Bee Culture

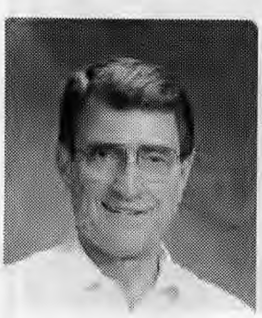
APR 1999

April Specials

Bee Culture
THE MAGAZINE OF AMERICAN BEEKEEPING

APRIL 1999 VOLUME 127 NUMBER 4

FEATURES



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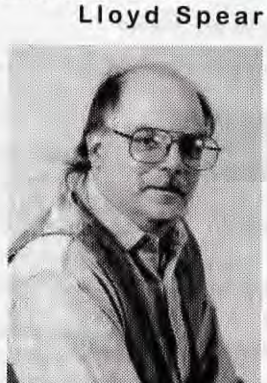
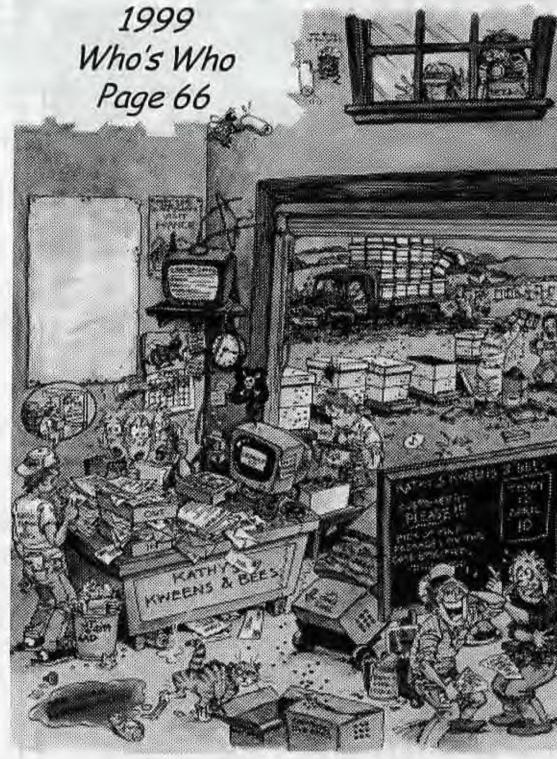


KIM FLOTTUM
Editor



COVER
Our somewhat skewed look at the package and queen business this month, via our cover art, is the work of the fertile imaginations of Jonathan Taylor and Lela Dowling. The inspiration, however, came from a wonderful lady who serves in the trenches of this hectic, and at times absolutely insane business. To all who provide all of us with the means of our hobby or business – we salute you. And to those who can't read pick-up dates . . . well, they'll try and take care of you anyway.

Bee Culture
THE MAGAZINE OF AMERICAN BEEKEEPING

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Subscription Information

U.S., one year, $17; two years, $33. Newsstand price: $2.50. All other countries, (U.S. Currency only), $9.50 per year additional for postage. Send remittance by money order, bank draft, express money order, or check or credit card. Bee Culture (ISSN 1071-3190), April 1999, Volume 127, Issue 4, is published monthly by The A.I. Root Co., 623 W. Liberty Street, Medina, OH 44256. Periodicals Postage Paid at Medina, OH and additional mailing offices.

Advertising

For information on placing display advertisements, contact Dawn Feagan in our Advertising Dept. 1-800-289-7668. Ext. 3220

POSTMASTER: Send address changes to BEE CULTURE, The A.I. Root Co.,623 W. Liberty St., Medina, OH 44256

INNER COVER

Rumors. There are always rumors. Idle gossip. Informed speculation. Wishful thinking. Misinformed do-gooders. Misinterpretation of actual events. One-sided stories. Downright lies.

The job of journalists is to determine which is which, to debunk the myths, counter the spins, expose the frauds . . . in short keep the world as black, and as white as possible. Journalists are, in short, dispellers of the gray things in life. That's the theory anyway but we all know it doesn't work that way. There's always more gray out there. Way, way too much gray.

Let me tell you one rumor making the rounds. It's not pretty.

At an American Farm Bureau meeting in February, representatives of the EPA were defending their role in implementing the FQPA (Food Quality Protection Act). They were under pressure from the farmers present who rely on the chemicals they use to protect the crops they grow – and their livelihood. The EPA people were adamant in their position . . . regulated pesticides would become more regulated and even removed from the market if deemed inappropriate under FQPA.

When confronted with the ultimate outcome of removing crop protection chemicals from the tool boxes of American farmers, that being the removal of the American farmer, one EPA official was *rumored* to say, "We don't need American farms, or farmers, because we can import all we need, more than we need, from the rest of the world."

Rumor? Only those who heard, and those who spoke can say for sure.

Let's expand that rumor a bit. Regulatory officials in Florida are searching for, and finding beekeepers in violation of pesticide regulations when treating for mites and wax moths. And they're doing it at the insistence of, and with the assistance of EPA guidance. Worse, the rumor goes, backroom EPA decisions were made that fast tracked the Section 18 permit for the coumaphos strip . . . for the express purpose of letting the industry mess up and contaminate their product. This, in turn, would give the EPA the opportunity to "get those cowboys off the streets once and for all," as one official was *rumored* to say.

Rumors. All gray, no black and white. Who do you believe? What do you believe? What can you afford *not* to believe?

•

Rumors aside, one of those statements, the one about where our food comes from, has been said before, by others who were arrogant enough to actually believe it. I've heard financial people, government people, even university people over the years make the same statement. I've never heard it from someone with calluses, someone who saw a crop through from seed to harvest, and definitely not from someone who was even once hungry.

Mostly the people who bank on 'big pictures' and 'global economies,' have never had to worry about where their next meal is coming from, about grocery store shelves being empty. They have too much money.

Yes, today we do import much of what we need from foreign growers at prices lower than available next door. But not all of it. Not yet anyway.

But this extremely short term outlook, this incredibly myopic philosophy has, in my simplistic view, a fatal flaw. Quite simply, those who assume that someone, somewhere will provide supper tonight are betting against Mother Nature and on a foreign country's political and financial stability. When, not if, but when there's a disruption of government, or a crop failure in that (or any) country – whether it be fruit, vegetables or honey – where do these commodities come from to fill the wallets, the store shelves and the plates of these speculators? The 'where' is the key question here, because the aforementioned arrogance is neatly assuring the demise of anybody wanting to farm within a thousand miles of where supper would have been served tonight.

To those who think only in big pictures I suggest the following: If you've never been hungry you may think it's a global economy. But if you've never raised your own food, don't bet on it. And the next time someone comes to you and talks about staying in business remember this: You don't replace farmers or beekeepers, you don't replace farm machinery manufacturers, you don't replace agricultural technology, and you don't replace farm land in time for supper. So, Bon appetite lenders and packers and regulators. Eat well today, because your next meal is inside that shipping container. Not at the grocery store, not at the farm market, and not, definitely not, at your local producers. You fixed that. Remember, you didn't need them.

•

Take three computers, a crashed hard drive, a particularly nasty virus, a whole bunch of corrupted files, a deadline measured in hours, not days, and unquestioned faith in an electronic system that no rational being would trust farther than you can throw a mid-size monitor and you not only invite disaster, you

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Rumors

KEEP IN TOUCH
**Write: Editor, 623 W. Liberty St.,
Medina, OH 44256
FAX: 330-725-5624
EMAIL: KIM@AIROOT.COM**

MAILBOX

Provoked!

It seems to me that every month since the Queen Bee symposium held at the ABF convention in Colorado Springs in January 1998 you have written something about the terrible problem the beekeeping industry is having with queens. You seem aghast at the huge scope of the perceived problem. Now, in a flyer that you mailed to an apparently large number of people you wrote, "Finally, will queen problems be addressed *so we can get reliable stock?*" (Italics mine.) I was already getting provoked, and that is the sentence that really upset me. Are you trying to convince every hobby beekeeper in the country that they cannot get good queens? Are you trying to bite the hand that feeds you? A lot of your advertising comes from queen producers who mostly raise good reliable queens. Or should I give you the benefit of the doubt and suppose that you are merely trying to spur the scientists and queen producers on to bigger and better research?

I do not perceive any greater problem with queens than there was when I first became a full time queen producer 53 years ago. There are some different problems because we have the two mites and more chalkbrood than we had in my early times. But on the other hand we now have Fumidil-B which is a control for nosema.

Yesterday I carefully reviewed the video you made of the 1998 Queen Symposium at Colorado Springs. I did not find any perception of greater problems voiced by the speakers. One or two of the scientists thought there might be some new problems associated with the exotic pests. The queen producers, with one exception told that they are working to try to alleviate any new problems. The commercial beekeepers, with one exception, could not say their problems were any greater than they have experienced in the past, and, with one exception could not blame their problems on the queen producers. That one exception got his queens from the producer who said he might be having problems producing good queens.

Your video did not show one interesting thing that was reported to me by two or three people who attended the Symposium. They said that beekeepers in the audience were asked to raise their hands if they were having extraordinary problems with queens. Only two or three hands were raised. On questioning, those people said they all got their queens from one producer. Now, where is that vast problem you keep writing about?

Nearly all the queen producers who advertise in your magazine are hardworking beekeepers who are dedicated to producing the best queens they possibly can. Most of them have apparently been quite successful. I see ads by the same producers year after year. They could not stay in business for such long times if they were not supplying satisfactory queens. Surely you have noticed that.

Because we are a dedicated group, it hurts to have you write over and over again about the problems we are causing the industry because of our inferior queens. Can you accomplish whatever goal you have by taking some other tack?

Roy Weaver
The R Weaver Apiaries Inc.
Navasota, TX

Editor's Note: *My purpose in focusing on queens is actually two-fold, Roy. First, the queen is definitely the most important bee, and any problems with her will reflect in problems with the colony – that's a queen. But there* ***are*** *problems with given, maybe they've always been there, maybe not. The Penn State study shows queens with nosema, queens with tracheal mites, queens shipped in deplorable mailing conditions . . . and beekeepers who still introduce queens incorrectly. Moreover,* Varroa, *viruses, illegal and legal chemicals are causing sterility in both queens and drones. Even if all of these are being addressed, queen producers cannot for a moment reduce their vigilance. I'd like to think I'm an equal opportunity annoyer, picking on everybody equally. I'll try to more evenly distribute my concerns, but they won't go away. But thanks for your comments, too. Your industry is a dedicated bunch.*

Extractors

In the September, 1998 issue of *Bee Culture* you carried an article by Richard Dalby entitled "A Short History of the Extractor." It was an interesting discussion of the development of the extractor, but the author did not do justice to the parallel or horizontal radial extractor. He dismissed it in two sentences one of which was "Such machines take up very little floor space." This may be true of small horizontal radials with a capacity of 20 or fewer frames, but such small machines do not really show the potential of this design. Larger machines, of this type, have loading and unloading racks which, in fact, call for a greater floor area than would a vertical radial extractor of similar capacity.

The essential advantage of larger horizontal radial extractors, that was not mentioned in the article, is the speed and efficiency with which they can be loaded and unloaded. Instead of handling each frame individually in and out of the extractor while the machine sits idle, the uncapped frames are pushed into the reels of the horizontal radial in bunches either manually or with a power feed. This reduces the loading and unloading times dramatically.

The speed of loading and unloading results in extracting efficiency. We once used a 72-frame vertical radial. We now use a 54-frame horizontal radial. With the latter machine we extract nearly twice as fast as we did

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formerly. The improvements in speed and efficiency are the principal virtues of the horizontal radial extractor that beekeepers should be aware of, as it represents an important step forward in the design of honey extractors.

Andrew Dziadyk
Saskatoon, Sask.

Response To Wise Guy

The *Wise Guy* comments in the February *Bee Culture* are my feelings exactly. We beekeepers should try to market directly to the public. I reduced the number of my colonies and hope to never sell to a packer again.

My reduced number of colonies now keeps me exempt to the National Honey Board. That government agency upsets me more than packers. Whenever you question them on price or promotion of American honey they say they can do nothing but try to increase the demand for honey. The increased demand is filled by foreign honey. The only time honey prices increased is when beekeepers won a lawsuit to keep China's honey out.

At our local meeting we had a guest speaker from the national honey board. A high ranking member – she also works for a big packer, how comforting. Why does the national honey board have packers and importers as board members, this makes me not want to contribute.

Government does not keep the playing field even. Are the Chinese and Argentina honey houses inspected? Do they have Apistan only as a mite treatment? If I want to export honey, most foreign governments impose a tariff.

Everyday I am more convinced the government that governs least governs best.

Herman Danenhower
Kutztown, PA

No Moldy Combs

In the February issue (Mailbox) an article by R.M. Mundle "Cold In Canada" he talks about the Shaparew inner cover ventilator and how important it is for over wintering bees. He states that the cover works so that there are no more moldy combs or dead colonies and gives fantastic over wintering results. Details have been published in *Gleanings* November 1982. Can this article or book still be purchased? Living in the mountains in Oregon, with a mixture of rain and snow, I have this problem in some of my hives. I would be interested in making some and trying them out. Also, in your earlier magazines you have these do it yourself projects sent in by other beekeepers, have you ever gathered these ideas up and put them into one book? Would be interested in a book like that. Thanks.

Ben Bender
Hillsboro, OR

Thank You, Richard

Thank you for your superb article on the Latest News from National Meetings. I enjoyed not only the content, but the upbeat tone in which you wrote it.

Picking a favorite writer in *Bee Culture* would be hard for me to do, but Richard Taylor would certainly be at the top of the list. His philosophy on life and beekeeping is refreshing, thought provoking and entertaining. I read his comments to my wife who is not a beekeeper, and she thoroughly enjoys it too.

I was saddened to read a venomous attack on his writing in the letters column. The originator of that letter shows the antithesis of the Taylor philosophy to us. Richard Taylor shows us love for nature, reverence for God and love of country, and love for one another as a good way of life.

These qualities are sadly lacking in society today.

My point here is to show the intolerance for source of all morality, namely, God, is alive and festering in beekeeping as anywhere else. I thank God for Richard Taylor. The world is a better place for his having been here.

He is to be admired.

Ernie Gregoire
Canaan, NH

Killer Ants

Many of us have followed the stories of the Texas beekeepers having trouble bringing bees into California because of infestation of the hive and soil under the hives with fire ants. It's too bad we have this problem, because we sure don't need the fire ants out here. The little 2mm Argentine ants, another recently introduced exotic species, are a major pest. I have my hives on greased blocks of wood, which have to be regreased weekly. The Argentine ants have displaced the larger and less invasive native ants, much to the demise of horned toads (actually lizards), which feed on the larger native ants, and find the Argentine ants unpalatable (they smell awful when one smashes them). The Argentines are so small that they are hard to keep out of houses as they come in through the smallest of cracks. The nests have multiple queens and these queens will march off with workers and brood to start a new nest. I've found queen ants and brood living in the top of a box where the frame ends are hung, beyond the reach of the bees.

Already there is an infestation of fire ants in Orange County, and a plan to eradicate them completely before they spread is being developed. It's unfortunate that the poor beleaguered beekeeper has to worry about yet another problem, and I hope California can work out an inspection system whereby bees don't sit in bureaucratic limbo on the tarmac at Blythe Airport, but I don't think we should allow importation of fire ants in beehives.

Paul Nicholson
Moorpark, CA

Loves *Bee Culture*

I have kept bees for 25 years in a very modest way. I pen this note to thank you for the layers of graceful writing and detailed information you have brought this amateur apiarist in northern Vermont.

Your Editorials and overall direction of *Bee Culture* have explained more to me about the industry and "culture" of beekeep-

MAILBOX

ing than any other source I can find.

It is work such as yours which not only draws people into this ancient and honorable craft, but helps keep them going through the rough patches.

William Mares
Burlington, VT

Headache Gone!

I received your magazine in the mail today (fast work) and I really love it.

For the last year I had the other bee journal coming to my home and for the last year I've had a headache for the two to three days it would take me to read it. I read your magazine from cover to cover today without a headache.

So happy. Thank you for not being too complicated or technical for a novice like me.

Connie MacAlister
Harrison, MI

Back To The Future

John Miller's letter, 'The Future,' in your February issue caused me to remember one of my mom's wise insights on human nature. Upon hearing a baseless or illogical expression of opinion, her comment would be that people have a strong tendency to believe what they want to believe. Politicians use this tendency on a daily basis in order to shape public opinion and achieve goals which in many cases are not in the public interest. Occasionally the facts get in the way and folks realize that what they want to believe is unfortunately not true.

Miller suggests that those of us who believe in U.S. honey promotion should "put stock in it" and asks whether any consumer attitude surveys indicate that the consumer cares about U.S. products. A recent survey conducted by C.B.D. Research and Consulting found that 80% of Americans believe products made in the U.S. are as good or better than products made elsewhere in the world[1].

Miller also maintains that when the big honey packers gain, we all do. This view is based on what is commonly known as trickle-down theory. This theory provides the economic argument for the present N.H.B. generic promotion program. Theoretically, if N.H.B. assessments are dedicated to increasing the total honey market (through generic promotion), then benefits 'trickle-down' to U.S. producers in the form of higher producer prices and increased marketing opportunities for U.S. honey. The facts (low producer prices and a tripling of imports coupled with stagnant U.S. production) show that U.S. producers have been paying into what amounts to a subsidy program for importers and the large processors who pack and sell those imports. Generic promotion has been a failure for U.S. beekeepers. Should we increase or even continue investing in a losing proposition?

Let's try a different approach. Use N.H.B. assessments to promote U.S. honey. How can we know it won't work unless we try? The main objection is that we would lose the import assessment which would lower N.H.B. revenue and give imports a 'free ride.' To some extent this is true, but U.S. producers are *already* subsidizing imports big time through generic promotion! If 80% of Americans believe 'U.S. made' is equal to or better than the imports, then it seems likely that advertising U.S. produced honey would be effective. Miller contends the consumer doesn't care. Why should they care about U.S. honey when it has *never* been nationally promoted as such by the N.H.B.? The purpose of advertising is to *create* a preference for the advertised product so that the consumer will choose it over another similar product even if it costs slightly more. I think we can focus less money on selling U.S. honey and gain a positive return for U.S. beekeepers. If we could achieve a 2-4 cent/lb. price preference for U.S. over imports at the bulk level, the program would be a success.

Mr. Miller wants to believe in the NHB and the proposed amendments. For 10 years, I too was a NHB believer, but now I'm sad to say the facts have got in the way.

From Incentive magazine, as reported in July 1998 *Bee Culture*.

Joe Rowland
Oswego, NY

Gathering Pollen

My wife and I have been into bee keeping about 5 years now and are very enthusiastic. We often get requests, though, for bee pollen and have invested in a couple different types of pollen traps. We were amazed at how much WORK it was to clean the pollen of debris. It seemed very time consuming hand work for the end product. I'd like to suggest an article or two on pollen production at the hobby level. Maybe something on methods others have come up with to mechanize the cleaning of pollen (you know- getting out the bee parts & pieces found in the pollen).

Thanks again for a super magazine. My wife and I almost fight to see who reads it first.

Ralph & Kathy LeFevre

Editor's Note: *Well, I hope the magazine survives the struggle. It's nice to know it's that much in demand. Yes, cleaning pollen is a chore. Small scale operations have more or less settled on a 3 step process. First, dry the pellets so they an no longer moist. Second, sieve the pellets to remove small debris. You will find the size of screen that works best for you, but make it as large as you can, without losing too much of the pollen. Third, using a low velocity fan, blow the remaining lightweight debris away. Then, you will probably need to visually sort and pick the rest, but if the other two steps go well, it will be minimal. Now, the sieve part works for you two ways. Yes, you will lose some of the pollen, about 10% or so, maybe 15%. Save it and feed to your bees in the spring. When complete, freeze until you sell it. It should stay dry so it doesn't spoil.*

For larger operations, collectors generally use seed cleaners to remove chaff from the semi to completely dried pellets. These come with sieves of various sizes and can generate a breeze of variable velocity. And yes, I agree, we need to do this again, since lots of people are getting into the business. I hope this helps.

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MAILBOX

Exception To Winston

My husband and I were thrilled to receive our complimentary copy of the December 1998 *Bee Culture*. A check for our subscription is enclosed. Although most of the articles in this issue were informative, I feel I must take exception to the "Table Talk" article by Mark Winston.

Mr. Winston characterizes the legitimate complaints of American beekeepers as whining. In this country we call it free speech, and when enough of our citizens practice it long enough and loud enough our government is forced to listen.

If foreign producers are allowed to flood our markets with cheap honey so that packers have a cheap source of honey, why shouldn't American beekeepers expect some type of government supports?

Mr. Winston's insinuation that American honey prices may have fallen due to adulteration is not backed by one single point of fact, and neither are the remarks that the professor makes concerning "allegations" that he "heard" overseas about residues and added sweeteners in honey exported from the U.S. Who are his sources and where did Mr. Winston hear these allegations? Good journalism demands that inflammatory remarks such as these be confirmed with solid evidence.

Coming from a Canadian, Mr. Winston's suggestion that American beekeepers export their honey to Europe seems a little self serving. Could it be that he hopes that U.S. beekeepers will ship product across an ocean so that "copious amounts of honey" produced in Canada can be economically trucked in across our borders?

In closing I'd like to remind Mr. Winston there is more at stake than cheap imports. If more and more U.S. beekeepers continue to leave the profession because of falling revenues coupled with increased expenses U.S. agriculture from home gardens to commercial operations will suffer. The U.S. has a great deal more to lose than packer profits.

Cherry Aiassa
Azalea, OR

Organic ID

I think in these days of such widespread misinformation it is essential that sources be identified. I noticed that the March issue "All the News that Fits" identified all but one source. That the source challenged a widely held view raised a red flag. I won't take your time to critic the item – either it was misread or someone has an ax to grind. I do feel that there is so much pseudo-scientific claptrap and industry/association misinformation flooding the media these days, that disclosure (your article on Bayer) and identification is essential.

This morning I read articles in two leading East Coast newspapers written by columnist who simply rehashed an industry news release. When I was in college a one-source paper would have received an "F" today we give it a by-line. Further, we seem to dump the criterion for plagiarism.

I have no problem with articles written by people who have a financial interest in the product or service as long as they are adequately identified (again your Bayer article). Given the problems the media has with credibility, no publication can afford relaxed standards.

Dick Starkey
Woodstock Valley, CT

Editor's Note: *Yes, good point. FYI, the organic piece should have been credited (the credit line was unintentionally left off the bottom of the piece) to Katherine Meintner, Associate Editor, Farm Digest. She did not mention, nor did I follow up on the 'new studies' quoted in the article. I get an F for that. I am familiar with the publication however, and know the Managing Editor who does have a record of not getting Fs. Thanks for the attention to detail.*

THE WISE GUY

Pollination *or* honey production! Pollination *and* honey production! How do these two fit for you? Is it an "and" or is it an "or"? Are you uncomfortable with the ever changing concerns we beekeepers have, such as . . . 1. the fire ant problem in California; 2. small hive beetle; 3. resistance to chemicals; 4. low honey prices; 5. African honey bees? These are just a few of the questions challenging us today. All of these are questions you must answer before you decide if you are an "or," or you are an "and."

I believe you must also look into the possibility of getting a new partner into your business. Why not involve your farmers or the companies you pollinate for into your bee business? They may have as much to lose as you do if your business fails. Colony numbers are decreasing in this country.

I see the agricultural producers becoming more dependent on each other everyday. What may happen if you don't start getting them more involved in your business is that the orchard owners may get involved in your business without you. The California fire ant nightmare is only pushing people farther into looking for an alternative to out-of-state beekeepers. California already has fire ants and a lot of California beekeepers Winter there, and they can freely move their bees over the whole state without any inspection, thereby dragging the ants wherever they go. That orchard grower may just purchase the bees himself at some point because the cost of a double hive of bees is getting very close to the cost of a pollination agreement. Even a marginal beekeeper could keep 50 percent of those bees alive for a year, so the orchard owner could become your own competition.

Don't limit your choices when it comes to how you will do business in the future. I believe that we all will change or we will be out of our business, and that will come soon.

If you sell your honey by the ton and not by the pound you will be history! The same holds true for pollination. You had better be selling more than cheap pollination services or you will be replaced.

Wise Guy

INNER ... Cont. From Pg. 6

welcome it with open arms. Now, add to that just a tiny bit of 'we don't make *these* kinds of mistakes' arrogance and 'voila' – major error.

A whole lot of things contributed to Jim Tew's article in the March issue being the same as the February issue, except for the photos, but ultimately we messed up. We missed the duplication. We proofed the real article, laid it out . . . and still got the wrong words in the right place.

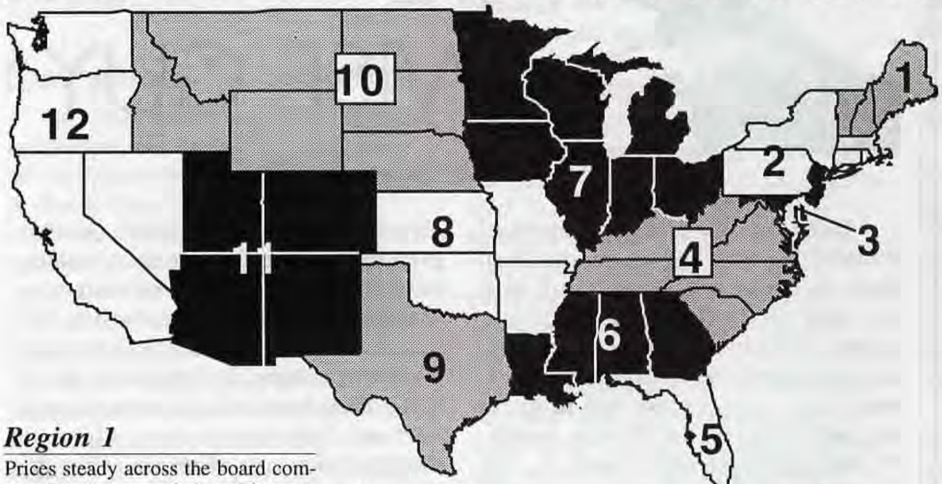
So, with apologies to Jim, and to you, we offer this month the article that should have been in last month's issue, plus this month's article. Two for one, so to speak.

It's ironic that 'The Virtual Beeyard' experienced this type of malfunction, but it could have been any article last month. All sorts of things went wrong, at the wrong time. But ultimately it was the human factor that called the shots, and takes the blame . . .

Or . . . I actually thought of offering the excuse that Jim's February article was so very well written that we should repeat it, just because it was so good. But that probably wouldn't work, would it.

So, with all this in mind, keep your wits about you, your debts, obligations and hard drives in check, your smoker lit and your hive tool sharp. It's a cruel world out there, and we're all we've got.

APRIL – REGIONAL HONEY PRICE REPORT



Region 1

Prices steady across the board compared to last month. Low, but not lower. Blueberries, apples and pumpkins main pollination crops. No plans to restrict colony movement into the region, as of yet.

Region 2

Prices steady at all levels. Still low Apples, pumpkins, blueberries, some other melons, cukes, small fruits and strawberries plus cherries are the pollination crops. No plans, but some thoughts on restricting colony movement into region.

Region 3

Prices down just a tad bulk and retail, but up at wholesale. Cukes, other melons are the main crops. No restrictions in place or planned, but some are moving in that direction.

Region 4

Prices down a little for bulk, up some for wholesale and steady at retail. Pumpkins, squash, other vegetables, some apples and blueberries and peaches are the crops to pollinate. Some states requiring pretreatment with cumophos before entering. KY looking for additional inspectors.

Region 5

Prices increasing, though not much at bulk, but down at wholesale and retail. Melons, cukes, vegetables, some citrus are the crops. Everything starts here, so no colony movement restrictions, but beefed up inspections for chemical abuse underway.

Region 6

Bulk prices down to leveling off as are retail and wholesale. Melons, peaches, apples and vegetables are the main pollination crops. Border closure, quarantines and increased inspections likely, or in place this year already to to the hive beetle.

Region 7

Bulk prices down for barrels and pails. Wholesale and retail steady. Apples, melons (lots of melons), small fruit - blueberries, raspberries, cranberries and strawberries - even peaches pollinated here. Some border closures, restrictions and plans for both for beetle and resistant varroa planned or in place.

Region 8

Prices down to steady at bulk, up at wholesale and steady retail. Apples, cukes, melons, small fruits, some seed crops and vegetables are pollinated crops. No restrictions planned, but some being considered.

Region 9

Prices at bulk steady to down a bit, wholesale steady but retail down a little. Pollinated crops include lots of melons, cotton, sunflowers and some seed. AHB restrictions have tightened up and reduced movement some, and fire ants are gaining.

Region 10

Prices up a bit at bulk, but not much, steady wholesale and retail. Pollination not diverse here, sunflowers and a few apples, but lots of seed crops. No plans for restrictions - yet.

Region 11

Bulk prices up just a tiny bit. But wholesale and retail continue downward. Lots of apples, melons and seed crops pollinated here. Restrictions unlikely.

Region 12

Pail prices up, barrels down, wholesale steady but retail down. Garden of Pollination Delights here - apples, cherries, pears, meadowfoam, melons, almonds (of course), cranberries, prunes, strawberries and seed crops galore. Restrictions already in place, and more probably on the way - ants, beetles, whatever.

	Reporting Regions												Summary		History	
	1	2	3	4	5	6	7	8	9	10	11	12			Last	Last
Extracted honey sold bulk to Packers or Processors													**Range**	**Avg.**	**Month**	**Yr.**
Wholesale Bulk																
60# Light	54.42	58.00	58.00	68.25	67.50	45.60	38.88	45.00	57.00	68.00	65.00	59.00	31.20-75.00	56.26	57.19	63.15
60# Amber	52.66	55.17	55.00	64.00	65.00	43.00	37.23	52.00	54.67	63.00	61.67	56.50	30.00-75.00	54.09	52.89	59.29
55 gal. Light	0.62	0.64	0.62	0.63	0.64	0.67	0.63	0.65	0.64	0.65	0.65	0.64	0.52-0.82	0.64	0.66	0.84
55 gal. Amber	0.60	0.64	0.60	0.59	0.63	0.63	0.60	0.66	0.61	0.63	0.62	0.63	0.51-0.80	0.62	0.62	0.79
Wholesale - Case Lots																
1/2# 24's	27.69	27.49	28.74	31.66	20.40	27.83	27.87	28.74	30.00	28.74	27.75	26.20	20.40-37.20	28.63	29.55	29.41
1# 24's	42.18	42.85	45.60	44.52	37.00	42.50	41.34	40.50	45.25	43.21	40.87	43.98	28.00-58.50	42.98	43.02	43.64
2# 12's	37.92	37.96	42.60	42.26	39.75	38.30	38.14	38.38	38.90	37.50	32.80	36.70	28.00-52.58	38.66	38.94	39.49
12 oz. Plas. 24's	36.57	37.64	43.20	37.35	39.19	36.40	35.82	34.98	38.00	37.60	38.47	35.76	26.40-54.00	37.16	36.20	37.09
5# 6's	40.35	43.59	48.00	43.63	45.35	45.58	37.49	41.67	42.50	41.25	33.78	37.47	28.00-67.00	41.05	39.22	41.80
Retail Honey Prices																
1/2#	1.82	1.52	2.83	2.17	1.25	1.75	1.79	1.79	3.25	1.59	2.48	1.61	1.09-4.00	1.83	1.81	1.84
12 oz. Plastic	2.19	2.24	2.40	2.14	1.59	2.13	2.06	2.34	2.44	2.32	2.76	2.07	1.59-3.20	2.23	2.16	2.23
1 lb. Glass	2.74	2.51	2.80	2.86	2.00	2.59	2.45	2.71	3.69	2.45	3.31	2.72	1.89-6.00	2.74	2.72	2.68
2 lb. Glass	4.45	4.29	4.55	5.08	3.99	4.24	4.26	4.83	4.66	4.26	4.86	4.28	3.25-6.00	4.53	4.56	4.53
3 lb. Glass	6.13	5.90	7.50	6.49	4.00	7.18	6.27	6.40	6.04	5.77	6.38	5.53	4.00-10.00	6.24	6.49	6.32
4 lb. Glass	7.68	7.55	8.64	7.80	8.64	7.50	7.42	8.65	8.83	8.50	8.64	6.00	6.00-12.00	7.93	8.36	7.68
5 lb. Glass	9.14	9.87	9.80	9.31	10.10	9.08	8.74	10.28	9.00	8.95	9.25	8.26	7.00-14.00	9.31	9.26	9.48
1# Cream	3.11	3.12	3.55	3.30	3.55	3.08	2.59	3.20	5.50	3.89	3.50	2.87	2.00-5.50	3.15	3.12	3.24
1# Comb	4.22	4.28	3.50	4.09	4.11	4.88	4.01	4.24	5.50	4.11	5.23	4.75	1.95-6.00	4.37	3.89	4.15
Round Plastic	3.77	3.09	3.50	3.81	4.20	4.50	3.33	3.87	5.50	4.20	4.50	4.12	2.75-6.00	3.86	3.51	3.59
Wax (Light)	2.41	3.23	3.00	1.87	1.60	2.41	1.94	2.16	2.51	1.40	2.17	2.47	1.25-6.00	2.41	2.17	2.58
Wax (Dark)	2.06	2.61	2.75	1.53	1.20	2.31	1.49	1.68	1.86	1.20	2.05	2.21	1.00-5.50	2.05	1.92	2.23
Poll. Fee/Col.	36.51	39.17	35.00	33.33	30.00	36.50	39.78	39.00	20.00	37.49	50.00	36.00	20.00-55.00	37.47	37.69	37.54

U.S. HONEY PRODUCTION

Colonies, Yield, Production & Price, 1997 & 1998 (Source: National Agricultural Statistics Service)

Honey Prices Down 13 Percent in 1998

Prices for the 1998 crop averaged 65.5 cents per pound, down 13 percent from 75.2 cents in 1997. Prices are based on retail sales by producers and sales to private processors and co-ops. At the State level, prices reflect the portions of honey sold retail, co-op and private. At the U.S. level, prices for each color are derived by weighting quantities sold for each marketing channel. Co-op and Private prices were lower for all color classes in 1998. Data is for producers with five or more colonies.

Honey: Price by Color Class, United States, 1997-98
Price – Cents Per Pound

Color Class	Co-op & Private		Retail		All	
	97	98	97	98	97	98
Water White, Extra White, White	74.3	64.7	117.9	113.4	75.7	65.7
Extra Light Amber	72.7	61.2	123.8	104.8	76.4	64.2
Light Amber, Amber, Dark Amber	68.1	60.2	127.1	119.9	72.8	66.0
All Other Honey, Area Specialties	66.0	64.5	201.0	168.4	79.8	83.2
All Honey	72.2	62.9	125.7	114.7	75.2	65.5

State	Honey Producing Colonies		Yield per Colony		Production		Average Price per Pound	
	x 1,000		Pounds		1,000 Pounds		Cents	
	1997	1998	1997	1998	1997	1998	1997	1998
AL	14	16	66	71	924	1,136	81	72
AZ	42	55	80	60	3,360	3,300	72	64
AR	50	53	95	65	4,750	3,445	70	59
CA	420	450	75	83	31,500	37,350	70	62
CO	35	27	55	72	1,925	1,944	82	70
FL	240	230	67	98	16,080	22,540	73	64
GA	75	75	46	56	3,450	4,200	79	69
HI	9	8	146	118	1,314	944	86	75
ID	120	120	64	50	7,680	6,000	72	65
IL	7	9	69	71	483	639	127	119
IN	8	9	71	92	568	828	113	85
IA	45	50	74	78	3,330	3,900	86	70
KS	17	16	71	46	1,207	736	81	87
KY	3	3	60	50	180	150	148	140
LA	44	41	115	111	5,060	4,551	70	59
ME	8	10	19	26	152	260	70	69
MD	6	7	40	44	240	308	159	110
MI	85	80	70	85	5,950	6,800	77	66
MN	145	140	73	79	10,585	11,060	74	65
MS	19	18	73	86	1,387	1,548	73	58
MO	24	23	77	66	1,848	1,518	78	76
MT	107	115	120	122	12,840	14,030	74	64
NE	61	64	67	70	4,087	4,480	77	86
NV	14	10	61	46	854	460	114	165
NJ	10	11	49	49	490	539	104	76
NM	15	14	60	55	900	770	87	76
NY	72	65	60	80	4,320	5,200	85	70
NC	8	8	58	59	464	472	119	138
ND	245	230	100	128	24,500	29,440	74	63
OH	22	18	80	78	1,760	1,404	85	83
OK	4	4	58	51	232	204	137	124
OR	50	50	53	45	2,650	2,250	79	90
PA	22	23	48	66	1,056	1,518	100	80
SD	240	225	65	95	15,600	21,375	74	64
TN	7	7	62	64	434	448	147	132
TX	94	91	106	77	9,964	7,007	75	62
UT	32	30	52	58	1,664	1,740	75	65
VT	5	6	63	64	315	384	83	107
VA	8	8	53	37	424	296	145	133
WA	60	58	52	51	3,120	2,958	76	64
WV	8	6	70	55	560	330	111	114
WI	79	89	60	91	4,740	8,099	90	72
WY	38	46	62	60	2,356	2,760	75	68
Other States[2]	14	15	81	66	1,134	990	145	121
US Totals[3]	**2,631**	**2,633**	**74.7**	**83.7**	**196,536**	**220,311**	**75.2**	**65.5**

[2]CT, DE, MA, NH, RI and SC not published separately to avoid disclosing data for individual operations. [3]U.S. price weighted by survey expanded sales. Total may not add due to rounding.

Roger Morse

Research Review

"DVAV Dance, and more vibrating dances are now better understood."

Those of you who have observation hives have seen the DVAV dance and probably have wondered what in the devil it was all about. It is one of the most common and conspicuous of hive activities. The dance takes place when a worker bee shakes her body up and down while grasping another bee. The dance lasts only one to two seconds. A bee doing a DVAV dance on one bee is most likely to do it on several bees during sessions that may last minutes or even an hour, during which time hundreds of bees may be shaken.

The term DVAV means dorsoventral abdominal vibration, the dorsum being the top or back of an animal, while the venter is the underside, and in insects the underside of the abdomen. The term DVAV was coined in the late 1940s by Professor V.G. Milum of Illinois. Others have since called it the "shaking dance," the "vibratory" and/or "vibration dance" and the "shaking signal." In addition to shaking other workers, the dance may be performed on queen cells and queens. One recent paper suggests that the chief message is to the effect that bees should prepare for greater activity in a variety of ways. It might be thought of as a dance that regulates or controls hive activities, usually increasing them, though obviously causing others to decrease.

As a result of the recent studies cited below, we now know much more about the circumstances under which workers do the DVAV dance. It appears that these dances enhance a variety of behaviors, depending upon the "age and caste of the recipient." Workers of all ages may undertake these vibratory dances, except that they do not appear to be done by one- or two-day-old bees. However, those that do this dance tend to be the older bees of foraging age. It has also been noted that successful foraging can trigger the dance. There is no evidence to suggest that young vibrators were bees that were early maturing foragers or that were special in any way.

Some examples of the type of activity the dance may stimulate are as follows: There may be a high level of vibrating dances early in the morning before foraging starts. This is especially true if the foragers had good success the day before. When bees are trained to take sugar syrup at a feeding station they are more likely to perform the dance if the sugar concentration is high rather than low. If caged bees are forced to forage on sugar syrup only and have no access to pollen for a few days, then successful pollen foragers are especially active in performing the dance when they are allowed to forage outside the cage.

Queen and queen cell vibrators

I found of special interest the bees that perform vibration signals on queens and queen cells. This study asks three questions as regards the bees that vibrate queens and queen cells. What is their age? What is their age as opposed to those that vibrate workers? How is their behavior different? It had been determined earlier that "laying queens are vibrated only during the two- to three-week period preceding swarming." (In my opinion, this part of the question needs better definition since other physiological changes in workers that take place when a colony is about to swarm do not start until about eight to 10 days before it actually occurs. However, these are closely related times.)

In this study, as is the case with those that vibrate workers, while very young bees might be queen and queen cell vibrators, most of the dances were done by a small group of bees that were more than 10 days of age. In this regard, the age of vibrators did not "differ substantially" from those that vibrate workers. While these bees were of foraging age, "they rarely engaged in foraging." In fact, they rarely, if ever, flew from the hive. In the colonies examined, the queen cells were vibrated "throughout" the time the queens were developing, but this vibrating was especially active two to three days before the young virgin queen emerged from her cell.

The proportion of bees that did these dances on queens and queen cells was small; furthermore, they were not bees that have any close involvement with the queen such as feeding or grooming. Only rarely did the observers see a queen or queen cell vibrator vibrate worker bees in the hive. In other words, they seemed to specialize in this behavior at the time swarming was about to take place.

My thoughts: Swarm control has always been the most important economic problem faced by beekeepers. It has only recently, and temporarily we hope, been superseded in this regard by bee disease control. Very slowly, but in positive ways, a number of researchers continue to investigate the physiological and behavioral changes that take place in a colony of honey bees as it prepares to swarm. Swarming is still a great mystery, but we are gaining a better understanding of the process, and the two papers I review here are pushing us in the right direction. BC

Footnote: Worker honey bees may do several different dances, the least well known of which is the DVAV dance. Other dances include the round dance to indicate food or a new home may be found within about 100 yards of the hive, the wag tail dance indicates food or a nest site is more than 100 yards from the hive, and the tremble dance that successful foragers use to stimulate more bees to function as nectar receivers.

Painter-Kurt, S. and S.S. Schneider. *Age and behavior of honey bees that perform vibration signals on workers.* Ethology 104: 457-473. 1998.

Mark Winston

Formulations

"The challenge in developing mite controls using natural substances from plants such as essential oils or neem is not to find products that kill mites."

Ever wonder why there are so few treatments besides the "hard" chemical pesticides available to control the *Varroa* mite? After all, if you listen up to the hallway conversations at beekeeping meetings, you'll hear about an extensive array of substances that kill mites. I was at such a meeting a few weeks ago, and heard about neem, thymol, mineral oil and ground-up pine needles, among other things, as sure-fire cures guaranteed to kill mites on contact. The proponents of each of these materials were so sure that they worked that I began to wonder why my laboratory and virtually every other bee laboratory in the world is spending so much time and money looking for a *Varroa* treatment outside the now traditional pesticides with which we bathe our bees.

I was just about ready to pack it in and move my research into another subject, when the light of reality turned on and I asked myself: "In our great capitalist society where someone with a good idea can make serious bucks, why are none of these substances for sale as products?" There are a couple of reasons you might not see these "natural" products on the market. One possibility is that there is an extensive conspiracy by the pesticide companies, government and the CIA to keep these products from us. The other reason, and the one that seems a little more reality-based, is that they don't work.

It's not that alternatives to synthetic chemical pesticides don't kill mites. You can put pine needle dust, neem, thymol, mineral oil and many other things into colonies and kill most or all of the mites in the hive. The problem is that at a high dose you'll kill the bees along with the mites, and at a low dose you'll kill nobody. A pesticide such as fluvalinate (Apistan) or the now temporarily licensed Coumaphos kills mites at a very low dose, but it takes an exceedingly high dose to kill bees, making them perfect miticides, at least until the mites develop resistance to them or the FDA shuts us down because of residues in honey and wax. Virtually all the other substances being tested also will kill mites, but the dose that kills mites is alarmingly close to the dose that kills bees.

Apistan is a good example; the amount of Apistan that kills bees is about 1000 times higher than the amount needed to control *Varroa*, leaving a considerable gap between mite control and bee death. In contrast, the dose of thymol that kills bees is only three times higher than the amount that kills mites, leaving little margin for error, especially given the difficulty in controlling the release of volatile substances like thymol or other essential oils that are highly dependent on temperature.

The challenge in developing mite controls using natural substances from plants such as essential oils or neem is not to find products that kill mites. There is an extensive pharmacopoeia of these substances available that are toxic to mites. Rather, our challenge is to figure out ways to formulate these compounds to precisely control the dose that is dispersed in colonies, so that we don't kill bees along with the mites.

Even formic acid, which is the second best control for *Varroa* after Apistan, has serious formulation problems. Apistan will kill better than 99 percent of *Varroa* mites in colonies when properly used, at least if your mites aren't resistant. Formic acid has to be applied four to six times at four-day intervals as a liquid dripped onto a pad in your colony to even approach that high level of mite control. Obviously, a slow-release formulation that can be put into colonies once and left for a few weeks is necessary for formic acid to become an effective and commercially viable control for *Varroa* mites. However, the slow-release gel formulations developed to date provide only about 70 percent control, which may not be adequate to keep mites below economically damaging levels. Further, formic acid disperses in the hive as a gas that volatizes from the liquid or gel formulation, and the dose that reaches the mites and the bees is dependent on temperature. If it's too cold, not much disperses, and mite control is poor. Too hot and it disperses quickly, possibly killing bees, but also dispensing all of the formic acid in too short an interval to control mites that might emerge from cells after all the formic acid is gone.

Essential oils such as thymol have a similar problem, perhaps even worse because these oils can be very hard on bees. Formulations of thymol available in Europe are presented to colonies in florist blocks, the same damp, crumbly material that cut flowers are put in before delivery to your sweetheart. Thymol,

Continued on Next Page

"I've become convinced that we no longer need to focus so much on finding compounds that kill mites. Many laboratories, including my own, have been screening compounds, and I can point to at least 20 substances that kill mites."

however, will not volatize through the hive at temperatures below 12°C (55°F), but at higher temperatures it can quickly kill bees. Thymol's reputation as a mite control has been tarnished because of its unpredictable activity at controlling mites and frequent bee death resulting from release of a high dose that kills bees. Gel formulations of thymol are being tested, but these remain in the experimental realm, yet to demonstrate consistent mite control while leaving bees alone, and tests in North America show only 70-75 percent control rather than the 99 percent control claimed from European tests.

I've become convinced that we no longer need to focus so much on finding compounds that kill mites. Many laboratories, including my own, have been screening compounds, and I can point to at least 20 substances that kill mites. All of these substances are similar in that they are extracted from plants, and as "natural" substances would be easier to license and regulate than synthetic pesticides. Also, their mode of action is less specific than most pesticides, so that resistance would be less likely to develop. However, they all kill bees at doses too close to those that kill mites. Our challenge with these compounds is to formulate them in such a way that we can provide a consistent dose over many weeks, at a level that won't harm bees but will kill the vast majority of mites in the hive.

How can we accomplish this? I hate to use clichés, but one of today's catch phrases that says it well is "thinking outside the box." I've been surprised at the lack of creativity shown by the research community in developing delivery methods for essential oils and other plant-derived miticides. We have timidly focused on one formulation type, gels, where we may need to go where no formulation has gone before. I've begun talking to industry on this subject, and the response I keep getting back is "Why are you using gels? There are many better materials to disperse volatile substances than gels, and at lower cost." Indeed, all we may need to do is get some innovative ideas from industry, take substances we know kill mites, test them at a range of doses and temperatures, and voila: mite control.

What would it take to screen a small number of compounds using various innovative formulations? First, I would convene a summit meeting of respected and active scientific experts, beekeepers and formulation chemists to decide on what to test. Then, how about U.S. beekeepers donate 1,000 colonies for a test, and we employ one research director, five students and a few technicians for two years to test the proposed formulations? The first year we test widely, and the second year focus on the 10 most promising formulations. Finally, in the third year we should send the top three formulations out to commercial beekeepers and researchers across North America and the world for field testing under commercial conditions.

How might we fund such a large project, and who should organize it? Piece of cake. We hope that the National Honey Board will soon have available a large pot of research money from the new legislation passed by Congress. Rather than dispersing it in dribs and drabs, why not conduct a large, focused project managed by the beekeeping community to develop formulations for new miticides that are based in substances more acceptable for use in beehives than the current pesticides? If successful, the NHB and the ABF could take out a patent on the new product, license it to the highest bidding private company, and royalties from sales would fund future research forever. We should be able to get the job done for $1-2 million over three years, within the range of expected research dollars available through this program.

Sure, I can hear the whiners and naysayers even as I write. Still, I can't help myself; I remain terminally optimistic that people can accomplish great things when they work together. What greater thing could you imagine than beekeepers funding a unified effort to control our most serious pest, in a project organized by beekeeping organizations, and in the end with the profits from any success directed back to the beekeeping community? Sure, I can foresee obstacles, challenges, disagreements and dissension from such a massive, centralized undertaking.

But I also can envision success. How about it, industry leaders? Why not at least convene a small meeting of influential movers and shakers to explore the best way to translate research funds into an effective *Varroa* control? Who knows, perhaps ground-up pine needles formulated as needle dust will be the answer, but we'll never find out unless we organize ourselves to try. BC

Mark Winston is a professor and researcher at Simon Fraser University, Burnaby, B.C. Canada. He is program director for Apimondia 1999.

? DO YOU KNOW ?

General Knowledge

Clarence Collison
Mississippi State University

Recently I read an article discussing the art and the science of beekeeping, which stated that to be successful, the beekeeper has to be a jack-of-all-trades. Some of the required skills include woodworking and a knowledge of botany. A successful beekeeper also needs to be a salesman, a veterinarian, a bookkeeper, etc., to name a few. Inexperienced beekeepers as well as the general public often look to experienced beekeepers as experts in all aspects of the industry. Being able to handle all of these inquiries requires an individual to have a broad knowledge in many different areas of the industry. Beekeepers need to be keen observers and good naturalists or be in tune with nature. A large part of this knowledge base is derived from personal experiences (learning from your own mistakes). In addition, beekeepers learn from reading a vast assortment of beekeeping literature, by attending beekeeper meetings and short courses, as well as by sharing experiences and ideas with other beekeepers.

Following are several questions dealing with different aspects of beekeeping to challenge and increase your beekeeping knowledge.

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. ___ Queens and drones lack wax glands.
2. ___ As the amount of wax bloom on a beeswax candle increases, the poorer it burns.
3. ___ Bees cannot survive without honey.
4. ___ Colonies normally swarm after the first virgin queen emerges.
5. ___ In the North, overwintered colonies normally begin raising brood early in January.
6. ___ At the present time (8 months post initial find), the small hive beetle has been found only in Florida.
7. ___ Wax bloom, a whitish material that resembles mold on the surface of beeswax, melts at a much lower temperature than beeswax.
8. ___ Honey vinegar is made from diluted honey and is a product of fermentation.
9. ___ Beeswax combs within a colony readily absorb fluvalinate when they come in contact with Apistan strips.
10. At times beekeepers attempt to trap colonies out of a wall of a building or bee tree. What are two disadvantages or difficulties in trapping bees out of a structure or cavity? (2 points)
11. What two factors determine "division of labor" within the honey bee colony? (2 points)
12. What is the name of the sugar syrup feeder that replaces a frame in the broodnest? (1 point)
13. Please give three reasons why dead colonies should be removed from the apiary when they are discovered. (3 points)
14. Please indicate what happens to the fecal wastes that are produced by the bees during the Winter. (1 point)
15. What is the best way to remove wax bloom from a candle. (1 point)

Purple loosestrife is recognized as an important honey plant in the northeastern U.S., and has spread throughout much of the U.S. and southern Canada.

16. Describe the type of environment where you would expect to find solid stands of this plant. (1 point)
17. ___ The honey is dark amber in color, and when held up to the light has a slightly reddish tinge. (True or False)
18. Please explain why this plant is considered to be an obnoxious weed, and as a result, several programs have been attempted to eliminate or control it. (1 point)

(Multiple Choice Questions, 1 point each)

19. ___ Recently, several states have received Section 18 registrations for Coumaphos (Bayer Bee Strips). These 10 percent Coumaphos strips are registered for the control of:
    A) Tracheal mites & *Varroa* mites
    B) Tracheal mites & small hive beetles
    C) *Varroa* mites & small hive beetles
    D) Wax moth & *Varroa* mites
    E) Tracheal mites & wax moth
20. ___ The FABIS Technique was developed to identify:
    A) *Varroa* mites
    B) Sacbrood disease
    C) Tracheal mites
    D) American foulbrood disease
    E) Africanized honey bees
21. ___ National Honey Month normally occurs in:
    A) September
    B) October
    C) December
    D) February
    E) May

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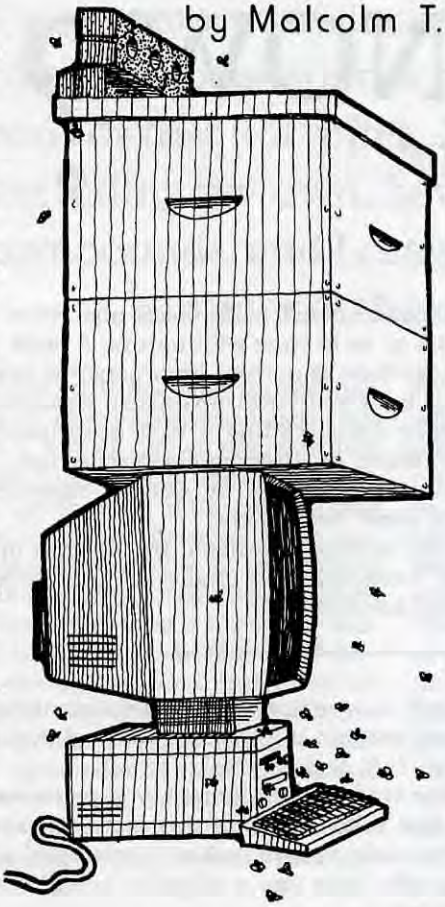
Beekeeping In The Digital Age

by Malcolm T. Sanford



Federal Honey Bee Research

At this year's American Beekeeping Federation convention in Nashville, Tennessee, there seemed to be a noticeable shift in beekeepers' attitudes about research at federal bee research laboratories. Several things contributed to this. Dr. Floyd Horn, Agricultural Research Service (ARS) Administrator gave the keynote address and was hosted at an open lunch where he pledged better cooperation between his organization and the industry. Many were surprised and delighted at the candor of Dr. Horn as he discussed the trials and tribulations of ARS in attempting the meet the beekeeping community's needs in the next millennium. One of the challenges is the continuing rise in cost to support a single scientist in the system, which includes both salary and operating expenses, now estimated to be in excess of $300,000 per year. Among other things, Dr. Horn pledged $150,000 in emergency funding for small hive beetle research, and he offered to look into the possibility of finding an ARS scientist who might be recruited to look at honey adulteration issues.

Dr. Karl Narang, National Program Leader, Medical and Veterinary Entomology, provided a list of things that his part of the ARS program will be actively engaged in developing for the beekeeping public:

1 Mite-resistant or tolerant honey bees
2. New pesticide formulations
3. Natural products to control pests
4. Methods to produce more populous colonies
5. Better ways to detect and find queens
6. Improved management methods for AHB
7. Wax moth and ant control
8. Bacterial and viral disease control
9. Pollination of specific crops
10. Detecting honey adulteration
11. Protecting honey bees from pesticides
12. Small hive beetle control

Dr. Narang urged participants to continue communicating with administrators and the four bee research laboratories. Only by taking an active role in advisory boards and bee research committees, he concluded, will beekeepers be able to have their needs addressed in the 21st century. Other contributing factors were presentations by the research leaders at the four bee laboratories, which revealed the scope and objectives of these institutions.

In the past, communication with federal bee research laboratories and personnel has been somewhat difficult. The Digital Age is changing that. The logical place to begin search for information about the ARS is its World Wide Web home page. The URL is http://www.ars.usda.gov/. As always, if readers are unclear about words used here in conjunction with electronic communications technology, they can easily look at **back issues** of this column on the computer or research back issues of this publication.

Among other things, the ARS home page features a graphic of a ***Varroa* mite**. The page shows three main program areas, **Animal Production, Product Value and Safety**, **Natural Resources and Sustainable Agricultural Systems**, and **Crop Production, Product Value and Safety**. Within the **first**, there are nine national programs. **Number 103** is Animal Diseases. Dr. Karl Narang is National Program Leader Animal Pests & Parasites (Medical and Veterinary Entomology) within Number 103. As noted above, bee research falls under his guidance.

The ARS home page features a "**Find the Expert**" function. Each search will locate two ARS scientists: one who can communicate the "big picture," and the other, a bench scientist, who has specific experience in the selected area. One can use key words, a broad subject area to research topics. **Apiculture** is one of the subject areas listed. A search there provides specific research areas, including honey, natural products in bee mite control, pollination, bees and Africanized honey bees. Searching these topics brings up both **Dr. Narang** and **Dr. H. Shimanuki** as contacts. Dr. Shimanuki has over thirty years service in many capacities. He was recently named technical liaison to the bee industry by ARS. Many know Dr. Shimanuki for his long service to United States' beekeeping. He recently won the Apicultural Excellence Award from the **American Association of Professional Apiculturists** (AAPA).

The ARS home page links to a map of **research locations** across the nation and world. Most of these facilities have a World Wide Web page that contains a comprehensive list of staff, along with other information concerning their research programs.

The Beltsville, MD Agricultural Research Area (BARC) is the largest and most diversified agricultural research complex in the world. Selecting **BARC** from **the Beltsville area home page**, one finds the **Bee Research Laboratory** under the **Plant Science Institute**. The Beltsville bee lab's **home page** contains an account of its **history** and also links to various disease and pest information, including that surrounding the **small hive beetle** (*Aethina tumida*). It also provides directions on **sending samples** for diagnosis. The current director is relatively new to bee research and the laboratory. He is **Dr. Mark F. Feldlaufer**.

At Baton Rouge, LA, the mission of the **Honey Bee Breeding, Genetics, and Physiology Research Unit** is directed to improving honey bee stock and honey bee management related to stock improvement. This includes research components related to problems caused by Africanized honey bees, Varroa mites, and tracheal mites. Dr. Tom Rinderer has directed that laboratory's research for a number of years. At this writing, the **Weslaco, TX** research facility's home page is undergoing re-development and was not available, but should be accessible in the near future. This is the newest of the bee research facilities, presently under the guidance of **Dr. Bill Wilson**.

Further west, The **Carl Hayden Bee Research Center** at Tucson, AZ has a home page that links to pollination resources and a variety of other beekeeping-related information. The research leader is **Dr. Eric Erickson**. A valuable resource found there is the online version of ***Insect Pollination of Cultivated Crop Plants*** by S.E. McGregor, USDA originally published 1976. Also accessible from the site, called GEARS (Global Entomology Agriculture Research Server), are links to information from Africanized honey bees to how to plant a garden that will attract bees. An important resource is **BK-Economics**, a financial analysis program that one can download for use on either Windows® or Macintosh® computers. There is also an online computer program called **WebBeePop** that can be used to visualize and study the dynamics of honey bee population growth. Other information on biodiversity and pollination, particularly in the desert environment is also found here.

A facility that doesn't get much press in honey bee publications is also part of the ARS system. This is the **Bee Biology and Systematics Laboratory** in Logan, UT. The research leader is **Dr. William Kemp**. It was founded in the late 1940s as part of the alfalfa seed production unit, and continues to focus its efforts on pollination research using all kinds of bees. Links to **accomplishments** show a wide variety of study going on at this facility. Although the laboratory generally concentrates on other pollinators besides Apis bees, there is information beekeepers can use here, including research by **Dr. Jim Cane**, formerly of Auburn University, on **pollen quality** and **blueberry pollination**.

The Agricultural Research Service has been a vital part of beekeeping information development since the turn of the century. The World Wide Web provides an alternative way to disseminate this knowledge. The technology also allows interested persons to see in some detail what is going on at ARS facilities, and makes it possible to contact individual scientists. In conclusion, **ARS** on the Web provides greater access than in the past to information developed at tax-payer-funded laboratories and the scientists employed there. This seems a logical follow-up to presentations by Drs. Horn and Narang at the 1999 Federation convention in Nashville, and promises to make the institution much more relevant to beekeepers in the future. BC

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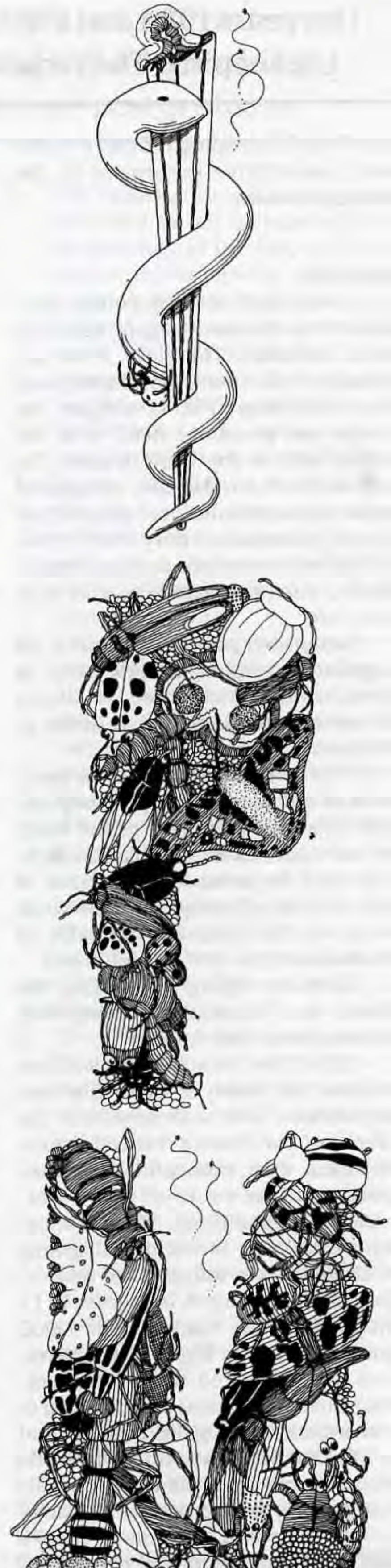
AN INTRODUCTION TO INTEGRATED PEST MANAGEMENT

Nicholas Calderone

IPM enables us to accomplish by finesse, that which we cannot achieve by brute strength alone.



This article is the first in what I hope will be a useful series on the management of honey bee pests, parasites, pathogens and predators, or, more simply, pests. My goal is to encourage beekeepers to approach pest management in a systematic manner using methods based on the principles of IPM - that's Integrated Pest Management. IPM, as I hope to convince you, provides the best long-term solution to the problems that challenge beekeeping today. Make no mistake, the problems we face are industry-threatening and difficult to solve. To survive, beekeepers must learn to manage pest populations in a manner that is not only effective and affordable in the short run, but also safe and sustainable in the long run. Without an underlying philosophy to guide our pest management decisions, we will fall short of those goals, and major sectors of the beekeeping industry may become little more than a historical curiosity.

A LITTLE BACKGROUND

Back in 1977, I had the good fortune to find work at one of the world's premiere honey bee research labs - that of Professor Walter C. Rothenbuhler at The Ohio State University in Columbus, Ohio. It was not by accident that I ended up working for Doc, as we all called him. Several years earlier, I had taken a class in apiculture taught by Dr. Tom Rinderer, then, one of Doc's Ph.D. students and now the head of the USDA-ARS bee research lab in Baton Rouge. Tom was an engaging teacher who stimulated my interest in bees so much that I decided to become a beekeeper and to return to school to pursue a degree in apiculture - Doc was my advisor. When I completed my degree, I leapt at the chance to work as his beekeeping technician.

I worked closely with Vic Thompson, Doc's colleague of nearly 25 years. Vic managed the bees, but after a couple of years of apprenticeship, he gradually turned that job over to me. I ran between 150 and 250 hives to support the lab's research programs. I remember Vic telling me one day that he had never used antibiotics for control or treatment of AFB or EFB. Vic kept the incidence of AFB below a half percent by using careful management techniques, and he was proud of that accomplishment. It was not that Vic was a purist who didn't believe in using chemicals. Far from it. We routinely used ethylene dibromide (EDB) for controlling wax moths, much to my dismay. No, Vic had figured out that he was best off managing diseases without chemicals.

Back then, AFB was the only big problem. Today, we have tracheal mites, *Varroa* mites and the small hive beetle, and chemicals play an essential role in the management of those problems. When you add it all up, we use chemicals for just about everything, including nosema, AFB, EFB, the tracheal and *Varroa* mites, the small hive beetle, and the wax moth. Problems have simply come upon us faster than we have been able to solve them, and we have become chemically dependent.

As I look at beekeeping today, I think back to my days with Vic and Doc at Ohio State. They were good beekeepers who limited their use of chemicals whenever possible. I think their success holds lessons for beekeepers today, even as we struggle to survive in a very different and more complicated world. So, let us get started by looking at how IPM

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The years 1984 and 1987 were watershed years in beekeeping. They marked a loss of innocence.

can help beekeeping remain a viable and competitive enterprise in the coming century.

JARGON

Every field of study comes complete with its own jargon, and IPM is no different. Therefore, if we are going to talk about developing and implementing IPM strategies for honey bee pests, we need to be familiar with a few basic terms. The key words for today are: integrated pest management, pest population density, economic injury level, LD50, chemical resistance, pest resistance, quality assurance, and sustainable.

Integrated pest management: an approach to managing pests that is based on the coordinated use of one or more methods and that seeks to minimize chemical inputs.

Pest population density: a measure of the size of the pest population relative to the size of the crop, in our case, bees; population density may be measured in terms of the number of mites per 300 adult bees, or the number of cells of chalkbrood per 100 cells of brood.

Economic injury level - EIL: the lowest pest population density that causes economic damage

LD50: the dose of a chemical that causes the death of 50% of a test population. LD50's are specific to the formulation being tested (pure chemical, dust, emulsifiable concentrate) and the route of entry (dermal, oral, inhalation). We can measure LD50's in terms of milligrams of chemical per kilogram of test organism, or mg/kg. A milligram is 1/1,000 of a gram. A kilogram is 1,000 grams. LD50's for highly toxic chemicals are measured in terms of micrograms of chemical per kilogram of test organism, or µg/kg. A µg is equal to 1/1,000,000 of a gram. LD50's can be measured in terms of µg/bee, although this is less precise. Toxicity is also measured in terms of LC50's and LT50's, reflecting the concentration of a chemical or the time of exposure to a specific dose or concentration of a chemical.

Chemical resistance: the ability of a strain of a species to tolerate or avoid factors that would prove fatal to or reduce the productivity of the majority of strains of that species. More narrowly, a condition in which a population of a pest species that has been exposed to a chemical has an LD50 for that chemical that is significantly higher than the corresponding LD50 in an unexposed population - the chemicals involved can be pesticides or antibiotics.

Pest resistance: the ability of a strain of a species to maintain productivity, relative to the majority of strains of that species, when infested with a pest.

Quality assurance: a systematic program for ensuring that all products conform to a well-defined set of quality standards.

Sustainable: a process that can be conducted indefinitely.

WHAT IS IPM?

The AFB management program I had learned at OSU was an example of a pest management concept called IPM, short for Integrated Pest Management. IPM is a philosophy for managing, not necessarily eliminating, agricultural pests so that the pest population density does not exceed the economic injury level. IPM programs originated in the 1950's in response to growing problems with environmental contamination, residues on crops, and an increasing number of cases of chemical resistance in pest populations. IPM programs grew steadily during the 1960's and 1970's, and the IPM concept serves as a model for pest management programs throughout agriculture.

IPM is not organic farming. Unlike organic farming, IPM incorporates synthetic chemical inputs for pest management when needed. However, IPM programs do seek to minimize chemical inputs. There are four very sound reasons for this. *First*, chemicals often have a negative impact on the environment. DDT is the classic example. Although not particularly toxic to humans, DDT proved to be environmentally persistent and highly toxic to many other species. *Second*, chemicals are expensive, and producers often realize a significant reduction in production costs by limiting their use. *Third*, chemical residues compromise the purity of the products produced, possibly rendering them unhealthy or undesirable in the market place. *Fourth*, chemical resistance develops at a slower rate when the pest population is exposed to pesticides or antibiotics less frequently, and that extends the useful life span of existing chemical controls.

IPM TREATMENT OPTIONS

IPM programs are able to reduce the use of chemicals because they employ a variety of other methods, depending on the crop. Below, I group these methods into several broad categories (after Luckmann and Metcalf 1982) and give a few examples of each. Some methods may fit into more than one group, but the categories serve to demonstrate the variety of methods available for pest management.

CHEMICAL inputs include, among others, antibiotics, pesticides, pheromones, attractants, repellants, sterilants, and growth inhibitors. Most of us are familiar with this group, especially the pesticides and antibiotics. Chemicals used in the bee industry include Apistan, Coumaphos, PDB, terramycin, grease patties, menthol, and Fumidil-B. Essential oils are a diverse group of natural plant chemicals that hold great promise for pest control.

Some chemicals are less well known. These are the pheromones and the allelochemicals. Insects use pheromones to communicate with other members of the same species. For example, bees use an alarm pheromone to recruit defenders. Pheromones are especially important in the mating process, and researchers have learned to use them in the management of agriculturally important pests. Pheromones may eventually play a role in the management of the small hive beetle and the wax moth. Allelochemicals are involved in communication between members of different species. One group of allelochemicals consists of compounds produced by bee larvae. These chemicals may be used by *Varroa* as cues for host location.

Allelochemicals may someday play a role in a *Varroa* trap.

CULTURAL methods include the use of crop rotation, pesticide rotation, variation in the timing of planting, fertilization, sanitation, and the planting of trap crops. Several studies have documented that the timing of an application of pesticide can have a major impact on mite populations (Delaplane and Hood 1997). Management techniques that reduce stress make up another large group of cultural methods that can provide a solid foundation for healthy colonies.

PHYSICAL methods include the use of heat, cold, humidity, light, and sound. Beekeepers have tried heat for mite control, but without much success. Beekeepers routinely use cold temperatures to kill wax moth eggs in comb honey.

MECHANICAL methods include hand destruction, barriers, and traps. Beekeepers use many types of barriers for control of skunks, ants, bears and wax moths.

BIOLOGICAL methods include beneficial insects and various pathogens. Everybody is familiar with ladybugs, one of 'the other beneficial insects' used for control of many pest species. Many farmers also use small wasps called parasitoids for fly control and these creatures might also be developed to control wax moths and the small hive beetle.

GENETIC methods include the release of sterile or incompatible individuals and the development of pest resistant stocks. The genetic solution is most desired; yet, it remains the most elusive. Rothenbuhler (1964) demonstrated that AFB resistance was a selectable trait. Recently, Prof. Marla Spivak, at the University of Minnesota, has selected for hygienic bees and improved the technique for identifying hygienic bees (Spivak and Downey 1998). The USDA-ARS lab in Baton Rouge is conducting promising work on mite resistance (Harbo and Hoopingarner 1997). Pest resistant stocks will play a major role in the future of beekeeping. On the horizon are modern molecular techniques that may help to identify desirable genotypes in the laboratory.

REGULATORY efforts include import restrictions, quarantines, eradication and suppression. Regulatory efforts have played an important, if often controversial role, in reducing the rate *at which pests have spread between countries and throughout countries.* Currently, Canada has restricted the import of U.S. bees to prevent varroa mites, Apistan resistant *Varroa* mites and the small hive beetle from entering the country. Some states in the U.S. have restricted the importation of bees to control the small hive beetle.

Pesticides in the absence of a rational pattern of pesticide use cannot and will not provide a sustainable solution to any pest problem.

IPM - WHY NOW?

Historically, beekeepers have not had to deal with many of the realities of modern agricultural life. Before 1984, AFB was the only serious threat to bees, and it was largely controlled by the use of terramycin, rigorous inspection programs, and hygienic management practices. The years 1984 and 1987 were watershed years in beekeeping. They marked a loss of innocence. The arrival of the parasitic mites accompanied by the emergence of a suite of disease causing pathogens propelled beekeeping into the world of modern agriculture. The recent arrival of the small hive beetle, the development of chemically resistant mites and pathogens, and the globalization of the honey market completed this transition. Like it or not, we can not go home again.

A discussion of IPM is important at anytime because it always represents the best long-term approach to the problem of pest management. It is especially important today because of the crisis in mite control, a crisis that was completely predictable from an examination of the history of chemical control of pests in other crop systems. There are five stages common to most crop systems (after Smith 1969):

1. The subsistence phase is characterized by low yields, a poor understanding of the crop system, and limited efforts in pest management. This phase characterizes beekeeping before the discovery of the bee space and the introduction of the Langstroth hive in 1851.
2. The exploitation phase is characterized by an increasing understanding of the crop system, better management, success with chemical controls, increased yields and the development of new markets. This phase corresponds to beekeeping between 1851 and 1997.
3. The crisis phase occurs after many years of chemical dependency. Resistance develops in the pest populations, growers substitute new chemicals for old ones, and the process is repeated. This is where we find ourselves today.
4. The disaster phase is characterized by the need for repeated applications of chemicals for pest control. Two or more chemicals may be required for control. The cost of pesticides increases production costs to a point where the crop can not be profitably grown. Pesticide residues increase to unacceptable levels, and eventually, the pest control program collapses with accompanying bankruptcies and social displacement. This seems to be where we are headed.
5. The integrated pest management phase is characterized by the coordination of multiple tactics that keep the pest population below the economic injury level. The IPM phase can only be achieved after research has first, produced a thorough understanding of the pest's biology and second, developed multiple techniques for effectively and reliably manipulating the pest population. This is where we need to be.

Sound familiar? Whether we can get to the integrated pest management phase without going through the disaster phase is uncertain. However, beekeepers should not fool themselves into believing that 'if we just had one more chemical, everything would be alright.' Pesticides in the absence of a rational pattern of pesticide use cannot and will not

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provide a sustainable solution to any pest problem.

PROSPECTIVE

As you will see in the articles to follow, many of the practices you are using right now qualify as IPM practices. As I wrote this article, I asked myself how beekeepers would benefit by attaching a name to their pest management program. I believe that there is a lot to gain. IPM provides an important theme to pest management. Viewing your pest management from an IPM perspective enables you to move from a series of often disconnected acts, to an organized system of pest management that is always in search of new ways to reduce the use of chemicals. IPM requires you to evaluate each management decision in terms of its impact on the health of your bees and your use of chemicals. IPM can help you to achieve your pest management goals, minimizing the use of chemicals in the short run maximizing the useful life span of those chemicals in the long run. Finally, by de-emphasizing the use of chemicals, IPM minimizes residues and ensures that your hive products continue to be of the highest quality possible.

IPM will not mean the same thing for all beekeepers. Some beekeepers run a few colonies, others a few hundred colonies, and others many thousands. Some techniques are compatible with small to mid-sized operations, but not with larger operations. Consequently, different beekeepers will need to adopt different IPM programs. For the hobbyist who does not want to use chemicals, drone trapping may suffice as a mite management tool. For the commercial beekeeper, IPM for *Varroa* may be as simple as using available chemicals only when needed and only according to label instructions. Tomorrow, new techniques will allow you to reduce the number of chemical treatments, in some cases allowing you to eliminate them altogether.

I hope the articles that follow will help you to manage better the pests that attack your bees. In the next article, I start with the basics, based on the adage that 'an ounce of prevention is worth a pound of cure'. Honey bee colonies are living, breathing creatures. They thrive in some environments and become sick in others. Never forget that your management system, from top to bottom, IS the bee's environment. You can help your bees by making sure that you do everything possible to provide them with an environment that promotes their health and well being. IPM does not yet have all of the answers, but it does provide an important conceptual foundation upon which to build our pest management programs. BC

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REFERENCES

Luckmann WH and RL Metcalf. 1982. *The Pest-Management Concept.* In Introduction to Insect Pest Management 2nd edition (RL Metcalf and WH Luckmann editors) John Wiley and Sons, NY

Smith RF. 1969. *The new and the old in pest control. Proc. Acad. Nazion. Lincei, Rome (1968) 366: 21-30*

Delaplane KS and WM Hood. 1997. Effects of delayed acaricide treatment in honey bee colonies parasitized by Varroa jacobsoni *and a late-season treatment threshold for the south-eastern USA.* J Apic Res 36: 125-132

Ellis MD and FP Baxendale. 1997. *Toxicity of seven monoterpenoids to tracheal mites* (Acari: Tarsonemidae) *and their honey bee* (Hymenoptera: Apidae) *hosts when applied as fumigants.* J Econ Entomol 90: 1087-1091.

Harbo JR and RA Hoopingarner. 1997. *Honey bees* (Hymenoptera: Apidae) *in the United States that express resistance to* Varroa jacobsoni (Mesostigmata: Varroidae). J Econ Entomol 90: 893-898.

Spivak M and DL Downey 1998. Field assays for hygienic behaviour in honey bees (Hymenoptera: Apidae). *J Econ Entomol 91: 64-70.*

Rothenbuhler WC. 1964. *Behavior genetics of nest cleaning in honey bees IV. Response of F1 and backcross generations to diasease-killed brood.* Am Zool 4:111-123

What's New In Florida

From the Epicenter of Beekeeping News

Roger Morse

On Saturday, February 13, nearly 80 beekeepers and their wives meet at the Archbold Biological Station near Lake Placid, Florida for a day-long meeting on current events. Some of the news is as follows:

There is building evidence that honey bee colonies in many parts of the country have *Varroa* resistant to fluvalinate (Apistan); however, resistance is not yet everywhere. This means many beekeepers can continue to use Apistan strips and expect good success but you must know your local situation. Learning how to measure the *Varroa* population in your hives using an ether roll or some other method, is increasingly important.

Dr. Patti Elzen, with the USDA bee group in Weslaco, Texas, stated that "fluvalinate resistance is not a stable trait." What this means is that if bees are switched to another material for *Varroa* mite control, and fluvalinate is not used, then over a period of a few years the mites will lose their resistance to fluvalinate, and it may sometime be used again for *Varroa* control. How long a period of time is involved so that we might have maximum effectiveness in this regard is being researched.

Laurence Cutts, who is in charge of apiary inspection in Florida, preached on the subject of chemical control of mites. A Section 18 has been approved for Florida so that beekeepers in that state can use Coumaphos strips for *Varroa* control. Several other states have or are seeking Section 18 approval. (This is a matter that must be done on a state-by-state basis according to existing regulations.) However, the chemical is approved for nonfood use only, and if any residue is found in honey the Section 18 registration will be withdrawn. The active ingredient in Coumaphos is not people friendly as is the active ingredient in Apistan. Cutts explained that if properly used, Coumaphos is a safe material for use in beehives. Label instructions must be followed closely.

To be most effective, all beekeepers should rotate the chemicals that are used for *Varroa* mite control at the same time so that when mixing bees occurs, they will all be on the same treatment schedule. This will be especially important for migratory beekeepers who are constantly mixing colonies and apiaries as they move from one area to another. There was some heated discussion regarding how the rotation might be controlled, but no agreement was reached. This is a matter that needs attention from everyone who keeps bees. The rotation of chemicals needed to control *Varroa* mites countrywide will no doubt be discussed at length at bee meetings this Spring and Summer.

Treatment for *Varroa*, of course, is done in the brood nest and because these combs become contaminated with whatever is used for *Varroa* control they must be kept separate from honey storage combs. This fact is objectionable to many beekeepers, myself included. Many of us have always interchanged brood nest and honey storage frames. But we must learn to not do so, and this is a fact we must learn to live with. The precise times when the treatments should be made in each state will be indicated, and again, instructions in this regard must be followed. At the same time we must learn to keep cappings wax separate from brood comb wax, as wax is easily contaminated by chemicals.

Florida state apiary inspectors are under instructions to report violations in the use of chemical control for *Varroa* and any other pests that they find in their state. There will be no exemptions. No doubt other states that have Coumaphos Section 18 exemptions will follow the same path. Like it or not, beekeepers are on a chemical control treatment because of the introduced *Varroa*, and the rules for the use of chemicals in food must be followed. All of this, of course, is good reason for stepping up our search for alternate methods of *Varroa* control.

Small hive beetles were discussed at length, and I learned much about them myself. These beetles now infest four states: Florida, Georgia, South Carolina and North Carolina. There is little doubt that they will be found elsewhere this Summer. They are another accidentally introduced pest we do not need. It is not clear how far north they can survive the Winter, but they have been found in bees on high mountains in South Africa from which country they were probably introduced.

Coumaphos is effective for small hive beetle control only when the temperature is warm (above 70°F) and the beetles are moving around the hives. When the weather is cool the beetles move into the brood nest where they are much less mobile and do not come into contact with the Coumaphos. The best control is to place parts of a Coumaphos strip under a piece of cardboard on the bottomboard. The beetles like to congregate under the cardboard, and when they do so they come into contact with the chemical. There is one problem, and that is the bees will chew the cardboard away; pieces of plastic may work better.

When honey is harvested from colonies infested with small hive beetles it must be extracted the next day or the beetles will eat the honey and destroy that which they do not eat. As many as 8,000 beetles were counted in one hive in Florida, and many escaped from that hive before they could be counted. These beetles multiply at a tremendous rate. Laurence Cutts advises migratory beekeepers to apply a seven-day

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More On The SMALL HIVE BEETLE

Small hive beetles, *Aethina tumida*, are apparently natives of South Africa and were discovered in Florida in June of 1998. Dr. Shimanuki stated that "there is a small question" as regards the relatedness of the beetle we have and that in South Africa. The DNA of the two are being examined.

James Baxter, with the USDA laboratory in Weslaco, Texas, spoke at the Florida meeting about small hive beetle biology and control. The beetle eggs are laid in the hive. The eggs hatch in one to three days, and the larvae, which are scavengers, feed on debris in the bottom of the hive, brood and honey in about that order. Interestingly, they do not appear to be too interested in pollen. The larval stage is seven to 15 days long. When the larvae are mature they move out of the hive entrance and into the ground, where they pupate. It is not clear how long they remain in the pupal stage. Florida's sandy soil appears ideal for pupation, but how soil type may affect pupation is not clear. When the adults emerge, and this is probably temperature controlled, they move back into the hive. It appears that the adult beetles cannot stand as much cold weather as can the larvae. There are no data as regards how far these beetles might fly, but presumably it is a considerable distance.

Baxter reported that the USDA has developed a trap that is effective as a survey tool in searching for beetles. The trap, which is a metal can with four two-inch diameter holes near the top, is baited with honey, pollen and about 50 live bees.

Coumaphos treatment before they go north. There is also one chemical that has been approved for use as a soil drench to kill the larvae that move into the ground in front of the hives to pupate.

Small hive beetles are a nuisance in stored combs, but they can be fumigated with already approved materials. It is heavy infestations in the hives that are most difficult to control. No one mentioned whether or not hobby beekeepers might eliminate small hive beetles in stored combs by placing them in a freezer as we do for wax moth control. I understand this has been researched, but nothing has yet been published on the subject.

Dr. Shimanuki of the USDA in Beltsville, Maryland, mentioned that one place to look for small hive beetles is on the tops of frames just under the inner cover. Depending upon how or by whom the equipment was built, the space just under the inner cover often does not have a full bee space. As a result the space is not used by bees and is a place the beetles like to congregate.

Shimanuki reminded the audience that there were still a number of honey bee pests, predators and diseases from abroad that threaten our country's bees. Vigilance in guarding our borders against invasion from more of these unwanted problems is still of great importance. Shimanuki brought with him a sample of a bottomboard over which there is a piece of eight-mesh hardware cloth. This bottomboard screen is undergoing testing in Beltsville, and may be useful in reducing the number of *Varroa* and small hive beetles in a colony. Apparently a number of *Varroa* mites and beetles fall to the bottom of a hive and then crawl back into the brood nest. It is not clear why these creatures fall onto the bottomboard, but perhaps it is a result of honey bee grooming. Whatever their origin, it would be useful if they could be trapped and removed. Dr. Shimanuki also mentioned that formic acid treatments for *Varroa* control had not yet been given full tests by beekeepers. He pointed out that no one had ever found mites resistant to formic acid. Formic acid gel will soon be marketed. It has been granted a Section 3, General Use Registration, for mite control.

I was interested to learn that American foulbrood, which was once considered the most serious of honey bee diseases and pests in the U.S., is now found in only one-fifth of 1% of FL colonies. I spoke to Laurence Cutts about this after the meeting. He told me that he thought that the loss of feral colonies, those living in trees and buildings, along with there being many fewer hobby beekeepers, has wiped out a reservoir that once harbored a number of diseased colonies.

Professors Tom Sanford from the University of Florida and Nick Calderone of Cornell University spoke about pesticide use and misuse. This included a lengthy discussion of Integrated Pest Management. This system blends natural and biological control of pests, together with the minimum use of man-made chemical controls, and seeks to take advantage of the best of both.

Several speakers emphasized that reducing stress on colonies helped the bees to facilitate natural control of pests, predators and diseases. I suspect that there will be considerable discussion of this point this Summer, too. Not much detail was given, but things like using good hive stands and keeping colony bottomboards dry are important insofar as removing stress on a colony is concerned.

The American Beekeeping Federation was represented by its president, David Hackenberg and the U.S. Beekeepers by their president, Jerry Stroope. There are considerable differences in the philosophies of the two groups regarding the operation of the National Honey Board, and these were discussed, but the overwhelming interest in the meeting was bee disease control. BC

Topsfield Fair

America's Oldest
Founded 1818

Pictures

Competition and Education

by Kim Flottum

There are three divisionsin the competitive contests: 1) Comb Honey; cremed, chunk and liquid honey; Fancy containers and gift packs; Feature displays; Beeswax and Beeswax candles; Educational exhibits; Beer, Mead, Liquor; Antiques, collections and honey pots; Staffed exhibits. 2) Pies and Puddings; Cakes; Sweet yeast bread; Non-sweet yeast bread; Quick bread; Cookies and bars; Jellies and jams; Condiments; Honey candy; Home canning; Low-cal. 3) Art; Wood/Metal crafts; Needle-work; Paper/Other crafts; Ornamental art; Other crafts.

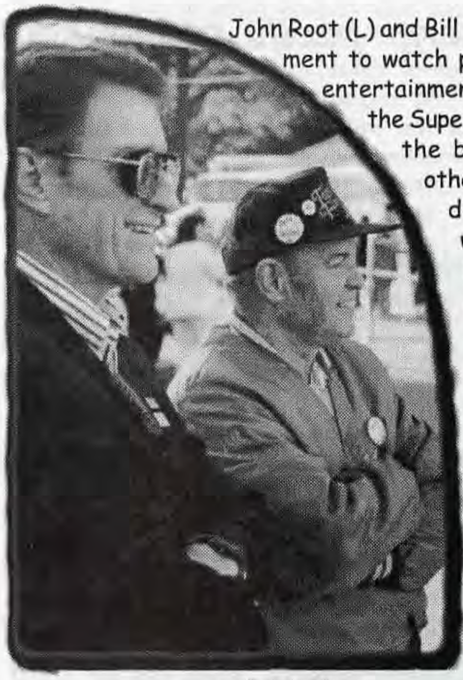
Generally, prizes awarded are 1st - $15, 2nd - $10, 3rd - $5, but there are exceptions (higher and lower). There are awards in each section over and above the financial prize. These include plaques, trophies, ribbons etc. For Divisions 1-14 special awards (1 is the Silver Hive Tool, from *Bee Culture*, for the best frame of honey); Division 2 has 4 awards; Division 3 has 4 awards.

Rules and regulations are even more stringent than those for selling honey and are spelled out in six and a half pages of the Fair's 116-page Exhibitor's Handbook. Exhibits of display types (not the strictly competitive entries) must promote the theme of the current year's fair, or another theme chosen by the Supervisor. This precludes entering the same item(s) two years in a row.

The sales booth. Lots of exposure area, going around a bend, and a corner. It takes 3, sometimes 4 people to staff the booth. Everything they sell is on display, educational signs hang on the wall in the back and prices are prominently displayed. The mural above the booth was done by a member, showing where other members live.

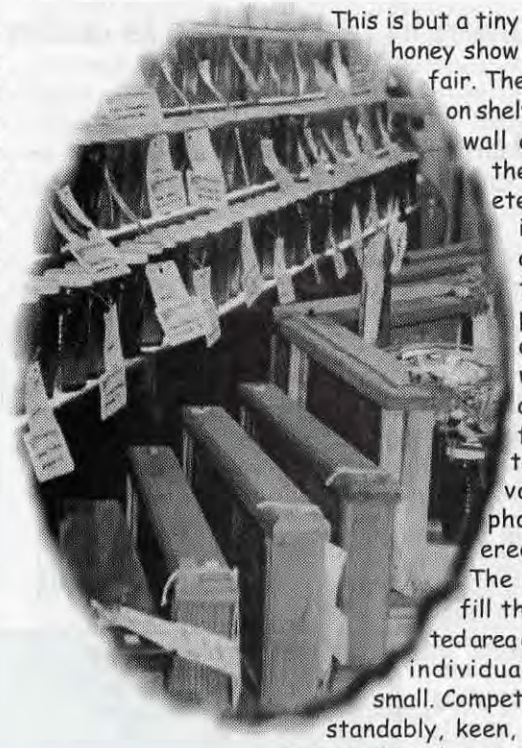
The candle display on the sales counter. Note that the packaging is well done and consistent. Each is labeled with the same label, the price tag is prominently, but not obtrusively displayed and the display is full. A full display, whether candles, honey or whatever, produces a feeling of confidence in the customer, and always leads to increased sales.

From The Fair



John Root (L) and Bill Wiley pause a moment to watch part of the fair's entertainment pass by. Bill is the Supervisor in Charge of the bee building, and other sections of fair displays. John, his wife Elisabeth and I visited the fair for two days last year.

The four observation hives are a constant draw for nearly everyone attending the fair, and absolutely everyone who enters the building. Hives are placed back from the railing, which can be leaned on, and a step is in front of each for the little people who visit. Each hive has a full time person on guard, explaining, explaining, explaining. "This job is," said one of the workers, "the most demanding, and the most rewarding thing I do all year." As mentioned before, staffing for each shift has an educational priority - hives before sales.



This is but a tiny portion of the honey show display at the fair. The displays were on shelves against the wall around nearly the entire perimeter of the building. Observers are kept away from the displays by a moveable fence, which consists of a 2' x 4' frame, finished top (see observation hive photo), and covered with burlap. The many displays fill the entire allotted area even though the individual spaces are small. Competition is, understandably, keen, for the prize money and trophies available.

Next to the observation hives, the candle rolling area is the most attractive. With space for 3 people at once, visitors can, for 50¢, or a $1.00 roll a 1 or 2 color candle. They choose the colors and the helper behind the table gets the wick started. It takes about 3-5 minutes per person, and there's a line waiting almost all the time. Wax triangles and wick are precut and ready to go.

So, What's In A Name?

Our common honey bee is called that for very specific reasons.

Richard Bonney

Beekeepers sometimes seem to lose sight of the fact that their honey bees are insects. Perhaps this relates to the popular conception that insects are unpleasant, stinging, biting, disease carrying, thoroughly nasty little creatures that no one wants around. Well, yes, some of them are, but many, most actually, are not. The fact is, honey bees are insects and we want them around. Our motivations are various – as a source of honey, pollen, or wax, or to pollinate our gardens and crops, or simply for the pleasure of watching them work. But to understand our bees-their origins, their activities, their behavior-we must recognize that they are insects, and we must interpret them as such. A starting place for this understanding comes from a knowledge of insect names-how and why do some of these names come about? Briefly stated, the names have come about from necessity. We cannot talk about something (e.g. a plant, an animal) until we have positively identified that something, and the more somethings there are, the more difficult the identification.

CLASSIFICATION	NAME	INCLUDED
Kingdom	Animal	All living creatures not categorized as plants
Phylum	Arthropoda	Invertebrate animals - insects, arachnids, crustaceans
Class	Insecta	True insects
Order	Hymenoptera	Wasps, bees, ants
Superfamily	Apoidea	Bees, about 20,000 species worldwide
Family	Apidae	Honey bees, bumble bees, orchid bees
Genus	Apis	Honey bees, one species in U.S., six species worldwide.
Species	mellifera	Western or European honey bee

An abbreviated version of the hierarchy within which insects are classified, using as an example "our" honey bee, the commonly named Western (or European) honey bee.

Insects are the most numerous group of animals on earth. This statement is true whether we are talking about the number of different kinds (species) or about sheer numbers of insects. Almost one million different species have been described and named by scientists, with the total number of species in existence estimated by various authorities to be anywhere between two million and 30 million. The total of individual insects is so large that they cannot be counted meaningfully.

For most of us these numbers have little practical meaning. We deal with insects in relatively small numbers, whether it be in the home, the garden, or as we are out and about our daily business. However, hundreds and thousands of these insects affect us in various ways, both positively and negatively, and in order to identify particular ones, we must have a way to name them that has consistent and universal meaning. We can talk about bees with our fellow beekeepers and generally know that we are talking about honey bees, the hive bees that we keep. If we want to be more specific, though, we may say Italians, or Caucasians, or Carniolans, or some one of the several other common names used to describe particular races or strains of honey bees. In the United States, when we use such terminology, each of us usually knows to what bee the other is referring. However, once we cross international borders, and especially as we move between languages and continents, we must have a more specific name to put on each different race or strain of bee (or other living thing.)

To put this all in perspective, consider that in the world there are at least 20,000 different species of bees. In North America we have perhaps 3500 species, and in almost any state in the United States there are between two and three hundred different species. (Our honey bee is but one of these species.) How do we keep all of these bees in order? How can we be sure that each of us means the same insect when we refer to a particular one? We use a universally accepted system of scientific or binomial nomenclature.

Over 250 years ago, a Swedish botanist, Carolus Linnaeus, recognized this problem of uniquely identifying living things, both plant and animal. He proposed a system of binomial nomenclature that was quickly accepted by the world scientific community. Over the years this system has evolved into a form wherein each insect is identified within a fifteen step breakdown starting at the Kingdom - plant or animal - and proceeding to the specific - species or sub-species.

Linnaeus' original system was not this complex. It had fewer levels, but as more and more insects were discovered over the years, more levels of identification were deemed necessary, hence the present fifteen. (However, all fifteen levels are not always used.) Insects and other living things identified within this system have a two part scientific name, and may or may not have a "common" name as well. In fact, they may have two or more common names. It was this possible plurality of common names that brought about the need for a universally accepted scientific system so that every plant or animal could be named uniquely.

Whenever we discuss a particular insect within a "scientific" context, we use its unique scientific name, that is, the genus and species. When we speak of our Western honey bee then, we say *Apis mellifera*, and the preceding steps of the hierarchy are assumed. Latin is the language of the binomial system, with an admixture of Greek, since these were the universal languages of educated men in Linnaeus' time. The rules for naming all plants and animals are now firmly fixed by international agreement within the scientific community and have a definite form. The genus name should be a noun and is always capitalized. The species (and subspecies) name is usually an adjective, although it is sometimes a noun. In this latter case the word is Latinized-that is, it is given a Latin ending. The species name is never capitalized, even though it might be a proper name of a person or place. Both names are either italicized or underlined. In a strict use of the scientific name, the individual who actually named the insect, along with the date (year) of that naming, may also be added.

Latin is no longer routinely taught to most of us, but it continues to be the basis of the binomial system, and the terms are usually descriptive. The genus name is usually the Latin name or word for what is being described. For instance, *apis*, in Latin, means bee. The species name, *mellifera*, is derived from the Latin *mel* meaning honey, and *fer* meaning one that bears-hence *Apis mellifera*, the honey-bearing bee.

Another example is one of the several wasps known as the yellowjacket, *Vespula maculifrons*. The genus name is derived from *vespa*, the Latin name for wasp, and the species is a combination of macula meaning spot or blotch, and frons meaning front. This name is understandable to anyone who has looked closely and head-on at the yellow-marked face of this particular yellowjacket.

Many people believe that laymen should ignore scientific names, that their use is unnecessary and elitist. Granted, when we say honey bee to another beekeeper there is seldom a question as to which insect we refer. However, in southeast Asia at least five other species of honey bees may be found. For some of these species we have English common names, and we must assume that each country in which they are found has its own common names. Scientific names allow us to identify each species positively.

As a further example, in North America we have more than forty different species of bumble bees. Although many of them have common names, these names tend to be unwieldy and seldom used. It takes a magnifier, an insect identification key, and a careful in-hand examination of a bumble bee to be sure of the species, so why bother to learn such appellations as the brown-patched bumble bee (*Bombus affinis*) or the yellow-notched bumble bee (*Bombus impatiens*). We just call them all bumble bees, and if we need to be more specific the scientific names are easily learned. Actually, more beekeepers are learning about bumble bees. Identifying and naming these insects has become more important in recent years as certain of the species are being raised and managed commercially for pollination of crops.

As we discuss insect naming, we might look also at the structure of the common names. You perhaps have noticed that in most writings, "honey bee" is two words, while "yellowjacket" is one word. This is deliberate, and follows a recommendation of the Entomological Society of America that if a two-part insect common name is used that is systematically correct, that is, it describes the insect properly, it shall be written as two words. Hence, honey bee, an actual bee that bears or makes honey is two words. The yellowjacket, although yellow, is not a jacket but a wasp, so it is one word. Following this logic you can see why other insect names are formed as they are-bumble bee, house fly, butterfly, stonefly, leafroller.

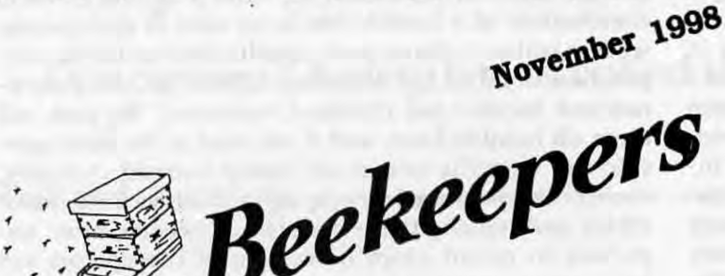
Whether we are dealing with the common or the scientific, insect names are interesting in themselves. Perhaps this is an area you would like to investigate. For instance, our honey bee, *Apis mellifera*, was once named *Apis mellifica*. In the species name, the derivation of *mel* has already been mentioned-it comes from the Latin for honey – while *fica* apparently comes from the Latin for make or making. The original species name of the honey bee, then, was honey maker. Why and when was it changed to honey bearer?

For those of you who are interested in the origin and derivation of scientific names, specialized books do exist in larger libraries. However, we don't have to have these books to get started. A dictionary can be a good starting place. For instance, when talking of bumble bees, where does the name Bombus come from? Looking in Webster's Ninth New Collegiate Dictionary, we don't find bombus but we do find bomb, the explosive device. As a part of the definition for bomb we discover that the word was derived from the Latin word bombus meaning a deep, hollow sound. Most bumble bees certainly can be said to make a deep, hollow sound as they fly, so we can make a reasonable assumption as to the derivation of the genus name.

Dig around in the dictionary. What else can you find? Look at possible derivations for polistinae, the family name for a group of social wasps, or pompilus, the genus name of a particularly colorful solitary wasp, or xylocopa, the genus name for the carpenter bee. The derivation of each is at least partially obvious. Scientific names are not the total mystery that they may first appear. BC

Richard Bonney is the author of several beekeeping books and a regular contributor to these pages.

And The Winners Are . . .



Our first-ever Newsletter contest was a huge success, at least from the perspective of our judges. Over 30 entries came in and quite frankly all of them were good. Of course you seldom see the family station wagon entered in the Indy 500.

We're going to examine Newsletters and all of the winners in depth next month, but first we'd like to give you some idea of how all these entries were judged.

Thirty-three criteria were considered for each entry. Thirty of them were 'yes' or 'no' answers – if an entry had a particular attribute it was awarded points, if not no points were awarded. Only three of the criteria were subjective, and certainly the most difficult.

CRITERIA

There were instructions to be followed for each entry. We deducted points if they weren't followed – simple things like who to contact, were they stapled together and labeled, the correct number of issues submitted, phone numbers, and a sheet with background information. Rules, you know.

Then there was content. We awarded points for next meeting information – date, time, place and topic were very important, while reports from the officers, new and educational information, though important are a function of budget and had less value.

We also put a value on how easy it was to get ahold of somebody in the organization. Surprisingly, many, too many actually, newsletters are not identified on the outside, and no contacts are listed on the inside. Incredible! None of the winners or runners-up had this problem however.

The final series of points focused on Esthetics – Format: was it comfortable and easy to read – not too busy, paragraphs, headers and the like. Reproduction: even the most expensive process can be poorly done, and the least expensive very well done. And finally, Appearance: This was the most subjective of all – how did it look: This came down to a gut call on the part of the judges. But, since it was so subjective we limited the numbers of points for this.

When it was all added up, from all the judges, there was a possible 329 points.

And now, the winners . . .

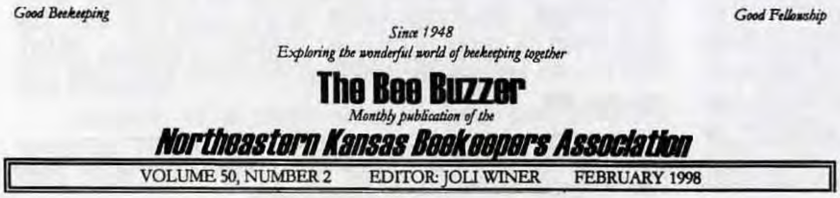
First Place: The Newsletter of the Rhode Island Beekeepers Association. Editor, Bernard Bieder. 265 points. $200.

Second Place: New Jersey Beekeepers Association News. Editor, Jim Puvel. 259 points. $100.

Third Place: The Northeastern Kansas Beekeepers Association – The Bee Buzzer. Editor, Joli Winer. 257 points. $50.

Note that only eight points, from a total of 329 points separate first from third. Also, three of the top five high scores were from local or county associations, not large, big-budget state groups.

Next month we'll examine these winners, and give some hints on how your newsletter, next year, can win first place! BC



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 • Effective March 1, 1999

● HIVES & HIVE PARTS

CAT. NO.	PKG.	DESCRIPTION	RETAIL	SHIPPING WEIGHT
A1	**C/1**	**Standard Hive** (Includes B12, C1F, B1)	**$77.00**	**28 lbs.**
A2	**C/5**	**Standard Hives**	**320.00**	**140 lbs.**
A12	**C/1**	**Beginner Outfit** (Includes A1, H13, H8B, N11, N6, N81,O2, X84, N26)	**155.00**	**42 lbs.**
B1	C/1	Metal Cover w/inner	34.50	12 lbs.
B1A	**C/1**	**Metal Cover ONLY**	**22.00**	**9 lbs.**
B2	C/5	Met. Covers w/inner	138.00	51 lbs.
B8	C/1	Inner Cover only	13.25	3 lbs.
B9	C/5	Inner Covers only	53.65	12 lbs.
B10	**C/1**	**Vent. Escape Board**	**12.00**	**2 lbs.**
B12	**C/1**	**Bottom Board**	**14.00**	**7 lbs.**
B13	**C/5**	**Bottom Boards**	**59.50**	**30 lbs.**
B18	C/1	Entrance Reducer	1.50	call
B14	**C/1**	**Slatted Rack**	**10.50**	**4 lbs.**
B20	C/1	Observation Hive	70.00	10 lbs
B25	C/1	Hive Stand	10.50	4 lbs.
B37	C/1	Wood Bound Excl.	11.00	3 lbs.
B38	C/10	Wood Bound Excl.	100.00	26 lbs.
O67	C/1	1 Gallon Wood Guard Preservative	30.00	10 lbs.

● SUPERS, FRAMES & FOUNDATION

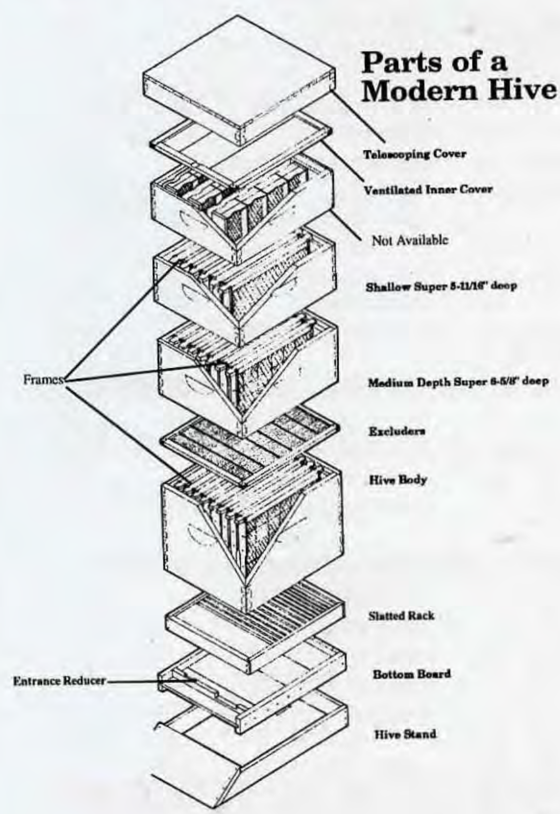
CAT. NO.	PKG.	DESCRIPTION	RETAIL	SHIPPING WEIGHT
C1	**C/1**	**Deep Hive Body, Empty**	**19.95**	**12 lbs.**
C1F	**C/1**	**Deep Hive Body w/Fr.**	**36.00**	**18 lbs.**
C2	**C/5**	**Deep Hive Bodies, Empty**	**80.00**	**43 lbs.**
G14	C/10	9-1/8 Frames	17.00	5 lbs.
G15	C/50	9-1/8 Frames	58.50	24 lbs.
G16	C/100	9-1/8 Frames	107.50	45 lbs.
H8B	C/10	Deep Wired Fnd.	13.35	2 lbs.
H11B	C/50	Deep Wired Fnd.	63.75	8 lbs.
H21	C/10	Deep Medium Brood Fnd.	11.20	2 lbs.
H23	C/50	Deep Medium Brood Fnd.	52.10	8 lbs.
B50	C/10	Frame Supports	2.50	1 lb.
G50	C/100	Wedges for Top Bar	15.75	2 lbs.
C19	**C/1**	**6-5/8 Super w/Frames**	**30.80**	**11 lbs.**
C20	**C/5**	**6-5/8 Supers, Empty**	**64.20**	**31 lbs.**
C21	**C/1**	**6-5/8 Super, Empty**	**14.50**	**7 lbs.**
G45	C/10	6-1/4 Frames	16.50	5 lbs.
G46	C/50	6-1/4 Frames	58.00	23 lbs.
G47	C/100	6-1/4 Frames	102.10	39 lbs.
B57	C/1	Spacers	.50	1 lb.
G50	C/100	Wedges for Top Bar	15.75	2 lbs.
H60	C/10	Medium Wired Fnd.	9.65	2 lbs.
H61	C/50	Medium Wired Fnd.	38.95	7 lbs.
C12	**C/1**	**5--11/16 Super, Empty**	**13.20**	**6 lbs.**
C13	**C/5**	**5-11/16 Supers, Empty**	**58.00**	**26 lbs.**
C17	**C/1**	**5-11/16 Super w/Frames**	**28.95**	**9 lbs.**
G24	C/10	5-3/8 Frames	16.00	4 lbs.
G27	C/50	5-3/8 Frames	56.00	21 lbs.
G28	C/100	5-3/8 Frames	99.75	37 lbs.
B57	C/1	Spacers	.50	1 lb.
G50	C/100	Wedges for Top Bar	15.75	2 lbs.
H27	C/10	Shallow Med. Brood Fnd.	7.40	2 lbs.
H29	C/50	Shallow Med. Brood Fnd.	30.75	5 lbs.
H50	C/10	Shallow Wired Fnd.	9.00	2 lbs.
H51	C/50	Shallow Wired Fnd.	39.25	6 lbs.

● UNCAPPING KNIVES

CAT. NO.	PKG.	DESCRIPTION	RETAIL	SHIPPING WEIGHT
N36	C/1	Plain Knife 10 X 2"	33.00	2 lbs.
N37A	C/1	Economy Electric Knife	88.00	3 lbs.
N38	C/1	Master Electric Knife	94.00	3 lbs.
N92	C/1	Cappings Scratcher	12.00	1 lb.

● STRAINERS & EXTRACTORS

CAT. NO.	PKG.	DESCRIPTION	RETAIL	SHIPPING WEIGHT
M62	C/1	Plastic Uncapping Tub	136.00	18 lbs.
M26B	C/1	Cheese Cloth	6.00	1 lb.
M26C	C/1	Nylon Strainer Cloth	8.00	1 lb.
M28	C/1	Filter Sock 150 mesh	12.25	1 lb.
L23	C/1	3/6 Frame Extr., hand	419.00	65 lbs.
L24	C/1	3/6 Frame Extr., pow.	600.00	65 lbs.
O62	C/1	14-1/2 oz. Grease Cart.	7.50	1 lb.
O63	C/1	Epoxy Tank Coating	16.50	3 lbs.



● VEILS, SUITS, COVERALLS & GLOVES

CAT. NO.	PKG.	DESCRIPTION	RETAIL	SHIPPING WEIGHT
N11	C/1	Alexander Veil (No Helmet Required)	18.50	1 lb.
N10	C/1	Indestructible Veil	19.00	1 lb.
N12	C/1	Delphos Steel Veil	22.00	1 lb.
N16A	C/1	White Ventilated Helmet	13.50	1 lb.
N16C	C/1	White Plastic Helmet	13.00	2 lb.
N20	C/1	Replace. Zipper Veil	22.00	1 lb.
N19	C/1	Coveralls w/veil (All sizes)	84.00	5 lbs.
N95	C/1	Coveralls (All sizes)	52.00	4 lbs.
N95 (XL)	C/1	Coveralls (XL)	52.00	4 lbs.
N98	PR	Leg Straps	4.00	1 lb.
N21	PR	Med. Soft Leather Glove	18.00	1 lb.
N22	PR	Large Soft Leather Glove	18.00	1 lb.
N22X	PR	XL Soft Leather Glove	18.00	1 lb.
N25A	PR	Small Vinyl Impreg. Glove	14.00	1 lb.
N25	PR	Med. Vinyl Impreg. Glove	14.00	1 lb.
N26	PR	Large Vinyl Impreg. Glove	14.00	1 lb.

● SMOKERS

CAT. NO.	PKG.	DESCRIPTION	RETAIL	SHIPPING WEIGHT
N4	C/1	4 x 10 Giant SS Smoker w/shield	40.00	3 lbs.
N6	C/1	4 x 7 Stainless Smoker w/shield	38.00	3 lbs.
N9A	C/1	4" Fire Chamber	1.15	1 lb.

● WIRING and EMBEDDING TOOLS

CAT. NO.	PKG.	DESCRIPTION	RETAIL	SHIPPING WEIGHT
G62	C/1	1/2 lb. Frame Wire	7.00	1 lb.
G63	C/1	1 lb. Frame Wire	10.00	2 lbs.
G64	C/1	5 lb. Frame Wire	24.00	7 lbs.
H13	C/43	Support Pins	4.00	1 lb.
H13A	C/205	Support Pins	14.00	1 lb.
N65	C/1	Spur Wire Embedder	4.25	1 lb.
N77	C/1000	Metal Eyelets	4.00	1 lb.
/79758	C/1	Eyelet Hand Punch	2.50	1 lb.

● HAND TOOLS and ACCESSORIES

CAT. NO.	PKG.	DESCRIPTION	RETAIL	SHIPPING WEIGHT
N81	C/1	10" Hive Tool	7.50	1 lb.
N83M	C/1	Alum. Frame Hand Grip	13.00	1 lb.
N85	C/1	Bee Brush	3.60	1 lb.
N91	C/1	Frame Cleaner	5.00	1 lb.
NL23	1 lb.	Hive Staples	3.50	2 lbs.
O8	C/1	Queen and Drone Trap	15.00	2 lbs.
O9	C/1	Entrance Guard	6.25	1 lb.
N100	C/1	Fume Board (unassembl.)	10.50	4 lbs.

● HIVE FEEDING & HONEY REMOVAL

CAT. NO.	PKG.	DESCRIPTION	RETAIL	SHIPPING WEIGHT
O2	C/1	Entrance Feeder w/lid	2.50	1 lb.
O3	C/1	Feeder Pail w/lid	6.00	2 lbs.
O5P	C/1	Plastic Bee Escape	1.85	1 lb.
O6	C/1	Conical Bee Esc. Board	20.00	4 lbs.

● MEDICATIONS and CHEMICALS

CAT. NO.	PKG.	DESCRIPTION	RETAIL	SHIPPING WEIGHT
O71	C/1	1/2 Gram Fumidil-B (Makes 6 Gal. Feed)	14.50	1 lb.
O73	C/1	2 Gram Fumidil-B (Makes 24 Gal. Feed)	38.00	1 lb.
O83	C/1	6.4 oz. Terramycin S. P.	8.00	1 lb.
O84	C/1	1 lb. Terra-Brood Mix	6.00	2 lbs.
O88	C/1	5.25 oz. Apicide Powder	5.00	1 lb.
P38	1 lb.	Paradichlorobenzene	7.00	2 lbs.
P39P	C/10	Menthol Crystals, 10 packs	41.50	2 lbs.
PA10	C/10	Apistan® Strips 10's	25.00	1 lb.
PA100	C/100	Apistan® Strips 100's	185.00	2 lbs.

● HONEY CONTAINERS

CAT. NO.	PKG.	DESCRIPTION	RETAIL	SHIPPING WEIGHT
Q12	C/24	8 oz. Gamber Jar w/lids	13.20	10 lbs.
Q17	C/24	1 lb. Gamber Jars w/lids	15.00	15 lbs.
Q22	C/12	2 lb. Gamber Jars w/lids	10.50	12 lbs.
Q40	C/6	5 lb. Round Jars w/lids	12.00	9 lbs.
Q60	C/12	2-1/2 lb. Square Jars w/lids	13.50	12 lbs.
/78883	C/120	48mm Lids Only (8 oz. & 1 lb.)	10.50	3 lbs.
/78924	C/60	63mm Lids Only (2 lb.)	8.00	2 lbs.
/78967	C/60	G70 Lids Only (5 lb.)	9.75	3 lbs.
/78940	C/60	89mm Lids Only (2-1/2 lb.)	15.50	3 lbs.
Q75	C/250	8 oz. Honey Bears	75.00	20 lbs.
Q7512	C/12	12 oz. Honey Bears	4.00	3 lbs.
Q75250	C/250	12 oz. Honey Bears	85.00	25 lbs.
/78958	C/250	Extra No Drip Hi-Flo Lids	25.00	4 lbs.

● PLASTIC PAILS and GATES

CAT. NO.	PKG.	DESCRIPTION	RETAIL	SHIPPING WEIGHT
M15P	C/1	2" Plastic Gate	12.50	1 lb.
M18P	C/1	1-1/2" Plastic Gate	13.00	1 lb.
R20	C/1	5 Gal. Plas. Jug (Square)	6.50	3 lbs.
R33	C/1	Lid-Off Pail Opener	13.25	2 lbs.
/79774	C/1	5 Gal. Pail w/Hole Only	15.00	3 lbs.
/43597	C/1	5 Gallon Pail Only	5.00	3 lbs.

● HONEY SIGNS

CAT. NO.	PKG.	DESCRIPTION	RETAIL	SHIPPING WEIGHT
U50	C/1	14 X 22", 'Honey for Sale' Poster Board	2.25	1 lb.

● CANDLE MOLDS

CAT. NO.	PKG.	DESCRIPTION	RETAIL	SHIPPING WEIGHT
Q99A	C/1	6-Pk Votive Mold - Plastic	9.00	1 lb.
Q99B	C/1	Bear & Skep - Polyurethane	16.00	1 lb.
Q99C	C/1	Christmas Tree - Polyurethane	22.00	1 lb.
Q99D	C/1	Santa Claus - Polyurethane	20.00	1 lb.
Q99E	C/3	Small Taper - Polyurethane	20.00	1 lb.
Q99F	C/1	Cat - Polyurethane	17.00	1 lb.
Q99K	C/1	Skep - Polyurethane	18.00	1 lb.
Q99L	C/1	Stuffed Bear - Plastic	7.00	1 lb.
Q99N	C/1	Spiral Taper - Plastic	8.75	1 lb.
Q99Q	C/1	2-Taper Tin	33.85	1 lb.

● ORNAMENT MOLDS - SINGLE SIDED

CAT. NO.	PKG.	DESCRIPTION	RETAIL	SHIPPING WEIGHT
Q99R	C/1	Angel, Heart, Bell (Set 6) Polyurethane	17.50	1 lb.
Q99S	C/1	Christmas, Santa, Heart (Set 6) Polyurethane	17.50	1 lb.
Q99T	C/1	Easter, Egg, Bunny (Set 6) Polyurethane	17.50	1 lb.
Q99U	C/1	Large Heart - Polyurethane	21.50	1 lb.

CAT. NO.	PKG.	DESCRIPTION	RETAIL	SHIPPING WEIGHT

● CANDLE WAX, WICK, BOOKS, VIDEO

Q99H	C/1	18 oz. Mold Release	9.00	2 lbs.
T12	C/1	Candle Gift Box	.95	1 lb.
R32B	5 yds.	Craftwax Wick	1.80	call
R32BS	C/1	1 lb. Spool Wick (330 yds.)	31.50	2 lbs.
BW1	C/1	3/4 oz. Beeswax Cylinder	.75	1 lb.
BW3	C/1	1 lb. Beeswax Cylinder	10.00	2 lbs.
/01058	10 lbs.	Bulk Candle Wax	14.50	12 lbs.
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Almond Pollination With Adee Honey Farms

Kim Flottum

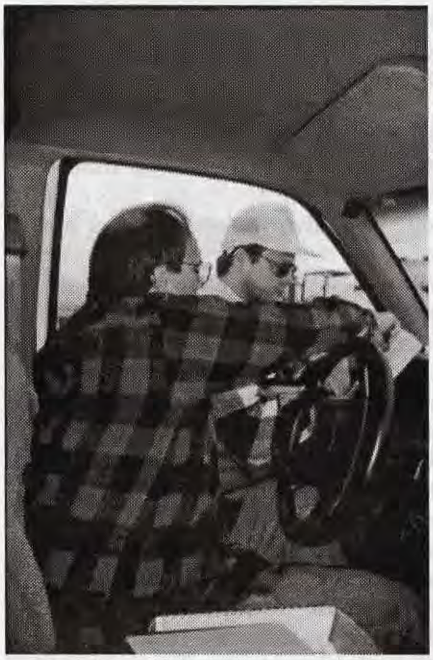
At the very southern end of California's San Joaquin Valley, near Bakersfield, sets a rolling, rocky cattle ranch. Bordered by mountains it once was a lush productive citrus orchard, complete with it's own water supply. But years-ago freezes finished fruit production, and today there's not a tree of any kind in sight.

For the last six years however, from late November until the end of January, 6,000 acres of this dry, rocky, rolling ranch land witness a remarkable transformation. For a brief time this barren place turns into the holding yard of nearly 40,000 colonies of bees, all belonging to the largest beekeeping operation in the world – Adee Honey Farms.

Bret Adee, the third generation in the family's business helps steer this organization and is in charge of the California part of this business' annual cycle. His brother Kelvin, who keeps track of the South Dakota honey production part of the business and works closely with his father, Richard in the Mississippi queen rearing operation is also on the scene. The supervisor of the Nebraska part of the business, Sam Rutten, also comes to California with his crew.

All told, 13 permanent and seasonal employees are in place to evaluate, prepare, and move these thousands of colonies from the holding yard to the nearly three dozen almond orchards Adee's contract with for pollination service.

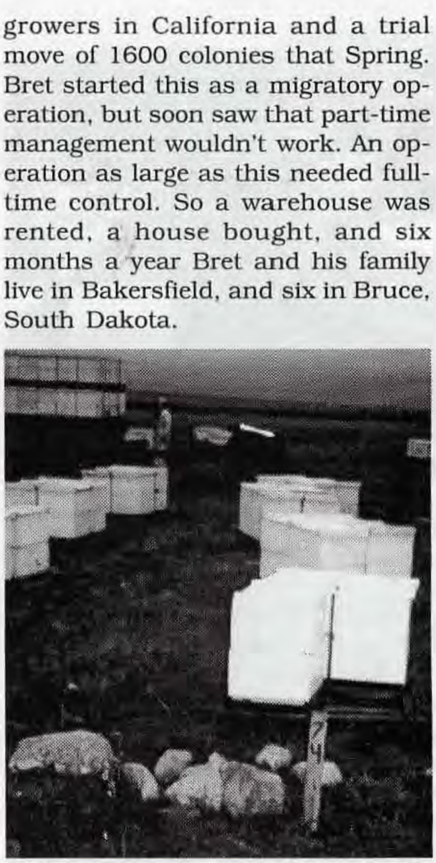
The history of this migratory part of the operation goes back six years, when Richard met one of the Almond Board people at a Winter meeting they were both attending. From there came contacts with brokers and



Bret Adee, sitting, confers with his brother Kelvin during an orchard move.

A view of the holding yard at dawn. Nearly 40,000 colonies are spread out over 6,000 acres.

growers in California and a trial move of 1600 colonies that Spring. Bret started this as a migratory operation, but soon saw that part-time management wouldn't work. An operation as large as this needed full-time control. So a warehouse was rented, a house bought, and six months a year Bret and his family live in Bakersfield, and six in Bruce, South Dakota.



Each semi drop is assigned a number for future reference.

Colonies head west from South Dakota when extraction is complete in November. When they arrive at the holding yard they are spread out by design over all that land. They arrive on semis, holding a minimum of 102 pallets each (408 colonies), and are dropped in groups of 32 pallets, the load size of the smaller trucks, used later.

Quickly colonies are evaluated and marked as dead, very light or light. Strong colonies don't need immediate attention. Dead (they lose only 1-2% on the trip) are re-

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ADEE ... Cont. From Pg. 41

moved to the warehouse for cleaning and moving to Mississippi later.

Light and very light colonies get fed high fructose corn syrup 55 (HFCS), cut 15% with water starting as early as December 1.

The HFCS/water solution, and later the straight HFCS 55 is fed to colonies using an efficient system of delivery. Two of the company's trucks are outfitted with one, 1,000 gallon HFCS tank, and two, 250 gallon compressed air tanks.

Once in California colonies are evaluated. Bret is one of those who checks bees.

The system starts with a tractor trailer 'home,' that contains four plastic tanks that have a combined capacity of 1-1/2 tanker loads of syrup. These are tied together, along with a tank for water, with a common piping system that feeds into a single hose that fills the 1,000 gallon tanks on the feeder trucks. This way any combination of syrup and water, or straight syrup from any tank can be drained by choice.

The compressed air tanks are filled by a compressor inside the trailer. When both are full the syrup is 'pushed' out of the hive-feeder hose by the compressed air from the tanks. When in the field there are essentially no moving parts to break down. Syrup is fed with an on/off diesel fuel dispenser valve for maximum flow. Syrup is fed into a plastic in-hive feeder in the brood nest. Feeders are filled on an as-needed basis so syrup is always available, and colonies are fed right up to moving if needed.

Syrup is purchased on a just-in-time basis and the supplier is determined by price-at-the-moment. Deliveries are scheduled two to four days in advance so space is available in the feeder tanks. Delivery time, however, is expected, and met within a half-hour of the time specified. Don't get lost and don't be late.

By January first nearly every colony is beginning to rapidly expand and, since little or nothing is in bloom a protein source is required to allow colonies to continue expansion. Bret went through an evolution of feeding techniques. Existing data and prior experience has determined that, using Mann Lake's Bee Pro as a source, each colony needed four ounces a day to supply the maximum daily requirement for rapid growth. For 38,000 colonies this comes to just under 200 fifty-pound bags fed every day for a month.

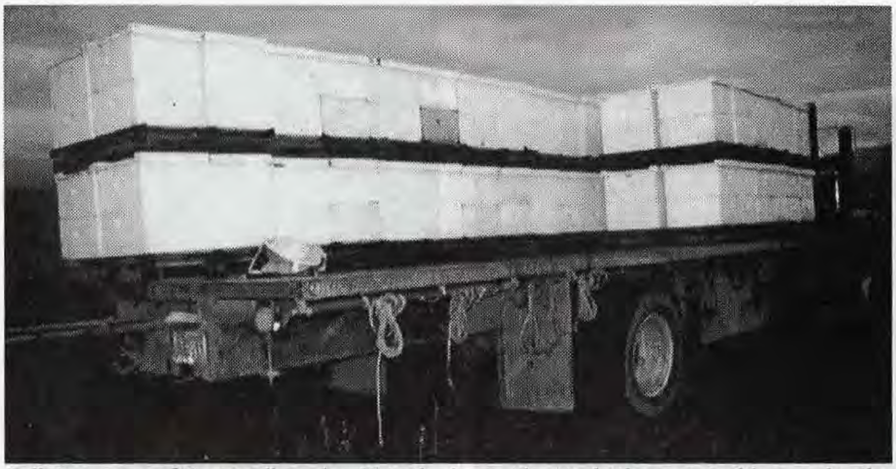
Imagine 38,000 extender patties: Not-to-be in an operation this size.

Almonds bloom before they leaf out, and when buds begin to show color, growers get nervous.

So, after a series of experiments, Bret found that the simplest, most efficient way to distribute this much feed was to simply spread it out on the ground. In January, morning fog dries off about 10 a.m., and afternoon temperatures fall below 50°F by four, which means the feed is spread at 10 and has to be consumed by 4 p.m. It works. Bees become, rather than foragers, grazers, flying to the ground and picking up loose feed. They return to the colony evenly dusted rather than having it

Inside the feeder 'home,' are huge plastic tanks to hold syrup and water, all tied to a single feed pipe. Syrup can be fed straight, or cut with any amount of water by simply opening or closing valves.

Syrup feeding can start as early as December 1, using this system. Each feeder truck has one 1,000-gallon tank for syrup, and two 250-gallon tanks for compressed air. Colonies are fed with inside feeders.



Pallets on one of the small trucks. Note the bar with attached ropes, tool box under the bed and the corner fastening boards also underneath. Colonies sit on pallets tight together side to side, but with a small space between back to back. See pallet diagram, below.

A load is secured on corners, over the top and across the back. It doesn't budge.

packed on their legs. And, if it doesn't rain or turn cold early, it's all gone by 4 p.m.

About the third week in January, weather depending, the earliest orchards are showing signs of flower buds (almonds produce flower buds before leaves appear), and orchard managers begin to get nervous.

When each semi pallet drop was made at the holding yard it was given a number. After evaluations, each numbered site was given a rating as to overall strength. Adee's guarantee an eight frame (bees and brood) average for a pollination contract. A 12,000 colony drop with mostly 12 frames of bees and brood can, to average out, tolerate a few seven framers. Not many, because that's the tolerable minimum and weak colonies are depopulated and the equipment quickly sent to Mississippi.

Everything is ready. Bees, orchards, trucks, forklifts, people. When it comes to moving bees though, weather isn't a factor. Trees don't care. They'll bloom no matter the rain, greasy roads, wind or cold. Head 'em up, move 'em out.

•

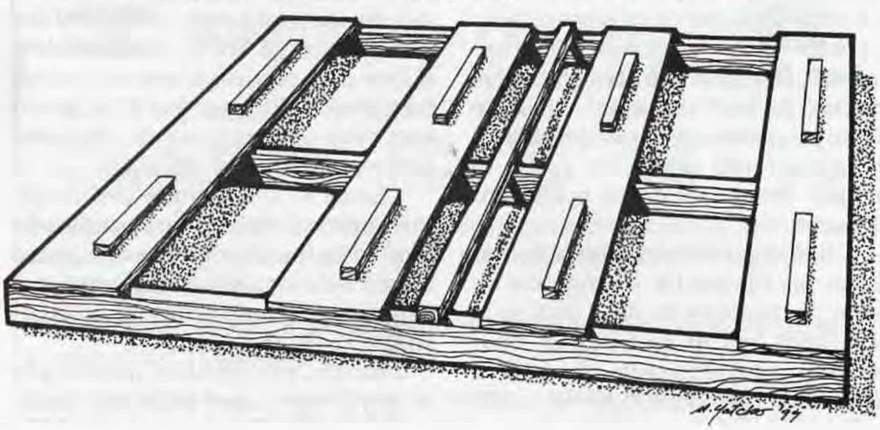
Before colonies are moved the crews need to know where to move them. Maps become important. Accurate and careful directions to the orchards and then exact pallet placement within the orchards is critical.

Growers may provide sophisticated pre-marked maps, showing university-designed pallet lay-outs for optimum bee distribution, all the way to a sketch on how to get to the orchard. When colony placements are not pre-determined Bret generally marks out pallet location and number for the delivery crews by driving the orchard and, according to the map, placing a small white flag at each location of pallet placement.

Once the colonies/acre are determined by the growers – from less than one/acre for very young or very

The forklift trailer, made sturdy. When the machine is unloaded the bed tips down. When loaded, the bed tips up to be level. The machine is chained on in two places.

The Adee Pallet. Outside dimensions are exactly two colonies wide, and two colonies deep, plus a 2" x 2" in the center. Bottom boards (all colonies have one) telescope over the 1" x 1" slats so the colony can be slid forward when on the ground. This allows sufficient space for good ventilation between the backs of colonies. The front of the colony will extend just a bit over the edge of the pallet when slid forward.



old trees, up to as many as four/acre for double planted orchards – colonies are evenly distributed throughout the orchard roads and map marks made.

Then, back to the holding yard to determine how many truckloads are needed, which roads in the holding yard each truck should start with and which crews go where, when.

Loading begins, usually, as early in the morning as possible with,

Continued on Next Page

Weather and greasy roads can't stop moving. Trucks are generally heavy enough to make it, but if not can be pulled. Forklifts, too can get stuck and if the mud is deep enough may tip – with bees and driver in jeopardy. This seldom occurs. Finally, when all delivered, colonies are checked again, counted, and covers straightened. Bret does much of the final check.

depending on the orchard, all small trucks (32 pallets), the one semi Adee's own (102 pallets) and perhaps up to several independent semi's.

It takes eight to 10 days to get everything moved, and, generally, the most southern orchards get moved first, then gradually moving north. The most distant orchard from the holding yard is 180 miles, the closest only a couple of miles.

Communication becomes a key in the orderly movement of all these colonies, all these trucks and all these people. Every truck, and almost every forklift has a CB radio. Moreover, the operation has six different cellular phones. It's almost impossible to lose a truck, a forklift or even an employee. Almost, but not quite because phone and CB range does enter in. Good maps, good plans and an informed crew, like any well-run operation make up the difference.

Back to the holding yard. Loading is still basic beekeeping. The weather plays a role, but it cannot dictate the schedule. Cool, cloudy days help keep bees inside, but if they are out colonies are smoked, pushed into place on the pallets (see pallet diagram) stacked two high, then lifted into place on the truck. The photos show how loads are secured, but they aren't netted for the short trips to orchards. Truck vibrations tend to keep bees calm during the trip.

Forklifts are carried behind the trucks on specially designed trailers for quick on/off loading, and security when hauling. The quality of these trailers bears notice. The design, while not rocket science, is not made as inexpensively as possible, but rather as durable as possible. Double and triple reinforcements at key points, very heavy gauge plating, and double welds insure this everyday piece of equipment will not be the Achilles heel in the operation.

This seemingly simple idea, however, is only part of the business philosophy that drives this organization.

"The pollination business is all about confidence," Bret said.

"You can't ask (or expect) a grower to bet his crop on a beekeeper who has shoddy equipment, trucks that break down, and that looks like a slob."

"Not only that," he adds, "when a grower takes on an operation the size of ours, he can be confident that if a truck breaks or gets stuck, if a forklift goes down, if a load of bees is lost, if a couple of employees take a powder, their crop won't be jeopardized. The machine goes on – we're too big, too well organized, have too many resources at our disposal that the grower will never see a blip in service, never experience a moment of doubt.

"Some growers hedge against these problems by hiring two or three beekeepers or deal with brokers with lots of colonies at their disposal, so if one bails, the others can cover. They don't have to guess, or rely on several people with us."

Trucks keep track of each other by CB while on the road so if one has to stop or makes a wrong turn somehow they're easy to redirect. Once at the orchard entry points, a short pow-wow is held so everybody knows where to go – and they're off.

Pallets are unloaded, usually with a two-man crew – a truck driver and forklift operator – at the locations indicated by the white flags placed previously by Bret, or other markers placed by the orchard owners.

"I try to keep them all just out of the way so orchard traffic isn't impeded, and they all go on the west side of the roads so they get morning sun as early as possible. This does help get the bees moving earlier" Bret stressed, "and keeps the growers happy."

Adee's use a fairly standard contract when negotiating with growers. An eight-frame average is the standard provided, but some growers will pay to have colonies inspected for compliance. If there is a problem Adee's may request a second inspection, which they pay for. This hasn't ever been needed however. Payment terms are industry standard.

Some of the owners are corporate entities, with no face, and these tend to be hardline contracts, signed before delivery. Many, however, are single-owner orchards and a handshake seals the deal.

Rarely, an operation doesn't pay or pays very late – as in any business – but these tend to not get repeat business, and the pipeline of information in the industry is very tight. A nonpayer can get blacklisted in a hurry by every beekeeper in the business – and no bees means no almonds.

An interesting figure here is that, on average, an acre of mature almond trees produces about 1,700 lbs. of nuts/acre. Sellable nut meats can range from 90-98% of that weight, depending on quality of production, insect damage and the like. Reduced exports and strong crops rendered the mid-March price, to about $1.10/lb, down significantly from a couple of years ago. Still, at even that price, that comes to between $1,700-$1,800 income/acre. All for only $40/colony.

After the pallets are unloaded the trucks head back to the holding yard for more. They already have instructions on which groups of colonies to pick up. Meanwhile, some of the crew has been double checking these colonies, removing those too weak, or dead, so only strong colonies are used. By the time the trucks arrive many of these are already double stacked and ready to load. The trip may be a return to the orchard just visited to finish, or to a new orchard already marked.

Once an orchard is complete, it gets checked to make sure all the pallets were placed in the right place, and in the correct amount.

"When a grower is paying you thousands of dollars, it's good business to see he gets his money's worth," Bret observed, "and we make sure it's exactly right."

If not, a truck is sent with enough pallets to round off the contract. Obviously this is time consuming and costly and mistakes are avoided – but always corrected.

There are details that need to be dealt with during all this that would be easy not to plan for. While I was there the registrations on all of the trucks, registered in South Dakota, expired, and new tags had to be applied and registration papers replaced. Employees, away from home for many days to many weeks have to deal with paychecks – where do you cash them? – and meal expense checks with the same problem. Hotel rooms are covered by the company but cash for food, laundry and incidentals is a continuing requirement for everyone.

And, since last year Bret kept colonies in California to take advantage of the El Niño induced honey crop (usually southern California is too dry to produce enough of a crop to bother with), there is a large honey crop sitting in the warehouse in nearby Arvin that needs to be sold. So, in the middle of the pollination craziness, a trailer of honey had to be loaded, weighed and delivered.

•

When the colonies are all moved (Bret was being asked for bees right up to petal fall, almost, this year), inspected and doing their thing, the crew takes a deep breath, and gets ready for what's next.

What's next is moving empty, cleaned and prepared-for-splits equipment to the Mississippi operation. Then, when growers start releasing colonies – after the last petal falls – colonies are loaded on semi's from each orchard and head out. When colonies are pulled, 12,000 go to Mississippi, 8,000 go back to the Nebraska operation, another 8,000 go to Bruce, South Dakota, a handful stay in California, and the balance return to Roscoe, South Dakota.

One of Bret's goals is to have no orchard hold fewer than a semi load – 102 pallets – and usually several semi loads, just to make it easy, and fast.

In fact, that very goal is the motto of this operation, and where the title of this article originated – *No Orchard Too Large.*

Next time we'll visit the Mississippi operation during the March queen rearing and split season – getting ready for honey production up north in South Dakota. BC

James E. Tew

Getting Ready

Building Simple, but Stout Hive Stands In anticipation of the weather getting better for a few days, I spent nearly all of one Saturday building hive stands. There was a clear and present need for something to get the hives off the ground in the demonstration yard. In BC issues past, I wrote a piece on hive stands entitled, "How Firm is Your Hive's Foundation"? There, I attempted to catalog all the various hive stands that beekeepers have used to raise their hives a bit. No one particular model came out on top as being the absolute best – though cement blocks and commercially purchased hive stands were very common. The problem with cement blocks is that they ever so slightly scant by about 1-½" therefore the bottom board never quite sits right on the blocks. Also, in Ohio, the block settles or heaves during winter requiring occasional readjustment at times during the year. No offense intended to bee supply companies, but the commercially manufactured hive stands are a bit lightweight for the long haul.

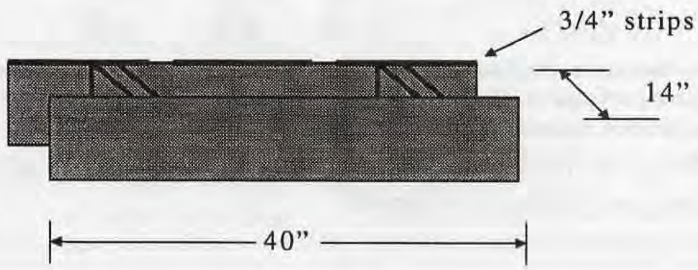
I settled on the design of a hive stand that Dr. Roger Morse described years ago. I recall not liking it at the time – for no particular reason. I suppose blocks and hive stands were too common then, but my attitude has changed. The Morse design is not perfect but no designs for hive stands are. Before you write me, I realize there are innumerable changes that could be made in the design - particularly in construction material. Make whatever changes that fit your needs. I chose this design for the following reasons:

(1) Simple to construct,
(2) Long use life,
(3) No enclosed areas for vermin to occupy,
(4) Could be used for other equipment such as nucs or storage,
(5) Could serve as a hive stand for two colonies.

Though many sizes of lumber could be made to work, I used 2" x 8" high-grade treated pine. I noticed that it came from Hope, Arkansas. A ten-foot board was enough to build one hive stand (that could serve two colonies). Such a board cost me just a bit less than $10.00. From start to finish, I built eight stands in one day – or enough for sixteen colonies - including making the trip to the lumberyard. So, roughly, on a per hive basis, I have a bit more than $5.00 in material and about 30 minutes in labor. In theory, the stand should last for 40 years.

For the most part, the hive stand is only made of four pieces – two side pieces and two cross pieces. The boards were heavy and wet. I didn't want to use my table saw due to the weight and potential for rust caused by the wet lumber. In order to get good, clean cuts, I built a simple jig that would allow me to get dead square cuts from my power handsaw. These cross cuts could readily be made free hand (but neatness counts when you are writing and explaining). I cut the sides to 40" in length with 14" cross members. That leaves roughly seven inches between the two colonies sitting on the stand. Once assembled, the hive stand is about 17 ½" wide and 40" long. I measured in ten inches down each side to position the cross members. I used four 20-d spiral-shanked, galvanized nails to attach each end of the cross members to the sides (16 nails per

Hive Stand
2" x 8" Treated Lumber



stand). Since the nails are large, pilot holes were a necessity. Once assembled, from the short piece of scrap that was left, I cut three ¾" strips that I laid on the top edge of one of the sides. I nailed these down with 16-d spiral-shanked, galvanized nails. I wasn't crazy about this procedure, but I wanted to use the scrap rather than cutting other boards. These strips provided a raised ledge that gave a slight cant to the colony in order for rainwater to drain out. The slots on the top are there only because the scrap pieces were not long enough to cover the entire top edge. The bottom board should **not** sit in these slots. A completed hive stand weights about 47 pounds, but should lighten a bit in the future as the preservative dries out.

The Situation in the Yard When I was working bees, it was strange day in the yard. Never mind that is a gray day with the ground saturated with ice and water. I set the hive stands about, as shown in the yard layout, and began to collect last season's dead-out nucs. I was working quickly and taking little notice of the nucs other than to stack them neatly in preparation for next season. I noticed bees coming from one of the four-frame nucs and upon checking all more closely, six of the eight nucs were still alive. I was surprised. We have already had cold weather down to 0 ° on several occasions. I could have tried to combine them, but most of you know what a hassle it will be to combine colonies during cold months. Of the six, four were surprisingly heavy while two others will obviously need help before spring. Since they have lived this long, I suppose I will see if they will come through the winter. We have had four-frame nucs survive in past seasons, but it's not a common event. Though I could have set four nucs per hive stand, I only set three. They seemed a bit crowded with four in place. The entrances are still fully opened, but there were no mice in any of them so I left them open. If I have the chance, I may try wrapping some of the nucs in blue expanded Styrofoam® to see if insulation will help a smaller colony survive the winter.

As was indicated in the first yard diagram, there were three full-sized colonies in the yard when I took it over. One colony near the storage box had two supers on it and was dead heavy. The remaining two colonies were in two deeps with one being considerably lighter than the other was. I removed the supers from the heavy colony and set it on one of the new hive stands (Now designated as Colony #1). The bees were clustered in the hive and I caused the lease disruption possible. However, I still had to use smoke. Working bees while during cold weather is a bit different that when the bees are warm. They don't seem to respond to the smoke as well and will attempt to fly. Unfortunately, many of the bees that fly will chill before being able to get back to the colony.

I expected the lighter of the remaining two full-sized colonies to be dead, but it wasn't. The heavier of the two colonies was loaded with honey and had good flight just a couple of months ago. From its location across the yard, I carefully moved it onto the stand beside the first colony (#1). The #1 colony was a good defensive colony while the second colony was quiet and easy to manage...in fact, too quiet and too easy to manage. After getting it positioned (it was heavy), I opened it up to see why the bees were do docile. It was the worst possible reason - American foulbrood, (AFB) an old familiar disease that had killed a good colony in my yard. It's a good reminder. While we are constantly concerned about Varroa and Small Hive Beetles, this colony died from a very traditional disease. I loaded the diseased equipment on the truck and removed it from the yard. The third colony – that should have been dead but was not – was moved to the spot and is now the #2 colony in the yard layout. It will need some help before spring. I have saved some honey frames to use as a food source for spring colonies. During hard winter, there is very little brood to become diseased. Bearing in mind that extensive colony manipulations during cold months kill many bees, I have decided to wait until warmer weather arrives before I determine if the other two colonies are affected by AFB. On the yard layout, I marked the spot where the AFB colony was sitting. As soon as possible, I will apply Terramycin, as is permitted in Ohio, as soon as possible. When a more extensive examination is permitted, I will look for dried scales and punctured cappings in both the other colonies and all the nucs. There is no easy solution here, but there's no reason to torment the other colonies or nucs unnecessarily at this time. However, having found AFB in the yard already, I will be applying Terramycin on a regular basis as per treatment recommendations late this winter and early next spring.

Plans for the Spring I have arranged to get some Carniolan queens next spring as well as some Caucasians. As reported before, we will plan a general mix of races of bees within the yard. I have also ordered a couple of packages for the spring. For those of you who have not placed package orders, by early winter, you've waited pretty late. Depending on how well the nucs survive the winter, if they survive at all, I will be purchasing packages and making splits in order to get up to about 5 - 10 colonies.

I have also ordered equipment from various suppliers of beekeeping equipment. I want to try the lock joint equipment from Brushy Mountain Supply as well as some of the cypress equipment from Rossman Apiaries. We already have equipment from Dadant and Kelley, but will be getting more from them also. Much of next month's bee time will be spent assembling and painting equipment.

Several of you have written me in past months with various questions concerning beekeeping in general or about various aspects of articles that I have written. Many of those have been good questions that I have answered individually. In future articles, I will be including some of those questions when their answers help to round out the material covered in previous articles. The untimely death of my computer prevented me from using some good correspondence this month. Sorry.

While lying awake, reviewing my bee day, I ask myself again, "Was today enjoyable"? I discovered that I had 4-frame nucs in the dead of winter with which to deal. I found AFB in what I had thought was a perfectly good colony. My boots were soaking wet. But I was pleasantly tired and I had won more than I had

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BEEYARD ... Cont. From Pg. 47

lost. I *felt* good about the day. But did I *enjoy* the day? Yep, I suppose so - not like I enjoy a good movie, but more like the good feeling you get when you have spent time well. It was a good, productive bee day.

The Real World (Of Beekeeping) The natural assumption that I frequently make is *because I enjoy doing something, it will always be enjoyable.* Wrong. Wrong. Wrong. Though I truly enjoy beekeeping, I must say that today's trip to the yard was not enjoyable. The ground was soggy and the day was gray and bleary. A mixed snow/rain was lightly falling on the saturated ground. There were soggy dead bees in front of the two full-sized colonies. My feet quickly got wet and my fingers were immediately cold. But...every bee yard trip cannot be the greatest. Unfortunately we must have the bad days in order to enjoy the good days. Or at least that was my attitude until I realized that my car was stuck in the soggy ground and would require a tow to get me road-bound again. But that was my intent with this article series - to assume responsibility for three untended hives and a few motley nucs - to make the yard productive again.

For anyone so fortunate (or otherwise) to be reading this BC series of articles for the first time, a short review is appropriate. I have taken on a project of bringing a neglected bee yard back to some form of beekeeping life with attention given to costs and time. So far, I am barely winning more than I am losing. Stay tuned.

From the Yard. The monthly report from the yard is simply not good. I debated attempting ways of making a negative situation look better than it was, but have decided to simply shoot straight with you. Things are simply not breaking even in the live bee category in the yard. Today's body count was a full-sized colony along with one of the nucs (nucleus hives). That leaves one full-sized colony and five nucs. Even so, the nucs continue to be surprising. I would have thought they would have all been dead. Unfortunately that is about the only good news from the yard.

In this yard, There were about ten nucs that were used in a queen production project last season. They should have been combined last fall, but something went wrong and they were forgotten. The nuc that died had a specialized frame in it to hold queen cells and was not intended to support bees during cold months. In reality the nuc was a three-frame rather than a four-frame nuc.

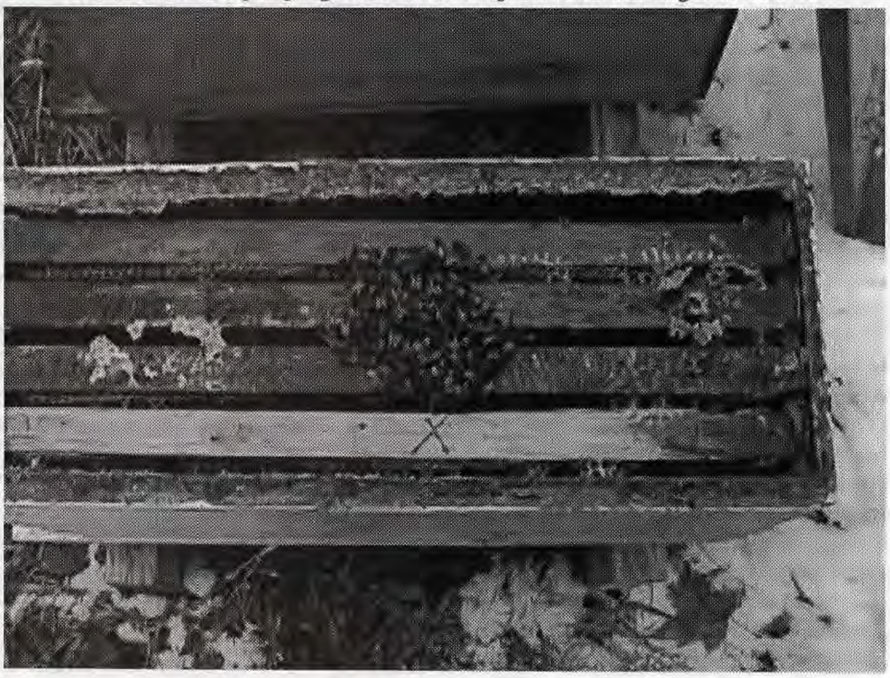
More on Nucleus Colonies In a sense, nucs are in the same category as observation hives. They both serve very specific functions and would appear to a new beekeeper to be easy to maintain. Not exactly right. Neither are especially *difficult* to maintain, but both are *quirky* to maintain. Both the observation hive and the nuc hive will quickly become crowded during warm months and will readily swarm. Both can overheat easily or chill easily. Not wishing to belabor the nuc/observation hive comparison, I will end by saying that though I expected the nucleus hives to be dead they were not and that's quirky. However, I have had four framers survive previous Ohio winters before. All variables are important: the harshness of the winter, the strength of the nucleus colony, the presence of diseases, and the quality and quantity of food stores.

A nucleus hive is a transient phase of a developing colony. It is essentially a "child" colony with all the promise of being a future productive adult. There is no real "standard" nuc. Nucs can range from a cupful of bees (a baby nuc) to a five-frame nuc. For some reason, five frames seems to be the limit on being referred to as a nucleus colony or nuc. Has anyone reading along here ever heard of a six-frame or eight-frame nuc? Graduation to the full-depth colony seems to coming-of-age for a nucleus colony.

Why use a nuc at all? There are no hard, fast reasons requiring that queen production, making splits, or hiving swarms, absolutely requires a small hive domicile. But the advantages are: nucs are lighter, nucs are cheaper, and finally, bees seem to like their living space to be relative to the size of their cluster. I have no good science to support the concept, but I have read (and support it with personal observations) that small colonies seem to prosper more in smaller living spaces. Imagine a cupful of bees with an unmated queen in a box half the size of a shoebox and then imagine that same cup of bees in a full deep single story colony. Something is out-of-balance with the cluster to space ratio.

Next Fall and Winter If these nucs are able to survive the winter, I want to explore the process of overwinter-

The clusters are painfully small in some of the nucs but larger in others.



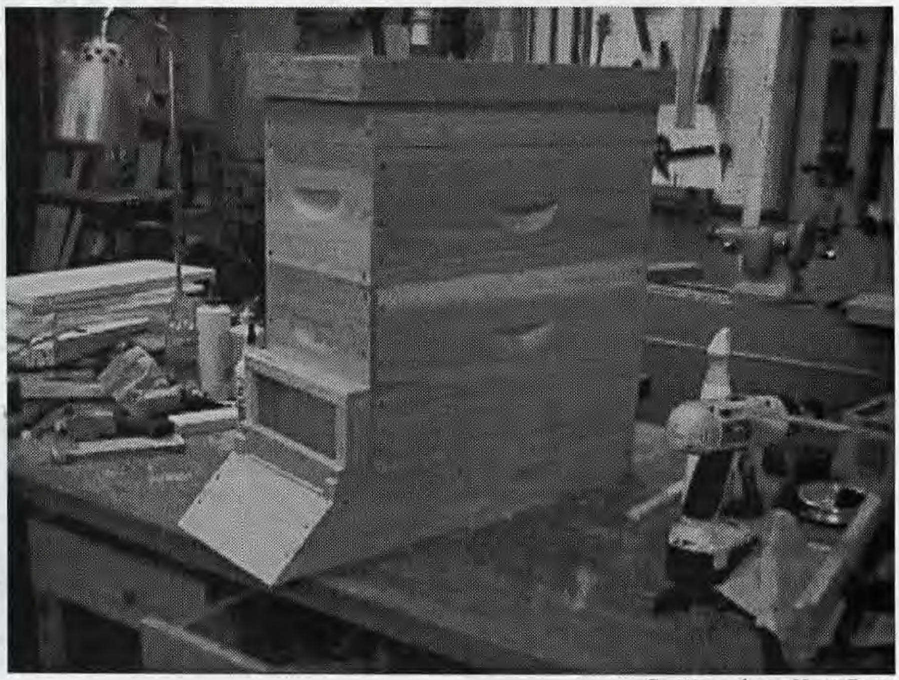
ing nucs next fall and winter. In past articles I have discussed the concept of fall requeening as an alternative to spring requeening. I don't thing fall requeening is particularly better than spring requeening, but it could possibly be another option for the time-stressed backyard beekeeper. Follow this line of reasoning - if I must add honey frames to a four frame nucleus during the winter (as I will have to do), would I not have been better off just to winter the colony in a single deep - with enough honey to survive the winter? I don't know yet. I suspect that much would depend on the size of the nucleus colony. My final word on nucs, for the month, "I like nucs and use them readily for a host of bee functions." *Bee Culture* even bought a new one, from Rossman Apiaries, for you to have a look at as it is being assembled and pressed into service.

Four-frame wintering nucs. (Note that the fourth nuc from the left is no longer among the living.)

Mysticism in the Yard Today in the yard there was a sense of late winter (or very early spring) blues. I didn't expect bees to be flying but the one remaining hive did have a few bees buzzing around the front. It was cold for bees - nearly 30°F. Having bees flying and showing excessive activity on such a cold day does not bode well for the future of the colony from which they are flying. I will give that colony, the last remaining full-sized colony, a 50/50 chance of surviving until spring. And I can't tell you why it will die, but I suspect it will. On the other side of the yard, the nucs were quiet. In fact, one was eternally quiet. There were dead bees in front of each colony, but they were too dead. "What am I trying to describe" I asked myself? The dead bees in front of the colony should reflect an on-going process of healthy house cleaning and bee death. Dead bees in front of the colony should range from fresh to decayed. Today, the dead bees were all old, wet, and putrid. They were too dead indicating a lack of housecleaning. The hives also showed signs of diarrhea spotting, something that has been a beekeeping problem long before mites. But the one big variable is that all the full-sized colonies that have died (two of three) died with full deeps or full supers of honey in place. That is notoriously symptomatic of mite predation. As you recall, one of the characteristics of this project was to take the colonies as they came to me and they came with nearly no disease control programs – other than having Apistan strips put in last spring. The bottom line of today's trip to the yard was that I am glad that I have packages and splits ordered for next spring. I suspect that I will need them.

A Little Something New A local Amish beekeeper, Mr. Monroe Miller, brought me a few prototypes of his entrance reducer that he has developed and currently manufactures on his farm. The device is simple and practical. I realize that it's the wrong time of the year to be discussing entrance reducers for they should have been in place months ago, but time flies. It's less than a year before it's winter again.

A large nucleus colony with multiple functions from Rossman's (5-frame with a super).



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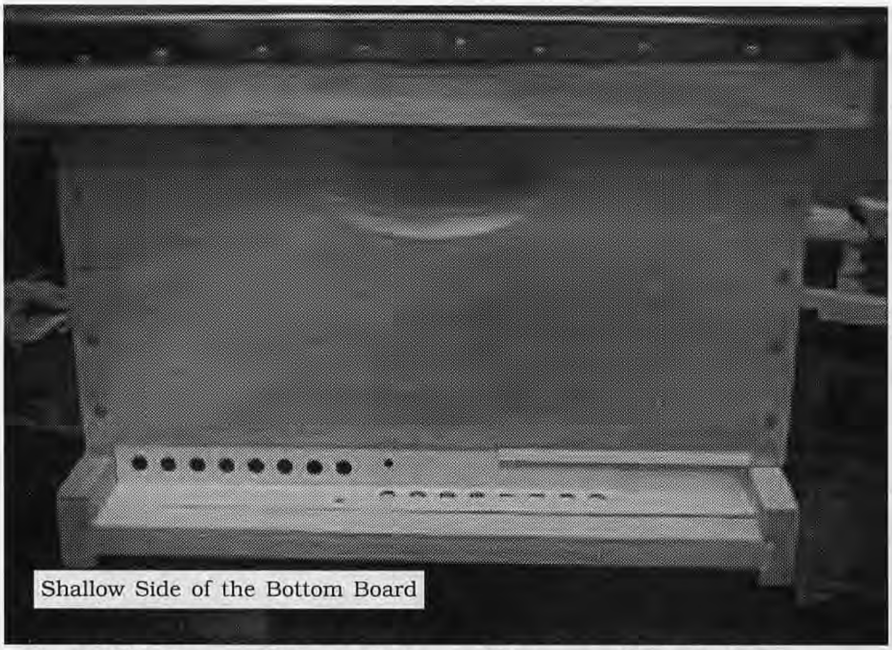

The M. Miller Entrance Reducer. The lower of the two smaller holes is for a screw.

The aluminum angle device has a series of holes punched that are about ½" in diameter. An extender piece slides on one end to make the entrance reducer fit the dimension variation size found on individual bottom boards. The device can go in either way and has a hole for putting a small screw in the bottom board to hold it in place. Put in one way, the reducer has the holes punched nearer the bottom board. If flipped and installed, the holes are nearer the bottom edge of the hive body. How well does it work? I don't know, but I will be putting them on my colonies next fall. The holes will definitely keep out mice, but bees will be unable to remove dead bees from the colony through the holes. I suspect a mid-winter bottom board scraping may be in order but that is the case with most entrance reducers. The M. Miller entrance closing devices are not readily available just now. If you want to give them a try, drop me a line and I will forward Mr. Miller's address and the selling price to you. I don't benefit from their sale, but I only pass this information along because it looks as though it has potential.

Entrance Reducers Entrance reducers come in a variety of styles. The most common is the reducer that comes with hive kits and is little more than a ¾" x 15" strip of wood with notches cut in two sides. In fact, most bottom boards are "reversible". The bottom board shown in the photo has two usable sides. In the photo, the deep side (3/4") is in use, but the board could be flipped during colder months to use the 3/8" side.

Interestingly, some bees, especially Caucasian bees, will contrive natural entrance reducers they make from propolis. Most colonies will not undertake such extensive propolization. But that it occurs at all bothers me. On innumerable occasions I have recommended, as I was taught, that a hive needs a reduced entrance during fall and winter to keep out mice and not necessarily to keep out cold. In my old(er) age, I am now leaning toward the notion that a reduced entrance is useful in keeping out cold, to a limited extent. Otherwise, why would the occasional colony go to so much effort to reduce the entrance? Another possible reason is that the artificial hive is designed with an entrance too large and the bees are doing all they can do to keep out mice - close the entrance with propolis. Obviously, mice can cut right through the propolis so the effort was lost.

Next Time I didn't have space this month begin the description of equipment assembly but I have alread begun that process. I have equipment from both Rossman and Brushy Mountain bee supply companies and will be getting still more. They both have unique characteristics that I want to highlight for you. Plus, we need to talk about protective coatings for the hives and I will continue the colony health discussion in the yard. True, things don't look great for the bees that are still alive, but as the warm-climate beekeepers can tell you, spring is already here in some areas and bees are already building up. We will have bees in this yard – one way or another. BC

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A colony having an entrance nearly completely closed with propolis.

Profitable Management For

COMB HONEY

Manage Your Comb Honey Colonies To Reduce Swarms

Lloyd Spear

Not long ago I received a letter from a new beekeeper saying, "I really want to raise comb honey, as I cannot find where to purchase it in my area. My friend who has been a beekeeper for many years says that comb honey production is too complicated for a newcomer. Can you recommend any simple ways of producing comb honey?"

I refrained from comment on the advice she had been given, but proceeded to give what I hope was advice that was more useful. I told her that in my opinion, newcomers to beekeeping should *only* produce comb honey as, next to joining an active bee club, it is the best way to learn beekeeping, and saves a lot of money otherwise spent on equipment. As George Imirie, the nuclear scientist and Master Beekeeper, recently wrote me, "I recommend that new beekeepers produce comb honey as it is guaranteed to provide the experience necessary to become a bee*keeper*, rather than a bee*haver*."

In this series of articles, I will outline the relatively simple methods both commercial beekeepers and I use to produce and sell thousands of sections of comb honey. Last month I commented on the different types of comb honey and how to prepare the equipment for producing round sections and cut comb honey. The article concluded by advising beekeepers to treat for *Varroa* and American Foulbrood, according to label instructions, when the pussy willows, red maples and skunk cabbage bloom. This month I will continue with spring and early summer management of bee hives for comb honey production.

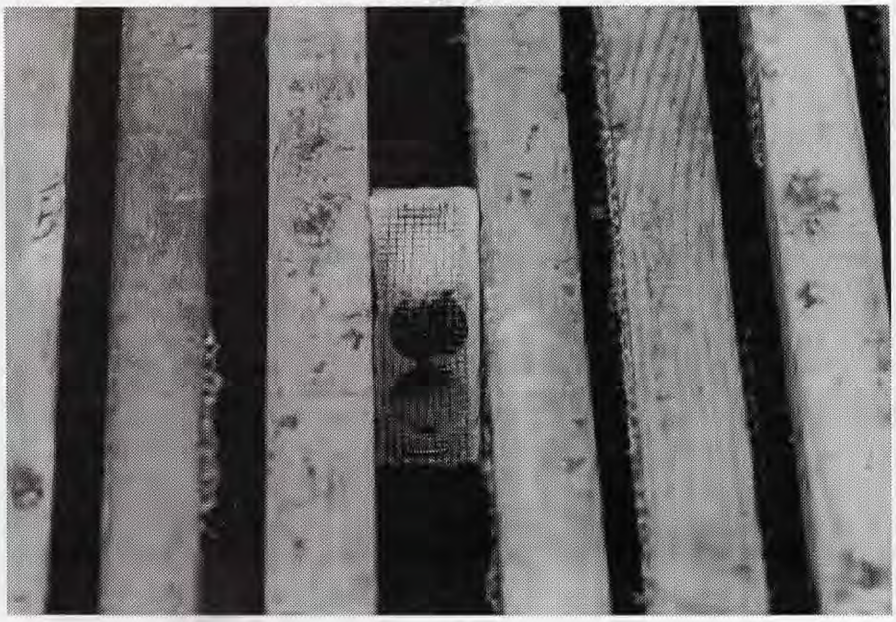
If you can get to your beehives without becoming mired in snow or mud, treatment for *Varroa* and American Foulbrood can be done several weeks before the early blooms mentioned above. In fact, it may even be beneficial to treat earlier as the mite populations will be lower. Regardless, in the coldest parts of the country, the queens will have started laying in January and a strong hive will have a good supply of young bees by early bloom. As comb honey can only be produced on very strong hives, the number of bees in the hive at the time of red maple and pussy willow bloom is very important. I call this time of the year 'spring bloom'.

In mid and late winter the hive will raise brood by using the pollen stores from the previous fall. When spring pollen starts to come in the hive is spurred to significantly boost brood production. In order to support a major increase in brood, there must be a good population of forager bees to collect the pollen. These are the hives you want to produce comb honey. Lift the cover and look at your hives at the start of the spring bloom. Without moving them, look down at the top of the frames to see how many are occupied with bees. If four or more frames are covered with bees, you have a strong hive for the time of year. Three frames are ok, but questionable, and two or fewer frames with bees is a hive that will not amount to anything for the current year.

Later, I will discuss swarm control in detail, but this time of year is when you first consider plans to control swarming. How old are the queens in your strong hives? If you replaced queens the previous fall, you can successfully use them for comb honey production. If not, they almost certainly will swarm before producing comb honey, and will need to be replaced before the major flow in your area. *If the queens in the strong hives are more than six months old, immediately order new queens.* Get them marked, so you can easily tell their age. Be certain they will arrive before your major flow, and introduce them as outlined below.

However, if your bees have overwintered in two deeps or more than

When requeening, maximize exposure of the queen to the new colony's bees no matter what kind of cage she comes in.



three mediums, looking at the frames in the top box does not tell you the whole story, as there are likely to be bees in the hive bodies below. (For an article on overwintering in a deep and a medium see the article "Comb Honey" in the May, 1998 issue of *Bee Culture*.) This is going to force you to do some lifting. With your hive tool, lightly crack the back and each side of the top hive body (if a deep) or the second hive body (if more than 3 mediums are used). Puff a *little* smoke in. Tip up the top hive body(s) just enough to look inside. Add however number of frames with bees you see in the lower super to those visible in the top super, to determine how many total frames are covered with bees.

If you have a hive with only three frames of bees, you might be able to make that into a productive hive if you can find another hive with a strong five or, hopefully, six frames with bees. From such a hive carefully lift out a frame with brood and brush off the bees. (A bee brush is invaluable for this, but you can gently use a cloth if necessary and later in the spring, you can use a bunch of grass.) Insert that frame in the hive that only has three frames of bees, and replace it with an empty frame from that hive.

That single frame of brood will give the three-frame hive another 2,000 or more bees. If the queen is good, and that is questionable since the hive is not as strong as others are, the frame should let her catch up with the other hives. This procedure is known as *equalizing* your hives. Put a rock or something on top of this hive to mark it (or better enter this information in your record book) and check in another two weeks. If you do not see four frames with bees at that time, this hive will still not be capable of producing comb honey this year.

What do you do with the hive with only two frames of bees, or the three-frame hive that couldn't catch up? If you want to increase the number of hives you have, use the drawn frames to make up nucs. Of course, you will have to order new queens to put in those nucs. If you don't want to increase your number of hives, just replace the queen in those hives. Order your new queen, and two days before she is expected remove the old queen. (If the new

"Your swarm control is a young queen, weekly checking for swarm cells, and cutting out those you find. That's it."

queen is late so you removed the old queen 3-4 days before she arrived, that is not a problem.) Take the cork out of the *candy end* of the queen cage, and place that end up in between two frames in the hive. Have the screen facing out and not buried in a comb. Leave the workers in the cage. Spray the bees with a 1:1 sugar/water mixture, and close up the hive. Go back in a week, and your new queen will almost certainly be out of the cage. If she is not, release her. Take the cage out and close up the hive without looking for the queen or for eggs. Go back in another week and look at a center frame. If you see eggs or young larvae, your queen is ok and you need not look further.

If you ordered queens to replace the older queens in your strong hives, or to make up nucs for increasing your number of hives, you will need additional bees to stock the nucs. Rather than introduce new queens to strong hives and risk them being killed, I first introduce them to nucs and suggest the same to you.

Two days before your new queens are to arrive, take one or two frames (how many doesn't make a difference) of sealed brood from each of your strong hives, shaking or brushing all the bees back into the hives the frames came from. Put four of these above a queen excluder on top of one of the strong hives. Bees from the hive below will come up through the excluder to keep the brood warm. The next day put one frame of sealed brood and the shaken bees from another frame, into a nuc. The nuc should also contain at least one frame of pollen and one frame of capped honey. Cover the nuc, screen the entrance, and set it aside to wait for the new queen to arrive. The entrances are screened to prevent field bees from returning to their original hive.

You will have used two of the four frames to make two nucs. If you wish, you can leave the remaining two frames (from which you shook the bees into the nuc) above the excluder and make up another nuc the next day. Otherwise, put the brood back into strong hives.

Introduce the queens to these nucs as outlined above. After at least three days and no more than seven days, remove the screens from the entrances.

If you overwintered in two deeps, about two weeks after red maples bloom you should reverse the hive bodies. This puts the brood on the bottom and, more important, puts lots of empty frames on the top where the queen likes to lay and the bees prefer to store incoming nectar and pollen. These empty frames stimulate more brood raising. You should continue to reverse the hive bodies every two weeks until approximately two weeks before dandelion bloom in your area. At this time, swarm control has to begin.

For successful, simple, swarm control two elements are needed. The first is **young** queens. With one exception, all commercial producers of comb honey that I know use current year, spring-raised, queens to

Nucs come in 3, 4, 5 frames, or two 4-frame in one, deep super evenly divided.

Continued on Next Page

COMB HONEY ... Cont. From Pg. 53

produce comb honey. The sole exception uses queens produced the preceding fall. For reasons not completely understood, older queens are more likely to swarm than younger queens are. In fact, a 1985 study in Israel documented that queens 20 months old (previous year queens) are *seven times* more likely to swarm than queens that were seven months old (fall raised queens)! The second element for successful swarm control is adequate honey storage room. This is somewhat difficult in comb honey production as the bees must have limited access to drawn comb or they will not build the comb necessary for comb honey.

Approximately two weeks before dandelion bloom, (or about May 1 in upstate New York and areas with a similar climate), I put *two* Ross Round™ supers on each hive if I am going to use the hive for circular sections. If I am going to produce cut comb, I put one Ross Round™ super next to the brood nest and the cut comb super *on top* of that. Now the bees will not use these supers for at least another two weeks, or until dandelion bloom and are not likely to use them for another four weeks until the Black Locust bloom. However, the extra space seems to reassure the bees and I believe that putting the supers on early is a key to swarm control. In case you are wondering, I do not use queen excluders.

I replace my queens in the spring, and order them for delivery so I can put them in nucs about April 15. About May 8, before the dandelion bloom, I carry my three frame nucs to my strong hives. I open the strong hives, find the frame with the queen, and set it aside. I then take out two more frames, preferably one of honey and one of pollen, and set those aside. I then spray the bees in the strong hive and in the nuc with sugar water, and put the frames from the nuc into the strong hive, keeping them together. The sugar water spray confuses the bees and masks the pheromones and the new queen and her attendants are accepted without fighting. The old queen and the three frames can either be put into a nuc for sale, or used to strengthen a weak hive. If sold as a nuc, the buyer should understand the age of the queen, but she is not likely to swarm if given new foundation or empty, drawn foundation in a full size new hive.

Beginning with dandelion bloom, reduce your hive to one body if over wintered in two deeps. If over wintered in three mediums, reduce to two mediums. If over wintered in a deep and a medium, you can leave as is, but be certain the deep is on top of the medium, as the queen prefers to lay there. When reducing the brood nest, be certain the bees have at least six frames of brood, and seven is better. The remaining frames should contain pollen and honey. If you have more than seven frames of brood between the two hive bodies, place the extra brood in a nuc or start a new hive with the extra brood from several hives.

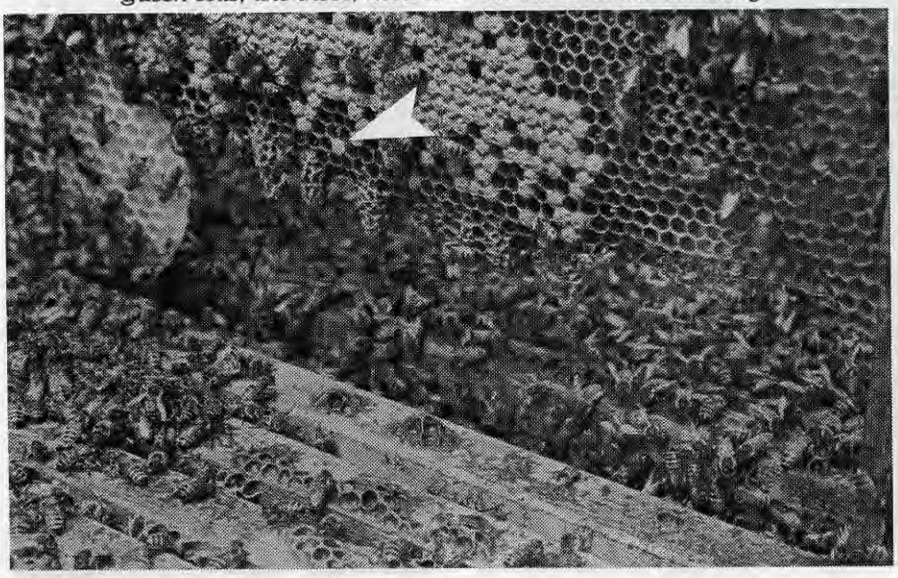
Beginning with the dandelion bloom, you need to check *weekly* for signs of swarming, but this will usually take less than a minute a hive. To look for signs of swarming, tip the brood nest forward and look for swarm cells along the bottom of the frames. If you do not see any, it is likely that there are none otherwise in the hive, and you can go on to the next hive. However, if even one is seen you will have to take every frame out of the hive, shake the bees, and destroy the queen cells. Even with young queens, perhaps one in ten hives will build cells. As I am pulling out frames in hives where I see queen cells, I check to see how much space is available for brood. In a nine-frame deep hive body I want seven frames to have approximately 75% of the cells available for brood. This means that there will be brood or eggs in 75% of the area, or the cells will be empty. If more than two frames are plugged with honey and pollen I take the extra frames out and replace them with an empty frame filled with drawn cells or a frame of foundation.

Usually hives that started queen cells will stop after cutting out the cells a time or two. However, some are stubborn and my rule is that I will cut cells three times (usually meaning three consecutive weeks). If they build cells a fourth time, I will either break down the hive, kill the queen, and use the frames elsewhere, or cut out the cells once more and move the hive at least 25 feet and face the entrance in a different direction. The move and change in entrance direction will cause the hive to lose its work force and they will drift to nearby hives. The population will be sufficiently reduced that the hive will not swarm, but it also will not be useful for production of comb honey. It is possible to have such a hive fill a super or two of drawn combs, if that is your wish. As a rule, if I am going to see queen cells it is in June and thereafter it is unusual.

In summary, your swarm control is a young queen, preferably one raised in the current year, weekly checking for swarm cells, and cutting out those you find. That's it.

If you're thinking about shook swarming, padgening, and the Killion

Queen cells, like these, need to be cut out to reduce swarming.



system – but feel these are complicated, time consuming, but necessary to prevent swarming . . . well, they *are* very time consuming, require exact attention to detail, and work extremely well when done by an expert. In fact, they can be interesting to do Richard Taylor's 1996 *Comb Honey Book*, has exact descriptions of how to do the manipulations. However, the procedures I outlined are those used by commercial beekeepers to produce comb honey. They do not have the time to spend on detailed manipulations and they, and I, use the procedures as outlined.

I used to use bait sections and frames in the supers, but no longer do so as I do not think it makes a difference. The bees will draw the comb when the flow is strong enough as they need to because they have run out of storage space adjacent to the brood frames. When I am doing my weekly check for swarm cells I look down at the super frames from above to see if the foundation is being drawn and nectar stored. When the super next to the brood nest is 75% or more filled, I reverse it with the super on top, placing that super next to the brood nest. When the super is moved up, I reverse it end-to-end so that the end that was toward the front of the hive is toward the back. Bees will usually first fill the comb next to the back of the hive, and reversing seems to speed up filling the entire section.

If you had a cut comb super on top of the Ross Round™ super, the cut comb super is now next to the brood nest. As there are no queen excluders, you may be asking, "what will prevent the queen from coming up into the cut comb super and raising brood"? Of course, this question applies equally to the Ross Round™ supers.

Management of hives with queen excluders is a technique I have never mastered. Whenever I have tried to use them the hive has swarmed, as I have never been successful in getting the bees to draw comb and store nectar above the excluder. While I am certain this is my failure, as many beekeepers successfully use them, I also know that many beekeepers feel that queen excluders are also "honey excluders". Fortunately, they are not necessary.

In over 20 years of using Ross Round™ supers, I have very, very seldom had a queen destroy sections by laying eggs in them. Moreover, I have asked dozens of other beekeepers and their experience is the same. The most "damage" there has ever been is a few drone brood in a single row of cells immediately above the brood nest. And by a few, I mean less than a dozen! Something about all the plastic and the confined areas does not appeal to the queen and she will not lay in Ross Round™ supers. However, in normal circumstances queens will readily lay in cut comb supers, effectively ruining many sections.

I believe Eugene Killion, a great comb honey producer from Illinois, first wrote of the best way to prevent queens from laying in cut comb supers. It is the essence of simplicity. First, have the bees complete at least 75% of a Ross Round™ super, then put the cut comb super below the Ross Round™ super. While the bees are drawing the comb and depositing nectar in the Ross Round™ super, they are also forming a ring of nectar and pollen around the brood nest. By the time the Ross Round™ super is 75% or so filled, the bees will have a space of about 2" on top of the brood nest filled with sealed honey and nectar. For reasons that are not clear, the queen does not cross that space, although there is a cut comb super above which would be ideal (from her viewpoint) for laying eggs.

It is difficult to give very precise advice about whether more supers should be added after the initial two, as flows vary widely across the country. If you know you should have at least two weeks of flow remaining when your first super is 75% full, I would add another super, placing it on top of the super that is 75% full. When the super next to the brood nest is 75% full move it up and place the third super next to the brood nest. If you still have two weeks of flow remaining, add another super to the top. If you are not certain how much flow to expect after your first super is 75% full, my suggestion is to still add another super. The worst thing that can happen is that the super won't be needed and you can keep it for next year. That is far better than missing a full super of honey because you didn't have enough equipment.

Carefully watch the supers you have moved up, and remove them as soon as they are fully capped. To determine if they are fully capped, look at the combs from the top, then tip up the super and look from the bottom. Remove when 95% or better are capped, as leaving the supers on the hive longer will cause the cappings to darken from the bees constantly walking on them...bees have dirty feet!

With a strong hive, beekeepers can produce at least two supers of comb honey in most areas of the country. Two Ross Round supers have only about 36 pounds of honey, and a single cut comb super will have between 28-35 pounds of honey (depending on the depth of the super). While a great deal of nectar is required to make the wax for the combs, the equivalent for two supers is less than five pounds of honey. I am not in a good honey producing area, and always average three Ross Round™ supers a hive, or one Ross Round super and one of cut comb. Occasionally one of my hives will fill five or even six Ross Round supers, but that is unusual. In better honey producing areas, considerably higher averages are common. For example, Ray Nicholson of Wadena, Minnesota has been producing comb honey for 60 years and I understand that in some years his hives will average 144 circular sections. In 1998, he had one hive produce 216 sections!

The next article will discuss harvesting, packaging and marketing the sections and preparing your hives for winter. BC

Lloyd Spear is a round comb honey producer living in up-state New York. And yes, he manufactures Ross Round Supers.

?Do You Know? Answers

1. **True** Only worker honey bees have wax glands and produce beeswax.
2. **False** Wax bloom on the surface of a candle has no effect on the way in which a candle burns.
3. **True** Bees cannot survive without honey or a carbohydrate source. Colonies with inadequate stores die, and the deceased workers can usually be found, each with nearly its entire body, headfirst in a cell. Often, hundreds of such workers are found in contiguous cells. Starvation is frequently found toward the end of Winter or early Spring, but can occur at any time of the year.
4. **False** A primary swarm normally leaves the hive before a virgin queen emerges from her queen cell. Once a queen cell is capped, the bees are committed to swarming.
5. **True** Brood rearing in honey bee colonies normally begins in northern temperate climates in early January. It appears that an increasing day length stimulates a queen to lay eggs. Some of the early eggs that are laid either fail to hatch or are eaten by the workers. Brood rearing gradually increases in late January and February, and rapidly increases as soon as fresh pollen becomes available.
6. **False** The small hive beetle was initially found in Florida, and within eight months it had been found in South Carolina, North Carolina and Georgia.
7. **True** Normal beeswax melts at 143° to 151°F whereas, bits of wax bloom melt at a much lower temperature, about 102°F.
8. **True** Honey vinegar is produced from diluted honey by allowing it to undergo natural fermentation. Through the fermentation process, the sugars found in honey are made into alcohol, and then the alcohol is converted into acetic acid. The natural process also requires a common but specific bacteria.
9. **True** Several studies have shown the beeswax combs readily absorb fluvalinate when Apistan strips come in direct contact with them. Fortunately, the fluvalinate does not tend to migrate out of the wax into honey that is stored in the cells at a later time.
10. A.Trapping bees out of a cavity or structure is a very slow process, taking several weeks.
    B. You will never get the queen, brood, wax combs or honey.
    C.Often the feral colony will have multiple entrances, which reduce trapping efficiency.
11. Age of the worker bee
    Needs of the colony
12. Division Board Feeder
13. Dead colonies should be closed up and removed from the apiary as soon as possible. Failure to follow this recommendation could result in the spread of disease when the combs are robbed out. Leaving the colony in the apiary or improper storage of the equipment will result in molds growing on the combs, and honey that remains may absorb moisture and ferment. The dead, rotting bees may also damage the combs.
14. The rectum of the honey bee is a storage chamber for the retention of feces until defecation can occur outside the hive. In overwintering bees, the rectum may become so greatly distended as to occupy a large part of the abdominal cavity before defecation occurs.
15. Bloom on beeswax candles may be easily removed by wiping the candle with a cloth.
16. Purple loosestrife is a wetlands plant, and abounds in many swamps.
17. **False** Purple loosestrife honey is amber in color, and when held up to the light, it has a slightly greenish tinge. The flavor is mild despite its somewhat darker color. It makes a reasonably good table honey.
18. Purple loosestrife has caused an ecological problem in wetland areas where it abounds. It outcompetes everything around it, and is replacing, for example, cattails in swamps everywhere it is found, and as a result has displaced a number of species of wildlife. In addition, it has spread relatively rapidly throughout the country, causing problems in irrigation systems in the Far West.
19. C) *Varroa* mites & small hive beetles
20. E) Africanized honey bees
21. B) October

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

Clarence Collison is a professor of entomology and head of the Dept. of Ent. & Plant Pathology at Miss. State University, Miss. State, MS.

Richard Taylor

Bee Talk

"There's more than one way to produce strong colonies."

Comb honey beekeeping has the great advantage of simplicity. You'll spend more time in your apiaries, which is where most beekeepers like to be anyway, but the honey house work will be simplified. Indeed, you don't even need a honey house and all the equipment that goes with that. All you need is a pocket knife and a good freezer, which most households have anyway. The freezer is for treating the comb honey against wax worm damage, as described in any recent book on raising comb honey.

The trick to getting comb honey is having very strong colonies that will not swarm. This means single-story hives or, better, story-and-a-half hives, the half-story being a regular shallow extracting super. Thus, two conditions for precipitating swarming are already present – a strong colony in a small hive.

Probably the single most effective step in discouraging swarming under these conditions is having young queens, and that means requeening every year, whether in Fall or Spring. This will certainly not prevent all swarming, but it does reduce it, and almost all serious comb honey beekeepers do this. I never used to, because I so disliked the idea of killing beautiful queens, but if you want to raise comb honey it is no doubt foolish to let sentiment dictate your management system.

Mr. Herman Dannenhower, a first-rate Pennsylvania beekeeper who runs about 125 colonies, has a system according to which the bees requeen themselves each year. His area of Pennsylvania is not a primary area for honey getting, but he has a method – or, really, two quite different methods – of getting good crops of top-grade comb honey. This is the more remarkable because his honey flows are pretty much over in June. He has little or no basswood in his area, and basswood is, in most areas of the Northeast at least, what comb honey beekeepers depend on most.

Mr. Dannenhower clips all his queens, and this is the basis of his first system. The hives are all one and a half stories. As soon as the colonies have built up to the point when they might be starting queen cells, he checks for them. This is a simple procedure – he just checks the underside of the shallow super in each hive. About one in 10 of the colonies start no queen cells during the entire swarming season, and these, of course, require almost no management. He simply adds supers as needed, and harvests them when they are filled. But the other nine colonies do have queen cells, if not the first time they are checked, then later, on subsequent examination. This check for queen cells is repeated every seven to 10 days throughout the swarming season.

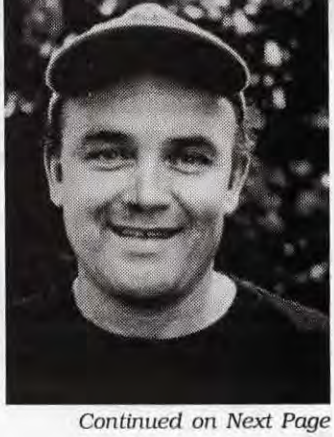
When Mr. Dannenhower finds queens cells, he proceeds to take the colony apart and destroy every single queen cell except one, and with that, his management of that colony is done for the season except, of course, for supering up and harvesting.

The result of this procedure is that the colony swarms, but the parent queen, being clipped, falls into the grass and perishes. Once in a while Mr. Dannenhower finds her there, but usually she just disappears. The new queen then emerges from the single cell that was left, and the colony is requeened – with a virgin queen, to be sure, but at no cost. Meanwhile the swarm that left with the parent queen, having discovered that it has no queen, returns to the hive, and it is once again a powerful colony in a small hive and with a new queen – just what you want for getting comb honey.

The comb honey supers start going onto the hives when the dandelions bloom. By this time, some of the colonies will already have been dealt with, of course, in the manner just described, and will require no more special attention, but others will still require the periodic checks for queen cells, up to June, by which time the honey flows are pretty much over in Mr. Dannenhower's area.

What is astonishing to me is that this beekeeper can get such good crops of truly fine comb honey in such a brief time. I am accustomed to seeing honey flows just starting to get underway at about the time Mr. Dannenhower's flows are ending, and then the really heavy flow comes in July, from the bass-

Herman Dannenhower



Continued on Next Page

BEE TALK ... Cont. From Pg. 57

woods, and we often get some good crops even into August.

Mr. Dannenhower's second system is altogether different. Here he begins with a two-and-a-half story hive, that is, one consisting of two full-depth hive bodies plus one shallow. As soon as the colony has built up to pretty good strength, but before swarm preparations are actually underway, he puts the queen in the bottom story, which he then separates from those above with a queen excluder. Brood rearing is thus confined to the bottom story, and the upper story and a half begin to fill with honey. It is important, when the queen is put below, to be sure that she has plenty of empty comb for brood rearing. Any combs that are mostly honey in the bottom story can be exchanged for empty or nearly empty combs from the story above it. Now for the next step: After 10 to 14 days, Mr. Dannenhower moves the bottom story off to one side with its own new bottomboard and cover, and returns the queen to the hive that was left on the original stand.

So now what have you got? You have a new colony, deprived of both queen and field bees, on a new stand, the field bees having all returned to the hive on the original stand and the queen having been put back there. This colony, having plenty of brood, will forthwith raise a new queen but will be unlikely to swarm, having been depleted of field bees. And the hive on the original stand has little brood, but *lots of honey.* Comb honey supers are added at once, and they fill up very fast, first because of all those field bees bringing in nectar, with little or no brood for the bees to deal with, and second, because the bees, in order to make room for brood rearing below, move the honey that is stored there up into the supers. It is this latter behavior pattern of the bees, which few beekeepers sufficiently appreciate, that explains the dramatic results this system often produces.

It should be noted that by this second system the beekeeper in effect creates an artificial swarm, but does so in such a manner as not to lose the field bees or the queen. BC

Richard Taylor is a philosopher and lifelong beekeeper who lives in the Finger Lakes region of New York.

Questions?

Slatted Racks Yes, No

What are slatted racks, and what are the advantages and disadvantages of using them?

Charles F. Byram
Oak Ridge, TN

Some beekeepers use deep bottom boards, usually about two inches deep, and then put a slatted rack in it to prevent the bees from building comb on the bottoms of the frames. I believe it was C.C. Miller who started this practice, and some beekeepers still use them. They think that it improves ventilation, having the larger entrance and space underneath the combs, and thus discourages swarming. In my opinion it has little if any effect with respect to swarming, involves having an additional piece of hive equipment, and non-standard bottom boards, so I do not recommend these slatted racks.

Reverse or Not?

I read that when the dandelions are in bloom you should reverse the two stories of the hive, to get the brood in the bottom, but when I checked, I found brood already in the bottom, as well as in the top. Should I have reversed anyway?

Harold Gatlin
Crete, IL

The purpose of reversing is simply to break up the brood nest, relieving congestion, thus giving the queen more new space to lay in, and discouraging swarming. So yes, it is a good idea to do the reversing, no matter where the brood is, if you have time to do it. It tends to delay, but not prevent, swarming.

New Hive

When I find queen cells in a hive, why could I not take two or three combs of brood out, including the one with queen cells, and put them in a new hive over a double screen on top of the original hive, giving this top hive an entrance of some sort? Wouldn't this stop them from swarming as well as giving me a new hive of bees?

Henry J. Hochstetler
Stoneboro, PA

That is an excellent way to increase your number of colonies. There is probably no better way. And it does indeed discourage swarming, but it will not necessarily prevent it. If the bees down below have a single queen cell they might (and might not) still swarm, and even if they have none, they might simply start building queen cells again. The use of the double screen is, incidentally, important; it should not just be a single screen.

Is It Safe?

I am new at beekeeping with three hives. I use Captan on my apple trees and garden. Is it safe to use this when the trees are in bloom?

Richard Borkholder
Nappanee, IN

No pesticide should be applied to fruit trees when they are in bloom. They can be used at other times provided you make sure they do not drift into the hives or onto other flowers your bees are visiting. I have seen entire apiaries wiped out by such accidental drifting. With respect to Captan, read carefully the precautions on the bag before using it on anything.

Queen - No Queen?

If one hive is not collecting pollen, and the other hives are, does this mean that hive is queenless? Does a queenless colony always make a roaring sound? What are the signs of a queenless colony?

Bert Clayton
North Charleston, SC

If a colony is collecting pollen then it almost certainly has a queen, but the fact that no pollen is going into a colony does not necessarily mean it is queenless. Check for brood. If there are eggs, then you have a queen. If there are no eggs, but only sealed brood, then you may have a virgin queen. The clearest sign of having a queen is to see her.

Lost Queen

I purchased several nucs, one of which lost its queen. I tried to raise a new one by giving this nuc a frame of eggs and young larvae, but after a week there were no queen cells. The brood was developing normally. It was a fairly strong nuc. I purchased and introduced a new queen and now everything is all right. What did I do wrong?

Doug Beattie
North Hadley, Quebec, Canada

In my experience a queenless colony always tries to raise a new queen if it has eggs and young larvae, even if the colony is very weak. The bees, however, though seemingly queenless, sometimes have something they consider to be a queen, such as, a virgin queen that the beekeeper fails to see, or a runt queen cell that is similarly overlooked. Maybe the queen that took over your nuc was one of these. The only thing you did wrong was try to raise a queen in a weak nuc. This usually results in poor (if any) queens, since the bees cannot make enough royal jelly and brood food, forage, keep the brood warm and protect the nest. The stress is more than they can handle.

Questions are eagerly solicited. Send them to Dr. Richard Taylor, Box 352, Interlaken, New York 14847 (not Medina) and enclose a stamped envelope for direct response.

Answers!

Richard Taylor

Ann Harman

Home Harmony

Newsletter Ideas

April is famous for April Fools' Day, income tax, the first day of Spring and sometimes Easter. This year the April issue features association newsletters – will yours be famous? I hope so.

In addition to news and tips for beekeepers, does your newsletter have a recipe of the month? A honey recipe, of course. An association newsletter is a great way of sharing recipes, as well as letting your members discover new ones. Encourage your members to submit recipes. But several words of caution – read the submitted recipes carefully before printing. Sometimes a critical ingredient is inadvertently left out, or a typo leads you to use ridiculous quantities of some ingredient. Other problems I have encountered are incomplete directions or no information about pan or bowl sizes.

Seasonal recipes are always appropriate – something for Christmas, Summer picnics, Valentine's Day and even Halloween. Certainly you should celebrate National Honey Month in September with at least one recipe that uses lots of honey. If your association has a potluck supper or picnic, recipes for beverages in quantity are always useful.

Where to find honey recipes? I've already mentioned your association members. And of course there are honey cookbooks, plus brochures from the National Honey Board. If you use a recipe from a known source, you must credit that source. I have not had much luck finding honey recipes in food magazines, but occasionally a newspaper will print one. Alert your members to finding honey recipes in various sources. It is difficult to find honey recipes in non-honey cookbooks – you can look under "honey" in the index, but the honey recipe may well be under "W" for "wonderful something or other." Caution – reading through a cookbook index may make you hungry. The American Beekeeping Federation has recipe brochures from the Honey Queen and Princess. Some state associations have recipe books, too.

Tips for cooking with honey are always welcome. You could encourage members to send in questions concerning honey cookery. You can find some nice recipes for hand creams, facials and lotions. Don't ignore recipes containing beeswax, not only for hand creams but also for furniture polishes. However (here's a tip), using shampoos or cosmetics containing honey just before visiting your beeyard will fool your bees into thinking a rich source has just appeared. That cloud of bees around your head may not be what you had in mind.

Here are some recipes to get you started on your "Recipe of The Month" column in your newsletter.

HONEY CHILLED ASPARAGUS

Springtime is asparagus time. This recipe would be appropriate for this time of year.

1-1/2 pounds asparagus
zest of 1/2 orange
1/2 tablespoon honey
1 tablespoon soy sauce
1 tablespoon olive oil
1 tablespoon dry sherry or red wine vinegar

Blanch asparagus in boiling water 4 minutes. Do not overcook. Drain and rinse under cold water. Pat dry, and slice into 1-1/2-inch pieces. Mix remaining ingredients. Toss with asparagus and refrigerate at least 1 hour.

Golden Blossom Honey Beeline

Here's another cooking tip for your recipe column: If a recipe calls for white wine, you can substitute mead. Just make certain to use the appropriate dry or sweet mead according to the recipe.

SAN FRANCISCO CHOPS

Recipe names are really interesting. I wonder whether these pork chops are well-known in San Francisco. Anyway, put the recipe in your newsletter, fix yourself some pork chops, and enjoy. You can cook these on top of the stove or in the microwave. The microwave directions are given here. The pork chops are delicious served over buttered noodles or other pasta.

4 pork chops, 1/2 to 3/4 inch thick, boneless
1 tablespoon oil
1 clove garlic, minced
3 tablespoons dry sherry or broth
3 tablespoons soy sauce
1-1/2 teaspoons honey
1/4 teaspoon crushed red pepper
1-1/2 teaspoons cornstarch
1-1/2 tablespoons water

Trim pork chops of excess fat. In a microsafe shallow dish combine oil and garlic. Spread evenly in dish. Microwave at HIGH for 1 minute. Combine sherry, soy sauce, honey and pepper in bowl. Add pork chops to dish, turning over in garlic oil. Pour sauce mixture over chops. Cover with wax paper. Microwave at HIGH for 4 minutes, turning chops and dish once after 2 minutes. Keep covered. Microwave at MEDIUM (50%) power for 12 to 15 minutes or until meat is tender and no pink remains. Remove chops to serving dish. Dissolve cornstarch in water. Stir into pan juices. Microwave on HIGH for 1 to 2 minutes until thickened. Leave uncovered and stir once. Pour sauce over chops and serve. Serves 4.

Great American Recipes

HONEY PEANUT BUTTER BALLS

Every once in a while, put a recipe kids can make into your newsletter. They like to stir things together and eat the results. Kids can make these as a gift or even as a treat for their classmates. The peanut butter balls are nutritious.

1 cup nonfat dry milk
1 cup peanut butter
1 cup honey
1/2 teaspoon vanilla
2/3 cup chopped peanuts
1 cup wheat germ

Mix well, roll into 1-inch balls, and refrigerate. Makes about 4 dozen.

Totally TX Recipes For Kids To Cook

Gleanings

APRIL, 1999 • ALL THE NEWS THAT FITS

BEE BADGE BACK

Many of today's beekeepers got their start in beekeeping by earning the Beekeeping Merit Badge through the Boy Scouts of America. Introduced in 1911 as "Bee Farming" the name of the merit badge was changed to "Beekeeping" in 1915. From its introduction until 1996, just over 60,000 badges were awarded to boys in scouting. Unfortunately and to the disappointment of many beekeepers and scouters alike, the BSA advancement committee decided in 1996 to discontinue the badge due to lack of interest. Many other badges are earned by 50-70,000 boys each year and in 1996, only 162 Beekeeping Badges were awarded. Normally when a badge is dropped, it passes with little notice, but reportedly there was a large unhappy response to this one. A massive campaign was launched including posting of a web site on the internet specifically to lobby for the reinstatement of this badge. Thanks to that effort and the hours of work by many others and the receipt of many calls and letters from concerned beekeepers who began as Boy Scouts, Mr. John Dalrymple, Advancement Director, Boy Scouts of America stated that the national review committee had reconsidered this badge and that on February 9, 1999 had decided to reinstate the merit badge. The calls and letters of beekeepers expressing the importance of the beekeeping industry in relation to today's agricultural climate and the world food production impacted this decision. Mr. Dalrymple further stated that this move will be announced to Scouts this fall and the current revision of the Merit Badge Pamphlet will be reprinted and available at that time. He expressed the intent of the BSA to revise the pamphlet within the next couple of years to include important updates concerning Africanized bees, and the latest on bee diseases and pests. They are also considering redesigning the merit badge.

The merit badge pamphlet for this particular merit badge was originally printed in 1957, revised in 1983 and last reprinted in 1988. The *Beekeeping Merit Badge Pamphlet* is a comprehensive booklet written at an introductory level for the beginning beekeeper. The booklet, however, can be difficult to understand for novice beekeepers without the benefit of an experienced beekeeper to assist in relating the information to practical explanations.

We all need to find opportunities to educate the public about these beneficial insects – on an individual basis and as you can see, there are many opportunities for interested beekeepers to become involved with a local troop in your area. Scouts eligible to earn this badge are typically boys between the ages of 11 and 18 years. You can contact your local area Boy Scout Council and let them know that you are interested in helping scouts earn the Beekeeping Merit Badge. Hopefully, this move will allow many more boys exposure to the fascinating world of beekeeping.

Letters of support and appreciation for this decision or comments and suggestions can be sent to John Dalrymple, Director of Advancement, P.O. Box 152079, Irving, Tx. 75015-2079.

Nanci Solis is a hobby beekeeper located in the Rio Grande Valley, Mission, Tx. She is a BSA Merit Badge Counselor as well as Secretary of The Rio Grande Valley BeeKeepers Association and has assisted three local scouts in earning the Beekeeping Merit Badge since it was discontinued. e-mail: hssolis@stcc.cc.tx.us

New Product
HIVE BEETLE DRENCH APPROVED

The U.S. Environmental Protection Agency (EPA) recently granted to Y-TEX Corporation a label amendment on its product, GardStar® 40% EC Livestock and Premise Insecticide, for ground drench uses around honey bee colonies to aid in the control of the small hive beetle, *Aethina tumida* Murray. GardStar 40% EC, an emulsifiable concentrate containing 40% permethrin under EPA Reg. No. 39039-8, has been registered in all 50 states for numerous pest control uses on livestock and their premises, including meat-processing premises, and for the control of imported fire ants as a mound drench. It is now approved for use any time of year as needed by sprinkler can application to the ground in front of beehives and by low-pressure spray application to apiary grounds for pest cleanup prior to hive placement. GardStar 40% EC is the only product approved by the EPA for ground treatment to control the small hive beetle.

The EPA responded rapidly to this urgent request in order to provide an effective product for use against the small hive beetle. The fact that GardStar 40% EC, a non-organophosphate general use pesticide, was already registered for use around food processing premises and as a fire ant mound drench assisted in the EPA's evaluation as to its environmental impact for the apiary use.

Please read label instructions for hive beetle application. For locating your nearest dealer, contact Y•Tex Corp. at P.O. Box 1450, Cody, WY 82414.

STAR THISTLE CONTROL

A depressed patch of weeds in the Idaho wilderness is good news for land managers. That's because the depression provides some of the first visible success by an imported six-legged natural enemy of yellow starthistle.

Known to scientists as *Centaurea solstitialis*, yellow starthistle is among the top 10 worst weeds in several western states and covers tens of millions of acres. It can kill horses that eat it, and other livestock will eat only small portions of very young plants. The weed displaces other plants as it spreads, and turns prime grazing land into worthless weed pastures.

But a small beetle named *Eustenopus villosus* is beginning to tame yellow starthistle. Female beetles lay eggs in older buds and the larvae eat most of the maturing seeds before they can disperse.

Biological control is viewed as the best long-term strategy for managing the weed. Once it takes over, physical controls like cutting or pulling it can't keep up. Chemical control is too expensive for widespread use on rangeland and may be environmentally undesirable.

1999 Who's Who In Apiculture

The information contained in this Directory is as current and correct as possible. If you are aware of errors or omissions, please contact us at 800.289.7668, Ext. 3214, or email at kim@airoot.com. We will correct our electronic version on the web, www.airoot.com/bee and include corrections in our next Directory.

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- PIKES PEAK BKPRS ASSN – Kim Gravestock, 113A Manitou Pl., Manitou Springs 80929

CONNECTICUT

- ★ CT BKPRS ASSN – James S. Gray, 15 Islieb Rd., Marborough 06447, 860.295.8972 nxdm55a@prodigy.com
- BACK YARD BEEKEEPERS – Ed Weiss, 3 Whipstick Rd. Wilton 06897, 203.762.3538
- EASTERN CT BEEKEEPERS – Timothy Grilley, P.O. Box 571 E., Lyme 06333 203.762.3538 beeweiss@erols.com
- WESTERN CT BKPRS ASSN – Ralph Harrison, 46 Oregon Ave. N., Milford 06460, 203.878.0462, harrisonrw@aol.com

DELAWARE

- ★ DE BKPRS ASSN – John S. Tulloch, P.O. Box 473, Odessa 19730

FLORIDA

- ★ STATE BKPRS ASSN – Charlotte Randall, 389 S. Central Ave., Umatilla 32784, 352.669.2441, workwax@aol.com
- CENTRAL FL BEEKEEPERS – Rebecca Randall, 389 S. Central Ave., Umatilla 32787 352.669.2441
- ESCAROSO BEEKEEPERS ASSN – Sylvia Bullard, 9801 Lyman Dr., Pensacola 32534 850.478.7690
- NE FL BEEKEEPERS – Mickel Herrington, 8477 W. Beaver St., Jacksonville 32220
- PALM BEACH CO BKPRS – Leonard Fultz, 146 Martin Ave., Greenacres 33463
- RIDGE BKPRS ASSN – David Adams, 427 N. Tecumseh Ave., Ft. Meade 33841, 941.285.6700, adamshonco@aol.com
- SO FL BKPRS ASSN – Charlotte Nichols, 3050 Rustic Ln. NW, N. Ft. Myers 33917
- TAMPA BAY BKPR ASSN – Betty Watson, 3507 Washington Rd., Valrico 33594
- TUPELO BEEKEEPERS ASSN – Fred Mellor, Box 397, Fountain 32438
- W CENT FL BKPRS ASSN – Ann Murray, 14260 SE 80th Ave., Summerfield 34491 352.245.8633

GEORGIA

- ★ GA BKPRS ASSN – Virginia Stephens, 1967 Sumter St. NW, Atlanta, 30318, 404.350.9500
- CHATTAHOOCHEE BK ASSN – Jim Ellis, P.O. Box 4556, Columbus 31904-0556
- CHEROKEE CO BEE CLUB – Ron Ridlen, 1710 Mountain Trace, Canton 30114-8723 770.245.7204 rridlen@hasimons.com
- COASTAL EMPIRE – Greg Stewert, 221 Larchmont Dr., Savannah 31419
- EAST PIEDMONT BK ASSN – Pete Shelnutt, 2570 New High Shoals Rd., Bishop 30621
- METRO ATLANTA BKPRS – Edward Burris, 5342 Harris Circle Dunwoody 30038, 770.394.1972
- NORTHEAST MT. BKPRS ASSN – Bob Binnie, Rt 1 Box 2064, Lakemont 30552
- NORTHWEST GA BKPRS – Bill Slack, 108 W. LaFayette Sq., LaFayette 30728
- SOUTHEASTERN GA BEEKEEPERS – Bob Rowell, Rt.1, Box 147, Nahunta 31553
- TARA BEEKEEPING – Bobby Boles, 2855 West Rd., Riverdale

HAWAII

- ★ HI BKPRS ASSN – Lee Ong Chun, 2115 N. School St., Honolulu 96819, 808.841.6440
- BIG ISLAND BEEKEEPERS – Walter Patton, 27-703 Kalele, Papaikou 96781 hihoney@hawaiihoney.com

IDAHO

- ★ ID STATE BKPRS ASSN – Golden Millet, 1 Box 8 Bee, Marsing 83639
- ID HONEY IND. ASSN – E. Randall Johnson, 720 Fletcher Dr., Nampa 83686, 208.467.5195

ILLINOIS

- ★ IL STATE BKPRS ASSN – Rita Taylor, 4274 Taylor Homestead Rd., Pleasant Plains 62677, 217.626.1319
- COOK-DUPAGE BEEKEEPERS – Charles Williams, 22W 424 Teakwood Dr., Glen Ellyn 60137, 708.858.6308
- CTL EASTERN IL BEE ASSOC – Andy Blum, 1453 Co. Rd. 3600N, Paxton 60957, 217.379.9992
- HEART OF ILLINOIS – Carl J. Wenning, 21 Grandview Dr., Normal 61761, 309.454.4164, wenning@phy.ilstu.edu
- ILLIANA – Kathy Wright, P.O. Box 83, Kansas 61933, 217.948.5353
- LAKE CO BKPRS ASSN – Helen DeVries, 43278 North Trevor, Antioch 60002, 847.395.3975
- LINCOLNLAND – Melvin Kemmerling, 1264 Jefferies Rd., Springfield 62707, 217.487.7455
- LITTLE EGYPT – Beverly Tanner, RR 2 Box 707, Fairfield, 62837, 618.842.6016
- LOWER IL BKPRS ASSN – Darrel Perry, 11 E. Lake St., M. Sterling, 62353 217.773.2530
- MISSISSIPPI VALLEY – Rita Taylor, 4274 Taylor Homestead Rd., Pleasant Plains 62677 217.626.1319
- NORTHERN IL BKPRS – Lynn & Rob Rosemann, 16504 Kunde Rd., Union 60180 815.923.2287
- SPOON RIVER VALLEY – Lyle Lefler, RR 2 Box 35, Cuba 61427 309.785.5369
- STATELINE BKPRS ASSN – Layne Bonvillain, 2001 S. Scout Camp Rd., Stockton 61085, 815.858.3425
- ST. CLAIR – Udell Meyer, 8844 Trio Lane, Edwardsville 62025, 618.633.2429
- WABASH VALLEY – Alice Apple, 1224 W. 6th St., Jasper 47546, 812.482.3024

INDIANA

- ★ INDIANA BEEKEEPERS ASSOC – Dave Laney, 25727 New Rd., North Liberty 46554, 219.656.8701
- ★ INDIANA BEEKEEPERS ASSOC – John Adams, 6834 E 200 S, Bringhurst 46913, 765.566.3254
- MICHIANNA BKPRS ASSOC – Jim Curlee, 2610 Sampson, South Bend 46614, 219.289.1992
- NORTHEAST INDIANA BKPRS ASSN – J.P. Jones, 3416 Fairfield Ave., Ft. Wayne 46807-1896
- NW INDIANA BK ASSN – Ben Blake, 4E 181st Ave., Lowel 46356, 219.696.0021
- SOUTHEAST INDIANA BKPRS ASSOC – Jerry Brelage, 759 S. Holyberry, Batesville 47006

IOWA

- ★ IA STATE BKPRS ASSN – Dan Sowers, Rt. 1, Box 240, Nevada 50201-9767
- CENTRAL IOWA BKPRS – Margaret Hala, 1988 Vine Ave., Marshalltown 50158
- DES MOINES BACKYARD BKPRS – Peter Coyle, 2425 Franklin Ave., Des Moines 50310, 515.277.2415
- EAST CENTRAL IA BKPRS. ASSOC – Terry Dahms, 3086 Sycamore Trl. NE, Iowa City 52240
- INDIAN CREEK NATURE CENTER – Russell Swenson, 640 29th St. NE, Cedar Rapids 52402 319.364.4386
- IOWA HONEY PRODUCERS – Patty Stewart, 2956 170th St., South Amana, 52334 319.662.4145
- LAPLANDERS HONEY CONFERENCE – Ann Garber, 206 N. Central Ave., Allenton 50008, 515.873.4119, logchain@netins.net
- SE IOWA BEEKEEPERS – Ron Wehr, 2270 Juniper Ave., Keota 52248
- SOUTHWEST IOWA HONEY PRODUCERS ASSN – Michael O'Hearn, RR 2 Box 17, Northboro 51647

KANSAS

- ★ KS HONEY PRODUCERS – Joli Winer, 1455 Winchester, Olathe 66061-5881, 913.884.5039
- CENTRAL KANSAS BEEKEEPERS – Anita Mead, Rt. 1, Box 90, Belle Plaine 67013
- FLINT HILLS BEEKEEPERS – Don Morey, 1026 Woodland, Emporia 66801, 316.342.3607
- NORTHEAST KS BEE ASSN – Joli Winer, 1465 N. Winchester, Olathe 66061-5881, 913.768.8967
- SOUTHEAST KS BEE ASSN – Tim Tucker, 366 Rd. 32, Niotaze 67355, 316.879.2926

KENTUCKY

- ★ KY STATE BKPRS ASSN – Gerald Burchett, 729 Rolling Meadows Rd., Grand River 42045, 502.926.4003, gbee@hcis.net
- BLUE GRASS BKPRS. ASSN – James Davis, 371 Caney Church Rd., Stamping Ground, 40379-9644, 502.857.2272
- DARK HONEY PRODUCERS – Stanley Bishop, 574 S.R. 290, Mckee 40447, 606.364.3196
- DIX RIVER BKPRS ASSN – Dennis Rachford, 3035 Skyline Dr., Stanford 40484, 606.365.9063, d.rachford@cwix.com
- ESTILL CO BKPRS – Edison Joe Estes, Star Route, Irvine 40336
- GRANT COUNTY BEE CLUB – Judy Gaida, Rt. 1 Box 126, Demossville 41033
- GRAYSON COUNTY BEEKEEPERS – Wilbur W. Willoughby, 3769 Post-Tussey Rd., Caneyville 42721
- GREEN VALLEY BK ASSN – Sherri Coleman, 4523 Sutherland Rd., Owensboro 42303

- **GREENUP CO BKPRS ASSN** – Carl Crabtree, Argillite 41121
- **HEART OF KY BK ASSN** – Halcyon Holt, 944 Belvoir Dr., Frankfort 40601
- **KENTUCKIANA BK ASSN** – Ray Williams, 2725 Sheila Dr., Louisville 40220, 502.459.9968, rfwill01@gwise.louisville.edu
- **LAKE BARKLEY BKPS ASSN** – Edgar Doores, 135 Nolan Dr., Paducah 42003 502.554.9519
- **LINCOLN TRAILS BK ASSN** – Joe Perry, 167 Santa Fe Trail, Elizabethtown 42701
- **NORTHEAST KY BKPRS ASSN** – Thomas Crabtree, 232 W. Greenhill Rd., Ashland 41102
- **NORTHERN KY BKPR ASSN** – Wilbur Hudson, 1525 Connor Rd., Hebron 41048
- **OLDHAM CO BKPRS ASSN** – Robert Stevens, 3511 Arrowood Ct., Lagrange 40031
- **WHITLEY COUNTY BKPRS** – Eddie Wells, P.O. Box 181, Corbin 40702-0181
- **WILDERNESS RD BKPRS ASSN** – James Patton, Rt. 2, Box 70, East Bernstadt 40729

LOUISIANA

- ***LA STATE BKPRS ASSN** – Steve Bernard, 1051 Frank Castille, Breaux Bridge 70517, 318.228.7535
- **ARK-LA-TEX BEEKEEPING** – Carl H. Greig, 219 Covington, Benton 71006

MAINE

- **★ ME STATE BKPRS ASSN** – Brant Miller, 67 Post Rd., Bowdoinham 04008, 207.666.3270, bsmiller@gwi.net
- **CENTRAL MAINE BK ASSN** – Mel Johnson, 49 Upper Garland Rd., Garland 04939
- **CUMBERLAND COUNTY** – Robert Nunley, 63 Webb Rd., Windham 04062, 207.892.4046, rnunley470@aol.com
- **DOWN EAST CHAPTER** – Jim Reed, RFD #1, Box 2625, Bar Harbor 04609
- **SAGADAHOC CO BKPRS ASSN** – Brant Miller, 67 Post Rd., Bowdoinham 04008 207.666.3270, bsmiller@gwi.net
- **TRI-COUNTY BKPRS** – Genevieve Delicata, RR 1, Box 417, Stockton Springs 04981, 207.567.3822
- **WESTERN ME BK ASSN** – Bruce Clark, RR 1, Box 1600, New Vineyard 04956

MARYLAND

- **★ MD STATE BKPRS ASSN** – David Simmons, 3212 Aldino Rd., Churchville 21028, 410.734.4188 asimmo1@tiger.towson.edu
- **ALLEGHENY MTN. BKPRS ASSN** – Harry Mallow, 11914 Valley Rd NE, Cumberland 21502, 301.724.2191
- **ANNE ARUNDEL CO BEEKEEPERS** – Jon Clulow, 871 Swift Rd., Pasadena 21122 410.255.2676, jonclulow@juno.com
- **ASSN OF SOUTHERN MD** – Walter Kielk, 8800 Dubois Rd., Charlotte Hall 20622, 301.884.4457
- **BOWIE-UPPER MARLBORO BKPRS** – John Lugmayer, 4002 Chelmont Lane, Bowie 20715, 301.464.9413
- **CARROLL CO BKPRS** – Peck Bond, 1710 Emory Rd., Reisterstown 21136, 410.239.7921
- **CTL MD BEEKEEPERS** – Bob Crouse, 5440 Dogwood Rd., Baltimore 21207, 410.265.7999, rlcrouse@qis.net
- **HAGERSTOWN VAL APIAN SOC** – Dick Roberts, 15 Hebb Rd., Hagerstown 21740 301.790.2292
- **HOWARD CO BKPRS ASSN** – Wayne Esaias, 6971 Mink Hollow Rd., Highland 20777, 301.854.3180
- **MONTGOMERY CO BKPRS** – George W. Imirie Jr., 12705 Circle Dr., Rockville 20850 301.424.5709, gimasterbk@aol.com
- **SUSQUEHANNA BKPRS** – David Kelly, 729A Cherry Hill Rd., Street 21154, 410.838.8420

MASSACHUSETTS

- **★ MA STATE BKPRS ASSN** – Ted Shylovsky, 192 Boston Post Rd., Sudbury 01776-3102, 508.443.7195
- **BARNSTABLE CO BEEKEEPERS** – Jean Kennedy, 575 Willow St., West Barnstable 02668
- **BRISTOL CO BKPRS** – Frederic Magee, 148 Turnpike St., West Bridgewater 02379
- **ESSEX CO BEEKEEPERS ASSN** – Dawn Watson, P.O. Box 10, Topsfield 01983-0010
- **FRANKLIN CO MA ASSN** – Ralph Whiteman, Martindale Rd., Bernardston 01337
- **HAMPDEN CO BKPRS** – Jean Gosselin, 127 Hendon Dr., Feeding Hills 01030 413.786.2780, jeang@javanet.com
- **HAMPSHIRE CO BKPRS** – Stephen Prajzner, 37 College View Hgts., South Hadley 01075, blues@java.net.com
- **MIDDLESEX CO BKPRS** – Ted Shylovsky, 192 Boston Post Rd., Sudbury 01776-3102
- **NORFOLK CO BKPRS** – Sharon Courchesne, 73A Tremont St., Rehoboth 02769-2822
- **NORTHERN BERKSHIRE BKPRS** – David Thayer, 720 Middle St., Clarksburg 01247 413.664.8688, thaydar@vgernet.net
- **PLYMOUTH CO BKPRS** – Holly Groelle, 221 Old Cordwood Path, Duxbury 02332
- **WORCESTER CO BEEKEEPERS** – Jania Antos, 24 Dudley So. Bddge, Dudley 01571

MICHIGAN

- **★ MI STATE BKPRS ASSN** – John Wrosch, 2411 Hickman Rd., Ann Arbor 48105
- **CRANBROOK BEE CLUB** – Larry or Sue Yates, 705 Coolidge, Birmingham 48009, 248.649.5078
- **HOLLAND AREA BKPRS** – Mike Gardner, 9305 Ransom, Zeeland 49464
- **SAGINAW BAY BEEKEEPERS** – John Kern, 12740 E. Curtis, Frankenmuth 48072, 517.652.2246
- **SCHOOLCRAFT BEEKEEPERS CLUB** – Roger Sutherland, 5488 Warren Rd., Ann Arbor 48105, 734.668.8568, rsuther@hotmail.com
- **SOUTHEASTERN MI BEE ASSOC** – Eric Goodrich, 263 Hunters Rill, Oxford 48371, 248.969.9678
- **SOUTHWEST MI BEEKEEPERS** – Don Hiatt, 123 Drum, Miles 49120
- **WESTERN MI BKPRS** – Larry Hasselman, 7390 W. 32nd St., Fremont 49412

MINNESOTA

- **★ MN STATE BKPRS ASSN** – Fred Holte, Rt. 1 43480 Andee, Harris 55032, 612.689.1065
- **CENTRAL MN BEEKEEPERS ASSN** – T & J Apiaries, Rt. 1 Box 250, Ponsford 56575
- **LAKES REGION BEEKEEPERS** – Wes Hull, 218.864.0129
- **MN HOBBY BKPRS ASSOC** – Gary Snydock, 6572 N. Stillwater Blvd., Oakdale 5512
- **MN HONEY PRODUCERS** – Fred Holte, Ri 43480 Andee, Harris 55032, 612.689.1065
- **NO CENTRAL BEEKEEPERS ASSN** – Donald Jackson, 2056 County 17 SW, Pequot Lakes 56472, 218.568.8469

MISSISSIPPI

- **★ MS STATE BKPRS ASSN** – Harry R. Fulton, P.O. Box 5207, Mississippi State 39762, 601.325.3390
- **CENTRAL MS BKPRS ASSN** – Del Sparks, 173 Plummer Circle, Jackson 39212
- **GULF COAST BKPRS ASSN** – D. Kilbern, 2910 Duncan Ave., Pascagoula 39581
- **MS DELTA BKPRS ASSN** – Huburt Tubbs, P.O. Box 3, Webb 38966
- **NORTHEAST MS BKPR ASSN** – Jim Archer, 204 Ridgecrest Rd., Booneville 38829
- **SOUTHEAST MS BKPRS ASSN** – Milton Henderson, 8 Bedrock Rd., Ellisville 39437

MISSOURI

- **★ MO STATE BKPRS ASSN** – Don Moore, 15 Kathryn Dr., St. James 65559, 314.265.8706
- **BKPRS ASSN OF THE OZARKS** – Mary Jane Kelly, 5938 W. Farm Rd. 94, Springfield 65803, mikelly46@hotmail.com
- **BOONE REGIONAL BKPRS** – Arlon Gelder, 6800 Kircher Rd., Columbia 65202, 573.474.8837, walkabot@computerland.net
- **DALLAS CO BEEKEEPERS** – Inge Foster, Rt. 1, Box 105, Urbana 65767
- **EASTERN MO BKPR ASSN** – Connie Abeln, 5815 Hillview Drive, Pacific 63069, 314.394.5395
- **JEFFERSON CO BKPRS** – Marko A. Biscan, 7255 Hwy. 30, Cedar Hill 63016
- **MID-MO BEEKEEPERS** – David James, Rt.1, Jadwin 65501
- **MIDWESTERN BKPR ASSN** – Roger Nichols, 8754 E. 83rd St., Raytown 64138, 816.353.1963
- **MISSOURI VALLEY BKPRS** – Sue Koch, 7568 Elmont Rd., Sullivan 63080, 573.627.3359
- **OZARK MTN BKPRS** – Eddie Rosencrans, 212 Newbury Rd., Reeds Spring 65737
- **SEMO HONEY PRODUCERS** – Ray Batton, 3032 N. 14th, Poplar Bluff 63901
- **SO CENT BEEKEEPERS** – Marge Kilton, RR 2, Box 2746, Alton 65606
- **SW MO BEE ASSOC** – Marilyn Spencer, Rt.1 Box 254-A, Rocky Comfort 64861
- **WEBSTER CO BKPRS ASSN** – Keith Nutting, Rt.1, Box 588, Fair Grove 65648 417.759.2205

MONTANA

- **★ MT STATE BKPRS** – Jeff LeFore, P.O. Box 88, Rapelje 54067, 406.663.2101
- **EASTERN MT BEEKEEPERS** – Sheri Kisch, 3175 Vista Ln., Laurel 59044

NEBRASKA

- **★ NE HONEY PROD** – Reed Koeppe, 2301 Ave. B, Kearney 68847
- **NE BKPRS ASSN** – Michelle Stenner, 13401 S 34th St., Bellevue 68123, 402.293.0973, stenner@radiks.net

NEVADA

- **★ NO NV APIARY SOC** – Bill Goff, 14060 Edmands Dr., Reno 89511, 775.851.1888

NEW HAMPSHIRE

- ***NH BKPRS ASSN** – Michael Bayko, 69 Bean Rd., Merrimack 03054, 603.424.5477
- **KEARSARGE BEE ASSN** – Deb Snelling, 23 Bellic St., Claremont 03743
- **LAKES REGION BKPRS** – Greg Sanderson, 1168 New Hampton Rd., Sanbornton 03269
- **MERRIMACK VLY BEEKEEPERS** – Roy Januskiewicz, 9 Huron Drive, Nashua 03063, 603.882.1106
- **PAWTUCKAWAY BKPRS** – Guy Senneville, 117 Smyth Rd., Manchester 03104
- **SECOAST BKPRS ASSN** – Joe Orr, 354 Rt. 108, Madbury 03820 603.749.3318

NEW JERSY

- **★ NJ BKPRS ASSN** – Herb Pabst, P.O. Box 1515, West Caldwell 07007-1515, 201.226.3863
- **CENTRAL JERSEY BKPRS** – Jim Puvel, 2 Smylie Rd., Wrightstown 08562, 609.758.3215, jimp562@aol.com
- **ESSEX CO BKPRS** – Marian E. Chandler, 85 Deerfield Rd., W. Caldwell 07006
- **MORRIS CO BEEKEEPERS** – Rhoda Duve, 2 Hartmans Trl., Washington 07882-9501
- **NW JERSEY BKPRS. ASSN** – Gary L. Bradshaw, 32 Hewitt Rd., Stockton 08559
- **SOUTH JERSEY BKPRS** – Edward Penny, 1777 Dutch Mill Rd., Franklinville 08322 609.697.4611 kodyz@jnlk.com
- **SUSSEX CO BKPRS** – Tom Webb, Rt. 519, Sussex 07461

NEW MEXICO

- **★ NM STATE BKPRS ASSN** – Patrick M. O'Hearn, #4 County Rd. 5149, Bloomfield 87413, 505.634.1417, patrick@cyberport.com

NEW YORK

- **★ EMPIRE ST. HONEY PRODUCERS** – Earl Villecco, 593 Tunnel Rd., Port Crane 13833
- **ALLEGANY CO BKPRS CLUB** – Harry Whitehead, P.O. Box 3052, Rushford 14777, 716.437.2332, 518.734.4629
- **CATSKILL MOUNTAIN BKPRS** – Dick Johnson, Box 81, Windham 12496
- **CHAMPLAIN VAL BKPRS** – Richard Crawford, 675 Mason St., Morrissonville 12962 518.561.7167
- **CHAUTAUQUA CO BKPRS** – Robert Dalhgren, 2902 Stone Rd., Falconer 14733-9732
- **CHEMUNG VAL BKPRS** – Clint Fudge, 1043 Breesport Rd., Erin 14838-9709, 607.796.2473, cfudge@exetrope.net
- **FINGERLAKES BK CLUB** – Mike Griggs, 6 Bald Hill Rd., RD #4, Ithaca 14850, 607.272.5791, mhg3@cornell.edu
- **LONG ISLAND BKPRS** – Raymond Lackey, 1260 Walnut Ave., Bohemia 11716-2176, 516.567.1936, lackey_rj@dtnhome.com
- **MID YORK BKPRS ASSN** – Lawrence A. Giglio, 11251 Deertrail Rd., Deerfield 13502, 315.724.8303
- **SE BKPRS CLUB** – Kathleen Smith, P.O. Box 121, Cuddebackville 12729
- **SO ADIRONDACK BKPRS ASSN** – Rick Green, 8 Hickory Grove Lane, Ballston Lake 12019
- **SOUTHERN TIER BKPRS** – Steve Shufelt, P.O. Box 352, Cincinnatus 13040, 607.863.3461 shufelts@syncorva.cortland.edu
- **STEUBEN CO HONEY BEE ASSN** – Jacques Begin, P.O. 236, Atlanta 14808
- **SULLIVAN CO BKPRS ASSN** – Jim Kile, 2011 Ulster Heights Rd., Woodbourne 12788
- **WESTERN NY HONEY PRODUCERS** – Vince Coppola, 10220 Bradigan Rd., Forestville 14062

NORTH CAROLINA

- **★ NC STATE BKPRS ASSN** – Irvin E. Rackley, 2431 Leggett Rd., Rocky Mtn. 27801, 252.446.5487
- **ALAMANCE CO BKPRS** – D Moore, 3634 Stoney Crk Church Rd., Elon College 27244, 336.584.3195
- **ANSON CO BKPRS ASSN** – Harvey Tucker, 201 Moores Lake Rd., Wadesboro 28170
- **BKPRS OF THE ALBEMARLE** – Jessica Lynam, 1833 Peartree Rd., Elizabeth City 27909
- **BUNCOMBE CO BEEKEEPERS** – Sally Ellis, 345 Rockhouse Rd., Marion 28752
- **CABARRUS CO BKPRS ASSN** – Charles Griffin, 5175 HW 601 S., Concord 28025
- **CATAWBA VALLEY BEEKEEPERS** – Bobby Glenn, 1730 Nelson Dr., Newton 28658
- **CHATHAM CO BKPR ASSN** – Richard Bradley, P.O. Box 1172, Pittsboro 27312
- **COASTAL PLAIN BKPRS ASSN** – Claiborne Holtzman, 117 Hubbard Lane, Rocky Mount 27801
- **CUMBERLAND CO BKPRS ASSN** – Marvin Carlsen, 2616 Wingate Rd., Fayetteville 28306, 910.425.4327
- **DAVIDSON CO BKPRS ASSN** – Colen Smith, 228 Bowers Rd., Lexington 27292
- **DAVIE CO BKPRS ASSN** – William Phelps, 666 Pine Ridge Rd., Mocksville 27028-6754, 336.284.2763
- **FORSYTH CO BKPRS ASSN** – M. Weatherman, 5395 Spainhour Mill Rd., Tobaccoville 27050
- **GASTON CO BKPRS ASSN** – John Hayes, 222 Lakeview Dr., Belmont 28012

- **GUILFORD CO BKPRS** – John Godfrey, 6304 Sable Lane, Greensboro 27406
- **HENDERSON CO BKPR** – Lynn Hinkle, P.O. Box 417, Hendersonville 28793
- **JACKSON CO BKPRS ASSN** – Fred Harris, Box 154, Cullowhee 28723
- **JOHNSTON CO BKPRS ASSN** – Lloyd Reynolds, 2283 Wilson Mills Rd., Smithfield 27577
- **LEE CO BKPRS ASSOC** – G.W. Godfrey, 3350 S. Plank Rd., Sanford 27330 gwjanet@wave-net.net
- **LINCOLN CO BKPRS ASSN** – David Noles, P.O. Box 186, Lincolnton 28092
- **MACON CO BKPRS ASSN** – Brian DeForest, 318 DeForest Lane, Franklin 28734, 828.369.9459, deforest@dnet.net
- **MECKLENBURG CO BKPRS** – Bradford Miller, 4719 Emory Lane, Charlotte 28211, 704.364.0935
- **MOORE CO BKPRS ASSN** – Bill Lathan, 902 Pinebluff Lake Rd., Aberdeen 28315
- **ORANGE CO BKPRS ASSOC** – Kenneth Medlin, 91 Daisy Lane, Hurdle Mills 27541
- **PERSON CO. BKPRS. ASSN** – Ed Johnson, 2039 Thee Hester Rd., Roxboro 27573
- **RANDOLPH CO BKPRS** – George Byrum, 3661 Old Lexignton Rd., Asheboro 27203, 336.629.9502
- **RICHMOND CO BKPRS ASSN** – Sam Yates, 299 Rosalyn Rd., Rockingham 28379
- **ROBESON CO BKPR ASSN** – M. Brewington, P.O. Box 2168, Pembroke 28372
- **ROCKINGHAM CO BKPRS ASSN** – Fred Small, 2306 Fernwood Dr., Greensboro 27408
- **ROWAN CO BEEKEEPERS** ASSN – Pam Deal, 1025 Lamb Rd., Lexington 27295
- **STANLEY CO BKPRS ASSN** – Billy Smith, 20553-A Hwy 52 5., Albermarle 28001
- **SURRY CO BKPRS ASSN** – Cecil Gilley, 108 Knobb Hill Lane, Pilot Mountain 27041
- **TOE-CANE BKPRS ASSN** – Alfred Ray, 10 Rolling Ridge Loop, Burnsville 28714, 828.675.5057, wsr@infonet.corp.net
- **TRANSYLVANIA CO BKPR** – Rick Queen, 305 Davidson River Rd., Pisgah Forest 28768
- **UNION CO BKPRS ASSN** – Jeff Knight, 5903 W. M. Griffin Rd., Monroe 28112 704.764.3731
- **WAKE CO BKPR ASSN** – Bruce Ledford, 208 Mt. Vernon Church Road, Raleigh 27615, 919.870.9046
- **WATAUGA CO BKPRS** – Joe Howser, 117 Highland Park Lane, Boone 28607
- **WAYNE CO BKPRS ASSN** – Jimmy Ray Mitchell, 2133 Dobbersville Rd., Mt. Olive 28365 jimalimitc@aol.com

NORTH DAKOTA

- ★ **ND BKPRS ASSN** – Caral Nix, P.O. Box 396, Valley City 58072 701.845.5130

OHIO

- ★ **OH STATE BKPRS ASSN** – Jim Walls, 7654 White Chapel Rd., Newark 43056-9310, 614.323.3681 jwalls@communigate.net
- **ASHTABULA BEEKEEPERS** – Bill Loudon, 86 Stockwell St., Painesville 44077
- **BUTLER CO BKPRS** – Alex Zomchek, 14 Carrie Circle, Oxford 45056
- **CAMBRIDGE-NOBEL BK ASSN** – Roger Seaton, 9488 Liberty Rd., Cambridge 43725-9023
- **CARROLL CO BKPRS** – Lisa Bulick, 9383 Hanson Rd., Minerva 44657, 330.894.2776
- **CENTRAL OH BKPRS** – David Casdorph, 4111 Maize Rd. Columbus 43224
- **CLARK CO BKPRS** – Andy Anderson, 1312 N Lowry Ave, Springfield 45504, beemanaa@juno.com
- **COLUMBIANA & MAHONING CO BKPR** – Andrea Deafenbaugh, 1305 Beard Rd., New Waterford, 44445, 330.457.0326
- **COLUMBIANA CO BKPRS** – Boris Vuksanovich, 4477 Villa Marie Rd., Lowellville 44436, 330.536.8731
- **CUYAHOGA COUNTY BEE ASSN** – William Conley, 292 Fowles Rd., Berea 44017, 440.234.6657
- **EAST CENTRAL BKPRS** – Jim Walls, 7654 White Chapel Rd., Newark 43056, 740.323.3681, jwalls@communigate.net
- **GEAUGA CO BKPRS** – Eleanor Spirka, 9093 Morgan Rd., Montville 44064, 440.968.3371
- **GREEN CO BKPRS** – Brian Stem, 571 S. Stadium Dr., Zenia 45385 937.656.0726
- **HIGHLAND CO BEEKEEPERS** – Jim Higgins, 3801 U.S. 50, Hillsboro 45133, 513.364.2331
- **HOCKING CO BKPRS** – Annette McClain, 20193 St. Rt. 328, New Plymouth 45654
- **JEFFERSON CO BEEKEEPERS** – Susan Kovaleski, 167 Rosslyn Blvd., Steubenville 43952
- **KOKOSING VALLEY BEEKEEPERS** – Gertrude Rasor, 500 North Ridge Hts. Dr., Howard 43028, 740.393.1595
- **LAKE CO BKPRS ASSN** – Mark Rinderman, 116 Hawthome Dr., Painesville 44077
- **LAWRENCE CO BKPRS** – Margaret Reid, 15754 St. Rt. 775, Willow Wood 45696, reidapiary@wwd.net
- **LORAIN CO BKPRS ASSN** – Teressa Nemeth, 1070 N. Ridge W, Lorain 44053, 440.233.8757, mozart@centuryinter.net
- **MAUMEE VALLEY BKPRS** – Robert D. Smith, 238 E. 5th St., Perrysburg 43551, 419.874.6003, rdsmith1@juno.com
- **MEDINA CO BEEKEEPERS** – Kim Flottum, 7011 Spieth Rd., Medina 44256, 330.722.2021, kim@airoot.com
- **MIAMI CO BEEKEEPERS** – Robert Neumann, 183 S. Dorsett Rd., Troy 45373, 937.339.3586
- **MORROW CO AREA BKPRS** – Carol Bartlett, 3486 Co. Rd. 25, Cardington 43315
- **NW OH BKPRS** – Zelma Cox, 1623 W. Wayne, Lima 45805, 419.228.8283
- **PORTAGE CO BEEKEEPERS** – Peggy Kaminski, 1459 E. Howe Rd., Kent 44240, 330.673.0664, kam.apiaries@juno.com
- **RICHLAND CO BEEKEEPERS** – Ralph Mitchell, 21690 Pealer Mill Rd., Butler 44822
- **SOUTHWESTERN OH BEE ASSN** – Karen Berry, 5186 Batavia Rd., Cincinnati 45244
- **STARK CO BEEKEEPERS** – Joyce Elavsky, 613 Webb Ave. SW, Massillon 44647, 330.832.1599, honeybeestark@juno.com
- **SUMMIT CO BKPRS** – Cheryl Beyer, 6423 Olde Eight Rd., Peninsula 44264
- **TRI-COUNTY BEEKEEPERS ASSN** – Dave Heilman, 1680 Madison Ave., Wooster 44691, 330.263.3684, heilman.2@osu.edu
- **WARREN CO BEEKEEPERS** – Oscar Brown, 7154 Hopkins Rd., Maineville 45039 513.683.2220

OKLAHOMA

- ★ **OK STATE BKPRS ASSN** – Steve Cashon, P.O. Box 781, Mounds 74047, 918.321.5140, scashon@webzone.net
- **CENTRAL OK BKPRS ASSN** – Robert Wagner, 2928 S. Oak Dr., Midwest City 73130
- **EAST CENTRAL BEEKEEPERS ASSN** – M.L. Lashbrook, Rt. 1 Box 59, Stonewall 74871, 580.265.9271
- **FRONTIER COUNTRY BKPRS ASSN** – Chuddie Smith, P.O. Box 34, Guthrie 73044, 405.282.4002
- **GREEN COUNTRY BKPR** – Shirley Wright, Rt. 1, Box 355, Locust Grove 74352
- **INDIAN NATION BKPRS ASSN** – James Hines, 1141 N. Main St., Muskogee 74403
- **NE OKLAHOMA BEEKEEPERS** – Euvonne Harrison, 109 West 50th St. North, Tulsa 74126, 918.425.2026, BEESAREUS@aol.com
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- **SW OK BEEKEEPERS ASSN** – Eva Bell Ritter, NC 84, Box 57, Marlow 73055
- **WESTERN AR/ESTRN OK BK ASSN** – Danny Self, Rt. 1, Box 1325, Arkoma 74901

OREGON

- ★ **OR STATE BKPRS ASSN** – Phyllis Shoemake, 1874 Winchester NW, Salem 97304, 503.364.8401
- **COLUMBIA BASIN** – Rocky Pisto, P.O. Box 131, Parkdale 97041
- **COOS CO** – Wade Weathersby P.O. 601, North Bend 97459, 541.756.3378, wrsunnyhil@aol.com
- **EASTERN OR BKPRS** – Jan Lohman, 77225 Colonel Jordan Rd., Hermiston 97838
- **KLAMATH COUNTY** – Ken Crow 541-882-1893
- **LANE CO BEEKEEPERS** – Frank Svejcar, 4418 Knoop Ave., Eugene 97402, 541.688.9153, FX 541.688.9153 easynet@pcsinternet.com
- **METROPOLITAN AREA BKPRS** – Chuck Sowers, 4390 Lords Lane, Lake Oswego 97304, 503.636.3127
- **NORTH COAST BKPRS ASSN** – Bob Allen, P.O. Box 434, Garibaldi 97118, 541.322.3819
- **PORTLAND** – Jim Allison, 503-663-1058
- **SOUTH COAST BKPRS ASSN** – Joann Olstrom, 3164 Maple Court, Reedsport 97467, 541.271.4726
- **SOUTHERN OR** – George Steffensen, 1634 Fish Hatchery Rd., Grants Pass 97527
- **TILLAMOOK COUNTY** – Bob Allen, P.O. Box 434, Garibaldi 97118, 541-322-3819
- **TUALATIN VALLEY** – Chuck Sowers, 4390 Lords Lane, Lake Oswego 97304, 503-636-3127
- **WALLA WALLA BKPRS** – Dave LeFore, 84760 Hwy. 339, Milton-Freewater 97862, 541.938.3286, sicfore@bmi.net
- **WILLAMETTE VALLEY** – Ron Bennett, 11260 Simpson Rd., Monmouth 97361, 503.838.2328, ooffy@aol.com

PENNSYLVANIA

- ★ **PA STATE BKPRS ASSN** – Yvonne Crimbring, RD 1, Box 315, Canton 17724, 570.673.8201, pabee@epix.net
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- **ADAMS CO BKPRS** – John Creighton, 1431 Goodyear Rd., Gardners 17324
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- **ALLEGHENY MTN. BKPRS. ASSN.** – Lois Shuck, 2550 Pine Hill Rd., Meyersdale 15552, 814.634.5153
- **ARMSTRONG-INDIANA BKPR** – Charlie Lyon, 207 Fairground Rd., Ford City 16226
- **BEAVER VALLEY AREA BKPRS** – William Patsy, 160 Klein Rd., New Brighton 15066
- **BERKS CO BKPRS** – Jerry Swartz, 22 Brown Rd., Shomakersville 19555, 610.926.6762
- **BUCKS CO BEE ASSN** – Dane Snyder, 113 Country Lane, Lansdale 19446, honeyacres@juno.com
- **CAPITAL AREA BK ASSN** – Maria Contino, 6087 Rockland Dr., Harrisburg 17112
- **CENTRAL COUNTIES BKPRS ASSN** – Valerie Lintner, HCR 1, Box 61, Huntingdon 16652
- **CENTRAL WSTRN PA BEE ASSN** – Robert Travis, 620 S. Market St., New Wilmington 16142
- **CENTRE CO. BKPRS. ASSOC** – Lyn Garling, RD 1 Box 77, Rebersburg 16872
- **CHESTER COUNTY BK ASSN** – Tom Hochheimer, 520 Saybrooke Lane, Downingtown 19335-1542, 610.458.0159, hochheimer@aol.com
- **CLARION CO BEEKEEPER ASSN** – Deanna McGiffin, RD 1, Box 11A Knox 16232
- **FRANKLIN CO BKPR** – Vincent Stone, 2187 Sollenberger Rd., Chambersburg 17201
- **HARRITON HOUSE BKPRS ASSN** – Bruce Gill, 500 Harriton Rd. P.O. 1364, Bryn Mawr 19010, 610.525.0201, bcoopergil@aol.com
- **LANCASTER CO HONEY PRODUCERS** – Loren Sadler, 1235 Red Run Rd., Stevens 17578
- **LEHIGH VALLEY BKPRS** – Ken Eisenhart, 1565 Kumry Rd., Quakertown 18951
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- **MONROE CO BKPRS** – Sandy Fisher, 4361 L Cherry Valley Rd., Stroudsburg 18360, 570.992.7274 rrbim@ptd.net
- **MONTGOMERY CO BKPR** – Harold Jenkins, 816 Kenilworth Ave., Lansdale 19446
- **SCHUYKILL CO BEEKEEPERS** – Rick Freeman, RD. 2, Box 24A, Auburn 17922
- **SUSQUEHANNA BKPRS ASSN** – John Brunner, RD2 Box 158, Montrose 18801
- **WAYNE CO BEEKEEPERS ASSN** – Francis Motichka, 417 Carroll, St., Honesdale 18431, 570.253.0166
- **WESTMORELAND CO BKPRS** – Ken Karg, 165 Piersol Rd., Belle, Vernon 15012, 724.929.3882
- **YORK CO BEEKEEPERS** – Judy Brenneman, RR 7, Box 7553, Spring Grove, 17362, 717.225.3076

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- ★ **RI BKPRS ASSN** – Bernard Bieder, 140 Coldbrook Rd., Warwick 02888, 401.463.8654
- **BRISTOL CO BKPR ASSN** – Bruce Holden, 11 Field Lane, Barrington 02806
- **KENT COUNTY** – Kent Cameron, 256 Buttonwoods Ave., Warwick 02886
- **NEWPORT COUNTY** – Ray Barker, 136 Cedar Ave., Portsmouth 02821
- **PROVIDENCE CO BKPR ASSN** – Claire Desrosier, 275 Pine Orchard Rd., Chepachet 02814
- **WASHINGTON COUNTY** – Ron Bachand, 33 Jeannette Court, Exeter 02822

SOUTH CAROLINA

- ★ **SC BKPRS ASSN** – Ron Taylor, 203 Bama Rd., Cottageville 29435, 843.835.2482, LcBlockLowCountry@Juno.com
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- **CHEROKEE CO BKPRS ASSN** – David Parker, P.O. Box 700, Gaffney 29342
- **COLLETON BKPRS ASSN** – Ron Taylor, 203 Bama Rd., Cottageville 29435
- **EDISTO BEEKEEPERS** – Henry Chassereau, Rt. 1, Box 172A, Ehrhardt 29081, 803.267.5075
- **GREENWOOD CO BKPRS ASSN** – Kathryn White, P.O. Box 246, Greenwood 29648
- **HORRY CO BKPRS ASSN** – L. W. Rabon, Rt. 3, Box 237, Aynor 29511
- **LOW COUNTRY BKPRS ASSN** – Archie Biering, 1081 Holly Ridge Ln., Cottageville 29435
- **MID-STATE BEEKEEPING ASSN** – Jack Morris, 4 Knollwood Ct., Columbia 29209
- **OCONEE CO BKPRS ASSN** – Dean Boggs, 103 Letson Cr., Walhalla 29691
- **PEE DEE BKPRS ASSN** – Ron Moore, 675 Mustang Rd., Pamlico 29583

- **PICKENS CO BKPRS ASSN** – Winfred Trotter, 926 Breazeale Rd., Liberty 29657
- **PIEDMONT BKPRS ASSN** – Steve Genta, 3450 Fork Shoals Rd., Simpsonville 29680, 864.243.9013, stevegenta@aol.com
- **SPARTANBURG CO BKPRS ASSN** – Joe Guthrie, P.O. Box 1010, Spartanburg 29304
- **SUMTER CO BKPRS ASSN** – F.L. Newman, 1030 State St., Sumter 29150
- **WESTERN PIEDMONT BKPRS** – Larry Williams, 501 Youth Center Rd., Belton 29627, 864.338.5470
- **YORK CO BEEKEEPERS ASSN** Patrick Lourgan, 1756 Shythe Lane, York 29745

SOUTH DAKOTA

- **★ SD BKPRS ASSN** – Judy Gulleson, Box 52 Britton 54430, 605.448.5163

TENNESSEE

- **★TN BKPRS ASSN** – Dwight Tew, 509 Ellington Drive, Franklin 37064-5013 615.791.1518, dtew@prodigy.net
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- **BLOUNT CO BEEKEEPERS** – Tammy Braglin, 702 Lee Shirley Rd., Maryville 37801
- **CAMPBELL CO BKPRS** – Adrion Baird, 1203 Davis Chapel Rd., LaFollette 37766 423.562.6963, FX 423.562.2232, adrionb@aol.com
- **CHEROKEE BKPR ASSN** – Steve Postell, 1211 Mayflower Rd., Sale Creek 37373
- **DAVY CROCKETT BKPRS** – Sarah Ledford, 550 Huff Lane, Midway 37809
- **DUCK RIVER BKPRS ASSN** – Austin DeJarnatt, 336 River Bend Rd., Shelbyville 37160
- **KNOX CO BKPRS** – Joel Parton, 7741 Dyer Rd., Luttrell 37779, 423.688.3294
- **LOUDON CO BEEKEEPERS** – Jim Goodman, 8633 Hwy. 11E, Lenoir City 37772
- **MEMPHIS AREA BKPR** – Ken Chrestman, 8516 Grand Oaks, Cv., Arlington 38002 901.377.1592, FX 901.767.9350, kchrestman@psgi.net
- **MONROE CO BKPRS ASSN** – James Hagemeyer, 5337 Hwy. 411, Madisonville 37354, 423.442.2038
- **NASHVILLE AREA BKPRS** – Barry Richards, 1020 Carr Cemetery Loop, Cross Plains 37049
- **OVERTON CO BEE ASSN** – Ronald Johnson, 317 Univ. St., Livingston 38570 931.823.5308, FX 931.823.6286
- **PUTNAM CO BKPRS** – Walter Hall, 420 Old Qualls Rd., Cookeville 38506
- **ROANE/MORGAN CO BKPRS ASSN** – Geraldine Hendrickson, 794 Dickey Valley Rd., Harriman 37748
- **SEVIER CO BKPR ASSN** – John R. Kelley, 613 Sandy Point Lane, Sevierville, 37876 423.428.1272
- **SUMNER CO BEE ASSOC** – Wayne Vantrease, 285 Vantrease Rd., Gallatin 37066
- **WASHINGTON CO BKPR** – K. Saylor, 207 Paul Saylor Rd., Jonesboro 37659
- **WEAKLEY CO BEE ASSN** – Jeff Lannom, P.O. Box 168 Dresden , 38225
- **WILSON CO BKPR ASSN** – Petra Eggenmüller, 3900 Rock Springs Rd., Watertown 37184, 615.286.2529

TEXAS

- **★ TX BKPRS ASSN** – Dr. John G. Thomas, 805 Vine St., Bryan 77802, 409.846.5068, FX 409.845.7029, jg-thomas@tamu.edu
- **ALAMO AREA BKPRS ASSN** – David S. Grinnan, 168 Four Bears Tr., Kerrville 78028
- **CAPITOL AREA BKPR** – Kim Lehman, 1106 Radam Circle, Austin 78745-3018, 512.707.0113, kim_lehman@capmac.org
- **COASTAL BEND BKPRS ASSN** – Tom Stewart, 4111 Catalina, Corpus Christi 78411, 512.852.4218
- **COLLIN CO HOBBY BKPR** – John N. Paulson, 2421 Laurel Lane, Plano 75074, 972.424.1832
- **CONCHO VALLEY ASSN** – Enoch Garcia, P.O. 60541, San Angelo 76906, 915.657.0377
- **EAST TEXAS BKPR ASSN** – Richard Counts, 16239 Audrey Lane, Arp 75750 903.566.6789
- **EL PASO ASSN** – Tim Channell, 516 DeLeon Dr., El Paso 79912, 915.833.0079
- **FORT BEND ASSN** – Elton Reynolds, 3419 Klosterhoff Rd., Rosenberg 77471 281.342.4388
- **GALVESTON CO ASSN** – Margie Coplin, 12230 Marion Lane, Dickinson 77539 409.925.6338
- **GOLD TRI ASSN** – Wallace Commander, 2445 Green Ave., Port Arthur 77642 409.982.0907
- **HARRIS CO ASSN** – Herb Barrier, 12318 Thornbriar Dr., Pearland 77581-2027 281.485.1234
- **HEART OF TX BEEKEEPERS** – Claude Lester, 900 Evelyn Dr., Lorena 76655 254.857.4969
- **HOUSTON BKPRS ASSN** – Herschel D. Womac, 11215 Tyne Court, Houston 77024 713.782.7755
- **METRO BKPRS ASSN** – Ray Stephens, 3800 N. Cummings Dr., Alvarado 76009 817.790.5050, dronebee@htcomp.net
- **MONTGOMERY CO BKPRS** – Jane Ivy, P.O. Box 66, Splendora 77372 281.399.8543
- **N. HARRIS CO BKPRS ASSN** – J Johnson 2403 Fawnwood, Spring 77386-2419 281.367.8250
- **PERMIAN BASIN ASSN** – Dean Brittingham, 2312 North Adams, Odessa 79761, 915.332.2215
- **RED RIVER VALLEY ASSN** – Bennie J. Watson, 1952-A Hines Blvd., Wichita Falls, 76303, 940.767.0207
- **RIO GRANDE VALLEY ASSN** – Billy Wright, RT. 5, Box 77, Donna 78537, 956.464.5042
- **TRINITY VALLEY ASSN** – Robert Hutchinson, 1802 St. Francis Ave., Dallas 75228, 214.321.0491
- **TRI-CO AREA BEEKEEPERS** – Dean Futch, 904 Chalk St., Copperas Cove 76522, 254.547.9125
- **WALKER CO BEEKEEPERS** – Steve Laube, RT. 1, Box 184, Bedias 77831-9610, 409.874.2819
- **WILLIAMSON CO** – Jimmie Oakley, 1799 Goodson Ct., Round Rock 78664, 512.388.3630, jloakley@juno.com

UTAH

- **★ UT BKPRS ASSN** – William Jones, 2586 Andrew Lane, Murray 84107, 801.358.2033
- **WASATCH BKPRS ASSN** – Byron Anderson, 4143 S. Morris, Taylorsville 84119, 801.966.8619

VERMONT

- **★VT BKPRS ASSN** – Dale Minor, 209 Rt. 7 North Milton, 05468-9069, 802.893.1281 minor209@aol.com
- **BENNINGTON CO BEEKEEPERS** – J. Esh, P.O. Box 723, Bennington 05201

VIRGINIA

- **★ VA STATE BKPRS ASSN** – Ron Hannawalt, 2615 Northridge Rd., Hardy 24101-0018, 540.721.3441
- **BLUE RIDGE BKPR ASSN** – Coy Shupe, Rt. 1, Box 2268, New Castle 24127, 540.864.5529
- **CENT VA BKPR EAST** – Edith McCoy, 6752 Cattail Road, Charles City 23030, 804.829.6282
- **CTRL VA BKPRS WEST** – Guy Miller, 2025 Spottswood Rd., Charlottesville 22903, gmiller@rlc.net
- **HALIFAX BEEKEEPERS ASSN** – E. Donald Chandler, P. O. 265, Virgilina 24598 804.585.2402, donl948@halifax.com
- **LOUDOUN BKPRS. ASSN** – Debbie Williamson, P.O. Box 67, Lovettsville 20180, 540.822.4511, debw@butterflybend.som
- **MT. EMPIRE BK ASSOC** – Edwin Wilson, 190 Dogwood Drive, Wytheville 24382
- **NASA-LANGLEY APIC CLUB** – Ray Wilson, 403 Calthrop Neck Rd., Yorktown 23693
- **NELSON CO BKPRS** – Michael Lachance, P.O. Box 298, Lovingston 22949-0298
- **NO PIEDMONT BKPRS** – Ann Harman, 1214 North Poes Rd., Flint Hill 22627 540.364.4660, FX 540.364.4660 ahworkerb@aol.com
- **NORTHERN VALLEY BKPRS. CLUB** – Frederick Co. Ext., 107 N. Kent St., Winchester 22601
- **NORTHERN VA BEEKEEPERS** – Pearl Liles, 2451 S. Culpeper St., Arlington 22206
- **PIEDMONT BKPRS ASSN** – George Kelley, P.O. Box 2411, Lynchburg 24501-2411
- **RICHMOND BKPRS ASSN** – Robert Falconer, 4440 Honey Lane, Glen Allen 23060
- **SHENANDOAH VLY BKPRS** – Alden Dodge Rader, Jr., Rt. 1 Box 591, Stuarts Draft 24477-9616, 540.337.3502
- **SOUTHWEST PIEDMONT BKPRS** – Jack B. Hill, 1091 Brentwood Dr., Collinsville VA 24078-2147, 540.647.8400, FX 540.647.8400
- **TIDEWATER BKPR ASSN** – Kenneth Carmody, 1908 Foxwood Dr., Chesapeake 23320, 757.548.8869

WASHINGTON

- **★ WA STATE BKPRS ASSN** – Alice Bounds, 418 Dean St., Zillah 98953, 509.829.6698
- **CENTRAL WA BKPRS ASSN** – Alice Bounds, 261 Meyers Rd., Toppenish 98948
- **CLARK CO BKPRS ASSN** – Mary Ann Morrison, 14303 NE267th St., Battle Ground 98604
- **COWLITZ CO BKPR ASSN** – Eva Davis, 3956 Columbia Hts Rd., Longview 98632
- **INLAND EMPIRE BKPR** – Albert Bell, 17110 N. Highland Lane, Colbert 99005-9758, 509.468.2201
- **MT BAKER BKPR ASSN** – Patrick Harman, 4540 Sand Rd., Bellingham 98226
- **NORTH OLYMPIC PENINSULA BKPRS ASSN** – Cherie Pickett, 878 N. Kendall, Sequim 98382
- **NORTHWEST DIST BKPR** – Jeanne Kneebone, 23807 5th Ave. W., Bothell 98021
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- **PIERCE CO BKPR** – Karl Crotty III, 19607 SE A.B.D. Rd., Auburn 98092
- **PUGET SOUND BEE ASSN** – Audrey Fells, 21009 46th Ave., S.E., Bothell 98021
- **SKAGIT VALLEY BKPR** – Judy Ray, 1120 S. 25 St. #61, Mt. Vernon 98274-4759
- **STANWOOD-CAMANO BKPRS ASSN** – James Osborn, 1340 E. Juniper Beach Rd., Camano Island 98292

WEST VIRGINIA

- **★ WV STATE BKPRS ASSN** – John Campbell, 102 First St., Parsons 26287, 304.478.3675
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- **EASTERN PANHANDLE BKPRS ASSN** – Bea Atkins, Rt. 3 Box 30-A, Martinsburg 24501
- **HAMPSHIRE CO BEEKEEPERS** – Darlene Fredrick, Rt. 4, Box 1494, Keyser 26726
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- **MID OHIO VALLEY BKPR** – Clifford Leeson, Rt. 2, Box 353-A, Washington 26181-9571, 304.863.6858
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- **RALEIGH CO BKPRS ASSN** – Barney Walls, 115 Honey Lane, Beckley 25801
- **TRI STATE BEEKEEPERS ASSN** – Don Snider, 7 Meadow Dr., Wheeling 26003, 304.242.5878
- **TUCKER CO BKPRS ASSN** – John Campbell, 102 First Street, Parsons 26287

WISCONSIN

- **★WI HONEY PRODUCERS ASSN** – Lee Heine, P.O. Box 544, Hustisford 53034, 920.349.8382
- **BROWN CO BKPR** – Thomas Cashman, 1418 Chicago St., Green Bay 54301, 920.432.2261, tcash99930@aol.com
- **CHIPPEWA & EAU CLAIRE BKPRS** – Fern Eggen, 11567-22nd Ave., Chippewa Falls 54729, 715.723.6584
- **MARATHON CO BEEKEEPERS** – Dean Kaatz, 210 River Dr., Wausau 54403-5449
- **POLK-BURNETT BEEKEEPERS** – Beverly Weber, 1006 25th St., Clayton 54004
- **ROCK CO BKPRS** – Ed Sprigler, P.O. Box 511, Sharon 53585
- **RUSK CO BEEKEEPERS ASSN** – Eleanor Albrecht, Rt. 1, Box 214, Glen Flora 54526
- **SAUK-COLUMBIA COS BKPR** – Daniel Licht, S 6566 Hwy PF, N. Freedom 53951, 608.522.4890
- **SHEBOYGAN CO BKPRS** – Mrs. Elaine Schuman, 126 Grafton Ct, Kohler 53044, 920.457.5492
- **ST CROIX CO BEEKEEPERS** – Bob Olson, 1237 Willow Ave., New Richmond 54017
- **TAYLOR-CLARK BEEKEEPERS** – Florette Kohn, N2580 Cte, Medford 54451
- **WAPUACA CO BEEKEEPERS** – Stan Jakubek, P.O. Box 54, Iola 54945, 715.445.2285

WYOMING

- **★ WY BKPRS ASSN** – Verena Booth, 2040 Carls Rd., Cheyenne 82009

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- **★ MANITOBA BKPRS ASSN** – Don Dixon, 204-545 University Cres., Winnipeg, MB R3T 5S6, 204.945.3861, FX 204.945.4327, ddixon@agric.gov.mb.ca
- **★ MARITIME BKPRS ASSN** – Mr. Don Amirault, RR 6 Hall Road, Kingston Kings, County, NS B0P 1R0, 902.756.8644, FX 902.756.8648
- **★ NEW BRUNSWICK BKPRS ASSN** – Paul Vautour, 488 Cape Breton Rd., St. Phillippe, NB E1H 1W2, 506.288.5127, pvautour2@gov.nb.ca
- **★ ONTARIO BKPRS ASSN** – Pat Westlake, RR#3, Bayfiled, ON N0M 1G0, 519.565.2622, ontbee@tcc.on.ca
- **★ PE ISLAND BEE CO-OP ASSN** – J. Burhoe, P.O. Box 1114, Charlottetown, NB C1A 7M8, 902.962.3843
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• **Apimondia. International Federation of Beekeepers' Associations,** President, Raymond Borneck, Rue Du Creux, Montbarrey, congress@apimondia99.ca www.apimondia99.ca

• **American Apitherapy Society,** Mrs. Linda Day, Office Coordinator, 5370 Carmel Rd., Hillsboro, OH 45133, 937.466.9214, 937.466.9215, linda.day@hopewell.net, www.beesting.com

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• **American Beekeeping Federation,** Exec. Dir., Troy H. Fore, P.O. Box 1038, Jesup, GA 31598, 912.427.4233, FAX 912.427.8447, info@abfnet.org, www.abfnet.org

• **American Honey Producers Association**, Jack Meyer, Jr., 536 Ashmont Rd., Madison, SD 57042, 605.485.2221, FAX 605.485.2231

• **Apiary Inspectors of America**, Barton Smith, Jr., State Apiary Inspector, 50 Harry S. Truman Parkway, Annapolis, MD 21401, 410.841.5920, FX 410.841.5835, smithib@mda.state.md.us, www.mda.state.md.us/DOCS/aia/aia.htm

• **Eastern Apicultural Society of North America, Inc**, Sec. Loretta Surprenant, Box 330A, County Home Rd., Essex, NY 12936, 518.963.7593

• **Western Apicultural Society of North America**, Eric Mussen, Davis CA 95616, 530.752.0472, FX 530.752.1537, ccmussen@ucdavis.edu

• **National Honey Board,** Executive Director, Bob Smith, 390 Lashley St. Longmont, CO 80501-1421, 303.776.2337, FX303.776.1177, bob@nhb.org, www.nhb.org

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• **Professional Apiculturists Assn**, Marion Ellis, 210 Plant Industries - E. Campus, P.O. Box 830816, Lincoln, NE 68583, 402.472.8696, http// ianrwww.unl.edu/ianr/entomol/aapa/aapa.htm

• **The Canadian Honey Council**, Heather Clay, Box 1566, Nipawin, SA S0E IE0, 306.862.3844, FX 306.862.5122

• **Can. Assn. of Prof. Apic.**, Dept. of Environmental, Biology, University of Guelph, Dr. Cynthia Scott-Dupree, Pres., Guelph, MA N162W1, 519.824.4120, Ext. 2478, FX 519.837.0442, csdupree@evbhort.uoguelph.ca

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• **Baton Rouge Bee Lab,** Dr. Thomas Rinderer, Research Leader, 1157 Ben Hur Rd., Baton Rouge, LA 70820, 504.767.9280, FX 504.766.9212, trindere@asrr.arsusda.gov

• **Texas Bee Lab**, Dr. William T. Wilson, Lead Scientist, USDA, ARS, SRC, Bldg. 205, 2413 East Hwy. 83, Weslaco, TX 78596, 956.969.5005, FX 956.969.5033, wilson@rsru2.tamu.edu, www.rsru2.tamu.edu

• **Utah Bee Lab**, Dr. William P. Kemp, USDA-ARS/Bee Biology Lab, Utah State University, Logan, UT 84322-5310, 435.797.2524, FX 435.797.0461, wkemp@cc.usu.edu

• **Tucson Bee Lab**, Dr. Eric H. Erickson, USDA-ARS Center, Director, 2000 E. Allen Road, Tucson, AZ 85719, 520.670.6481, Ext. 103, FX 520.670.6493, eric@tucson.ars.ag.gov, gears.tucson.ars.ag.gov

• **Honey Market News**, Linda Verstrate, USDA-AMS, Fruits & Vegetable Div. 2015 So. 1st St., Rm. 4, Yakima, WA 98903, 509.575.2494, FX 509.457.7132

• **Biosystematies Research Centre**, Dr. R. J. T. Trottier, Rm. B149, K. W. Neatby Bldg., Ottawa, ON K1A 0C6, 613.996.1665

• **Agriculture & Agri-Food Canada**, Dr. Don L. Nelson, Research Scientist, Research Branch, Agriculture & Agri-Food Canada, Box 29, Beaverlodge, AB T0H 0C0, 403.354.5122, FX 403.354.8171, nelsond@em.agr.ca

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BOTTOM BOARD

The Italians

Kim Flottum

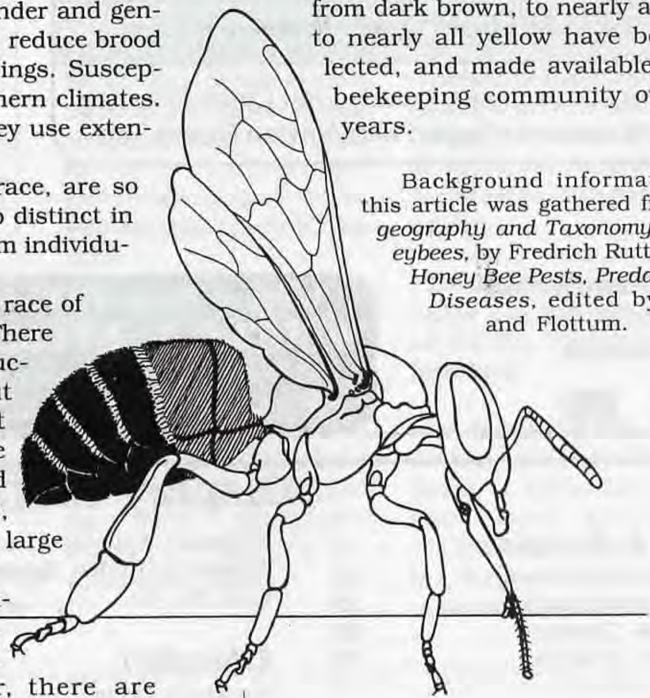
Apis mellifera ligustica Spinola (1806)

This central Mediterranean race of bees, closely related to *cecropia, macedonica, carnica, sicula* and *adami* of the same geographic region is undoubtedly the world's economic race of importance.

The closely related Sicilian honey bee, *sicula*, is more adapted to a hot, dry subtropical climate, is dark, but with some yellow spots, with yellowish hair on the thorax. Drones are dark. Sicilian bees tend to be gentle, swarm easily with incredible numbers of swarm cells, but both mother and several virgin daughters live together before the swarm issues. No other European bee does this. They produce only 50 - 60 pounds of honey per year, with snow white cappings.

The bees of Greece, *cecropia* in southern Greece, and *macedonica* in northern Greece both have comparatively longer legs and proboscis than the Italians, are more slender and generally smaller. They are gentle, with little swarming, reduce brood production in late summer and have watery cappings. Susceptible to nosema, if treated they winter well in northern climates. Color is mostly dark, but some yellow appears. They use extensive propolis.

Carniolans, though a central Mediterranean race, are so abundant, and cover such a large area, and are so distinct in behavior and morphology that we will deal with them individually.



The Italians are the most generally distributed race of bees outside their normal habitat in the world. There are ample reasons for this. They have not only successfully adapted to a wide range of climates, but have in many cases out competed local races (not unlike the picture of African honey bees in the Americas). They are, in their true sense, docile and gentle when disturbed (though some may argue that), extremely prolific, and seldom swarm, even with large populations.

Their original distribution - the Italian peninsula - completely defined their development with water on three sides and mountains on the fourth. Compared to the carniolans, their closest neighbor, there are several differences. Italians have yellow pigmentation, they have a smaller, but broader abdomen, a longer proboscis and different hair characteristics. Color is interesting, as bees in southern Italy are a bit different than those in the north. Brown, or leather colors appear, yellow on three, or four tergites may appear, and the amount and intensity of the yellow varies. Thus, three banded, five banded and leather Italians are available - but all are very similar behaviorally.

Italians are short distance foragers and tend toward robbing. So much so that they have a medium distance dance (between the round and waggle). They orient to their hives more by color than spatial orientation and drifting is a major problem in large apiaries.

Brood rearing reflects their original climate. True Italians start slowly in the spring but go strong into late summer and fall. Sometimes very late fall. Winter brood rearing is common. This necessitates high food consumption all year, which can be detrimental in locations with late springs.

Selection for certain traits has modified these behaviors, especially in the U.S., but most northern latitude countries as well. Earlier brood rearing for pollination, earlier brood cessation for better wintering and other behaviors have been selected for to accommodate specialty beekeeping practices. This is especially true for gentleness and quietness on the combs during manipulation.

Color, probably the most often selected for trait, has been greatly modified, and Italians that range from dark brown, to nearly all black to nearly all yellow have been selected, and made available to the beekeeping community over the years.

Background information for this article was gathered from *Biogeography and Taxonomy of Honeybees*, by Fredrich Ruttner, and *Honey Bee Pests, Predators and Diseases*, edited by Morse and Flottum.