Bee Culture

OCTOBER 1993

WINTER WELL

Octo

COLUMNS

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FEATURES

Cover

Washing your hive tools, giving them a fresh coat of paint and hanging them up to dry may seem a bit far fetched when thinking of picking up, cleaning up, fixing up and putting away your summer tools, but it brings up a good point.

The old saying, "A place for everything, and everything in its place," is perfect for all of the paraphernalia we use in a season. And will need again, in a hurry, next season.

Now, where did you leave all those feeding jars last May?

photo by Diana Sammataro

WINTER WELL

INNER·COVER

Winter dominates the pages of our issue this month, and unless you live in the tropical part of Florida there's something here for you. But even though winter in the tropics usually consists of only a Christmas card from some place cold, the basics don't take a holiday. You can still learn something this month.

The rest of us though must deal with the snow, the cold, the rain or at least the dearth during nature's down time. And 'dealing' with winter is still a critical aspect of managing honey bees.

Mike Burgett, from the Pacific northwest cites winter losses of 20% or so in his area due to mites. But claims of mite kills of 20%, 40%, even 100% are heard each spring from some part of the country.

But mites aren't all that's going on.

A few years ago (before tracheal mites were wide spread) we took a random survey of our readers from all over the country. One question – "What are your *average* winter losses", gave some interesting feedback.

With a range of 0% (a bit low, I suspect) to 32% (high, for an average, I think), the *average* was 14.5%. Not far off from my experience, such as it was, up till then. But to solidify that number, another survey that asked the same question came up with 15% – this from a single northern state, however.

Now you can argue with that 15% figure all night if you want, but two independent surveys found that's how many colonies died, on average each winter.

Or you can pick any number you want. If your experience is 5%, O.K. Or maybe my 15%, or even that 32% extreme. Go ahead, pick one.

Take your chosen number, the number you think died on average each year *before* tracheal mites changed the picture, and subtract it from that 20% figure in Burgett's story. For argument let's say you stuck with my 15%. Subtracted from 20% leaves – 5%. That is the effect mites have had on wintering in the Pacific northwest. Mites *aren't* the only winter time killers out there.

I don't mean to pick on Burgett. He's a pretty good guy, actually. But I want him, and you to clearly understand that even if mites are making your life miserable there are some things going on in your colonies that you can control – medication for common diseases; healthy, productive queens; ventilation; wind breaks; good food and lots of it; security; population Reduce or eliminate the stresses caused by these age old (but often overlooked) problems and you *will* reduce your winter losses and give your bees a fighting chance. Five outstanding authors seem to think so and so do I.

•

The O.B. in O.B. Wiser's pen name, in case you didn't know, stood for Older But Wiser, a title he'd earned, he thought, from years of experience keeping bees. I think he earned it, too.

O.B. passed away recently, suddenly and unexpectedly. And since so little was known of O.B. I thought I'd share a bit of what I knew about the man who for nearly two years contributed to the pages of this magazine.

He started like many, with the help of his dad when he bought a hive. He caught swarms, extracted honey in the kitchen and convinced his life's partner that keeping bees wouldn't interfere with being married. He had an advanced degree in the biological sciences and spent some time as an inspector so he was pretty well grounded in the basics.

For several years after school he stayed in the industry in one form or another, working for others, teaching or keeping his own bees. He was teaching at a small college and running a mid-size commercial operation when he approached me about writing on a regular basis. I said we'd try it for awhile and see. We never looked back.

Not that O.B. was perfect, mind you. He had little time for some things some beekeepers do, or equipment they use, and he said so, regularly. This inflexible attitude wasn't appreciated by some, was loved by others.

But he dispensed an uncommon amount of common sense most times. Everything from moving bees to catching swarms to wiring frames.

And there seems to be far too little of that anymore.

We'll miss you O.B., and thanks.

Kim Flottum

Something Else Is Going On

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NEXT MONTH

We take a somewhat broader view of the beekeeping world next month, with a short trip to Thailand, examining the market, and marketing techniques of one of the citizens of that fair country. Very different standards apply, but they make sense in the environment in which they exist. Visit the exotic, and taste the fruits of Thailand's largest bees.

Next stop is in part of the former Soviet Union, where beekeepers are just beginning to get a taste of the free market. The untapped resources in this great land are almost beyond belief, and the potential for exporting honey to much of the world is just beginning to be felt. Much of what they do is similar to what we're used to, but much isn't. Explore the production, and the markets of what may become our greatest competitor.

But the basics are here, too, starting with a real basic article on where to find information. You already know some things available (like this magazine), but if you're new to the craft the amount of material can be overwhelming. A one-time beginner does some evaluating, makes some suggestions, and gives his reasons for picking up good information. See if you agree.

A business profile wraps up the features next month. Starting small, finding a nice market and expanding to fill the demand created is a sure formula for success. Here's another winner, and their story.

We'll also visit a cranberry bog next month, following behind a pollinator last spring. See what makes it all happen, right at a bee's eye level.

But don't forget our regulars. Dick Bonney, Tom Sanford, Roger Morse, Richard Taylor, and the rest. Next month, in *Bee Culture*.

MAILBOX

■ Likes Ads

Neal Esko's complaint about the number of ads in *Bee Culture* (August 1993 Mailbox) took me back a few years. I remember the first issue I received when I subscribed. The first thing I did was read all the ads in the magazine before I read a single article. There was much for a beginning beekeeper to learn just by seeing what was advertised. Even after a number of years, I still scan every ad to see if something new has been added.

The important thing about each issue is the substantial content. Why should I care whether the ad ratio is 30%, 60% or 160%? It takes less than a second to flip past an ad. Why should I care if you carry automobile or liquor or perfume ads?

Frankly, I can't see how a bee magazine, or a bee supplier stays in business. The only thing which would really detract from my beekeeper life is if some of these companies could no longer cover their expenses.

Dan Hendricks
Mercer Island, WA

■ "Friends"

I have not written to you since 1980, when Mr. Lunt had a heart attack. We sold the country house, gave away my bees and have been living a different kind of life.

Maybe someone can tell me why I dream of my little friends a few times a month. By the photo enclosed you can see that I spent many happy hours close to the hives, letting them walk over my hands going and resting at the hive entrance. Am I strange, or are there other people who have these tendencies?

Now I am 87 years old, had a "silent killer" heart attack a few weeks ago. Overcame the attack and will be careful to check with my doctor and take the high-blood tablets.

In Chalmette, LA we are close to the River, the Lake and Bayou Bienvenue, and swampland, so have a mosquito control program. The spray-poison trucks pass around at sundown. All insects are killed. Fewer of our birds come here and it is strange not to see the old lightening-bugs at night. Life is so different!

Serena Lunt
Chalmette, LA

Serena Lunt

■ Queen Cells

Read with interest Dr. Taylor's comments in the August issue of *Bee Culture* regarding the queen cells in queenless nucs.

I have believed for a long time that God is still creating and this looks like another example.

Donald Cox
Lima, OH

Continued on Next Page

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MAILBOX

■ Healthy Beekeepers

On August 14, 1993, I attended the meeting of the Association of Southern Maryland Beekeepers. Near the end of the meeting, the subject of cholesterol came up. It was just a short discussion and I did not think much about it until on the way home.

What I heard was that all the people that spoke up about cholesterol levels had levels 180 or below. This included most of the older, regular beekeepers who probably get stung on a regular basis. I heard several comments such as "I raise chickens and I eat eggs every day", "I eat whatever I want and my cholesterol is 150." Everyone who spoke up had a lower level than me, 180. This seems odd since the average (I'm guessing) is over 200.

I was wondering if some of the other beekeeping organizations could take a survey of the their members, those who are stung on a regular basis and forward that information to me to compile and publish later. This may be good information for the new alternative medicine group at the National Institute of Health in Bethesda, MD. I have also forwarded this information to the American Apitherapy Society.

Somewhere in the reading that I do, I seem to remember something about bee venom and cholesterol, but I can't find it now. I hope that by putting this in the *Bee Culture* Mailbox it will help satisfy my curiosity and perhaps a lot more.

William A. Bartlett
Star Route Box 83D-1A
Leonardtown, MD 20650
301-994-0671

■ How Dry!

I've just harvested my first honey, 240 lbs. from my six hives, (bees had to draw out all of the foundation). I was pretty excited about it and looking forward to entering a jar of nearly colorless honey in the states largest fair. In fact, just a few days after harvest I attended the state beekeeper's association meeting where Steve Parise, the state Apiculturist measured the moisture content of a sample of my honey – 14.8% read the refractometer. Cool! Blue ribbon for sure I thought. Except for the bubbles. My honey has thousands of minute bubbles suspended throughout; I can't get rid of them.

At the extractor I go through a double sieve and nylon strainer cloth. Then heat in a double boiler setup (150°) stirring very gently. It still comes up bubbles! Even two weeks of settling hasn't helped.

My honey is visibly more viscous than any other I've seen in the area. Do you suppose it's the low moisture content causing the problem (honey so thick it holds the bubbles suspended). If so, how can I clear it up? Maybe one of those $400 bottlers (let it sit at about 100° for a few days to settle) might help.

Steve Magnant
Shelburne, VT

Editor's Note: Heating your honey will undoubtedly cause some bubble movement upward. And, I suppose, those bubbles may cause you some points in show. How to get rid of them? Probably the best way is blend your very low moisture product with some higher moisture honey. This would help the viscosity, and the bubbles, but may affect the flavor or color. It's a tradeoff. From a seller's point of view your product is just fine, and I wouldn't be concerned.

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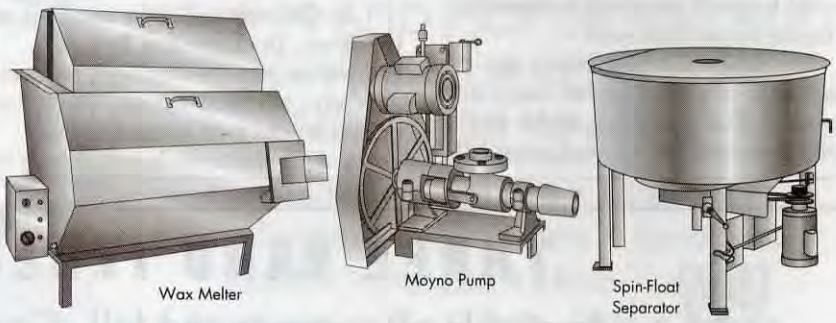

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MAILBOX

■ Purple Loosestrife

I much enjoyed your comprehensive piece about purple loosestrife. It is a honey plant that has long interested me. I had never seen it until the 50s, when I found vast meadows of it in Massachusetts. Over the next 10 years I began finding it westward, as far as Michigan, where I had grown up but had not seen it hitherto. I was told by people in Massachusetts that the seeds had come to these shores accidentally in the woolen mills there. As you note, it grows only where the ground is wet, so it is not a threat to agriculture generally. It is quite true that it has changed the wetlands, sometimes dramatically, by driving out other plants, especially cattails, but I think it is idle to expect beekeepers to destroy this beautiful honey plant. I scattered some dried up blossoms, with seeds in them, in a ditch near my house a few years ago, and in three years the plant had extended itself three miles down the ditch, but it is now disappearing there due to repeated mowing by the highway department. I am told that the honey is greenish, resembling motor oil, and have heard contrary opinions concerning its quality, but oddly, I have never seen or tasted pure loosestrife honey myself.

Richard Taylor
Trumansburg, NY

■ Cut Comb How-To

In regard to Pat Morris' question on cut-comb honey, we use eyelets in the end bars of honey frames. This keeps the two wires from digging into the wood. Also, we use thin foundation and try to imbed the wire. We put these frames in a nine frame honey super. We install five drawn frames and only four for the cut comb mixed between. Mark your frames with a "C" for cut comb so you don't lose track of them.

Make two wires two to three feet long with small alligator clips attached at one end. When you are ready to remove the comb honey from the now-full frame, clamp the wires to your wire imbedder, cut the wires on the end bars and clamp the clips to the ends of each frame wire. Press the button on the imbedder two - three seconds and pull the wire out with a pair of pliers. Do each wire separately. After the honey is cut from the frame, it should drain for 24 hours on a screen. We use a frame covered with window screen that holds four frames.

We made the wood frame from 2 x 2" lumber. Heavy mill plastic is placed on this frame to catch the liquid honey. One frame should yield four cut combs 4-1/4" square. Any that are not can be cut into short strips and placed in a pint jar. Then fill the jar with the honey on the plastic. This is your chunk honey and should weigh just over one pound.

Kleber J. Minich
Natrona Heights, PA

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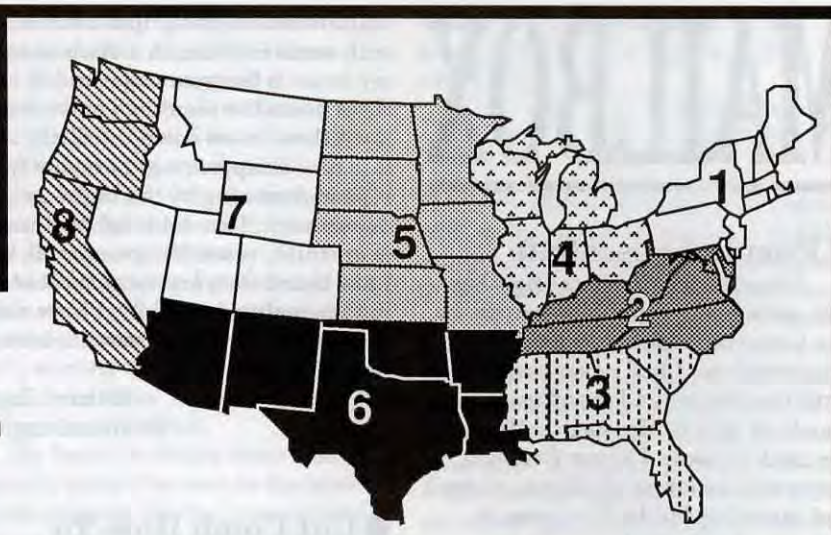


REPORT FEATURES

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

	Reporting Regions								Summary		History	
	1	2	3	4	5	6	7	8			Last	Last
Extracted honey sold bulk to Packers or Processors									Range	Avg.	Month	Yr.
Wholesale Bulk												
60 #Light	45.40	50.25	36.92	39.10	37.22	41.85	38.61	37.48	31.20-57.00	42.63	42.14	45.18
60 # Amber	42.37	43.91	36.30	34.70	35.51	39.02	35.50	37.90	26.70-49.00	39.81	39.66	41.47
55 gal. Light	.643	.545	.504	.515	.530	.575	.509	.595	.43-.85	.576	.604	.574
55 gal. Amber	.570	.495	.481	.470	.529	.522	.479	.544	.41-.73	.528	.549	.537
Wholesale – Case Lots												
1/2 # 24's	22.32	26.05	19.75	19.61	19.63	20.70	20.27	18.40	16.80-27.60	21.50	19.96	19.87
1 # 24's	30.26	28.49	29.91	30.50	26.54	30.58	28.21	28.00	25.00-35.00	29.87	30.29	30.08
2 # 12's	27.88	28.68	28.05	28.70	25.93	26.92	26.87	30.05	23.75-32.00	28.10	28.43	28.37
12 oz. Bears 24's	27.48	28.05	29.72	25.22	25.93	24.98	24.99	22.74	21.00-28.80	26.44	26.40	26.58
5 # 6's	30.31	28.56	27.56	31.27	28.85	28.63	27.62	28.70	25.50-33.45	29.62	30.90	31.07
Retail Honey Prices												
1/2 #	1.27	1.52	1.08	1.13	1.09	1.22	1.10	1.07	.95-2.10	1.25	1.15	1.19
12 oz. Plastic	1.62	1.70	1.77	1.49	1.62	1.38	1.42	1.29	1.19-1.75	1.58	1.59	1.52
1 #	1.74	2.00	1.80	1.84	1.79	1.67	1.69	1.84	1.39-2.50	1.82	1.77	1.76
2 #	3.42	3.34	3.25	3.13	2.26	2.90	2.96	3.26	2.69-3.99	3.23	3.10	3.04
3 #	3.95	4.63	4.42	4.79	4.00	3.78	4.06	4.59	3.50-5.69	4.33	4.23	4.21
4 #	6.14	5.39	5.62	5.34	5.37	4.99	5.21	6.09	4.95-6.99	5.73	5.45	5.17
5 #	7.26	6.60	5.85	6.83	6.70	5.90	5.91	6.14	5.20-8.75	6.55	6.83	6.48
1 # Cream	2.56	3.20	2.03	1.79	1.92	2.65	2.05	1.94	1.69-4.00	2.37	2.29	2.15
1 # Comb	3.23	3.56	3.02	3.39	3.00	3.14	3.23	3.15	2.45-4.50	3.28	3.22	2.52
Round Plastic	2.99	3.05	2.59	2.89	2.50	3.03	2.89	2.65	2.29-3.50	2.88	2.86	2.33
Wax (Light)	2.83	1.18	1.63	1.65	1.51	1.84	1.35	1.35	1.10-3.80	1.79	1.80	1.46
Wax (Dark)	1.76	1.09	1.25	1.33	1.42	1.58	1.14	1.13	1.00-1.95	1.36	1.36	1.26
Poll. Fee/Col.	35.40	31.00	32.50	33.75	30.75	27.25	31.50	31.00	22.00-40.00	32.54	30.68	28.87

MARKET SHARE

Retail prices continue to inch up compared to last month and last year. However, wholesale prices aren't moving much at all. This disparity is beginning to be questioned by producers. What, we wonder, could be the reason.

Region 1

Sales steady, prices strong but supplies just a bit short. Cooler weather has helped demand, increases in comb honey sales have helped.

Region 2

Prices strong, good crop and demand steady. But, an uncommon amount of complaints regarding syrup contaminated honey being heard. Some states checking these out with vigor, others not at all. Mites mixed in their affect.

Region 3

Sales steady to strong and demand steady, but exceptional crop has driven down prices. Northern area of region dry, reducing crop. Fall crop in question.

Region 4

Sales steady to slower due to weather - cool and damp in parts, hot and dry in others supplies mixed for the same reason. Winter losses last year added to reduced production.

Region 5

Sales at retail surprisingly good, probably because summer was brief (if at all) and cool weather dominated. Production down, but not as much as expected earlier.

Region 6

Prices and sales normal for the season, demand mixed, but not dropping much. Production speciality crops receiving more attention special packs, chunk and cut comb.

Region 7

Prices holding to dropping a bit, but demand steady. Good crop means supply will be strong, but prices may drop more.

Region 8

Undoubtedly the star region this year. Exceptional crops all over the region have produced more honey than in years. Demand is steady to increasing too, due to cooler weather, especially up north. Prices steady now.

THIS YEAR'S HONEY CROP

The mixed and mixed up weather this year has affected honey production across the country. Rain and cool temperatures in some places, while heat and drought in other locales have changed the rules of the game for many beekeepers.

Preliminary USDA and Honey Board estimates predict the U.S. will produce about 185 million pounds this year, compared to the average 200 to 210 million pounds, about a 10% drop. The final count isn't in yet, of course.

Fewer colonies producing honey have also played a role this year, but reliable numbers are difficult to obtain. Extension, regulatory, supplier and other information sources give estimates ranging from 5-35% fewer colonies in the field this year than last – all due to mites.

To find out just how much effect these variables have had we surveyed our honey reporters, asking what their average honey production per colony has been in the past and what they made per colony this year.

Our reporters range from small scale hobbyists to big-as-they-come commercial operations. And, predictably, average production ranges from almost-a-nuisance to making-a-living top-end poundage.

The chart shows the average production per colony for each of our reporting regions for this season and the historical average for that region as experienced by our reporters. The USDA's average for each region for 1992 is also listed for reference.

Reporting Region	Avg/Col. 1993	Avg/Col. Historical	USDA 1992
1	30.4	57.1	40.0
2	81.6	59.0	43.7
3	115.0	110.0	66.8
4	80.0	53.8	50.2
5	58.3	71.2	76.9
6	54.4	52.0	71.8
7	91.0	90.0	71.0
8	82.5	54.3	65.1
Total U.S.	**62.0**	**62.3**	**69.9**

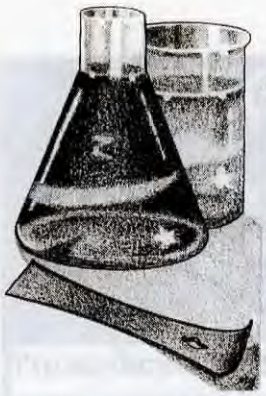
Several regions stand out, Region one particularly. A 27-pound decrease in production/colony from the average and 10 down from last year will significantly affect production from that area. Region two, suffering a drought came in nearly 22 pounds *above* average and 38 pounds above last year. Even when it's dry, sunshine makes honey. Region four was just over 26 pounds above average – surprising considering the erratic weather where they sit. Region five, the soggy area of the country was down 13 pounds/colony and nearly 20 off last year. And there are lots and lots of colonies in region five. Region six has had a second low year.

The bright spot was region eight – where a honey crop has been mostly a memory of late. Between region eight and the exceptional crop in region three the U.S. total came out close to average, even though region five – the bread-basket nearly washed away.

A somewhat reduced U.S. crop, coupled with a questionable loan program and infinite imports have thrown honey prices to the wind. The reasonable ability to predict price increases or decreases due to domestic production appears to be only an economic exercise of the past.

However, small scale suppliers will probably be most affected by these variables. If you made lots of honey you most likely can compete with large, out-of-state packers. But if you need to buy honey because of a short crop profit margins will be reduced.

Short crops for even smaller scale suppliers (back door, farm markets, etc.) will be able to increase prices though, because this is the only area where supply and demand still dictate prices.



RESEARCH REVIEW

roger morse cornell university ithaca ny

The Cape bee/African bee dilemma.

The honey bees we know are natives of Europe, Africa and the Near East. From Norway to Africa there are over 20 races. In the United States the best known and most widely used of these are the Italian, Caucasian and Carniolan, all from Europe. One of the little known races is the Cape bee, found in a relatively small area in the southern most tip of South Africa. Despite the introduction of other races into the area, the Cape bee appears to have remained pure. However, the reverse is not true. When the Cape bee is moved north out of its native habitat it poses a threat to beekeeping.

Commercial beekeeping in the country of South Africa has been growing but only recently has anyone moved colonies of bees in and out of the Cape area in large numbers. Growing temperate fruits in the area has become increasingly popular and bees from other parts of South Africa are moved to the Cape to pollinate these, especially apples. In some cases, colonies of Cape bees have been inadvertently moved out of the area in large numbers and their peculiar behavior and effect on other bees has suddenly become of great concern.

The Cape honey bee is different in that colonies have a tendency to become queenless easily. When this occurs, laying workers produce eggs which, despite the fact that they are not fertilized, result in females – both workers and sometimes a queen. In the process, however, the colonies' population is greatly reduced, to the extent that little honey is produced. This peculiar behavior has been known since the early part of this century but little attention has been paid to it.

In 1983 the Cape bees caused a problem when eight colonies were taken out of their native area and placed in an apiary with about 50 colonies of another race for experimental purposes. Workers from the Cape bee colonies entered other hives through drifting where they became laying workers and were soon treated like queens. The hive's queen would disappear and eventually be replaced with a Cape bee queen. Often the laying worker colonies just dwindled and died.

As colonies were taken over by the Cape bees they were killed by the beekeeper in charge but that did not stop the takeover. Eventually he found it necessary to kill all of the colonies in the apiary and to start beekeeping with new colonies brought in from other apiaries. There is a great deal that is not clear but apparently only a few Cape laying workers can cause the change.

In the case of laying workers, usually only one egg is deposited in a cell. (Laying workers in European colonies usually deposit many eggs per cell.) However, like laying workers in other races, the eggs are usually in the sides, not the bottom of the cell. One paper reports that queen cups appear especially attractive to Cape laying workers as egg receptacles.

Regarded as a curious event in 1983, the problem now has blossomed into a great threat.

One of my commercial beekeeper friends in South Africa wrote recently that he now had only 35 colonies; a few years earlier he had about 2,000. The problem: a takeover by Cape bees and there is no clear solution.

Dr. Robin Crewe from South Africa spoke about the problem at the recent Eastern Apicultural Society meeting in Maine. There is no question that the movement of Cape bees out of their native habitat has had a ruinous effect on beekeeping in the rest of South Africa. Killing colonies of Cape bees as they are found (out of their native area) has not been helpful since it is not possible to find all such colonies. Apparently only a few workers are needed to perpetuate the line. One hopeful thought is that the Cape bees may not be able to survive naturally outside of the Cape area because of a climatic difference. Left alone colonies might die but that would take a number of years.

Cape bees are fair honey producers in their own area. However, some beekeepers have reported that other races do better when they are transported into the area, at least until they are taken over by Cape bees.

The Cape bees are different and there is good agreement that they should be protected. However, what has occurred is another example of what can take place when animals are moved out of their native territory.

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?DO YOU KNOW?

Kinds of Bees

clarence collison

In late summer and early fall many relatives of the honey bee such as wasps, hornets, yellow jackets, bumble bees as well as other species often become a serious concern for the general public and a few species may even become a problem to honey bee colonies. Since beekeepers are considered by many as bee specialists in their local area, they are often contacted by their friends and neighbors to assist in dealing with other species of stinging insects. Are you able to identify the various species of wild bees, wasps, hornets etc. that are often encountered and understand their biology?

Please take a few minutes and answer the following questions to find out how well you understand these important topics.

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

1. ___ Yellow jackets and several species of hornets and wasps are unlike honey bees since both males and females can sting.
2. ___ Yellow jackets may nest in the ground, walls of buildings or build aerial nests in trees and shrubs.
3. ___ Individual female wasps and hornets can sting more than once.
4. ___ Neither wasps or hornets depend on pollen for the rearing of their young, thus their bodies lack plumose hair and special structures for collecting and carrying pollen.
5. ___ There are over 5000 species of bees in North America and the majority of these are solitary in habit.
6. ___ White-faced hornets, yellow jackets and bumble bee colonies are annual in which only young fertilized queens overwinter.
7. ___ Polistes wasps and yellow jackets reuse their same nest year after year.
8. ___ The European or giant hornet (Vespa crabo) at times is predacious on adult honey bees.
9. ___ Bald-faced hornet nests and populations are typically smaller than yellow jackets.

Multiple Choice Question (1 point)

10. ___ Leaf-cutter bees carry their pollen on the _____.
    A. Mandibles (Jaws)
    B. Middle legs
    C. Front legs
    D. Ventral surface of their abdomen
    E. Hind legs

Listed below are several species of bees, wasps and hornets. Please match the insect with the appropriate nest material or nesting site. (7 points).

A. Nest in tunnels within the soil
B. Hollow stems, straws, bored wooden blocks
C. Under-ground in abandoned mouse dens, piles of straw, chaff, old rags etc.
D. Construct nests of mud on the ceilings or walls of buildings.
E. Nests are composed of a paper-like material produced by the insects from wood and vegetable fibers.
F. Nests are constructed in dried seasoned wood, especially soft woods such as pine, redwood, and fir.
G. Nest in hollow trees within a brown paper nest.
H. Single horizontal paper comb attached under the eaves of houses, behind shutters etc.

11. ___ Leaf-cutter bees
12. ___ Alkali bees
13. ___ Bumble bees
14. ___ Polistes or paper wasps
15. ___ Carpenter bees
16. ___ White- or bald-faced hornets
17 ___ Giant or European Hornets

Please match the following:

A. Polistes or paper wasps
B. Yellow jackets
C. Bumble bees
D. Carpenter bees
E. White- or bald-faced hornets
F. Mud daubers

18. ___ Which of the above species often invade honey bee hives stealing honey and even attacking brood?
19. ___ Which of the above species normally hibernate in attics and walls of houses, barns etc., becoming active on warm winter and spring days?
20. Compare the brood diets of mud-daubers and bumble bees. (2 points)
21. In the social wasps, at what time of the year are the queens and males produced? (1 point)
22. Please identify the diagrams below (3 points).

_____ _____ _____

ANSWERS ON PAGE

WHAT'S A BEGINNER TO BELIEVE?

bruce t filbeck

I've always been an avid reader and my approach to almost any new endeavor has been to read all the printed matter that I could find on the subject before leaping into it with both feet. This approach has served me well on such diverse subjects as vegetable gardening, stamp collecting and flying airplanes so I naturally assumed that it would continue to do the job when I developed an interest in beekeeping. Well, at least the theory was good

I don't know if reading caused my interest in beekeeping or if the interest was there from some other source, but it certainly affected my desire to finally "do something about it." Last summer a local public library was having one of their periodic "a bag of books for a buck" housecleaning sales and one of the gems that I picked up was a *Guide to Bees and Honey* by Ted Hooper. That book, coupled with building a new house on a rather secluded 10 acres, sparked the realization that I could be a beekeeper. It also started me down the long and sometimes winding path of bee "literature."

The amount of printed material that is available on the subject of beekeeping is much greater than on most other topics. Books on beekeeping range from the basic to the extremely complex and specialized. There are also equipment and beekeeping supply catalogs and, of course, magazines. If you are so inclined, there are even beekeeping magazines available in several languages other than English. At times it seems like anyone who ever had a thought or theory about beekeeping decided to write it down!

It seemed to me that the most reasonable way to get started on the subject of beekeeping was with a book that was general in scope and not too "heavy" on the technical parts of the subject. I found *Guide to Bees and Honey* to fit these requirements nicely even though it is somewhat dated (first published in the mid-1970s) and the author relates to beekeeping from his British viewpoint. From Hooper I learned about bee anatomy, about the exact meanings of the "bee dances," that hives should always be moved "under three feet or over three miles," all about "spreading the brood," swarm control and a whole bunch about flowers and plants that bees like. Later I was to learn that there were others who had different opinions about the "correctness" of some of Hooper's statements.

Another beginner's book that I found interesting was Garden Way Publishing's *Practical Beekeeping* by Enoch Tompkins and Roger M. Griffith. This book was first published in 1977 but, with the exception of listing the names and addresses of some equipment suppliers who are no longer in business, this wasn't much of a problem. This book told me that it was " best for a beginner to check his hives once a week during the spring and summer. Don't worry about doing harm to the colony by inspecting them this often. More harm is done to bees by not checking them often enough." Here, too, was mentioned (complete with pictures) that sugar syrup should be fed to newly arrived package bees – " . you may brush the syrup onto the sides of the screen with a clean paint brush . "The book also has a chapter about cooking with honey and includes several recipes.

Two other books deserve special mention here. They are *The Hive and The Honey Bee*, an extensive and thorough reference book covering all aspects of beekeeping, and *The Best of Bee Talk*, a collection of some of Richard Taylor's columns from *Bee Culture*. In my opinion, both books should be permanent fixtures in the library of every beekeeper. In the latest edition of *The Hive and The Honey Bee* you are treated to 27 chapters of detailed information by nearly as many highly qualified authors covering everything from Business Practices to Bee Venom. Richard Taylor's columns speak of both the practical and the aesthetically pleasing aspects of beekeeping. I found that his discussions of philosophy as it relates to beekeeping were a pleasant reminder that the real rewards of this endeavor are measured not only in pounds of honey per hive.

Catalogs are an accurate and inexpensive source of information that is easily overlooked. All the major suppliers of beekeeping equipment and supplies will happily send you one of their catalogs. These are excellent for the beginner since you can see pictures (and prices!) of all the equipment that you have been reading about elsewhere. I found that I would be able to fill in the gaps in my knowledge about such things as the different types of wax foundation and which sizes of frames fit which sizes of supers by browsing through these catalogs. I also found that there could be a big difference in price for similar

pieces of equipment. All of the suppliers I have dealt with have been especially anxious to please when they found out that I was a new beekeeper.

The two foremost American beekeeping magazines are *Bee Culture* and *The American Bee Journal*. Although each is informative in its own way, I found that *Bee Culture* tends to be more "readable" and "practical" while *The American Bee Journal* leans more in the direction of scholarly articles that are heavy on theory and experimental results. Sample copies of each are available on request, so see for yourself which one is more your style. Of course, for an additional point of view, you could subscribe to both.

Multiple points of view seem to be standard in matters related to beekeeping. After browsing through some of these materials it becomes apparent that not only are there innumerable theories and instructions on every aspect of beekeeping, but these are often in direct conflict with each other. One author advises that a lot of smoke be used when opening the hive – another says that just a little smoke drifting into the hive entrance is the only way to do it! One says check your hives and your bees at least weekly – another says don't open the hives unless absolutely necessary! Trying to separate the true from the untrue and the practical from the impractical becomes a real exercise in persistence – especially for the beginner!

You will have to decide on your own what to believe and what not to believe, but I'll share with you the approach that I use. Since there are so many differing theories and since each of these authors has had some degree of success in beekeeping then there must be a lot of different ways that work. If there are two differing approaches to something, I tend to lean toward the one that makes the most sense to me. Take the statement that I previously quoted about feeding newly arrived package bees sugar syrup by brushing it on the cage with a paintbrush. At a bee school sponsored by the Southeast Michigan Beekeeper's Association, one of the speakers said, "Don't brush the syrup onto the sides of the cage with a brush since the brush may injure the tongues of the bees as they get the syrup off the cage." One of the first things that I noticed as I gave my newly arrived bees sugar syrup (with a paint brush) was the large number of little red tongues lapping it up through the screen. Now, I don't know how tough the tongues of bees are, but it seems reasonable to me that their tongues could be injured by being caught between the brush and the screen so, until further notice, I will sprinkle or spray the syrup on the cages.

It's important to realize that any advice and information that you read needs to be tempered with some "common bee sense" – a basic understanding of how bees are likely to respond to a situation. To illustrate, let me tell you about one of the first decisions that I had to make regarding my bees. I had to decide what date I wanted my package bees shipped. Based on information that I had read, the middle of April seemed right. Well, they arrived just when they were supposed to and I hived them just like the books said I should. A couple weeks later (the books said I should wait a couple of weeks before checking on them) I found that the comb they had drawn was not very much like the pictures of newly drawn comb that I had

Lots of bees on a comb of their very own design! (photo by Ken Babich)

seen. They had used one sheet of foundation and then added a second comb right next to it – but not connected to the next frame. (Starting out with 10 frames of foundation to a super usually eliminates this problem.) The bees had decided to build their own comb rather than use the foundation that I had so kindly furnished for their use and I couldn't understand why. I realize now that expecting them to run all over the hive and build comb on the foundation when the temperature was in the 40's was asking a bit much, but then I didn't know any better.

I particularly enjoy Richard Taylor's "Bee Talk" column in *Bee Culture* because he combines his philosophy of beekeeping with that of life in general. One of the other things that I find refreshing is that he doesn't tend to make "absolute" statements like some other writers. He says, "This is the way that I do this. It works for me in my location under my own particular circumstances. It may work for you in your unique situation and it may not." That method of writing is actually what most authors *do*, but few admit to. Their experiences are unique to their locale and their situation, but they often try to convince their readers that the techniques will work universally.

Beekeeping seems to be an ideal area for experimentation, a chance to try ideas to see what happens. Somewhere along the way, somebody mentioned a "carpeted" bee yard. The comment was made in passing and wasn't explained, but I took it to heart. Since I had a lot of carpet

Continued on Next Page

One of my "carpeted" hives. (photo by Ken Babich)

BEGINNER ... Cont. From Pg. 537

scraps from my newly built house, I laid them around my hives to keep the weeds down. It worked. Other ideas, such as not wearing a veil while putting a new queen in a hive, didn't turn out as well.

Much of how beekeepers handle their bees is dictated by their particular approach to beekeeping, the size of their operation and their general outlook on life. If you understand something about a particular writer's beekeeping situation, you will be better able to decide whether or not his writings are something you can apply to your own. I've found that the more opinions I read and the more advice I get the more likely I am to gather information that will work for me. Trying out the information that you have gathered and changing it to work in your bee yard is what makes this such a unique activity.

Although some of the material written about beekeeping is confusing, contradictory, and complex, because there is so much of it available it's possible for the beginner to learn a tremendous amount about the subject. Sometimes it is necessary to make some comparative judgements about what you are reading, but it is nearly always worth the effort. The answers to your questions and the solutions to your problems are likely written down somewhere – all you've got to do is find them.

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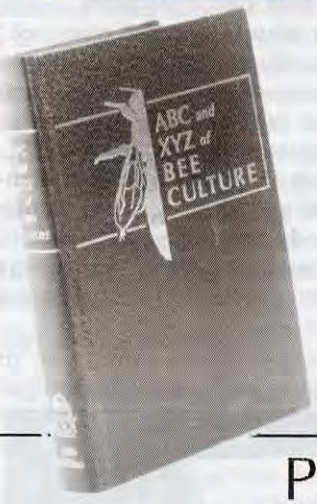

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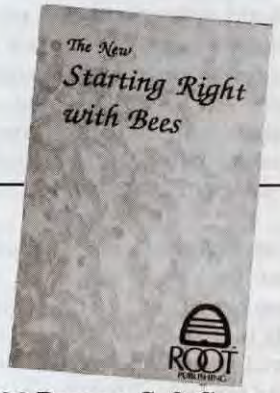

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P.R. From the BEEYARD

walter clark

Do you read newspapers, watch television or listen to the radio? Of course. Whether you like it, love it or despise it, the "media" is a fact of life in our society. It's also a formidable force; the media shapes how we do business, how we communicate, and how we recreate. It also shapes how we perceive ourselves, and how others perceive us. This is very true for the beekeeping industry. The general public knows little about bees or beekeepers, and that is the purpose of publicity – to inform, educate and promote about your chosen subject.

To Promote and Defend

Too often we see the negative side of the media, but like the very magazine you're reading, there's good news to be told as well. As beekeepers we can use the media as a tool to make our job as defenders of the craft a little easier.

Publicity is the key to getting our message out about the wonders of bees and honey. For a small commitment of time, we as a beekeeping community can have an impact on how the public perceives our craft. And as amateur publicists for our beekeeping organizations, we can have some fun along the way and increase our sales, too.

Why Publicity?

Look at what's happening in the news. The media has been full of new stories this year about beekeeping. *National Geographic* did a piece on migratory beekeepers in their May issue. The *Christian Science Monitor* did a couple of spots on bees, and I've seen numerous TV pieces, from news shorts to science documentaries. This year so far, the *Wall Street Journal* alone has had 13 stories about the honey bee, mostly negative pieces about the Africanized bee (commonly characterized as the "killer bee" by the media) and about the Honey Loan program.

So, 1993 has been the year for the honey bee to have its "fifteen minutes of fame." But whether it's a piece about the Africanized bee, the Honey Loan program, mites, bad crop weather or any other topic, media exposure influences public opinion. And public opinion influences public policy makers, business folks and, ultimately, the honey consumer.

Publicize or Perish

There's one rule I can tell you about the media that works every time; exposure is self-perpetuating. Get one article in a newspaper and every other publication wants to do the same type of story. Get one promotional in the newspaper or on TV or radio and everybody knows about the product. What do you think happens when Paul Harvey talks about (endorses) a product on his radio show? You've got it; the product goes gangbusters. What happens if you don't get media exposure? Your competitors do. (Have you seen the "Sugar is a Natural" theme out there lately?) Negative press effects us negatively, positive press, positively. They both hit our pocketbooks.

Remember, publicity is not paid advertising. It's generating media interest and getting press space or broadcast time for free. And at $50 a column inch or $2,000 a minute in broadcast, it's worth every effort to try and get free coverage.

Publicity Works

This spring my hometown newspaper, the *Des Moines Register* published a half-page interview with Senator Tom Harkin (IA). In it Harkin explained how he had recently alleviated a 20-year allergy problem with bee pollen. I saw the article, and knew what the response would be. The result: I've sold over 15 pounds of bee pollen so far this summer, $5.50 lb. retail. And 5 oz. sampler bags go for $2.00.

The article in *National Geographic* has also cemented the value of pollination in the minds of local apple growers here, and it has deepened a knowledge of bees in my coworkers at the bank. I think most of them had previously classified beekeeping with cardboard-collecting or bungie-jumping. Some of them are eating bee pollen. Fancy that. They've even wanted to know what environmental impact bees have. Well, I told them all the positive information I could and didn't mention getting stung.

Working with the media pays off, and it doesn't cost you a cent. What's better, you can increase sales, demonstrate pride in honey products and improve and maintain public awareness. The National Honey Board has put together a fabulous pre-printed media kit, outfitted with feature articles that include photos, tip sheets, consumer brochures, bee facts and trivia, clip art, stickers and other beekeeping information galore. And it's free to beekeepers who need this kind of help. With the kit and a little self-ingenuity, you could be very effective in making and keeping contact with your local media.

Four Steps to Better Media Coverage

You don't need a degree or a lot of time, money or expertise to effectively communicate the meaning and

message of beekeeping. Most media relations are based on common sense and four basic rules:

1. Set your objectives.
2. Determine what's noteworthy.
3. Decide on your publicity approach.
4. Make your contacts and track them.

This is basically all you need to know to make great year-round publicity activities efficient and effective.

Setting Objectives

First off, be realistic about what you want to accomplish. Is it an article in your hometown newspaper, an interview on public radio or a TV news spot? You might say, "Gee, me, contact the media? I don't know what to say." The media aren't necessarily interested in experts as much as they are experienced crafts people. Set brief objectives and expand with your successes. During pollination season, harvesting season or holiday times, you'll be surprised with the response you might get.

Some Objectives	Supporting Activity
Increase general public awareness	Make contacts with the (chosen) press by phone. Be sure cooking, human interest and agricultural editors are sent names, phone numbers and addresses of key contacts in your area. Develop adjunct news releases. Publicize special events by radio news release. Send a letter about an award winner to the press. Get local gardening, environmental, cooking, agriculture groups on your (business or Association) newsletter mailing list.
Increase volunteers or get new beekeepers interested	Place public service announcements. Arrange a talk show appearance for your state apiarist or other local experts. Arrange a beeyard tour during pollination or harvest time. Invite the media to a field day.
To sell a product	Send feature articles on the subject to cooking editors. Invite the media to a honey cook-off. Send samples along with press materials. Send along a one-page description about your product line and business, answering, "Where Can I Buy It?"

Determining What's Newsworthy

Why does one news release get printed verbatim and another end up in the trash? In other words, what's newsworthy? A story with news value affects a large number of people, or is "odd" or unique. Beekeeping fits into both categories. You know (or should know, if not start reading) what your local publishers and editors like by the stories they use. Here's help on judging a newsworthy topic:

1. **Is it relevant?** How is your local effort affecting the consumer, his/her pocketbook, lifestyle, ambitions?

2. **Is it timely?** Pollination articles don't work in December, honey fruit cake recipes do. Is the state or county fair coming up? How about your annual state association meeting?

3. **Is it novel?** Does your bee business have a particularly unusual product or use for honey, say in a hand lotion or as a candy? What's new, undiscovered, unexpected about beekeeping in your area?

4. **What are the consequences?** Are there pollinators going out of business? Will the success of your new honey farm provide local economic impact? What's major or minor about your activities?

5. **Is it prominent?** Is your local bee club president also a doctor or the governor of your state? Is the state fair having honey as a focus product or event? Could you arrange an interview on a local talk show or news show and provide bee trivia?

6. **Does your topic have human interest, or suspense?** Will your bee club be doing special research or financially assisting a Boy Scout troop? Is one of your club members over 90? Has the weather this year severely affected local beekeeping and how will that create a ripple in next year's markets?

Match your message to your audience and create a "hook" Keep it brief, exciting and interesting.

Continued on Next Page

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P.R. FROM THE BEEYARD ... Cont. From Pg. 541

Decide on Your Approach

Now it's time to decide on your publicity activities. Here's a list I've organized in an ascending order of difficulty.

Activity	When To Use	Disadvantages
Press Release	For "hard" news. For summaries. To reach many contacts.	Lots of competition for attention.
Fact Sheets	To describe programs, projects, products.	May not generate interest used alone. Use on informed audience.
Letter to Editor	Clarify positions or thank community.	Reaches fewer readers.
Public Service Announcement	To obtain free spots, To educate, To draw attention, To recruit.	Competition.
Interviews	To promote. Give exposure. Get more air time/press space.	Can be difficult to arrange. Preparation is essential. Public speaking skills needed.
News Conference	Many participants. Impact is large or very critical with expert panel needed.	Complex. Good advance prep needed. Chance of low turnout.

Other methods or materials might include sending a fax or providing video tape, photographs, slides or other visuals as needed. Maybe you have a video of extracting or some pictures of blossoms or the inside of a hive. All of these can be real interest generators.

Make Your Contacts

You've established what your objectives are, what's newsworthy and what approach you'll use to get the message out. Now, go out and do it! Decide which media to contact: (press, TV or radio), copy your release and send it to an all-media mailing list you maintain just for publicity purposes. (You can obtain this list from a local library.) Don't fear the media! They're people. One warning: they are always in a hurry and can be blunt or rude (but usually aren't). Not to worry.

Use tact in working with reporters. Keep in mind they're looking for newsworthy items and will ask hard or unusual questions. Keep your answers positive and brief. For example, if asked, "But don't you get stung?" say, "Occasionally, but that doesn't really hurt. Have you ever tasted wild thistle honey? It's great!" Don't be defensive or say "no comment." Be professional and maintain a positive image.

The point of action here is to get their attention, get the materials in their hands in good shape and on time. Let them know what information you have to share, when you'll deliver it and how, and they'll be more cooperative. Give your contacts plenty of lead time. For most publicity dates, a week ahead of time is good (and three weeks may be too long).

Track Your News Nose

After contacting the news desk at your local radio or TV stations, follow up. Be sure to watch for use of your materials and track the progress of your publicity efforts. Override bad press with follow-up phone calls or additional materials.

In addition, keep the messages flowing. Clip articles from other publications which reinforce your messages and send them to your contacts. Give as much information as you can and maintain a yearly calendar of press releases and up-to-date articles on stinging insects, AHB, pollination, food production, swarming, harvesting the crop, cooking, holiday time, beekeeping craft and other topics that keep positive and realistic images of beekeeping in the media.

Good Luck! Getting a "spin" out of the media is a worthy challenge. With a well planned program you can be the contact for beekeeping information in your area and become known as the local beekeeping "buzz doctor." Write me, let me know your successes and send a copy of your published materials. I'm happy to answer what questions I can and to assist with any marketing, publicity or promotion efforts you're making. Include your phone number if you wish, and write: Walter Clark, Sun & Flower Honey Co., P.O. Box 30008, Des Moines, IA 50310-9401.

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JAR TAGS

AND YOUR HONEY WON'T HANG AROUND

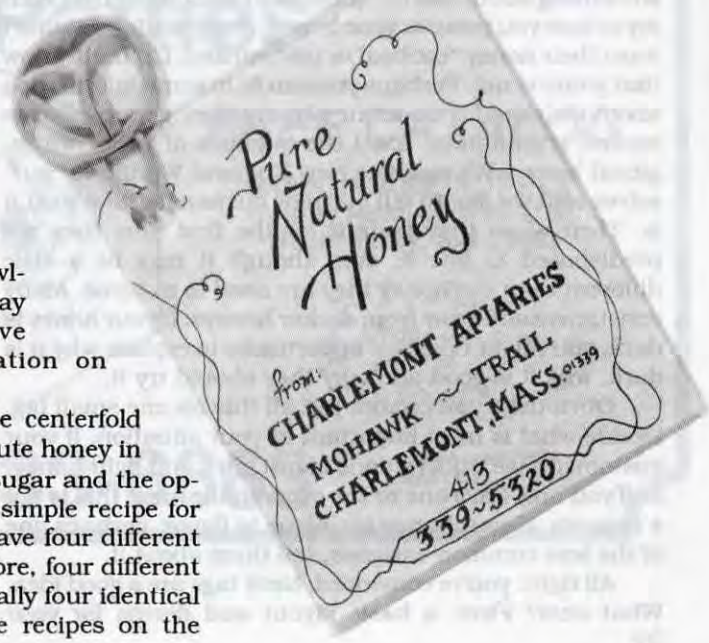
richard bonney

Are you facing competition in the outlets where you sell your honey? Many stores like to have two or more brands on the shelf to give shoppers a choice. Your honey may sit up next to that of another local beekeeper, one whose product does not differ appreciably from yours, or perhaps you are competing against one of the large national brands with an impossibly low price. Either way, you need an edge. How about a neck tag. No, no, no. Not on you, on the jar.

What is a neck tag, you say? Just that – a small tag, one that hangs from the neck of the honey jar. It is designed to attract the shopper's attention and impart some information to make the shopper want to buy that honey. We had some of these tags made up some years ago and they do make our product stand out. We don't use them all the time, only when we feel that the extra edge is needed. The cost was low back then, a few cents each, and with the proliferation of copy centers these days and with the improved technologies for printing, the price is still low, perhaps even lower.

The size of the tag is governed by a couple of practical matters. First, the size of the jar. Design the tag with your smallest jar in mind. The tag should not overwhelm the jar or obscure the regular label. Second, to keep costs in line, the tag should reflect the dimensions of readily available paper stock. Our tags measure 2-11/16 by 4-1/2 inches. Folded once, they become 2-1/4 by 2-11/16 inches, and give us four "pages" for our message. These dimensions allow for eight tags from a single sheet of 8-1/2 by 11 inch paper, a size readily available in many different colors, finishes and weights. The tags could be made differently, 2-1/4 by 2-11/16 inches and not folded, allowing for sixteen to be cut from each standard sheet. This saves money but gives less room for the message.

Our tags carry a four-part message. First, on the front, information about us – our business name, address, and phone number. Adding the phone number seems to make us more credible and has resulted in extra business. We live in an area traveled by tourists, and more than one has picked up our honey somewhere in the area and later called or written to inquire about having more of our "delicious" honey sent to them. We also have had queries from business people outside of the area, shop owners, for instance, who were vacationing here, picked up a jar and became interested in stocking our product.



On the back of the tag we acknowledge that honey may granulate and give standard information on reliquefying it.

One side of the centerfold tells how to substitute honey in recipes calling for sugar and the opposite side gives a simple recipe for using honey. We have four different recipes and, therefore, four different tags. They are actually four identical tags except for the recipes on the third page. These recipes are all basic and failsafe. Their purpose is twofold. They suggest to the consumer some ways to use honey that they may not have thought of previously and they are ways that honey can be used with a minimum of fuss and bother. Of course, an underlying goal here is to get the consumer to use more honey. So many people think of honey as something to put in tea or to spread on toast, and that's it. We want to expand their thinking.

The four recipes we use are Orange Honey Syrup, Honey Butter, Honey Nut Butter, and Switchel. They involve no cooking, so can be made up quickly, in large or small quantities.

Ten or so years ago when we first decided to use neck tags, home computers were neither as common nor as capable. I didn't have one then. Today they are everywhere and can do anything. Well, almost anything. I took a few minutes and worked up a copy of one of my tags. It was easy. If you have access to a desk top computer and a laser printer and have a little competence in using them, you can do everything yourself. If you don't have a laser printer, you can still bypass the graphic designer and lay it all out yourself, then take your disk to a printer who has a compatible computer and a laser printer.

I have a Macintosh LC, Microsoft Word, and a personal laser printer. Other software might have made the job a little easier but MS Word is what I have. It takes a little fancy footwork but I can print out sheets of tags as I need them. I am limited to black ink but have my choice of paper colors.

One of the great advantages to this approach is that you can vary the content on every run of printing, whether it be one sheet or many. Of course, now you need a paper cutter.

All pure natural honey granulates, some in a week or so, some not for several months. To liquefy, place the jar in hot (not boiling) water. Let stand until liquid. Reheat water as necesssary.

Pure Natural Honey

from
Charlemont Apiaries
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413 339-5320

The back and front of my computer tag. Inside was a recipe and substitution information.

JAR TAGS ... Cont. From Pg. 545

Other kinds of information might be included – something about the uniqueness of your particular variety or how you process your honey. Many customers don't want their honey "cooked" or pasteurized. Let them know that yours is not. Perhaps you can fit in some information about the need for moderate heating during processing to control granulation. Extol the qualities of your own regional honey. We produce New England Wildflower ourselves and we like to tell our new customers how good it is. Then when they taste it for the first time they are predisposed to like it, even though it may be a little different than the honey they are used to at home. Many consumers shy away from darker honeys. If your honey is dark, you might take this opportunity to explain why it is dark, why it is good and why they should try it.

Obviously, you cannot put all this on one small tag. Decide what is most important in your situation. If your customer base understands about dark and light honey, or if you only have one or the other in the area, this is not a concern. If your honey is unique in flavor, perhaps one of the less common varieties, tell them about it.

All right, you're convinced. Neck tags are a good idea. What next? First, a basic layout and design for your personalized tags. You can do this yourself or you can shop around for a graphic artist. We roughed out the information we wanted to include and then found a local designer who was willing to work up the material into camera-ready copy in exchange for some honey. We wanted an informal look so she used hand lettering. You might choose to have a more formal presentation. After we approved the design and layout, she drew up the camera-ready copy in black ink on white stock. Be sure that your artist understands that holes will be punched in these tags. A small blank space is left in the appropriate place on each page so that no important information or design element is punched out. On pages one and three this will be the upper left corner, and on pages two and four, the upper right corner.

Because we were using an experienced graphic artist, she understood the printer's production process, and the

We use four different recipes on our tags. Each can be made quickly, with a minimum of fuss and bother. They were chosen for their simplicity, ease of preparation, and lack of stickiness in use at the table. Over the years so many people have told us that they don't use honey because it is too sticky or runny. Each of these recipes also uses a proportionately significant amount of honey, fifty percent of the total ingredients. Here are the recipes as they appear on our tags.

- **Orange Honey Syrup**
  For a delicious taste treat, try this on your pancakes or waffles. To make, simply mix together equal amounts of honey and orange juice. (You may wish to vary the proportions to suit your taste.)

- **Honey Butter**
  For a delicious spread on toast or muffins, blend together with a fork equal parts of honey and butter or oleo. Vary the proportions to suit your taste.

- **Honey Nut Butter**
  To a cup of any kind of nut butter (peanut, almond, cashew or what have you) add a cup of honey. Beat until smooth and creamy.

- **Switchel**
  For a truly delicious warm weather drink, try this variation of a recipe from Colonial times. To a tall glass partly filled with water add 2 tablespoons of honey and 2 tablespoons of cider vinegar. Stir well, add ice, and top with water. You'll be surprised.

A little searching will turn up other simple recipes. For instance, the *ABC and XYZ of Bee Culture*, 40th edition, offers two – a dessert topping using honey and egg whites, and a cake frosting using honey, cream cheese, and vanilla. *Cooking With Honey* by Hazel Berto offers an easily made candy using honey, peanut butter, dry milk, and vanilla. All three involve mixing the ingredients in a bowl but no cooking. What could be simpler?

camera-ready material was truly ready for the copy shop when she turned it over to us. There's no reason why you or a talented family member can't do this design and layout yourself. However, anyone doing this for the first time should talk to someone at the print shop before doing the final layout. For instance, referring back to the size of our tags, four times 2-11/16 does not equal eleven inches as would be expected. It is off by 1/4 inch. The printer needed a 1/4 inch margin on one edge of the paper.

While you are talking with the printer, check on paper availability and the different ways to actually print your tags. We used a 60-pound offset paper, beige color, with a parchment finish. We chose brown ink to give a softer appearance. Sixty-pound paper is not a heavy stock. It is just a little stiffer than 20-pound bond. It folds readily, whereas a stiffer material might not fold as neatly and evenly. If you are using a single thickness tag, you might want to consider a stiffer material, a 65-pound cover stock, for instance. This could put you into a different print process, although that is not necessarily bad. It could be a less expensive process. Again, talk to the printer about your options. He or she also may have some thoughts about layout, about advertising in general or even about selling honey specifically. It is surprising what information a competent printer can absorb. Throughout all of this, as you choose paper, colors, and basic design, keep your jar label in mind. Tags and labels should coordinate.

Now, assuming you are having multiple tags printed on a single sheet, someone must then cut, fold, and punch (drill, in printer parlance) them. You can choose to do some or all of this yourself. If the printer does these tasks, each one will add to the cost. Cutting will probably add about ten percent to your total. Folding and drilling involve hand work and will cost significantly more. The printer cut ours but we do the folding and hole-punching ourselves, a few at a time as they are needed.

To use these tags, we slip an elastic through the hole that has been punched through the upper left corner and hang the tag around the neck of the jar. The elastic usually disappears from view under the rim of the lid. We take a little extra care in putting the labeled and tagged jars back into their carton to prevent wrinkling and tearing.

In our experience, shop owners like the tags. It adds a little something extra to the product, and the tags do make the jar stand out on the shelf People will take down a jar to read the message; once in hand, it's that much closer to a sale.

Occasionally, a customer will like our message but for whatever reason will not be interested in the honey. He or she will remove the tag and put the jar back on the shelf. Perhaps that person is collecting each of our different recipes. We carry a few extra tags with us when we make deliveries so we can replace the missing ones. We do believe that using tags has resulted in more deliveries – and that's what it's all about.

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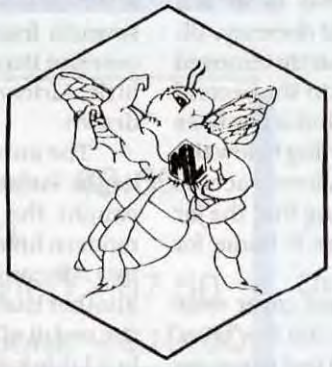

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FIRST AHB COLONY IN TUCSON

gordon d waller

I started keeping bees about five years before the African bees escaped into the tropical forests of Brazil and began their much-publicized journey toward the U.S. Thus I've anticipated their arrival for more than forty years. Unlike many beekeepers and bee researchers I've chosen to wait and let the Africanized honey bee come to me. Ironically, "come to me" it did.

Some cynical bee experts have said "when you get *it* you'll know you've got *it*," e.g., you won't need FABIS, morphometrics, DNA tests or any other high-tech diagnostic service to tell you you have the Africanized bee. The other often-repeated phrase answers the question of what you do when you discover you've got it. The answer: "Run like hell." Right in both cases.

In mid-June of 1993 some friends persuaded me to leave the hive in their yard after catching a small swarm on their property. June is just about the worst month to hive a swarm of bees in Tucson – the spring honey flow is long gone, the summer rains won't produce new forage until August and the temperatures often exceed 100°F. If this little two-quart-sized swarm survived its first month it would be a near miracle. (I added one frame of honey and a jar of sugar syrup a couple of days after hiving it on 10 frames of new foundation.

My first African queen. (Photo by Jim Maender)

Five weeks later I was returning from grocery shopping and decided to stop by to see if it was still alive. Shopping attire for Tucson in July consists of as few clothes as possible and still obey the laws of decency. Ill-prepared as I was – no smoker, no veil – I quietly removed the shade board and hive lid and peeked into the second chamber that held only the now-empty jar and a few bees dancing and prancing around the small opening below the jar. (A two-inch opening in the inner cover allowed access to the syrup from the bottom chamber.) Noting that the jar was empty I instinctively removed it to take it home for washing.

The few bees observable above the inner cover were hyperactive and when the jar came out so did the bees. Replacing the hive lid and running about 50 feet to my car took only a few seconds as both the bees and I were highly motivated. I recalled recently publicized advice to get into a vehicle or building and then close the doors and windows if you are attacked by bees.

During this hasty departure and the one-mile drive to my home I decided I had had my first Africanized bee experience. Returning later that afternoon with smoker and bee veil I was able to properly examine the colony. All the worker bees seemed hyperactive all of the time, but smoke controlled them nicely. Their color varied, with some resembling golden Italians and others looking like pure Caucasians. Many of the workers were extremely small, but some were as large as our European bees. The queen was as big and beautiful a golden queen as you could ever hope for. Only one drone and four cells of drone brood were present at the end of July.

Every frame removed gave a repeat performance of runny bees festooning on whichever corner was the lowest and some bunches of bees fell off onto the top bars of the brood chamber. Holding a frame horizontally resulted in an almost complete clearing of bees from the upper surface with all of them quickly gathering on the underside of the comb. Eventually many bees were clustered on the exterior of the hive body. This kind of runny behavior reminded me of some colonies of *Apis cerana* I had seen in India. But I knew after the first examination that this was not just a regular bee, more defensive than most.

The big surprise was that every frame of foundation was drawn into comb and being utilized. Six frames were filled with brood (three in the second brood cycle) and a seventh frame had brood on one side only. The slightly oversize Permadent foundation was no problem for these little Africanized bees – nearly every cell was perfectly drawn.

The announcement that Africanized bees had killed a dog in Tucson in June came only a couple days after I had caught the first Africanized swarm known to be in a modern hive in Arizona. As of August first there have been two Africanized swarms in Tucson, four in Sasabe, and another east of Yuma. Some have suggested that these are the result of man-assisted entry into the U.S. on a vehicle, but I think it's time we admit they're coming here on their own. The forage and weather conditions across southern Arizona will facilitate Africanized bees to thrive better than any bee we've seen here previously. As a well known radio commentator concludes his daily editorial presentation: "That's my opinion, What's yours?"

WINTER WELL

How do you deal with winter? The answer, of course depends on where you live. Winter can be cold toes and snow drifts by the first of November, or working in the garden after a brief shower. The key, again, is where do you live?

Too often those in the business of providing information develop tunnel vision. They lose sight of what they seldom see or experience.

When it comes to giving advice on a subject as complex as keeping bees tunnel vision can be dangerous. You can't overwinter colonies in Maine the same way you do in South Carolina. Can't be done. Yet how often have you read or heard advice from someone who's climatic experience is radically different than yours? How do you make sense of it? Can you use any of what those out-of-staters tell you? Why can't you find information that tells you how to do it in your own back yard?

This month we've assembled what we think will be the source for many of the answers to your questions. Roger Morse takes a look at the northern extremes, where winter plays a major role in management choices. Dewey Caron tackles that relatively undefined place that isn't north or south, the inbetween climate area. Keith Deleplane explains the south in detail. Mike Burgett takes care of the Pacific northwest and a collection of residents tell all about winter in the desert southwest.

But no matter where you are, don't limit what you read to the area you live in. Each of our authors offers a unique perspective to the subject, but at the same time they all draw on the basic biology of the honey bee, and wintering colonies. And by examining winter from *each* point of view you'll find things that can apply to what you do.

Some things you will find repeated in every article – those basics I mentioned – and they don't change just because of where you live. Bees eat in the south, the north and out west. If they don't, they die. But there's more. Adequate housing, a good medical plan and proper law enforcement protection are expected and required out east, in the midwest and the mountains. This repetition should tell you something.

The requirements of wintering in each area are well defined but sometimes the extreme details are not. Each author required a broad enough brush to cover several states at once. But the tiny details, as each author explains can be worked out once you understand the basics. Further, each author does reveal a few of those tiny details that when combined offer a wealth of information.

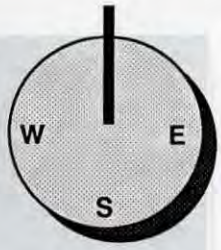
So once you understand all those basics, providing them is the key. Those two words, *understanding* and *providing*, will eliminate at best, or certainly ease the harshness inherent in the season we call winter.

In the long run, and certainly by next spring reducing the stresses we can control will give your bees a better chance of defending themselves against those elements we can't. That's what keeps bees alive, and beekeepers in business.

Winter well.

The Editors

UP NORTH



roger morse

There are four major requirements for good wintering in the north– young bees, good food, protection and relative freedom from disease.

The Problem

In the fall when the temperature in a beehive without brood falls to about 57°F, the bees form a hollow cluster over the empty combs below the honey. Within this cluster some of these bees flex their muscles, fan their wings and in the process generate heat and hold the interior cluster temperature at a more or less constant 57°F. It is important to note that bees do not keep the whole of the inside of the hive warm, only the cluster.

Sometime in late December it is normal for the queen to start laying eggs and for brood rearing to commence. Brood rearing starts at much the same time in the whole of the United States, both north and south. When they are rearing brood, bees hold the brood nest area at a temperature of about 92 to 96°F. It rarely exceeds a temperature of 97°F. Such a high temperature is difficult to hold during cold weather, especially during January through March, and proper protection of a colony at this time is especially important. Of course, the amount of brood reared in the spring varies depending upon the temperature. Colonies in the southern states build their populations in the spring much more rapidly than do those in the northern states.

The wintering problem is one of assisting the bees in their normal cycle of the year. There are many things beekeepers can do to supplement the bees' efforts and to make their lives easier in winter.

Young Bees

Worker honey bees live for only short periods of time. In the summer, when there is a great deal of flying and foraging, a worker may live only four to six weeks. Flying is obviously hard work and wears out the bodies and wings of workers. There is a great variation in how long the average worker lives in winter but it probably does not exceed four months. Thus, replacement bees are needed in the spring and rearing bees in January through March is important if the colony is to survive.

A young queen will lay later in the fall and as a result the colony will have more young bees for winter. Colonies should be checked carefully in late July and early August and those that have failing queens, or queens with poor brood patterns should be requeened.

Food

The average colony of bees in a tree will consume about 40 pounds of honey during winter. However, tree cavities are usually small and a colony in a two-story Langstroth hive is larger and will need 60 to 70 pounds of honey. It is possible to winter bees in a single super with less honey but there is a great deal of preparatory work that must be done.

Light colored honey is the best bee food for winter. Dark or amber honey, such as that from goldenrod, contains a great quantity of indigestible material that causes more fecal matter to accumulate. If bees have a number of flights in the colder months, especially January and February, they can void these feces and there is no problem.

In the far north, especially Canada, beekeepers often feed the bees sugar syrup for winter because the bees have fewer opportunities for flight and too much fecal matter may accumulate if honey is used for winter food. A syrup made from cane sugar, or isomerose (not glucose) is best. Honeydew honey makes poor bee food because it too contains too much indigestible material. Any honey that granulates fast and forms hard crystals, such as aster honey is also poor bee food. Bees can dissolve the hard glucose crystals if they have access to water.

Feeding

I like to weigh colonies in the fall to make certain they have enough food. Many beekeepers tell me they can lift a hive from one end and estimate the amount of food present, but I don't believe this is a sufficiently accurate method.

When feeding in the fall is necessary it should start about a week or two after the heavy killing frosts. In central New York this is about October 1. In my opinion, the best feeders are jars or cans that rest on the top of the brood frames, close to the cluster.

Division board feeders are usually okay. Entrance feeders, such as Boardman feeders are never satisfactory for fall feeding and rarely satisfactory for feeding at any time of the year, especially in the north.

Sugar syrup fed in the fall consists of two parts of sugar and one part of water by weight or measure. Spring sugar syrup is usually less dense.

The Apiary Site

A proper apiary site provides colonies with much of the protection they need for winter. It's exposed to the sun, has good air and water drainage, slopes to the south or east and is protected from the wind. *A maximum of sunlight in the winter is especially important* as warming the hives encourages flight and gives the bees an opportunity to void fecal matter and engorge on honey. The honey the bees consumes carries them through the next cold period. Bees *can* starve even if honey is only an inch away unless the hive is warmed and they can rearrange the cluster. This warming can be affected by the location of the apiary.

You cannot judge the quality of a wintering site in one year. We have seen good honey-producing apiaries that were poor for wintering. Keep records of losses and select only the best apiaries for wintering even if that means moving colonies.

Humidity And Its Control

When bees eat honey they break down the sugars and metabolic water is produced in the process. This water must escape or it will condense, freeze and further cool the inside of the hive. Many northern beekeepers give the bees an upper entrance just to give the bees more ventilation. The building paper packing system described below has the advantage that moisture may escape through an open inner cover hole. It may condense in the packing straw or, better still escape from the packing.

Packing

The purpose of a winter pack is to give the bees some additional protection and to allow the colony to be warmed on days when flight may otherwise not be possible. The winter pack is not meant to insulate the bees as they might be in a refrigerator case. Fifteen-pound slater's felt is too heavy for wrapping colonies. A light-weight black building paper is needed. One method of using black building paper for a winter wrap is illustrated in the pictures. Other methods are available.

The Hive Stand

A hive stand helps to keep bottom-boards dry and protects against rot. If properly built, the hive stand creates a dead air space under the colony. In summer, it helps to raise the entrance above grass and weeds growing in front of the hive. We drive some nails in our wooden hive stands and use them to tie the winter pack in place.

Mouse Control

It is a curious fact that a mouse may enter an active bee hive in late fall, chew out an area six to eight inches in diameter, fill that space with dry grass and whatever other nesting material can be found, have a litter of young in the spring and move outdoors in the late spring without being stung or molested by the bees. When the bees are in

The steps in wrapping colonies are illustrated here. Note that colonies with and without projecting bottom boards are used and both are easily wrapped.

A nail has been woven into the paper to hold this pack in place.

In this step, the paper is wrapped around the colonies. Pieces of wood lath are used front and back to hold the paper in place. Wheat straw is placed over the holes in the inner covers.

Continued on Next Page

UP NORTH ... Cont. From Pg. 553

their winter cluster mouse activity apparently does not disturb them.

The dollar damage caused by mice is great, yet I've seen apiaries where every hive is infested because it's difficult to protect a bee hive against mice. Reducing the colony entrance with wire screening makes it difficult for house bees to remove dead bees and this may plug the entrance. If screening is used, provide the bees with an upper entrance.

Most mouse poisons are difficult to use and have a short life, especially if they become damp.

Disease Control

Sick colonies, even with all of the other criteria properly attended, will not winter satisfactorily and may often die. The situation has become complicated in the past several years because of the accidental introduction of chalkbrood, *Varroa* and tracheal mites into North America. American foulbrood has always been of concern but has often been overlooked in recent years because of mites and the devastation they bring. As a result American foulbrood rates have risen.

Further complicating the picture is the fact that agriculture has much less of a voice in politics today than it did when more people lived on farms. As a result, tax money that was once used to support such projects as honey bee disease inspection and control is being used in other programs that affect larger groups of people.

The result is that successful beekeeping depends much more today on individual beekeepers doing their own inspections and applying control methods as needed. A thorough disease inspection in the fall is critical.

The final pack is tied in place using binder's twine, the same twine that is used to bail hay. It has a good life and survives the winter with no difficulty. In the spring the twine is used as smoker fuel.

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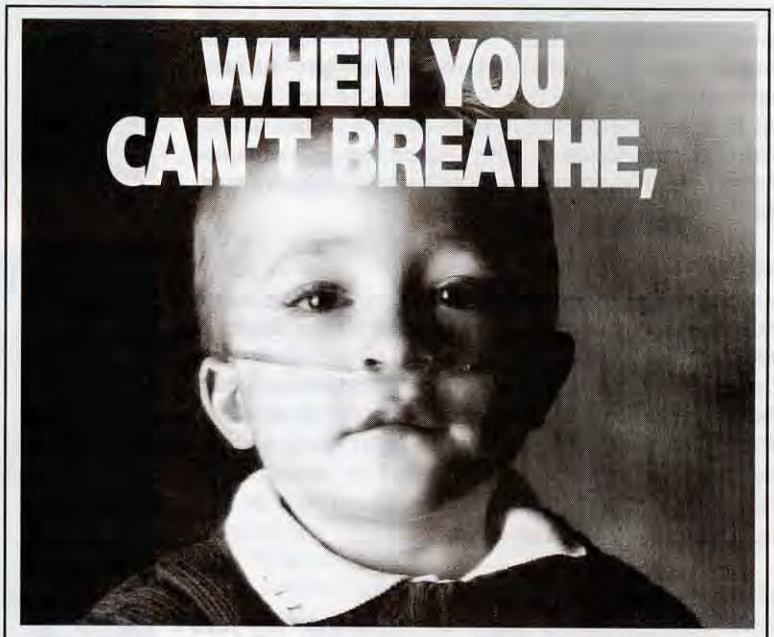

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IN BETWEEN

dewey caron

There are a lot of beekeepers who winter their bees in between – where the temperatures are too low to permit much or any flight but where winter is neither long nor severe – somewhere between "the south" and "the north." But beekeepers still need to pay attention to proper wintering techniques, when they keep bees in between climate areas. Most colonies will survive even if the beekeeper does nothing, but proper winter management can improve colony survival, make spring management easier and beekeeping more profitable.

Wintering in between has never required wrapping colonies in black paper or providing extra protection for success. That doesn't mean in between beekeepers shouldn't pay some extra attention to their colonies before and during the winter. The bees do the work but beekeepers can assist them in their preparations.

The Basics

Wintering success in between, as success in beekeeping anywhere, is dependent upon good queens. The population needs adequate honey stores where they can be reached during colder weather. Older bees die over the winter so pollen reserves and disease-free brood are another prerequisite. Overwintering success improves with the size of population. Since bees are alive, some method of venting excess water vapor assists them in successfully getting through the coldest portions of winter. Finally, bees undisturbed overwinter best, so pests like mice or overmanipulating beekeepers should be kept to a minimum.

Wintering in between means weather conditions that change, unlike the north which is frigid most of the time, or the south, which isn't. We get cold spells, sometimes snow or freezing rain and sometimes bright sunny days when the temperature is high enough for some flight, particularly in the middle of the day. These varying conditions mean the bees may consume considerable honey and pollen stores before fresh pollen becomes readily available.

Because of this variable weather it is possible to perform periodic winter inspections in our area, but they should be brief so little harm comes to the wintering cluster. Our winters are not mild enough for continuous sugar feeding although it might be possible with a quick winter inspection to determine if the colony needs more food. Feeding should be concentrated in early spring when food consumption is heavier due to the expanding brood population. During mild winters when more flight activity is allowed, bees eat more honey.

It is possible to overwinter weak or nuc-size colonies with a queen you hope to preserve, but consider doing so only in special circumstances. Weak colonies in the fall will be still weaker next spring and require extensive (and expensive) management. It is a good practice to take winter losses in the fall by uniting two or more weak colonies or combining such units with stronger colonies to improve their chances of survival. Nucs or special queen stock can be wintered over stronger colonies by allowing warmth to rise from the stronger colony below to the nuc above. This usually takes a special double screen and some practice to develop a technique that yields good consistent overwintering of small colonies.

Why Colonies Die

Colonies die over-winter because the bees run out of honey, because there are too few bees to maintain an adequate cluster or because their digestive tracts compact with too much waste matter. Even so, beekeepers often overmanage their colonies. Remember, the bees do the work. Our job is to simply assist them.

Overmanaging in between colonies means providing winter insulation. Colonies do not need such attention. Upward ventilation, which allows warm, moisture-laden air to escape from the colony should be provided but other manipulations are not needed. We do not wrap colonies, provide extra ventilation space or seek to create artificial heat or insulation barriers. Keeping a colony from exposure to direct prevailing winds is, however, a good idea.

We can not help our bees with their protein requirement to any great degree. Bees overwinter best when able to accumulate adequate fall pollen reserves which they store next to the brood. Much of this natural pollen will lose its nutritive value by spring. Wintering in between is most successful when there is spring pollen available. When foragers start collecting new pollen, brood rearing begins in earnest. Thus some locations are better wintering sites than others because they protect bees from prevailing winds, allow more cleansing

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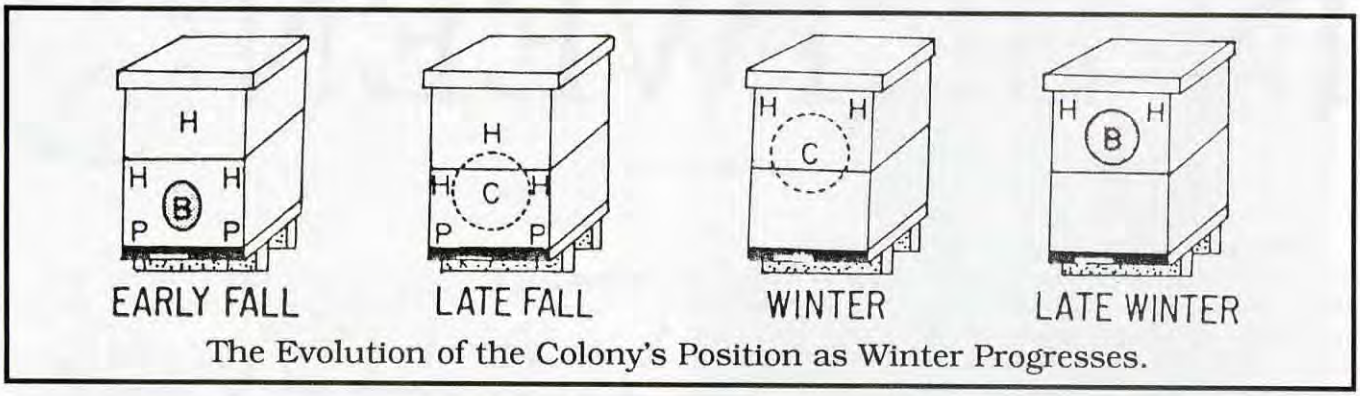
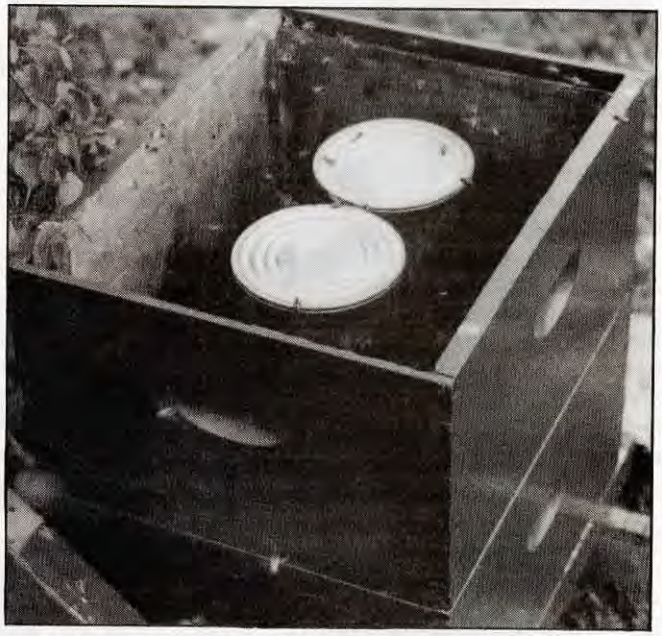


The Evolution of the Colony's Position as Winter Progresses.



Two ways to feed sugar syrup - using gallon jars or friction-top cans placed directly on top bars.

flights on cool but sunny days, and for their proximity to early spring pollen. Such areas are often located near a stream or river since plants rooted in water have the best early spring bloom that bees can utilize for pollen. Bees kept in suburban locations also find lots of plants with early pollen.

The Real Key

The in between beekeeper should supplement colonies low on honey stores in the fall before winter weather leads to a fulltime cluster. Fortunately, we are usually blessed with a long fall to make such adjustments. One technique is to put partially filled combs below the brood, just above the bottom board, and have the bees move the stores up. Opening any capped honey by scoring it gives the bees an incentive to move this honey upward but you need to be careful this doesn't lead to robbing by stronger colonies. You can also feed a heavy sugar syrup well into the fall and have the bees use it to make sugar-water honey to store.

The real key to successful wintering is not only having enough honey stored but to have it properly positioned for cluster behavior. This means the fall brood rearing sphere should become very compact and very central in the lower hive box, just extending into the second box. The second or upper hive body should be essentially full of capped honey. Pollen should fill the side of both frames just to the outside of the brood sphere in the lower box and above the area used to actively rear brood.

Beekeepers in between often need to force this arrangement for best wintering success. Too few do, in part because many beekeepers don't understand the bees' needs and because we put off our fall management until it is too late to accomplish our goals. In most seasons, our up-and-down weather is forgiving and our bees survive anyway.

Generally, the queen should be forced into a lower brood box to get the ideal cluster position. Reversing brood boxes or locating the queen and putting her below a queen excluder (later removed) in the bottom box are the two best techniques to accomplish this objective. A strong fall flow will do the same thing if you don't oversuper above the brood chamber. Since we can't rely on the fall flow, and some locations lack one completely, perform the manipulations to get the queen into the lowest box and then feed sugar syrup to get the second box full of stores. For seasons when you just don't get fall management accomplished, leave a filled honey super or third brood box with

frames of honey on top of the existing brood nest as an alternative. It's not perfect, but it works.

Too Few Bees

It is relatively easy to look in or weigh a colony and determine how much honey it has for winter. This is a skill and practice will improve your honey store assessing abilities. If you have ever participated in a hive-lifting activity at a bee meeting you know how inaccurate and optimistic some people are in estimating weight. Guessing the size of the colony population is a skill that needs much refinement. If in doubt, ask several beekeepers at the next hive demonstration meeting to estimate the hive population size. I predict that the range of differences will be tremendous!

How many bees are enough? A common answer is something to the effect of, "Well, I know when there aren't enough bees but I can't really explain it to you." I recommend you say 30,000 bees (roughly 10 lbs.) is enough and make an educated guess that the colony you are examining is over or under that amount. You can estimate this by knowing the weight of the equipment and how much honey there is.

If a colony is judged too deficient in bees to overwinter (recognize we usually say something like this in the spring when we see a tiny cluster of bees that has starved to death) you can boost the hive population. Forcing the queen to lay more brood as a means of increasing the population is probably not good management. This uses pollen stores that might be better used in the spring and it quickly ages a queen. Older queens lead to more swarming behavior next season.

The best means of increasing the size of a colony is by uniting weak units. This means combining either two or more weak colonies together, or combining one or two weak colonies with a stronger colony. This means taking your winter losses in the fall. You can also give weaker colonies frames of capped brood taken from strong colonies still actively involved in brood rearing. These manipulations must be done early enough for you to check on the "new" colony to be sure you accomplished strengthening. It also gives enough time for the colony to organize a brood sphere with cluster below and adequate honey stores above.

Diseases & Pests

Finally, wintering in between will only be successful if you strive to overwinter colonies that are free of diseases, mites and other pests. This means a brood inspection to confirm that your colonies are free of American foulbrood. Destroy all you find with AFB in the fall. Also check for European foulbrood, sacbrood and chalkbrood. You can use terramycin for EFB but there are no materials to treat colonies with sacbrood or chalkbrood. Requeening often helps with these diseases, but this should not be done too late in the fall because your colony will not have sufficient time to complete preparations for overwintering.

Nosema is one disease we can and should treat for. Nosema is a protozoan that lives in the lining of the midgut of the adult bee. Under confinement, such as in winter or while being shipped in a package, the numbers of this pathogen increase rapidly. Surveys often find about 50% of colonies have significant infestations of Nosema – which can reach into the millions of protozoa. An individual bee with this many uninvited guests in its gut is sick. She won't work as hard nor live as long as a healthy sister.

Nosema can be avoided by feeding fumagillin in the fall. It will pay off with better wintering and stronger colonies in the spring. If you aren't convinced of the devastating effects of Nosema, perform the following experiment in your apiaries this fall: Randomly divide the colonies you overwinter into two groups. Feed all the colonies of one group with fumagillin in sugar water. Feed the other group the same amount of sugar water but leave the fumagillin out. Evaluate the colonies and overwintering success next spring and the following summer. See if you don't prove to yourself that bees fed fumagillin overwinter better and are more productive next spring and summer.

You also need to make decisions on fall treatment for mites – the "new disease." They are having a significantly negative effect on overwintering success of both managed and feral bee colonies. Every recent issue of *Bee Culture* has information on mites. Decide if you are going to put a chemical into your colonies to reduce the effects of the mites or if you are going to allow colonies to die that cannot adequately resist mites and only keep colonies that survive. This is a critical decision, for last year colony losses of 30 to 60% were common in apiaries when beekeepers did not use miticides. Some beekeepers reported 100% losses.

There are chemicals that provide some protection from mites. Determine if you have *Varroa* mites by using one of several sampling techniques. At this point you should generally assume your bees have tracheal mites since they are so widespread; sampling for this tiny mite that lives in the tracheal tubes of host bees is not easy to do.

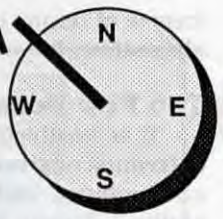
If you have *Varroa* mites, then use the pesticide Apistan® which gives good control. If *Varroa* mites are not present applying menthol (pellets or crystals) for tracheal mites is probably a good idea. Another treatment for tracheal mites is the use of 'grease' patties. This is a combination by weight of two parts table sugar and one part solid vegetable oil (Crisco, for instance). Adding terramycin, following label directions, will give added protection against EFB, too.

If you do nothing, be prepared to have significant winter losses. You won't see the losses every winter in the in between states, so you may do nothing and still have good overwintering. Hopefully, chemical treatments will not be necessary in the future but they are the best protection until we have bees more resistant to these mites.

You also should reduce populations of pests. Skunks, raccoons, or other nighttime visitors eat bees. Keep such pests from the front of the colony. Also keep mice outside. Mice chew up comb and create a disturbance that results in bees being more active than they should be, thus eating more winter stores.

Attention to these few details are what insures successful overwintering for beekeepers in between. If you maintain bees in more southerly climates or further to the North the activities are the same but with less or more detail. Sometimes, being in between is harder than being on either end.

NORTHWEST



michael burgett

The stress and strain of getting colonies through the winter period in Oregon and Washington are managed in two rather different ways by beekeepers in the region. Like a northern bird in the autumn, the beekeeper has two basic options: 1) stay in place and provide enough food stores for the colonies to make it until the spring bloom replenishes the nutritional requirements of the hives or, 2) migrate out of the area, i.e., "fly south" to an area with a mild climate and early nectar and pollen sources.

As a group, commercial beekeepers take the second option by moving their hives to California. This changes winter management rather dramatically by basically eliminating the stresses of the winter period. The advantages are numerous and include earlier buildup of colonies in California than would be experienced if left in the north; accessibility of queens in March and April for requeening parent colonies and splits; reduced labor costs involved in wintering and income from pollination when almonds bloom.

Approximately 80,000 commercial colonies are taken from Oregon and Washington to California during two time periods. For some beekeepers the first move is early, occurring in October and November when colonies are placed throughout California's central valley. A second period, which involves a majority of the colonies, is in January and early February immediately before almond bloom where colonies are normally placed directly into the orchards. Following almond pollination the colonies are moved back to the northwest for tree fruit pollination. These commercial colonies have essentially escaped the rigors of a northern winter in the Pacific northwest.

Year round, "resident" colonies face many of the traditional problems of winter. As a group these resident colonies are owned by non-commercial beekeepers and the majority of them reside on the west side of the Cascade mountains where most beekeepers live. Our winter climate, while north in a latitudinal sense, is unique

in that prolonged spells of cold are unusual and snow is rare. One of our major wintering concerns is moisture. Cool and damp are the characterizations of a Pacific northwest winter and beekeepers need to take special care to see that these aspects of our weather have as little effect on colonies as possible.

Our "winter period" runs from October through February. Winter is not a particularly accurate term for this five month period of non-foraging as the weather can be exceptionally mild, especially in October and early November. A colony on October first should be in its winter yard, in a double deep configuration, with 40 to 60 pounds of honey. A colony will typically consume 20 to 30 pounds of honey during this five month "winter." (Apart from the relatively new winter stresses caused by mites, most traditional winter losses actually take place in March and early April and are due primarily to starvation.)

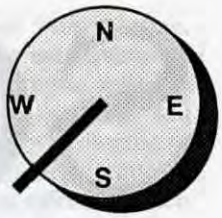
Winter apiary selection is important and all the standard recommendations should be taken into account. Wrapping colonies is rarely done. It is important to see that colonies are tipped slightly forward and that the tops are waterproof. A frequently insinuated aspect of our winter is rain. While a typical winter in the northwest doesn't actually experience the rainfall of Noah, we do possess long periods of cloudiness with moderate daily precipitation, especially in December, January and February.

Our high winter humidity finds expression in a colony when combs turn moldy, principally in the bottom super. Another interesting feature of our winter is that in any given month we can encounter a few days of extremely mild and sunny weather. I have witnessed worker bees foraging for pollen in every month of the winter. Albeit a rare event, it does give evidence of the potential mildness of a winter in the Pacific northwest.

Prior to the arrival here of the honey bee tracheal mite in 1985 and *Varroa* in 1989, wintering colonies was not a particularly great hardship for beekeepers. On the basis of surveys conducted by the Honey Bee Laboratory at Oregon State University, beekeepers in Oregon have experienced an average annual colony winter loss of 21% over the past six years. These losses are the same whether the colonies are migrated to California or remain at home, which is strong evidence for the role of the mites as deterrents to successful wintering.

Pollination plays a big role in how NW beekeepers prepare for overwintering.

SOUTHWEST



The Southwestern United States are characterized by climatic extremes throughout the region. Southern extremes range from the temperate rainy zone of the Southern California Coast, to the inland deserts of California and Arizona and on to the semiarid steppes of New Mexico. The more northern steppes of Arizona and New Mexico are punctuated by high mountain ranges. Similar vertical climatic zones can be found at the base of the Sierra Madre range in California.

Differences in strategies for the winter management of honey bee colonies throughout the region are as diverse as is the climate and these strategies are climatically driven. In some instances, human demographics exert additional influence. This latter influence is largely the result of the replacement of native vegetation with an everblooming array of ornamental plants, and the high use of water which along with heat generated creates a "green house effect" In this brief account, we will examine honey bee wintering strategies as generally practiced in the major climatic zones of the southwest.

Coastal Zone

This zone is, in many ways, nearly tropical, particularly in and around the major population centers. Here, high humidity and lush vegetation provide year-round forage for bees, although areas which are exclusively in native vegetation may experience a dearth of bee forage due to the lack of soil moisture. This area is primarily evergreen hardwood forest.

In urban areas brood rearing declines during winter but seldom ceases. Most remote areas experience some winter dearth of forage and hence a break in brood rearing. Moderate winters encourage beekeepers who have migrated during summer to higher elevations in pursuit of more favorable conditions to return each fall. Wintering problems and resultant colony losses are relatively few. Special attention is given to the adequacy of food stores, basic colony vigor, and those disease conditions, such as varroasis, which may be worsened by the absence of a break in brood rearing.

Deserts

The deserts and semideserts of the Southwestern United States are tropical in origin and subject to two rainy periods. The first occurs in midwinter while the second in mid-summer is monsoon like. Hence, there are

two disparate bloom cycles for native plant species and a dearth period precedes each. The winter dearth normally induces a broodless period which lengthens with elevation.

Remote areas, especially at higher elevations may experience mild freezing temperatures for brief periods with snow occurring some years. Here a true winter cluster may form for brief periods. Winter management strategies necessarily include concern for adequacy of food stores to pass periods of dearth, queen condition and colony vigor, as well as those disease conditions exacerbated by a break in brood rearing or stress.

At lower elevations, valleys along major riparian areas are densely populated and/or extensively cultivated. The "greenhouse effect" is obvious. Population centers like Phoenix and Tucson, AZ, as well as major winter vegetable and seed productions like El Centro, CA and Yuma, AZ are nearly tropical. A wide range of native and cultivated plant species bloom more or less continuously. Thus brood rearing declines over winter but seldom ceases. Here, colony management concerns mimic those of the Southwestern Coastal Zone.

Semiarid Steppes

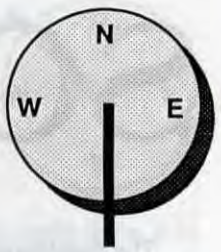
Unlike the deserts, the semiarid steppes of the Southwest are not densely populated and any man made "green house effect" is minimal. Thus, the entire area is subject to natural conditions of climate including winter cold that increases with northern latitude. Colony densities seem highest along river bottoms and near intensive agriculture. Some beekeepers take exclusive advantage of native plant resources and many move their colonies one or more times during a season.

Winter dearth of forage induces a break in brood rearing and both vary with elevation and northern latitude. Here, winter colony management strategies approach those of the northern states and address those problems common to colony survival during cold, flightless periods. Even so winter here is relatively brief and hence, its impact on colonies is less severe.

Deciduous Forests

The forested mountainous areas of the southwest have the fewest beekeepers and colonies. This is undoubtedly the result of both shortened seasons for crop production and problems encountered when wintering bees where the flightless period is protracted. Frequently colonies are moved south to take advantage of early spring conditions at lower elevations, then moved back north incrementally to take advantage of major nectar flows as they occur during seasonal change. Unlike their more northern counterparts, southwestern beekeepers are able to move relatively short distances to take advantage of mild climates and eliminate the need to implement rigorous winter management strategies. This colony movement also contributes significantly to improved colony productivity. Among the trade offs in this management strategy may be an increased susceptibility to *varroa* mites.

SOUTH



keith delaplane

To a bee, winter is a prolonged period of forage dearth, short days and, sometimes, cold temperatures. Whether in Minnesota or Florida, these can be stressful conditions for a colony, and successful beekeepers learn how to help their bees through winter.

Honey bees take winter seriously. So seriously in fact, that much of what they do is aimed at surviving the next winter. For example, colonies swarm early in the season so the new colony has all summer to collect a winter food supply. During summer, bees hoard a large honey and pollen supply to feed and insulate the overwintering adults. During fall and winter bees rear less brood, conserving food and sparing adults the energy cost of feeding larvae. During cold temperatures bees cluster together to conserve heat. The ultimate aim of these behaviors is to produce a surviving remnant population which will have new swarms next spring.

Likewise, beekeepers must take winter seriously. Because we subject honey bees to an artificial hive and management regimen we shouldn't assume they can just make it on their own. Plus, our objectives are entirely different from the bees' We want large colonies that *do not* swarm and, instead, make unnaturally large honey crops. We start toward that goal in autumn.

The fundamentals of overwintering are fairly universal although the details of working them out differ across regions. For example, southern beekeepers don't worry much about cold temperatures, but they worry a great deal over food supplies and fast early-spring buildup. Here's some important guidelines for overwintering southern bees.

Good Queens, No Disease

Queenless, diseased bees will not survive winter. During the last honey removal examine any hives that produce noticeably less honey than their neighbors. Often these poor-performers are queenless. If the population is low or you see lots of irregular drone cells simply shake bees off the combs into another hive and salvage the equipment for future use. You have just retired the colony but it would have died anyway, and this way you salvage the equipment before wax moths ruin it. If the population is still adequate and there's little or no irregular drone brood, insert a caged mail-order queen. A few queen breeders sell queens until November.

In early autumn treat all hives with Terramycin® to prevent foulbrood diseases. If you have a history of Nosema disease, (and almost everybody does) treat hives with Fumidil B® in sugar syrup. Your state bee inspector or county Extension agent can help you submit bee samples for laboratory disease diagnoses.

Ventilation & Drainage

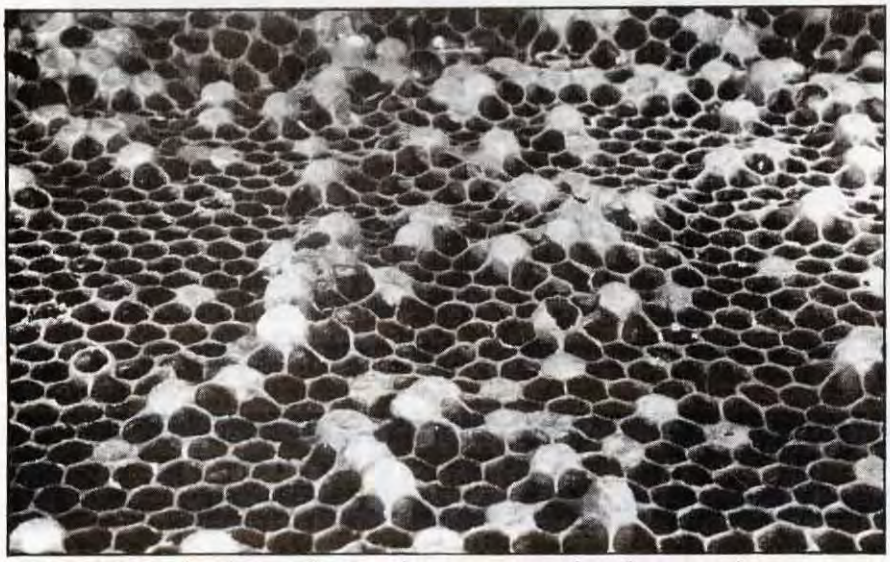
Year-round, beehives should be angled forward slightly to let rain water drain out the entrance. During winter provide a means for warm, moist air from the cluster to exhaust out the top of the hive. You can do this by simply propping up the outer cover slightly with a small block of wood. If you don't take these measures the hive interior will be cool and humid – conditions that promote disease.

Enough Food

In spring and early summer super hives abundantly to promote a big surplus honey crop. In late summer and fall crowd hives with fewer supers to encourage them to store honey densely in the brood nest. In the south there's not many good honey sources in late summer, with the occasional exception of soybean and cotton. In fact many southern beekeepers must begin feeding bees as early as July. In some years there are good flows of goldenrod and aster in September and October, but these are not dependable. In short, fall feeding is a routine part of southern beekeeping.

In the south each hive should have at least 60 pounds of honey or syrup going into winter. This equates roughly to one hive body half-full of food and one medium super completely full. If colonies need feed, mix a syrup of two parts sugar and one part water and feed them with an internal division board feeder. Better yet, put the syrup in a pail with a perforated lid and invert it directly

Two ways to feed sugar syrup. A plastic pail with a mesh feeder, or an internal division board feeder.



Irregular drone cells strongly suggest queenless, laying workers.

over the top combs; enclose the space with an empty super and an outer cover.

If colonies have no pollen in fall feed them a commercially-available pollen substitute. However, most areas in the south have good late summer and fall pollen flows and substitutes are usually not needed.

Correct Configuration

The arrangement of food in the nest is almost as important as the quantity. When bees cluster during cold spells, they fill not only the space between combs but they enter cells on both sides of a comb head-first. This means the cluster is nearly continuous in spite of the interspersing combs. This also means that clustering bees need empty cells.

If you have heavy late summer or fall flows colonies may become honey- or pollen-bound; that is, every available cell is filled with honey or pollen. Because there are no empty cells bees in these colonies cannot cluster adequately and are vulnerable to freezing. In fall make sure the center-most combs in the brood nest have some empty cells to permit good clustering.

Remove queen excluders in fall. If you don't the queen will be fatally trapped below the excluder as the cluster moves upward to eat honey and pollen during winter.

Treat for mites

Check hives in spring and fall for tracheal and *Varroa* mites. Your state bee inspector or county Extension agent can help you do this.

If your colonies have tracheal mites, a fall treatment of menthol may help. Research in Georgia found excellent control of tracheal mites with spring applications of menthol. Fall treatments slowed mite population growth but did not reduce overall mite numbers.

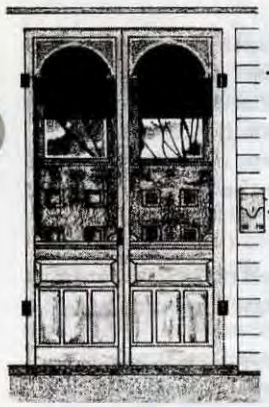
If your hives have *Varroa* mites, fall is the best time to treat. Apistan®, the only approved *Varroa* miticide available in the U.S., can only kill mites when they are not protected in brood cells. Consequently, miticide applications are most effective when there's little brood and most of the mites are on adult bees. The south enjoys a long, mild fall during which brood rearing is low but bees are still warm and actively moving about in the nest. These conditions optimize the effectiveness of Apistan®.

Protect from extremes

Extreme low temperatures are rare in the south and few, if any, beekeepers insulate hives or take unusual measures to protect them from cold. Year-round, face hives south to southeast to maximize sun exposure. Don't place hives in low spots in your yard which accumulate cool, damp air. Shield hive entrances from direct wind. Reduce entrances to guard against mice (although mice aren't as much a nuisance as they are up north).

Monitor closely

The blessing of the south's mild winters is offset by the dangers of quick starvation. Bees are more-or-less active all winter, and food consumption remains high. In the deep south pollen flows can begin as early as *December* at which time bees start rearing brood and food consumption skyrockets. Southern beekeepers must hover over their overwintering hives and quickly step in with sugar syrup if necessary.



HOME HARMONY

ann harman

Chocolate

CHOCOLATE. This world would be a pretty boring place without it. Ask any "chocoholic" what could be substituted and you will probably receive the horrified answer of "Nothing!"

The story of chocolate is really quite interesting. It seems hard to believe that the secret of obtaining chocolate from cocoa beans ever got discovered. Chocolate as a form of cocoa drink was possibly discovered by the Aztecs. Cortez, during his conquest of Mexico, was introduced by the Aztecs to the cocoa drink (chocolatl" (or perhaps "cacahuatl"). Although cocoa beans were taken back to Spain by Columbus, nothing could be done with them because nobody understood what to do.

Chocolate is not easy to produce. If you look on a globe you will find the cacao-growing countries clustered from lower Mexico into Brazil, from Ghana south in Africa, and Indonesia and Malaysia in the far east. The tree is also particular about other growing conditions. The soil must be well drained, but rainfall must be distributed throughout the year. Newly planted cacao trees need to be shaded by larger trees, but once established, they will grow in the sun with fertile soil and dedicated care. A cacao tree will not give a good yield until it is about five years old. Although it can live for a century or more, its productive life is about 25 years.

The cacao tree has even more peculiarities. The tree itself is fragile and shallow-rooted so it cannot be climbed for harvest. Therefore cultivated trees are pruned for a maximum height of 15 to 25 feet. If left to grow, a cacao tree can reach a height of 60 feet or more. But it needs protection from wind. The leaves are about one foot long and glossy, red when immature and turning dark green when mature. That seems ordinary enough, but the blossoms and fruits are in keeping with the tree's odd ways. The blossoms, white or pink, waxy in appearance, grow in clusters on the trunk and older large branches. The fruit – the source of chocolate – is a football-shaped pod that is at first green or maroon. Ripe pods can be golden or scarlet with colorful flecks. The hard, woody pods are about six to 14 inches long and about two to five inches in diameter. Unfortunately only a small percentage of the blossoms will mature into fruit. In its tropical home, the cacao tree produces blossoms, and therefore fruit, 12 months of the year. Various cultivars have characteristic properties, but even these are not consistent. Propagation from cuttings is the most reliable way to obtain uniformity.

Once the woody pods are harvested they are broken open with a few blows of the machete. A good "breaker" can crack 500 shells an hour. Each pod has 20 to 50 cream-colored beans buried within husk and membranes. As these pale beans are exposed to air, they change color to lavender or purple, without any of the chocolate flavor or fragrance. Each bean weighs less than two ounces with a pound of finished chocolate worth about 400 dry beans! The beans, with clinging pulp are piled up and covered. In the hot climate fermentation begins and continues for three to nine days. A completely fermented bean has no purple center. This fermentation process removes bitter components from the beans and creates some that are characteristic of chocolate. Now the fermented beans are a rich brown color – but not chocolate yet. You will have to wait a while. The beans, still moist, have to be dried, either in the sun or in dryers. Without rain, drying will take a few days. But you cannot ignore the beans while drying – they must be turned and cleaned of foreign matter, flat beans (no chocolate) and broken or sprouted beans. The moisture lost during drying represents more than half the weight of the bean. Now the dried beans are ready for the next step in processing. (Getting impatient?)

If the dried beans are to be stored, they must be protected from contaminating odors and flavors. But if they are to be used immediately, the processor will clean the beans of dried pulp and blend several type of cocoa beans to produce a consistent product. Now it is time to roast the beans. At this time we begin to realize that the final product will be chocolate. During the roasting, from 1/2 hour to two hours, the beans are turned and the color changes to a deep brown. Here is where the characteristic odor of chocolate appears. (Not ready yet!) The thin shells, brittle from roasting, are removed by a machine that winnows the shell pieces from the beans. The "meat" of the bean is called the "nib." These nibs, containing about 53% cocoa butter, are crushed and ground, liquefying the cocoa butter to form "chocolate liquor" or chocolate liquid. Pour this liquid into molds, allow to solidify, and you finally have unsweetened chocolate. (At last – chocolate!)

At this point the unsweetened chocolate can become cocoa or left as chocolate to be used for cooking or be processed into other chocolate products. If cocoa is the desired end product, the chocolate liquor is put into giant presses which can be set to press out any desired amount of co-

Continued on Next Page

HOME ... Cont. From Pg. 563

coa butter. This fat is then saved for other manufacturing processes for chocolate.

Cocoa butter is a strange substance. (Not surprising.) It is solid at room temperature but melts at about 90°F, only a bit lower than body temperature. This property gives chocolate that smooth "melt in your mouth" texture. Another wonderful property is that cocoa butter will keep for years without becoming rancid.

After the removal of some cocoa butter, the resulting cake is pulverized into the cocoa powder that we use in cooking and as a beverage.

The drink offered to Cortez was very bitter. The Spaniards proceeded to sweeten it with cane sugar and then introduced it to Spain. Just as the cacahuatl was considered a royal drink by the Aztecs, the sweetened mixture became the popular drink of the Spanish aristocracy. The drink was held in such high regard that Spain's Princess Maria Theresa gave an engagement present of cocoa beans to Louis XIV. Somehow, perhaps because the processing was entrusted to monks, the Spaniards managed to keep the secret of chocolate to themselves for almost a hundred years. Once the technique was known, chocolate, considered a healthful and delicious drink, spread across Europe then to Great Britain. There the famous English chocolate houses appeared where the public could enjoy the drink.

Up to the end of the 1600s chocolate manufacture was strictly a hand process. In the early 1700s a steam engine was developed to grind the cocoa. Mechanization was so successful that by 1730 the price of chocolate had gone from three dollars a pound to a price affordable by many. A cocoa press, to remove some of the cocoa butter, was on the scene by 1828. This invention made drinking chocolate into the smooth and pleasing beverage we have today. The 1800s also saw the development in 1847 of eating chocolate with smooth, creamy texture. In 1876 the addition of milk gave us the very popular milk chocolate. All of those developments occurred in Europe and England although America had its first chocolate factory in 1765.

Chocolate today comes in many different types, each with its own properties and uses. In some recipes substitutions can be made but in other cases, because of the varying amounts of cocoa butter and sweeteners and perhaps other ingredients, it is best to use the specified type of chocolate.

Unsweetened chocolate contains no sugar and is used in many recipes.

Semi-sweet chocolate has sweeteners, cocoa butter and the chocolate liquid added. It is a popular chocolate for cooking and is also used in many recipes.

Sweet chocolate contains more sweeteners than semi-sweet; otherwise, it is similar. It is used in a few recipes but is more popular for decorating.

Milk chocolate is basically an eating chocolate. It contains milk, as well as cocoa butter, sweeteners, chocolate liquid, and may even have various flavorings. It should not be used in a recipe unless specified.

White chocolate does not contain chocolate! It is made from sugar, co-

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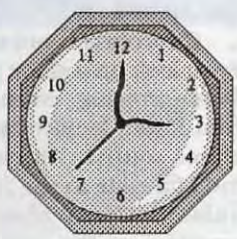

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coa butter, milk solids and flavoring. It should not be substituted for any of the chocolate called for in recipes. However it can be used for decorations.

Cocoa is unsweetened and has a low content of cocoa butter. Cocoa can be frequently, but not always, substituted for cooking chocolate. An ounce of unsweetened chocolate is equivalent to three tablespoons cocoa plus one tablespoon butter. For other substitutions, consult a good, general cookbook.

Delicious Chocolate Drink

Although there is still more to the fascinating story of chocolate, by this time you really want a recipe so you can indulge in one of your favorite flavors.

2 cups milk
4 teaspoons cocoa
1/3 cup honey (try a medium to dark variety)

In a saucepan bring milk to boil. Remove from heat. Add the honey and cocoa and stir. Pour into four small glasses filled with crushed ice. Top with clouds of whipped cream. Serves four.

A Honey Cookbook
A.I. Root Company

Honey Brownies

Chocolate makes people think of brownies. You may have a favorite recipe, but if you don't here's one.

2 squares unsweetened chocolate
1/4 cup butter or margarine
1 cup honey
2 eggs
1 cup all-purpose flour
1/2 teaspoon baking powder
1/2 teaspoon salt
1/2 teaspoon baking soda
2/3 cup chopped nuts

Melt chocolate and butter or margarine over hot water. Add eggs and honey and blend. Sift dry ingredients together. Combine with the chocolate mixture. Add the nuts. Spoon into a greased and floured 8-inch square pan. Bake at 325° for about 30 minutes. Cool before cutting into squares.

Honey Recipes
NC State Beekeepers Association

Yes, there are many more recipes since chocolate definitely has a love affair with honey. If you would like to share some of your favorites, send them to me and I will include them in this monthly article.

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UPWARD VENTILATION

tom sanford

In temperate areas of the United States, overwintering honey bees is a constant challenge. Collective wisdom deemed it of utmost importance to insulate the beehive against cold. To this end, beekeepers have tried a variety of techniques including surrounding colonies with hay, straw, tar paper, styrofoam or fiberglas batt insulation.

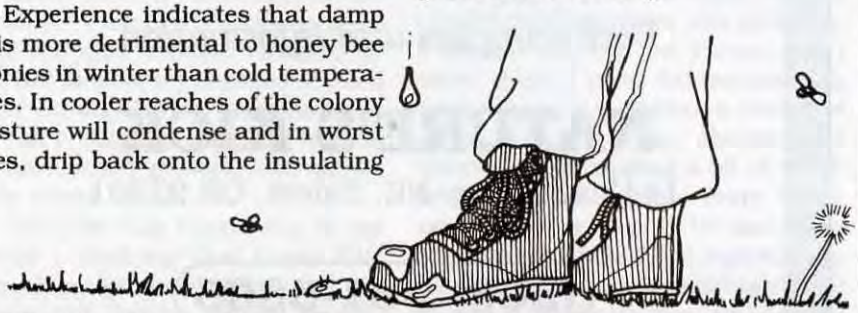
Wrapping colonies in this manner was no doubt influenced by those who believed bees were attempting to heat the interior of their hive as human beings did their houses. This is only partially the case. The bees only attempt to warm a discrete cluster within the hive. The cluster begins to form at 57°F; it is made up of an inside population covered by an insulating layer of individual worker bees. Further insulating by beekeepers can bring on other problems. Of major significance is that the air, warmed by the bees and trapped inside a tightly wrapped colony, is full of moisture.

Experience indicates that damp air is more detrimental to honey bee colonies in winter than cold temperatures. In cooler reaches of the colony moisture will condense and in worst cases, drip back onto the insulating layer of workers surrounding the cluster. Cold, wet bees do not stay healthy for long.

Although the bees do a good job of keeping colonies ventilated during the active season, they cannot do so while clustering at low temperatures. Two common methods to promote air circulation are to prop up the cover with wooden wedges and/or bore holes in the front of supers.

In summary, insulation is not as important as venting excess moisture in cold weather. This is even true in southern climes where high humidity levels may lead to growth of various fungi such as the organism responsible for chalkbrood. The need for adequate ventilation is also important during nectar flows. Swarming is also reduced by this process.

Providing upward ventilation for colonies is universally good beekeeping practice. However, care must always be exercised to provide for maximum ventilation with minimum exposure to robbers.



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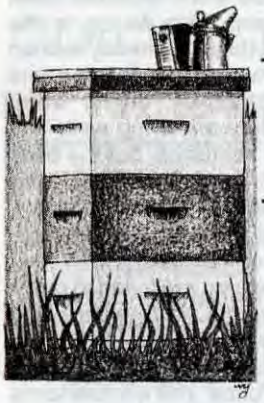


BEE TALK

richard taylor

"I violated my own principle this year. It was a mistake."

This is a tale of folly and woe. It would be pleasanter to boast, as I am always fond of doing, but I have always understood it to be a part of wisdom to learn from *other* people's mistakes, so I shall confess to my own, hoping that others may learn from them.

Things were fine in the spring, and after two seasons in which my bees made record honey crops I was feeling that I could not fail. Two years ago it was hot and dry, and my bees found nectar everywhere. Then last summer it rained all the time and my bees again filled their supers. The great Taylor principle, I decided, had been confirmed yet again. That principle, modestly named for myself, and upon which I still pin my hope for lasting fame, requires that colonies be kept strong *at all times*. It is not enough that they survive the winter alive. They must be *strong*, all winter and into early spring. And the rest of the principle spells out just how this is achieved.

Well, considering that just about all the other beekeepers I know had lost half or more of their colonies over the winter, I felt pretty good, because I had not only suffered virtually no loss, but most of my colonies seemed pretty strong. In my imagination I saw the prodigious stacks of beautiful comb honey growing ever higher in my honey house.

Then the folly began. But in my defense I shall say that it was folly born of my generous heart. All my friends and, indeed, several strangers, began begging me to make up nucs for them, to revive their winter-killed colonies and I could not turn them away. I began buying queens and making up nucs until I had responded to every single request. I somehow imagined that my badly weakened colonies would all build up again and I would get my great honey crop, as usual.

Now if a fool is someone who doesn't know better, then it is a fool's fool who does know better but fails to heed what he knows. I *knew* that colonies must be kept strong at all times, and most especially in spring. It is the whole point of the great principle that bears my name. And here I had gone right ahead and acted as though I had never heard of that principle.

The result of all this splitting out of nucs is that my apiaries never did recover. The early nectar flows came and the colonies were too weakened to take advantage of them. I got almost no honey at all from them. Then the basswood flow, usually the most important of all, failed utterly and my colonies were still unable to build back up. Then the parasitic mites came. I'm sure of it. In the grass, in front of a couple of the hives, I saw bees crawling about, a sure sign of tracheal mites. And I'm sure *Varroa* has gotten into them too. I haven't checked for *Varroa*, but I don't think I need to, because I'm pretty sure it is there. A friend of mine, not far away, checked for Varroa, by uncapping a bit of drone brood, and found that every single one of his hives has it. He had made the same mistake I did, splitting up his surviving colonies excessively to make up for winter loss, and now he is in as bad shape as I am.

Now of course splitting up colonies does not by itself result in mites, but I believe that weak colonies are more vulnerable to such things, and in any case, my troubles had begun with my overdoing the making of splits.

It has all been very depressing, and I know how the great Langstroth felt in his periods of deep discouragement. He has written that at such times he could not bear even a reminder of his bees. Getting into my ancient bee wagon for a tour of my apiaries has always been an occasion for joy, but this summer the visits to them were filled with melancholy. I found myself turning, instead, to my tropical fish room for my fulfillments.

Now, however, the time has come for courage and resolve. I have equipped myself with the means of combating the mites and I shall go about it with determination. My apiaries will thrive again, strong and productive, and next summer I shall stand in them, the roar of the bees overhead, the supers filling with honey, and again I shall boast and rejoice.

QUESTIONS?

Used Honey

Q. When we set aside partially capped frames of honey to feed the bees the next spring, how do we keep the wax worms out of them? Can we use paradichlorobenzene? And does it matter if the honey in them crystallizes?

John Anderson
Arcola, IL

A. If the frames of honey are stored in a cold place wax worm damage will be zero to minimal. If there is no way to store them cold, then the next best thing is to give them to a strong colony of bees, so the bees themselves can fend off the wax worms. Honey should not be exposed to paradi, as it absorbs the odor. Perhaps you could leave the honey on the hives until cold weather begins to set in. In the spring, bees are slow to utilize granulated honey and they waste quite a lot of what they do remove from the cells; it appears as dry powder in the bottom of the hive. But it can be used, especially for very hungry colonies.

Treat Correctly!

Q. I had considerable winter loss from tracheal mites, so I put Miticur strips in my surviving colonies about mid-March, leaving them there until I added supers about six weeks later. In May I began gathering stray swarms, so I reused these Miticur strips in the colonies established from the swarms. When should these strips be removed? Should they be left in all winter? How long can they be kept before losing their effectiveness?

Bill Taylor
Columbus, OH

A. You have raised some very important points. It was probably, in my opinion, a waste of time to treat the surviving colonies, since the fact that they survived indicates that they were not seriously infected, and once a colony becomes active and begins building up in the spring tracheal mites (unlike Varroa) are not a serious problem. The six-week treatment period is correct, and it is also essential not to have strips in the hive after supers have gone on, so you did that just right. As for treating stray swarms, the fact that a colony is strong enough to throw a swarm indicates that it has no serious tracheal mite problem, so it was probably a waste of time to treat those. As for the effective life of the strips, I do not know this.

Editor's Note: Since Miticur is no longer available this question is essentially moot, although Dr. Taylor's conclusions are very probably correct regarding treatment needs. However, this raises serious questions about label restrictions on the use of a pesticide in a hive. Miticur, Terramycin, Fumidil-B, menthol, Apistan, Terra-Patties and Terra Brood Mix are all chemicals whose use is dictated on their respective labels. Failure to follow these directions is not only illegal and foolish, it is dangerous and threatens the livelihood of all honey producers. Read the label. Read the label. Read the label. Then, *follow the directions!*

Moving Speed

Q. I have a row of eight hives facing south which I must move about 30 feet back in a northerly direction. What is the best time of year to do this? How far can they be moved at a time? And how often can I move them?

Stanley Stehle
Schertz, TX

A. Since you want to move them back, keep them facing in the direction they are already in, then try moving them two or three feet at a time every other day or so, during warm weather when they are flying well. You will notice some confusion, but the bees will soon find their proper entrances. It will depend some on the nearby objects – trees, etc. – that the bees use for landmarks. You will quickly learn, from their behavior, whether you are trying to move them too far at a time. Alternatively, you can wait until early spring, before the bees begin regular flights, and move them the whole way at once. You will lose some bees that way, but they will be old bees destined to perish soon anyway.

How Hot

Q. Recently I lost most of my bees to mites. The supers were almost full of honey but a lot of it was not capped. The honey is thin and I think some of it is starting to ferment. I understand that if such honey is heated to 160°F it will be useable. What is the best way to do this when all you have is the kitchen stove for doing it? And if I sell it, how long will it last after the buyer opens the container?

Brett Bozeman
Andalusia, AL

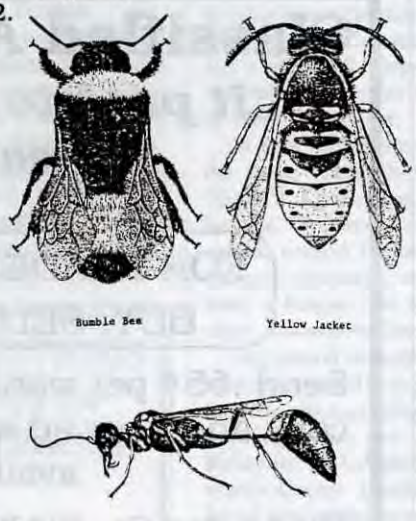
A. I would suggest putting any supers of unripe honey on your hives that have survived, for the bees to finish. Even if not all of it gets capped over, it will eventually become thick and ripe. If you do have to heat honey, on a stove, put the container in a larger container of water; do not heat the honey directly over any burner, as that will ruin it. Stir it and keep track of the temperature; 150°F should be hot enough. But I would not sell that honey, because even this amount of heating will degrade the flavor. Use it yourself, and for baking.

Questions are welcome. Address Dr. Richard Taylor, Box 352, Interlaken, NY 14847, enclosing a stamped envelope.

ANSWERS!

Richard Taylor

?Do You Know? Answers

1. **False** All species of bees as well as yellow jackets, wasps and hornets are similar to honey bees from the standpoint that only the females can sting.
2. **True** Yellow jackets build annual nests of paper in underground cavities, hollow logs, under stones, in shrubs and in foundation walls of buildings.
3. **True** Unlike honey bees, female wasps and hornets have much smaller barbs on the stinger. Consequently, the sting does not normally become fixed in a person's flesh, and the wasp may quickly withdraw with an upward pull of its abdomen and sting again.
4. **True** The bodies of hornets and wasps are relatively smooth and shiny, whereas the bodies of bees are covered with plumose hairs that are used in the collection of pollen. Wasps and hornets do not depend on pollen for the rearing of their young thus lack the body structures needed for the collection and handling of pollen.
5. **True** Most species of bees are solitary in habit. Each fertilized female constructs, provisions, and deposits eggs in her own nest. No parental care is provided after the egg is laid.
6. **True** White-faced hornets, yellow jackets and bumble bees all have annual nests. Nest inhabitants are killed by the autumn frosts. Newly produced queens are the only members of the colonies to survive the winter. These queens overwinter in sheltered locations away from the nest, such as under tree bark, in decaying stumps or in the soil. They emerge from hibernation during the first warm days of spring. Soon after emerging, they start to feed and begin seeking a new nest site. Each new nest is initiated by a single, overwintered queen.
7. **False** Polistes wasp and yellow jacket nests are abandoned in the fall and are not reused.
8. **True** The European or giant hornet (*Vespa crabo*) workers are predacious on a variety of adult insects and will occasionally become a pest of honey bee colonies.
9. **False** Since the bald- or white-faced hornet is very large, extremely large nests are constructed and typically this species also maintains larger populations than other species of yellow jackets.
10. D) Ventral surface of their abdomen
11. B) Hollow stems, straws, bored wooden blocks
12. A) Nest in tunnels within the soil
13. C) Under-ground in abandoned mouse dens, piles of straw, chaff, old rags etc.
14. H) Single horizontal paper comb attached under the eaves of houses, behind shutters etc.
15. F) Nests are constructed in dried seasoned wood, especially soft woods such as pine, redwood, and fir.
16. E) Nests are composed of a paper-like material produced by the insects from wood and vegetable fibers.
17. G) Nest in hollow trees within a brown paper nest.
18. B) Yellow jackets
19. A) Polistes or paper wasps
20. Each female mud dauber constructs her own clump of mud cells and provisions them with paralyzed spiders.
    Bumble bees feed their young with honey and pollen.
21. Social wasps produce queens and males in late summer and early fall.
22. 

There were a possible 25 points in the test this month. Check the table below to determine how well you did. If you scored less than 12 points, do not be discouraged. Keep reading and studying- you will do better in the future.

Number Of Points Correct
25-18 Excellent
17-15 Good
14-12 Fair

This column was initiated in February 1984 and was published continuously until March 1989 when I left Penn State and moved to Mississippi State University to become department head. We started writing the column again in 1992 and have continued until now. Given the amount of information we have covered over the years, we feel that it is time to provide our readership with a final exam as though you have been taking a university course in beekeeping. Begin reviewing and we will publish an extensive and all inclusive final exam for you in the December issue. Then in January, 1994, we will go back and begin all over with beekeeping basics. *Clarence Collison*

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Gleanings

OCTOBER, 1993 ALL THE NEWS THAT FITS

CHC HAS NEW PROMOTER

The Canadian Honey Council is pleased to announce the appointment of Mary Lye to the position of Promotions Co-ordinator. Mary started working for the Canadian Honey Council effective July, 1993. Mary will be responsible for the promotion activities for the next two years.

Mary grew up in Devonshire (rural England). She graduated with an Honours Degree in Home Economics from the University of Bath in England. Her ongoing interest in food, its origins and uses is manifested in her enthusiasm for the Canadian food industry.

In 1981 Mary arrived in Canada and began working for a national grocery chain (IGA) writing weekly food ad copy and giving talks to consumer groups across the country. In 1983 she joined Robin Hood Multifoods as Consumer Services Supervisor which entailed co-ordinating national product promotions in both English and French. This included helping to develop such innovative projects as: a national cake baking contest at 230 agricultural fairs; the *Best of the Fairs*, a fund-raising cookbook featuring prize winning recipes from Canadian fairs; and the Robin Hood Gingerbread House Kit.

For the past five years, Mary has worked as a consultant through her company, InterActions, for clients such as Robin Hood. She has created and executed several publicity campaigns for Robin Hood consumer products during which she has appeared on over 40 television shows.

Mary is married to David Lye, an aeronautical research engineer and pilot, and they have a daughter, Harriet, aged six. They live in Richmond Hill, Ontario, about 30 km. north of Toronto.

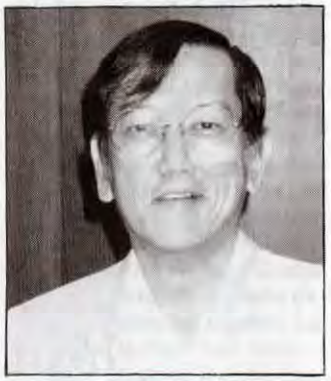
Please feel free to contact Mary with any comments or concerns regarding the promotion of our product, HONEY. Her address is as follows: Ms. Mary Lye, Promotion Co-ordinator, Canadian Honey Council, 196 Stephen Street, Richmond Hill, Ontario L4C 5P1 and her phone number is (416) 884-5930.

SEND YOUR MEETING NOTICES AT LEAST TWO MONTHS IN ADVANCE TO ENSURE TIMELY PUBLICATION.

TOMASKO-FRAZIER WED

Maryann Tomasko and James Lewis Frazier were married on June 12th, 1993. Maryann is the extension apiculturist at the Penn State University, where she is involved in applied research on the control of honey bee mites, an apiculture extension program and teaches an undergraduate beekeeping course. Jim Frazier is an insect physiologist who received his Ph.D. at Ohio State University and is now the Head of the Entomology Dept. of Penn State.

NATURAL AFB CONTROL



Hachiro Shimanuki never thought that one honey bee disease would lead to a cure for another. But that's what U.S. Department of Agriculture scientists discovered by surprise last year.

"It was serendipitous, to say the least," said Shimanuki of USDA's Agricultural Research Service. "We were looking for a natural control for two serious bacterial diseases – and it came from a fungus that causes another, less serious bee disease."

The natural remedy is a common unsaturated fatty acid called linoleic acid, according to the bee specialist at the agency's Beltsville, MD, Agricultural Research Center. Linoleic acid – found in oils from peanuts, corn, soybeans, cottonseed, sunflower and other vegetables – is also produced by the *Ascosphaera apis* fungus that causes honey bee chalkbrood disease, which infects larvae inside the beehive. The scientists are filing a patent application on the discovery.

Continued on Next Page

Earlier and Different

EAS IN 1994 IN PA

What will make EAS '94 in PA so unique you ask? First, we're early! Mark your calendars; the EAS Short Course will be held July 11th, 12th, and 13th and the conference dates are July 13th, 14th and 15th. Second, we are holding the '94 conference at a conference center – that's right, air conditioning and a private bath in every room! Both the short course and conference will take place at the Willow Valley Family Resort in Lancaster, Pennsylvania. This beautiful, consolidated location has all guest and meeting rooms situated in two connected buildings. The resort also offers three dining rooms, two swimming pools and a golf course. And believe it or not they don't even mind if we have honey bee colonies on the property!

Third, our theme for next year's conference will be "The A Bee C's of Education – How we can do a better job of educating ourselves and the Public." In addition to an excellent slate of speakers that already includes, Andrew Mathason (IBRA), James Tew, William Towne, David Fletcher, Clarence Collison, Dewey Caron and Cliff Sunflower, we will be touring Dutch Gold, the largest private honey packing plant in the country. Two additional aspects of the '94 program will make it a special educational experience for beekeepers and the public. EAS is a family oriented organization – in order to make this a family affair we plan to offer an "entomologically" educational program for children that will coincide with the conference. So don't hesitate – bring the kids! Also, because we are in a highly visible, public location, we will invite the public to come in and view our honey show. Maybe even have honey tasting. This will create an excellent opportunity for us to educate the public about honey bees and their importance.

These are just a few of the reasons why you must not miss EAS in 1994, keep watching for more. If you would like additional information on the meeting or the Lancaster area including a video on the Willow Valley Family Resort, to share at your state or local association meeting, write to: Joe Duffy, 309 Clivden St., Glenside, PA 19038.

New Video Available

WHY HONEY BEES?

As a beekeeper YOU may know the answer to this question but many people do not. For this reason, Penn State has produced a professional video about honey bees and beekeepers tha is aimed at the general public. It is designed to help the public understand who beekeepers are, why they keep bees and the important role honey bees play in pollination. In addition, it compares beekeeping as it was in the past to the way bees are kept today, examining the many new problems and challenges that beekeepers are facing. We will try to air this video on Public TV and possibly the Discovery Channel.

The program runs approximately 28 minutes and is also appropriate for use in the classroom or in conjunction with other educational activities such as presentations on honey bees for community groups, demonstrations at state fair, programs at nature centers, etc. This video, *Why Honey Bees?* will be available on loan through Penn State Extension. If individuals or beekeeping associations would like to own a high-quality copy, it can be purchased for $35.00 from: Ag Information Services, 119 Ag Admin. Bldg., University Park, PA 16802 (814) 865-6309.

ANIMAL MAG

According to experts, there are 136 times as many animals on earth as there are humans. This is hard for most persons to realize, especially since their most frequent contacts are with the most common species – cats, dogs, horses, cows, etc. The fact is that the vast majority of the population knows little or nothing about the thousands of varieties of animals that inhabit the earth. That's one of the reasons why the unique publication, ANIMALS EXOTIC AND SMALL, was created.

This quality bi-monthly contains articles about virtually every type of animal from those that you can hold in the palm of your hand to those that weigh tons. ANIMALS EXOTIC AND SMALL is superb for pet owners and professionals as well as those who would like to have a better understanding of the comprehensive animal world.

The publication specializes in articles about unusual animals and offers advertising from firms that sell virtually every type of animal and supplies for their care and maintenance. In its nearly 100 pages is a wealth of information that is not readily available in newspapers, magazine or on T.V.

A sample copy which includes an extensive catalogue is available for $3.00 and may be obtained from ANIMALS EXOTIC AND SMALL, 1302 Mountain Ave., Norco, CA 91760 (909) 371-4307.

NATURAL AFB CONTROL ... Cont. From Pg. 573

In laboratory tests, linoleic acid inhibited the growth of the two bacteria that cause European and American foulbrood diseases, the scientists found. They also said it poses no harm to the bees and would not harm humans.

The surprise discovery didn't happen overnight, but only after more than a decade of research on New Jersey honey bees showed a curious trend in honey bee diseases.

From the early 1960s to 1988, scientists at the agency's Bee Research laboratory in Beltsville were studying ways to control European foulbrood in southern New Jersey. The disease was widespread in areas where honey bees were used to pollinate blueberries and cranberries.

"During that time," Shimanuki said, "researchers also discovered an increase in chalkbrood, which by 1986 had become widespread in southern New Jersey."

"But samples of diseased bees analyzed at our lab showed that, during 1980 to 1990, European foulbrood in bees from New Jersey declined drastically and was hard to find by the late 1980s," he said. "Meanwhile, chalkbrood remained constant in bees from that region."

Further tests confirmed that the *A. Apis* fungus produced a substance that inhibited both types of foulbrood. ARS entomologist Mark F. Feldlaufer, of the Insect Neurobiology and Hormone Lab in Beltsville, later isolated and purified the substance. William R. Lusby, a chemist at that lab, identified it as linoleic acid.

"Both foulbrood diseases are found in all 50 states. Both infect honey bee larvae inside the hive and can kill the bees if left unchecked," Shimanuki said. The bacterium *Melissococcus pluton* causes European foulbrood; *Bacillus larvae* causes American foulbrood.

"American foulbrood is considered the biggest disease threat to U.S. honey bees, causing an estimated $8 million in damage each year," he said. "Losses from European foulbrood and chalkbrood are unknown. In some states, regulations require beekeepers to destroy colonies infected with the diseases."

Currently in the United States, only the antibiotic oxytetracycline is approved by the U.S. Food and Drug Administration for controlling European and American foulbrood. "We are concerned that these diseases could eventually develop resistance to the antibiotic, so we need new, natural biological controls," Shimanuki said.

The substance discovered by Shimanuki and colleagues could be fed to bees either as part of a sugar-water syrup or could be placed in hives in patties along with pollen and other feed supplements.

The ARS research team includes Shimanuki, agency entomologist David A. Knox of the bee lab, Feldlaufer and Lusby.

CALENDAR ... Cont. From Pg. 575

Florida operations. All beekeepers are invited to attend. For further information contact Roger A. Morse, Field Secretary.

☆ OKLAHOMA ☆

The Annual Fall Meeting of the Oklahoma Beekeepers Association will be held Saturday, October 16, 1993, in Oklahoma City. Registration will begin at 8:00 a.m., and the meeting at 9:00 a.m., at the O.S.U. Extension Building, 10th and Portland. A covered dish dinner will be at noon, and the meeting will be over at 4:00 p.m.

Hosts for the meeting will be the Central Oklahoma Beekeepers Association. They will have their regular meeting on Friday night, October 15, 7:00 p.m. at the same location.

All interested persons are invited and encouraged to attend these meetings. For more information Phil Lindell, OBA President, can be contacted at 745 N. Central, Enid, OK 73701, phone (405) 234-2015.

☆ WASHINGTON ☆

Washington State Beekeepers Association will have it's annual convention this year in Everett, Washington at the West Coast Everett Pacific Hotel on October 28, 29 and 30, 1993. The convention is sponsored by the Northwest District Beekeepers Association of Snohomish County. Registration can be made by mail. Speakers will talk on Apiculture, Forestry, Transportation of Bees, Weed identification, Biological Pest Management.

Hotel reservations may be made by phone: 1-900-426-0670. Be sure you mention that you are with the BEEKEEPERS.

For registration information contact Peg Dougherty, 9312 222nd St. SE, Woodinville, WA 98702, (206) 483-1946.

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THE SCOTTISH BEEKEEPER. Magazine of The Scottish Beekeepers' Assoc. Rates from D. B. N. Blair, 44 Dalhousie Rd., Kilbarchan, Renfrewshire, PA10 2AT, Scotland, U.K. Sample on request, $1.

DIE NEUE BIENENZUCHT Monthly magazine for beekeepers interested in German beekeeping. Hamburger Str. 109, D-2360 Bad Segeberg, West Germany.

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BEE CRAFT — Monthly journal of the British Beekeepers Association. Subscription, including postage is £12.96 surface mail to Mr. L. Connor, P. O. 817, Chesire, CT 06410,

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THE AUSTRALASIAN BEEKEEPER. Published monthly by Pender Beekeeping Supplies Pty. Ltd. Send request to: The Australasian Beekeeper, PMB 19, Maitland NSW 2320, Australia. Subscription $US 27.00 per annum, Surface Mail (in advance). Payment by Bank Draft. Sample copy free on request.

RARE BREEDS JOURNAL. Bi-monthly journal about exotic, minor and rare breeds of domesticated animals and their owners. $18.00 (U.S.)/year, $24.00 Foreign; $2.50 for sample copy. Rare Breeds Journal, Dept. Bee, HCR 1, Box 45, Hebron, ND 58638 (701) 878-4970.

CANADIAN BEEKEEPING. The news media of the Canadian Honey Industry. One year sub. (10 issues) in Canada and the U.S.A. $20. Foreign subscribers send $40. Send to Canadian Beekeeping, Box 678, Tottenham, ON, Canada, L0G 1W0.

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THE AUSTRALIAN BEE JOURNAL. Monthly, Sea Mail $27.50 (Aus.), Air Mail $40.70 (Aus.). Write to: Victorian Apiarists' Association Inc., Editor, Ms. Judy Graves, 23 McBride Rd., Upper Beaconsfield, Victoria, 3808, Australia. Sample $3.00 (Aus.) on request.

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THE NEW ZEALAND BEEKEEPER. Quarterly magazine by the National Beekeeper's Association of New Zealand. Write for rates and indicate whether airmail or surface mail. N Z BEEKEEPER, P. O. Box 4048, Wellington, New Zealand.

THE GIBSON LETTER. A monthly newsletter that takes another look at beekeeping news. Edited by Glenn Gibson. Subscription - $48.00/year. The Gibson Letter, P.O. Box 368, Minco, OK 73059.

SCOTTISH BEE JOURNAL. Monthly magazine. Sample copy from Robert NH Skilling, FRSA, 34 Rennie St., Kilmarnock, Scotland. $4.00 per annum.

BOTTOM ... Cont. Fom Pg. 580

Occasionally, I had coffee with other beekeepers and they told me about their progress, adding supers, catching swarms and starting additional hives, getting ready for a big honey harvest. As they spoke, a memory of past years came to me – catching a swarm and replanting, feeling the intense activity in the center of the hive, harvesting four honey supers. But I felt dry, parched. Something inside twisted. Their excitement was my sorrow.

I stopped having honey in my tea in August. For one thing our honey stores were running low. Secondly, twirling the honey dipper in the golden syrup reminded me of my misfortune. True, I could have harvested the stores in the two hives, but I wasn't inclined to do that. Somehow I didn't deserve the lucre. It would stay in the frames to give next year's packages a good start. Nor would we be able to give all those jars of Dancing Hill Honey to friends, who've grown accustomed to our gifts, over the long winter.

Even my wife, not a beekeeper, complained. Although her garden bloomed, she missed having the little critters around. She missed their fervid buzzing and frantic motions. When she was bent over, weeding or transplanting, it was as if they were friends, working together, making nature bloom.

In my bee diary, there were only five entries. The final entry on July 13 said – "bees dead. Put supers in garage." Although in past years, I often opened the journal, writing random philosophical thoughts, I could not make any additional entries this year.

But the season is over. Now, I can begin looking forward to next year, when I will begin anew with bees.

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Display Index

Without Bees

howard scott

This summer, both my hives died. They came out in April full force, but something happened. They became sick, the queen died without being replaced, multiple swarms depleted the population, they consumed poison nectar – whatever – and by late June, there was hardly any flying activity. When I went in, the few remaining bees were like zombies, walking lethargically in their crumbling homes. In mid-July, I dismantled the hives, put the boxes in storage, and placed the metal-topped covers over the stands, almost as gravestone markers. It was my first summer in 13 years without bees.

Daily, I walked around my backyard, tracing the path I had trod in past years to view the bees hard at work. But once there, seeing the thin, flat covers, I continued meandering. perhaps I might stare up at the high pines at the edge of my property, or I'd observe my wife's manicured garden, or I'd stare from the ridge line down the gentle slope, and imagine what the land looked like before civilization settled in. The walks were forced, effort-full, almost unpleasant. it was as though I were a lost soul – an orphan without a family, an emigre in a foreign land, a lover who had been jilted.

Aimless. That's the word that most comes to mind. it was an aimless summer. It didn't have roots. There wasn't any fixed anchor. Not that I ever spent a lot of time on bees. But just one daily dose of seeing the bursts of energetic activity at the entrances always spurred me on, gave me hope, made me contemplative and yet eager to renew my own tasks. If I were unproductive that day, somehow the bee's energy and enthusiasm made up for my laziness. Without this boost, I returned from my excursions in a glum mood.

Sometimes I went over to the violet thyme bushes, and watched the rich profusion of insects – blue wasps, bumble bees, yellow jackets, and hornets – feasting on the rich sweet buds. The bumble bees had thick sacks of yellow pollen on their legs and flecks of yellow dust on their bodies. There was a blooming frenzy of feeding. The merged buzzing was like an orchestra-like crescendo of sounds.

Watching this was fun, but it was also disheartening. My bees were not partaking in this harvest. They were missing out in this prodigious undertaking, this contract with nature to blanket the countryside with magic pollination powder that enhanced the natural beauty of the landscape, while simultaneously enabling societies (of bees) to prosper. In turn, I felt denied being able to witness one of the great annual natural events.

I also wondered about the vanquished hives. Was it something I did or didn't do? Could it have been avoided? Would more careful observation by a more knowledgeable beekeeper have resulted in a quick remedy and two prosperous beehives? Was my two and a half week vacation in May the cause? Why didn't I go in the hive until a week after I returned? All these ifs and buts created a trail of guilt. After all, it's no small crime being a mass murderer of 160,000 potential existences. The years of successful hives stirred in my mind like hoary ghosts of past generations strung together like construction paper chains, now cut and broken forever.

I tried to think in terms of winter. After all, every year, I endured eight months of inactivity. But it didn't work. In the midst of all the green, there was a palpable absence, a lack of joy and grace around the yard.

Continued on Page 578

BOTTOM·BOARD