

GLEANINGS IN



FEB '88

BEE CULTURE

INSIDE:

Honey Bee
Genetics
Part II

Bee Pasture
Perspectives

Varroa In
Poland

Early Spring
Inspections



AND MUCH, MUCH MORE. .

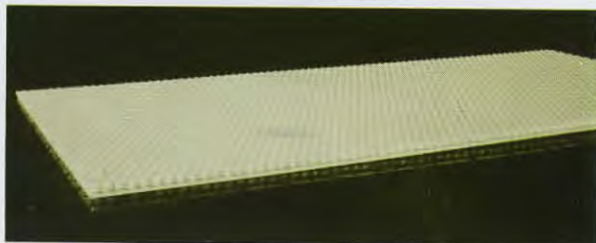
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FEBRUARY CONTENTS

(ISSN 0017-114X)

Vol. 116, No. 2

115 Years Continuous Publication by the Same Organization

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- **HONEY BEE GENETICS** Steve Taber **68**
Part 2 of this 3 part series looks at the breeding and background genetics for the Midnite and Starline hybrids; plus some problems associated with these types of programs.



- **VARROA IN POLAND** Piotr Jurga **84**
After over 8 years of learning to live with this pest, Polish beekeepers have settled on a variety of chemical controls and also have discovered much of its biology.



- **EARLY ON** Phil Mariola **90**
The first spring inspections are the most important you will make all year. Feedings, brood rearing and disease are all critical aspects to check for in February and March.

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NEXT MONTH

For many of us the world starts getting just a little crazy next month when we start finding that the tasks we kept putting off all winter need to be done yesterday. The March *Bee Culture* will help a bit, so that come April you won't be quite so far behind.

We'll be looking at information on swarms and swarming next month to help prepare you for the busiest time of the year. Plus, we'll take a quick look at some history of swarm control techniques. Reinventing the wheel may be fun, but certainly not profitable. Of course, splitting and requeening colonies is part of this, so we have some thoughts on those activities, too.

Part of good apiary management consists of having a donor colony. Phil Mariola hints at how these work this month, but goes into detail next month. A great way to save work — and bees!

High-Tech Beekeeping? Well, not quite, but using radar is helping researchers understand some aspects of drone behavior. We'll have the low-down on this high-tech activity here in March.

You want more? O.K.! More on marketing from R. T. Edwards; Dr. Beebe blasts common sense; writing a news release that works; even some tax tips for beekeepers — and there's still more!

Don't forget the third of Steve Taber's three part series on bee genetics. And — Richard Taylor, Charlie Koover, Clarence Collison, Ann Harman, James Tew and all the rest. Excellent reading, solid, practical information, and all the surprises we have EVERY month.

So be prepared, and enjoy it all — see *Bee Culture* in March. \$

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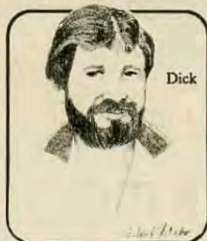
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THE INNER COVER

Well, the final results are in on the Ohio Estate's (and branch locations) honey crop. Boy, this was one weird year. Now we don't manage our colonies for maximum honey production, we don't pollinate, make splits or pour packages with our bees either. However, we do subject them to some rather bizarre management and equipment schemes.

Most small scale beekeepers try new things once in awhile, some certainly more than others. New equipment, or a technique learned or read or heard about. If they're smart, it gets tried on one or two colonies while the remainder go 'unmolested', and live normal, happy lives. After a season or two of trial and error, the new 'thing' is evaluated — then adopted on a larger scale or abandoned. And then usually something else gets tried. It goes on and on — it's one of the great things about beekeeping.

The Ohio Estate's bees tend to get a bit over worked in the trial and error area, though. In fact, they get trialed and errored to death occasionally. It sometimes gets to the point where there aren't enough colonies to go around for all the things that need doing. As a result, some of the colonies get two, or three, or four or more 'things' done to them, or with them or for them.

Actually, that's why we have colonies. That, and just getting to fool around with your nose in the bees once in a while.

So all things considered, that we got some honey this year is fairly amazing. But one of the benefits of doing all the research we do is that we have some incredible records. Records for every frame in every colony in all three apiaries. That may sound extreme, but in some colonies every frame was of a different style, or had some attribute that set it apart from its neighbor.

So we've records of honey production from each of those frames. We know how they worked this year, and last, and we know enough to use some of them next year and to trash the rest.

We also know which yards did the best, and worst, and by how much, and when. We know that we'll be moving some of the Estate colonies to one of our outyards this spring because, all things being equal, our out yard out-produced the Estate nearly 3 to 1.

Another set of records we have is an account of what our nectar sources are. After a few weekend afternoon excursions we've got a pretty good idea why one yard was good and one wasn't. Corn and hay (primarily grasses, not legumes) don't make much honey, while acres of sweet clover, basswood, fruit, wildflowers and fall goldenrod usually can be counted on for a great return.

Like I said, we've gone to some pretty incredible extremes for regular hobby beekeepers. But the time spent in collecting and analyzing all this information will certainly be useful — and productive, next year.

If you don't have good information about your colonies — each colony and each yard — from last season, now is a good time to start thinking about doing it next year. It not only can be profitable for you, but it will make life easier and you (and your bees) will see the results in a hurry.

Tony Jadczak is the Head Apiary Inspector for the State of Maine. I've known Tony since he started serving on the Board of

Continued on Page 103

COVER . . . Even when you expect the unexpected, Beekeeping may surprise you . . . when you look inside.

Drawing by Dwain Meyer

February Honey Report

February 1, 1988

The following figures represent current prices reported by our contributors. 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.								R	A
Containers Exchanged	1	2	3	4	5	6	7	8		
60 lbs. (per can) White	43.50	40.30	35.04	29.70	21.99	35.75	38.80	41.30	21.60-45.00	37.01
60 lbs. (per can) Amber	41.50	36.44	34.50	23.00	20.00	32.00	36.25	35.00	20.00-43.00	34.20
55 gal. drum/lb. White	.60	.60	.55	.45	.46	.62	.61	.60	.36-.67	.57
55 gal. drum/lb. Amber	.58	.48	.41	.37	.37	.53	.55	.49	.33-.65	.48
Case lots - Wholesale										
1 lb. jar (case of 24)	28.63	30.60	26.00	24.50	26.39	24.25	25.75	29.27	22.80-35.00	27.82
2 lb. jar (case of 12)	26.25	25.13	26.10	23.50	24.25	23.85	28.13	28.57	21.00-32.40	25.88
5 lb. jar (case of 6)	30.67	25.00	23.90	26.10	27.00	24.35	25.63	25.53	24.00-32.00	26.50
Retail Honey Prices										
1/2 lb.	1.00	1.01	.89	.85	.96	.85	.92	.89	.85-1.29	.94
12 oz. Squeeze Bottle	1.45	1.51	1.49	1.40	1.45	1.22	1.25	1.34	1.14-1.79	1.40
1 lb.	1.58	1.99	1.59	1.55	1.65	1.55	1.52	1.49	1.25-3.50	1.67
2 lb.	2.75	2.95	1.82	2.79	2.55	2.57	2.84	2.70	1.82-3.90	2.71
2-1/2 lb.	3.55	3.38	3.40	3.00	3.29	3.13	3.75	--	2.90-4.00	3.36
3 lb.	4.10	4.07	3.49	3.30	3.39	3.91	3.82	3.32	3.15-4.20	3.77
4 lb.	5.20	4.58	4.25	4.00	4.10	4.62	4.85	--	4.00-5.40	4.65
5 lb.	6.50	5.53	5.75	5.79	5.71	5.25	5.81	5.11	5.00-7.00	5.74
1 lb. Creamed	1.75	1.50	1.59	1.59	1.69	1.55	1.63	1.76	1.35-2.25	1.68
1 lb. Comb	2.37	1.73	2.08	2.75	1.53	2.00	2.00	2.20	1.60-2.75	2.05
Round Plastic Comb	2.00	2.23	1.10	1.55	2.00	1.75	1.75	1.65	1.10-2.50	1.83
Beeswax (Light)	1.70	1.15	--	1.00	.81	.88	.95	1.82	.88-3.00	1.33
Beeswax (Dark)	.92	.98	--	.85	.72	.69	.83	1.15	.69-2.00	.97
Pollination (Avg/Col)	27.50	--	21.00	--	--	18.00	23.00	25.00	18.00-30.00	23.86

Honey Report Graph Features

On the far right hand side you will see two different columns. The first, labeled "R", is the price range of prices reported from all contributors -- lowest to highest. The second column, labeled "A", is the average price of a particular commodity across all regions. Example: the range in price of a 1 pound jar of honey sold retail is \$1.25 - \$3.50 and the average price across the country is \$1.67.

In the comments section you will see a figure called the "Price Index". This figure is only a descriptive statistic that compares ALL regions to the highest region of the month.

Example: Region 1 has a price index of 1.00 this month and remaining regions are compared to that index.

Region 1.

Price Index 1.00. Prices steady to lower, sales slowing a bit. Colonies in good shape generally, but some areas will need attention by spring because of light flow last year. Watch for feeding. Concern over varroa growing, but mixed.

Region 2.

Price Index .93. Sales and prices steady to increasing. Some areas with large crops have lower prices, but sales still good. Regional honey types strong seller. Most areas in good condition but warm fall and flying bees may require spring attention.

Region 3.

Price Index .85. Sales slow to very slow and prices dropping in many areas. Bees appear okay but check for feeding in some areas with warm fall.

Region 4.

Price Index .77. Prices steady but low compared to national average. Sales, however, are strong -- probably due to low prices. Feeding required in most areas because of poor fall crops. Varroa high on everybody's concern list.

Region 5.

Price Index .73. Sales slow and prices dropping. Packers generally paying below buyback, and not looking for white honey. Mild fall may require spring feeding. Varroa concern growing.

Region 6.

Price Index .83. Sales and prices steady to improving. Seasonal rush over, but pre-Christmas sales strong. Colony conditions strong, with spring outlook good.

Region 7.

Price index .91. Sales above average and prices firm to increasing. Colonies wintering well nearly everywhere, with good to exceptional snowfall providing needed spring moisture and colony insulation. Eastern Montana still needs more moisture.

Region 8.

Price Index .89. Sales normal to strong, with prices steady to a bit lower. Generally adequate moisture in most areas, pollination strong in southern areas, with feeding required there.

MAILBOX

10238 Mile Rd.
Chardon, OH 44024

The Editor
P.O. Box 706
Medina, Ohio 44258

Who's Teaching Whom?

Dear Editor,

Who gets the most out of telling the bee story to school children — the beekeeper or the children?

Recently I was asked to talk about bees to the children of Roosevelt School, Lima, OH. A date was set so the observation hive would still be in operation.

The props for my talk were an observation hive, hat and veil, comb honey, several jars of light and dark honey and pictures of bees. A half hour talk was prepared centered around the twelve pictures. At the time of the presentation, 80 some students walked into the assembly hall. After telling them about the members of the colony and the products of the hive, the principal of the school called for questions. He told them this was their science class for the week and each class would be tested on what they learned from this presentation. Then each class was allowed some time to look at the observation hive. In all, several hours were spent in telling the bee story.

A couple of weeks later I received a large envelope containing 72 letters of thank you from the students. I certainly enjoyed reading them and they made me feel good. Like I said, who gains more — the student or the teacher?

Donald Cox

Speak Out!

We encourage your input, comments, suggestions, ideas, thoughts and criticisms. Take a minute, write it down and send it in. We like to hear from you, and it will be the best spent 22¢ you can imagine.

Fair Trade vs. World Trade

Dear Editor,

Why do we import honey when we produce more than is needed? They call it fair trade. I must ask, fair to whom? Real fair trade would be when beekeepers in, lets say China, would trade goods with beekeepers in the U.S.A. and both end up satisfied with the deal. Now that sounds fair. It seems some didn't like the words, "fair trade" so now they call it "world trade". They know it isn't fair anymore. Our right to prosper in our chosen line of work has been taken from us.

If you think I am wrong, write to me but if you think I am correct, please write to your government representatives.

Norman E. Farmer
147 Perkins St.
Bristol, CT 06010

Shaparew Hive Top Ventilator

Dear Editor,

The comments below are in response to the article: "Bee Culture's 1987 Research Review", published in *Gleanings in Bee Culture*, Dec. 1987 issue.

I would like to commend The A. I. Root Co. for their efforts in testing and publishing the results on my Temperature Controlled Honey Drying Ventilator (H.D.V.) pages 701 and 722. The graph on page 722 shows a substantial difference in weight gain between test and control hives.

Several beekeepers have performed similar tests with H.D.V.'s during the last few years in different parts of U.S.A. and Canada. Their reports on increased honey production vary from 15% to 25%, depending on climatic region and nectar availability. The majority of reports have shown about a 20% increase. The honey from hives with H.D.V.'s contain about 1% less moisture.

With the spread of tracheal mites, *varroa* mites and AHB's, beekeeping will experience strong challenges. We will have to incorporate all possible improvements in beehive management to maintain our present productivity level. One such improvement is the H.D.V. with it's excellent potential for increased honey production. However, to dispel any doubts in beekeepers' minds, we must perform comprehensive tests on several dozens of hives in different climatic regions. The apicultural institutions, with their resources and capabilities, should conduct such tests and I am soliciting them herewith to participate in testing.

V. Shaparew
3371 Trafalgar Road
R. R. #1, Oakville,
Ontario, L6J 4Z2, Canada

Wax Processor Update

Dear Editor,

I still remember my advisor in graduate school saying the minute you complete a piece of research, it is already out of date. I don't think that he was a prophet, but rather he had come to this conclusion after years of experience.

The fact of the matter is that some of the information in my article that appeared in the December, 1987 issue of *Bee Culture*, on building your own wax melter, is already outdated. First, I came to find that W. T. Kelley Co., no longer makes a separate electrical control unit. I have been told that some electrical supply manufacturers do make units which could be substituted for the Kelley unit, but to date I have not been able to find one in a local store. Also, the company that supplied Agway with the immersion heaters is no longer producing that unit. Some stores may still have some of the original immersion heaters in stock, and there may be substitutes available that I am not aware of.

One solution to the problem, if you still want to build your own wax processor, is to substitute a Walter T. Kelley Co. 110 volt, 1,500 watt immersion heater for the immersion heater and control unit mentioned in



MAILBOX



the original article. We used one of these units in one of our wax processor prototypes, and found it satisfactory. It is threaded to be screwed into a one inch threaded fitting and has its own thermostat control unit with a sensor.

Robert Berthold, Jr.
Prof. of Biology
Assoc. Dean, Science
Delaware Valley College of
Science and Agriculture

Working For Free?

Dear Editor,

Some swarm collecting experiences I have had have been downright depressing:

- While removing bees from a rotten grainary, the owner told me to replace his rotten wood with new, since I had the bees;

- I once cut down and split a large tree with bees inside for the owners. They took the honey, and said I could have the bees — this was in October!;

- Once I cut up a bee tree for a fellow that had gone down in a storm. The center was hollow, but very narrow. The bees used 16 feet of it. I got no honey or bees, drove 30 miles one way several times to help. I helped the owner set up a hive, but his equipment was of no use — very old and abused. I ended up even losing a hive of my own in the process.

I'm not complaining, but I think our image as a "free" service needs to be examined. I'm 75, and not rich. These experiences aren't making me richer, or younger.

Walter Prahl
Mindo, SD 57559

Research Sinks

Dear Editor,

In the December "Research Review" by Dr. Roger Morse, he states that the dead mites will float to the top of a 70% alcohol solution. My experience with *Varroa* mite in alcohol (70% or 100%) is just the opposite. *Varroa* mites, dead or alive, sink to the bottom of the jar.

Anthony M. Jadcak
Maine Dept. of Agriculture

Bee Calm

Dear Editor,

Recently there have been a number of studies that confirm the calming effect that animals have on the emotionally ill and the elderly in nursing homes. Blood pressure and heart rates were shown to moderate demonstrably when the individual had the opportunity to be with a pet such as a dog, or cat.

My guess is that a similar result would be shown with the beekeeper who is engaged in a stressful occupation. I would suggest that this might be a worthy and interesting subject for some research particularly with those in a recognized stressful job. I expect that there are beekeepers among big city police departments, air traffic controllers, surgeons, and, yes, Wall Street stock brokers. In fact, one might say that there are few jobs without stress.

I would be interested in having someone determine the actual physiological results. A comparison of tests during working hours, shortly after work has ceased, prior to going in to the beeyard and during, or after working among the bees.

Of course, it might be said that such a calming effect follows any leisure activity whether it be jogging, fishing or after a game of tennis or racquet ball.

I am most familiar with the stress related to that of a high school administrator of as many as 1900 students. The stress in any day when one can expect the unexpected such as a student injury, act of vandalism, bomb scare, false alarm, or drug bust. Added to this is the routine stress that comes with paperwork deadlines, a sensitive personnel problem, and too much to do with what appears to be insufficient time to do it.

I am certain that my small beekeeping hobby was a release from such stress. Not only while working my bees, but from all the other spin-offs that resulted: used book store browsing for bee books, the newly

acquired interest in the plants that attract bees, participating in the county (Hampden) beekeeper association, scouring flea markets to add to my honey pot collection, or working the bee booth in the Massachusetts building at the Eastern States "BIG E" Fair.

Those of you who are long time beekeepers will appreciate this. Any reader who is initially considering beekeeping is encouraged to do so for its satisfactions and joys not the least of which is the escape from stress. Literally, be calm with bees. You won't need the scientific evidence to prove it!

G. S. Wallis, Jr.
303 N. Loomis St.
Southwick, MA 01077

U.S. Union Supports U.S. Beekeepers!

Dear Editor,

I assume most beekeepers are like myself and that is besides beekeeping, they have some other full time occupation to support their full time hobby. My occupation is a tire builder in Topeka, at the Goodyear Plant.

Awhile back I was sharing our concern with the increased flow of import honey, with a fellow union member and this is what followed:

Keep 'Em Buzzing

Many of our Local 307 Brothers and Sisters have an avocation both profit and non-profit in nature. One of them approached me with a particular problem he was having with his avocation. He is a beekeeper and imported honey is his problem.

In checking at our local super markets I found most major national brands had imported honey in them. You have to read the fine print but Brazil was one foreign country that stands out on the label.

Business leaders have always claimed labor was their reason for importing. Usually work rules and wages are the main culprits in business and industry's eyes. In this case, however, no proof can be found to establish that the Kansas Honey

Bee has shorter work hours or any other work rules to keep it from being competitive. Wages are equal, also.

In addition, the Brazilian honey bee does nothing to help pollinate our Kansas plants.

In this, as in every case, we are all better served if we purchase all American Products. If you enjoy honey on your biscuits, try a local brand that you have checked the label on and find it to be American grown.

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Let us all be more concerned with helping to support the American Job Market by purchasing Quality American products.

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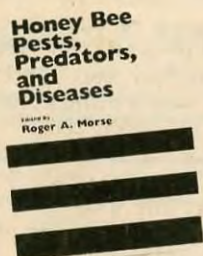
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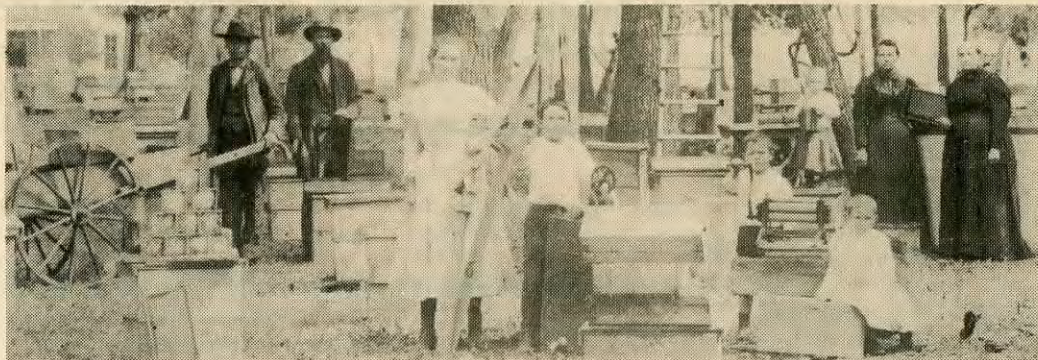


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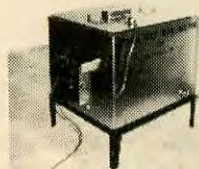
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Guest Editorial

Our Community Image

By DAVID L. GREEN

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IT SEEMS like every other year some kind of agricultural catastrophe hits the local fruit growers — perhaps a spring frost, or a drought spell, or hail. The media picks up the story and tells of the millions of dollars lost, with photos of farmers surveying the barren trees or ruined fruit.

"Yeah, you hear them whining when things go wrong," a friend said to me one day. "But they never say a word when things are going fine. They just take their Cadillacs and Winnebagos to Florida for the winter."

My friend is a bit cynical, and not entirely accurate. There are some wealthy fruit farmers. But they all made theirs in another era. The younger farmers are struggling.

But there is a distorted perception in the community, partly as a result of the media's love of the sensational, and partly because nobody is telling the rest of the story. Those who aren't involved in fruit farming have little concept of what goes on from day to day.

There are lots of interesting things happening "down on the farm". For example, the fruit industry is bucking the general trend of reduced hand labor and more mechanization. In the push for high quality fresh fruit, the trees are getting smaller — in some cases so much smaller that they have to be supported like a vineyard. And they require a lot of hand training. More pruning is done in the summer and less in the spring. IPM (Integrated Pest Management) has changed pesticide application procedures, too.

There is a lot of hard work, and some seasons see plenty of reward in "the fruit of your labor".

We beekeepers are a bit that way too. We are all but invisible in the community most of the time. The general public hasn't the foggiest notion of what we are doing. Or they may picture Uncle Ed with his three hives out behind the shed.

Along comes a pesticide kill and the public hears plenty. We weep and carry on. Makes a good show! And

the media loves it. I know I'm exaggerating a bit. But I also know I have been guilty of this offense.

Once in a while we get some media attention for our famous bee beards. The press goes for that kind of sensationalism. But is also gives a distorted image of beekeeping, making us seem like a bunch of whackos.

I'm not saying that we shouldn't let others know of our problems, or that we can't have a little public fun. But we should be aware of the

**"Think of your
press release as
the core of a
feature story."**

distorted perceptions gained by non-beekeepers from these media events. From time to time we ought to be making some effort to provide media information that portrays beekeeping as it really is: a vital part of our agricultural system, lots of hard work, an interesting, specialized profession, with reasonable rewards at times.

Each beekeeping club ought to have a good press relations person. This should be someone who knows beekeeping well, who can express him or herself clearly, and who has an upbeat attitude.

Western New York Honey Producers Association has been trying to provide an occasional press release in this vein. Whenever possible, we deliver the releases in person, so reporters can get additional information to make the story their own.

One such release celebrated the arrival of the fruit bloom in New York. Most of the papers who

received it used it in some form or another. One reporter followed our president, Mike Potoczak, and myself for a while, taking notes and pictures for a photofeature.

We'd be smart to have written material to give reporters. I have had reporters follow me around for half a day, then found some pretty strange "facts" in the story, sometimes even that I "said". We've got to keep in mind that beekeeping is pretty mysterious to the non-initiated. A reporter may not really catch what is going on. Or, preconceived notions may just be too strong to upset verbally. The reporter just doesn't hear what you are saying. It's harder to mix things up when its all in writing.

A young fellow was helping us set off a truckload of bees in hot weather. The air was getting pretty thick, but he had the "deluxe armor plate" gear, so we didn't think the bees could hurt him much. With coveralls and zipper veil, leather gloves and taped pantlegs, heat was a more practical enemy. So I was surprised to find him just standing, with a faraway look in his eyes.

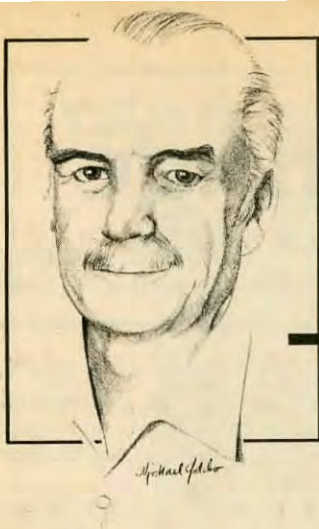
I asked him if anything was wrong and he did not respond. I went over to him (and was thinking about shaking him to bring him back) when he said quietly, "Man, this freaks me out!"

Remember that first time you had "millions" of bees buzzing around your veil? We probably can't fault the reporter too much for not hearing what we say.

Think of the press release as the core of a feature story. Have the basic facts down straight. And make it as interesting as possible. Some papers just use it the way they get it. Others elaborate to make half page features. Newspapers are hungry for news that is interesting to readers.

There is much to be gained by keeping plenty of contact and good relationships with editors. When issues arise that are of vital concern

Continued on Page 71



THE BEE SPECIALIST

By ELBERT R. JAYCOX • 5775 Jornada Road North • Las Cruces, NM 88001

“Early spring feeding can be a life saver; and cool weather inspections are not only safe, but beneficial — if done correctly.”

This time of year your bees can suffer for what you did not do last fall. Maybe you left them with a marginal amount of stores in hopes they could get by without any extra feed. If so, you'd better get out there and check — don't wait for the nice weather in April or you may be harvesting dead colonies.

In general, many beekeepers are hesitant to look into a hive of bees unless the temperature is in the 50's or 60's with bright sunshine. They have been told repeatedly that this is a bad practice. Actually, some early checks on colony reserves are better done in cold weather than when it warms up. As R.O.B. Manley noted in his *Bee-keeping in Britain*, the bees stay quieter at such times and, as far as he could see, no harm comes from opening hives in cold spring weather. He points out that you need to do the work or observation quickly and go on to the next hive. He believes, too, that providing some extra food offsets the disturbance and the chance of losing the bees to starvation.

The ideal food for bees in late winter/early spring is a comb of sealed honey. It can be from storage or from another colony that has a surplus. Otherwise, you can take a chance on sugar boards or granulated sugar placed above the colony in the hive. It is better to use some liquid feed because the bees can use it more easily without having to find moisture to dissolve the granules or candy. W. J. Diehnelt of Ashippun, WI sprays sugar syrup into empty combs for this purpose. He uses a thin mixture for stimulating the bees. If you are feeding for stores, however, better to use a thick syrup even in spring.

It is easy to find directions for making sugar syrup. But it is more difficult to find information about

feeding honey back to the bees. There are times when you have some honey not suited for sale yet good enough for early spring feeding. I am not concerned about using a honey early in the year that would not make good winter stores. As the bees will soon be flying regularly, they are less liable to be hurt by old or darkened honey that would be dangerous for wintering.

As always, you must know the source of the honey and that it is free of disease organisms. Never feed purchased honey unless you know for sure that it came from disease-free bees. Although we always stress this point, some beekeepers persist in feeding their bees with honey purchased at the supermarket. Both U.S. and foreign honeys frequently contain spores of American Foul Brood that will produce the disease in colonies to which they are fed.



G. F. Townsend and P. W. Burke published the following information about feeding honey back to colonies. They explained that adding sugar to honey syrup helps to prevent crystallization of the stores produced from it. In spring, add 50 pounds of water to every 100 pounds of honey. For the honey and sugar mix, use 100 pounds sugar, 400 pounds of honey, and 300 pounds of water. Obviously if you are dealing in much smaller quantities, just use the same proportions (1:4:3 by weight) for whatever amount you want to mix.

Townsend and Burke also offered formulae for stimulative feeding, to get things going in a colony with plenty of stores already present. For this usage, blend 100 pounds of honey and 100 pounds of water. Or mix 100 pounds of sugar, 400 pounds of honey, and 600 pounds of water. For use in the fall, they suggest more concentrated solutions: 1) 100 pounds of honey and 25 pounds of water or 2) 100 pounds of sugar, 400 pounds of honey, and 150 pounds of water. The latter mix is best with honeys that granulate readily such as alfalfa, goldenrod and aster.

Select the easiest system of giving the feed to the bees, but stay away from any feeder that does not present the food close to the cluster. Even the tray-type feeders that sit on top of the hive may not be visited well in cool spring weather. I still prefer using friction-top pails or large plastic containers on the frame tops right above the cluster.

Have a Ball in the Spring

One behavior of bees not well understood is that of "balling" a queen. If you read Morse and Hooper's *Encyclopedia of Beekeeping*, you will find the explanation that forming a tight ball of bees around a queen is not an aggressive act but one to immobilize or protect her from attack by another queen. If this is the case, why is she so often damaged and even killed? R.O.B. Manley said he thought that if the queen could form an opinion, she would prefer not to be protected in this way.

Manley spoke of balling behavior in relation to spring manipulations, a time in which he believed that bees were twenty times more liable to ball a queen than at any other time of year. In the spring the bees are all old

Continued on Next Page

and, seemingly, more liable to jump on their queen when their colony is disturbed. As she begins to lay more heavily and the population of bees gradually becomes younger, the queen is safer from being damaged by being balled.

According to C. R. Ribbands, balling may occur at several different periods: 1) in early spring when colonies are disturbed, 2) when a young queen begins to lay after a break, 3) after a recent introduction of a queen, and, sometimes, 4) when a queen returns from a successful mating flight.

I haven't seen many incidents of balling. However, I am sure I have seen the results after introducing new queens to strong, overwintered colonies. Before I realized the reason for it, I saw many such queens that looked old before their time: they had frayed wings and lacked hair on their bodies. This condition was apparently the result of balling, or at least of aggression, that damaged the queen without killing her. When I began to make sure that queens

stayed at least three days in the introducing cage, I rarely, if ever, saw such "beat-up" queens.

My observations agree with Ribbands' statement that all the different cases of balling can be interpreted in terms of response to an unaccustomed odor. And as our knowledge of pheromones has increased, we can relate all or part of the reactions to the level, or change in the level, of pheromones along with the odors. Pheromones are compounds, such as queen substance, that are released by one individual and which influence the behavior of another individual. We would do well to forget about the idea of balling being a protective action by the bees of a colony.

If you find a tight ball of bees when you are working with colonies this spring, disperse it with smoke or water to find out if a queen is at the center of the ball. If so, cage her and put the cage into the brood nest. Release the queen in a day or so if there are no aggressive bees on the cage at that time. You can tell there is aggression if you see bees holding tightly onto the screen of the cage

and giving the appearance of trying to get in or to attack the queen.

Losing Your Head Over a Swarm

Fletcher Miller, writing in *The Pheromone*, told a strange tale about an Alaskan swarm of bees. The swarm settled in the backyard of a dog owner who was upset because her dog could not use the yard to relieve itself. So she fired a couple of 22-caliber rounds into the swarm in an attempt to drive it away. When this did not work, she appealed to a neighboring beekeeper. While getting the bees into a container, he noticed a small cluster on the ground and wondered if the queen was among the group. When he investigated and separated the bees, sure enough, there was the queen — minus her head. Apparently one of the shots struck the queen, beheading her, and then ricocheted into the residential neighborhood. Lucky it was the queen and not one of the neighbors. §

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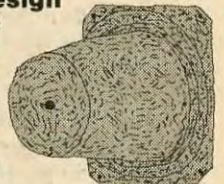
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HONEY BEE GENETICS

By STEVE TABER of Honey Bee Genetics • P. O. Box 1672 • Vacaville, CA 95688

"In the second of this three part series, we discuss several past breeding programs — and some we should try in the future."

Summary from Part I.

In the first of this series, we discussed basic genetic nomenclature, and the mechanisms involved in trait selection.

Several different breeding programs have been devised in the past 40 years by scientists who study bee genetics. All of them have their own good points and bad points. Presented here are several, with their respective advantages explained.

The first breeding plan based on sound genetic information was formulated by W. C. Roberts more than 40 years ago, but not put into practice until about 1947. He developed inbred lines and crossed them to produce a hybrid.

Hybrids, particularly in corn, were outproducing the old outcrossed dent corn by wide margins all over the corn belt. Roberts copied the breeding program for corn exactly, producing 4 different inbred lines, each from different parental stocks. Inbred lines A and B were crossed to provide the drone mothers, and inbred lines C and D were crossed to provide the queen mothers.

The initial matings to cross the AxB drones with the CxD virgins were done naturally on an island in Lake Erie, near Sandusky, OH named Kelly's Island. As a student, I was employed from 1948 to 1949 to raise those hybrid queens and send them out to the beekeepers who had purchased them. The whole program was very complex. The genetic stock, which had been developed by Roberts at the Madison, WI, USDA Bee Culture Laboratory, was finally donated to a group of Ohio beekeepers, as I recall, The Ohio bee

Improvement Cooperative. There were about 8 members to this Co-op and I only remember the names of a couple, Charlie Reese, Ohio Extension Apiculturist and W. E. Dunham, Professor of Apiculture at Ohio State.

This program lasted several years and in the beekeeping literature of the early 50's you can see references to the "Island Hybrids". It was expensive to operate on the island and the entire program was turned over to Rossman Apiaries in Moultrie, GA about 1960.

A second breeding program, developed by Dr. G. H. (Bud) Cale Jr., who was employed by Dadant and Sons, was modeled on the same principles. Bud developed and bred queens that would lay more eggs. He then crossed these exactly as Roberts had done. The resulting hybrid, called "Starline", not only laid more eggs but all the eggs hatched, putting more bees in the hive — more bees means more honey. Beekeepers who raised

these queens were supplied breeders that had been artificially inseminated to head up their drone mother colonies and to use as grafting mothers for the virgins. Cooperators were licensed and paid a 25¢ royalty on the queens they sold. The "Starline" was an all Italian hybrid and the "Midnight" hybrid, which he also developed, was a combination of two European black lines, Caucasian and Carnolian.

Hybridization produces many advantages when divergent inbred lines are crossed. You get "hybrid vigor" in the resulting offspring; and, by controlling the sex genes so that all of them are different, all the eggs hatch. This is the only breeding program in which all eggs hatch. The biggest drawback to the breeding program, as it was operated then, was that the inbred lines were reduced to only 2 sex genes each. As such, the inbred colonies could not maintain themselves because only half the eggs would hatch. Bees and honey had to be constantly added, and the queens were so poor that the bees were constantly trying to supersede them. Another problem which developed was that it was very difficult to collect semen from the drones from the inbred colonies.

Breeding for specific traits, such as gentleness or resistance to Chalkbrood disease is easier, quicker and cheaper by inseminating the virgin queens with semen from only one drone if that queen and drone are unrelated; or at most, two drones if they have the same mother. This was

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the technique Hellmich (1985) used to breed bees that preferentially collected pollen, and it would be the same technique to use to breed bees resistant to Nosema disease or to Varroa mites.

I have based much of my disease resistance breeding on the work of W. C. Rothenbuhler. However, I am finding information different from his early scheme of 2 recessive genes being responsible for 1) uncapping dead brood and 2) the removal of dead brood. I am not saying that Walter is wrong, but I feel that resistance is far more complicated than the work which he and his students have published. He worked with two lines, the Brown Line (disease resistant) and the van Scoy line (susceptible). Experiments were concerned with inbreeding these two lines to "fix" the genetic characteristic. Then, they crossed the lines, and backcrossed this first cross, called an F1, to each of the original parents.

Then he investigated a number of different environmental factors that could have affected the resistance or susceptibility to disease.

My work has been entirely different. I felt that the genes for resistance to disease are widely distributed in the bee population at large and if I went looking I could find them. To test for resistance genes in the general bee population I would kill a piece of sealed brood comb by placing it in the freezer for 24 hours, then place it in the brood nest in the place of an identical sized piece of live sealed brood, about 4 square inches. On these first test queens, which were all naturally mated, I arbitrarily made the decision that if the bees uncapped and removed the dead brood in 48 hours or less, they would be considered resistant. At the time I did this test I had about 200 colonies and was able to pick 15 disease

resistant queens from which I raised virgins and drones. I expected that all inseminated queens would show disease resistance, but they didn't (Taber 1982).

The next year I requeened all my colonies from daughters of those original 15. I also had inseminated daughters from those queens. When I subjected these to the disease resistant test, only about a third of them tested resistant. This was my indication that there were more genes involved in disease resistance than the two originally described by Walter.

Then last year we started breeding bees resistant to Chalkbrood disease. We found that some bees highly susceptible to AFB would be resistant to Chalkbrood but that all bees resistant to AFB would also be resistant to Chalkbrood (Taber 1986). This indicates that breeding resistance to these two diseases has certain similar mechanisms, but also some that are different. It's a real nice problem for some future researcher to tackle. As an added note, bees that are disease resistant keep clean bottom boards and those that aren't — don't. It also seems that fewer wax moths are in hives with resistant bees, or as Walter calls them, "hygienic" bees.

Most breeding work is easier to do if a scientific study has been conducted to determine how much of the variation is due to environment and how much is due to genetics, or heritability. Virtually no trait is controlled 100% by environment or heredity, but rather, most traits are an interaction between the two. However, if the number of genes, or genetic factors that primarily influence a trait, can be measured, it implies a high heritability factor. Dr. W. C. Roberts estimated the number of

genes involved in the abdominal color of bees and found it to be about 4 but with several modifying genes. Many beekeepers are particularly interested in their bees' color; they either want them black or yellow or something in between. Selecting for yellow color alone, for 5 or 6 generations, will yield the yellowest bee in the world. Roberts' work shows that the heritability of color in bees is high; but, you should expect that differences in the weather, the colony population, the kind of food the bees are eating and other environmental factors will all influence the abdominal color of bees, too.

Another characteristic which we are all interested in is the genetics of temper. A Brazilian scientist named Stort estimated the number of controlling genes to be 6 (Goncalves 1978). This tells the same thing, namely, that you can select for fierceness or gentleness and in a few generations have exactly what you want. A recent study of heritability of temper conducted over a period of time in New York State showed that the environment, mostly weather, influenced the temper of the bees greatly (Moritz 1987). This is something most of us have known for a long time, but I think it's the first time it has been accurately measured. §

In the final section of this series we'll look at the advantages, and problems, associated with a closed population breeding program, and some future considerations for every beekeeper to consider in honey bee genetics.



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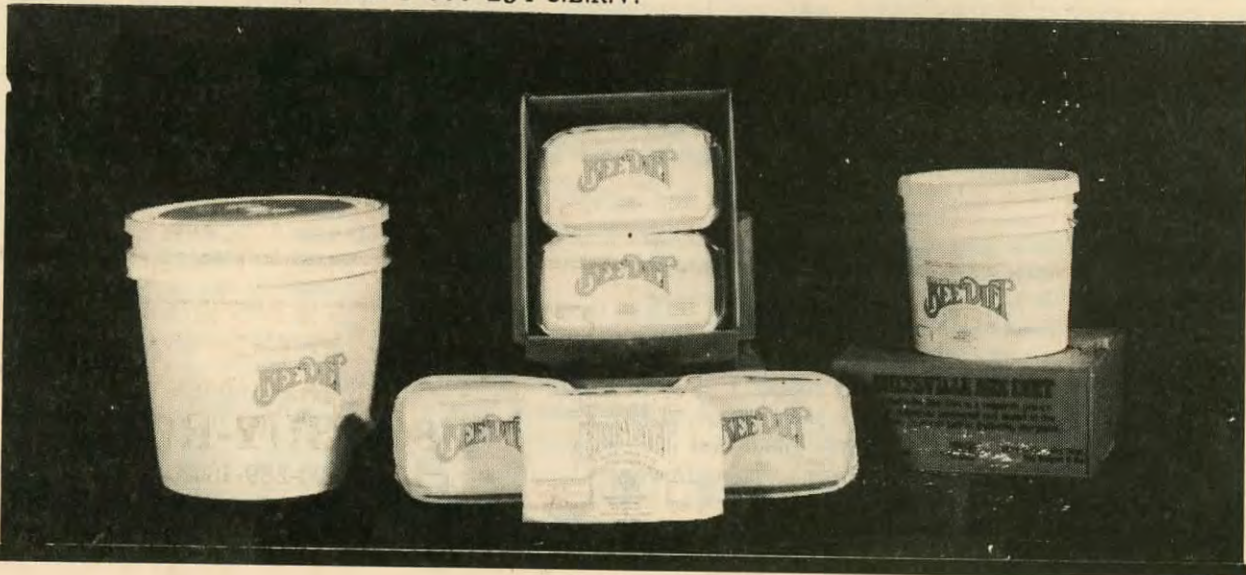
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1. Honey bee defense: $\overline{15}$ $\overline{1}$ $\overline{8}$ $\overline{4}$ $\overline{17}$
2. New Zealand tree producing toxic honey: $\overline{5}$ $\overline{23}$ $\overline{20}$ $\overline{28}$
3. A duty performed by hive bees to the queen: $\overline{13}$ $\overline{26}$ $\overline{34}$ $\overline{3}$ $\overline{29}$ $\overline{30}$
4. An ommatidium: $\overline{10}$ $\overline{6}$ $\overline{12}$
5. Box for bees: $\overline{21}$ $\overline{19}$ $\overline{9}$ $\overline{31}$
6. An activity bees do without water: $\overline{51}$ $\overline{16}$ $\overline{38}$ $\overline{25}$ $\overline{40}$
7. Oxygen, chemical symbol: $\overline{18}$
8. Colonial symbol of justice: $\overline{2}$ $\overline{27}$ $\overline{44}$
9. Bee tongues: $\overline{24}$ $\overline{41}$ $\overline{22}$ $\overline{33}$ $\overline{54}$ $\overline{42}$ $\overline{48}$
10. Scout: $\overline{7}$ $\overline{35}$ $\overline{14}$ $\overline{46}$ $\overline{47}$ $\overline{52}$
11. Alkaline gland: $\overline{37}$ $\overline{45}$ $\overline{50}$ $\overline{36}$ $\overline{32}$
12. Miel: $\overline{39}$ $\overline{49}$ $\overline{43}$ $\overline{53}$ $\overline{11}$

Answers on Page 101

IMAGE...Cont. from Page 65.

to our industry, they can be a big help. Lord knows, we are too few to have much direct influence on public policies. If we are perceived as being on the fringes we'll be completely ignored by the politicians. We know that our pollinators are at the core of the agricultural system. Does the public know that?§

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SIFTINGS

By CHARLES MRAZ • Box 127 • Middlebury, VT 05753-0127

"When we have a problem with our bees, the best solution is to ask how mother nature did it."

Recently I made a pilgrimage to Buckfast Abbey, Devon England, to visit Brother Adam, on the recent Southern States Beekeeping Tour. I have known Brother Adam for many years, 25 years ago when he was in the US, he came to visit me. I believe Brother Adam knows more about queens and races of bees than anyone from personal experience in his travels to many parts of the world studying bees in their country of origin.

Brother Adam and his bees have lived with Acarine Disease for over 60 years. It was this that sparked his interest in resistance to disease, a subject I too have been interested in for the past 60 years. Acarine Disease is no longer a problem in England, as the bees there have developed a resistance to it over the years. Queens imported to England from the U.S., Australia and New Zealand will eventually become infected with Acarine and die out for lack of resistance. Native English bees crossed with these imports will develop resistance. This is also true with Varroa. Asian and African bees (not *mellifera*) have apparently developed resistance to this mite as well, by whatever means. Chemicals may be a short term control, but over the years, resistance is the only practical solution. Depopulation and eradication is a waste of time and money. Resistance development can be a permanent solution with no further cost in time and money.

In order to breed resistance it is important to raise queens exposed to heavy infestations of the pest or pathogen. This exposure selects those with a built-in immunity to the problem. Eliminating the problem — the mites — by depopulation, prevents a possibility for breeding resistance.

In the 1930's, when I was breed-

ing bees for resistance to American Foul Brood, I would inoculate all queen cells with dead AFB larvae in the royal jelly. Also, at Sioux Bee, Ed Brown maintained a yard of bees whose sole purpose was to rob out the diseased honey from dead hives beekeepers brought in to be melted down for wax.

I once asked Ed if any of the hives ever came down with AFB. "I don't know," he said, "if they do we just melt them down with the rest of them". As far as I know, those hives stayed healthy on their diet of diseased honey for 50 years or more.

A similar thing happened in Hawaii. A great deal of Algaroba honey was produced in Hawaii during the 20's and 30's. When the price dropped to 2¢ a pound in the depression, the bees were abandoned. AFB took over and wiped them out, except for a few hives of resistant strains. These quickly multiplied and in a short time the Islands were full of bees again, resistant to the disease.

These are good examples. When we have a problem with bees, the best way to find a solution is to ask, "How does Mother Nature do it?" After all, Mother Nature has been solving these problems for some 30 million years — as long as bees have existed on this earth. You cannot argue against 30 million years of experience.

It is encouraging to see interest in Apitherapy continue to grow, even in the Medical Community. As one doctor expressed recently, "You cannot argue against success". We are planning an Apitherapy meeting for about March 12th, 1988 in the Washington/Baltimore Airport area.

Bee Venom Therapy as a treatment for Rheumatic Diseases is fairly well established, after more than 100 years of experience by many doctors in nearly every country. In my 53 years of experience in the field of Bee Venom Therapy, I have seen good results in other forms of degenerative diseases. For years I have felt BV Therapy might be helpful with Multiple Sclerosis. This is a devastating disease for which there is currently no known cure. About a year ago I started treating two cases with most encouraging results.

About that time someone wrote me from Israel asking for information on the treatment of M.S. with BV Therapy. How he knew I was interested in this work, I do not know. Recently, another beekeeper stopped in from Israel. I had met him when I was there several years ago, "preaching the gospel of BV Therapy". He was one of those that became interested enough to actually treat Arthritics himself. He also told me of the latest developments with the Varroa that has been causing losses for several years in Israel.

It turns out he knows the first man in Israel that wrote to me that has M.S. On his way here to the U.S. and Canada to see relatives, he stopped in to see this man with M.S., who told him an interesting story. The M.S. man told my beekeeping friend he recently bought a TV. The man that delivered it to him, told him he had M.S. when he lived in Russia 30 years ago. He said he was treated with Bee Venom at that time. Thirty years later he is living in Israel apparently in good health. Does this mean that BV Therapy might produce a permanent cure for M.S.? I know 30 years ago a great deal was being done with BV Therapy in Russia. Another three years or so of experience may give us an answer. We have so much to learn. §

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The Hobbyist and DISEASE CONTROL

By STEVE BURT
19316 Brandt
Roseville, MI 48066-1066

BEE DISEASES pose some special problems for the hobbyist. Although making no claim of entomological training, I feel reasonably comfortable raising this issue — if only to initiate some interesting debate. In all the furor about *Acarapis woodi* and *Varroa jacobsoni*, my considered opinion is that by far the most significant disease of honey bees remains American Foul Brood. Far from being exotic, AFB is a continuous threat to American beekeepers, and the back-lotter is at least as vulnerable as the commercial operator according to recent bee literature.

Most back lot beekeepers are found in at least fairly settled locations, areas having numerous, small apiaries and considerable numbers of feral colonies in old buildings and decaying trees. Not every hobby beekeeper is responsible enough to register his apiary, either. In view of these facts, one could argue whether apiary inspection — especially when conducted as infrequently as once every several years — can possibly protect the interests of the hobbyist. A further problem is that reporting relationships are not very clear between a hobby beekeeper with diseased bees and a government agency that may not have even provided a name or phone number, let alone an on-site inspection.

Virtually every bee text assays the problem of bee diseases, especially American Foul Brood. A picture of "ropy" AFB is standard, as the gummy remains of a decomposed larva are shown extruded an inch or so between the cell and the point of a toothpick. Actually, AFB may not be ropy until the larva has deteriorated to a coffee-and-cream color, and the ropiness is enhanced if the comb is

held at a level or even downward angle. If AFB is suspected, open a punctured or concave capping, twirl a toothpick or splinter in the larval remains, and slowly withdraw as much of the body fluid as possible. If an inch or so of the material forms a strand between the cell and the probe, you quite probably have AFB.

The Stress Factor

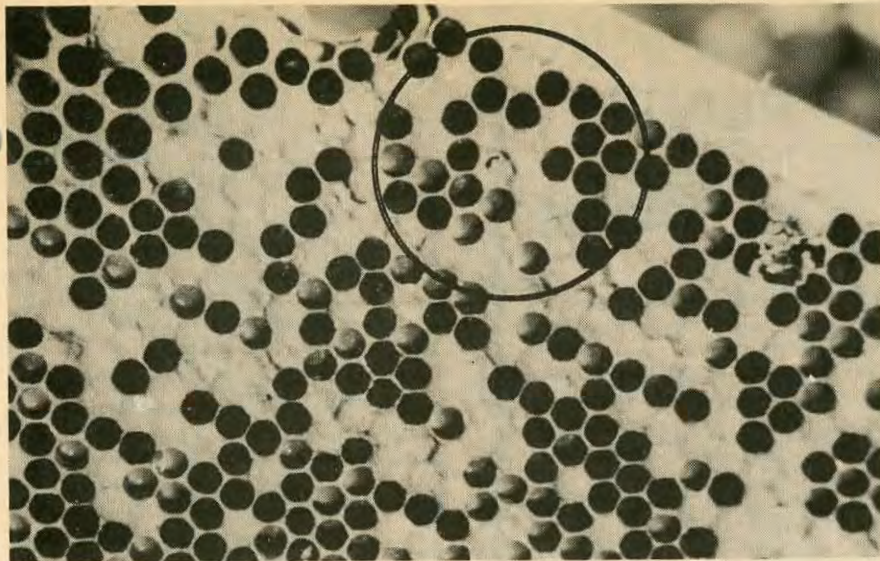
A diverse group of bee ailments are often grouped under the heading of "stress diseases". Three rather serious maladies, *Nosema apis*, which infects adult honey bees; European Foul Brood and Chalk Brood, which infect larval honey bees; are the headliners among those diseases which

typically appear when colonies are dealing with environmental stress. Spring build-up, with its heavy brood rearing coupled with periods of chilling and dampness, is a stress period for the best of colonies. Queenlessness, starvation and the constant transport of colonies associated with pollination are other situations that weaken a colony to the point of making it vulnerable to opportunistic disease. Providing dry, sheltered locations and never permitting a colony to exhaust its stores are management factors easily within the control of the hobbyist who wishes to minimize or prevent the stress diseases. Keeping a vigorous, young queen in each colony — particularly a queen from a line with good housekeeping traits — is



A healthy comb of brood.

"My considered opinion is that, tracheal and varroa mites notwithstanding, American Foulbrood REMAINS the most significant bee disease."

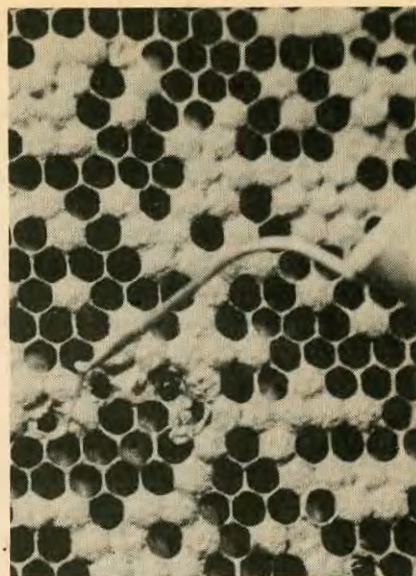


This comb has a mixture of healthy and apparently diseased brood. Note shrunken cappings and perforated capping (in circle).

the prevention of a considerable list of beekeeping problems, not the least of which are the stress diseases. Bees from a quality line of Italian stock are a recommended control of EFB, having the qualities of prolific egg laying and good housekeeping which often brings the disease under control.

What's Wrong?

Diagnosing bee diseases poses some difficult problems for the hobbyist. Unlike the commercial operator with many colonies in a number of locations, the back lotter, with a few colonies in one locality, will not see most bee diseases with



The diagnostic "ropy" condition of an AFB infected larva's remains, drawn out on a probe.

great frequency. Also, while the commercial beekeeper will have better contact with his fellow apiarists and with extension personnel, the hobbyist is much more likely to be a solitary performer, alone with his

Continued on Page 77



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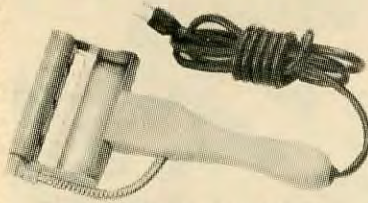


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DISEASES... Cont. from Page 74.

bees in sickness or in health. The first clue that something is amiss may be nothing more than the failure of the colony to develop during the spring build-up. Wax worms in a living colony, a persistent ant invasion, or brood combs "peppered" with unemerged brood after adjacent cells have been polished for egg laying are symptomatic of trouble. Dead adults with swollen abdomens suggest *Nosema*, especially in the spring. Adults dead and dying with trembling behavior could indicate pesticide ingestion. Brood in open cells having a dry, chalky appearance suggest a fungal infection of Chalk-brood. Dead brood, coiled in uncapped cells might well prove to be EFB. Brood, dead after capping and showing shrunken, often punctured cappings with gummy cell contents suggests an AFB infection. Brood also can die from spring chilling, pesticide problems, and quite a number of minor causes and ailments.

The outstanding reference work on bee disease, and a very worthwhile addition to any beekeeper's library, is the text by Roger A. Morse, Editor — *Honey Bee Pests, Predators and Diseases*, Cornell University Press. An alternative suggestion is H. Shimanuki's chapter on brood diseases to be found in *Agriculture Handbook No. 335 / Beekeeping in the United States*, USDA, 1971, pp. 86-92. Each of these sources combines readability with excellent technical depth to help the amateur beekeeper solve most bee disease diagnosis problems.

What Can I Do?

Terramycin is the only medication available for the prevention or attempted treatment of American Foul Brood. This antibiotic also has activity against the bacteria responsible for European Foul Brood. Pfizer's 6.4 oz. size is practical for the hobbyist, containing enough medicine to treat eight colonies spring and fall for one year. The preventative dosage is one teaspoon per colony administered each of three times at four or five-day intervals. The easiest way to prepare a dose for one colony is to thoroughly mix one teaspoon of Terramycin with two tablespoons of confectioners sugar. To administer the medicine, simply sprinkle it with a spoon throughout the top bars of the brood nest. In accordance with package labeling, *any such antibiotic treatment must cease at least thirty days prior to any surplus honey flow to be harvested for sale.*

Pfizer, in its labeling, does not distinguish between preventative and

therapeutic dosages, or recommend exceptional measures for colonies which clean up AFB with the assistance of antibiotics. Common sense would suggest that any colony which had active AFB in its history be administered a preventative course of antibiotics for at least the next several seasons, if not permanently. Given the long life of AFB in its spore form (as much as fifty years), the treatment of AFB with antibiotics — rather than the traditional poisoning with burning of the bees and combs — remains a highly controversial subject.

Given the normal inclination of a vigorous colony to rob out the stored honey of one too weak to protect itself, any bee disease problems in nearby colonies will sooner or later come to visit your apiary. Discarded honey and its residue on empty

containers is also highly attractive to active bee colonies, and can be an unsuspected vector in the spread of disease. Remembering that people eat what the bees produce, the maintenance of healthy colonies and hygienic conditions is at the essence of being a good beekeeper. Your bees are too polite to complain about their health. You must perceive any problems which arise and take effective action where warranted, or risk the loss of your bees and equipment investment. §

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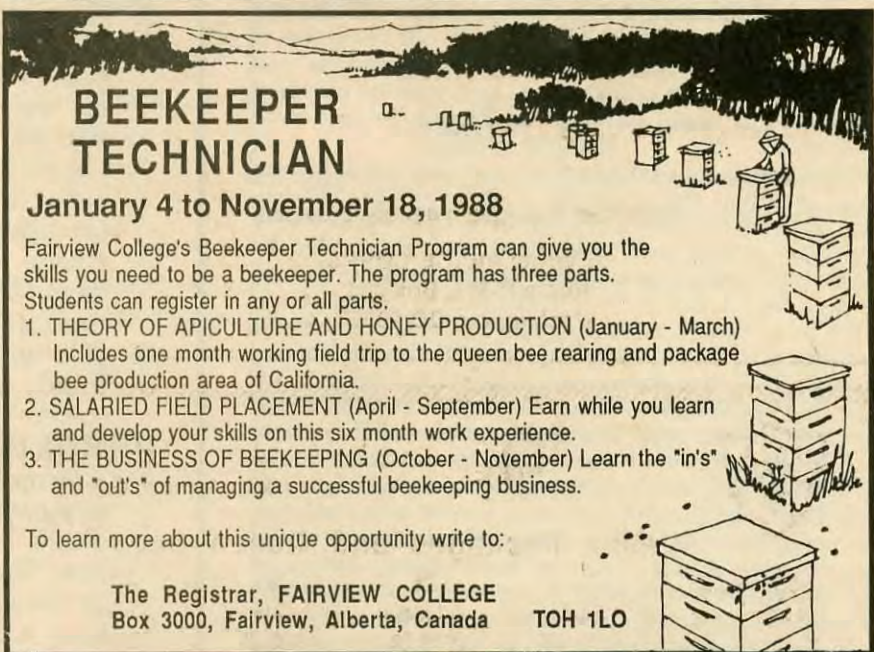
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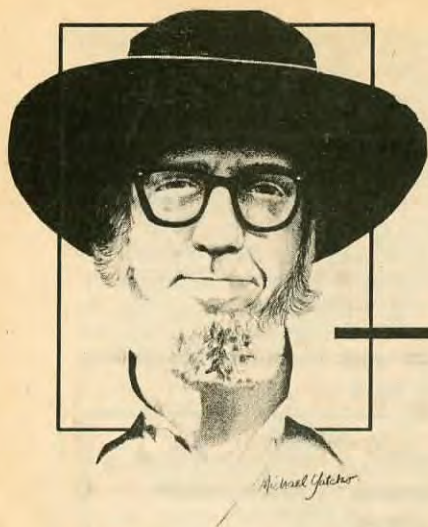


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BEE TALK

By RICHARD TAYLOR • R. D. 3 • Trumansburg, NY 14886

"The Golden Rules of Comb Honey Production."

I've been worrying lately about honey quality. This is nothing new. I worry about it a lot. But this time it is comb honey that I'm concerned about, and with good reason. Last summer I saw a beekeeper offering for sale at a farmer's open-air market, round sections of comb honey that were not capped over. I don't mean they were not completely capped. I mean they were not capped over at all. They were just unfinished sections, taken from the hive before the bees had capped a single cell. Then later, a good friend of mine, who does quite a business in comb honey, had the following experience. His own supply was gone, so he arranged to purchase a considerable amount from another beekeeper, to keep his customers supplied. When the honey was delivered he found virtually every section had been damaged by wax moths, and the wax moth cocoons could be seen in some of them, right on the surface of the honey. On top of that, the entire lot was granulated rock hard. Think of this: A beekeeper had undertaken to sell comb honey of this character, with the idea that it would end up on the tables of purchasers. Can you imagine the effect this would have had, and the numbers of people who would have resolved never to buy comb honey again?

We beekeepers have lots of competition, not only from abroad but from the producers of other sweets. The one thing that we do have going for us is that we can offer something unique and distinctive, something that is genuinely better in every way than anything that is remotely comparable to it — provided it is produced and packed properly and in keeping with the highest standards of quality. And here, I have long thought, the comb honey beekeeper has the distinct advantage. Not only do we suffer no competition from imports, we can offer something that no other food in the world even resembles. Comb honey surely is, or can be, the finest delicacy on the face of the earth. We comb honey beekeepers can offer honey that is unmingled with honeys from other sources, thus preserving the flavors and qualities of some of the more unusual kinds, such as black locust honey or buckwheat. And we can offer it in a form that is a delight just to behold, so beautiful that one feels a reluctance to cut into it. But this advantage is totally lost at the hands of a careless and slovenly beekeeper. Worse yet, they spoil things for everyone else.

It is not hard to produce beautiful comb honey, provided you live in a region of intense honey flows. It does not require more work. In fact I think it takes less work, when you consider that there is no extracting to be done. But it *does* require close attention to detail. You

cannot just put supers on your hives and then go off and forget them for a month.

What I'm going to do is spell out some *rules* for raising comb honey, in the hope that beekeepers wanting to get into this challenging specialty will tack them up where they will see them, and then follow them religiously. I offer two sets of rules, one having to do with the production of comb honey, and the other with the harvesting and packaging of it.

RULES OF PRODUCTION

1. Use only strong colonies for getting comb honey.
2. As soon as a super is partially filled, move it to the top, above any supers that the bees have not begun to work in or have just barely started. This not only reduces travel stain, but also ensures that the super will get noticed and harvested promptly when it is ready.
3. Check your hives *at least* every ten days, to be sure that finished sections are not getting travel stained.
4. If a super is almost, but not quite, filled, harvest it. The unfinished corner sections can be returned to the bees in another super.
5. Unfinished sections can all be put in supers and returned to the bees to finish, provided there is a honey flow. Put the least finished sections in the center of the super and those that are closer to being finished at the sides.
6. Do not try to produce comb honey on autumn flows, as such honey is waxy and often granulates.

Now for the second set of rules, which are the more important ones, and which must be scrupulously observed:

RULES OF HARVESTING AND PACKING

1. Comb honey, at least in most areas, *must* be put into a good freezer for at least a day or two, to destroy any wax moth eggs or tiny larvae. Put the packed but unlabeled sections in small plastic bags to protect from moisture, put a thermometer in the freezer, and leave the honey there until the temperature goes down close to 0°F. Then remove, leaving the sections bagged until back to room temperature.
2. Do **not** offer for *regular* sale sections that are badly travel stained. If you sell directly to customers, then you can offer these, unlabeled, as "seconds", at half price, with an explanation of why they are offered cheaply. Better yet, avoid travel stain by following the first set of rules.
3. Never offer for regular sale comb honey that is not properly capped over on *both* sides. Honey that is perhaps half uncapped can be offered, unlabeled, as "seconds", as above, again with an explanation.
4. Never offer for sale comb honey that has granulated, or begun to granulate. Either use this at home, or set it out in the apiary in late summer and let the bees clean it out.
5. Never offer for sale comb honey that has a bad flavor. This is seldom a problem, since nearly all natural honey is delicious; but there are a few nectar sources that yield bad-tasting honey. Avoid these at whatever cost.
6. Aim always for comb honey sections that are white or at least very light in color, well-filled and well-capped over.

It is easy to see that these rules require very little beyond diligence and care. But the beekeeper who disregards them hurts not only himself, he hurts all of us, and the damage is sometimes irreparable.

Your questions and comments are welcomed. Please use the Trumansburg address and enclose a stamped, self-addressed envelope for prompt reply. §

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RESEARCH REVIEW

By DR. ROGER A. MORSE • Cornell University • Ithaca, NY 14853

"What to do about Mites and Africanized Bees?"

There is much misinformation and a great lack of knowledge about bee mites and Africanized bees in this country. A positive move beekeepers and beekeepers' organizations might make this spring (or even earlier), would be to finance their state apiculturists to go abroad to see for themselves. This includes the professors, teachers, apiary inspectors and all those state and ivory tower types who sit in their armchairs and make profound statements and regulations based on little or no background.

For example, is there an extensive commercial beekeeping industry in Brazil using Africanized bees or is the whole thing a hoax? Are Africanized bees resistant to *Varroa* mites or is that a humbug? Do feral colonies of Africanized honey bees live in trees, houses, crates, etc., in cities in Brazil, as they do in the U.S., in apparent harmony with people, or is that not true? Are thousands of colonies of honey bees dying from *Varroa* in Europe and around the Mediterranean or is that a myth?

Beekeepers will be the ones most affected by mites and Africanized bees but they can also do much to help the problem. Beekeepers and their organizations can proceed in several ways. One is to tell the Dean of their State College of Agriculture that they want their professors to see the facts for themselves. Every state has a College of Agriculture. Beekeepers should also contact the Commissioner of their State Department of Agriculture to allow the state apiary inspectors to do the same.

When *Varroa jacobsoni* was found in the U.S., on September 25 of last year, I believe there were ten or fewer people working in our country who had seen the thing alive in the field. And of that number even fewer had worked on any control systems.

How many people in this country have visited a beekeeper who owns a thousand or more colonies in Brazil, or Argentina, and asked him what he thinks of Africanized bees? The number is small.

State Colleges and State Departments of Agriculture vary greatly. Many are very provincial and refuse to see beyond their own borders; others will encourage their people to travel within the country but they fear travel abroad is a lark.

In some states the only recourse will be for beekeepers' organizations to make money available for such trips. What is needed is about \$1,500 to \$2,000 per person. Beekeepers and their organizations cannot afford to finance the research that is needed on mites and Africanized bees; too much money is required and it must come from existing organizations that support research at the State and Federal levels. However, beekeepers can start things in the right direction by getting those who will do the research, and make the regulations, out to see the facts. Any group that puts up money for one or two of their professors and/or regulators to go abroad will catch the eye of the administration. And as a result, their administration will understand that the questions may be serious.

I have been most fortunate to have been associated for many years with Cornell University, an institution that has a strong and ongoing

international program in agriculture. Travel is encouraged by Cornell. It is because I tried to control *Varroa* mites in experimental colonies in the Philippines in 1968, and failed miserably, that I have a different appreciation of these animals. Also, after I received a few good stings in both Africa and Brazil from Africanized bees, I learned how one dresses properly in an Africanized bee apiary. I have also seen how apiaries are properly located in these countries.

This coming summer we can expect a great deal of adverse press and probably see some serious errors on the part of regulators in dealing with both Africanized bees and bee mites. But, if people have no experience, how can we expect otherwise? I'm sure not everyone who examines a mite-infested colony, or who opens a colony of Africanized bees, will view the problem as I do; however, at least they will know more than they will sitting at home reading and thinking about the situation.

Where to go?

One must, of course, seek out those who will be willing to talk and show visitors what is taking place in their respective countries. However, we do know where the commercial beekeeping industry exists and who is in charge. To see the devastation brought about by *Varroa* one should visit one of the countries around the Mediterranean; heavy *Varroa* infestations are present in all of these countries except Egypt. Excellent mite research is being conducted in laboratories in France and Germany, too. Africanized bees are found throughout Brazil, but Sao Paulo state has some of the large commercial outfits. In Argentina, the chief honey producing province is Buenos Aires. Travel to these areas should prove very valuable. §

HAPPY NEW YEAR!

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From Washington State . . .

SMOKER FUEL

By HENRI DELANGE, M.D.
1301 Spring St., 30J
Seattle, WA 98104

With all the things that have been said and written about smokers, I thought for a long time that it will be hard for anyone to say something new that hasn't been said a hundred times over. But particularly because it seems so simple, why have I never seen this item mentioned — namely the smoker fuel to use, one of the most important things about a smoker.

Many articles advise using burlap or even burlap soaked in oil as smoker fuel, and at times even other more artificial products are advocated. Personally, I think that pine cones make the best fuel, and I have never used anything else, although I have experimented with many other materials such as pieces of old carpeting, etc.

In this part of the country, pine cones are easy to come by. This may not be the same in all parts of the country, of course, and maybe that's why it is so rarely brought up. The main reason Washington is called the "Evergreen State" after all, is due to our many varieties and species of pine trees. Whole forests of them, acres and acres and acres of them.

However, one doesn't have to go to the forests to see them. They grow in the cities, too. For instance, here in Seattle, there is an incredible abundance of pine trees. They grow in people's yards and in the city's parks and green belts. If you go out in the

suburbs — even more so. Every fall they shed pine cones by the hundreds (millions?) in all shapes and sizes, depending on the type of tree they come from. Even if one doesn't own a pine tree, a friend or neighbor has one, or you can pick up the cones from the street.

They all make the most wonderful smoker fuel. Some are a bit oversized for a smoker but most fit just fine.

The greatest advantage is that they start burning easily, because of their resin content. Particularly if one

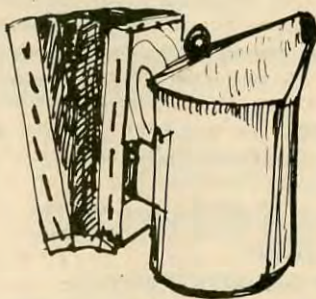
imagines some of the materials I have seen described give off a pretty nasty smell, and some others may even have fumes that are toxic to bees and humans alike!

The smoke from pine cones seems to give the bees a clear message. An age-old instinctive warning about forest fires and the need for sudden escape. A message well heeded. They invariably settle down and fill up on honey, to be ready if the need should arise to run — taking their riches with them. A few puffs at the entrance, maybe some above under the cover is all you need.

If more is needed, something else is probably wrong. Maybe they have superseded and it is time to order a better mannered queen. Or you open the hive while the weather is turning. Even though you don't see it yet, they know it is, long before we do. I think they feel barometric changes a lot better than we can. Although everyone has heard stories about people getting grouchy when the weather turns.

Or maybe you are attempting to manipulate them during a dearth in the nectar flow, which is a no-no, and they want to let you know that you shouldn't.

This pleasant, readily available and inexpensive smoke also overcomes other alarm scents and pheromones, with which the bees alert each other to fight or defend themselves. §



uses past years' crops, which had a chance to dry out overwinter. They also keep burning for a long time. A few puffs and a seemingly dead smoker is back alive. They also give off a pleasant smelling, natural woodsy smoke. Finally, they burn up to a clean ashy residue. I would

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HOME HARMONY

By ANN HARMAN
6511 Griffith Road
Laytonsville, MD 20879

February is an interesting month. Someone once told me it was tiresome and boring. My response was — how could it be with Groundhog Day, Valentines, Day, Washington and Lincoln's birthdays and occasionally a Leap Year Day thrown in. February has more reason for celebration than perhaps any other month of the year.

On February 2nd, the groundhog is supposed to be up bright and early to find out if he sees his shadow. If you are planning to join the groundhog you might wish to start your day with some hot muffins with honey.

Cranberry Muffins

2 cups flour
1 teaspoon salt
3 teaspoons baking powder
1 cup milk
4 tablespoons honey
1 egg, beaten
1/4 cup melted butter or margarine
1/2 cup coarsely chopped cranberries

Sift flour with salt and baking powder. Mix milk, honey, beaten egg and melted shortening. Mix chopped cranberries with either 2 tablespoons of flour mixture or 2 tablespoons powdered sugar. Add liquid ingredients and cranberries to dry mixture. Stir quickly just long enough to moisten dry ingredients. Batter should be lumpy. Fill greased muffin pans one-half full. Bake at 400° for 25 to 30 minutes or until delicately browned. Makes 24, 2-inch muffins.

adapted from
*GOOD AND WHOLESOME
HONEY RECIPES,*
American Honey Institute

Well, if you feel the groundhog can handle the rest of winter's weather by himself, you can serve the muffins for Valentine's Day. However, Valentine's Day calls for a gift of candy. Here is a simple, but delicious, recipe for men to make to woo their Valentine.

Honey Cream Cheese Fudge

1 3-ounce package cream cheese
1/2 cup honey
2 sq. unsweetened melted chocolate
1/2 teaspoon vanilla
1 cup powdered milk
1/2 cup chopped nuts

Cream together the cream cheese and honey. Add the chocolate and vanilla. Blend well. Gradually add the powdered milk and nuts. Spread in 8-inch square pan that has been lightly buttered or lined with wax paper or cooking parchment. Allow to set before cutting.

HONEY RECIPES FROM WISCONSIN

published by Ozaukee-Washington
County Bee. Assn. of Wisconsin

Now for some red, white and blue to honor the presidents.

Ruby Red Sauce with Chicken

2 cups grated raw beets
1-1/2 cups peeled and grated apple
3 tablespoons dry red wine
2 tablespoons honey
2 tablespoons lemon juice
1 teaspoon grated lemon rind
3 to 4 tbs. prepared horseradish
salt and pepper to taste
6 chicken breasts
3 tablespoons butter

In a saucepan, combine the beets, apple, wine, honey, lemon juice and lemon rind. Add just enough water to cover. Cook for 15 to 20 minutes or until the beets are tender. Place mixture in food processor or blender and process until smooth. Add the horseradish, season to taste with salt and pepper and keep warm. Saute chicken in butter until done and serve with sauce spooned over.

*GARDEN WAY'S JOY OF
GARDENING COOKBOOK*
by Janet Ballantyne

Creamy Egg Nog

6 eggs, separated
4 cups milk or light cream
1/3 cup honey
2 teaspoons vanilla
1/8 teaspoon salt
1 teaspoon each rum and brandy
flavoring OR
1/2 to 1 cups rum or brandy
whipped cream for topping

Separate eggs. Beat whites in large bowl until foamy. Add salt. Continue beating until peaks form. Fold in egg yolks and honey; mix until well blended. Stir in milk and rum or brandy or flavorings. Mix well. Chill. Serve with whipped cream topping and sprinkle with nutmeg. Makes 12, 4-ounce servings.

DELMARVA FARMER
Prize-winning recipe from
K. Isobel Hamm

Blueberry Tapioca

1 pint container fresh blueberries or frozen, thawed (about 2-1/2 cups)
1/2 cup honey
1/2 cup water
2 tablespoons tapioca

Stir together all ingredients in 2-quart saucepan. Let stand 5 minutes. Bring to boil while stirring constantly. Ladle into individual dessert dishes (5, 1 cup) if desired. Allow to stand for 20 minutes. Serve warm or chilled. Top with whipped cream.

*THE ENCYCLOPEDIA OF
CREATIVE COOKING*
ed. by C. Turgeon

Perhaps you have already noticed that 1988 is a Leap Year. So, ladies, before you get set to chase your desired man, take time out to bake this next recipe. A delicious honey treat is sure to make him succumb. This cake won Best in Show at the 1987 Maryland State Honey Cookery Show. The frosting is sugar-based, which makes it a suitable year-round frosting.

Continued on page 99.

WINTER CHARM

By JOHN BOLF

4710 Carman Drive • Lake Oswego, OR 97034

ON A COLD AND damp winter evening, while sitting by the front window, I could perceive only black emptiness outside. But in the darkness there was life, asleep and alive, in the soil and on the ground, and in the thickets across the lawn. All creatures of the animal kingdom were hidden in their natural habitat.

In this raw weather the birds sought refuge in the foliage of the evergreen boughs, laurel and vines. Chipmunks were secure in their underground dens and in the back woods the skunks, racoon and rabbits had their retreats in hollow logs, under rocks or stumps and in the shallow cavities under clumps of vine maples. Yellow Jacket queens weathered the rigors of winter under tree bark, inside rotting wood or in the ground.

We were secure in our home, and the fire in the hearth created a note of cheerfulness. Our bees were protected against the cold and wind, and had ample stores. In the day, chickadees, towhees, and the juncos came to their feeders. I wondered about the wildlings which must endure the bleak weather in their crude shelters all on their own.

One night it snowed and we awoke in the morning to a landscape mellowed with white purity, under a pale and sunless sky. It had softened the sharp features of trees and terrains, and obliterated winding roads, leaving only the dark interstices of fence posts to delineate their courses. All was still as though charmed by this rare, imposing beauty that had moved in so silently and swiftly. The smell of the snow was the breath of the boreal frost; the wavy characters of the snowscape were the notes of the north winds. The frigid air stung the nostrils and numbed the cheeks, but the enchantment of the outdoors warmed the heart and inspired the soul.

Ofentimes there was not the slightest movement when large feathery snowflakes came drifting down from their rendezvous in the sky. They came stealthily, like legions of miniature parachutes of an in-

vading army of tiny snowmen. They came in such numbers that they quickly occupied the entire area. They brought vengeance to the highways and sidewalks, formed barricades and slicks, heaped stresses upon roofs and caused avalanches in the high mountains. Or they came like Santa Clause, bringing gifts and joys to children and grown folks alike. They painted the whole countryside with the finest brushes and most artistic strokes, creating a scenery of exquisite elegance and charm. Children, and those feeling young, took sleds up hillsides and raced down snow packed slopes, screeching and laughing in exhilaration. Pudgy snowmen appeared in front yards wanting to be seen. These invading snowmen were dancing and singing in the winds, jumping off treetops, building mounds, and piling on bee hives to protect them from the raw weather. Many of them came to rest upon

“... like midget igloos in a wavy sea of snow.”

window sills to be more closely seen and admired. Slowly they yielded to the warmth against the glass. Drop by drop they fell to the ground and seeped into the soil, eventually merging with streams of restless waters dashing away to the sea.

In reminiscing moods I visualized each individual hive in the back woods. They stood like midget igloos in a wavy sea of snow. Here and there dark shrub limbs stood at careless angles against an engulfing haze. I could hear no sound but the whispering of the snow and detect no movement but that of a lone wren hopping from twig to vine in a berry clump close to the ground. But inside those white mounds in the apiary there were sparks of life, latent life, cozy, yet energetic.

I made deep footprints on my strolls, and I made them often. Although there was no activity at the hive entrances in this cold, my observations were not unrewarding. I made sure that bottom temperatures were clear of snow and dead bees, and that they had not been troubled by animals, as at times there were signs of skunks in the area.

On a clear night the valley was bathed in the charm of silver moonlight. The sky was spangled with thousands of stars, small, but bright. They glimmered like candles hung out in the vast overhead in a sort of benediction. The moon was a huge glowing disk and it looked warm and friendly in the still night. Gray shadows made splotches on the white ground by each clump, tree and post. They looked like shapeless creatures that came out to greet the lunar visitor and to admire its splendor and magic.

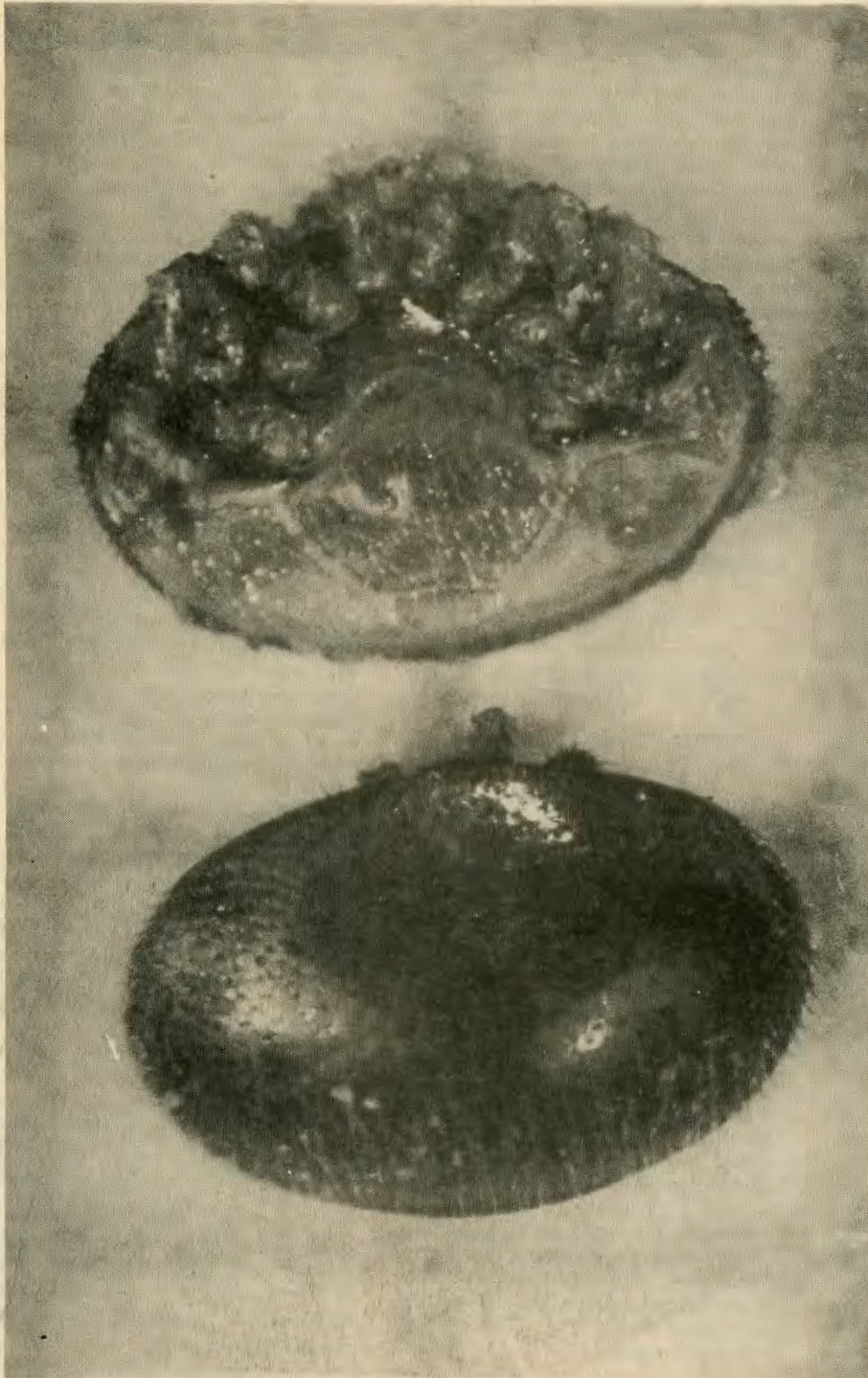
In a week, or possibly two, the land will have emerged from under the arctic grip of snow and ice. Then the drizzles will return; lazy drizzles that come at dusk and retreat at dawn, or persist for several days without letup. It is the kind of moisture that leaves the ground hardly more than damp.

In the Willamette Valley we generally have several spring-like days in February. During that time the weather is warm and the bees are out in large numbers. They are out on cleansing flights and on gathering trips, too. Pussy willow and hazel catkins will be in blossom and there will be nectar and pollen for them to bring in. But this is only an interlude in their long winter's quiescence. Winter is still with us and raw weather is likely to confine them for yet another month before they can go out again. This will be a critical time to keep check on each hive for stores — lest they suffer loss to a spring dwindling.

While the stars and the moon in the winter sky watch over the valley slumbering in serenity and contentment, we delight in the drama of the drifting snowflakes and the falling raindrops, in the green hills and the cascading streams. §

VARROA IN POLAND

By PIOTR JURGA
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60-651 Poznan
Poland



*"It has not
been the end of
beekeeping."*

Introduction

Since 1980 *Varroa* has been a serious problem for beekeepers here. However, it has not been the end of beekeeping as we know it. Our beekeeping practices have changed though, and will continue to evolve as discoveries regarding *Varroa* biology and control are made.

Understanding *Varroa*

Varroa spreads rapidly here, due to colony migration, import of queens and packages, drifting and robbing. Infection not only depletes a colony because of the initial stress, but the mite aids in the spread of some debilitating diseases, such as 'paralysis'.

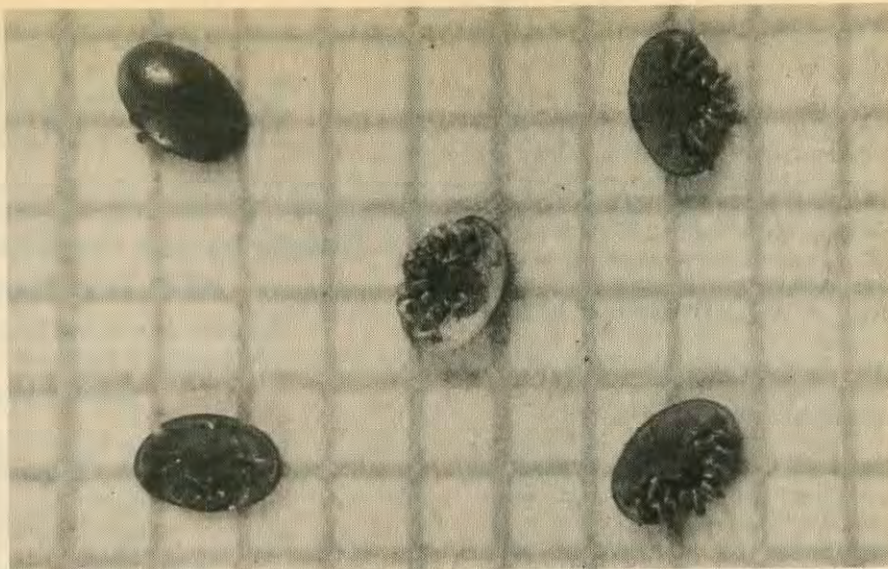
Varroa females can live without food for about 5 days, and from 16-17 days on dead bees. Males play little role in the colony, other than fertilizing the female inside a cell.

Autumn generations of females overwinter on adult bees, and begin reproduction as soon as there is brood present in the colony. Reproduction rates for *Varroa* are quite high. In our climate there are usually 10 generations produced per year. However, a single female could produce up to 80 offspring per generation; since about half are female, the total number of *Varroa* produced by 1 female could, in theory, approach 1 million in a single season. Fortunately, natural mortality and other factors keep reproductive rates at about 10 females/female/year.

By far the greatest percentage (80%) of *Varroa* females are found in the drone and worker brood areas. About 20% can be found on adult bees. The mite does not reproduce at all in queen cells because of the very short development time for queens.

Drone brood is usually infested 11-15 times more heavily than worker brood. We suspect this is due to the difference in development time, but also diet, hormonal differences and temperatures play a significant role. Drone brood, found primarily in the outer areas of the brood nest generally are subjected to a somewhat lower brood nest temperature than worker brood.

We have also found that *Varroa* multiply more rapidly in weak than in strong colonies. We feel this is in part due to the fact that smaller colonies have a lower, but in this case, significant brood nest temperature. This temperature difference has two effects; first, it prolongs brood development by as much as 2 full days; second, the higher, though normal, brood chamber temperature is actually detrimental to the *Varroa* mite, while perfectly safe for honey bees.



Female *Varroa*. NOTE: They are wider from left to right than front to back.

However, a surprising contradiction does exist. Early spring drone brood is far more heavily infested than drone brood found in mid to late summer. During the latter part of the season, worker brood will be nearly equally infested. I have two theories why this behavior exists.

First, the rate of reproduction increases during the summer due to the presence of greater amounts of brood, coupled with the fact that female mite movement tends to be somewhat restricted. This would account for an increased number of females found in the worker brood nest area — females go where there is room. Second, there may be competition between females for available favorable breeding areas (drone brood), therefore some females migrate to less favorable areas (worker brood).

Controls

Chemicals are the primary, and most efficient controls used for *Varroa* in Poland. Amitraz, Folbex VA, formic acid and others are used routinely. However, all of these only kill those mites **NOT** in sealed cells. Further, many (but not all) are toxic and treatments must be made when there is no honey in the colony.

It is strongly recommended that chemical treatments be made when there is no brood in the colony — late autumn is best. Colonies can be treated in summer but these treatments are very labor intensive and no more effective than at other times of the year.

Some beekeepers treat their colonies during the late fall or winter

Continued on Next Page

Varroa on larva.



when ambient temperatures are below freezing. Their technique is as follows.

Since there is no brood (or very, very little) in the colony, chemical treatments are extremely effective. But, since the bees are clustered, thus reducing the effectiveness of the chemical movement in the hive, the colony is literally 'warmed up' before treatment is applied. To achieve this, small (20-30 watt) electric or battery heaters are placed on the bottom board which warm the inside of the colony enough to loosen cluster. The medication is then applied.

This treatment is especially effective for several reasons. There is no (or very little) brood present, so all mites are exposed. Also, there is no opportunity for reinfection until spring because there is no drifting or robbing. Finally, though this too is labor intensive, at this time of year our beekeepers have more time for such activity.

As a side note, some beekeepers use hot bricks or jars of hot water to warm the colonies instead of electric heaters. This is especially true for small scale beekeepers, or for out yards with no access to electricity.

A Final Note

Nearly all the treatments we use are 90-95% successful. The remaining 5-10% can, and do, cause problems. By far the greatest concern is that due to their rapid reproduction rate, it usually only takes 2-3 years before resistance to any one chemical is noticed. Our recommendation, therefore, is that treatment be rotated at least this often to avoid what could be a far more serious problem. §

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Bee Pasture Perspectives

By ROGER HOOPINGARNER and GEORGE S. AYERS
Department of Entomology

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THERE ARE several factors that can influence the yield of honey from a colony. Among these are 1) the strength of the colony at the time of the nectar flow, 2) the morale of the colony as indicated by the extent to which bees are concentrating on gathering rather than on such activities as swarming, 3) the genetic characteristics of the bees, and 4) the presence of nectar and pollen plants. The last item could also include a major source of nectar in order to provide the surplus honey essential for a successful beekeeping enterprise.

In years past many parts of North America provided ideal locations of honey production. However, changing agricultural and land-use practices have converted excellent beekeeping areas into areas which have become poor or incapable of supporting commercial beekeeping. We can anticipate a continuing reduction in the number and size of areas suitable for profitable beekeeping, as the human population increases, houses, pavement, factories, etc. will more and more replace the open fields of bee forage.

In spite of diseases, mites, pesticides and other challenges, deterioration of the nectar and pollen environment must rate as the most serious long-term threat to the beekeeping industry. It is with this in mind that we are putting more emphasis on the study of nectar and pollen sources. There may still be opportunities to increase honey production through better use of nectar and pollen producing trees, or by introducing new crops useful to beekeepers as well as farmers. Beekeeping could also benefit through influ-

Michigan Honey Production Records
J. N. & V. N. Harris (Gratiot County)

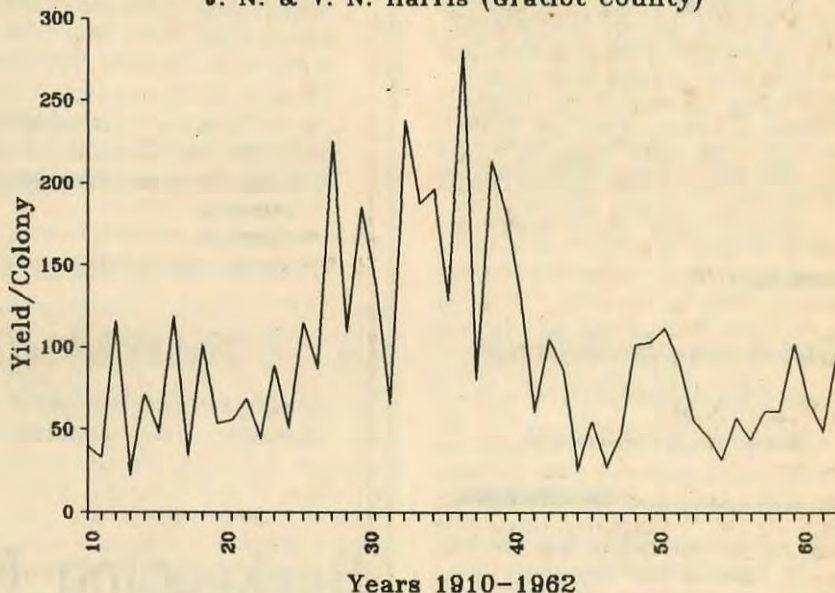


Fig. 1. Honey production record plotted from data of Harris & Woodman (1963).

encing the methods of re-vegetating land damaged by coal mining, by breeding crops for honey production, or selecting favorable wild plants.

In line with these studies we are trying to analyze various aspects of the influence of bee pasture on honey yields in Michigan. We happened to uncover a printed listing of a beekeeping family's honey production records covering a period of 85 years (Harris and Woodman 1963). In examining these records we decided to plot some of the data to see if we could observe any trends, as there were high yields in some years. Fig. 1

is a plot of the average honey yield for the years 1910 to 1961. The total record included 85 years but we elected to start our chart in 1910 (52 years) since by that time the Harris' had stabilized both colony numbers and location in Gratiot County, Michigan. While there were the obvious up and down movements that characterize average honey yields, there was also a trend of substantial upward movement in the mid to late 1920's. This higher production continued until about 1940 when the yields returned to the averages that were seen prior to the rise. The average per colony yield from 1910-1925 was 67.6 lbs; from 1926-1940 it was 168.7 lbs; and from 1941-1962 was 67.2 lbs. This was an increase and subsequent drop of 101 pounds.

"The amount of honey gained could be 500 lbs. per acre from alfalfa, if these cultural practices were followed."

In trying to analyze these changes we enlisted the help of
Continued on Next Page

MSU's hay and forage expert, Dr. M. B. Tesar. He said that one explanation might be a change in forage crop production. In the early 1920's the flat, wet fields of mid Michigan were tilled to reduce the wet areas. The better drained fields allowed the farmers to change hay crops from red clover (*Trifolium pratense*) to alfalfa (*Medicago sativa*), as successful alfalfa growing requires well drained fields. Thus, one major change that occurred was one hay crop was exchanged for a better one — one that was obviously a better honey plant. What then was the explanation for the drop after 1940 since the average farmer was still growing alfalfa? In the 1920's and 1930's the farmers were only cutting the alfalfa once or twice during each season. They allowed it to flower significantly before they cut it to make hay. By 1940 most of the farmers had been advised to increase their cuttings to three per year to increase their yield, and to retain a

“But it may be difficult to change current cultural practices.”

higher percent protein in the alfalfa hay. Dr. Tesar thinks that once this practice was common the yields of honey took the drop to present levels. It thus appears that alfalfa may have the potential to yield an extra 100 pounds of honey per colony if it is allowed to flower, and there are hay fields near a beekeeper's apiary.

There may have been other factors that affected the reduction in yields during this period, e.g., sweet clovers (*Mellilotus alba* and *M. officinalis*) also were phased out of use about the same time. Many farmers in this area of Michigan also changed from an animal-forage agriculture to field crops such as white beans. The extensive use of herbicides was not common in 1940, and thus while they may have importance now, were not a factor then.

It may be somewhat difficult to change the practice of cutting of alfalfa back to two per year. First, the pest management of the alfalfa weevil is accomplished by early harvesting of the first cutting. Second, if the yield of alfalfa is reduced by the shift from three cuttings to two, the loss to the farmer could be significant. However, the amount of honey gained by the beekeeper could be 500+ pounds/acre from alfalfa (Crane et al. 1984).

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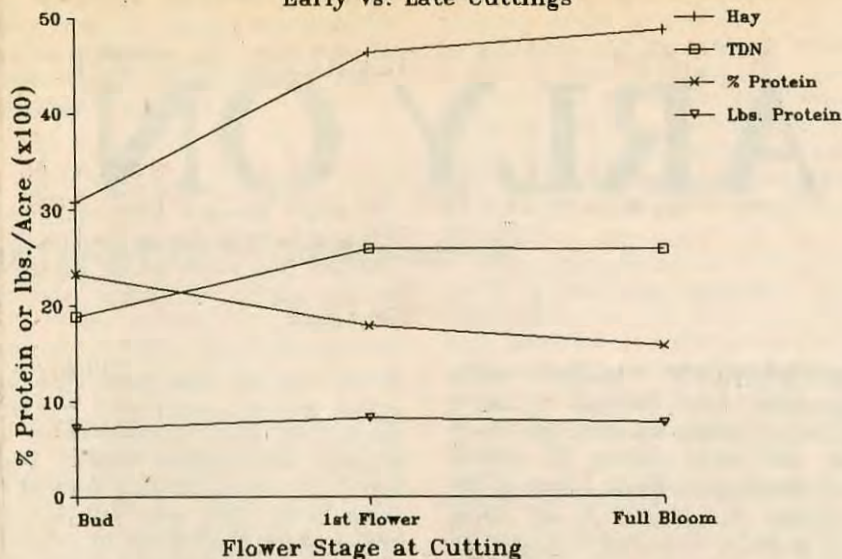


Fig. 2. Alfalfa yields taken from data of Smith (1981). Values are in pounds/acre (in 100's), except for percent protein. TDN is total digestible nutrients.

acre from alfalfa (Crane et al. 1984). The difference between the loss to the farmer and the gain to the beekeepers would vary with the market values of each. It may be that when the price of hay is low (as it is currently), the beekeeper could entice the farmers in his area to delay cutting of the second crop by paying a fee for each acre not cut, at least until the alfalfa had flowered for a period of time. While the percentage of protein decreases as the alfalfa matures, the total amount of hay would increase somewhat. The total protein and the

total digestible nutrients (TDN) are essentially level as the alfalfa moves from early flower to full bloom (Fig. 2) (Data taken from Smith 1981). The only apparent loss is in percent protein (quality) of the hay. The beekeeper would have to cover any reduction in value for this loss of quality, and for any reduction in total tonnage because of the loss of at least one cutting of hay over the growing season. A significant reason for delaying the cutting until full bloom is that the alfalfa has transported the maximum amount of reserves to the

roots at that time. This allows for a healthy, stronger stand for wintering and subsequent re-growth.

There are probably many crops that in large acreage will produce significant amounts of honey if they are allowed to bloom. This may explain the good yields seen by the Harris' (Fig. 1) and others earlier in this century, and the current high yields from sunflowers in the Dakotas or from oil seed rape (*canola*) in the prairie provinces of Canada.

We have been interested in reversing the loss of the honey production potential caused by changes in agricultural practices by substituting at least small acreage of various species of high yielding nectar plants (Ayers et al. 1987). When we compared the nectar potential, as given by bee visitation, of the various hay crops versus some of the other possible honey plants, we found that plants like mountain mint (*Pycnanthemum pilosum*) had between 5 and 500 times more bees visiting it than the various clover species. While it may not always be possible to change back to past practices, it may be feasible to plant high yielding honey plants nearby your apiaries. One or two acres of the right plants could make up for some of the losses due to the reduction of nectar provided by agricultural crops. §

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ARLY ON

By PHILIP MARIOLA • ATI, Wooster, Ohio

OBSERVATIONS MADE while examining your colonies in early spring are among the most important you will make during the entire beekeeping year. Being aware of the condition of a colony in the early spring, and taking proper actions as follow-up can make the difference between a weak, slow-to-build colony, and a boomer, ready to sock away honey. It can make the difference between a sick, stressed colony which may never amount to much or a healthy, active colony which will do all the right things for its keeper. It can mean the difference between a nice cluster of bees that starved to death for lack of carbohydrate or a colony that "made it over the hump" because of timely feeding.

In this article I will attempt to highlight the appropriate tasks you should perform in early spring to prepare your colonies for the swarming season and the first honey flows. When referring to a specific month I am speaking for Ohio, but beekeepers in other areas should adjust the time sequence accordingly.

What is a date which can be used as a rule of thumb for the *first spring examination* of bee colonies? The answer to that is the same as the answer to so many other bee questions: it depends! It depends upon several factors such as the condition of the colony the previous autumn (if your colonies were light going into winter this would be all the more reason to check for stores throughout the late winter and early spring), and the winter weather patterns. In most northern areas we can at least check for stores on a mild late February day. I'm assuming that you will use common sense and disrupt the colony as little as possible. The objective in a late February exam, unless the weather is unusually warm (greater than 50°F), is to check

to see that the bees have adequate stores, and are queenright. Weather permitting, brood frames could be checked for possible disease. Bees don't have central heating systems in their hives, they generate enough heat to keep themselves alive while clustered. It isn't harmful to examine bees in cool weather, if the beekeeper doesn't exaggerate. It's not a question of letting too much cold air into the hive. The greater danger is of disrupting the cluster when a cold front is moving in. In examining the bees the cluster may become "loose", and if the bees aren't able to recluster tightly they could be killed if the temperature drops rapidly in the hours following hive manipulation. The moral of the story is simply this: in late February open the hive, check for honey stores, take note of the brood pattern (or lack of brood), and close the hive. No more.

If a colony is found to be light on stores, feed of some kind must be provided. I don't wish to get into a discussion of feeding in this article. Feeding bees in cold weather is not always successful, because the bees don't necessarily get to the food provided. Combs of sugar or corn syrup placed on both sides of the cluster or top feeders and candy boards are probably the best ways of feeding, if necessary. In my opinion, though, the best way to feed bees is to add a couple of frames of honey from another colony *known* to be disease free. This can be done by designating one colony in the apiary as a donor colony which will be left with much more honey than is normally the case when it is closed up for winter. In this way there is no mixing, no hauling and no spilling sugar syrup. When you find a light colony in late winter or early spring, merely take a couple of frames of honey from the donor colony and use it to feed the hungry neighbor.

If you wish to feed pollen substitutes or supplements, late February

"Food reserves, the Queen and colony health must be found — Early On."

would be the time to begin in northern areas.

Any dead colonies found during this February excursion should be taken from the apiary, examined for possible disease and cleaned in preparation for introduction of a split, a package or a swarm.

In March the importance of inspecting your colonies increases. The reason is simple: the bee colony is producing brood at an ever-increasing rate, and brood rearing means more honey consumption. Many colonies die of starvation in March and early April *because of beekeeper neglect.*

In March, the colonies can be more thoroughly inspected for disease, and the queen can be evaluated by observing the brood pattern. It should be solid and not spotty. Bottom boards can be cleaned and hive stands repaired or adjusted. It is a good time to straighten a hive stand that is leaning, as the colony is light and the brood supers are easy to lift.

If you use reversing as a swarm prevention technique (the two brood supers are reversed, the theory being that the bottom super, by March, is empty and when placed on top

allows room for the queen to move up and continue to lay), March is usually the proper time to begin, if the weather isn't too cold. Once again common sense is needed to avoid unnecessary chilling of brood, which happens when a colony has some brood in the top of the lower brood super, as well as in the bottom of the upper super. By reversing in this case the brood nest is split and the cluster may not be sufficient to cover all of the brood.

The main point in all of this is to begin to learn the seasons in your area and to use good judgement. The main objective in early spring exams is to see that colonies have ample stores of honey to avoid stress and starvation, and are queenright and disease free. How thoroughly you examine the bees depends on the weather. Remember, there is no need to disrupt a cluster in cold weather, when a quick check of available stores will suffice. At the same time, in years when spring comes very early, it is wise to take advantage of the warm weather and check colonies for disease, queen quality and honey stores, as well as to clean bottom boards and begin whatever swarm prevention techniques you happen to prefer. §

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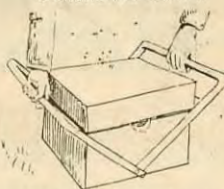
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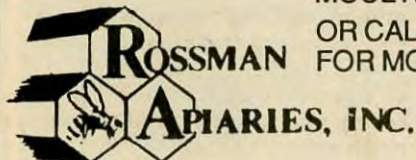
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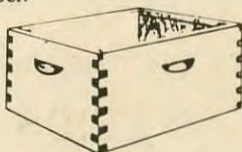
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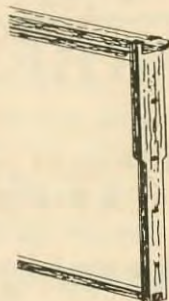
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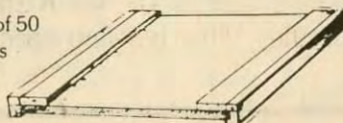


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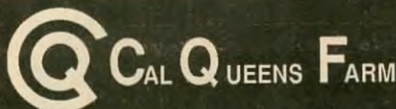
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IT MAY SEEM trite to mention, but, nearly every expert maintains that the more bees there are in a hive when the major nectar flow begins — the better. Further, most articles published on spring management state that the main objective is to build up colony population from low overwintered numbers to maximum size.

It has been my experience that unless there are 10 pounds or more of bees in the hive just before the first nectar flow, the colony will produce little, if any, surplus. I've also found that it takes about seven pounds of bees to take care of the brood that is, by this time, being produced at a great rate. Also, this group has to be concerned with cell cleaning, comb construction and handling the incoming nectar for storage and ripening.

Up until this past year, I have not been able to meet or exceed the required strength for any colony in my apiary.

As background, I have been keeping careful records for nine years as relative to colony weight changes and of the honey produced by each colony in the apiary, which has ranged from 11 to 20 in number.

The Problem

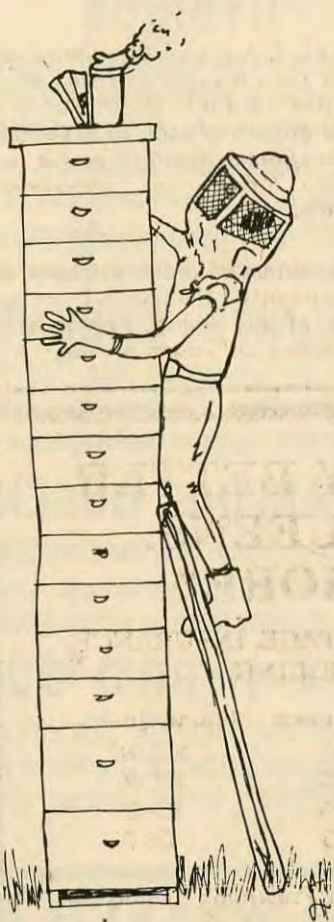
Early on, I was continually frustrated by the fact that the same colonies performance was not consistent over time. There were always a few that produced a big crop, a number that were average producers and always two or more that didn't produce enough to feed themselves over winter. And what was worse, a colony would be good one year and bad the next. Sound familiar?

From reading the literature I assumed that my queens must be at fault. Over several years I had obtained Italians, Caucasians, Carnolians, Midnites, Starlines, Mraz, Buckfast, and one year a number of Northern raised queens. All this with no discernible affect on improving the variation in the honey crop from one hive to another.

Next I tried feeding straight pollen and pollen supplements in great quantities. The only affect this had was to lighten my pocket book.

Two years ago I was looking at the data I had accumulated and it suddenly

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came to mind that a number of experts had written, at various times, that a fertile queen can lay from 1000 to 2000 eggs per day. Nothing new here, but one more piece to this puzzle.

A quick calculation showed that even with the minimum rate of 1000 eggs laid per day, a queen could produce the 10 pounds of bees I wanted in only 30 days. This from the basis that there are about 3000 bees per pound.

So, even a substandard queen, laying only 500 eggs a day, could supply 10 pounds of bees by May 10 if she started March 10. There is usually bee flight by the first of March, so I guessed that some egg laying was underway, and, as the season progressed, the new egg laying rate would increase. So, there was good reason to believe that every colony should have at least 10 lbs. of bees at the onset of nectar flow, which normally starts about May 10 in my area. The queens were obviously not the source of the problems, I surmised.

Next I calculated the number of cells in a full sized frame and came up with about 7000. I checked my data for the weight of the bees in my overwintered colonies and came up with from 3 to 6 pounds. This meant that on March 1 there should be from 9000 to 18000 bees in the colony. Enough to cover only one or two frames of cells. Then the light dawned.

The Facts

If a queen could fill a frame with eggs in two or three days, there was no way possible the adult bees in the colony could feed and keep warm that many larvae. The date of the last frost in my area ranges from April 10 to May 10. So, from March 1 up until at least the middle of April (and probably longer), when the temperature dropped the adult bees would cluster to keep the queen and any eggs and larvae close to her warm. Any larvae outside this cluster area obviously would not survive. So the size of the brood nest was determined by the weather, and thus the size of the colony. Queen 'production' had little to do with it.

That reminded me of 1982 — the season I thought I had mastered the art of beekeeping. That year several of my

colonies produced over 200 pounds of honey and even the poorest collected enough to overwinter well. That spring there was a three week period in February with temperatures over 70°. March and April were also mild, and the nectar flow started on April 25 and lasted until July 14.

Now that the problem was defined, I had to figure out what to do about it. I couldn't control the weather, and it wasn't economical to heat the hives. And, since requeening, feeding pollen and stimulative feeding was a waste of time and money I had to come up with some other solution. Then I remembered that as a child, we had raised a lot of chickens on our farm. We didn't save and incubate our eggs, or raise our own chickens, we bought them from a hatchery. More light.

The Solution

Why should I try to raise bees when there are dozens and dozens of businesses who raise bees for a living. They could certainly raise them cheaper and better than I could — Right?

In 1986 I tested my theory on a few hives and it worked. So, in 1987 I set up a procedure that any one could follow that would verify my findings. Early in 1987 I ordered five, four pound packages of queenless bees. They were scheduled to arrive on May 10 so that I wouldn't have to feed them. May 10 is the date for the beginning of our nectar flow. I selected 5 overwintered hives at random. Some were strong, some

average and some were weak. I also selected 5 adjacent, comparable colonies to act as a control.

When the bees arrived, I put a slit newspaper over the brood chambers of my five selected colonies, then a super with foundation and comb, and over that an empty super. The queenless bees were dumped into the empty super and the cover put on. In about an hour the empty super was removed and the cover replaced on the now filled super.

Hive #	Col 1	Col 2
1	131	(72)
2	117	(67)
5	106	(60)
8	107	(74)
10	83	(53)

4	64	(45)
6	89	(52)
9	57	(39)
11	80	(42)
13	40	(12)

(All weights are in pounds)

Hives #1, 2, 5, 8 and 10 collected 136 pounds more honey than Hives #4, 6, 9, 11 and 13. Cost of 20 pounds of bees @ \$6/pound was \$120.00. 136 pounds of honey @ \$1.50/pound was \$204.00. Return on investment was 70%.

In column #1 is the weight of the hive contents. Column #2 is the weight of the honey produced by each colony *in excess* of what was

consumed over the winter and during the spring build up. The overwinter stores consumption varies from 13 to 26 pounds and the spring build up will take an additional 20 to 50 pounds. Therefore, the colony's efficiency is not measured by how much honey is in the hive (some of which may have been left from the previous year), but rather by how much surplus each colony provides this year. The result was that the hives supplied with additional bees (1, 2, 5, 8 and 10), produced 136 more pounds of honey than the control group which received no additional bees.

I paid \$6 per pound retail for these bees, for a total cost of \$120.00. I thought it reasonable to calculate the monetary gain by valuing the honey at my usual retail price of \$1.50 per pound or a total of \$204.00. This figures out as a rate of return of 70%. If I had put that money (\$120.00) in a CD at the bank for a year, I would have received only \$129.60.

Try It!

If you are a newcomer, try this technique. It will help your spirits considerably if you can get a good supply of honey during your first year in beekeeping.

If you order package bees for the first time, order between 8 and 12 pounds, with one queen, to be delivered close to the time of your first major nectar flow. If you have one or more overwintered hives, order several pounds of queenless bees to be added to those colonies at the time of the first major nectar flow.

The question has come up concerning the swarming problems with a large colony. To date, I have not had that problem with any of my augmented hives. My theory is that even if queen cells had been started prior to adding the bees, the infusion of a lot of new bees of all ages, and the ensuing upset will take a colony's mind off swarming. Further, the rapid influx of nectar to be processed may take all of their attention.

The data presented was collected using a K-8 Super Balance. This is a 2-part hive scale. The first is a small wooden base, placed under each hive that acts as a hive platform. The second part is a 5 pound sensor that is slid under each hive for a 10 second weight reading. §

Further information about any of this equipment can be received by contacting the author.

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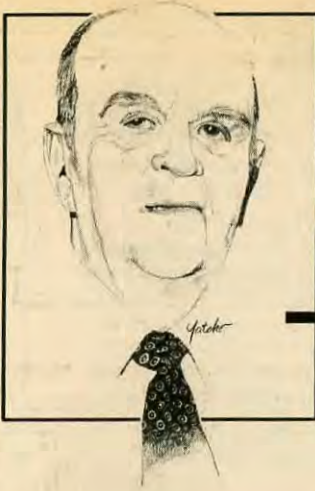
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KOOVER'S KORNER

By CHARLES KOOVER • 1434 Punahou St. #709 • Honolulu, Hawaii 96822

"One of my friends had a couple hives of bees, until a neighbor built a swimming pool."

All of you hobbyists must move your bees. That is, if you love them. For Varroa is like aids. There is no cure for getting rid of them, as of yet. Foul Brood was bad enough. But these mites are something else.

And then there is all this talk of 'killer bees'. The press loves to harp on that. It keeps your neighbors stirred up. You can't enjoy your bees in your backyard when your neighbors are constantly calling the police about someone in the family having been stung, and you know full well it wasn't one of your bees. Or a stray swarm hanging in one of their trees when your

bees didn't even swarm. For bees will seek other bees. Long after I had moved my bees out of my yard, stray swarms would come to my garden and hang there. Why, I can only surmise.

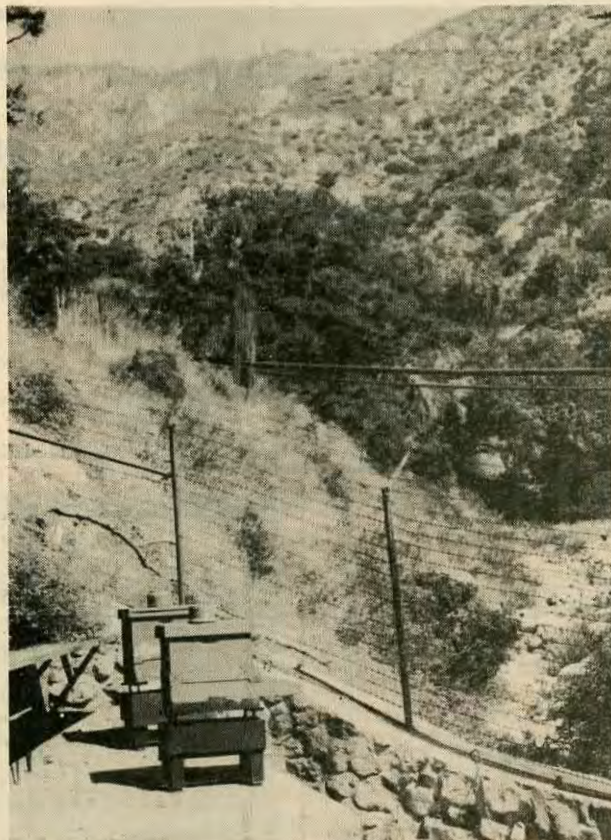
More than forty years ago I was confronted with having to move my bees. I hated it. When I came home from work I would go into my backyard to have a look at my bees and then would go into the house and kiss my wife. That's a hobby for you. I did move my bees and I wrote a story about it which was printed in *Bee Culture*. Here it is.

THEY TOLD ME I would have to get off the lovely mountain spot where my bees are because the property had been sold and would be subdivided. Like a mother cat expecting babies I went prowling through the nearby mountains trying to find a safe secluded spot to have a litter.

I knew of a pumping station deep in a nearby canyon where the company which supplies our town with water gets some of its supply. The sign at the dirt road leading to it said, "Keep out. No trespassing.", but I drove on until I got to the end of the road and two padlocked gates, one after another.

It looked like Fort Knox where Uncle Sam keeps his gold. Heavy concrete walls, abutments and wire fences with barbed wire on top, almost climb-proof, except for boys, but even a bear would have trouble getting in.

Bees need water in a dry mountain spot like that. But there was water. The water company had thoughtfully



Safe from floods, slides and neighbors, above the Canyon floor, behind the walls of my 'Fort Knox'.

built a drinking trough for deer and other wild life. A pipe was dripping water into it from 15 feet above and it sounded like a brook. How my bees would make a bee line for that.

I spied a spot way off at the very end of the fortress, for that was what it looked like. It would be safe from boys trying to stone the hives. I am afraid of American kids, they play baseball and know how to throw a rock. The fence would be too close to the hives and they could heave rocks in and that would be no fun.

I noticed there was electricity, for I could hear the pumps clanking away. It would be nice to blow the bees out of the supers with air when the time came to take off the crop.

I was purring with anticipation, like a cat spying a bird. The only thing to do was to go and see the

Continued on Page 99

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KOOVER... Cont. from Page 97

manager of the water company and plead my case. Putting my best foot forward I approached him and meekly stated my predicament and asked if he would help me out. He looked me over carefully. "You are a nice fellow," he said. How many hives will you put there?" My hopes began to rise. "Only two," I replied. He gave me the key to the gates.

It was as if Gabriel was blowing his horn, opening the gates of Heaven to let me in. My bees think it's Heaven, too. They found the water trough and are visiting it all day long, for everything has dried up at the end of a long hot summer. But soon the first rains will come to the parched mountains and eucalyptus will be in bloom. This bee location is in the National Forest and due to fire hazard, no one is allowed in the mountains, except the water company personnel and lucky me, with my key to Heaven.

I have since found out that the water company manager has four grandchildren who love honey. And the foreman has a French wife who won't use sugar and loves honey, too. I have honey and I speak French. I think I'll be around for awhile in my lovely mountain spot.

One of my friends had a couple of hives of bees until a neighbor built a swimming pool and wanted him to give them up. He did. Don't be like that. Go prowling around like that mother cat expecting babies. You will be surprised and pleased with what you will come up with. §

Home Harmony

Cont'd. from Page 82.

Hot Fudge Cake

- 3, 1-ounce squares unsweetened melted chocolate
- 1 cup milk
- 1-1/3 cups honey
- 3 eggs
- 1/2 cup butter
- 1-1/4 teaspoons vanilla
- 2 cups sifted flour
- 1 teaspoon baking soda
- 1 teaspoon baking powder
- 1/2 teaspoon salt

Frosting:

- 1 box confectioners sugar
- 1/2 cup cocoa
- 1/4 teaspoon salt
- 1/3 cup boiling water
- 1/3 cup softened butter or margarine
- 1 teaspoon vanilla

February 1988

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Combine chocolate, 1/3 cup of the milk, 1/3 cup of the honey and 1 egg, well-beaten, in a saucepan. Cook over low heat, stirring constantly, until thickened. Set aside to cool. Cream butter and vanilla. Continue creaming while adding 1 cup honey in a fine stream. Add remaining 2 eggs, one at a time, beating well after each. Sift together dry ingredients. Add the remaining 2/3 cup milk to the chocolate mixture. Now add dry ingredients to creamed mixture alternately with chocolate mixture, beating well

after each addition until smooth. Pour into 2 greased 9-inch cake pans with a lining of wax paper or kitchen parchment. Bake at 325° for 25 to 30 minutes or until done. Cool for 5 minutes before removing from pans.

• For frosting, combine sugar, cocoa and salt. Add water and butter while beating. Add vanilla. Frosts tops and sides of 2, 9-inch layers.

Exhibited by Merle Robinson

With these recipes everyone can have fun with February! §

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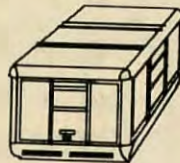
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T W E N T Y F I V E Y E A R S
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

A G O I T H O U G H T I
 16 17 18 19 20 21 22 23 24 25 26 27

U N D E R S T O O D T H E
 28 29 30 31 32 33 34 35 36 37 38 39 40

L A N G U A G E O F B E E S.
 41 42 43 44 45 46 47 48 49 50 51 52 53 54.

1. Honey bee defense:

S T I N G
 15 1 8 4 17

2. New Zealand tree producing toxic honey:

T U T U
 5 23 20 28

3. A duty performed by hive bees to the queen:

A T T E N D
 13 26 34 3 29 30

4. An ommatidium:

E Y E
 10 6 12

5. Box for bees:

H I V E
 21 19 9 31

6. An activity bees do without water:

B A T H E
 51 16 38 25 40

7. Oxygen, chemical symbol:

O
 18

8. Colonial symbol of justice

W I G
 2 27 44

9. Bee tongues:

G L O S S A E
 24 41 22 33 54 42 48

10. Scout:

F O R A G E
 7 35 14 46 47 52

11. Alkaline gland:

D U F O R
 37 45 50 36 32

12. Miel:

H O N E Y
 39 49 43 53 11

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QUESTIONS?

Q. *How early in the spring can I order fertilized queens without risk of their becoming chilled in the mail?*

Ralph Bennett
Saranac Lake, NY

A. I think you can order them to come as early as you need them and they are available. The post office will probably be glad to hold them there so they won't get chilled in your mailbox, and most queen breeders are willing to guarantee live delivery.

Q. *What are the pros and cons of using eight or nine frames rather than the usual ten?*

Ben J. Moore
Batesville, MS

A. Combs are much easier to uncap when only eight are used in the supers, but they must be carefully spaced to avoid getting two combs built on one frame. In the brood chamber nine frames are desirable in order to facilitate removing them for inspection. But when frames contain only foundation, rather than drawn comb, use ten, then reduce to nine (or even eight in the extracting supers) after they are drawn out.

Q. *A swarm that I had hived swarmed out again three times the day after I had hived them, even though I put frames of honey in the hive. Does the presence of wax moth residue drive them away, even though the hive has been cleaned up?*

William Deveney
McDonald, PA

A. Combs of honey have little or no effect so far as trying to make a swarm stay put after it has been hived. A single frame of brood, on the other hand, will almost always hold them. And no, bees are not repelled by traces of wax moth residue in a hive. They sometimes occupy and clean up

a long-abandoned hive that is filled with such residue.

Q. *What do you think of reversing hive bodies in the spring?*

J. A. Yoder
Millersburg, OH

A. Reversing the stories of a two-story colony breaks up the brood nest, thus creating more area in the combs for brood rearing and thereby discouraging swarming, at least temporarily. It must be repeated at about ten-day intervals for three or four weeks. The same effect is produced by simply removing a couple of combs of brood from the center of the brood nest, provided you have some use for those brood combs.

Q. *I have a hive of Italian bees to pollinate my orchard of apple, pear, quince and nut trees, but seldom see more than a single bee on a tree that is covered with blossoms. Would I get better pollination with a different race of bees?*

George F. Sheehan
Centerville, MA

A. I believe there are no significant differences between the races of bees so far as pollination is concerned. The more likely relevant factors are: 1) a pollination colony must be strong, with brood in at least six combs; 2) the weather, over which we have no control, must be such as to stimulate

nectar secretion in the flowers, requiring ample sunshine, and 3) sometimes other bloom, especially dandelion, is more attractive to the bees than fruit bloom, in which case they will ignore the latter in favor of the former. I suspect this last in your case. Some orchardists mow the dandelions in and around their orchards. Pears, because of the low sweetness in the bloom, are always difficult to get pollinated.

Q. *How do you keep the queen out of the supers without excluders?*

John E. Palmer
Newmarket, NH

A. The queen will not go up into the supers if there is honey between the brood nest and the supers. So if there is plenty of honey in the hive before the supers go on, this usually keeps the queen down below.

Q. *What are the advantages and disadvantages of having marked or clipped queens?*

Dennis F. Level
APO New York

A. A marked queen is easier to find in the hive, but the advantage of this is slight because there is seldom any need to find her, and an experienced beekeeper can see an unmarked queen just about as quickly as a marked one, anyway. You can also keep track of her age by the color of the spot, in case that is important to you, or know whether the queen has been superceded. As for clipping, I think there is no advantage. A clipped queen will not leave with a swarm, and a swarm will not leave without a queen, but what the swarm will do, after a delay of perhaps a day, is leave with a virgin queen. §

Questions are welcomed. Send them to: Dr. Richard Taylor, RD 3, Trumansburg, NY 14886. Please enclose a stamped, self-addressed envelope for prompt response.

& ANSWERS!

by Richard Taylor

Inner Cover Cont. from Page 59

Directors of EAS. We've had some good conversations in the past. He recently put together an excellent pamphlet on disease identification published by the Maine Department of Agriculture. He's a good guy to have on our side.

However, he recently took offense to some things I wrote in this column. To wit:

Your negative comments in December's "The Inner Cover" serve absolutely no purpose other than breeding malcontent in American beekeepers. You state that the industry is "under siege by forces not under our control". This statement could not be further from the truth. It was the beekeeping industry which requested regulatory programs to protect the industry and which ultimately influences rules and regulations through the political process. It is comments received during the hearing process from individuals which influence budgets and regulatory actions/inactions on the State and Federal level. You are part of the decision making process.

If the beekeeping industry wants deregulation and wishes to encourage the transport of colonies regardless of their condition then the reasoning should be justified and industry should lobby for deregulation.

There has been little positive input regarding the role of regulatory agencies from this publication. What does the editor of Bee Culture propose? What immediate actions should be taken so government agencies are not criticized in future issues for procrastination. Resistant strains (other than A. M. scutellata) and registered chemicals with no residues are presently not an option. Please get off the fence and take a stand.

Well, Tony, let me explain. First, my primary concern was, is, and will always be that there be a consensus among regulatory officials on any course of any action taken. If APHIS runs the show, let EVERY state agency follow the same rules. On the other hand, if APHIS bows out, let's have some cooperation between state agencies. Fifty different sets of rules do not make life easy. Rather, the morass would be more confusing than anything I can imagine. I would guess you agree.

My comments are my input to the political system, Tony. I'd like to see the *Varroa* situation handled better (read consistent) than the tracheal mite ordeal was. If APHIS wants in — fine. If not, well, if you

Department of Ag. can't/won't talk to mine, or vice versa, we're all in trouble.

I can understand your first comments Tony, but I'm really surprised at your last note about *Bee Culture's* regard of regulatory agencies. I won't speak of previous editors, but I stand on my record of support of Inspection, Inspectors and the continuing need we have for this service. I lobbied for increased support of the Inspection Service as President of the Connecticut Beekeepers Association and worked cooperatively with the same group while in Wisconsin. I'm on your side here, Tony. But there is a bigger picture. It is, unfortunately, somewhat idealistic. Henry David Thoreau stated it quite eloquently many years ago, "That Government Governs Best That Governs Least". In this vein, and still operating in the real world, I suggest that some Federal Agency (probably APHIS) take the reins of tighter restrictions, or less for that matter. Not fifty different sets of rules — only one. And, good or bad, that's it.

How's that, Tony?§

FOOD FOR THOUGHT

Are you an active member
The kind that would be missed
Or are you just contented that
Your name is on the list?

Do you attend the meetings
and mingle with the flock
Or do you stay away content
To criticize and knock?

Do you ever work on committees
To see there is no trick
Or leave the work to just a few
And talk about the clique?

So come to meetings often
And help with heart and hand
Don't be just a member
Take an active stand!

Think this over, member
So you'll know right from wrong
Are you an active member
Or do you just belong?

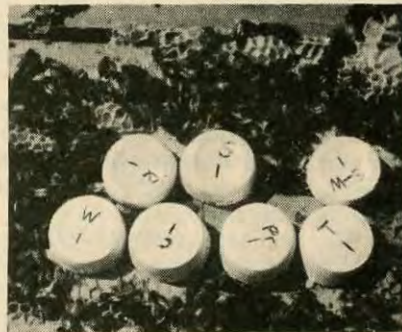
Stolen in its entirety from the
Newsletter of the Ontario
Beekeepers' Association

FOR THE RECORD . . .

Gleanings continually seeks accuracy in our publication. We recognize that errors do occur and use this space to correct them when discovered by staff or readers. Mistakes may occur in writing, editing or mechanical reproduction of the magazine. It is our policy to correct these mistakes. We encourage questions or comments from readers. Call (216) 725-6677 during business hours or write us at the address on the contents page of this magazine.

In the December, 1987 issue we published an article entitled *Root Research Review*. Part of our report focused on a pollen substitute feeding experiment we conducted. Two charts, featured on page 709 showed the results of this experiment. They listed a particular hive number, and the amounts of each treatment recorded **Before** being fed and the remainder of each treatment **After** 24 hours. The weights were in grams, however, this was not included on the charts.

Also, the bottom treatment on both charts was shown in bold. This was an error, as they should not have been singled out. We regret any inconvenience this may have caused, but are heartened by the enthusiastic response this report generated from academic, commercial and hobbyist beekeepers. We will be publishing a follow-up report, along with the results from this coming season's research next winter.



Treatments were placed as above, directly on top of the brood nest of each colony.

NEWS...

Puerto Rico Enforces Permit

The Department of Agriculture of Puerto Rico has been concerned for some time about the possible introduction to the island of bee pests and diseases. For this reason Law 93 was approved on June 5, 1973 prohibiting the introduction of bees to Puerto Rico. The Law, however, allows the entrance of queen bees provided the importer has a permit issued by our Secretary of Agriculture. The Secretary issues the permit after a thorough investigation to assure the queen bees will come without pests.

The recent appearance of *Acarapis woodi* and *Varroa jacobsoni* plus the threat posed by the closeness to the main land of African or Africanized bees has deepened our concern. Local beekeepers are unaware that they can introduce these pests with illegal importations of queen bees. We have tried to inform all known beekeepers on the island about the situation but some have not received the information or choose to ignore it.

When anybody imports a queen bee without a permit our laws require that we destroy it on arrival. You can understand the pain we go through when we have to destroy a perfectly healthy queen bee, which is probably of the best type, simply because the importer did not get a permit. For this reason we are requesting your help.

Please inform all queen bee producers that all queen bees to be shipped to Puerto Rico must be accompanied by a permit issued by the Secretary of Agriculture of Puerto Rico plus the usual certificate issued by your personnel that it is free of known diseases and pests and that these queen bees must be submitted for inspection on arrival.

1988 N. C. Beekeeping Calendar Available

Back in 1980 the N. C. Beekeepers Association began the tradition of producing an annual beekeeping calendar and the tradition continues for 1988. A limited number are available for sale to non-members.

The N. C. Beekeeping calendar serves two purposes. It is an attractive and professional wall calendar with ample room for writing notes, recording appointments and other day to day activities which need recording. In addition, it serves the special needs of the beekeeper and anyone interested in bees. Each page contains a wealth of information of special interest to beekeepers throughout the U.S., with special emphasis on the mid-eastern states around North Carolina.

Information includes blooming dates of nectar and pollen sources; honey recipes; history of early beekeepers and gardens for bees and birds. In addition, it contains the meeting dates for many of the national and regional beekeeping organizations.

Non-members of the NCSBA interested in obtaining one of the 1988 Beekeeping Calendars may purchase one calendar through one of the following methods:

1. **Direct Calendar Purchase** — Individual copies sell for \$3.00 each with the price dropping to \$2.00 per copy for purchases of 10 or more mailed to the same address. Checks should be made out to the NCSBA and mailed to N. C. State Beekeepers Assoc., 1403 Varsity

Drive, Raleigh, NC 27606. The price includes postage & handling.

2. **Calendar Purchase through NCSBA Membership** — Individuals who submit 1988 dues of \$8.00 will receive a free 1988 calendar plus a free 1989 calendar when published. NCSBA dues also include additional benefits such as quarterly newsletters and other NCSBA publications. Checks should be made out to the NCSBA and marked "1988 dues". Mail to the same address as above.

Washington State Fair Winners

The Pierce County Beekeepers Association is pleased to announce that it held the first annual Honey and Hive Products Show at the Western Washington State Fair in Puyallup. The Western Washington State Fair ranks as the United States 7th largest regional fair. This was the first honey show to be held in conjunction with the fair in over 50 years.



Darrell Mills, Show Superintendent; Miriam Bishop, Judge.

All winning entries were displayed at the Pierce County Beekeepers Association booth at the fair. The P.C.B.A. has manned a very popular beekeeping information booth at the fair for many years.

Judging at this years show was Miriam Bishop. Miriam is a veteran show judge, member of the Pierce County and Puget Sound Beekeepers Assn., and is a locally renowned beekeeping consultant. Darrell Mills was show superintendent.

The Pierce County Beekeepers Association looks forward to next years show at the fair. Beekeepers throughout the Pacific Northwest are invited to participate.

Toxic to Humans — Toxic to Bees?

The following article was printed in *The Arizona Daily Star*:

Pressure-treated lumber is hard to beat for any outdoor building project.

During manufacture, this lumber is placed in a huge tank and a very effective preservative — usually chromated copper arsenate (CCA) — is forced deep into the wood. This preservative is so effective against decay and termites that some makers of pressure-treated stock offer 20-year, 40-year, even lifetime guarantees on their lumber.

But the very effectiveness of CCA derives from the fact that it is toxic. And for that reason, any time you work with pressure-treated lumber you should use and handle it with respect.

First of all, treated lumber costs more than untreated stock, so use it only where decay- and termite-resistance are needed. Outdoor projects such as decks, docks, fences

and so on are obvious examples. Less obvious are parts of your house that might be exposed to moisture or termites. The sills of your home and possibly the floor joists — especially over an open crawl space — can often benefit from CCA protection.

Second, do not use treated lumber where it might be a hazard. Examples? Water tanks, beehives, kitchen countertops and cutting boards, grain-storage bins, and the like. Keep the stuff away from food and water supplies.

Third, protect yourself when working with treated lumber. When sawing or machining the stuff, wear a dust mask. Try to do this kind of work outdoors to allow good ventilation and to keep the dust from building up indoors.

Wear gloves to help guard against splinters. If you do get splinters, remove them. Wear goggles or a face mask to keep dust and chips out of your eyes while working with power tools.

After working with treated lumber, don't eat, drink or smoke until you wash your face and hands. Be sure to take a shower at the end of the workday. I just finished building a treated deck, and after working on it 15 hours one day, I stumbled off to bed without showering, a thin layer of dust covering my face. In the middle of the night, I awoke with an intense pain in both eyes. I got up, took a shower, changed my pillowcase and finally got back to sleep. The next day my eyes were still sore, but they gradually improved the next night. I'm not positive the sawdust caused the problem, but it's my number-one suspect, and I'll never skip a shower after using treated lumber again.

Your clothes as well as body need to be cleaned at the end of the workday. The makers of Outdoor Wood advise you to wash work clothes every day, in a batch separate from other household clothing.

Finally, dispose of wastes (scraps, sawdust and chips) properly.

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2 lb. w/Queen	3 lb. w/Queen
1-24 — \$17.25	1-24 — \$20.50
25 up — \$17.00	25 up — \$20.00

Young Queens	Certified Mite
1-10 — \$5.50	and Disease Free
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(205) 562-3542	

Bury them or leave them for the trash pickup, but do not burn them. Toxic chemicals can be produced as part of the smoke and released into the air. Also, do not use the dust or chips for pet bedding, litter or garden mulch.

If CCA treated lumber is toxic to humans, what of bees?

New USDA Office to Deal with Needs of Small-Scale Farms

Secretary of Agriculture Richard E. Lyng has announced the formation of the U.S. Department of Agriculture's Office for Small-Scale Agriculture. The new office will work with other USDA agencies to focus department expertise and resources on issues concerning small-scale farming, and will coordinate its functions with other rural development activities within USDA, according to Lyng. The office falls under the jurisdiction of USDA Assistant Secretary for Science and Education Orville G. Bentley, and is headed by Program Director Howard (Bud) W. Kerr Jr. an agricultural economist specializing in small-farming operations. "Changing trends in recent years have caused small-scale agriculture to become a viable economic enterprise," said Kerr. "Small farms have increased in number and importance partly as a result of consumer's increased preference for fresh, locally grown farm produce. Another reason is the increase in direct marketing avenues, including local retail farm markets." Kerr said the office will assess and disseminate information on research, education and technological developments of interest to small and medium-sized farm operators. Support for the new office will be provided by the Small Farm Resources Development Working Group, consisting of representatives from several USDA agencies, he said.

Ed. Note: Let's hope beekeepers get some of this action.

Mead Gets New York Grant

The New York State Department of Agriculture and Markets has announced a \$20,000 grant for a project designed to enhance the sale of N. Y. State Honey, through the production of Mead. Mead, a wine made strictly with honey, has a colorful and ancient historical background.

The project was one of 19 out of 140 proposals selected for funding

through the Ag and Markets Research and Development Fund.

The grant represents seed money for a commercial mead-making plant producing 10,000 gallons per year. The plant, called "The Meadery at Greenwich" will be located in Greenwich, N. Y. in Eastern N. Y. State. Principals in The Meadery are Bob Stevens, a commercial beekeeper and President of Betterbee Inc., a beekeeping supply firm, and Wayne Thygesen, a pharmacist and long time hobby meadmaker.

Initial mead production is expected to begin in late winter with the first sales of the finished product projected for the summer of 1989.

Interested beekeepers are invited to visit The Meadery.

Good Neighbor Policy Being Established

The Eastern Apicultural Society, at a recent Directors Meeting, voted to draw up a model "Good Neighbor Policy" for beekeepers to use at the community level.

One aspect of this policy is the study of past problems with zoning, and the resolution of these problems. If you are aware of any zoning conflicts that were in your locality, the situations that led to them, and the final outcome, this information would be of great value to all beekeepers.

Dr. Dewey Caron, Chairman of this program, has requested that any information along these lines be sent to him for study and/or incorporation into this program.

If you have such information in the form of press clippings, newsletters, etc., please send it to Dr. Dewey Caron, Dept. of Entomology, University of D.E., Newark, DE 19719 or to *Bee Culture* and we will forward it for you. Thanks for any help you can offer.

Varroa, APHIS and FL.

At press time, still no definitive word on approved chemical control for Varroa in the U.S. Researchers in Florida are working feverishly to finish the work started earlier. Done in conjunction with Zoecon and Nor-Am, this should provide the answers EPA is waiting for.

When complete, APHIS will make their move.

There is light at the end of the tunnel, however. The chemicals looked at show great promise in controlling the mite, while not causing side effect problems.

More next month.

& EVENTS

☆ COLORADO ☆

The Pikes Peak Beekeeper Association in Colorado Springs, CO will hold a class on the gentle art of beekeeping at the Bear Creek Nature Center in Colorado Springs, CO on Saturday, Jan. 30 and Sunday afternoon Jan 31, 1988. Contact Bear Creek Nature Center, 245 Bear Creek Road, Colorado Springs, CO. 80906 (303) 520-6387. Cost is \$15.

The Pikes Peak Beekeeper Association will meet Thursday, January 28, 1988 at 7:00 p.m. in the Sirloin Room at Penrose Stadium in Colorado Springs, Colorado. Interested beekeepers are welcome. For more information contact Dave Easley, (303) 495-2715.

Your Next Meeting Notice should be here. Why isn't it? Send in your information now, while you're thinking about it. Allow a 2 month lead time — 3 is even better.

☆ INDIANA ☆

Claudine Alexander was crowned the 1988 Indiana Honey Queen at the fall meeting of the Indiana State Beekeepers Association in Indianapolis, IN on October 24, 1987.



Claudine is the 17 year old daughter of Mr. and Mrs. Randall Alexander of LaFontaine, IN and is a senior at Oak Hill High School.

She will be traveling throughout the state promoting Honey and the beekeeping industry at various fairs, parades, festivals, presentations at

schools or civic organizations, radio and TV interviews, and any other event that she is called upon to promote honey. One of her biggest activities will be at the Indiana State Fair in August.



John Haskett of Kokomo, IN was named the 1987 Indiana Beekeeper of the year. This award is presented for outstanding achievement in promoting apiculture in Indiana. John was presented this award at the fall meeting of the Indiana State Beekeepers Assoc. in Indianapolis, IN.

The 1987 Clover Blossom Award was given to Martin & Dorothy Hoernig for Outstanding Service to the Honey Industry.



This award is given by Don Shenefield of Clover Blossom Honey to someone who has contributed services to the Honey Industry over a period of years. Martin & Dorothy have fulfilled this with their services in the local and state association as well as out of state contributions, work with the Indiana Honey Queen

program and Recipe Leaflet and Hoosier Honey Cookbook projects. Martin has just completed 19 years as a member on the Indiana State Beekeepers Board of Directors in various capacities. The Hoernigs were presented the award by Don Shenefield.

☆ MASSACHUSETTS ☆

The Norfolk County Beekeepers' Association offers a course in beekeeping for beginners at the Norfolk County Agricultural High School, 460 Main Street, Walpole, Massachusetts starting at 7:30 p.m. on Monday, January 11, 1988.

This course is open to all who are interested in beekeeping, especially the hobbyist. Subsequent sessions are on Monday, January 25, February 8 and 22, March 14 and 28, and April 4 at the Norfolk County Agricultural High School, which is located 1.5 miles north of Walpole Center on Route 1A. A registration fee of \$20.00 per family is charged to cover the cost of the text and audiovisual materials.

Topics include: Starting with bees, hives and beekeeping equipment, spring and summer management of the colony, swarm control, local honey and pollen plants, honey processing, diseases and pests of the bees. The final session features a classroom demonstration of installing live bees in a hive. A certificate is awarded to those satisfactorily completing the course. For more information contact Kevin F. O'Donnell, 265 Pleasant Street, Canton, MA 02021, (617) 828-4184.

☆ MICHIGAN ☆

Michigan State University will hold a Beekeeping ANR Week on March 22-23, 1988, East Lansing, Michigan.

Tuesday, March 22

Kellogg Center Auditorium

- 9:30 Visit and get acquainted
- 10:00 Movie: Sexual Encounters of the Floral Kind
- 11:00 "Learn the Natural Behavior of Bees Before Trying to Manage Them", Dr. Roger Hoopingartner, Dept. of Entom, MSU
- 12:00 Luncheon, Michigan Beekeepers Association, and Michigan Wildflower Group, Big 10 Room
- 2:00 "Everything You Wish You Didn't Have to Know About Varroa Mites", Dr. Malcolm T. Sanford, University of Florida, Gainesville, Florida

- 2:45 Break
 3:00 "Honey Promotion, National, State and Local"
 3:45 Questions and Answers
Evening Program
Kellogg Center Auditorium
 7:30 Honey Queen Pageant
 •Beekeeper-of-the-Year Award, presented by Richard Hubbard, Hubbard Apiaries, Onsted, MI
 •Gadget Round-Up, Dr. George Ayers, Dept. Entomology, M.S.U. (Bring your favorite gadget for others to see)
 •Reception Following

Wednesday, March 23

- Kellogg Center Auditorium**
 9:30 Visit and Get Acquainted
 10:00 Movie: Queen Rearing
 10:30 "Populations of Bees and Foragers", Walter Boylan-Pett, Dept. of Entom., Michigan State University, East Lansing
 11:15 "Two Queen Colony Management; and What Effect It Has On Honey Production", Roger Hoopingarner & Beekeeper Panel of Experts.
 12:00 Lunch on your own
 1:30 "Florida Beekeeping; Queen Breeding, Packages and Changes in the Industry", Dr. M. T. Sanford, Dept. of Entom., Univ. of Florida, Gainesville, FL
 2:15 Break
 2:45 "Rearing and Mating Queen Honey Bees", Dr. Roger Hoopingarner, Dept. of Entom., Michigan State University, East Lansing
 3:30 Questions and Answers

★ OHIO ★



The Northwest Ohio Beekeepers Association participated in the 1987 Allen County Fair during August. This year Kyna Naylor, 1987 Ohio Honey Queen was present to promote honey, the State and local associations. She passed out honey recipes, samples of honey and attracted many people to stop at the booth.

The display featured honey, other products of the hive along with beekeeping equipment and educa-

tional pictures of the bees. The contests consisted of nine classes. Again this year the ladies out did the men with the most entries in any one class: The use of honey in cooking!

For those that like to look but not touch, pointing fingers and saying "See the bees", the observation hive was, as usual, an attraction.

The Tri-County Beekeepers Association, in cooperation with the Wayne County Cooperative Extension Service, will hold its Tenth Annual Beekeeping Workshop on Saturday, March 12, 1988, from 8 a.m. to 3:15 p.m. in Fisher Auditorium at the Ohio

Agricultural Research and Development Center (DC), Wooster, Ohio.

Our program is as follows:

- A.M. Registration, refreshments and videos. Keynote speaker: Dr. James Tew "Africanized Bees; Facts, Fantasies and Implications for U. S. Beekeepers"
 Lunch Keynote Speaker: Dr. Glen Needham, OSU Dept. of Entomology, "Varroa Mite"
 P.M. Swarm Prevention/Colony Division - Phil Mariola; Nectar Sources/How Bees Produce Honey - Diana Sammataro; Bee Equipment (Maintenance/Construction) - Tom Tonn; Queen Production/Queen Introduction - Dr. Jim Tew

This plus a honey baked-goods contest, door prizes (awarded throughout the day), wax-weight guessing, scholarship award and question and answer opportunities will make it a day beekeepers shouldn't miss.

Pre-registration is \$4.00 (\$5.00 at the door) and lunch is \$3.25 *but, lunch is available ONLY BY PRE-REGISTRATION which must be received by March 4.* Mail you check (\$4.00 registration only, or \$7.25 registration plus meal) with your name and address to Ruth O'Loughlin, Secretary, 8948 Ickes Rd., Wooster, OH 44691.

For further information contact your Extension Office; Phil Mariola at 216-264-3911 or the Association's Secretary at 216-264-8980.

ATI Workshops:

For the past few years, the **Agricultural Technical Institute of the Ohio State University** has offered summer short courses. These courses are actually compacted regular classes, they are intensive and compre-

hensive. We realize that many beekeepers have problems finding time to attend summer programs, therefore, we are always searching for the right "mix" of course content and dates. This summer, we are trying the long weekend approach.

- On May 13, 14 and 15, 1988, we will offer introductory beekeeping. We gave this course a break during the past few years and feel that it is time to offer it again.
- On June 10, 11 and 12, 1988, we are offering a new program — Contemporary Issues in Beekeeping. On June 10, a full day of Africanized Beekeeping — the latest information. On June 11, Varroa Mites — What They Are and How Can They Be Controlled. On June 12, a discussion of Tracheal Mites during morning hours and a short discussion of Honey Marketing during early afternoon hours.
- The VIII International Beekeeping Seminar will be presented July 18-29, 1988. As in past years, this is a symposium on the International Aspects of Beekeeping. During the past years, approximately 200 participants have participated from 30 countries. We anticipate another successful year.

Additional information on all courses are available from: The Office of Conferences, Ms. Gail Miller, The Agricultural Technical Institute, Wooster, OH 44691. (216) 345-8336.

If we can be of any assistance, feel free to contact us.

★ OKLAHOMA ★

Oklahoma Beekeepers honored one of it's own with it's most prestigious awards at their Fall Meeting in Oklahoma City, OK, October 24, 1987. The Albert Lincoln Award is Oklahoma's Beekeeper of the Year. Named for one of the pioneers of Oklahoma Beekeeping, and a great supporter of the State Organization. This Award is presented annually to an outstanding beekeeper by the State Organization. The award was presented to Dorothy Brister in an emotion filled ceremony. This is the first time this award has gone to a lady beekeeper.

The membership compounded the award by electing Dorothy President to lead them during the next year. Mrs. Brister has been a 'long suffering' and innovative beekeeper for many years and has served the organization well.

☆ OREGON ☆

Glorybee B Box, Inc. will host a Beekeeping School on March 26, 1988 at 120 N. Seneca Rd., Eugene, Oregon from 8:00 a.m. to 5:30 p.m. The cost is \$15 per person or \$20 for two people. It includes a beginning book on how to keep bees, materials, slides, and more. There will also be special discounts on woodenware and package bees ordered on the day of school. For more information contact Dick Turanski, (503) 689-0913.

☆ SOUTH DAKOTA ☆

Central Beekeepers Association will hold it's annual meeting on February 13, 1988 at Murdo, South Dakota. Registration will begin at 9:00 a.m. Gary Erickson, Ext. Agent at Murdo, SD will give the Introductions and Welcome. A Bee Disease video will include Varroa mite information at 10:15 followed by Bob Reiners, S. D. State Apiarist speaking on "Varroa mite-tracheal mite-

African Bee plus Bee Law changes update". After lunch, Jean Steffen presents "Honey Cookbook"; Don Schmidt "The Honey Program-What's Happening at the Washington Level" and Joe Grimson, "Yearly Bee Management". There will be a business meeting at 2:00.

For more information contact Gary Erickson (605) 669-2512, Joe Grimson (605) 859-2297 or Dave Steffen (605) 259-3248.



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QUEENS	1-24	25-99	100 up
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No. of Queens	Thru May 14	After May 15
1 - 5	\$5.50	\$3.90
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25 - 99	\$5.00	\$3.50
100 - up	\$4.75	\$3.25



PACKAGE BEES

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	1 - 10	11 - 99	100 - up
2 lb. w/queen	\$18.75	\$18.25	\$17.75
3 lbs. w/queen	\$22.75	\$22.75	\$21.75

- All hives & nuclei fed Fumidil-B
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☆ Classified Corner ☆

Classified rates: 55¢ 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) counts as one word. Copy or cancellation orders **MUST** be in by the 1st of the month preceding publication (Example: January 1 for February publication). If your order has missed the cut-off date, your ad will appear in the following issue. Proof sheets available on request for an additional 2-word charge. Send classified ads to: The A.I. Root Co., Attention: Cyndi Stephens, Class. Ad. Mgr., P. O. Box 706, Medina, Ohio 44258-0706. For more information call (216) 725-6677, ext. 213.

WANTED

OLD STYLES OF beehives, extractors, smokers, also old bee books and supply catalogs. Wyatt Mangum, 120 Forrestwood Drive, Durham, N. C. 27707. (919) 834-3349. (3/88)

ALMOND POLLINATION NEEDS YOUR BEES — If you can provide strong colonies. **Pollination Contracting**. Now arranging contracts. Offering reliable service in central CA for 1988 season. L. Hicken (209) 823-5141 or C. Carroll (209) 823-1386. (2/88)

WANTED TO LEASE:

Or Lease Purchase, 500-1,000 colonies from June - September 1988. Contact Harvey Johnson, (405) 338-7409 (OK). Call evenings for contract information. Bees to be used in Kansas. Credit References Available. (2/88)

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COMPLETE LUCRATIVE ARIZONA BEEKEEPING BUSINESS IS AVAILABLE FOR SALE. Very clean, topnotch, ten frame operation with 1987 queens. 87 registered proven locations. 53 are state protected with four mile protection zone state enforced including the finest citrus locations in Arizona. Absolutely no competition and no pesticide exposure. Locations can easily support 9,000 colonies. Famous water white honey area. Prime mesquite, catsclaw, alfalfa, wildflower, brush and agricultural locations. Year around production. Pollination on apples, pistachios, melons. These and all other locations within sixty miles of Tucson. Excellent potential wintering other beekeepers' beehives as sideline as well as raising queens, packages and nucs. Complete, automated honey house, hydraulic liftgate trucks, pollen traps and production equipment. Honey and pollen business. Must sell due to owner injured in semitruck collision. Business will not be parted out. For more information call Tom Martin, **ARIZONA BEE PRODUCTS**, 1-602-327-3800. Evenings. (TF)

45 **HEALTHY PRODUCTIVE** colonies ready for almond pollination. San Francisco, (415) 861-5636. (2/88)

30 **COLONIES DOUBLE** story hives. 33 frame extractor and processing equipment. John Thompson, 3227 Broadway St., Fort Wayne, IN 46807 (219) 745-2455. (3/88)

175 **STANDS, WITH EXTRACTOR**, lots extra equipment. Write for details and price. Stearns, 4605 Redstart, Houston, TX 77035. (4/88)

60 **COLONIES DOUBLE DEEP**, standard equipment for 500. Also shallow and jumbo supers, drawn combs, 100 standard supers empty. Power extracting equipment, filter pump, flasheater. Leon Winegar, 2100 LaVelle Rd., Flint, MI 48504. (2/88)

HIVES. 350 1-1/2 **STORY**, pick up in Texas after spring honey flow. 400-450 supers (6-5/8) with drawn comb. 120 empty nuc boxes (4 & 5 frame). (512) 780-3521. (3/88)

BEEKEEPING SUPPLIES - 1988 Catalog - FREE. New Product: Honey Stix - Information Available. Toll Free No. 1-800-325-1046. Glorybee, P. O. Box 2744, 120 N. Seneca Rd., Eugene, OR 97402 (503) 689-0913. (5/88)

100, 2-**STORY, 10-FRAME** Hives of bees. Heavy, new queen. \$39.00 each. Southern Honey Inc., P. O. Box 726, Belleview, FL 32620. (904) 245-1106 (2/88)

ROOT CELLAR SPECIAL — New Maxant 1700 Chain Uncapper, \$750.00. F. O. B. Medina, Ohio (216) 725-6677, Ext. 219. (2/88)

1400 **LBS. CAPPING WAX.** 600 lbs. Star Thistle Comb Honey in frames. Sunfield, MI. (517) 566-8858. (2/88)

600, 10-**FRAME SHALLOW SUPERS** w/ comb; 3,000, 10-frame supers w/o comb; 700 8-frame hive bodies w/o comb; 1400 8-frame supers w/o comb; 300 5-frame nuc boxes w/o comb; 150, 2-story 8-frame colonies; misc. excluders, feeders, extracting equip. Terms, Cash or Honey (805) 985-5815. (2/88)

100 **DOUBLE STORY HIVES.** 360 6-5/8 supers. 50 extra tops and bottoms. 50 extra deeps. Extracting equipment. Sherman, NY 14781 (716) 761-6355. (5/88)

AUCTION, APRIL 2, 1988. 11 a.m. Located on U.S. 24, 1-1/2 miles East of Banner, IL. 130 colonies of bees, supers, extractors, pumps, tanks, vibrating knife, mixing tank, misc. John Sanders, R. R. 3, Canton, IL 61520. (3/88)

100 **COLONIES, 50 1-1/2, 50 2-story**, inspected acarine, varroa free, good equipment, recent frames, good strong hives. Must sell. \$43.00 per 1-1/2 story, \$48.00 per 2-story. M. Johnston, 29354 Westmore Rd., Shingletown, CA 96088. (2/88)

200+ **STRONG COLONIES** in Cuama Santa Paula, Santa Barbara, CA. No Saturday Calls. Karl Wollartz, 3879 Fairfax Rd., SB, CA 93110. (2/88)

NEW SHEETER AND MILL machine for making beeswax sheets - \$11,500 could deliver. Semi-automatic uncapper, boiler, \$600.00. 50 hives, \$65 each. Box 586, Rossville, KS 66533 (913) 584-6206 (3/88)

COWEN 120 FRAME EXTRACTOR \$2,800.00. Maxant wax spinner \$800.00. El Centro, CA. (619) 357-6388. (2/88)

ALL OR PART, 1200 COLONY operation. 1000 doubles, 200 Kerkhof Ventilated bee hives. '87 queens, very large clusters, very heavy for winter. Medicated. Certified foulbrood and mite free. Over 3500 supers. All related equipment. 600 Kerkhof supers. Swinger 4-w/dr. Articulating Fork Lift; 9 stainless tanks 1000-30 gal. heat agitation. 4000 lb. Stainless deganulation unit. 18" Shriver plate frame filter; pumps, stainless plumbing, valves, etc. Custom extraction line, uncapper, wax melter, sump, 10' clarifying pan, twin extractors, 500 lbs. per hour. Pyle Apiaries Inc. Box 72, Star Route, Middlebourne, WV 26149. (304) 758-4479. (2/88)

BLACK LOCUST 13¢ EACH and other flowering stock. Coldstream Farm 20300 Freesoil Rd., Freesoil, MI 49411. (616) 464-5809. (3/88)

HONEY MOISTURE TESTER. Hydro-meter 15-21%. \$21.95 airmail. **AMBROSIUS**, Svanvagen 50, 83162 Ostersund, Sweden. Checks Accepted. (12/88)

HONEYSTRAINER. 8th year. Easy, practical, convenient. Guaranteed. Use with bucket. Instructions. Approximately 18"x21" 100 mesh nylon bag. \$3.50 each, two or more \$3.00 each. Beckman G, Box 633, Stuart, FL 33495. (TF)

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COMMERCIAL QUALITY SUPERS — 9-5/8 @ \$2.85, 7-5/8 @ \$2.75, tops & bottoms @ \$1.70. Satisfaction guaranteed. Orders less than 50 add 50¢ each. For prices or to order, write: North Idaho Woodcrafters, Box 201, Spirit Lake, ID, 83869. (2/88)

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