby and am told by relatives that I was very sickly until put on a honey-milk diet, after which my health improved to such an extent that I was nick-named the "fat man" because of the weight I'd gained.

With my own children we found that dipping their pacifiers in honey was a good way of quieting them down.

As a beekeeper I advocate the use of honey in as many ways as possible. Honey helped me and it never hurt my children, but, at that time I do not recall any honey-botulism information.

My feelings now are mixed. Although honey is a good natural food, if there is any doubt that it could be harmful to infants, I don't believe I would take a chance by using it. After all, there are many other foods infants cannot consume and we think nothing of it.

Beekeepers can be proud of their products, but unless there is absolute certainty that honey does not cause infant botulism poisoning, I feel it is unwise to promote the use of honey as food for babies. **Milton Schalow, 7850 Yawberg Rd., Whitehouse, Ohio 43571**

The enclosed picture of my two children, Vanessa and Sasha King appeared when I was cleaning out some old beekeeping papers. I could not resist sending it to you. We continue to harvest about 200 to 300 pounds a year from our three hives. You can see that my "staff" enjoys their work. Victoria King, 975 Hillside Ave., Plainfield, NJ 07060

No Tracheal Mites Found

Dear Editor:

Regarding my previous correspondence in regard to certification of Mississippi package and queen producers, please publish the following list of beekeeping businesses which have been examined in depth for tracheal mites and appear to be free of infestations. To this date, 430 apiaries have been examined and nothing similar to trachael mites has been detected. All other commercial producers will be completed as soon as samples are received.

Continued on page 159

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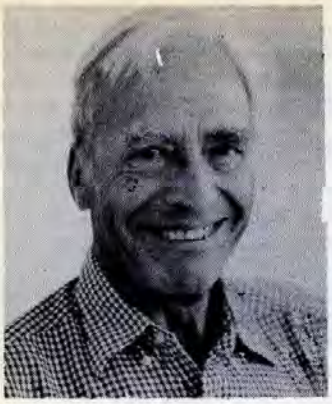

Siftings

by Charles Mraz
Box 127
Middlebury, VT 05753

Page one of January 1985, *Gleanings,* Editor, Mark Bruner quotes several "Random Thoughts of a Grumbly Nature". How true so often much time is spent on useless "nit picking" like the proper name of a problem, but not enough about how to solve the problem. This is true in every business, not only in beekeeping.

An important point Mark brought out is the Honey Promotion Bill and the opposition there is to it. There is no question the bill will be difficult to enforce and to develop to actually increase the sale and consumption of honey. There is one important thing to remember and remember well; we beekeepers are the only people who can be expected to increase the sale of honey. To do this will take money. Not money supplied by others, but money from beekeepers, however that money can be collected.

We have had too much bad publicity in the past by those with no experience in honey by such statements that honey is no better than common sugar, honey will cause tooth decay faster than sugar, honey can cause cancer and botulism and Lord only knows how many more bad things will be said about honey, apparently by those that are not happy by the great interest in the "Natural Food" business. Honey is the first scape goat in this attack. Other natural foods no doubt will soon follow. Our only protection is research that will prove that natural honey is a protective food. It will not cause diseases, but like all natural protective foods tends to protect the body against them.

On page 15 of the January issue is a letter warning me of being sued for mal practice if I recommend honey for infant feeding. Do any of your old beekeepers remember Miss Grace and The American Honey Institute? It was one of the greatest organizations the beekeepers every had to promote the use of honey. Miss Grace promoted thousands of dollars of free advertising for honey in many news releases. Also at that time, perhaps 40 years ago the American Honey Institute printed information on a post card size cardboard on the use of honey for infant feeding and supplied it to beekeepers to advertise honey for this purpose. I bought hundreds of them that I distributed to many of my honey customers. I believe at this time Miss Grace had the seal of approval by the American Medical Association on this material. So, believe it or not, Dr. Hawkins at one time the AMA approved the use of honey for infant feeding!

I kept one of these infant honey formula information cards for many years, but it appears to be lost. I wonder if any of you old time beekeepers who save material of this kind might have one of these infant formula cards. I would indeed like to get a copy.

If Dr. Hawkins and the 27,000 pediatricians in the U.S. are now against honey-milk formulas, what do they recommend for bottle fed infants? Commercial formulas with corn syrup? Corn syrup is supposed to have more botulism spores than honey. Do these pediatricians warn mothers also against feeding infants corn syrup? I have seen nothing of any such warnings? Why?

Far as I know, no infant has died of botulism that was supposed to have been caused by honey. On the other hand, there have been many news releases reporting many cases of mental and physical retardation and even hundreds of deaths caused by commercial infant formulas that lacked certain vital protective elements in their composition. Dr. Hawkins boasts that these pediatricians have 500,000 years of infant feeding experience. Well, Dr. Hawkins, I would like to remind you that Mother Nature apparently has millions of years of experience in the production of infant formulas and infant feeding. If we are to base the knowledge of infant feeding on experience, I'll go along with Mother Nature, as having far more.

I do not know if Dr. Hawkins is aware of it, but many manufacturers of infant formulas export their products to so called undeveloped "third world countries". One of these countries was the Philippines. Apparently, the results of these infant formulas was so bad in the Philippines imporation of these formulas is now prohibited into that country. Few of these formulas contain milk. They seem to be based on various processed soy bean proteins, whey powder (a by product of cheese making), cornsyrup and Lord only knows what else. Perhaps even more important is what does not go into it; protective factors that natural foods have that are essential to good health. Even pediatricians do not know the answer to all these essential protective factors in food, but Mother Nature does.

Perhaps if Dr. Hawkins is unaware of it, but I've had my head on a chopping block ready to be chopped off with lawsuits for the past 50 years. For 50 years I have been treating people with all types of arthritics with bees stings with excellent results, after years of failure on many arthritics with modern medicines. People often ask me if I'm afraid of being sued treating arthritics with bees stings. I realize only too well it can happen, anybody can sue me, anytime. If they do, so what! At least I have the satisfaction of helping hundreds of arthritics to live normally again without pills or pain. I have also learned by this most valuable, first hand experience a tremendous store of knowledge with rheumatic diseases that one can only get with many years

Continued On Next Page

experience in Bee Venom Therapy. That experience is priceless, Dr. Hawkins, and I would not have missed it for anything. If we are going to let fear prevent our search for knowledge, God help us, we will never learn anything. I hope to keep learning as long as the Good Lord lets me, even with my head on the chopping block.

Page 24, Michael Johnson continues his article on a "new idea" for a double queen hive. In my 65 years of beekeeping, I have seen many of these "Revolutionary New Bee Hives" spring up with many new beekeepers as something that has never been thought of before. Well, Mr. Johnson I am sure if you go back through the literature you will find that these ideas have come and gone for over 100 years. What makes it worse is that apparently Mr. Johnson has not tried his "New Hive" on the bees yet to any extent. Before you waste any money on a patent try it on the bees first. You will be shocked to see what bees can do to wonderful new ideas, they have absolutely no respect for them, what a mess you will find, when you try to work them. The bees will run back and forth between the two divisions when you take the hive apart, you won't know which bees are which. Even the bees won't know. The idea has so many faults, no time to list them all. The bees will do it for you.

However, this idea is excellent for queen nucs as long as you do not have more than one story. They use the exact same bottom board with divisions for nucs in Mexico at Miel Carlota. They use as I do, a shallow super with a long division down the middle and 4 or 5 frames in each division. This center division matches the division on the bottom board to keep the two nucs separate. Three divisions can be used, but after many years of experience I find two divisions more practical.

The Mexican bottom board has an added feature, one side is divided with one long cleat for making the two nuc hive. Then when the queen season is over, they turn the same bottom board over which is just like a regular bottom board without any cleat. Then they put the shallow combs of bees, brood and honey used for nucs in a regular shallow super without divisions, take out one queen and put all the combs and a queen, bees and brood out of the nucs, into the shallow supers. Then more supers can be added to make a strong hive of bees for honey production.

Another important "no-no" is never make odd sized frames for queen nucs. It is almost impossible to protect these combs after you are finished raising queens in them. The bees and brood are lost, wax worms eat up the combs, etc. At Miel Carlota they used these small frames for years, and every year the worm eaten combs had to be replaced, melted up and new foundation put in and redrawn. Now with the shallow combs there is no loss of bees, brood, honey or combs. Nucs are simply turned easily and quickly into honey producing colonies. Then when it is time to raise queens again, the bees, brood and honey of hives of shallow combs is divided again into nucs for raising queens. For over 30 years this system has worked well for me at least, perhaps it will for you as well. Worth trying anyway. Don't waste your money getting patents on a bee hive, the Langstroth Standard Hive and Shallow Supers (5¾") is still the best hive ever made and the chances to improve it is remote to say the least. Before you say too much about these new ideas, try it out on the bees first, it will save you a lot of embarrassment, if the bees tell you your idea is no good.□

GUEST EDITORIAL

Continued from page 115

Charles Mraz and Richard Taylor for filling such a niche in the beekeeping area. Not too many other industries care enough to provide a niche. Their thoughts compliment the scientific research going on in agriculture and help give meaning and broader purpose to our apiphilia (bee love).

The US government in the 1980's is openly friendly to corporate America unlike the more balanced 1960's when Ralph Nader types influenced the day, and it is becoming all too clear that the beekeepers have few real friends in Washington. Sure, they'll "buy" our honey for now and put it up in storage and continue to handle us as welfare types not able to find a place in the scheme of today's economy (abusive capitalism).

If General Foods comes to your door and offers to buy your beehives, don't sell them!

HONEY REPORT

Continued from page 116

1157 samples, all negative. Package and queen demand is iffy. Colonies in good condition.

REGION SEVEN

Oklahoma hit by cold weather in early January. Feeding probably needed. Sales slow. Little or no crop in parts of that state, after two years of bad results. Moisture has improved, large crowd reported at last beekeepers meeting in east, central OK. Texas relieved by no further mite detections. Retail sales good. Hive sales active.Pollination operations expanding. Due to lack of fall honey, colonies are being fed in some sections. Heavy snows in Central and South Texas did not damage the brush and other honey plants as has been the case in the past. Country of Origin labels starting to appear.

REGION EIGHT

Retail sales steady in Colorado with little or no changes in shelf prices. Packers keeping up with store demands. Warmer temperatures have allowed for spot checks. Stores are adequate. Arizona colonies mostly in good shape. Sales slow.

REGION NINE

Cool, foggy January in the Central valley has kept hives dormant. Virtually no precipitation. Beekeepers moving into almonds early. Mite sampling negative. Beekeepers with proper certification can now move into California. Pollination fees about about $4 due to reduced availability and increased pollination needs. Demand for honey fair to good. Eucalyptus near ocean on central coast began blooming in early January. Bees off to early start. Washington honey sales picking up. Prices a little lower in some cases. Canadaian honey competing. Some Canadian white selling at $3.99 for 5 pounds. Feeding necessary in some cases.

Bee Talk

By RICHARD TAYLOR
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Trumansburg, N.Y. 14886

An Eyewitness Account of Early American Beekeeping: The Autobiography of A.I. Root. Medina, Ohio, The A.I. Root Co., 1984. Pp. 165, $4.95 ppd.

I have just spent a most pleasant cold winter day reading this engrossing book. Of course it would be hard for anyone to know anything about beekeeping without knowing about A.I. Root, but this account gives one a new insight into this remarkable man and revives what was certainly the most exciting and dynamic era of beekeeping history. The moveable frame hive had not been invented when Mr. Root was born, in 1839. The smoker, foundation, the extractor, and virtually all the tools and methods of modern beekeeping came into being during his lifetime. He had a direct hand in most of them, and more than any other individual laid the foundations of modern beekeeping.

Amos Ives Root was, from his childhood, a person of intense curiousity about everything. All it took was the discovery of a stray swarm of bees to change not only his life, but the future course of beekeeping. He took the all-day thirty-mile stage coach trip to Cleveland to search bookstores for anything he could find about bees. He found Langstroth's book, and spent the night in his hotel room reading it. The intensity and industry he poured into this new interest eventually led to the establishment of *Gleanings In Bee Culture,* first published as a quarterly at seventy-five cents a year. The first issues were written and printed by Mr. Root on a press operated by a foot treadle, which his inventiveness soon supplemented with power from a windmill.

I had always thought of A.I. Root as an inventor and manufacturer. I did not know that he was a very close student of bees, both in his apiary and by his observation hives. Everything he saw ignited his curiosity. He speculated that the queen may mate several times, as was long afterwards proved true. He noted the dance of the bees, but quite naturally misinterpreted it as a dance of joy. His zeal for the practical matched his curiosity, and this led to the establishment of the factory and the company that bears his name. Financing proved very difficult, and at one critical point, when a miracle was needed to avert disaster, he prayed to God for help, as usual. A few days later a total stranger walked in and lent him the needed funds, unsecured, saving the day and confirming in his mind, once more, the providence of the Creator. Mr. Root experimented endlessly, tirelessly and, ultimately, with overwhelming success with beeswax foundation. It was he who discovered that the bees could draw out the original foundation to almost the full depth of the cells. He proved this by using a sheet of foundation that was half white and half deep yellow, and noting that the colors were carried out in the cell walls. The same energy and experimentation went into developing one-piece section boxes, dove-tailed hives, and numerous things we now all take for granted.

Mr. Root paid twenty dollars, a huge sum in that day, for his first Italian queen, with little assurance of live delivery. Some years later he introduced thirty such queens, imported from Italy, into thirty colonies in one hour. He had removed all the old queens, then introduced the new ones simply by shoving the little cages in at the entrances that same evening. All were accepted, and he attributed this — rightly, I believe — to the fact that the bees were unthreatened by such an intruder at that hour of the day.

What has since become the *ABC & XYZ of Bee Culture* was begun in 1877 as a series of eight-page leaflets, intended to answer the questions with which he was flooded. There has always been some confusion among collectors as to the date of the first edition of this work, and Mr. Root's autobiography does not clear it up. My oldest copy, of what was then called simply *The ABC of Bee Culture,* has no date, but the preface is dated 1877. My next oldest copy has the publication date 1880, Probably my oldest is the first edition of the bound volume.

Mr. Root died in 1923, at the great age of 84. He had written this account of his life to be published after his death, and it appeared serially in *Gleanings* from 1923 until 1928. Some readers will find this somewhat heavy espousal of his religious ideas a bit oppressive, but it is a fascinating story, all the same.

[Reader Questions are invited. Please include a self-addressed, stamped envelope.]

Obituaries

Miss Shirley J. Horn, 24 years old of Fairdale, Kentucky, died suddenly at her home on November 19, 1984. She was the daughter of Robert and Barbara Horn. They are past President and Secretary-Treasurer of the Kentuckians Beekeepers Association and members of the Kentucky State Beekeepers.

Shirley was very active in beekeeping. Her late grandfather had bees for many years and she was introduced to bees at an early age. During the winter she would help put frames together. In the spring she would help super, work the hives and loved to go after swarms. Also she loved to talk to people about the bees and tried to educate them.

In 1980 she was the Kentuckian Beekeepers Association "Honey Princess", and was very active at the State Fair. If she was not at the sales booth she was working with the observation hive. In the past several years she entered the Honey Cooking at the State Fair and was mighty proud of the ribbons she won.

Besides her parents' she is survived by a sister, Christine Tally and a niece and nephew.

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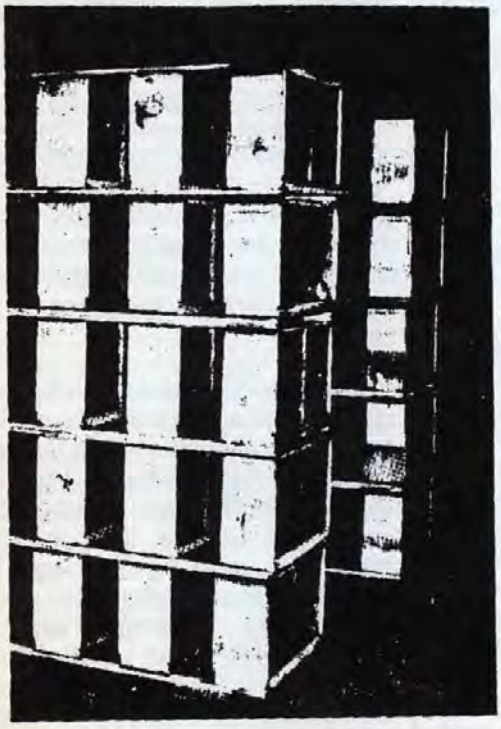

April 1985

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The First Spring Inspection

by DEWEY M. CARON University of Delaware Newark, Delaware 19717-1303

What do you see when you open a bee colony in the spring? What should you be looking for? The bees provide important clues as to what kind of shape they are in and how they will perform during the coming spring and later honey flow seasons. As a beekeeper, you must be skillful in looking for those important features you need to evaluate colony strengths and weaknesses and to determine the management that you must perform on each colony.

The first spring inspection should be performed on a nice day in March or early April when the temperature is above 60°F. You should have on your bee veil and your smoker puffing a good volume of 'cool smoke'. Begin in the inspection by removing and looking on the inside of the top cover. Do you see moisture? If you do or if you see evidence that there was moisture during the winter, then there was inadequate top ventilation in the colony. All colonies need to get rid of the warm moisture laden air which accumulates at the top of the hive underneath the covers. Examining the cover will tell you how well you did on this factor in the first inspection.

When you remove the inner cover (provided you have an inner cover — they are not always necessary but are of use during the winter), determine where the brood cluster is located and its approximate size. You should also look on the inner cover for evidence of moisture as you did with the top cover. Ideally, the cluster should be centered in the top box with honey stores to the side, front and back of the cluster location. Each bee colony should have 15 or more pounds of honey stores. If you cannot determine how much honey the colony has, lift the back of the colony to get a feel for the amount of honey stores. A little practice with this technique is extremely useful for future beekeeping success.

You will want to examine the brood but should do so quickly. Whenever you look in the brood chambers, you should have several things in mind during the inspection. Certainly you want to be sure there is a queen present and laying eggs that will yield worker bees. It is difficult to look for a queen so we look for eggs. Eggs will be on the periphery of the brood and are difficult to see. You must develop the skill to find eggs among brood cells. You will also want to determine if the ratio of eggs to larvae to pupa is approximately correct. This ratio should be one egg: 2 larva; four pupa.

Figure 1. First inspection of overwintered 1½. Beekeeper is looking for brood, food and colony conditions.

Whenever you examine brood you should be conscious of any irregularities. This means looking for diseases such as sacbrood, chalkbrood, or either of the foul broods. You should also look for evidence of chilled brood. The amount of brood is difficult to assess but you should at least be reasonably comfortably with the compactness of the brood pattern. The brood area should approximate a sphere extending across several frames and the queen should be skipping relatively few cells in her egg laying.

One of the most difficult assessments in a colony is of size of both adult and brood populations. Developing this skill comes with comparing colonies over more than one season and comparing several colonies at one time. You should eventually get a feel for what size would be normal in both adult and brood populations and you should be able to group your colonies in terms of those that are weak, those that are normal and you should find one or two that are stronger than average. The amount of bees and brood will vary with time of season. Hopefully, during the first spring inspection the brood will be on four or more sides of frames and adult bees will be clustered on 3 or more frames.

Most of the bees and honey stores will be in the top brood box on your first spring inspection. After you complete your spring inspection of brood and have made your assessment of honey stores, lift the top box off and place in upright on it's end on the ground or on the overturned cover. We do not advise placing supers or brood boxes directly on the ground as you will pick up and introduce dirt and debris into your colony when you put the boxes back together. In most instances the bottom boxes will have a few bees in the center and will have returning foragers walking through the box from the entrance below. There may be some stores of pollen and even sometimes honey stores in a few frames.

If you remove frames from the lower box, you will see that they do not look appealing. A mold will often form during the winter months from the moisture and they will have a grayish-whitish appearance. Bees will clean this a they use the frames. Honey that may be present frequently will be crystallized in the comb. There is no way that you can remove that crystallized honey but adult bees can do so. The stored pollen may look old and probably has little nutritive value

Continued on next page

to bees. The bees will use it as they expand brood rearing during the spring.

Remove the bottom box and clean the bottom board. The bottom board of many colonies may have an accumulation of dead bees, caps from cells of honey, particles of wax and other debris. Scrape the bottom board clean using a hive tool and replace it in the same location. Then replace the first box and put the second box on top. Securely close the colony as you leave. It is too early to reverse any but the very strongest colonies. On your next inspection you will probably want to reverse the position of the two brood boxes moving the top one down and the lower one to the top. If your first inspection is late and the colony has a fair number of bees and brood you can reverse at this time.

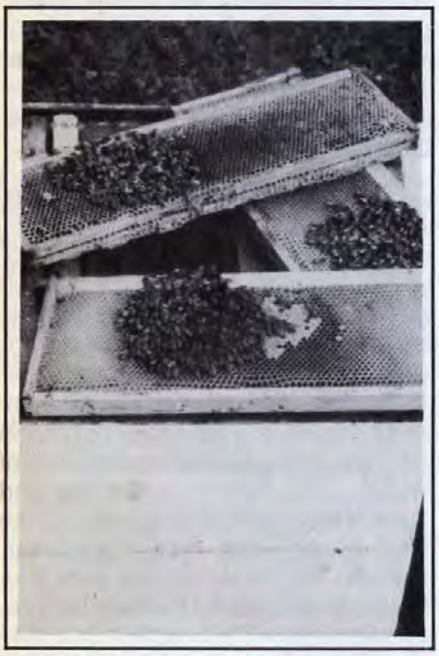

Figure 2. Spring inspection was too late to save this colony. Although population was low, brood rearing had started when this colony starved as no honey was available.

What did you learn from your first spring inspection? You should approximate amount of honey stores in a colony. Each colony should have a minimum of 15 pounds of stored honey. You should have an approximation in size in adult population and each colony should cover a minimum of 3 frames. You should know the size of the rearing area, know that the ratio of eggs to larva to pupa is correct, know you have a queen laying fertilized eggs and know that most of the brood is hatching and healthy. The amount of brood should be on at least four sides of frames and hopefully larger. You also have cleaned the bottom board, examined the lower chamber and examined the covers. You now should be able to record strengths and weaknesses of the colony.□

CORRECTION

In the last sentence of the January article "The Bee And The Boll Weevil" by S.B. Bambara, the last sentence is printed: "...the boll weevil eradication program is not applauded *at* all..." This should have read: "is not applauded *by* all..."

Research Review

By DR. ROGER A. MORSE
Department of Entomology
Comstock Hall
Cornell University
Ithaca, NY 14853

The Deterioration of Honey in Storage

Honey deteriorates slowly in storage. The chief enemy of stored honey is high temperatures but given the time storage at lower temperatures can be harmful. Heating honey to pasteurize it can have an adverse effect on honey aroma, color and taste especially if it is kept warm too long. Sunlight, interestingly, does not appear to have a bad effect on honey because light has a bleaching effect. The fact that honey storage will slowly spoil is not well known. Some people believe that honey will keep indefinitely. There are even stories that honey found in ancient Egyptian tombs is edible but these are not true. All honey will become black and more liquid in five to 25 years because of chemical changes that take place in it. This can be seen in any stored at room temperature for very many years.

Europeans have been much more fussy about the quality of their honey than have Americans. Honey that is heated too high, or stored too long, builds up a chemical called hydroxymethyfurfural (HMF). The quantity of this material in honey can be easily measured. Honeys that have high HFM values have "unwanted alterations"; these include loss of color and aroma as well as some of the antibacterial qualities for which honey is so well known. Some countries in Europe have limits on the amount of HMF that is acceptable in honey. This has sometimes caused difficulty for those who ship honey to Europe and have heated their honey too high for too long.

A number of factors, including the chemistry of the honey itself can influence the buildup of HMF. In order to standardize and better understand what is taking place the authors in the paper cited below undertook a number of tests. They found that in honey high fructose the buildup of HMF was more rapid. However, their results showed that the temperature and time were the most serious problems.

I think it has been agreed among beekeepers that high quality honey should be marketed and consumed within a year. Beekeepers who are in areas where the honey is naturally strong-flavored are well aware that storing it for a year will do much to dull the flavor. Of course, if one stores honey too long there is always the danger of fermentation. A minimum of five percent of honey will ferment within a year if not properly treated and stored; the figure is higher during the second year with often 25 to 35 percent being ruined.

Reference

Pichler, F.J., G. Vorwohl, and K. Gierschner
Factoren, die die Bildung von hydroxymethylfurfural im honing beeinflussen. Apidologie 15:171-88. 1984.

Varroa Mite Detection

The parasitic varroa mite that is now in five of the six southermost countries in South America, and slowly working its way toward the United States, is difficult to detect but no so much so as the tracheal mite. Adult varroa mites are brown and about half the size of a pinhead. They can be seen with the naked eye, especially when they are moving, but one really needs a microscope to identify them and to make sure one is not looking at *Braula coeca,* the wingless fly that is found on bees in many states in the U.S.

It is now reported that tobacco smoke will cause the mites to drop off adult bees and onto the bottomboard of a hive. If one places a sheet of white paper or cardboard on the bottomboard it is simple to check for mites after a smoke treatment. An empty super is placed on the bottomboard and under the brood nest to act as a fumigation chamber. The varroa mites infest both capped and brood and adult honeybees; there is no way one can cause the mites to leave brood cells but those on bees, even those that have burrowed between and under the abdominal segments, will drop off.

Dr. David De Jong, who is working on the Cornell University mite project in Brazil, has used tobacco smoke in the above manner and reports that it works quite well to determine if mites are present or not. He says that queen breeders in Brazil use tobacco smoke to remove most of the *Varroa* that might be on worker bees in queen mailing cages before the queens are mailed. The method is to place the queen cages upside down on a grid in an empty super, drop in a lighted cigarette, and cover for five minutes. The mites will drop to the floor but are not killed and will move back onto the bees if given time. One must be careful not to use too much smoke or the bees may be harmed. The chief disadvantage of the method is that there is no good way to control the dose being given to the bees.

The tobacco smoke method is not the only way one may check for *Varroa.* Removing drone pupae, one by one, may also be done but is a little slower method. Other methods have been devised but require more elaborate laboratory equipment.

One of our great concerns today is that we do not know how far north in South America the varroa mite might bee. In the case of this mite, unlike the acarine (tracheal) mite, at least we have some reasonable ways for anyone to check for infestation.□

Ruijter, A. de and J.v.d. Eijnde
Detection of varroa mite in the Netherlands using tobacco smoke. Bee World 65:151-154. 1984.

Continued on next page

How Widespread is the Acarine Mite

Florida has done an outstanding job of showing the rest of the country how widespread and difficult to detect is the acarine (tracheal) mite. No other state has spent so much time and money searching for the mites.

On January 22, Harold Denmark, Chief Entomologist with the Florida Division of Plant Industry in Gainesville, told me that had concluded their survey. Florida has looked at 1782 samples. They have found 32 beekeepers in 19 Florida counties have bees infested with mites. Most of these beekeepers have migratory operations. This year these beekeepers brought bees into Florida from several states. Some beekeepers brought bees into the state after other states had certified they were mite free.

In Florida a minimum of 150 bees per sample were examined for mites. This was three times the number of bees that the USDA suggested should be looked at under the microscope. In some samples more than 700 bees were examined before mites were found.

Denmark said it was senseless for Florida to continue the state survey. He felt they had proven that the mites were everywhere in the state. Further searching would only reveal more beekeepers with infested bees.

This spring Florida officials will survey the bees owned by beekeepers who wish to move out of state and who request that their bees be checked. Certificates indicating freedom from mites will be issued to those requesting them provided mites are not found. However, in making this survey Florida inspectors will follow the federal recommendations and look at only 50 bees per sample. Denmark said he was certain that this means many beekeepers known to have mite infested colonies could obtain certificates because of the small sample size would not reveal the true situation.

Denmark said that originally he thought the mite had been in the United States for three to five years. Now he believes it has been here much longer. All this suggests that economic losses from *Acarapis woodi* are small.

I write about this because it is evident that finding a better method of detecting the mite is necessary. I have had discussions with several persons and many ideas have been put forth. Dr. Camazine of our laboratory has written about tracheal floatation, a method whereby the tracheae are separated from the muscle tissue that surrounds them. It speeds up mite detection somewhat but we are all hoping someone will come up with an even better method.

Beekeeping Merit Badge Classroom Unit on Beekeeping

by Kathleen & Roger Hultgren

This program was initially designed for a boy scout merit badge. However, its format can easily be implemented within a classroom setting. The entire program can be used as a unit or individual lessons can be extracted for talks on beekeeping for upper elementary (Grades 5-6) and junior high grades. The format is delineated with respect to subject matter and materials as well as quizzes. These quizzes can be used to see how effective you were with a particular group or how well the group has mastered the material.

Historical Background

Robert Baden-Powell was a British Breve Colonel who was assigned in 1899 to Mafeking, South Africa. This particular town was the pulse of South Africa and the focal point of a conflict between Britain and the Government of the Transvaal Republic. Baden Powell held his position here in Mafeking during a 217 day seige until he was reinforced by Lord Roberts. He returned to England as a hero and found his book for army training "Aids to Scouting" was in great demand. Seeing an opportunity to help young boys grow to manhood through his scouting practices, Baden Powell wrote the handbook "*Scouting for Boys*". This handbook became the impetus to the present day Boy Scouts of America.

Within the boy scouts program is a merit badge and pamphlet on beekeeping. My husband and I were approached in 1981 to be counselors for Holden troop 180. In discussing this badge with the troop leader, we learned that the beekeeping merit badge for this troop had not been received by a boy for over 20 years. When we inquired as to why, the response was, they could not locate a local beekeeper willing to volunteer his time. With that, we took the pamphlet home determined to have this merit badge the most prized by the troop members.

Planning Stages

Most merit badges are attained in a day or within a few days. After reviewing material in the boy scout pamphlet, we sketched out the areas we wanted to cover. The realization hit that this merit badge would take at least 10 lessons. We approached the scout leader and were told we had a free hand in designing the program. The troop's philosophy was to have each boy who received a badge to be able to perform in that particular area, speak on the subject and be able to commit his knowledge to paper. The decision was made to have the boys keep a notebook in which they were to answer in writing the five requirements contained in the pamphlet. This notebook would also contain notes taken by the boys during our lectures, slides and demonstrations as well as any articles located by them in magazines and local newspapers. In looking at our personal schedules, we decided to have the boys meet once a week for ten two hour sessions. Our next concern centered on a liability suit should one of the scouts get stung and have an allergic reaction. One of the scouts' fathers was an attorney who drafted a release. It read as follows:

> *The undersigned being a parent of the boy whose name is set forth opposite my signature do hereby give permission for my son to take the Beekeeping Merit Badge course and do hereby release Boy Scout Troop 180, and its leaders and Roger and Kathleen Hultrgren from any and all liability or responsibility for any injury or damage which my said son may suffer during the course of earning the Beekeeping Merit Badge.*
>
> *Dated this 11th day of May, 1981.*

After each parent signed, our class of seven scouts was formed.

Our attention then turned to a grading system. With both of us experienced teachers, we realized that a passing grade had to be established and a criteria for grading was needed. Since the program contained quizzes, we anticipated someone being absent on that particular day and determined that all makeup quizes would be oral. A grade of 70 or better was needed in passing all quizes and an overall grade of 80 was selected for receiving the merit badge. The overall grade was subsequently broken down into the following areas with respective points assigned:

Attendance	**20**
Quizes	**21**
Handling bees	**25**
Extracting	**9**
Notebook	**25**
Total	**100**

With this standard it was felt that the weighted scores were compatible with the troop's philosophy: performing equated to handling bees and extracting, committing knowledge to paper was satisfied by the notebook and being able to speak on the subject would be fulfilled by class participation, quizzes, question and answer sessions as well as informal discussions.

After expanding our outline we persued the boy scouts' pamphlet and assigned pages to be read each week of the program

Lessons

At the first meeting each boy was asked to complete a card with his name, address, date of birth, parents' name, phone number and a short

Continued On Next Page

statement of why they wanted the beekeeping merit badge and what their present knowledge of beekeeping consisted of; such as, a family member who was presently keeping bees, etc. This provided us not only an insight into each boy's motivational reasons but also a quick reference should there be a need to cancel a class. Each participant was given an outline (figure 1) which contained the topics to be covered, the assigned reading, dates of the program, due date for the merit notebook, grading criteria as well as the overall score needed to obtain the badge. With this in hand, each boy knew what was expected of him and each one committed himself to the challenge and goal of the beekeeping merit badge. A question and answer period followed and all left enthusiastic about bees.

Figure one

BOYSCOUTS MERIT BADGE
Instructors: R.D Hultrgren, K.A. Hultgren

	Pages to Read	Class Dates
I INTRODUCTION		7:00 p.m.
A. Registration		
B. Overview		
C. Questions & Answers		
II EQUIPMENT	p. 15-18	
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(Due 2 weeks after last class)		

Requirements

1. Total of 80 points
2. Passing all quizes with 70 or better
3. All makeup quizes oral.

Equipment was the main topic of our next meeting. Slides were shown on how to assemble a bottom board, brood chamber, honey super, frame, inner cover, outer cover and where these parts are positioned on a hive stand. A short break followed during which time we put on display a white beekeeper's suit, hat and veil, gloves, hive tool, smoker, bee brush, lighter, wood shavings and stingfoe kit. Each item was reviewed with respect to function. The sting kit was specifically included to ease the participants' minds about their ingrown fears of bees and to educate them on the procedures to follow if stung.

The third lesson was a hands on workshop in which the class assembled a hive body, frames with foundation, bottom board and inner and outer cover. With an extra hive body, supers and queen excluder the group was able to assemble a hive as it would appear at an apiary site. This activity was built in as a review for today's quiz. (figure 2) Once the hive was set up a short lecture followed regarding a site selection for an apiary. The discussion involved the five characteristics of a good site: being exposed to full sunlight and facing southeast, locating close to flowering plants and a source of water, a provision for good air circulation and secluded location and a provision for water drainage.

A combination of slides and lecturing was utilized in the life cycle of the honeybee. We began this topic by dividing the inhabitants into males (drones) and females (queen and workers). the queen's role in the hive was delineated with respect to her laying capacity, her ability to lay fertilized and unfertilized eggs and the effect of her pheromones on the workers. In defining the drone's function within the hive the mating procedure was explained as well as their fall demise. The worker and her duties, which are the inner management function of a colony, were finally explored. Since the care of young bees is a duty of the workers, this provided a natural link to the study of the developmental stages of the queen, drone and worker. Included in this segment was the common anatomical features which are the head, thorax and abdomen as well as the anatomical differences of the three hive members.

Hiving a swarm of bees is one of the requirments for the merit badge. As we all know, swarms do not occur at our convenience, therefore, installing a package of bees was substituted. It was felt that this substituted procedure was valid for it is a common method employed by all beekeepers at some point, whether it's to replace, expand or strengthen a colony. An old shipping crate, sugar water can, queen cage with the tab and a hive setup were the materials used to demonstrate this procedure. Once the package was supposedly installed, a review of the developmental stages and role responsibilities of the drone, queen and worker was conducted prior to distributing the next quiz. (figure 3)

The production topic proved to be quite popular with the group. Using samples of pollen, propolis, honey and water provided everyone with a visual example of each item collected by the bees. These items were discussed as to how they are transported by the honeybee and what purpose they serve in the hive. Comb, chunk, cut comb, creamed, round and liquid honey, pollen, beeswax and propolis were displayed as hive products. The by-products consisted of candles, polishes, cosmetics, examples of batiking from beeswax, and fruits and vegetables from pollination. Each product and by-product was discussed in detail. There was mention of royal jelly and larvae as vitamins and protein sources respectively. This area could be expanded or condensed depending upon the group. Honey tasting followed with four distinct flavours to emphasis the variation in color and taste.

Swarming is a natural instinct for the propogation of the honeybee. Man intercedes to inhibit this instinct for his own gratification. For each swarm, a colony loses ⅓ of its flying bees and 30 pounds in their honey production. Such losses are minimized if prevention and control methods are practiced. The scouts were exposed to the basic procedures of caging a queens, body reversal, supering and interchanging the hive placements of strong and weak colonies. More advanced and technical procedures were excluded from this section. A review of the production topic was not needed for the visual and tactile stimuli

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presented in the previous lesson enabled the class to retain that information. A quiz followed this presentation. (Figure 4).

The seasonal activities of a beekeeper were delineated under the topic of hive management. Fall, winter, spring and summer was the format selected for discussion purposes. Emphasis was placed on fall being a preparation for spring buildup and a factor in the quantity of the summer honey crop. The fall managerial procedures of checking for mice, installing mouse guards, reducing hive ventilation and assessing winter stores were demonstrated through slides. The ramifications of a poor decision in one of these areas and the resultant effect on the hive were included. Winter hive inspections encompassed monitoring honey stores, inspecting the area in front of the hive for dead bees and observing the melting of snow approximately two inches around thehive. The latter two items were explained as to why they were indicative of a colony which was alive. The beekeeper's spring duties were comprised of feeding pollen supplements/substitutes, cleaning bottom boards and noting the queen's laying pattern. Pesticide spraying is of much concern to beekeepers at this time of the year. The devastating effect that improper applications can have on a colony and the measures which can be employed to safeguard a hive were described. Swarm prevention and control, honey production and some honeybee diseases were the essential ingredients in the summer examinations. The bee diseases selected, AFB, EFB and nosema, had the cause of the disease, the symptoms within the hive and the treatment cited.

In the next phase, two boys at a time were assigned a day in which they would open and inspect a hive. Veils and suits were available to them and each brought a pair of gloves and boots from home. A quick review as to what one expected to see in the colony preceded the opening. Each scout examined a hive body and filled honey supers were removed.

Extracting was by far the favorite class of everyone. Each boy uncapped two to three frames, ran the extractor and bottled a jar of honey for

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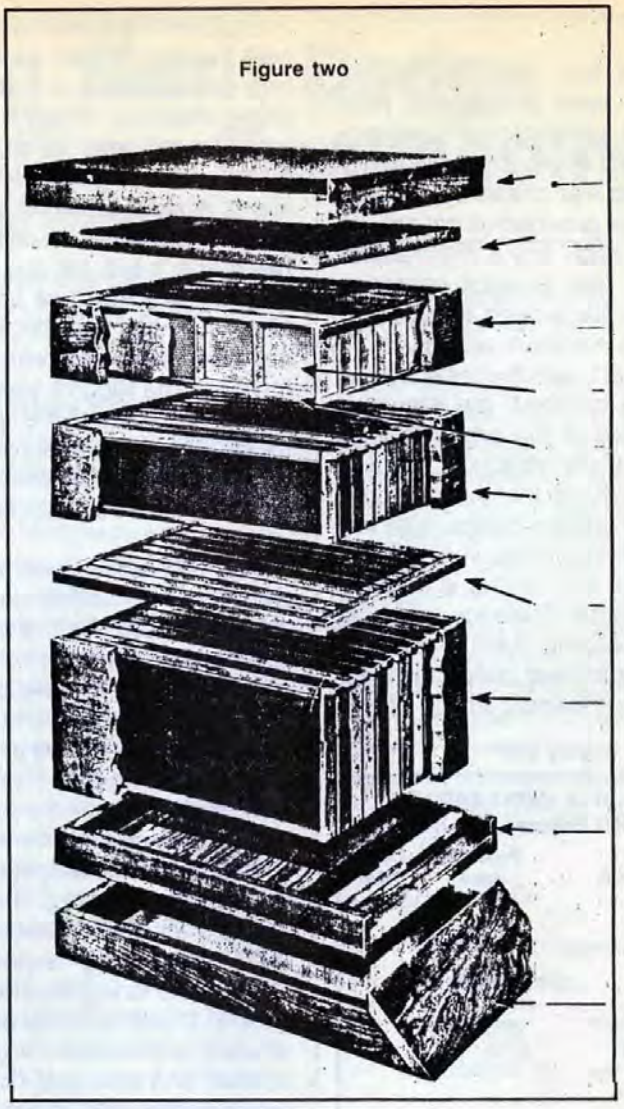
Figure two



Resistance to the Varroa Mite Discovered

By STEVE TABER of TABER APIARIES 3689 Oak Canyon Lane Vacaville, CA 95688

Observations and experiments of two investigators in Germany, Moritz and Hanel (1984), showed that bees with a more rapid development time reduced infestation levels of the mite, *Varroa jacobsoni,* almost 80%. The reduced level of the mite in the population should be sufficient to enable honey bee colonies to produce normal crops of honey.

The varroa mite is not be confused with the internal parasitic mite, *Acarapis woodi,* and the varroa mite is not now in the United States. It is a recent invader of honey bee colonies in Western Europe and is in South America. Its native host is another species of honey bee called *Apis cerana* or the Chinese honey bee which is closely related to our honey bee, *Apis mellifera*. It has been called the worst of all possible bee diseases by Dr. N. Koeniger of West Germany and presently is receiving most of the research effort by German bee scientists. The mites develop in sealed cells of the honey bees in from 230 to 260 hours with another 24 hours if necessary for the mite cuticle to tan and harden.

The discovery of resistance was made in the following way: Varroa mites were placed into sealed cells of

Steve Taber

faster developing bees and compared with bees with a longer development time. Mites placed with the fast development bees did not have enough time to complete their life cycle.

The fast development bees were a subspecies, *Apis mellifera capensis* and live in a very small geographic region centered about Capetown, South Africa. The slow development bee, *A. m. carnica,* is quite similar to our own bees. The difference in development rate for the sealed stage was determined to be 9.6 days for *capensis* and 12 days for *carnica.*

The authors in their last sentence say that the results suggest selection for a more rapidly developing bee which could result in a bee either more resistant to varroa or at least less susceptible to it. Many years ago when I was working with Dr. W.C. Roberts (now deceased), a bee geneticist with the Baton Rouge USDA bee laboratory, he planned an experiment never published comparing development times of different genetic lines and found as much as a 48 hour difference.

I would assume from the seriousness of the disease in Germany that these authors are actively pursuing this approach right now. It provides good news for us here in the US because it is widely predicted among bee experts that the mite will shortly be here, brought in as either an illegal importation of infested bees or by flying across the Mexican border as the internal mite did.

Reference

Moritz, von R.F.A. and H. Hanel. 1984. Restricted development of the parasitic mite *Varroa jacobsoni* Oud. in the Cape honeybee *Apis mellifera capensis* Esch. Z. ang. Ent. 97: 91-95.

A Requeening Plan

By Grant D. Morse, Ph.D. 121 Ulster Ave. Saugerties, NY 12477

Does a beekeeper need a requeening plan? Why not let the bees take care of requeening when they decide it is desirable?

Honey bee queens quite normally live from one to five years. This means that an average yard of bees will have as many 4-5 year-old queens as 1-2 year olds if the beekeeper has no program for requeening. Older queens are more likely to go out with swarms than one year-old queens. Also, colonies headed by older queens have smaller populations. Many beekeepers have found from experience that a colony with a one year-old queen will produce on the average as much as 30 pounds of honey more than a colony headed by an older queen, particularly where the queen is more than two years old.

Many commercial beekeepers find that some kind of requeening program is essential in order that they remain competitive with producers in such foreign lands as China, Mexico, Argentina. They have to decide whether requeening actually costs them less than loss from failing to winter, swarming, and lower honey production from colonies headed by older queens.

A colony that fails to winter is a total loss in honey production. A colony that swarms seldom produces a surplus for the beekeeper. Young queens help to combat pests and diseases better.

Queen Replacement by the Bees

Why not let the bees replace their queen? Many colonies will not replace their queen until she dies a natural death. Most colonies swarm while their queen is young enough to help them succeed in a new location, well in advance of compulsory supercedure. Most will tolerate the retention of a queen whose workers do not produce as much surplus as a unit with a younger queen. In nature, in the wild, many colonies with older queens have no difficulty in producing as much honey as they need for their own use. It is the beekeeper who is interested in large surpluses.

When bees are allowed to raise their own queen replacements, they fail often to secure as good a queen as produced by the queen-breeder. As Jaycox points out, they do not always choose larvae of the best age. In fact, he states that R.D. Fell (at the time a research student at Cornell University) found that in 35% of the cases studied the bees selected larvae that were three or four days old. Nor does a colony always get as good a queen as a single committee of its best bees could produce. What they ususally do get is the first and oldest queen produced by one of several self-appointed worker committees.

Queen breeders normally raise queens from a well chosen mother of proven quality, usually superior quality. Queen breeders take steps to assure that there is an adequate force of high quality drones in the neighborhood with which the virgins can mate. Professional breeders are quite aware of the importance of high quality drones being present within the flight-distance of their mating queens. After all, the quality of the mating drones is as significant as that of the queens.

When colonies are allowed to replace their queens, they do not always make a replacement at a time that is most advantageous for the beekeeper. If a beekeeper concludes that he cannot afford the time and the money to replace queens annually, he frequently adopts a policy of replacing one half of his queens each year.

Another objection to letting a colony replace its queen when it decides to do so is that often when a colony decides to supersede a queen there may not be an adequate force of young bees in the hive to feed the queen properly.

When To Requeen — Spring of Fall

Each season has advantages. Personally, here in New York, I prefer August requeening. It's harder finding the queen then in the midst of large numbers of workers but not disturbingly so. When I fail to find the queen rather readily, I let that hive go for a time, and either come back later in the day or leave it for treatment next year.

Today's light-colored, large queens are not usually too hard to find. It helps if one will place a queen excluder between the two parts of the hive while searching for the queen. She's usually right where she's supposed to be—on a brood comb where she's currently laying.

August requeening has advantages in that queens raised at that time of year, have the benefit of plenty of food, especially pollen, and freedom from the restrictions of cold weather. They're cheaper then, too, by quite a bit. When installed in early August they have time to produce a good-sized cluster for wintering and brood raising for spring.

Requeening in the spring is all right if it's done early enough to give the queen time to raise a good-sized gathering force. That usually means installation early in April in the North.

Should Queen Bees Be Marked?

Of course, it's the sole way of knowing for certain what queen is present and how old she is. But few commercial beekeepers mark their queens. They mark the hive instead. But many of us are a bit prone to depend on our memories too much. It pays to record on the hive the date of every requeening. It's also valuable to record the surplus honey production. Low yielders usually need requeening. If one always kills the old queen before requeening, the queen one finds in the hive next time is likely to be the one you or I installed — or one created by the workers, or a visitor.

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Some beekeepers follow the practice of clipping a wing from a queen, clipping alternate wings each year. When this is done, not more than 1/3 of a wing should be clipped else the queen may be too damaged and her ability to keep her balance may be impaired. Personally, I want no wing-clipped queens. I have too much respect for the body of the queen and its parts, though clipping is not supposed to be damaging. I prefer also not to smudge the body of the queen with identifying paint.

How To Install A New Queen?

There are many recommended ways of installing a new queen. The most common, probably is by way of a mailing cage. It's the easiest. Most experienced beekeepers find it pays to kill the escort bees that came with the new queen. The old queen must first be destroyed, the new queen introduced straightway to discourage worker bees from becoming laying workers.

The queen cage should be placed near the center of the upper hive body so that the workers can form at least minimal contact with the queen before she is released. Enough sugar candy should be left in the exit hole so that it will require approximately 24 hours before she is released. The two frames between which the cage is placed should be shoved together tightly enough so that the cage will not fall. The colony should not be opened for several days.

Researchers generally tend to believe that one of the safest and best ways to introduce a new queen to an established colony is by way of a push-in cage made with eight wire strands to the inch. This facilitates contact between the queen and workers and gives them good opportunity to feed her. The queen should be alone in the cage. The cage should be located over a portion of a brood comb that has hatching bees. But few beekeepers have the time or the patience to risk the use of a push-in introduction cage.

But perhaps the most successful and safest way to introduce a new queen is by way of uniting a queenright nucleus with a colony to be requeened, using the paper method.

Beekeepers normally make up nuclei at their convenience, to be used later when needed. Most operators find such nuclei almost invaluable to salvage the production of a crop by a colony with a failing or dead queen. A good way to make up such a nucleus is to use a regular size hivebody. Into this a frame of brood and clinging bees is placed along with a frame of honey and pollen, together with as many other frames and young bees as the beekeeper can spare. On some occasions, a colony that had developed queen cells of good quality and inheritance can be broken up, and each frame bearing a cell given a different nucleus. Care should be taken not to jar such cells unduly.

Queen Supersedure

Probably too many beekeepers depend upon supersedure as their method of queen replacement — actually not a method at all, but a retreat from personal responsibility. Roger Morse says in *Bees and Beekeeping* that supersedure often takes place in May and June in the North. We all know that if it occurs at such a time, swarming may be the result. If it occurs in August or September (when it more frequently takes place) swarming may not so frequently occur. But we know from experience that what begins as supersedure may become swarming; and that what apparently began as swarming may become supersedure.

Rearing One's Own Queens

The size of the beekeeping operation may help determine whether one should try producing his own queens. I'd recommend that one try his hand at it at first on a small scale and see how well his queens perform.

I once had a neighbor who produced his own queens, and sold a few. The ones I purchased from him were mostly failures. Queen raising is an intriguing specialty.

The Matter of Distance

Beekeeping for many of us today is different from its nature when we started out with all the hives in the back yard, and we knew everytime a swarm issued.

Today, most bees are maintained in yards that the beekeeper visits only occasionally. He must accordingly adopt policies that can work reliably whether he is present or not.

Since the beekeeper doesn't see any one hive very often, his requeening plan must be one that works even when he is absent. He must depend at times of visiting a yard upon the information he has recorded somewhere for each hive. Often this will be somewhere on the individual hive but definitely not on his memory alone.

Requeening calls for planning, particularly for communication with one's queen breeder. We must expect that there will be an expenditure of money, and the giving of time. But the beekeeper who leaves requeening to the supersedure process must count on many failing hives. □

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Fell, R.D. Thesis. The Study of the Biology of Queen Honey Bees *(Apis Mellifera L.)* at Different Times of the Year. 1977

Jaycox, Elbert R., Beekeeping Tips and Topics, 5775 Jornada Road North, Las Cruces, New Mexico 88001. 1975-1981

Morse, Roger A., Bees and Beekeeping. Cornell University Press, Ithaca and London, 1975.

Ibid. Rearing Queen Honey Bees. Wicwas Press, 425 Hanshaw Road, Ithaca, NY 14850. 1979

Questions and Answers

Q. Does honey ever become contaminated by pesticides, rendering it unsafe as food? **Charles E. Barton, Lexington, Kentucky**

A. The chance of this happening is extremely remote. Contaminated nectar would almost certainly kill the bee before she got back to the hive with it. Pesticides, carelessly used, could drift into hives, but even if that happened the honey would be quite well protected, first by being in the supers, far from the hive entrance, and second by being mostly capped over in combs. Encapsulated pesticides are sometimes carried back to the hive by the bees, but they get mingled with stored pollen rather than with honey. This poses a great threat to the colony, but not to human beings. I have often wondered whether pollen trapped for human consumption might get contaminated, but so far I have heard of not confirmed case.

— Richard Taylor

Q. I introduced queens to two queenless colonies by the entrance method, rather than placing the mailing cages between two brood frames. This made it easy to check them without disturbing the colonies. I fed them heavily, removing the cork only after the third day. The bees released the queens after six days, but two weeks later there was still no brood. Why didn't they accept the queens? **Dennis Wellman, Johnstown, OH**

A. A queen should not be introduced through the entrance of the hive, even with the precautions you describe. She should be introduced into the brood area, or close to it. Even so, acceptance is dubious. The sure-fire way to introduce a queen to an established but queenless colony is to first introduce her to a three-frame nucleus colony, composed of young bees, then combine that nucleus colony with the queenless one.

— Richard Taylor

Q. I have a hive that has swarmed twice each year for two years, even though I added supers early each year. Should I requeen this hive, and if so, should I do it in the fall or spring? **William E. Wray, Muncie, IN**

A. Congestion does not cause swarming, in spite of what is sometimes said even by experts. It is only one of the contributing factors. Hence one should not expect to control swarming merely by adding supers. Often there is no apparent reason why a colony swarms while others, more congested, do not. Requeening might or might not solve the problem. Your hive has, after all, requeened itself at least twice in two years. Many beekeepers keep swarming down by requeening each year and also supering the colonies early. If you want to try it, spring is the easiest time. But remember that if the bees don't accept the new queen, they you'll be worse off than if they had swarmed.

— Richard Taylor

A. I have trouble with the queens I order by mail being dead on arrival. The last time, the attendant bees were all dead, as well as the queen. The supplier replaces them, but is this normal? **R. Douglass Williams, Moreland, CA**

A. It is not normal. The main cause of queen loss in the mail seem to (a) heat and (b) dessication. The former can be reduced by not having the bees en route over a weekend, so as to reduce time in the mail. The former can be reduced if a drop of water is given to the bees before mailing.

— Richard Taylor

Q. I divided a strong colony by inserting a double screen between the two stories. The bottom part robbed out the top. What went wrong? **Bernard Lockstampfar, Newport News, VA**

A. When a colony is divided, simply by separating the two halves, than the heaviest story, which is invariably the top story, must remain on the original hive stand in case the other story is left in the same apiary. If both are left at the original location and a screen inserted, as in this case, then the heaviest half must be placed in the bottom. Otherwise the flying bees simply bring the lost honey back to where they think it belongs, which they identify as their regular entrance.

— Richard Taylor

Q. In raising comb honey by the shook swarm method, when should I make up the shook swarm in relationship to the nectar flow? When the flow begins, or before? **Tim Ordway, Rochester, NY**

A. Before the flow. My practice has been to do the shook swarming in early May, when the dandelions are coming on well, the bees are building up good, but before they have begun serious swarm preparations, that is, queen cells.

— Richard Taylor

Q. I have some off-flavor honey from last year. Can I feed it back to the bees? When is the best time? How can I prevent robbing? **Marshall T. Slotterbach, Sellersville, PA**

A. If the honey is from your own bees and is not likely to have foul brood spores in it, you can feed it back to the bees in early spring, as soon as they resume flying. Thin the honey with some warm water and feed it from a large jar inverted over the inner cover hole with only about four nail holes in the cover or, if it is granulated, just ladle it onto the inner cover. The bees have very little tendency to rob in the spring, and the honey will considerably stimulate brood rearing.

— Richard Taylor

Q. My wife likes only crystallized honey, and buys this at the store in preference to the honey from my own bees. How can I make creamed or crystalized honey for her? **Gerhard A. Gesell, Leesburg, VA**

A. The easiest way is to leave the honey, strained but unheated, in a cold room for a week or two. But it doesn't always work. Some honeys crystalize faster than others, some might never crystalize at all. Honey from trees, such as basswood, black locust, etc., are usually slow to crystalize.

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Beekeeping In The Virgin Islands

by ARNOLD & CONNIE KROCHMAL 119 Bell Rd. Asheville, N.C. 28805

The U.S. Virgin Islands which includes St. Thomas, about six miles long, mountainous and considered the major tourists attraction; St. John, the smallest, including the Virgin Islands National Park; and St. Croix, the largest, about 25 miles long, are not very much involved in agricultural pursuits.

There are some cattle projects on St. Thomas and St. Croix, and on the back of St. Thomas there is a community of farmers who grow vegetables and herbs on hand-made terraces.

There have been continuing projects for decades now to encourage small farming projects. From 1961-1966 I worked for the U.S. Department of Agriculture as horticulturist and Assistant Officer in charge of the federal program in the islands, but the entire program was closed down. Now there is some brightening of possibilities of beekeeping expanding modestly in the islands.

On a recent visit to the islands while looking around for local products, I ran across a number of jars of honey produced on St. Croix at Beresford Apiaries. I checked the address of the apiarist and phoned him. He was available to have us visit him the next morning, when we rented a car and drove over familiar roads to the western part of the island, beyond Fredericksted to Estate Northside.

Mark Beresford turned out be an airlines pilot who, with his wife and children, had settled on St. Croix to make his home. He had several aces of mango, and avocadoes, some citrus, bananas and coconuts.

We discussed his project which at the moment has four hives and seemed an ideal model for others on the island. Small enough to be manageable part time, yet productive enough to bring in some income.

He planned on bringing in bees by U.S. Mail, as we have in the states, but the local post-office refused to accept them, and he began bringing in his bees by plane, which is somewhat more work for the beekeeper.

Originally he had more hives, but problems with the wax moth reduced that numbers. However, using *Thuricide* helped control the problem and he has not had further difficulty with the moth. The hives re-queen themselves, and he periodically divides the colonies.

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Testing Your Beekeeping Knowledge

by CLARENCE H. COLLISON Extension Entomologist, The Pennsylvania State University, University Park, PA 16802

While the beekeepers in the north are anxiously awaiting the first signs of spring, in the south efforts are well underway towards the development of strong producing colonies. Southern beekeepers will soon begin shaking packages, splitting colonies, making up nucs and raising queens. Even though colony development varies from one geographical region to another in relation to time of year and climatic conditions, beekeepers practice similar management techniques during the foraging season. Regardless of where you are located, early season management is concerned with colony survival, development of strong productive colonies and swarm prevention. How well do you understand the basic principles of colony management? Take a few minutes and answer the following questions to find out how well you understand this important topic.

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

1. _____ There is a reduction in foraging activity approximately one week prior to swarming.
2. _____ Colonies with young queens are least apt to swarm.
3. _____ HFCS (High Fructose Corn Syrup), a commercial source of bee food, is composed primarily of fructose and sucrose.
4. _____ The Demaree Technique is a method of raising large quantities of queens.
5. _____ Pollens vary in their nutritional value for brood rearing.

Multiple Choice Questions (1 point each)

6. _____ Pollen is the bee's natural source of:
   A) carbohydrates and proteins
   B) proteins, minerals , vitamins and fats
   C) proteins, carbohydrates and minerals
   D) proteins, minerals and vitamins
   E) proteins and vitamins
7. _____ Larvae used for grafting in the production of queens should be _____ hours of age.
   A) 30-36
   B) 24-30
   C) 36-42
   D) 12-18
   E) 6-12

8. Explain the differences between a pollen supplement and a pollen substitute. (2 points)

9. List three characteristics you would expect to observe in a colony with laying workers. (3 points)

10. Name four ways of removing bees from honey supers. (4 points)

11. Explain what happens when a colony absconds. (1 point)

12. The presence of white, freshly secreted wax along the lower edges of 3-4 comb top bars in the upper hive body.

13. You find five queen cells on the comb surface in a hive with two full-depth brood chambers.

14. During the winter of inactive season, the bees are clustered at the top of the upper-most hive body.

ANSWERS TO TESTING YOUR BEEKEEPING KNOWLEDGE

1. True Colonies preparing to swarm go through a number of behavioral transformations. Associated with the reduction of foraging activity, is an increase in the number of bees engorging with honey which is related to wax gland development. Also many foragers become scouts looking for a new homesite.

2. True Researchers have found that swarm preparations are less frequent among colonies with queens in the current year than among those with queens of the previous year. Queens either produce less queen substance as they age or enter a cycle of production with periods of lowered secretion that are more conducive to swarming.

3. False HFCS (High Fructose Corn Syrup) is a carbohydrate liquid composed of approximately 50% glucose; the same sugars predominantly found in honey. This syrup is produced by an enzymatic process which changes the starch found in corn into fructose and glucose.

4. False The Demaree Technique is a method of swarm control that separates the queen from most of the brood within the same hive.

5. True Pollens of different plants vary greatly in their nutritional value for brood rearing. The protein contents of pollen are quite variable, ranging from 8 to 40%. Total protein in the honey bee diet should range between 23 and 30%. Honey bees maintained on a diet of less protein fail to raise brood. In addition, some pollens are deficient in the essential amino acids needed for brood rearing.

6. B
7. D
8. A pollen supplement is a protein source such as soybean flour, powdered skim milk, brewer's yeast or a mixture of these with some pollen added to it. The natural pollen attracts the bees so that they will make use of the protein source. A pollen substitute is a protein source containing all the essential nutrients for bees but no pollen.
9. Only drones are reared in worker-sized cells. Usually find multiple eggs per cell (2-15). Eggs are usually laid on the sides of the cell instead of at

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The Washington Scene

By GLENN GIBSON
P.O. Box 368
Minco, Oklahoma 73059

Mr. Gibson is a registered lobbyist for the American Honey Producers Association.

For several years we have continuously asked beekeepers to write their congressmen and explain their problems. The willingness of a large number of industry members to follow our suggestions pleases us very much. Since constituent (beekeeper) mail is the primary link between our office and the congress, our success will be directly related to:

1. The number of beekeeper letters going to Washington.

2. The number of phone calls and personal visits with members of your state's congressional delegation.

3. How closely you will work with your state beekeeping association and the national organizations. Playing a "lone hand" doesn't net very much unless your political clout is strong.

Letter writing to your members of the congress cannot be overdone. Once the technique is mastered; you will be pleased with the results. Technically everyone who writes a letter, makes a phone call, or visits with his senator or U.S. representative is lobbying. However, none have to comply with the lobbying laws except those who are paid. Since beekeepers are repeatedly asked to write their congressman about their livelihood, it is difficult to understand why a heavy percentage of our members don't bother. All of us are willing to visit about our problems with neighbors, but somehow feel it isn't the same with members of congress. I will agree there is a difference. Our neighbor is not as anxious to hear about your troubles as your congressman. After all, please keep in mind that you are an expert in beekeeping and know more about the results of governmental action of whatever nature than all of the Washington establishment. Also, keep in mind that your tax money pays the salary of an aide that is authorized to hear your tale of woe.

Members tell me that letter writing is difficult for them. Excuses are given, but most of them are not good enough for us to quit asking for more letters. "What to write" is the number one question. This one is easily answered for those who will contact us. Some are concerned about the appearance of their letter. Correct grammar? Neither point matters a whit. The congressman's main interest is the message.

Our Lobbying Role

We have complied with the congressional lobbying laws. I am the registered lobbyist for our association. This means that I stand ready to answer all questions and file quarterly reports with both the Senate and House. Over the years no questions have been asked, but this doesn't mean that some of congress had not made inquiry. The reports are burdensome, but worthwhile.

Decades ago lobbyists had a seamy reputation, but this has gradually changed and is now one of the honored professions. Sure—some are still crooked, but fortunately they are a minority. To my knowledge no university offers a course on the subject. This may change soon since so much of legislation is written by lobbyists—both state and nationally. I have been told on a number of occasions these last few years that we need a full-time man in Washington. I agree, but this would not mean that association activity would cease. On the contrary, association activity would need to be increased so that the heavy expenditure of a Washington representative could be justified. It is doubtful that the industry would fund a rep in Washington.

Attendees at our national convention feel a sense of accomplishment for their part in hammering out the organization's resolutions. And well the should, but this is only a wee beginning toward our objectives. Carrying them up and down the halls of congress poses a number of questions that need to be addressed. Because our time and funds are limited, we must make both count. Which of our resolutions are most urgent? Whom shall we see first? Shall we avoid members who are hostile to our program? Or try to sell them? If the Administration is adamantly opposed to our recommendation, shall we advise them about our plans? Do we have the necessary data to prove our point? Do we have time to call on members who have received mail from beekeepers? Will we need to compromise or say no?

During the course of a week in Washington all or some of these questions are asked and answered. We try to report our work in Washington, but unfortunately we cover only the tip of the iceberg.

What You Need To do

First, Mr.and Mrs. Beekeeper, we hope you will become an enthusiastic part of our program. Hard core insiders are hereby urged to work harder and recruit the reluctant. Without fail write your congresssional representatives at least once a month. Remember the success of our efforts will be in direct relation to the number of letters you write. Also, remember that your letters open the door for us in the halls of congress. May we count on you?

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Beekeeping Technology

By DR. JAMES TEW
The Agricultural Technical Institute
Wooster, Ohio 44691

Honey Festivals — Promoting Bees and Beekeeping

I'm honestly frightened when I think how fast time passes. It seems like only a year or so ago that I came to Ohio State from the University of Maryland. I vividly recall that one of the first things I did was attend the Lebannon Honey Festival at Lebannon, Ohio. Mike Wagner, an ATI student at the time took me on the tour.

The Ohio State Extension people had a tent set up from which they gave bee demonstrations and answered endless questions. I was impressed with all the noise and fanfare, but I also recall being a bit disappointed at the seemingly minor part bees and bee products were playing in this "Honey Festival".

This past September marked my seventh year of Festival involvement. It has taken most of that time to realize that a honey festival is not really for beekeepers but rather for the 140,000-160,000 non-beekeepers who attend. A festival needs all the "noise and fanfare" to keep all those people entertained while I and many other beekeepers try to sneak in positive honey bee propaganda.

Now please believe me people, I wish all of those 160,000 festival visitors were beekepers, but the simple fact is that they are not bee lovers and they probably never will be. However, you can bet that some of those people will be our neighbors, local businessmen, city councilmen, firemen, teachers, and honey consumers. Our efforts should be to show this mass of people a good time and have them leave the activities feeling good about bees.

I would guess that, short of mass media exposure, a well run honey festival can do more for beekeeping good will than anything else that we try. Georgia, West Virginia, and Paris Illinois, all sponsor yearly events. You can bet that they're all hard work and require a lot of planning. You can also bet that the long-term rewards will be profitable.

(1) **Beekeeping Goodwill.** I and many gracious people (especially you, Louie) who have worked at the extension tent at the Lebannon, Ohio Festival have had the opportunity to **try** to change the minds of many people who (a) didn't like honey, (b) didn't like bees, or (c) didn't like beekeepers. We've not only been totally successful, but it has definitely helped.

(2) **Public Exposure.** You know that anytime that many people get together the news media is going to be there. They always have been. It always looks so good on the evening news to see throngs of people packing the streets at one of the festivals. Newspaper and radio coverage is always abundant, also.

(3) **Honey Sales and Promotion.** Naturally honey can be sold at such events — normally in considerable quantities. The honey queens and princesses are there promoting our product, insuring subsequent honey and related product sales.

(4) **Beekeeper Cooperation.** Many beekeepers visit, many beekeepers participate. The chance to exchange information and news is always rejuvinating The "after festival hours" when meals and ideas are exchanged are a great time to reassure each other that beekeeping is the thing to do. The Paris, Illinois, festival provided a combined state meeting with Indianna. The results were a well run festival with parades, meetings, exhibits, and food—lots of it, all kinds.

(5) **The Parades, Honey Festival Runs, and Exhibits.** These bring even more people who are attracted because of other things which interest them.

All things considered, the work, the time, the hassle always seem worth it after the event is over. Problems do crop up occasionally. Bad weather, for instance, sometimes cannot be avoided. Presevere. The next day, or even the next year will be better.

If your state group wants to hold a unique meeting, bring in large numbers of non-beekeepers to view bees and beekeeping, sell some honey and bee products, and just generally have a good time, you should consider a honey festival. □

NORTHERN NEW YORK BEEKEEPING SEMINAR

The William H. Miner Agricultural Institute will be holding its annual beekeepinf seminar on Saturday, April 27, 1985 at Miner Center auditorium in Chazy, NY from 8 a.m. until 5 p.m. Dr. Larry Connor, Beekeeping Education Service, will conduct the seminar entitled: "Bee Problems: How to Recognize and Solve Them." Registration is $10. Champlain Valley Beekeepers Association members will be charged $5.00. For further information contact: Loretta M. Suprenant, Miner Institute, Chazy, NY 12921, (518)846-8020.

OHIO

March 30, the Tri-County Beekeepers will hold their 7th Annual beekeepin workshop at Fisher Auditorium, Wooster, OH. Fisher is located at the Ohio Agricultural Research and Development Center (State Route 250 and 83) in Wooster. Registration will begin at 9 a.m. Topics will include: the acarine mite, beginning beekeeping, building your own equipment, record keeping, biology of the honey bee, diseases and pests. Cost is $8 (includes lunch) or $4.50 without lunch. Checks or money orders should be made out to "Tri-County Beekeepers' Association." For registration or information: James Thompson, 8227 Eby Rd., Smithville, OH 44677, (216) 669-3352.

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1—24	$4.00	$17.25	$21.75
5—25	3.75	17.00	21.25
25—99	3.25	16.00	19.50
100—up	3.00	15.25	18.75

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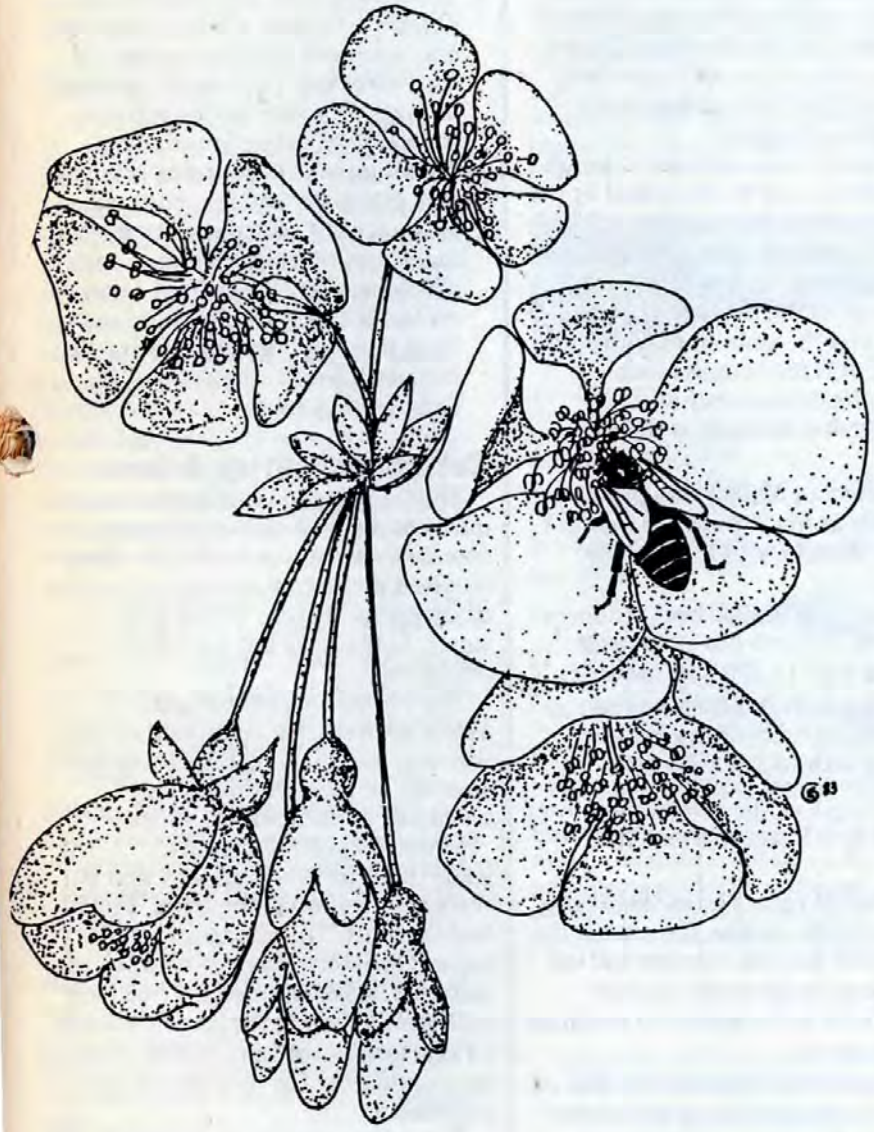
Evaluating Honey Bee Colonies for Pollination

A Guide for Growers and Beekeepers

Much recent emphasis has been placed on the necessity for the U.S. beekeeping industry to do a much more thorough job of developing pollination markets and opportunities, The hidden value of beekeeping has always been in terms of its service to pollination, but except for relatively few geographic areas, pollination has been a free by-product of beekeeping. In order to help develop the basis for beekeepers to consider the possibilities of fee pollination, we present this reprint, originally prepared by D.M. Burgett, Oregon State University; Glenn Fisher, Extension entomology specialist, Oregon State University; Daniel Mayer, Extension entomologist, Washington State University; Carl A. Johansen, Extension entomologist, Washington State University. Despite the regional emphasis, we feel the comprehensiveness of this manuscript makes it also valuable to pollinators in other areas.



Honey bees as pollinators

In the United States it is estimated that managed honey bee colonies are annually responsible for the pollination of agricultural crops valued between $4 and $8 billion. Honey bees are accurately described as indispensable pollinators.

The reasons for the success of honey bees as pollinators are seen in certain aspects of their biology. Honey bees forage for nectar and pollen from many thousands of plant species, so they efficiently pollinate a wide variety of crops we all consider important.

The second reason is that, while foragers from one hive may visit many species of plants in a given day, individual foragers display flower fidelity or constancy.

When a forager begins collecting nectar or pollen from the flowers of one species of plant, she will continue to visit flowers of *only that species* for at least one foraging trip and more often for several days, or until the resource is no longer producing nectar or pollen. This is obviously important to the plant she visits as it requires pollen from a flower of the same species for pollination.

The third reason honey bees are so successful in commercial agriculture is that colonies are mobile. Hives are easily moved to locations where native pollinators may not occur in sufficient numbers to adequately pollinate a specific crop.

Continued On Next Page

Perhaps the most important question regarding pollination for the commercial grower is: How many colonies are necessary to insure maximum pollination of a given crop?

This is a difficult question to answer because absolute pollination requirements are not established for most agriculturally important plant species.

Furthermore, bloom periods, bloom density, bloom attractiveness, blossom structure, competing bloom, and weather play major roles in determining how well honey bees will forage on and ultimately pollinate a given crop.

Finally, the quality of individual colonies needs consideration in determining how many to use. We designed this publication primarily to assist growers and beekeepers in evaluating the quality of colonies used in commercial pollination.

What is a colony?

Honey bees are social insects. Look at a colony of honey bees as a family unit. A colony has a single queen, who is the sole female reproductive in the hive and is the mother of the sexually sterile female workers.

During periods of food abundance in the spring and summer, drones (male honey bees) will also be present in a healthy colony.

In addition to the adult bees, a healthy colony will also have *brood,* the collective term for eggs, larvae, and pupae (the immature stages in the life cycle of bees).

The population of a single colony of honey bees is not static. During the course of a normal year, a colony will have its lowest population of adult workers, approximately 10,000 to 15,000, in January and February. The colony will grow to a maximum of 50,000 to 60,000 workers by midsummer. The control and management of colony growth most frequently depends upon the age and health of the queen and the skill of the beekeeper.

Worker bees

These are short-lived. During the active foraging season (from March to October in the Pacific Northwest), a worker lives approximately 5 to 6 weeks. After an adult worker emerges from a pupal cell, her first 3 weeks are spent inside the colony serving as a "house" bee.

She goes through a series of tasks that includes cleaning comb, feeding larvae, secreting wax, building comb, accepting nectar loads from foragers, ripening nectar, ventilating the hive, and (for a short time) acting as a guard bee at the entrance of the colony.

When she is about 21 days old, she begins to take short orientation flights. This marks the beginning of her 2- to 3-week life as a forager bee, seeking nectar and pollen to bring back to the colony.

Colony size and efficiency

You can probably appreciate that only the older worker bees in a colony serve as foragers. As a colony grows in worker population, the proportion of bees old enough for foraging increases.

As a general rule, smaller colonies send out a smaller percentage of bees as foragers. On the other hand, larger colonies send out not only more bees but also a higher proportion of the population as foragers.

The greater value of larger colonies for pollination can be illustrated by the amount of honey produced by colonies of different populations. The ability of a colony to store surplus honey is a direct result of the number of bees foraging and the amount of forage available. It is the foragers that pollinate the flowers they visit.

Research has brought us these figures:

- One colony of 30,000 bees produces 1½ times as much honey as the sum of *two* colonies with 15,000 bees each.
- One colony of 45,000 bees produces 1½ times as much honey as *three* colonies with 15,000 bees each.
- One colony of 60,000 bees produces 1½ times as much honey as *four* colonies with 15,000 bees each.

The strength of the colonies a grower rents will be influenced by several factors:

1. *The time of year.* The earlier a crop blooms in the season, the greater the likelihood that the colonies will not be as large as the same colonies rented later in the season to pollinate another crop.
2. *Management of the colonies.* Beekeepers can speed up or slow down the natural growth of their hives with a variety of techniques. Colonies provided with supplemental food such as sugar syrup and/or pollen supplement early in the season will be stimulated to grow more rapidly.

Colonies taken to California in December or January (primarily for almond pollination) will begin foraging earlier. Later on, they will be stronger than colonies left in the Pacific Northwest.

When the beekeeper brings such colonies back to our area, they will be in better condition for early season pollination service. When beekeepers consider colonies overly strong early in the year, they often divide them or split them into several colonies, adding new queens to the new colonies. This is the method most beekeepers use to increase their colony numbers.

3. *Weight and size.* For commercial beekeepers—who often manage several thousand colonies—practical considerations (such as the number of hives they can haul on a given truck) are of prime importance.

Commercial beekeeping is migratory in nature, and the seasonal movement of colonies often covers thousands of miles. The ease with which beekeepers can load colonies on and off their trucks and place them into fields and orchards often dictates the maximum size of the colonies they rent.

Colony-strength regulations

The Oregon and Washington Departments of Agriculture have mandatory colony-strength regulations for hives involved in the commercial pollination of agricultural crops within their states. Idaho does not have such regulations.

The regulations are designed to assure growers that colonies they rent will meet minimum biological standards. The box on page 5 outlines the standards as presently set forth.

In the Oregon regulations, while there are two grades (A and B), there are also two grade *types,* Field and Orchard. This recognizes the natural growth pattern of a honey bee colony. Colonies rented for tree fruit pollination early in the season will not be as strong as the same colonies rented later in the year for field or row crop pollination.

The colony grades, as defined by the regulations, can be more easily understood with a few explanations.

Continued On Next Page

Disease. Two bacterial infections are significant for beekeepers, and it takes an experienced beekeeper to tell them apart. The difference between them, loosely, is that between cancer and a heavy cold.

American foulbrood is the most serious bee disease in North America. It simply means the death of the infected colony—it can't be tolerated at any time.

European foulbrood can be tolerated at low levels of infection, especially early in the season. It usually disappears in a month.

Amount of comb. Rather than mandate a specific type or physical size of a pollination unit, Oregon sets out the amount of comb required. This is preferable, as different sizes of hive bodies are regularly used.

A standard unit, used by most beekeepers, is the Langstroth deep-hive body (see figure 1). When used with 10 frames, it provides 2,700 square inches of comb. A common variation is eight frames deep, with 2,160 square inches of comb. Oregon requires 3,000 square inches of comb.

Therefore, a pollination colony requires more than one standard deep-hive body, or its equivalent. A commonly used unit is two standard deeps (see figure 2) or one deep (2,700 square inches) with an additional semideep-hive body (2,000 square inches).

Amount of brood. As we mentioned above, a healthy honey bee colony during the foraging season will possess eggs, larvae, and pupae. Brood indirectly influences the pollinating efficiency of a colony.

Larvae require food, especially pollen. Many studies have shown a direct correlation between the amount of brood in a colony and the amount of pollen returned to the hive by the foragers.

Grade A Orchard colonies are required to have 600 square inches of comb occupied by brood. Grade A Field colonies must have 1,000 square inches (one standard deep comb, if fully occupied, would have 270 square inches of brood).

Brood combs are rarely, if ever, completely filled by brood, but a good queen on a good comb will create a brood area that often occupies 90 to 95 percent of the comb space (see figure 3).

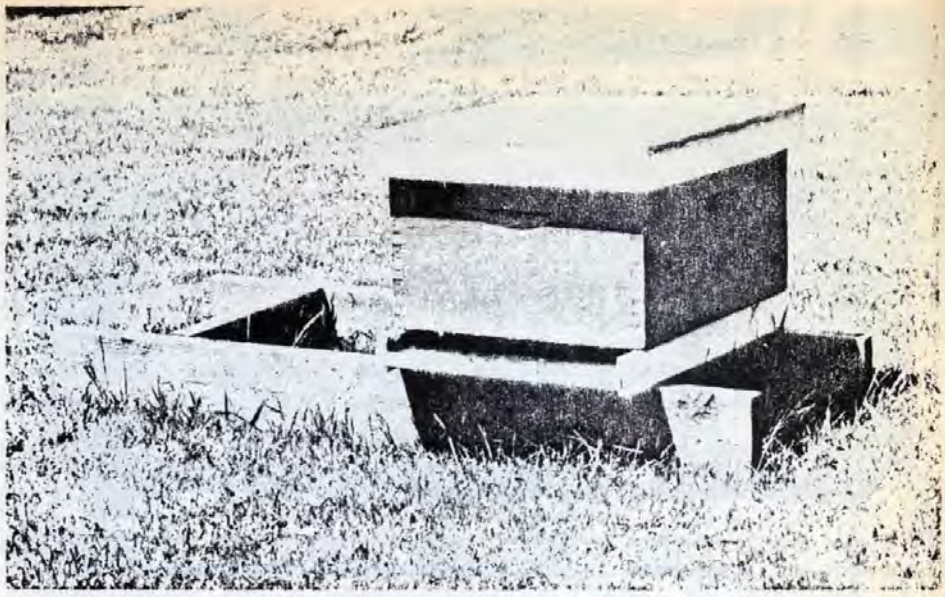


Figure 1.—*A standard one-story colony consisting of one 10-frame-deep super. This unit would not meet the minimum requirements for amount of comb under the Oregon regulations, but it would meet Washington Department of Agriculture regulations.*

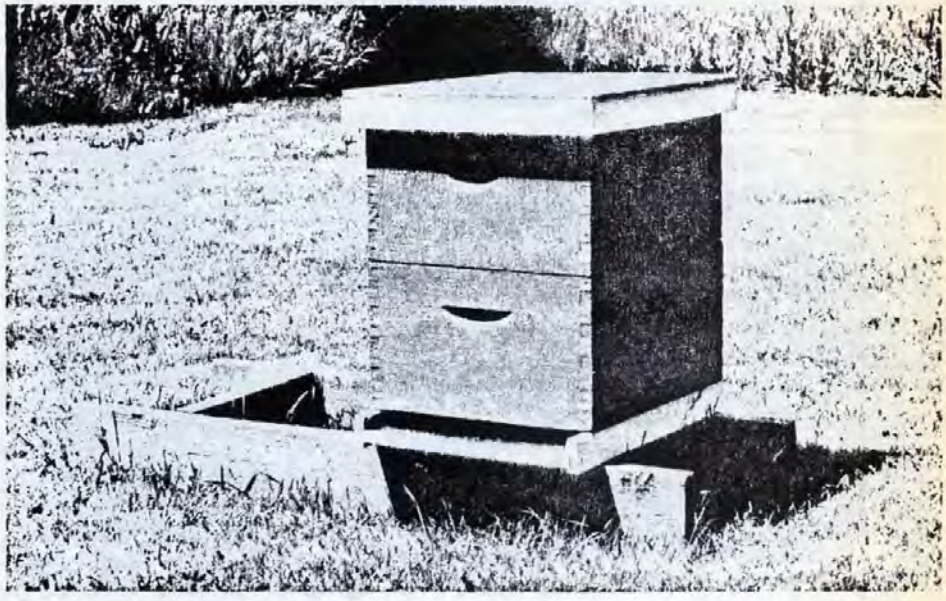


Figure 2.—*A standard two-story colony, consisting of two 10-frame-deep supers. This colony possesses 5,400 square inches of comb. Typical pollination colonies might substitute a semideep or western super in place of the second deep super. In either case, the unit would meet either Oregon or Washington Department of Agriculture regulations for amount of comb in a standard pollination unit.*

A Grade A Field colony should have six combs well filled with brood, and a Grade A Orchard should have four frames well filled.

Number of bees. Since the older bees in a colony do the pollination, the regulations take into account the relative number of bees a colony should have. Grade A Orchard colonies require six standard Hoffman combs to be well covered by adult bees; Grade A Field, ten standard Hoffman combs. (A Hoffman comb is a standard deep comb, 270 square inches.)

How many bees are on a well covered standard comb? Studies at Oregon State University have shown that one standard comb, when completely covered, accommodates about 2,400 adult bees (see figure 4).

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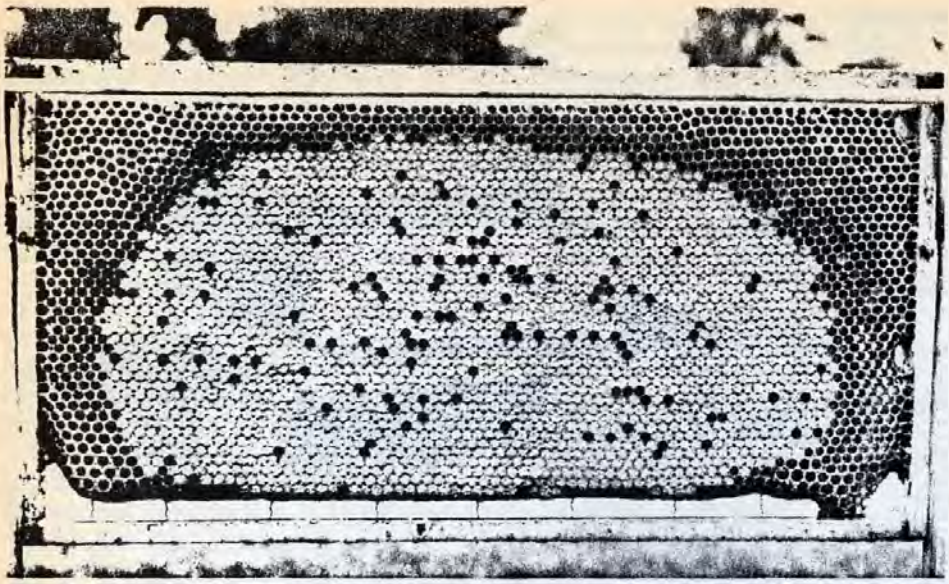

Figure 3.—*A standard deep Hoffman comb with brood. For illustrative purposes, the worker bees have been removed. This comb is approximately 70 percent filled with capped brood (pupae). The picture is only one-half of the comb; for inspection purposes, both sides of the comb would need to be examined. This is a typical brood pattern for a young queen in good health. The top corners of the comb are filled with ripening nectar, and a narrow band of stored pollen is between the nectar and the brood.*

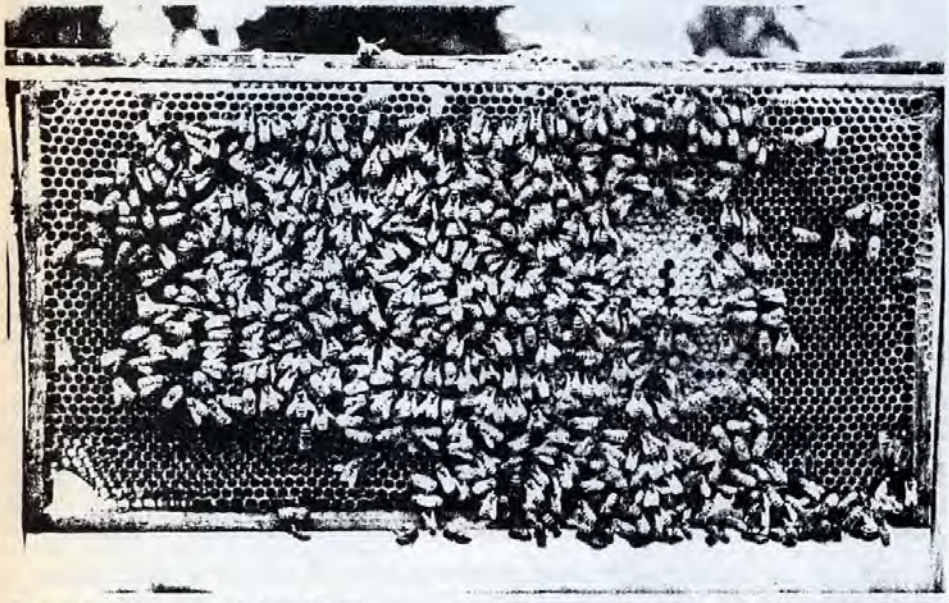

Figure 4.—*A standard deep Hoffman comb with brood and adult bees. This comb side would be rated as 50 percent covered with adult bees. To estimate the amount of brood accurately, the bees would need to be shaken off the comb. There are approximately 600 worker bees in this photograph.*

Simple multiplication then shows that a Grade A Orchard colony must have 14,000 adult bees. The Grade A Field colony must have 24,000 adults.

Washington's standards are stated somewhat differently. The number of adult bees, "six frames, two-thirds covered with bees at a temperature of 65°F.," will not reflect all the bees in the colony, as about one-third more adults than measured would be foraging. Therefore, the total number of adults in a minimum standard colony would be approximately six frames fully covered or 14,400.

Food requirement. A colony of honey bees requires nectar and pollen for normal growth. The food requirement of a hive is met in two ways, by the daily activities of foraging bees and from food stored in the combs.

An overwintered colony should never be allowed to have its stored food reserves drop below 10 pounds. Inclement weather is a frequent feature of early flowering crops such as tree fruit.

A colony unable to forage for even 2 or 3 day during poor weather can easily exhaust 10 pounds of honey in that short a time. Starvation could rapidly mean the death of that hive and the loss of its benefits for pollination.

A normal queen. The queen is the sole egg layer in a healthy colony and the heart of the hive. Without her, a colony will not increase in size because normal replacement bees will not be produced to compensate for the natural mortality of the older bees.

Eventually, a queenless colony will have no brood and, therefore, no stimulus for bees to collect pollen. As a general rule, production colonies should have queens less than 2 years old. The reason is that, as a queen ages, her ability to lay eggs decreases.

The egg-laying capacity of a queen 3 or more years old is usually not enough to maintain a colony at proper strength for pollination or honey production.

Grade B colonies. In the Oregon regulations, these are hives that fail to meet Grade A standards on the amount of bees and brood by not *more* than 25 percent—but do meet all other requirements of a Grade A colony.

These units for orchard pollination would have at least 450 square inches of brood, 4½ frames of bees, and approximately 10,800 adults. A colony of this size would be of minimum pollination value.

A Grade B Field crop unit would have a minimum of 750 square inches of brood and 7½ frames of bees, or approximately 18,000 adults.

Notice that a Grade B Field crop unit is stronger than a Grade A Orchard colony.

It is relatively simple to describe colony-strength standards for pollination. In the field, colony-strength inspections require opening the hives and removing combs to examine the biological activities within the colonies. This is a practice most non-beekeepers would rather avoid!

Continued On Next Page

However, beekeepers who rent colonies for commercial pollination should be willing to open their hives and show the grower the quality of the units to be rented. Beekeepers will usually provide the grower with the necessary protective garments such as a veil and gloves.

We suggest that growers ask their beekeepers to randomly open portions of the hives, so that the growers can indeed see what they are paying for.

Ideally, colony inspections should take place in mild weather that allows for good bee flight. Growers should *not* attempt to conduct in-hive inspections without the beekeeper's permission. Even gentle bees will offer a stiff defense if they're examined in cool, windy, or rainy weather—especially by an inexperienced person.

Colonies can also be examined with some degree of accuracy *without* opening them and inspecting combs. On a good foraging day, when the temperature is above 60°F (preferably above 65°F), a grower can observe the flight activity of the colonies. Good colonies will have relatively uniform flight from each hive.

Preliminary data from Washington State University indicate the colony is a good pollinating unit if there are more than 100 incoming bees per minute at 65°F and above, with winds less than 10 miles per hour.

By standing close to (but *not* in front of) the hive entrances, growers can examine incoming bees for the presence of pollen pellets attached to the pollen baskets of their hind legs.

Continued On Next Page

Due to an error in Wilbanks' summer & fall queen prices in the January & February issues, we regret any inconvenience this may have caused.

On the average, one-fourth to one-third of the returning bees will be pollen foragers, as opposed to nectar collectors. However, this percentage will vary, depending upon the crop, the time of year, the time of day, and the amount of brood in a hive.

Rented colonies should be of uniform physical size, but remember that the quality of the colony *inside* the hive is not always related to the *outward* appearance of the hive bodies. A fresh coat of paint—or the lack of it—has no relationship to the number of bees in a hive!

Colony flight. Bees must have suitable light and temperature before they begin foraging. A general observation is that stronger, more populous hives will begin foraging at a lower temperature than weaker, smaller colonies. Even so, only rarely will honey bees fly at temperatures *below 55°F.*

As the outside temperature increases to about 70°F, the number of bees foraging from a given colony increases. Here's a rule of thumb for relating *springtime* temperatures to foraging:

- 55° to 60°F — some foraging
- 60° to 65°F — a moderate to fair amount of foraging
- 65° to 70°F and above — the maximum amount of foraging

During *midsummer,* the same colonies will often not start foraging till the temperature reaches 70°F. The bees' "acceptable foraging temperature" apparently shifts with colony requirements and the season.

Department of Agriculture colony inspections. If you are concerned that a colony you have rented is not strong enough for the job, you can request an inspection of the hives, in Oregon and Washington, by the apiary inspection service at your state department of agriculture. (The Idaho Department of Agriculture does not offer colony-strength inspections.)

A state bee inspector will then examine the hives for grade standards and will charge you for the service at an hourly rate.

In Oregon, phone the Commodity Inspection Division, Department of Agriculture, Salem (503-378-3774). In Washington, phone the chief apiary inspector, Department of Agriculture, Yakima (509-575-2756).

Recommendations for renting bees

It is wise to contact your beekeeper long before the anticipated bloom period of your crop. In order to schedule the movements of their hives, beekeepers need to know well in advance the time their colonies will be used.

Use of a contract. For many growers and beekeepers, the use of a written pollination contract has not been necessary. However, a written contract is often advisable for growers who use a new beekeeper, or for beekeepers who service a new grower.

Whatever the situation, both grower and beekeeper need to understand various aspects of the rental. These include—but are not limited to—the following points:

1. *Number of colonies* to be provided.
2. Guaranteed *colony strength.*
3. *Timing* of colony movement into and out of the crop.
4. *Placement* or distribution of the colonies within the crop.
5. Colony *rental fee* and *schedule of payment.*
6. *Right of entry* to the beekeeper, for colony maintenance.
7. *Advance notice* to the beekeeper if any pesticide that is toxic to bees will be applied while the colonies are in the crop.

Growers need to appreciate the value of a strong colony of honey bees in maximizing crop yields.

Consider the rental of honey bees *not* as a guarantee of crop success, but rather as a guarantee against crop failure.

A working partnership between a grower and a beekeeper best assures the maximum use of honey bees as pollinators.

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himself. The wide-eyed enthusiasm of the scouts as the honey pails were emptied into the bottling tank, was an experience etched in these boys' minds forever.

The program as delineated is demanding, not only from the standpoint of time but also in respect to material covered. The philosophy practiced by us has always been to set individual standards which are compatible with the person's abilities. These standards are taken into account when the merit notebook is graded. Each scout that has gone through the program comments, it's tough, it's the most interesting and the badge is his most treasured award.

Figure 3.

1. A fertilized egg produced a _____.
   An unfertilized egg produces a _____
2. The stages of the honeybee development are:
   _____ _____ _____
3. The two dances that the bees do are:
   _____ _____.
4. The three kinds of bees are:
   _____ _____ _____
5. Three duties that a worker performs in her life are:
   _____ _____ _____
6. A good queen can lay as many as _____ in a day.
7. The workers feed _____ to a larvae in order to produce a queen.
8. The life span of a worker in summer is _____.
9. What influences the nature of the hive?_____
   _____
10. _____of agricultural food production is related to the pollination of bees.

ANSWERS: 1. worker or queen, drone; 2. egg, larvae, pupal;3. round tail and wag tail; 4. worker, drone, queen; 5. nurse bee, guard, gatherer etc.; 6. 1500 ; 7. royal jelly; 8. 6 weeks; 9. the queen's pheromones; 10. ⅓

Figure 4

1. Name the four things collected by the bees:
   _____ _____ _____ _____
2. Name 2 uses of beeswax. _____ _____
3. The first source of pollen in this area is_____
4. _____provides fat and protein for the young bees.
5. _____dilutes honey and cools the hive.
6. _____is used to fill cracks and crevices in the hive.

ANSWERS: 1. water, pollen, nectar, propolis; 2. candles, polishes, waxes, batick, for fishing lines etc.; 3. skunk cabbage; 4. pollen; 5. water; 6. propolis

References

Boy Scouts of America, Handbook for Scoutmasters, Volume One, New York, New York, 1938.

Root, A.I., A.I. Root Catalogue, 1981.

VIRGIN ISLANDS

Continued from page 140

Mark Beresford

There is an all-year round nectar flow, typical of the tropics, so no supplemental feeding is required. He estimates each hive yields about 150 pounds per year, and there is a ready market on the island for all of the honey. He usually extracts about October using a motorized 4-frame extractor.

The plants with particularly good nectar sources were limeberry (*Triphasia trifoliata*) and coral vine *(Antignon leptopus).*

This small but productive operation is a model for what can be done in the Caribbean with modest investment. Land area is not a problem, and there are adequate nectar sources, cultivated as well as wild.□

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Honey from clover, goldenrod, alfalfa and many other plants are fast-granulating. The faster it granulates, the finer the crystals and hence, the smoother and nicer the product. Granulation can be hastened by "seeding," that is, by mixing in some finely granulated honey, stirring thoroughly, and leaving in a cold room. Use good, thick, well-ripened honey, to make sure no fermentation occurs after granulation. Some people heat the honey first, to prevent fermentation, then when it is cool seed it, but that never worked well for me. Best temperature for fast granulation is in the 'fifties (F). It doesn't crystalize as fast at colder temperatures.

— Richard Taylor

Q. I give my bees an extra shallow super in the fall, on top of the double story hives, so they will have plenty of winter stores. In the spring I put a queen excluder under the shallow super to keep the bees from raising brood in it, but sometimes I find brood already there. Is it all right to drive the queen back down with smoke? **William F. Stapel, N. Muskegon, MI**

A. Sure, but then check again after four days or more to see that there are no eggs in the shallow super. If there are, then the queen did not go down. You can also, if you see the queen, brush her off into the hive below with a bit of grass, or you can shake all the bees off the combs at the entrance, letting her re-enter the hive there.

— Richard Taylor

Q. Suppose one were to create a two-queen colony this way: Insert an excluder between the top and bottom story, with queen below, wait a week, then give the upper story and upper entrance and a capped queen cell. Would that work? **Kent & Sharon Wenkheimer, Peck, Idaho**

A. I doubt it. You need more than an excluder to separate the two parts. I believe that either (1) the bees would soon swarm, leaving the new queen to head the parent colony, or (2) the virgin queen would penetrate the excluder to attack the queen below, or (3) the bees would tear down the new cell.

— Richard Taylor

NOTE: In the last issue's Questions & Answers we cited Dr. Taylor's contribution to the last several items and neglected to note the help of Bruce Wright, Ohio.

MAILBOX

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List of Company's with NO trachael mites found

John Pennington — 194 Cooper Hurst Rd., Pearl MS 39208

John Ed Montgomery-Montgomery Apiaries — Route 1, Box 201, Saltillo, MS 38866

Hubert Tubbs — P.O. Box 3, Webb, MS 38966

J.N Russell — P.O. Box 53, Bolton, MS 39041

Stover Apiaries — Mayhew, MS 38868

Holder Homan — Rt. 2, Shannon, MS 38868

Farris Homan — P.O. Box 4, Shannon, MS 38868

Roy Collins-Wildwood Apiaries — 407 Chestnut, Starkville, MS 39759

McCary & Sons Apiaries — Buckatunna, MS 39322

J.W. (Honeybee) Hendrix — Route 2, Box 416-West Point, MS 39773

Donald Rushton — Route 6, Box 15, Laurel, MS 39440

Ken Riley — Route 4, Box 380, Arberdeen, MS 39730

Alfred Andrews — 827 Cromwell St., West Point, MS 39773

Luther Williams — Route 1, Box 21, Macon, MS 39341

OHIO

March 23, the Ohio Beekeepers will hold their spring meeting on the OSU campus. The featured speaker will be Dr. Eva Crane from England. Dr. Crane will be in the U.S. for the purpose of receiving an honorary Doctorate degree from Ohio State University. For further information, contact James Thompson, 8227 Eby Rd., Smithville, OH 44677, (216)669-3352.

TESTING YOUR BEEKEEPING KNOWLEDGE

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the base, where they are placed by a queen.

No evidence of a queen present.

Large population of under-sized drones.

10. Fume board and chemical repellent: Benzaldehyde (oil of almond), or Butyric anhydride (Bee-Go®).

Porter bee escapes.

Shaking and brushing the bees from the combs.

Bee blowers (high volume, low-pressure air supply).

11. Absconding is when an entire colony of bees abandons the hive because of disease, wax moth, or other maladies. Even though some brood may be left behind, no provision for the replacement of the queen occurs.

12. The presence of white, freshly secreted wax along the lower edge of the combs' top bar is an indication that an additional super is needed.

13. Queen cells on the comb surface in a colony with a double brood chamber usually indicates that the colony is in the process of supersedure (replacing the old queen). No action should be taken.

14. Bees clustered at the top of the upper-most hive body in the winter is a signal for the beekeeper that emergency feeding or rearrangement of food stores is needed. Adequate supplies of honey and pollen above and to the sides of the cluster are essential, especially if brood rearing is occurring.

There was a possible 20 point in the test today. 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

20-18 Excellent 17-15 Good 14-12 Fair

NEWS and EVENTS

Beekeeping Course Available through UC Davis Extension

Two courses in beekeeping will be offered by UC Davis Extension this spring.

"Intermediate Beekeeping Workshop" will be offered in Davis from 9 a.m.-4 p.m., April 27.

Students will learn to effectively manage colonies of bees, including diagnosing and treating diseases, feeding, rearing, introducing queens, and evaluating colony performance. Honey production and harvest, and proper use of beekeeping equipment will also be covered.

The enrollment fee for the course is $50.

"Queenrearing" will be offered in Davis from 8:30 a.m.-5 p.m. on May 11.

This course includes the principles of queenrearing as well as demonstrations of practical techniques. Participants will perform all operations involved with queenrearing.

The enrollment fee for this course is $50.

To enroll in either course or for more information, call (916) 752-6021.

Mite Workshop for Beekeepers

A laboratory based workshop is scheduled for Saturday, March 16, 1985 at the Waterbury Branch of the University of Connecticut. Course instructors are Professor Alphonse Avitable and Dr. Larry Connor. The course will run from 9 a.m. to 3:30 p.m. and will show beekeepers how to examine their own bees for the tracheal bee mite *Acarapis woodi*. Mite contaminated samples will be made available. Several techniques will be shown for mite detection.

Biology and literature information will be presented on both *Acarapis* and *Varroa*.

The course fee will be $25 per person, and will include handout materials. The course will be limited to a small enrollment, but if an overflow situation exists, the course will be repeated on March 17.

Registration in advance is required. Write to MITE WORKSHOP, P.O. Box 817, Cheshire, Connecticut 06410. For further information call 203-271-0155.

Bee School Set For Western Connecticut

A five-evening beekeeping school is scheduled for the Fairfield County Cooperative Extension Service Offices in Bethel Connecticut starting Tuesday, March 5th 1985, and running for five consecutive Tuesdays.

The school is open to all beekeepers and non-beekeepers. Basic beekeeping methods will be taught through demonstrations, lectures, and slide programs. The *Beekeeper's Handbook* will be the textbook, and will be supplemented by the Home Study Program titled 'Beekeeping Basics' by Dr. Larry Connor.

Dr. Connor will conduct many of the sessions and coordinates the instruction. The fee for the course is $60 for instruction, textbook and home study program, or $25 for the course only.

Sponsored by the Fairfield Cooperative Extension Service, the Western Connecticut Beekeepers Association, and Beekeeping Education Service, course reservations are being taken by Mr. Howard Kemmerer, County Extension Agent, RD 2, Box 165A, Bethel, Connecticut 06801. Phone 203-797-4176.

Beekeeping Short Course Offered At Delaware Valley College

A short course on "Beekeeping" will be held at Delaware Valley College, Route 202, Doylestown, PA. This course will be offered on three consecutive Saturdays, March 30, April 13 and April 20, 1985. Classes begin at 8:30 a.m. and continue until 4:30 p.m. Instructors for the course will be Dr. Berthold from Delaware Valley College assisted by Jack Matthenius, New Jersey Supervisor of Bee Culture.

Subjects to be covered are: Honey Bee Diseases, Equipment and its use, Locating your apiary, Seasonal Management, Uses of Honey and Bee Yard-Colony Manipulation.

It is suggested that a 3-ring notebook be carried for materials to be distributed. Those having bee veils should bring them for field work.

Class will be held at Mandell Science Building, Room 114. The fee for the course is $30.00.

For further information contact: The Director of Continuing Education, Delaware Valley College, Doylestown, PA or call 215-345-1500.

Beekeeping in South America Talk To Be Featured

Doylestown — Dr. Rad Roberts, Rutgers University Beekeeping Specialist, will be the featured speaker at the Thursday, March 28, 1985 bee meeting. The meeting will begin at 8:00 p.m., and its being sponsored by the Bucks County Pennsylvania Beekeepers Association, the Delaware Valley College Apiary Society, and Delaware Valley College. The meeting will be held in the Mandell Hall Auditorium on Delaware Valley College's main campus located on Route 202, one mile west of Doylestown, Pennsylvania.

Dr. Roberts who is in charge of the Rutgers University Beekeeping program has just recently returned from a prolonged stay in South America where he had the opportunity of observing their beekeeping practices as well as getting a first hand look at the so called "killer bees". Dr. Robert's illustrated talk will deal with both of these topics. The meeting is open to the public; anyone interested in attending is cordially invited to do so. There is no admission fee.

Starting the following Saturday, March 30, 1985 and continuing on Saturday, April 13 and April 20, 1985 Delaware Valley College will be presenting its Annual Spring Beekeeping Short Course. The three day short course is designed to benefit not only

Continued On Next Page

the established beekeeper but also those who think that they might be interested in learning more about the honey bee and how it is cultivated. Additional information about the course may be obtained by writing Dr. Bob Berthold, Delaware Valley College, Doylestown, PA 18901 or by calling the College at 215-345-1500.

Introduction to Beekeeping Telecourse offered in Indiana

Purdue University will be offering a two-hour introduction to beekeeping over their closed-circuit television system (IHETS) on Wednesday, March 13 from 7:30-9:30 p.m. This is a live video telecast with phone communication for questions and answers. This is the first time a beekeeping course has been offered over the IHETS system.

The course is primarily designed to give those persons interested in getting started in beekeeping the necessary information to do so. Persons who already have bees are also welcome and are encouraged to attend as there will also be a brief update on the honey bee tracheal mite and Africanized bee situations.

Persons living in Indiana or those who are willing to travel to one of the approximately twenty receiving sites in Indiana should contact the nearest Indiana Cooperative Extension Office or Bill Chaney at the Dept. of Entomology, Purdue University, West Lafayette, IN 47907 for more details. The registration fee will be $10 per adult.

Kansas

The Kansas Honey Producers Association will hold its spring meeting March 29th and 30th at the Elks Lodge, Abilene, Kansas. The program on Friday will feature guest speaker Ivan Stoller of Stoller Honey Farms, Inc., Latty, Ohio. Cooking with honey demonstrations by the state and local honey queens, and a talk on honey promotion. A banquet is planned that evening with a cost of $8.00 per adult and $3.50 for children 12 and under. A report will be made that evening on the mite problem by state apiary inspector Gary Ross.

Saturday's agenda will include the Kansas Honey Queen and a field trip to Lenhart's Apiary and Honey House. For further information on the meeting write to Melissa Noel, 7327 Sloan, Kansas City, Kansas 66109.

Alan King, left, of Indianapolis, Indiana, was named 1984 Indiana Beekeeper of the Year at the Fall Convention of the Indiana State Beekeepers Association. The award is being presented by Claude F. Wade, Secretary to the Association. The Indiana Beekeeper of the Year Award for outstanding beekeeper who has promoted honey and beekeeping in Indiana was started in 1970. Mr. King is serving his second year as president of the association.

1985 Indiana Honey Queen

Suzanne Bishir, 18, daughter of Mr. & Mrs. Duane Bishir, is a senior at Western High School and lives near Russiaville, Indiana. Fashion Merchandising, tennis, hiking, skiing, animals, music, aerobics, are a few of Suzanne's hobbies. She writes for her school newspaper, is a member of her church youth group, a nine year member of 4-H of which she held offices, and also beekeeping projects. She also helps prepare honey market with her family. Suzanne was crowned at the Fall Convention of the Indiana State Beekeepers Association at the Ramada Inn, Fort Wayne, Indiana, on October 27, 1984. Suzanne will be promoting honey at various events throughout the state. Photo: Courtesy of Kokoma Tribune.

BUY & SELL

Classified rates: 49 cents per word, each insertion, payable in cash in advance. Each initial, each word in names and addresses, the shortest word such as "a" and the longest word possible for the advertiser to use, as well as any number (regardless of how many figures in it) count as one word. Not less than 10 words accepted. Copy or cancellation orders MUST be in by the 1st of the month preceding publication. Send classified ads to the A.I. Root Company, Advertising Dept., GLEANINGS IN BEE CULTURE, Box 706, Medina, Ohio 44258-0706 **Note: BLIND ADS: Any ad sent in that does not contain the seller's Name and Address within the ad, will be charged an additional $6.50 per month.**

MAGAZINES

THE AMERICAN BEEKEEPING FEDERATION needs your support! Join in supporting efforts to stop adulteration, to improve marketing conditions and to encourage the continued research on African Bees and Varroa and Acarine Mites. Send for information, membership application and sample copy of bi-monthly News Letter! Write To: **THE AMERICAN BEEKEEPING FEDERATION, INC., 13637 N.W. 39th Avenue, Gainesville, FL 32606.** TF

THE SCOTTISH BEEKEEPER — Magazine of The Scottish Beekeepers' Association, International in appeal. Scottish in character. Membership terms from A. J. Davidson, 19 Drumblair Crescent, Inverness, Scotland. Sample copy sent, price 20 pence or equivalent. TF

The INTERNATIONAL BEE RESEARCH ASSOCIATION urgently needs your membership and support to continue its work of publishing informatin on bees, beekeeping and hive products. Write for details about publications and the benefits of membership to USA Representative, H. Kolb, P.O. Box 183, 737 West Main, Edmond, OK 73034 (phone (405) 341-0984); or to IBRA, Hill House, Gerrards Cross, Bucks SL9 ONR, UK, regularly publishes new information on bees, beekeeping, and hive products, for beekeepers and scientists all over the world. Mail inquiries from USA: H. Kolb, P.O. Box 183,, 737 West Main, Edmond, OK 73034, Phone: (405) 314-0984. IBRA PUBLISHES: **Bee World,** a quarterly journal for the progressive beekeeper. **Apicultural Abstracts,** a survey of scientific literature from all languages. **Journal of Apiculture Research,** for original bee research papers. Books and pamphlets on all beekeeping topics. Catalogues of publications and details of journals and membership $1. Specimen copies of **Bee World**; **Journal of Apicultural Research** or **Apicultural Abstracts** from INTERNATIONAL BEE RESEARCH ASSOCIATION, Hill House, Gerrards Cross, Bucks. SL9 ONR, England. TF

DAIRY GOATS—for milk, pleasure and profit. Excellent for children, women and family! Monthly magazine $11.00 per year ($13.50 outside U.S.A.). DAIRY GOAT JOURNAL, Box 1808 T-3, Scottsdale, Arizona 85252. TF

BEEKEEPING. A West Country Journal—written by beekeepers—for beekeepers. 1.50p inland or 1.80p ($4.00 Overseas). 10 issues yearly. Editor, R. H. Brown, 20 Parkhurst Rd., Torquay, Devon, U.K. Advertising Secretary, C. J. T. Willoughby, Henderbarrow House, Halwill, Beaworthy, Devon, U.K. TF

SCOTTISH BEE JOURNAL. Packed with practical beekeeping. Sample copy from Robert NH Skilling, FRSA, 34 Rennie St., Kilmarnock, Scotland. Published Monthly, $4.00 per annum. TF

BEE CRAFT — Official (monthly) magazine of the British Beekeepers Association. Contains interesting and informative articles. Annual Subscription $5.10 (surface mail) and $7.10 (Airmail). The Secretary, 15 West Way, Copthorne Bank, Crawley, Sussex, RH10 3DS TF

INDIAN BEE JOURNAL Official organ of the All India Beekeepers' Association, 817, Sadashiv Peth, Poona 411030. The only bee journal of India Published in English, issued quarterly. Furnishes information on Indian bees and articles of interest to beekeepers and bee scientists.

Annual subscription postpaid in foreign countries: For individuals US $7.00 for institutions, companies and corporate bodies US $10.00 or it's equivilent, to be received in advance by IMO or bank draft, payable in Poona (India). TF

WANTED

WANTED—All varieties bee gathered pollen. Must be clean and dry. Pollen traps available. Hubbard Apiaries, Onsted, Mich. 49265. Phone: 517-467-2151. TF

WANTED — Old Beekeeping Books and Bee Journals. James Johnson, 107 State Ave., Terra Alta, W.V. 26764. TF

Wanted — Experienced Beekeeper until May 15th; Top wages; Will consider permanent. Richard Winesett, 1574 Passaic, Fort Myers, Florida. (813) 332-2205; (813) 332-2205. 3/85

WANTED: 1500 colonies of bees and equipment to lease on shares for 1985 crop in my North Dakota clover, alfalfa, sunflower locations. Must be disease and mite free. Jack Egeland, Rt. 4, Box 35B, Yoakum, Texas 77995. Phone 512-293-5844 4/85

HELP WANTED

Help Wanted: 2 Professional bee men for year-round work. Must have large scale queen rearing and package bee experience. Also can use 2 part-time bee men for package season February through May. Absolutely NO DRUG USERS. **Huck Babcock, P.O. Box 2685, West Columbia, SC 29171. Phone: 803-256-2046.** TF

SINGLE MAN — preferred, in the production of honey in the Northeast for our successful honey business of 50 years. Job starting May 1st. Howland's Honey, R 2, Box BEE, Berkshire, NY 13736 4/85

HELP WANTED— Responsible, experienced beekeeper for year round employment. Send resume to Powers Apiaries, RR #5, Box 356, Bismarch, N.D. 58501 3/85

FOR SALE

Protective Clothing for Beekeepers. Write now for brochure. B. J. Sherriff, Dept. GBC P.O. Box 416, Nacoochee, GA 30571 TF

INSEMINATION DEVICES. For prices write Otto Mackenson, Box 1557, Buena Vista, CO 81211 TF

For Sale: clean, fresh, dry, Bee Pollen. $6.50/pound. You pay shipping. Honeycomb Apiaries, R.R. 3, Box 74, Wrightstown (Kaukauna), Wi. 54130. Ph: (414) 532-4314. TF

FOR SALE: Bee Operation on 15 acres. 14' x 60; wood frame building on cement. Also 20' x 30' storage shed. Excellent line of equipment plus 500 hives. 25 yard sites available mostly on Sweet Clover. Call 873-5900, Renaud Realty, Box 416, Tisdale, Sask. SOE ITO TF

FOR SALE: 2700 colony bee operation with North Dakota locations, Texas locations, and queen and nuc business. 10 acres with 3 bedroom mobil home and warehouse in Texas. MITE FREE and ready for production. Equipment in excellent condition. Reply to Gleanings in Bee Culture, P.O. Box 706, Medina, Ohio, 44258-0706. JE 4/85

Honey refractometer and bee equipment, write 242 E. Larwill St., Wooster, Ohio 44691 JC 3/85

For Sale by Owner: Complete operation, 325 colonies, 5 deep high on location. Additional locations for 700 more. Sell separate or together with honey house and equipment. Ideal set up for combining with southern location for migratory operations. North Central Nebraska. (402) 376-1262 (evenings). MF 4/85

150 STANDS BEES WITH RELATED EQUIPMENT SALE. FOR DETAILS WRITE STEARNS, 4605 REDSTART, HOUSTON, TX 77035 6/85

For Sale—Honey Bear Labels in color $10 per 100. Write for samples and your address to put on labels. Funk Honey & Vegetable Farm, RR 5, Box 199, Portland, IN 47371. Ph: 219-726-2425 3/85

4-Frame Extractor $135.00, Wax Melter $150.00, New Bee Hives $27.50, Used Shallow Supers $10. Ed Scales, 51515 Webee Rd., Bellaire, Ohio 43906. Ph: 614-686-2645 3/85

1200 Colony operation in Ontario, Canada with pollination contracts. David Mitchell, Box 48, Vineland, Ontario LOR 2CO 3/85

For Sale — One American Bee Journal—Vol. 1, 1861. One Gleanings in Bee Culture— 1 Volume, 1873 through 1876, hard bound. Also old journals. Glenn Reed, 537 — 2nd Street, Evansdale, Iowa 50707. 3/85

FOR SALE: 90 2-story 10-frame hives, good equipment $50.00 each. 100 2-story 8-frame hives, excellent equipment $55.00 each. Ph. 303-857-2445 GJ 4/85

For Sale: Cook & Beals uncapper $25.00. Two 3,000 gallon stainless steel outside tanks, cork insulated, steel jacket $2300. each. Bobcat Trailer just overhauled $1000. Also Forks & Apron & Barrel Holder. 2-Wheel heavy duty hand carts, Barrel carts, & drip pallets. Ph. 608-356-7038. GK 3/85

FOR SALE: 200 Colonies, 2 deep, 10 frame equipment, strong out of almonds, not split, on pallets with own bottom board $65. — Pick them up with 4 WD towable forklift-V-8 Ford, double forks with hydraulic holdown— $10,000. Put them on 1960 Ford 19 foot flatbed, Perkins diesel $3000. All available after almonds can be seen in modesto. Call Russ Webb, P.O. Box 117, Garden Valley, CA 95633. Ph. 916-333-1106 3/85

For Sale — 25 Strong hives $50 each. Move or stay. Also extra equipment and supers. Barney Miller, 6522 Wetmore, Everett, WA 98203. Ph: (206) 355-5777. 3/85

BLACK LOCUST for bees 7¢ each. HYBRID POPLAR for firewood 13¢ each. 616/464-5809. CSF 3/85

For Sale — Unusual honey pots for sale, write J. STeed, P.O. Box 115, Richmond, KY 40475. TF

For Sale: Bee Business in Central Montana. 2500 palletized 10-frame colonies registered state protected locations. Complete facilities — honey houses and equipment, forklift and trucks. Call 406-632-4654. LB 5/85

FOR SALE: Deep supers, 10 frame, wired foundation, $18.00; Deep supers, 9 frame, drawn comb, $21.00; Kelly 33 frame radial $650; Kelly 8 foot uncapping tank $150; power staplers including staples, $270 each; Air compressor $250; Inner covers $100; Bottom boards $4.00; Telescoping covers $1.00; Ten 4-story hives $100 each; Deep wired foundation 50● each; numerous misc. supplies; all quantities limited; (206) 454-4612; Mason Hess, 2726—106th PL SE, Bellevue, WA 98004 3/85

For Sale: 1,000 colonies. 10 frame and 8 frame equipment, two and three stories high with additional supers available. Jelinek Apiaries, 130 E. Filion Rd., Filion, Mich. 48432. (517) 874-4355 or (313) 987-6593. 3/85

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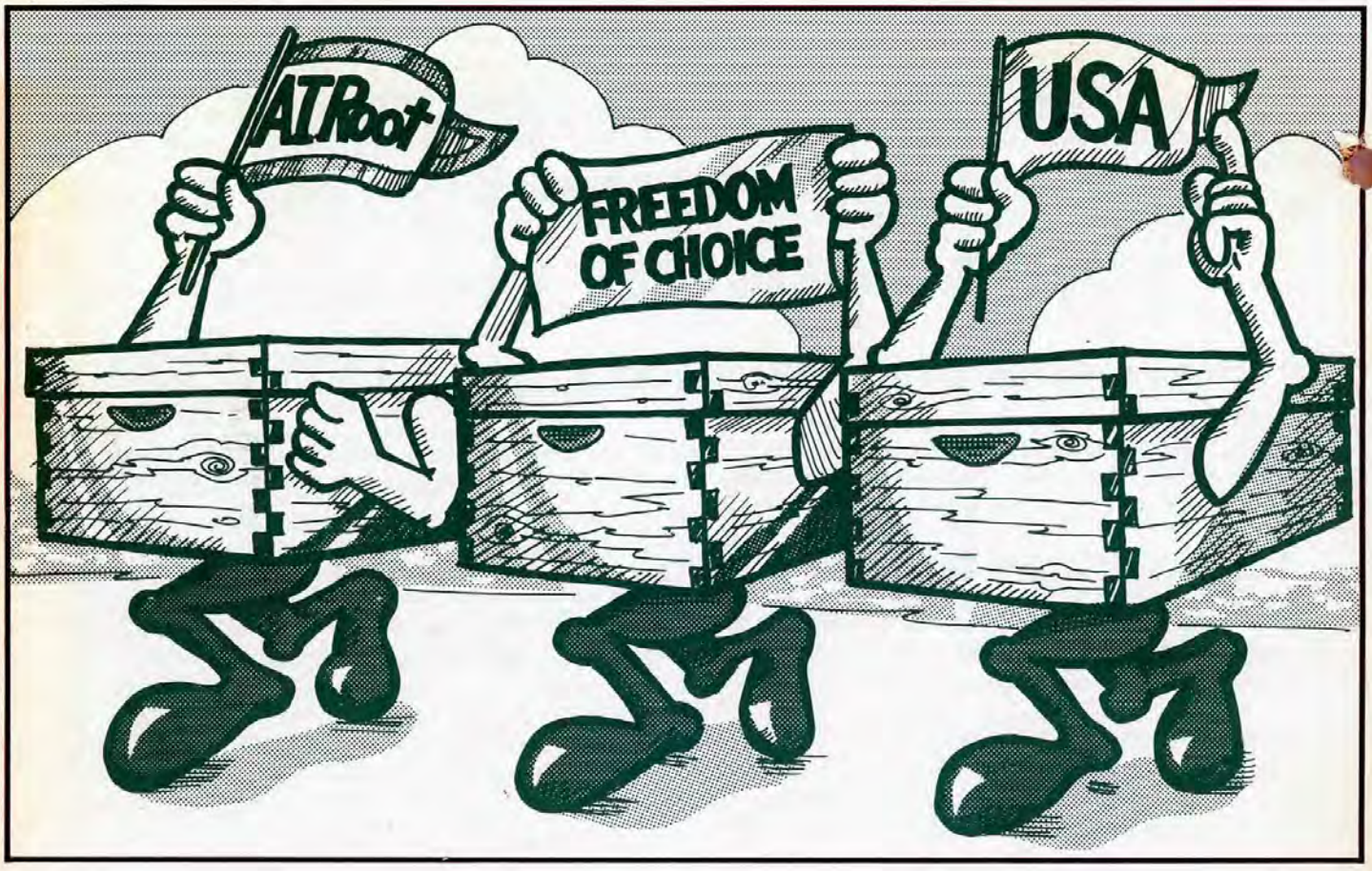

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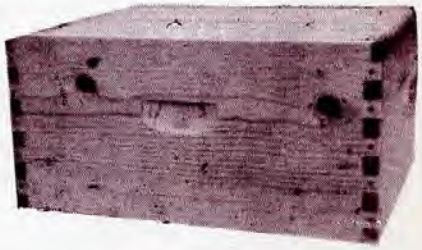

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