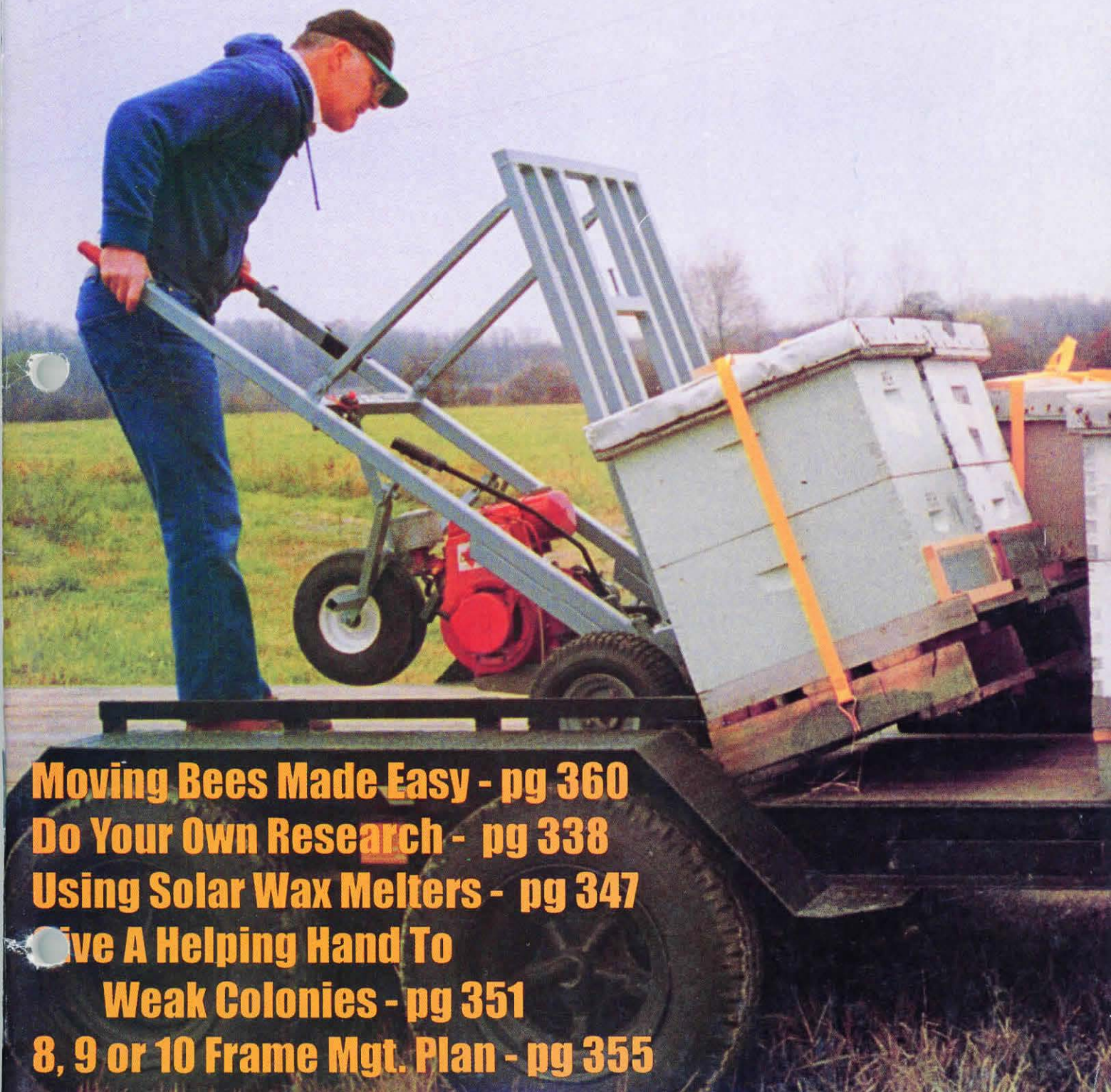
JUN 1996

# BeeCulture



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Weak Colonies - pg 351
8, 9 or 10 Frame Mgt. Plan - pg 355

# Bee Culture
THE MAGAZINE OF AMERICAN BEEKEEPING

JUNE 1996 VOLUME 124 NUMBER 6

## FEATURES



**COVER**
*Moving bees, whether two feet, or 200 miles, requires some planning, and knowing some basic biology. But the right equipment goes a long way in making the job easier.*
Hendrickson Photo

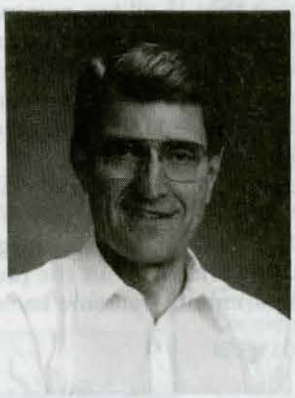
## DEPARTMENTS



*Give A Helping Hand, Pg. 351*

## COLUMNS





JOHN ROOT
*Publisher*

KIM FLOTTUM
*Editor*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# INNER COVER

We welcome back two old favorites this month, Buzz Phillips and Jim Tew. Buzz did some interesting stories for us several years ago, and even hung around the office here for awhile. He's been somewhat preoccupied of late, but got the idea for his story after reading several articles and listening to a lot of beekeepers. He told me that, although lots of people have good ideas concerning *Varroa* control, they didn't really have a handle on the concept of research as a science.

Buzz explains the fundamentals of conducting a research project fairly well, I think. And, if there's an idea you've had floating around in the back of your mind on controlling some pest, or a management trick that will increase honey production, or a line of queens you want to try or a piece of equipment that makes life easier . . . or whatever it is you want to experiment with, the basics remain the same.

Some cautions are in order though. There's nothing wrong with testing incredibly lethal, nasty or evil chemicals in a colony. Just don't expect to sell any honey, or even render wax from those colonies – maybe ever. Experimentation is good, and your idea may be the one that saves the day. The magic bullet may be yours. But don't jeopardize the rest of us by contaminating your honey or your wax with what may, or may not be a good idea.

By the way, Buzz picked basil leaves for his article because they present no danger of contamination, and they offer absolutely no control, (*at least* that we know of). The techniques are solid, though, and if you're going to try something, do it right.

The added advantage is that on the rare chance you do find something of value (a colony truly resistant to tracheal mites; an inner cover replacement that increases honey production 20%; or grass clippings lethal to *Varroa*), when you do go to someone with your results, you actually will have some results to go with worth discussing.

•

Back too, is Jim Tew, late of the USDA Africanized Honey Bee Border Patrol and Extension Service. He's been wearing that hat for several years which has pretty much occupied his free time and his paid-for time, until now. Now, the USDA is spending their dollars elsewhere (see below) and Jim is back in the Buckeye State full time and looking for action.

His article covers something that is all too common this season. With the heavy losses that occurred this past winter and spring, especially north of the Mason Dixon line, lots and lots of us are trying to build up packages, nucs or splits started earlier to take advantage of whatever honey flow happens this summer, to harvest as much of that buck-a-pound honey as possible.

It's good to have both Buzz and Jim back home, as it were, but Jim will be making routine contributions on a variety of beekeeping topics. For the July issue he's already busy preparing a piece on uncapping equipment – everything and all about the process – from bread knives to major power equipment. Welcome back Jim.

•

The USDA has, in its infinite wisdom, decided to yet again scale down Bee Research funding. A preliminary move to close the Tucson Bee Lab has begun. Not yet fully approved (in early May) the plan is to divide personnel between the understaffed Weslaco and Logan labs.

Because its location is in the primary seed producing part of the country one of the lab's missions is to study pollination, and management decisions that affect pollination. This covers a fairly wide range of research – from mites to Africanized honey bees to plant/insect interactions to the plants themselves.

Those making this decision have, I'm sure, valid fiscal and budgetary excuses to hide behind, while the political strings pulling them get tighter and tighter. I cannot believe anyone with a gram of common sense would choose to reduce funding for, and thus output of, research in the pollination area. But common sense, even in quantities as small as a gram, is too often hard to find. More as this unfolds.

•

## The Good, The Bad & The Ugly

A thought crossed my mind recently while listening to a talk radio show. The host, a well known conservative with his own line of fashion ties, made mention of "All of us across the fruited plain will . . . ," and finished with something appropriately inflammatory. I tend not to get too excited by inflammatory statements by left- or right-minded people, but that fruited plain thing caught my attention.

Will he, or any of the voices of America take notice when the fruit on the fruited plain is missing? What will it take to have people notice the plight of the honey bee?

Like dangerous railroad intersections, someone must die before someone acts. We are, I think, approaching the intersection full speed, and there's a train on the horizon.

*Kim Flottum*

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**Bee Culture**
THE MAGAZINE OF AMERICAN BEEKEEPING

***Publisher*** ..... **John Root**

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***Photo Reproduction*** ... **Moonlight Graphics**

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**Subscription Information**
*United States, one year, $16.50; two years, $30.00. Newsstand price: $1.95. 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. Published monthly. Change of Address: Return form on this page. Articles are solicited. Opinions expressed by the authors are not necessarily those of the publishers.*

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*Circulation Figures reviewed monthly by Deloitte & Touche, CPAs, and are available on request.*

*The A.I. Root Co., Publishers*
*623 W. Liberty Street*
*Medina, Ohio 44256*

*ISSN 1071-3190*

*Second Class Postage Paid at Medina, OH and additional offices.*

**KEEP IN TOUCH**

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# MAILBOX

## Eggs & Frames

Walter Peterson asked, in the April issue, if bees move eggs. Once, a few years ago, I checked a super of foundation I had placed above a queen excluder to see how much drawing had occurred. I was surprised to find not a speck of wax had been added to any of the 10 frames. Except that on a middle frame, about a couple of inches above the bottom and in the center, was a sealed queen cell. And on the other side, directly opposite, was another one.

I wasn't perplexed about seeing this because I had red in *Bee Chats, Tips & Gadgets* that author Roy Thurber had seen a bee (bees?) move an egg (eggs?).

Also in the April issue John Schneider complained about frames which assembled with a twist. He should glue all the joints with carpenters glue and then twist them until the top and bottom bars are parallel. Then when the glue hardened, they would be flat. Be sure to verify that the angles between the top and end bars were 90°, also.

Dan Hendricks
Mercer Island, WA

## Tree Comments

I enjoyed the article on trees. It should have been longer and included more trees. I have several comments.

Any article on nectar producing trees is incomplete without the world's premier nectar producing tree, the Tulip Poplar *Lirodendrum tulipifera*, native to Eastern North America from East Texas up into Canada. It is a reliable and prolific nectar source. The honey is a dark amber with a robust flavor and is preferred by many people, especially those that don't taste with their eyeballs. The tree grows to a height of over 100 feet and several feet in diameter. A related species, the Chinese Tulip Poplar, *Lirodendrum Chinese* is native to parts of China and Vietnam, and only grows to about 50 feet.

The Sourwood or Sorrel tree *Oxydendrum arboreum* and sometimes sold as Lily of the Valley tree is famous for its light but distinctively flavored honey. The tree is native to Eastern U.S. and grows to as much as 65 feet tall.

Fred G. Deer
Cary, NC

I just finished B.A. Stringer's excellent article in the April issue and thoroughly enjoyed it. Since she was unable to cover all significant tree sources of pollen and nectar (especially regional favorites such as Redbud) and had to give a shortened section on orchard crops as sources, please have her back.

Logan VanLeigh
Lenoir City, TN

## No Bees!

As I studied your April cover it reminded me of our dandelion patches of the last few years! No bees!!

All feral colonies gone!

Any winter survivors of managed colonies still weak.

Packaged bees being delivered later and later (increased *demand*, I'm sure).

I hope you don't mind, but I've drawn in a few on my copy for old times sake.

Rick Thibault
Ayer, MA

## *Varroa* in U.K.

The March '96 issue arrived yesterday. As usual, well worth waiting for. No beekeeping periodical on this side of the pond can touch it.

*Varroa* of course is one pest that bothers us all. Though it has been detected within half-a-mile of my single home hive, this hive appears to have resisted, so far. It would appear that the answer to *Varroa* will be found in the U.S. as the commercial beekeeping interests are greater there, and therefore so is the USDA funding. The Ministry of Agricultural Fisheries and Food in the U.K. appear to be getting starved of fundings and do not appear to pay great interest to beekeeping, and the hobbyist, etc. is trying to find his own remedies.

Once again thank you for *Bee Culture*.

Roy Gellett
Hillingdon, Uxbridge, U.K.

## ARS-Y-C-1 Report

I've been using ARS-Y-C-1 for the past few years. These were purchased from Blue Ridge Apiaries. I've been extremely satisfied with their performance. I'm a "thirty something" hobbyist with 10 hives who keeps them for pleasure and orchard pollination. For the past three years, I've lost no hives to any stress factors, including severe winters and *Varroa* mites. The ARS bees have wintered extremely well, arriving each spring, including this one, in great shape. They do have a few negatives, though I consider them to be minor. They tend to gather a lot of propolis, and they are somewhat aggressive, similar in behavior to the Italian bees that I've had in the past. However, the ARS bees have been super honey producers and good pollinators.

I need to add, though, that I've done everything humanly possible to improve their chances of survival. I use Apistan in the spring and fall, using new strips each time. The fall treatment goes on no later than 9/1, and last year I applied the strips by 8/20. I also use the Crisco/sugar treatment to deter tracheal mites, and treat every hive with terramycin in the spring and fall. All honey is extracted by late July. Everything gathered after that point is left for the bees to winter on. My goal is to have 70+ pounds of honey on each

*Continued on Next Page*

# MAILBOX

hive by 10/15.

Keep up the good work, and please continue to publish the latest information about beating the *Varroa* mite in the present, and the future.

Thanks again.

Tim Peters
Linden, VT

In May of 1994 I acquired nine, two-pound packages with ARS-Y-C-1 queens. I installed them in a yard on my farm, on foundation. I fed with sugar water for about a month. The first two gallons of sugar water had Fumidil-B in it and the rest was sugar and water only. Two Apistan strips were put in every colony for the first 45 days.

All were slow to build, and one dwindled and died early – probably because of a weak queen. By the end of August the colonies were still weak and did not have much honey reserve. One of the colonies was very weak but it did have some brood. The inspector visited in early September and reported that all colonies were weak and mite infested. New Apistan strips were then installed and left in for a month. By mid-October the weak colony was dead. Seven colonies went into winter 1994/95.

Considering that the colonies were weak in autumn they survived the winter quite well. By the first week of April they had built up quite well and all except one had queen cells, ready to swarm.

The one hive that did not have queen cells had more drones than workers. There were full frames of capped drone brood. It was obvious the queen was in trouble. I swapped out two frames each from two neighboring hives (with queen cells on them) and that saved the hive. I later replaced the queen.

My experience with the ARS bees indicates they are: 1. Resistant to mites. After all, the colonies were weak and mite infested and survived the winter quite well; 2. They tend to be small and probably will not give much honey; 3. They seem to have an excessive tendency to swarm.

I came to the conclusion that ARS bees were great for hobbyists who want to work with bees but not with honey. I wanted honey so I gave up on ARS.

Jüri Volmer
Beavercreek, OH 45434

## Smokeless Beekeeping

I wonder if there are many beekeepers who gave up using the smoker to calm down the bees as I did, after reading about the detrimental effect of smoke on your health, particularly the lungs.

Are there any statistics on the rate of lung cancer of beekeepers versus similar groups, such as foresters, etc.? Whenever I used a smoker, no matter where nearby I laid it down, the smoke would always find me.

I read on the effectiveness of using a fine spray of 1:1 water/sugar syrup. In my opinion it is as effective as a smoker. In addition, if I thoroughly soak my hands with this mixture I am much less prone to be stung on them when working barehands.

For a few colonies a small two gallon sprayer is ideal – do not use the same one you use to spray pesticide! I believe this method controls the bees in at least two ways: They get busy engorging themselves with the sprayed syrup, and their wings get sticky with the spray so that they have trouble flying.

John Bunicci
Shoreham, NY

## Book Review

The July 1995 issue had a letter from Jim Anderson of Carriere, MS, mentioning Maurice Maeterlinck's classic, *The Life of the Bee*, and asking, "Does anybody out there know the date that this book was published and whether or not it is of any value."

It sells for about $25 from old book dealers. It originally appeared in 1901 (U.S. copyright). One copy I own is by Dodd, Mead & Co., New York, 1911, and the other is undated, Blue Ribbon Books, New York. Both have 427 pp. each, were translated by Alfred Sutro and have the five-page appendix.

Nobel-prize winner (literature, 1911) Materlinck was some writer, mixing "philosophy, fancy and natural history" in his prose, as Jim Anderson was happy to discover.

John Iannuzzi
Ellicott City, MD

## Mites, Bees and CA

In a recent issue there is an article by Georld Loper, who says that out of 245 feral colonies only 28%, or approximately 67 colonies, survived. From his analysis of dead colonies it appears they died of tracheal and *Varroa* mites.

Another article in *Bee Culture* states that the AHB is not moving East out of Texas but rather West into New Mexico because of diseases, fire ants and mites.

I moved my bee operation from San Louis Obispo County in California a couple of years ago to Cochise County, Arizona as I was convinced the AHB was coming and knowing the mind set of SLO and California there would be no room for bees or beekeepers there. Before I departed it was evident that feral colonies did not exist as they once did, if at all. It is thought they have been destroyed by the mites.

In Cochise County, Arizona the AHB has been here for more than two years as well as the mites. Some of my colonies have AHB, but not all. Some very strange bee things are happening, tennis ball size swarms issuing in December and January; deserted hives with plenty of honey and pollen; the inconsistent behavior of my AHB hives; swarms that are issuing are not apparently Africanized; and the almost complete absence of feral AHBs.

I believe the AHB has met the mites and are being destroyed by mites and diseases. The only hives that will remain alive are those under the careful care of beekeepers. It follows that California will probably see very little of the African bee unless it is moved in by a commercial beekeeper. It is possible the AHB may be able to set up resistance to the mites but that is highly unlikely. San Louis Obispo County here I come.

Maynard B. Putman
Cochise, AZ

# MAILBOX

## The EPA and Mite Solution

Did your bees die from mites in the past two years because you were unable to get an inexpensive, effective and safe miticide? FIFRA (Federal Insecticide, Fungicide and Rodenticide Act), in sec.3.a states that pesticides need to be registered "to the extent necessary to prevent unreasonable adverse effects on the environment." A further annotation in "Law of Environmental protection: sec. 17.02[4] [v] states that "EPA (Environmental Protection Agency) may exempt pesticides from FIFRA provisions if the Agency determines the pesticides are adequately regulated by another federal agency or are of a type that need not be subject to FIFRA in order to carry out the purposes of the statute (EG., because the pesticides pose a negligible risk to human health or the environment and the burden imposed by regulation is not justified)." But the EPA seems more interested in collecting millions of dollars for UN-REQUIRED REGISTRATION FEES than in saving the environment they were created to protect. As a beekeeper you will be interested in this case in point:

A natural, edible plant extract which works as a miticide for use in beehives was submitted for registration with the EPA – Mite Solution. It is already regulated and approved by the FDA for human consumption. Studies performed over several years for the "necessary registration process" proved that Mite Solution was safe and was an effective miticide for beehives. The EPA stated – your product is an effective miticide for beehives. The EPA stated – your product is an effective miticide and is safe for the environment.

A safe miticide doesn't need to be registered with the EPA. Still the EPA has stopped all advertising, has threatened thousands of dollars of fines, and has kept you in the dark about a way to inexpensively rid your hives of mites. We need your help.

Please write your congressmen, and help us to gather EPA's refusal to comply with the laws which govern them by joining us in a Class Action Law Suit:

TUTTLE APIARY LABS, U.S. BEEKEEPERS AND FARMERS vs. THE EPA. To be filed in Federal Court. Please write and say you would like to be part of the above action for RECOVERY OF LOSSES due to administrative negligence, etc. State your losses from all mite effected products, honey bees, fruit, wax, etc. Thank you.

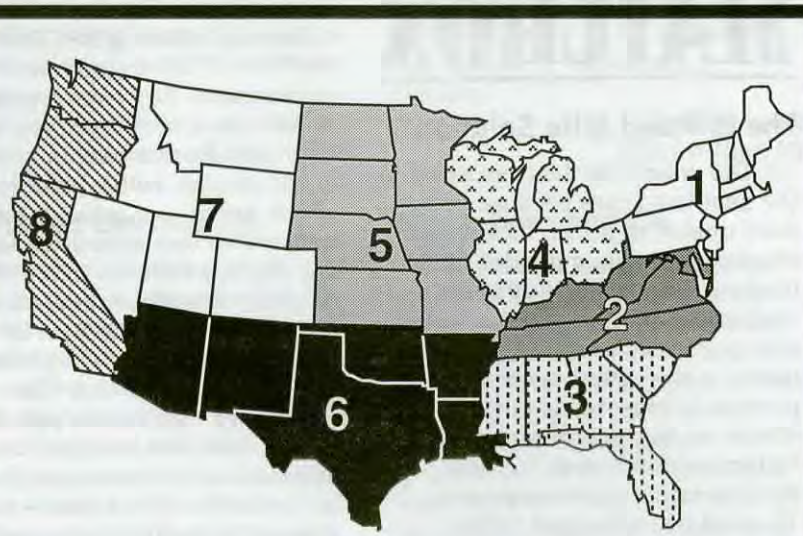
Steven L. Tuttle
3030 Lewis River Rd.
Woodland, WA 985624

# JUNE Honey Report

**JUNE 1, 1996**

## REPORT FEATURES

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




| | Reporting Regions | | | | | | | | Summary | | History | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | Last | Last |
| Extracted honey sold bulk to Packers or Processors | | | | | | | | | Range | Avg. | Month | Yr. |
| **Wholesale Bulk** | | | | | | | | | | | | |
| 60# Light | 45.61 | 47.50 | 60.00 | 57.87 | 57.60 | 42.67 | 50.00 | 58.50 | 39.00-81.00 | 54.72 | 50.87 | 41.49 |
| 60# Amber | 44.19 | 53.33 | 52.60 | 57.27 | 53.50 | 40.03 | 47.50 | 53.00 | 36.00-68.75 | 51.71 | 50.30 | 39.97 |
| 55 gal. Light | 0.78 | 0.60 | 0.85 | 0.88 | 0.90 | 0.70 | 0.70 | 0.88 | 0.56-1.23 | 0.81 | 0.76 | 0.57 |
| 55 gal. Amber | 0.73 | 0.77 | 0.85 | 0.86 | 0.96 | 0.63 | 0.67 | 0.80 | 0.46-1.08 | 0.77 | 0.71 | 0.53 |
| **Wholesale - Case Lots** | | | | | | | | | | | | |
| 1/2# 24's | 23.69 | 27.44 | 22.50 | 24.38 | 23.28 | 22.58 | 25.50 | 25.20 | 20.00-33.12 | 24.97 | 25.03 | 20.14 |
| 1# 24's | 33.02 | 31.30 | 35.50 | 35.79 | 36.20 | 32.30 | 32.10 | 36.00 | 18.00-45.90 | 34.69 | 35.25 | 30.10 |
| 2# 12's | 30.88 | 32.97 | 32.50 | 31.46 | 31.85 | 27.75 | 34.50 | 32.19 | 24.88-39.00 | 32.68 | 32.94 | 28.25 |
| 12 oz. Plas. 24's | 28.87 | 28.65 | 30.00 | 30.39 | 28.55 | 27.30 | 27.95 | 28.80 | 19.60-45.90 | 29.98 | 30.97 | 26.95 |
| 5# 6's | 32.17 | 34.73 | 37.75 | 35.77 | 31.09 | 27.90 | 31.50 | 33.00 | 21.00-45.95 | 33.91 | 34.84 | 30.16 |
| **Retail Honey Prices** | | | | | | | | | | | | |
| 1/2# | 1.68 | 1.99 | 1.71 | 1.41 | 1.29 | 1.79 | 1.29 | 1.87 | 1.00-3.50 | 1.70 | 1.48 | 1.33 |
| 12 oz. Plastic | 1.92 | 2.00 | 2.39 | 1.79 | 1.58 | 1.76 | 1.75 | 1.88 | 1.26-3.29 | 1.97 | 1.86 | 1.60 |
| 1 lb. Glass | 2.19 | 2.50 | 2.36 | 2.11 | 2.05 | 1.94 | 1.95 | 2.25 | 1.79-3.59 | 2.23 | 2.20 | 1.79 |
| 2 lb. Glass | 3.66 | 3.93 | 3.80 | 4.22 | 3.43 | 3.19 | 3.25 | 3.93 | 2.97-5.00 | 3.81 | 3.78 | 3.08 |
| 3 lb. Glass | 4.68 | 4.97 | 5.25 | 5.25 | 5.06 | 4.07 | 4.50 | 5.50 | 3.87-6.00 | 4.94 | 4.79 | 4.45 |
| 4 lb. Glass | 5.50 | 6.48 | 5.60 | 6.75 | 6.30 | 5.27 | 5.45 | 6.30 | 5.09-7.95 | 5.85 | 6.12 | 5.54 |
| 5 lb. Glass | 6.63 | 7.50 | 6.66 | 7.93 | 4.65 | 6.08 | 6.95 | 8.37 | 5.10-9.99 | 7.09 | 7.33 | 6.62 |
| 1# Cream | 2.74 | 3.60 | 3.26 | 2.34 | 2.50 | 2.73 | 2.75 | 2.63 | 2.00-4.95 | 2.82 | 3.07 | 2.19 |
| 1# Comb | 3.52 | 3.30 | 3.38 | 3.84 | 2.50 | 4.25 | 4.50 | 3.75 | 1.95-5.00 | 3.73 | 3.70 | 3.24 |
| Round Plastic | 3.33 | 2.95 | 4.00 | 3.76 | 2.55 | 4.00 | 3.69 | 3.75 | 2.55-5.00 | 3.51 | 3.23 | 3.04 |
| Wax (Light) | 2.28 | 1.71 | 2.51 | 3.47 | 2.18 | 1.73 | 1.90 | 2.53 | 1.25-4.05 | 2.34 | 2.21 | 1.66 |
| Wax (Dark) | 1.78 | 1.58 | 1.88 | 2.50 | 1.50 | 1.28 | 1.85 | 2.75 | 1.00-3.25 | 1.84 | 1.80 | 1.35 |
| Poll. Fee/Col. | 31.43 | 31.08 | 35.00 | 32.50 | 35.00 | 16.00 | 35.00 | 31.00 | 10.00-55.00 | 33.06 | 32.66 | 30.86 |

### MARKET SHARE

A buck a pound is the standard for honey – wholesale – according to the big guys. Smaller operations being squeezed at the dock and not getting, or asking (?) for as much.

China playing games while others charging as much as domestic. Packers scrambling for product. Meanwhile, shelf prices only inching up. Where was all the money going before, when wholesale was 40¢?

### *Region 1*

Prices just steady since last month. Demand steady to increasing a bit, but supplies are low. Colony conditions all over the map, but those that manage will have strong colonies, those that didn't have packages.

### *Region 2*

Bulk wholesale and retail prices up, but case prices only steady. Something fishy here. Demand steady but supplies down to very little in most places. Colonies in pretty good shape, generally, but hot spots easy to find.

### *Region 3*

Prices climbing across the board. Demand still strong, especially for specialty crops, and supplies light. Colonies in good condition, building fast and strong, especially in far south.

### *Region 4*

Prices generally steady, but some areas are still catching up with earlier increases. Demand steady to stronger because of cool weather late in season. Supplies nearly non-existent. Colony conditions, for what few colonies are left generally poor, except for those that were treated to the max.

### *Region 5*

Wholesale bulk prices up as supplies essentially gone, case prices and retail about steady as demand levels off. Northern areas had high losses, and slow spring. Southern areas more normal to too dry. Tough call which is best.

### *Region 6*

Prices steady to increasing just a little. Demand dropped off early due to dry, hot weather, but supplies low to none. Some areas still have fairly low prices, comparatively, bringing down the averages. Colony conditions generally good, straight up, but dry weather could be a problem, soon.

### *Region 7*

Prices steady to up a bit, especially in bulk. Demand steady as cool weather lingers. Supplies low, and getting lower fast, colony conditions O.K., but slower than expected due to cool spring.

### *Region 8*

Prices rising sharply this month, probably an adjustment. Demand strong though, even in warm spring. Supplies strong as early crops came in. Colonies in good shape. Most out-of-state gone or going, to honey crops or pollination.

## Guest Editorial by Ruth Rosin

# The Dance Language Controversy

The information Webster and Caron provide in their article "Bee Language" (*Bee Culture* 7/95) about actually observable data is unquestionable. Their interpretation of the data they provide in favor of the "dance language" hypothesis is, however, questionable. Their evidence is drawn from research done by von Frisch between the mid-40s and mid-60s. It involves data regarding where recruits arrive in the field, as well as data on sites which some recruits were observed to pass over during flight.

The data provide no information about complete flight routes. Von Frisch never observed the complete flight route of any recruit. Only two scientists who worked jointly and allowed a very thick stream of foragers to fly to the food and back, with a strong attracting effect from such foragers have done this.

The data on *how* they approach food sources and arrive at them already completely discredits the "dance language" hypothesis. Recruits invariably arrive at the food by way of an *upwind* zigzag only from *as far* as they can be spotted by observers at the food, even with binoculars. This is exactly what is expected from use of odor alone, not from "dance language" information. Moreover, von Frisch knew of this typical manner of arrival at least as early as 1920; long before the inception of his "dance language" hypothesis.

Contrary to the belief of "dance language" supporters, von Frisch never discovered that honey bee recruits use spatial information from forager dances about the approximate site of the foragers' food. Instead, he was the first to discover, in the early 20s, that they use odor alone. This was not known until I accidentally stumbled on an article by von Frisch, published in the United States in 1939. I published the "find" in 1980, but it was ignored. *Bee World*, 74 (2): 92-98, 1993, published a brief English summary of von Frisch's honey bee research concluded in the early 20s, and clearly shows that he was quite right when he initially inferred that recruits use odor alone. The results *adequately refuted his "dance language" hypothesis* long before its inception.

According to von Frisch's presentation of his "dance language" hypothesis in *Scientific American* February 1962, round dances cause recruits to find food only within 100 meters of the hive, in his Austrian bee strain. But according to the *Bee World* reprint, round dances caused recruits to find food dishes with the foragers' food odor, (but not with a different odor), only where ever he provided such dishes, including those at a distance of one kilometer from the hive. Obviously, they did not find food by following the foragers in flight from the hive to the food, nor by using information about the location of any food. They found dishes with the right odor, though the initial foragers did not fly to those dishes and could not have known of their existence. Obviously, recruits used only odor.

I do not want to question that honey bees can obtain "dance language" information. They cannot, however, obtain the information with the high degree of accuracy required by the "dance language" hypothesis. To fit the accuracy claimed von Frisch assumed that they *average* the information from all dance circuits they attend, with the average providing more accurate information than each individual waggle run.

This requires adding and dividing numbers, which requires *counting*, and von Frisch knew that *the counting ability of insects is practically non-existent*. He concluded that honey bees cannot do so either. The "dance language" hypothesis was, thus, stillborn even if for no other reason than that.

Webster and Caron claim most biologists believe the honey bee "dance language" exists, but the validity of scientific beliefs does not depend on the number of believers. Valid innovative ideas in science are usually launched by a small group or even by a single scientist, and often meet with resistance from the scientific "establishment," too set in its ways to seriously consider innovation.

Touting the honey bee "dance language" hypothesis, not only continues to delude beekeepers into believing that use of the honey bee "dance language" to communicate with honey bees is some day still going to greatly help beekeepers. It also prevents honey bee researchers from studying how they could really help beekeepers by learning to maximally utilize the ability of honey bee recruits to find food by use of odor alone; which is the only way recruits can find food. BC

Roger Morse

# Research Review

## "About social insects, and new thoughts on queen rearing."

"Theoretical work far outreaches the data," according to the paper I cite below, but that doesn't stop people from thinking about how social insect colonies, including honey bee colonies, function. Two points are clear: Queens do not issue commands, and workers do not direct the work of other workers. However, the work gets done and without any central control.

So how does the system work? There are both internal and external forces that are active. Internal forces are perhaps easier to understand. Age, for example, is a major factor: Young bees do housework, and older bees do field work. While they are young, honey bee workers graduate through a series of jobs appropriate to their age. Genetic factors are also important. Since a queen honey bee mates with many males, there are several groups of half sisters active in a colony at any one time. It has been shown that certain of these groups are more likely to do certain tasks than are others. In many social insect groups, especially ants, there may be workers of different sizes; larger workers might guard the nest while smaller workers are foragers. However, a relatively small number of species of social insects have workers of different sizes, so this is not a major internal force.

Environment is a strong external force. One of the most remarkable activities to watch is how bees respond to high and low temperatures. When it gets warm, they gather water, spread it around the hive, fan their wings to evaporate it, and thus cool the hive interior. When it gets cold, they cluster. Still, each bee acts on her own and without direction. On some occasions, workers may choose to do nothing. One of the best examples occurs when a hive is full of honey and the foragers stop collecting food because there is no place to put it. Again, however, all of the workers seem to recognize this fact on an individual basis. With regard to all of these activities there is some variation, and the time when workers pick up or abandon a job varies.

There is still much to learn about the organization of work in social insect colonies, but bits and pieces of the puzzle are falling into place. Most important, the allocation of tasks among bees is appropriate to the need. And, social insects seem to know what is needed.

### Current Thinking About Queen Rearing

Queens and workers may arise from the same fertilized egg produced by queen honey bees. What causes the difference between these two life forms? We know that larvae destined to become queens are fed royal jelly, a secretion from the head glands in worker bees, for a longer period of time than are worker larvae, but how does this work?

The current thinking is that there is no "diet determiner" in royal jelly that causes the differences between queens and workers. Many researchers have searched for such a factor(s) without success. Instead, the difference between queens and workers appears to be brought about by the "nutritional balance," that is, the blend of royal jelly, honey and pollen fed to the larvae.

The critical point, according to the paper cited below, is between the 3.5 and 4th day after the larva hatches from the egg. "This corresponds to the molt from the fourth to the fifth instar."

The food fed both types of larvae through the third day is royal jelly. Three- to five-day-old larvae destined to become queens are fed 10 times more often than are worker larvae and continue to be fed royal jelly only, but worker larvae are given a mixture of royal jelly, honey and pollen. This food, in turn, affects the production of hormones that work internally in the developing larvae and dictate which form will develop.

The theme of this paper seems to me to be on the right track. Of course, there are those who look upon royal jelly as some kind of special food for humans. The paper below does not support that thought but rather the idea that it is merely a protein-rich food that triggers chemical reactions in developing larvae and in itself contains no special controlling factors.

Some of the timetables cited in this paper are a little different from those I have read elsewhere. Most queen breeders in the United States graft one-day-old larvae whereas this paper states two-day-old larvae may be used, which is probably correct but not preferred by our breeders. However, no mention is made of the fact that bees intermediate between workers and queens may sometimes be produced though this may not be entirely food-related but affected by temperature as well. BC

References:

Gordon, D. *The organization of work in social insect colonies.* Nature 380: 121-124. 1996.

Hartfelder, K. and A. Rachinsky. *Royalty runs in the blood – the role of hormones in honey bee caste development.* The Australasian Beekeeper 97: 288-289. 1996

# ? DO YOU KNOW ?

## *Bee Stings, Allergic Reactions and Bee Venom*

Clarence Collison

The general public has an extreme fear of stinging insects and many people falsely believe that they are highly allergic to bee stings. Great variability exists among individuals in their reactions to stings. A relative small proportion of the population actually experience life-threatening, allergic reactions to stings and require emergency medical treatment. Some individuals die each year from anaphylatic reactions due to stings. Over time, beekeepers if stung often enough, will actually develop an immunity to bee stings and have only a very minor reaction when stung. However, to maintain this immunity, it is important for the beekeeper to be stung on a regular basis. However, an individual's reaction to stings may change over time in relation to their physiological condition. Among the general public there is an unfortunate tendency to blame any allergic reactions to insects on honey bees. An important role of beekeepers should be educating the public about the realistic dangers of sting allergies and helping to dispel unfounded and unrealistic fears.

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How well do you understand bee stings, allergic reactions, and venom ? Please take a few minutes and answer the following questions to determine how well you understand these important topics.

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

1. ___ A true allergic reaction to a bee sting is a systemic reaction of the body that occurs at body locations distant from the sting site.
2. ___ Most species of bees and wasps are not responsible for causing venom allergies.
3. ___ Middle-aged and older people are more susceptible to life-threatening allergic reactions to stings than young people.
4. ___ In sting-induced deaths, the venom toxins are the direct cause of death.
5. ___ The allergens in bee, wasp, hornet, and ant venoms are proteins.
6. ___ Several hundred individuals in the United States die each year from honey bee stings.
7. ___ Allergic reactions are generally believed to require at least one "sensitizing" sting prior to the sting that induces the allergic response.
8. ___ Bee venom is an acidic substance.
9. ___ Any stinging insect species can cause allergic reactions in humans.

Multiple Choice Question (1 point each)

10. Honey bee venom is stored in the bee's _____.
    A. Poison gland
    B. Poison sac
    C. Poison canal
    D. Alkaline gland
    E. Sting shaft

Listed below are several chemicals associated with bee venom, the bodies reaction to a sting and sting immunotherapy. Please select the correct answer for questions 11-15. (5 points)

**A.** Epinephrine **B.** Apamin **C.** Immunoglobulin G (IgG) **D.** Histamine **E.** Hyaluronidase **F.** Phospholipase A. **G.** Melittin **H.** Acid Phosphatase **I.** Immunoglobulin E (IgE)

11. ___ The main peptide of bee venom.
12. ___ The only treatment that is capable of arresting ongoing allergic systemic reactions.
13. ___ The allergy causing antibody produced following a sting.
14. ___ The primary antibody produced by the body following a sting in a normal non-allergic human immunological reaction.
15. ___ Chemical component of bee venom that is involved in the disintegration of red blood cells.
16. Why are antihistamines sometimes administered to sting victims? (1 point).
17. What group of stinging insects are generally considered the most important cause of sting allergies in the United States? (1 point).
18. What is the primary reason for placing ice on the site of a bee sting. (1 point).
19. Name three conditions/symptoms that occur at the sting site at the time of the sting. (3 points).
20. Name two symptoms associated with normal, non-allergic reactions, that are experienced hours or a day after being stung. (2 points).
21. Name two possible conditions associated with an allergic systemic reaction. (2 points).

ANSWERS ON PAGE 366

Mark Winston

# Semiochemicals and Varroa

The most significant issue in bee research today is a very applied one, and a seemingly simple problem: How can we best control the *Varroa* mite? Fortunately, there is at least one solution to the problem today, and that is Apistan. Although expensive and tedious to apply, at least it kills most *Varroa* without harming the bees or leaving undue residues – if it is properly applied. Apistan, however, has some real and potential problems associated with it. The real problem is that it is a pesticide, and none of us like putting chemicals into our beehives. The potential problem is resistance; mites are notorious for developing resistance to pesticides like Apistan, and resistance has already been reported in Europe. Thus, new approaches to *Varroa* monitoring and control should be a primary focus of our research community, particularly methods that do not involve hard pesticides.

One such method may involve semiochemicals, and is a research area that a number of laboratories may enter in the near future, depending on funding. The term semiochemical, from the Greek *semion*, to sign or signal, was coined to reflect the broad scope of today's scientific inquiries into chemical communication. The existence of semiochemicals and their potential for managing insects and other pests have been acknowledged for some time. The French entomologist J.H. Fabre was the first to formally investigate the ability of insects to find each other over long distances using chemical communication. He conducted classic experiments in which he put female moths in wire cages placed on his windowsill, and then observed that tens or even hundreds of males were attracted to the cages. Even more remarkably, Fabre and other colleagues marked male moths and released them up to 11 kilometers from the caged females, yet many of the released males appeared within hours at the cages. However, when their antennae were removed or painted over with lacquer, the males lost their ability to find the cages with the imprisoned females, even at short distances. Fabre speculated that male insects, especially moths, could orient to scents released by females, and that one day "science, instructed by the insect, would give us a radiograph sensitive to odors, and this artificial nose will open up a new world of marvels."

The isolation, chemical identification and synthesis of a pheromone did not occur until the late 1950s, when the use of gas chromatography was perfected by chemists. This technique separates compounds and allows them to move at different rates through a column, where they can be identified. German scientists used this new technique to (elucidate) isolate (or) identify the sex pheromone produced by the female silk-producing moth *Bombyx mori*. This insect was an unlikely candidate to initiate the field of insect chemical ecology because it is not a pest but a beneficial insect, and there was not a compelling economic reason to find this particular pheromone. However, this moth had one advantage over pest species that might have been chosen for the singular honor of being the first insect to divulge the identity of its aphrodisiac chemicals: It is a large insect, and in the 1950s the technology to identify minute quantities of insect-produced chemicals was in an early and crude state.

Even with its large size, the task of isolating enough moth-produced chemical to identify was daunting. The mating ritual of the male and female moths was well-known, and provided a good bioassay to test potential pheromonal compounds. The female sits on a tree trunk, everting a gland in her abdomen and releasing the attractive pheromone. The male flies upwind, using his large, plumose antennae to smell the female's species-specific scent and orient to her. Subsequent studies showed that the male antennae could respond to as little as one molecule of attractant, and orient to the female with only a few hundred molecules released in her odor plume.

Unfortunately for science, each female produces only about one-millionth of a gram from her abdominal gland, enough to potentially attract up to a billion males but far below the detection capabilities of 1950s technology. The Munich scientists, led by A.J. Butenandt, had to clip 500,000 female abdomens to extract enough attractant to identify its chemical structure, but they finally succeeded in 1959. They named the attractant odor "bombykol," and found that, when a synthetic version of bombykol was placed on a lure, it

*"New approaches to* Varroa *monitoring and control should be a primary focus of our research community, particularly methods that do not involve hard pesticides."*

attracted males in a fashion very similar to that of a live female moth.

The potential impact of identifying the silkworm sex attractant was not lost on the scientific and pest-management communities. The 1960s saw a trickle of new chemicals isolated, identified, synthesized and then tested as management tools to overcome insect pests with their own compounds. However, the trickle grew to a torrent as techniques improved, instrumentation became more sensitive, and basic knowledge concerning semiochemical-based biology created an increasingly sophisticated substrate for subsequent researchers to build on. The growing interest in semiochemicals, and our increasing technical capability to identify them, was reflected in the number of U.S. patents granted for novel compounds. There were only 13 patents granted before 1970, but 150 were granted by 1988, and 257 by 1991.

Interest in mating attractants gradually expanded into the discipline of chemical ecology, which includes not only mating substances but any chemical involved in communication between organisms. Today's chemical ecologist might still elucidate the identity and function of an insect sex attractant, but is just as likely to study the odors that attract a pine beetle to its host tree, the inhibitory secretions that prevent a worker bee from laying eggs, or the alarm chemicals given off by an aphid that is under attack by parasitic wasps.

The work of these chemical explorers has been of considerable interest to pest managers because semiochemical-based pest management has great potential advantages over more traditional pesticide-based control. Most significantly, semiochemicals are highly specific to individual species, active at sometimes unbelievably low concentrations, and have the advantage of being relatively easy to register and market because they have virtually no side effects on vertebrates, or even other insects.

The practical uses of semiochemicals in pest management have settled out into three main techniques – monitoring, attract-and-kill, and mating disruption. Of these, monitoring and attract-and-kill have excellent potential for *Varroa* management. In both cases, if we can find an attractant for *Varroa*, it would be possible to monitor their presence and levels in hives, and hopefully even attract most mites to a trap in which they could be killed.

The first step in a semiochemical-based control program would be to find compounds that would attract *Varroa* mites. We already know that mites are attracted to a number of identified compounds that honey bee larvae release just prior to capping. The purpose of these compounds for the bee is for the larvae to signal adult workers to construct wax cappings over their cells. Since *Varroa* mites enter the cells just prior to capping, these compounds would be ideal attractants in a monitoring or control program. However, *Varroa* mites also are preferentially attracted to drone larvae and to adult nurse bees, providing additional possibilities to isolate, identify and synthesize *Varroa* attractants.

Once we have an attractant, the next step would be to develop monitoring and control traps. Monitoring is the most common application of pheromones to pest management. Typically, an open trap is set out with a lure inside that is baited with the target mite or insect attractant. For *Varroa*, the mite would enter the trap expecting to find a larva or an adult bee, but instead would encounter a sticky lining from which it cannot escape. Beekeepers could then check these traps on a regular basis, correlate the numbers of trapped insects with potential economic damage, and make informed decisions about when and how often to apply miticide treatments.

Even better would be a trap in which most *Varroa* mites could be attracted and killed. This technique has proven particularly effective against insects in enclosed spaces, such as beetles in grain bins or cockroaches in interior urban settings. The approach would be similar to monitoring in that a trap is baited with the attractant, but the mites that enter the trap would be met with a contact poison, and quickly die. The advantage of this technique over the current Apistan application method is that miticides could be contained within traps, without contacting bees, comb or honey. Even better would be a trap that would work via a sticky lining alone, without any miticide needed.

Is semiochemical-based control of *Varroa* really feasible? The use of semiochemicals for pest control is becoming more popular and effective as scientists and pest managers become more familiar with these techniques, and there is no reason to believe that *Varroa* management with semiochemicals would be more difficult than for other pests. The semiochemical approach to *Varroa* management certainly seems to have potential, even if it doesn't go beyond providing an inexpensive and easy-to-use monitoring technique for mite levels. The only way to find out whether this research potential can be realized is to try. That, after all, is what research means: "The act of searching carefully for a specified thing." My own feeling is that a careful search for an attractant-based monitoring and control system for *Varroa* will prove effective. If I were a beekeeper or a chemical company, this is where I would put my research dollars. After all, *Varroa* is our most important problem, and semiochemicals offer the best alternative to putting hard chemical pesticides into our colonies. BC

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# DO YOUR OWN RESEARCH

**You don't have to be a Rocket Scientist to conduct honey bee research. But to be taken seriously, and to know if what you did is worthwhile, you have to follow the same rules.**

Buzz Phillips

We all have seen the effects of mites on honey bees, and many beekeepers are in real trouble, having lost all or most of their bees over the last few years. Many of us have tried various 'cures' to control or reduce mite numbers but much of the information is based on opinion or hearsay and little, if any scientific evidence. And what is science, anyway? Webster's defines *science* as a "systematized knowledge derived from observation and experiment." So, let's apply some scientific principles when looking for that magic bullet for mites.

If you are going to test some of your own 'cures' this year, here are some guidelines on the correct procedures for conducting experiments and making reliable observations. If you consider them carefully and follow the steps, you will not only have done some good scientific research, but will begin to understand how time-consuming and expensive this work is and why it takes so long for mite or any honey bee research to produce reliable results that can be published.

**1. Forming a hypothesis.** The first step in forming a hypothesis is to ask a question. An example of this is: *Do basil leaves kill mites?* After doing some experiments you will come up with some answers or potential explanations (*hypotheses*). But this simple question has many complex layers, such as: Do basil leaves kill mites, bees, brood? Do they have an effect on honey production? And which mite does it kill? And which bees are we talking about?

So you have to ask a very specific, precise question, taking into account all these other layers. A more specific question then, and the goal of your research would be: *Do fresh basil leaves control Varroa mites in Carniolan bees in my state this year?*

Now you're ready to go to the next step.

**– Question –**

**Do Fresh Basil Leaves Kill *Varroa* Mites?**

**EXPERIMENT**

**Test Subject: Bee Colony**

**Parameters:**

- **10 colonies per treatment**
- **25,000 workers per colony (approximately)**
- **New Carniolan queens from Grazer's Bee Farm**
- **Start from 3 lb. packages May 15**
- **Medicate all with Fumidil-B (in 1 gallon 1:1 syrup), feed 6 oz. pollen patty (Hi-Pro Brand) and treat with 8 oz. extender patty (2:1 oil:sugar + appropriate dose of Terramycin at installation)**
- **Bees on 100% pure beeswax foundation (Root) in new, pine hives treated with white Latex paint (K-Mart)**
- **Set up in Fulmer's Apiary.**

**Test Product: Fresh Basil Leaves**

**Parameters**

- **Application – fresh chopped basil leaves from garden**
- **Rate – one cup (Treatment A); one-half cup (Treatment B), none (Control)**
- **Frequency – every 30 days**

**Data Collection**

**Parameters:**

- **Sample size – 150 to 200 bees**
- **Sampling Technique – bees captured in jar from center two brood combs**
- **Frequency – every 30 days, same day as treatment, *before* treatment applied**
- **Materials needed – jars, alcohol, labels, marking pens, 30 colonies and necessary hive furniture, basil leaves**
- **Appropriate medications**

**Results . . .**

*Sample Flow Chart for Conducting a Scientific Experiment.*

**2. Designing an experiment.** How do you set up an experiment to answer your question? First, you have to go through a check list to define the parameters of your test (see the Chart).

**a. Subject.** You need to select your test subject, in this case a colony of bees. You must include in your experiment colonies that do not receive any treatment (fresh basil leaves) at all. These are called *control* colonies. They get everything else (Terra, Fumidil-B, etc.), except the leaves. This is very important, for without comparing your tested-colony results to no-treatment control colony results, your experiment is meaningless. Further, make sure everything else in all colonies is equal: All should be of equal strength, a 3-lb. package, all have the same type and aged queen (3 months old, Carniolan, same source) and all are treated equally (fed the same, worked the same day, medicated the same amount); the only difference is the *one thing you are looking at* – basil leaves.

Then you need to decide how many colonies are needed to make your results meaningful. It won't be very impressive if you use only two colonies (one treated, one not), because any results you get could simply be due to chance. One hundred colonies would be best, but most of us are not able to do this, so if possible compromise on 10 or 20 colonies *per treatment* (are you beginning to see why research costs so much?). That means 10 colonies will receive the basil and 10 colonies will not. If you want to test two different amounts of basil, that will require an additional 10 colonies in the test. These colonies should not be used for any other purpose until the experiment is done.

**b. Test Product.** What is the material you are testing, how do you apply it, how much and how often do you treat? In the case of our basil leaves, you could come up

*Make and use a data collection sheet during your experiment.*

**DATA COLLECTION SHEET**

| Date | Hive# | Treatment | Date Treated | #Bees Collected | Mite Count |
|---|---|---|---|---|---|
| 6/30/96 | 15 | A | 4/13/96 | 50 | |
| 6/30 | 5 | B | 4/13 | 55 | |
| 6/30 | 1 | C | 4/13 | 60 | |
| | | | • | | |
| | | | • | | |

with fresh, chopped basil leaves, scattered on the top bars of the broodnest, in one cup and half cup quantities, once a month. (Weight is better than volume, if you can.) It is better to have *at least two different amounts of material*, to give you more options. If you just test basil leaves and no basil leaves, and both treatments die, you have not answered your question. But if you test two (or more) amounts of basil applied to colonies you will get more information. This is how many pesticides are tested – not if it just kills insects, but how much of it is needed to kill all the insects, some of the insects, none of the insects and not kill the plants they are on.

The reason you absolutely *must* carefully plan, set up and carry out your project, and take very good notes in the process is that to be taken seriously, your project must be 'repeatable.' That is, anyone who reads your notes, plans, and results should be able to duplicate your experiment to see if it works for them. The sure sign of good research is 'repeatability' by anyone, (nearly) anywhere.

Now that you have decided on what you are testing, and how you are going to do it, you can go to the next step.

**3. Collecting Data.** Okay, you think you are ready to start? Nope, you have to make some more decisions. One is how often will you make your observations? This means collecting bees and counting mites, or, in research-speak, collecting data. Data are merely the numbers you generate in the course of your experiment; for example, the number of mites counted per colony, per treatment, per month.

Since you cannot count all of the mites or all of the bees in each colony every time you collect data, you have to take a representative *sample*. So, you need to decide what a *sample* will be. How large will a sample be or within what range should it be? For instance, if you are collecting bees, a sample could be no fewer than 50 bees and no larger than 200 bees. Next, how often will you collect your samples? Many *Varroa* researchers sample bees once a month during the summer and into the fall months, while others test once a week; you have to decide for yourself how often and how long you can realistically sample your colonies. Remember, to get good results you can't skip data collection times. Now, cancel those vacation plans before the airline penalizes you!

Next, decide on *how* you will collect those samples. If you are looking for mites on bees, will you use the ether roll method, tobacco smoke and sticky board, or collect adult bees. You don't want to use an Apistan strip to collect mites because even a short exposure could affect the mite population such that a basil-leaf test would be meaningless. This will depend on how much time you can spend collecting and what you will collect in. Once you choose a sampling technique however, use it throughout the entire experimental period on every colony the same way every time. Remember, make all other conditions as identical as possible, collect data on the same day, in the same way and treat all colonies alike except for that one difference, *the treatment*. For instance, if you have to treat some colonies for Nosema, treat all colonies with Fumidil-B, since you are *not* doing Nosema research, but *Varroa* mite research.

When collecting the data, you will need to devise some kind of data collection sheet to keep sampling dates and treated colonies in order. See the sample above.

Next, pick your apiary site. There can be much variation even in different apiary locations. So, to keep it simple, use only one apiary for your experiment if at all possible. If you must use more than a single location be certain you have colonies in each spot receiving the same treatment. You'll need the same number of treated colonies and controls in each location. It's best to keep everything together in one site though.

Once your location is picked, your colonies equalized, your levels of basil leaves chosen, (full cup, half cup, control) and randomized, (see box), take your baseline data. Establishing a baseline simply means "what is the condition of each colony *before* the treatments began. Take samples, as described above, before you start your treatment.

In our experiment we started with three-lb. packages. For our purposes let's assume no Apistan treatments were given at installation. Then, our experiment will begin some time (pick a date) in June.

Since you probably will not be able to count mites until later in the year, devise a way to easily collect your samples and store them, either in alcohol or in the freezer, until you can do the work. This means you will need some kind of collector and lots of containers to keep the bees or mites in. Many researchers use a modified hand-held

*Continued on Next Page*

## How To Randomize Your Treatments

There are many good methods to randomize treatments in an experiment. Most pocket calculators can do it, but they use 1,000 numbers. Math books may have a chart to use. For an experiment of this size a simple way is to draw numbers from a hat. Let's say you have 10 colonies receiving 1 treatment, 10 receiving another, and 10 controls. First, number your colonies 1-30 and make a map of the apiary site. On 30 same-size slips of paper simply write A, B, C. Then walking through the apiary (or using a map) draw a slip from a hat for each colony. Just don't forget which treatment is which, or which colony gets 10 As, 10 Bs and 10 Cs.

*DO YOUR OWN ... Cont. From Pg. 339*

vacuum cleaner to collect bees into a vial. Then mark each vial carefully as to colony number and date collected. Don't put the treatment on there as that may bias you later when counting mites. Store your samples in the freezer, or in a safe place if using alcohol or sticky boards, until later, when you can count mites and record the numbers on the data sheet.

One last thought. Make sure you can dedicate these colonies to the experiment for the entire duration of the experiment. Pulling several away in the middle renders the research useless. However, a colony that dies counts.

Now that everything is in place, you've made all of your decisions and you're ready to go, recheck all of your notes, plans, maps, diagrams, lists and ideas to make absolutely sure you haven't forgotten to record something. Too many notes is far better than too few.

Once samples are counted, add up the numbers and do some simple statistics to see if there is significant difference between treated and untreated colonies. This is important. You must be able to show that your results are not due to chance alone. We'll explore the wonderful world of statistics next month. BC

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# *VARROA* MITE SPREAD IN THE UNITED STATES

Adrian M. Wenner and William W. Bushing

Early in the 17th century, beekeepers introduced European honey bees to the United States, forever altering relationships between plants and insects in this country. Previously, hummingbirds, bumble bees, other native bees (mostly solitary) and various insects pollinated native plants. As with a great many other invading species, honey bees soon became a major factor in the flowering plant ecosystem.

More than 300 years after the initial introduction, a beekeeper also imported honey bees (and a very serious problem), perhaps from Brazil, despite a quarantine that had existed for several decades. That person was not the first to break the quarantine; all too often the quarantine had been ignored by others hoping to "improve their strain." Unfortunately, this time the imported bees harbored a voracious parasitic mite, *Varroa jacobsoni*, soon to populate all contiguous states and Alaska.

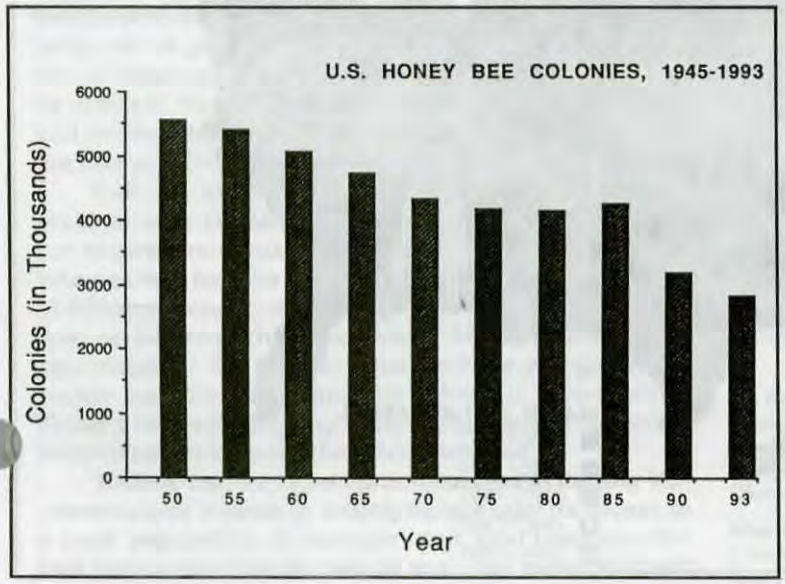
In September, 1987, colonies in some hives transported from Florida to Wisconsin experienced colony failure — the first recorded case of *Varroa* infestation in this country. A spot check around the nation that Fall revealed the presence of *Varroa* mites already in a dozen states.

Florida seems likely to have been the initial introduction point. Subsequent queen and package distributions, as well as movement of colonies by beekeepers (e.g., for pollination and overwintering), hastened the spread of *Varroa* mites throughout the nation. At the local level, swarm movements, robbing of weakened hives, incidental drift between colonies, freedom of drone movement between colonies, and some mite transfer by bees visiting blossoms all contributed to a rapid, near-universal infestation.

Attempts to check the spread in the United States came too little and too late. After a flurry of reported finds in this country, officials in most states apparently rather suddenly ceased keeping records of new finds — perhaps overwhelmed by the speed of the inevitable widespread disaster. As Sanford wrote: "...beekeepers did not believe what we in extension or [regulatory agencies] told them about the mites. Thus, they did no treatments and then were surprised by losing a great many colonies..."

Not only in the United States but elsewhere, the rapid and nearly worldwide spread caught nearly everyone by surprise, though it shouldn't have. As early as 1975, Akratanakul and Burgett published a warning about the threat posed by *Varroa* mites.

*Decline of managed bee colonies during the past half-century. The sudden plummet after 1985 coincides with first appearance of Varroa mites. This figure is adapted from one published by Hoff and Willett (1994).*




## The Rapid U.S. Spread

Some individuals kept rather extensive records during the first few years of *Varroa* infestation in the United States, notably Stephen Bambara (Entomology, North Carolina State University), I. Barton Smith (Secretary, Apiary Inspectors of America) and Jim Pheasant (USDA/APHIS). Queries broadcast over e-mail networks (e.g., BEE-L) yielded yet other information. Finally, ***Bee Culture's*** publication of resource people by state (April, 1995) enabled us to contact officials in undocumented areas, thereby gaining information to fill in the remaining gaps.

The information gathered permitted us to generate a composite map that illustrates earliest known establishment of *Varroa* mites in each state. A study of that map allows one to speculate about probable distribution patterns. In a few cases, reports did not mesh with one another, but such conflicts did not differ by more than a year.

Although not shown on the map, Canada has not escaped *Varroa* mite infestation. In the late 1980s, isolated cases appeared along the U.S. border in New Brunswick and Manitoba. By 1992 in Manitoba and 1993 in New Brunswick, *Varroa* seemed to have become established in a few operations and were later

*Continued on Next Page*

*VARROA MITE SPREAD ... Cont. From Pg. 341*

(1993) found in Alberta among some colonies that had been overwintered in southern British Columbia. Other Alberta finds in 1994 occurred in bee yards containing colonies that had overwintered in British Columbia areas distant from the U.S. border. By 1995, more general finds were recorded from a few bee operations in Alberta, Manitoba, Nova Scotia and Saskatchewan. Most beekeepers in Canada, however, still remain unaffected by those mites.

During the last few decades, the number of maintained honey bee colonies in the United States plummeted, largely as a consequence of the combined effect of tracheal and *Varroa* mite infestations. Between 1945 and 1990, the number of managed colonies dropped to about one-half of its former level. However, that circumstance does not represent the true level of devastation to agriculture. From all indications, feral bee colonies (see below) have effectively disappeared in all areas of *Varroa* mite infestation.

## The Feral Bee Reservoir

By their extermination of feral honey bee colonies that had existed previously, perhaps for many years, the tracheal and *Varroa* mite invasions eliminated a primary pollination source for most urban gardeners and other growers — who suddenly lost virtually all pollination services taken for granted earlier. However, cavities in which those "wild" bees formerly resided can repeatedly become filled with swarms from nearby managed colonies, feral colonies that will weaken and die with time from their combined parasite load. Robbin Thorp, a California bee researcher, refers to this rather rapid reoccupation of cavities and subsequent death as "annualization" of feral populations.

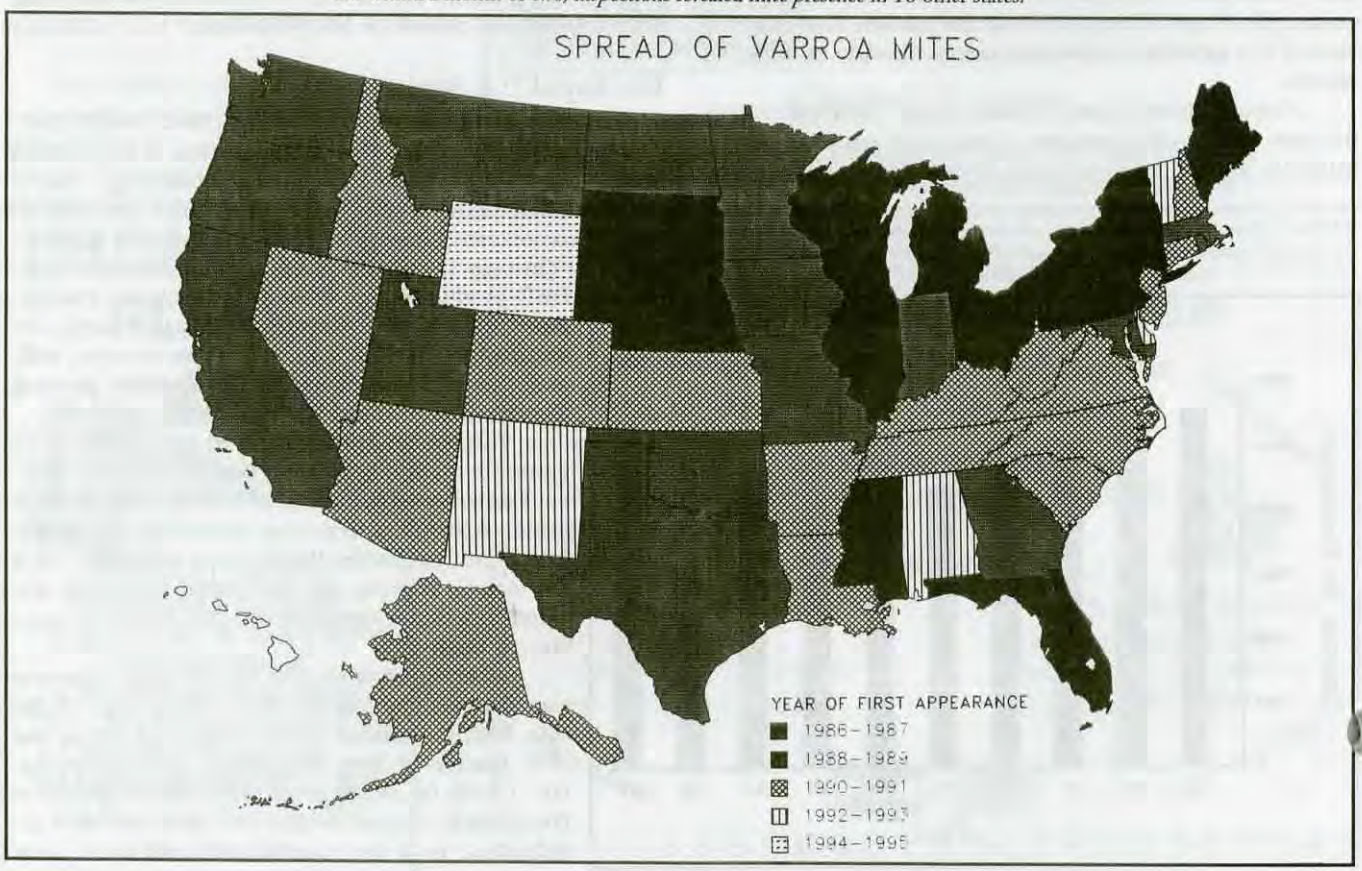
The rather temporary feral colonies in reoccupied cavities provide a source of *Varroa* mites for contamination of nearby managed colonies because mites travel freely between managed and feral colonies on drifting and robbing bees. This situation thereby complicates efforts to manage commercial colonies effectively. Whereas the beekeeper can depopulate managed hives of mite parasites to a great extent by judicious use of oil patties and Apistan strips, nearby newly re-established feral colonies remain untouched by that treatment. In the case of absconding swarms, the mite load can be considerable, since colonies often abscond when mites become too abundant.

A rapid mite buildup in feral colonies soon leads to their early demise and a vicious cycle. Highly infested and weakened feral colonies then become robbed out by bees from managed colonies, requiring more frequent miticide treatment of managed colonies. Lack of a uniform program for *Varroa* mite control efforts exacerbates the problem, in that infestations can also surge back and forth between apiaries managed by different beekeepers. Furthermore, misuse of Apistan strips (as apparently occurs) can be expected to lead to fluvalinate-resistant mites.

## Prospects for the Future

With each new introduced problem, beekeeping has become ever more challenging in the United States and

*Year of first documented incidence in domestic colonies by state in the United States. Varroa mite infestations were first noticed in Wisconsin and Florida, but within a month or two, inspections revealed mite presence in 10 other states.*



## Mite Detection and Colony Treatment

One can detect *Varroa* mites in a colony by a variety of methods, some more effective than others:

1) Insert an Apistan® strip into brood nest for a *couple of hours and then remove it — with a sticky* board (e.g., vegetable oil coated) in place under brood combs to catch any mites that fall during that period.
2) Inspect advanced drone pupae by spearing and lifting them out of a comb with a capping scraper.
3) Look for mite fecal accumulations in recently emptied brood cells.
4) Employ the standard ether roll technique — use a quart glass jar with vegetable oil, drop in a few hundred bees, spray ether (from auto supply store) into the jar, rotate the jar, and look for mites stuck on the jar walls.
5) Slip a horizontal sticky card (overlaid by a coarse screen so bees will not become mired) into the entrance and keep it underneath the brood combs, inspecting it each few days.
6) Look for mites on young bees as they walk about on brood combs.
7) Inspect advanced-stage drone brood extracted from cells with perforated cappings.
8) Search for deformed young bees in the hive and outside on the ground.

Beekeepers around the world employ a number of chemical treatments (tobacco smoke, fluvalinate, formic acid) to control *Varroa* mites, but those in the U.S. can legally use only fluvalinate incorporated into plastic strips (Apistan®). In Canada and Germany, one can also legally use formic acid, an inexpensive but quite dangerous substance that is reportedly not always particularly effective — especially if one does not have sticky boards in place underneath the brood combs during treatment.

elsewhere. The foulbrood plagues, followed by indiscriminate pesticide use devastated the beekeeping industry in mid-century. Each time, beekeeping managed to rebound and furnish profit and/or pleasure for those who persisted.

The influx of tracheal and *Varroa* mites (particularly the latter), however, poses problems far greater than any faced before. From all indications, we can breed strains of tracheal mite-resistant bees and can do so ever better as we gain greater understanding of the interaction of those parasites with their bee hosts. *Varroa* mites, by contrast, feed on the blood of larvae, pupae and adults and can reproduce astonishingly fast; faster, that is, than the rate at which bee colonies can replace their losses.

Can one breed a *Varroa* resistant bee? The major problem here stems from the fact that virtually all our bee strains are actually quite highly interbred. That is, when queens mate in midair with nearly a score of drones of different genetic makeup, the resultant colony has a host of different characteristics. Perhaps some small percentage of the bees in a colony have a hygienic behavior suitable for ridding the colony of *Varroa* mites. Finding and isolating any such useful feature remains a formidable task under the circumstances.

Neither can we expect much success at finding *Varroa*-resistant strains by letting nature take its course in a joint population of managed and feral colonies. Our best hope along this line would be to find some relatively isolated population consisting of many feral colonies and follow the progress of *Varroa* infestation through time. If any of those colonies would survive, they could serve as a source of breeding material if kept isolated from contamination by importation of other bees from outside the area.

We are currently examining this possibility (resistance) on Santa Cruz Island and (hopefully) on Santa Catalina Island, two large islands that lie off the coast of Southern California. Contamination of the bee strain on Santa Cruz Island (currently a very homogeneous strain) by material from the neighboring mainland appears remote. We do not yet know enough about the Santa Catalina Island honey bee operation to determine whether that population might have potential for *Varroa* resistance.

With the advent of tracheal and *Varroa* mites, beekeepers may well have to rethink the degree to which they embrace the relative freedom they earlier practiced. We as individuals can no longer focus exclusively on the health of individual colonies, or even beeyards. We must now deal with contamination of the entire system of all managed and feral colonies within flight range (as with the early influx of foulbrood). It may well be that we will have to impose a region-wide and coordinated application of Apistan or other treatment to insure that we do not have mite infestations merely surge about among managed bee operations and feral colonies.

The alternative? We could merely cease all apiculture inspection programs and let the strong survive, whether it be the strong colonies or the most resourceful beekeepers. The danger of this last approach, of course, is that we can end up with the possibility of producing contaminated honey and beeswax by those who will try anything to keep their colonies alive. BC

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*Dr. Wenner, Professor Emeritus (Natural History) in the Department of Ecology, Evolution, and Marine Biology at the University of California, Santa Barbara, continues his honey bee research on Santa Cruz Island. Mr. Bushing of the same department is finishing his doctoral studies on the application of geographic information systems to marine habitats; he now serves as the Catalina Island Conservancy's Director of Science, Education, and Ecological Restoration.*

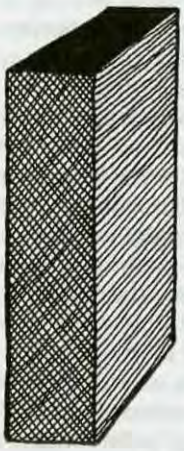


*Many individuals provided input for this article. In particular, we thank Steven Bambara, I. Barton Smith, Hachiro Shimanuki, Jim Pheasant, Tom Sanford, Robbin Thorp, and Kenn Tuckey.*

# USING BRICKS

## Even though you keep excellent records, here's a solid beeyard information system you might want to consider.

Richard S. Vetter



At the University of California-Riverside, we have 40 to 70 honey bee colonies spread out over four apiary sites. We have several people using the apiaries for a variety of research needs and, over any time period, two to four people could be inspecting hives. I found that each person had a different way of indicating a condition of concern (i.e., queenlessness, disease). It was not uncommon for me to stroll into an apiary and see the tops of our colonies festooned with one rock or two rocks, or bricks on their sides or bricks standing on end, or a combination of these events. It was understood that this signified something special about that colony that required attention. It may have meant something to the person who placed them there, but for anyone else entering the apiary, their significance was meaningless; the unaware person would have to inspect the hive to try to figure out what the rocks/bricks on top meant. I devised a very simple system for our lab, and I thought that it might help others as well. By painting different colors on the sides and ends of bricks, we now have a much more sophisticated system which makes multi-user apiaries easier to use.

I used bricks because we just happened to have about 25 of them in our storage shed. I asked around for leftover paints of bright colors from colleagues and was readily supplied with sufficient cans of paint. The sides of the bricks were painted a different color which was coordinated with some meaningful beekeeping concept. For example, disease was signified by red (danger), queenright by purple (royal), honey by yellow and the fourth side was green, which just meant "other." Also, the ends of each brick were painted to indicate the degree of the condition; black on one end (meaning "attend to condition immediately") and white on the other (meaning "the condition exists, it has been remedied but one still needs to be aware of the situation"). We designated that the colored side facing upward and the black/white end of the brick facing the front of the hive would be the indicator of the colony's condition.

Here is how we use the multicolored bricks. During our inspections, if a colony is found to be queenless, a brick is placed on the top of the hive with the purple side up. If the colony is doomed (that is, if it is queenless, has no eggs or young larvae and therefore, can't rear a new queen without beekeeper intervention), the black end of the brick is placed toward the front of the hive. This "purple-black" configuration means the beekeeper must provide either a queen cell or a frame with eggs, or the colony should be combined with a queenright one. If the white end is placed toward the front instead, this "purple-white" means "queenless but there are queen cells" either from the bees taking care of the situation themselves, or a cell from a queen graft has been added.

In the other cases, "red-black" means the colony has disease and it must be treated; "red-white" means a colony is diseased or recently was diseased but remedies have been provided. "Yellow-black" means the colony is honey-bound or needs another super; "yellow-white" means the colony has room for honey but if we are near a harvest, we can take that super. (The "yellow-white" combination doesn't actually get used all that often in our apiary.) Green is a catchall and can mean many things, such as the colony is missing a frame or needs a queen excluder. I have also used it to indicate that eggs were found above the queen excluder and the queen was not found, so another search was necessary. Green indicates that "something" is going on in the colony and when you inspect it, you should find something other than queenlessness, disease or a supering/harvesting situation. To add an additional bit of complexity, we have started using a "purple-yellow" combination to indicate in a colony which is queen rearing, a queen has emerged but has yet to lay eggs, so a "queen-caution" con-

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***"Disease is signified by red (danger), queenright by purple (royal), honey by yellow and the fourth side is green, which just means 'other'."***

***"It allows us to go into an apiary and be aware of colonies that need attention or remind us which colonies need to be checked to see if they are coming back to healthy, queenright status with sufficient room for honey. In addition, it sure is a lot prettier and aesthetically more pleasing than the bunch of rocks we used to use."***

*USING BRICKS ... Cont. From Pg. 345*

dition exists; when eggs are seen, then the brick can be removed.

This color-coded system has helped us tremendously because we have several people using the apiaries. Quite often, one person is looking inside a colony for a specific research purpose (i.e., gathering drones for experiments or obtaining eggs for queen grafts) and finds a condition that has come about since the last inspection. The colony can then be marked immediately for future care, especially if the incidental inspector doesn't have the time or proper equipment on hand to remedy the situation on the spot. One person who is looking to grab a frame of eggs for queen rearing will avoid colonies with purple or red-sided bricks. If we find a colony with queen cells on many frames, we might look for purple bricks on covers so we can switch them around with colonies that are queenless. If the brick on top indicates disease, we can also avoid taking or switching any frames or combining any of these colonies.

Our system is more elaborate than it needs to be. I decided to use colors that could be associated with some beekeeping significance because we have a variety of folks in the beeyard (professors, post-docs, grad students, several undergraduate workers). I felt having a color-coordinated system would make it easier to learn and remember. However, if you are interested in trying this in your apiary and want to cut costs, you can use pieces of 2 x 4 instead of bricks, although they might topple more readily. A "queenless" hive might become "honey-bound" by a strong wind. Also, there is no need for all the colors. By using black and white paints and mixing them to get gray, one could still paint the ends black and white and paint the sides white, gray and black and leave the last side the original color. But it might be harder to remember what color or colors go with what condition. I have found that a local paint store sells mistakenly mixed or leftover paint very inexpensively, so one might be able to pick up a variety of colors for less than $5 total. I also found that the brighter colors are easier to see from a distance and easier to remember for the other folks in my lab.

Not every beekeeper will want to bother with all the extra effort, time, money and trouble to paint bricks like this, but I have found that in our system of about 50 hives and multiple beekeepers, the multicolored bricks system works well. It allows us to go into an apiary and be aware of colonies that need attention or remind us which colonies need to be checked to see if they are coming back to healthy, queenright status with sufficient room for honey. In addition, it sure is a lot prettier and aesthetically more pleasing than the bunch of rocks we used to use. BC

*Rick Vetter is a staff research associate with the Entomology Department at UC Riverside.*

# SOLAR WAX MELTERS

Richard Bonney

## Making and using a solar wax melter makes perfect sense, and there are as many styles as there are people who make them.

Why bother with a solar wax melter? That's a legitimate question for a neophyte beekeeper with just one or two hives and I'll answer it because I believe you *should* bother. It can lead to better beekeeping.

During those first couple of seasons, when we're just getting started with bees, we don't have to deal with much old wax. The comb in our new hives is presumably drawn from foundation and remains relatively new for a while. When we work the hive, scrapings don't add up to much, and even cappings don't overwhelm us at extracting time. But as time passes, all that changes.

First, brood comb ages and darkens with use, and the cells get a little smaller. Disease organisms, ever present in a hive, find their way into the wax. These organisms are of no great import to a strong, healthy hive, but they are there, a potential threat in times of stress. That comb should be replaced periodically as a sanitation measure. Not every year, of course, but a little each year. We'll come back to that.

Aside from brood comb, there is other wax accumulating. Each time you work the hives during the active season, you probably scrape a little burr and brace comb from the frames and boxes, and at extracting time there are the cappings. After the first year or so, this excess wax begins to add up, and it is a shame to just throw it out. Wax does have value. *Bee Culture*'s April 1996 Honey Report page shows average values for dark wax ranging (depending on geography) from $1.26 to $2.15, and for light wax, $1.63 to $2.83. Of course, those are unlikely to be your net prices if you sell your wax. You will probably sell to an intermediary, a local dealer, for instance, or you may sell it to a processor, paying shipping charges to get it there. But the potential is there for a few dollars' return on what many consider to be a waste product and a nuisance – provided you handle it right. A solar melter helps with this handling.

First, however, let's talk more about accumulating the raw wax. Do you have a program for recycling your older comb? I firmly believe you should. Many beekeepers are proud of their old, black comb, some of it handed down from earlier generations, but continuing to use such comb is a highly questionable practice. As stated, the wax is a repository for disease organisms, buried and dormant perhaps, but present, and a potential danger in times of stress. Furthermore, the cells of brood comb become smaller with use, first because each generation of emerging brood leaves behind its cocoons which adhere firmly to the cells, and second, because the bees add propolis to the cell walls, strengthening them but also thickening them.

I believe that brood comb should be replaced regularly with foundation, and for my own hives, I have a program of replacing two frames per brood chamber each year. This means that no comb will ever be more than five years old. (If you write the date semi-permanently on top of each frame when you put them in the hive, you can keep track more easily.) Then what happens to the old comb? It goes into a solar melter, of course.

I do not replace comb from honey supers anywhere near as often. This comb, normally used only for honey storage, does not darken, and the cells do not shrink in the same way as brood comb, nor does it house disease organisms to the same degree. I replace these only when they become obviously old or defective. Then, into the solar melter.

Burr and brace comb are another source of surplus wax. With "experienced" hives, such wax can build up

*A unit large enough to handle inner covers and queen excluders, a good way to clean both.*

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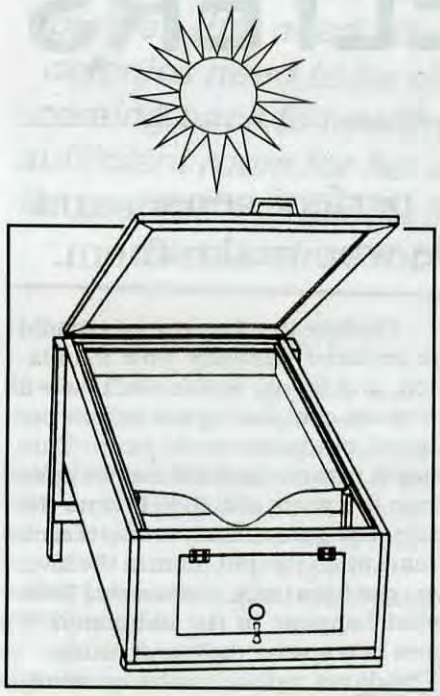
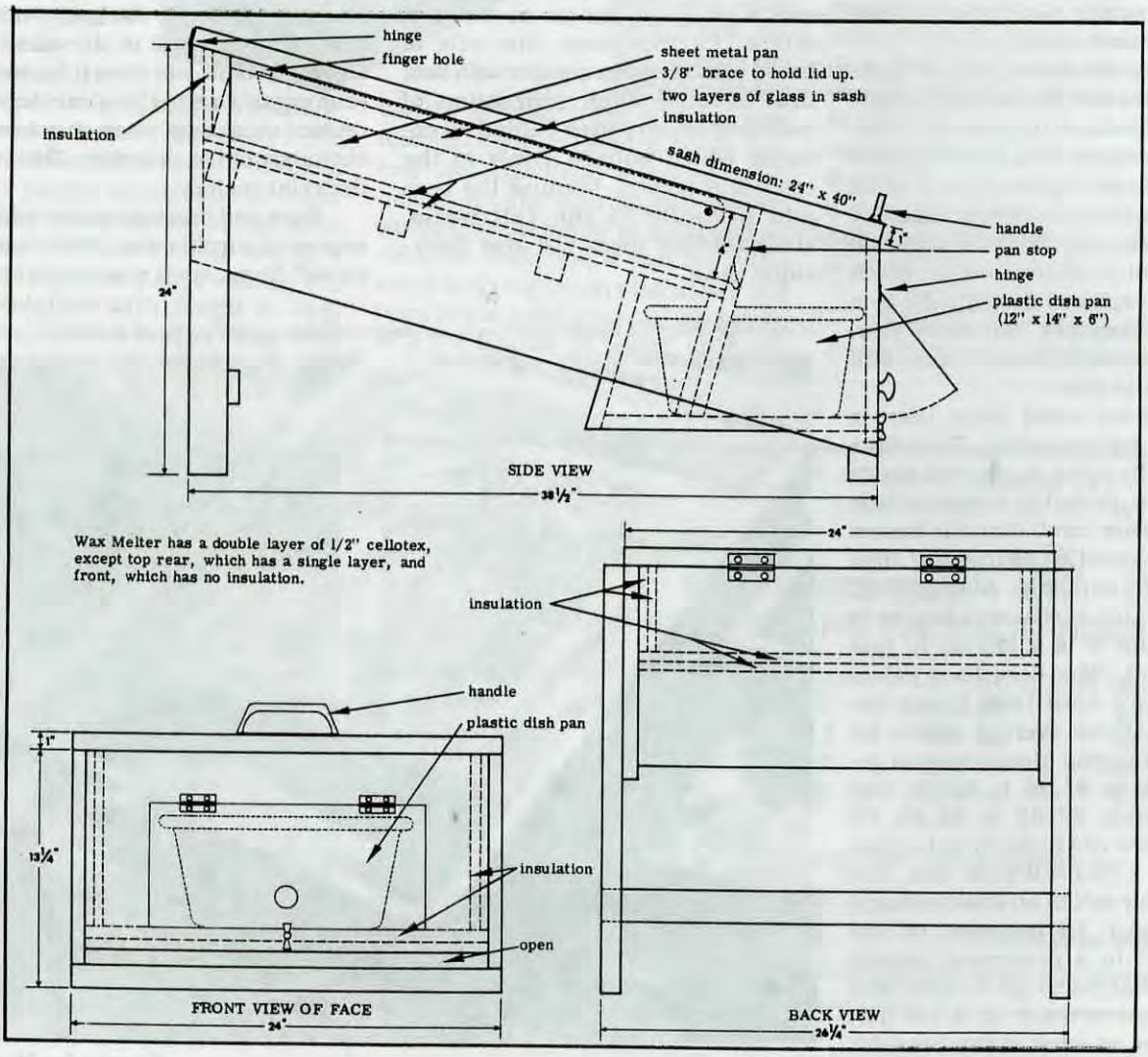


rapidly, between frames, on top of frames, next to frames and side walls – you know, you've coped with it. If you are to continue working your hive with any degree of ease, such comb must be scraped periodically. The temptation is just to throw those bits and pieces on the ground as they are scraped, but that's not a good idea. Such scrapings usually contain some amount of honey, and when dropped randomly on the ground, can trigger robbing as bees from other hives find them. Even if robbing does not result, such a practice can spread disease. A seemingly healthy hive may contain foulbrood spores, quiescent for the moment in that hive, but when introduced into a weaker or less healthy hive, they become a potential source of infection. Make it a practice to carry a covered scrapings bucket with you when you are working your hives.

So far we have been talking of two kinds of wax – dark and light. Brood combs, when it is time to recycle them, will yield dark wax. Scrapings and cappings are normally light. Because of the difference in the selling prices, it is worthwhile to keep these colors separate. But what we are talking about here ultimately is rendered wax. The old comb, the scrapings and the cappings each must be melted and strained. As already mentioned, the old comb will normally contain discarded cocoons and propolis, and no doubt other random debris. Scrapings may contain a certain amount of the same materials, perhaps even some brood, and varying amounts of honey. Cappings will be mostly wax and honey, but impurities do creep in. No purchaser is interested in any of this wax as it comes from the hive. You must melt and strain. How? With the solar

*Plans for a melter from University of Illinois.*



melter of course.

So far, we have talked about the solar melter, but we haven't described it. What is it? Basically, a solar melter is a wooden box with a double-glazed glass top – two panes of glass set parallel to each other with about 1/2 or more between the panes. The dimensions of the box are such that one or more frames can be placed flat in the box so as to expose the comb to the sunlight coming through the glass. Double glazing causes intense heat to build up in the box on a sunny day, and the wax melts from the comb. However, single glazing can be used, it just slows the process. It is easy to use, and not overly difficult to build. If you are not interested in making one yourself, they are available in several of the equipment catalogs available.

If you do choose to make a solar melter yourself, you can follow one of the several plans available, or make one of your own design. Two such designs are included in this article, along with photos of others, There is nothing sacrosanct about the available designs and in fact, some of them are overbuilt for casual use. If you choose to make your own, here are some things to think about. Although I have seen flat-topped melters, they are usually made slanted so as to catch the rays of the sun more or less at a right angle. This results in more interior heat, and of course, that is the whole purpose of these units, to generate heat.

*Some melters are built on a bigger scale, this one using a discarded storm door as the glass top.*

Finish your box by painting it, inside and out. Black paint on the outside absorbs heat, increasing the temperature inside. White paint on the inside reflects the sun's rays and helps concentrate the heat on the material to be melted.

When you use your melter, you will find that most of the wax will melt out of the brood combs, but the cocoons will remain, along with the propolis and other debris. You can run several sets of frames through a melter in the course of a day, so you will find yourself removing melted-out frames from a hot melter – and it gets very hot in there. Gloves are a good idea for handling those frames and the accumulated residue as you remove them.

Solar melters tend to be heavy, and you will probably find a need to move the melter at least occasionally, whether it be to follow the sun, to put it away, or for any other reason. A pair of wheels mounted at one end is a nice addition. Without the wheels, it can be awkward to move. Another possibility is to mount the melter on a sturdy child's play wagon – one that the child is no longer using, of course.

If you choose to make a melter of your own design, check available glass sizes before you start. While glass is not a terribly expensive item, there is no point in buying oversized panes when you might have saved by reducing some dimension an inch or two. I know from experience that there is a temptation to build big. I also know from experience that a box with a near-horizontal glass top that just sits around in the yard is subject to breakage – falling branches, random rocks, hail and gremlins are constant threats.

Another possibility for glass is to find a couple of discarded window sashes and sandwich them together. These will be already mounted in frames and will save you some labor. The sash dimensions, of course, will govern the size and shape you make your melter, but the dimensions are not terribly important. Just don't get too big.

Most melters use a large, flat pan to contain the wax to be melted. As with the glass, this melting pan may be a constraint on overall melter size. It is a good idea to have the pan before you start building, or if you are going to make a pan from sheet metal, to have the piece of metal.

I like to have a grid and a filter cloth in the bottom of the melting pan. An old queen excluder cut to fit

*A smaller version, with wheels for easy transport.*

*Another small design, large enough for a frame at a time.*

*Continued on Next Page*

and without the rim works nicely for this, or a piece of 1/8" or 1/4" wire mesh. Whatever you use, raise the grid slightly on thin slats to allow free flow of the melted wax underneath. I also lay a piece of cheesecloth or similar material on the grid to act as a filter. The resulting melted wax is quite clean of debris, although it may contain varying amounts of honey if you started with scrapings or cappings.

For the collecting pan, a bread pan or anything similar works well. Have a spare so you can remove and replace a full one in the middle of a melting run. Keep in mind that if you do remove it on a sunny day, the wax will be liquid, and hot. Use those gloves! When the wax hardens in the pan, expect a layer of darkened honey at the bottom.

Do recycle your wax. Do replace your comb. Don't think of it as an expense. The value of the recovered wax will help compensate for the cost of new foundation, and your colonies will be healthier. BC

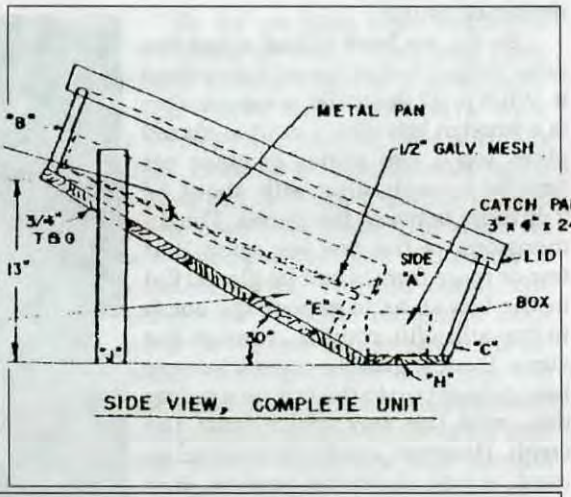
*Richard Bonney is an Extension Educator for the state of Massachusetts. He is a regular contributor to these pages.*

## Recycle Now

If you put 10 frames with foundation into a hive body the first year, you don't want to wait five years before recycling the first couple of those frames. That would mean that the last of those frames is 10 years old before it is recycled. Instead, to get your program started, take out a couple of frames each year anyhow and for the first couple of years or more take those frames with their still relatively new comb and store them away, protected from wax moths and rodents. There is often a need for a frame or two of drawn comb and it's nice to have some on hand.

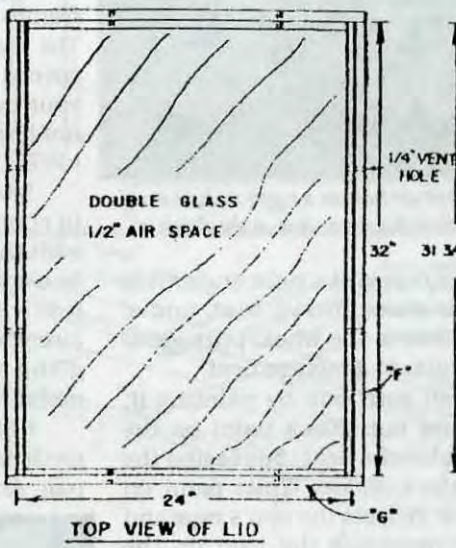
Materials Needed

Parts "A" through "G", also J" - 1" x 12" Pine
Glass strips ½" x ½" cut from waste pine above
Part "H" - bottom - 14' - 1" x 6"T & G Pine or 24" x 36" Exterior Plywood (½" or 5/8")
Pan Platform - 1 pc. 2' x 2' - ½ Insulation board
Lid Glass (double) - 2 pcs. 24" x 32" DS window glass
Comb Pan - 1 pc. 24" x 28" 24 Ga. galv. steel.
Catch Pan - 1 pc. 10" x 27" 24 Ga. galv. steel.
Comb support - 1 pc. 20" x 26" ½" galv. mesh
Hardware - Small nails 1" long

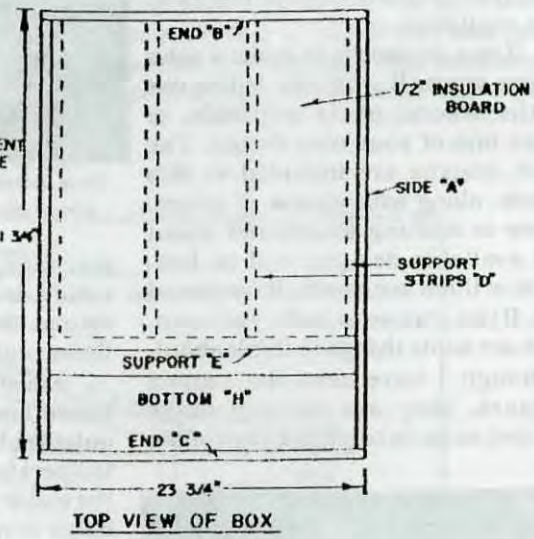


SIDE VIEW, COMPLETE UNIT

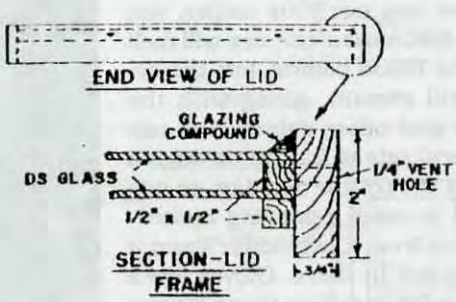
# PENN STATE PLANS



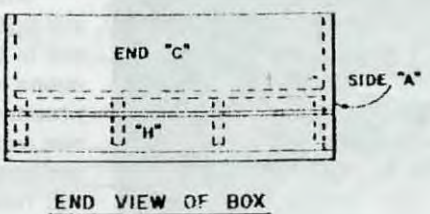
TOP VIEW OF LID



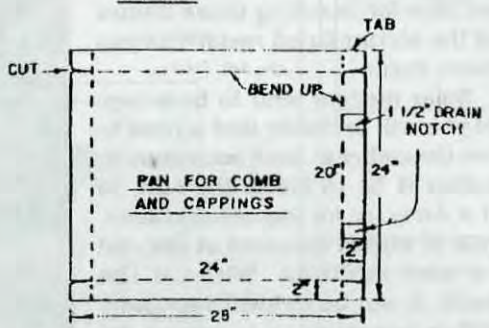
TOP VIEW OF BOX

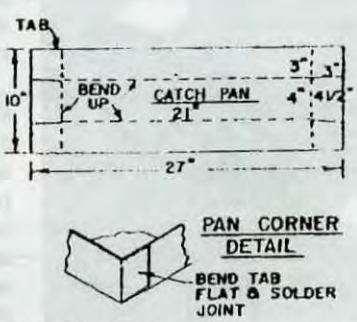


SECTION-LID FRAME



END VIEW OF BOX






CUTTING DIAGRAMS FOR 24 GA. GALVANIZED STEEL PANS

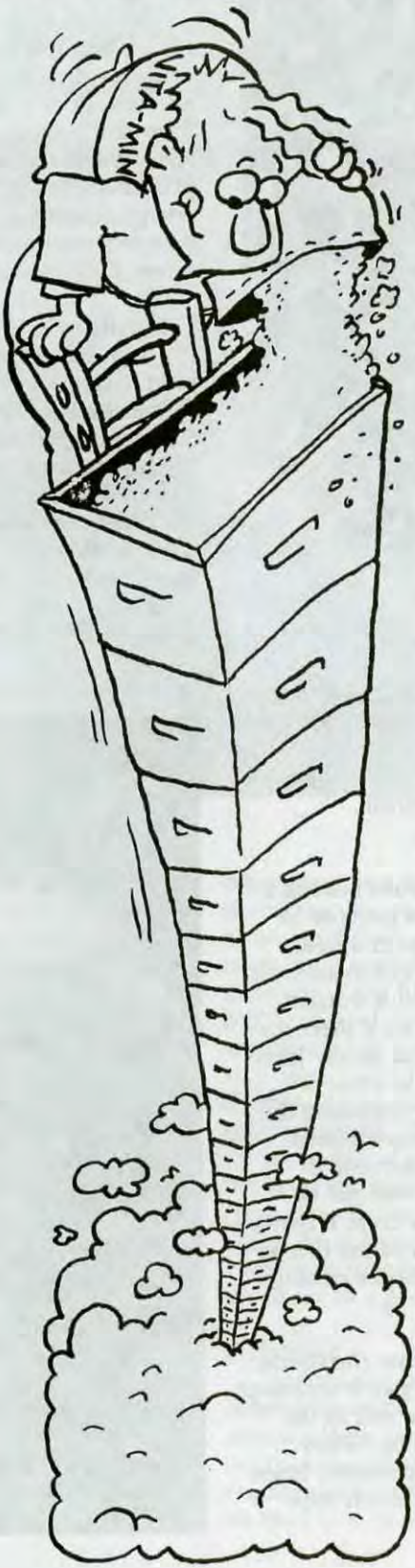
# GIVE A HELPING HAND

James E. Tew

## Apicultural Assistance For The Population-Challenged Colony.

It's still too early to say, but I suspect that 1995 may be the year that we accepted mites and began to move on with our beekeeping lives. The number of both managed and wild bee colonies that have died within the past few years has been nothing short of spectacular. With such a high number of colony losses and the concurrent increase in honey prices, it's no surprise that our industry is in a topsy-turvy condition. The most obvious way to rebuild colony numbers is to purchase packages of bees for colony replacement. The problem with this simple solution is that so many of us have had the idea at the same time. Package producers have told me that they could have sold thousands of packages more than they could produce this past spring. Those beekeepers who didn't order packages early, in many cases, didn't get package bees at all. In other instances, quite a number of you took any package shipping date you could get - which invariably means "late".

What about the condition of colonies that survived? It's not like we have eliminated any other diseases or pests just because we have added mites to the list. Many colonies that have survived are weak having been stressed by mites and a long winter. Is there anything that can be done to build up colonies having small populations? Though there are no "silver bullets," there are some ways you can help late-blooming colonies along.




**1. The population.**

Decide right away if the colony is even worth saving as an individual colony. If you're down to a frame of brood and two or three frames of bees, this hive isn't going to do anything toward surplus honey production. It'll do well just to build up enough to survive next winter. If you have other colonies, consider combining it with other below-average colonies.

**2. Mite control.**

Varroa Mites. If you have not had an aggressive *Varroa* mite control program, consider putting in a fluvalinate strip for a few days. Look on the bottom board for dead mites. If you see many more than about 25 - 30 mites, you've got to make yet another decision. You can sacrifice part of this year's crop and go into a traditional *Varroa* control program. This colony will be in better shape to survive winter and be better prepared for spring, 1997. Or, if you think the colony can stand the mite population until the flow is over, continue to prepare for the flow. Remember to remove all strips before putting on supers.

Tracheal Mites. If you suspect tracheal mites, at this point in the year, there's not a lot you can do. Put vegetable oil patties on if you haven't already done so. If you decide the that the colony can get through the flow with the tracheal mite load that it has, then super up. If it appears really weak, consider combining it with another. Keep the grease patties on.

**3. Diseases.**

Though mites are the glory problem just now, don't ignore the time-honored diseases. American foulbrood is alive and quite well. If AHB is the problem causing a weak hive, I would eliminate the bees and destroy the frames. This is a harsh recommendation, but just cut your losses. If European Foulbrood is the problem, I would suggest giving up on honey production for this year and consider the remainder of the suggestions on this list. EFB-infected colonies are infamous for merely "breaking even" when it comes to honey production. Many common bee diseases will clear up if the brood cycle is broken thereby giving bees a chance to clean up the mess.

*Continued on Next Page*

*How's the queen? Replace if needed.*

*GIVE A HELPING HAND ... Cont. From Page 351*

Normally, the queen gets blamed for diseases like this. Okay, if you've gotten beyond 1-3 above and the hive still seems to have a bit of a future, consider the following suggested beekeeper maneuvers that may be useful in bringing hives back from the brink.

**4. The queen.**

A good queen can go a long way toward solving a lot of colony problems. Alternatively, it's going to be nearly impossible to build up a colony with a weak queen. If you don't know the age of the queen and: (a) if the brood pattern is spotty, or (b) if adult worker bees are small or unhealthy looking, or (c) if there are signs of stress disease like chalkbrood, or finally (d) if there is a significant number of drones in what is otherwise a small colony, then consider replacing the queen immediately. It may be hard to buy a queen quickly, but try. Don't let the colony supersede if possible. The new queen and her brood will not be available in time to help with this year's crop. If honey this season is the goal, an "okay" queen in the hive is better than a "Good" queen that the bees are raising.

**5. Feeding.**

If you have the slightest suspicion that the colony needs either honey or pollen - or both - give it whatever it needs. It's best to provide honey that's still in the comb, but that's probably hard to come by. When feeding sugar syrup, feed it as thick as possible. Since this colony is weak now and there's not much time before the flow, I would suggest buying a pollen substitute if you feel one is necessary. There are several recipes for pollen supplements in the literature, but some of the components can be difficult to get. Buying it would be faster and easier. If the colony doesn't need the supplemental food, it won't take it. No great loss and possibly a great help.

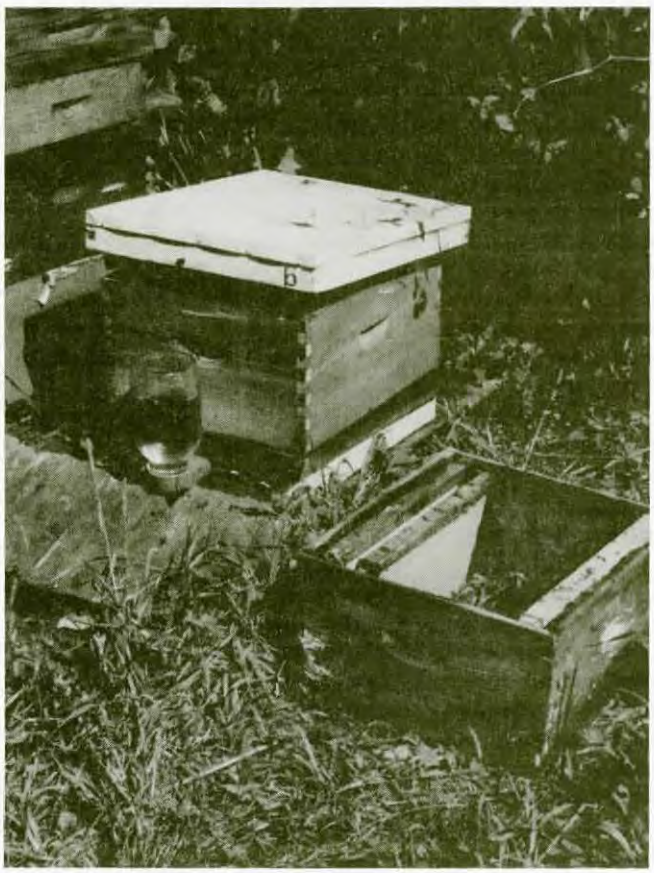
**6. Water.**

It's very important that the hive have access to water - water-from-any-source water is better than no water at all. Water is too frequently ignored by beekeepers. Bees need water mostly to dilute honey, but they also need it to maintain the colony's humidity level. Water can be fed in open containers or can be provided internally. Don't make a weak colony spend energy searching for a water source and don't let the source you provide run out. Bees are thirsty at odd times. Don't second guess them.

**7. Location.**

Too Hot or Too Cold. This sounds too simple to even list, but if you are in a hot climate, put the hives in the shade or ventilate the hive so air can easily pass through. If you are in a cool climate, consider putting the hive where it gets full sunlight. After living in a hot climate for many years, I mistakenly put small colonies in deep shade after I moved to Ohio. The colonies didn't build up well, didn't store a surplus and didn't winter well. My advice has worked fine for this part of the country until last summer when it routinely got above 100° F. We had to provide water and a shade for

*Feed if they're hungry. Boardman feeders will work now.*



*Put weak colonies on a row's end to help boost the population.*

bees that were really cranky and not very appreciative. Protection from Winter Elements. Though it's too late now for this year, if the location doesn't protect the colonies in the winter, consider moving the apiary before next year. Hives shouldn't sit in cold valleys or on unprotected hilltops. Provide wind breaks and position hives in full sunlight. Some authorities say to face hives to the east. I don' t think that's a big deal, but if you can, turn them toward the east. Accessibility. Can you get to the yard conveniently? It becomes easy to procrastinate if there's always a locked gate, muddy path, or nasty dog with which to contend. This is a useless comment, but I like scenic yards. I find it pleasant to work bees in pleasant surroundings. Pesticide Exposure. Thanks to mites, a lot of old-fashioned problems just aren't heard from much more. Insecticide kills may be one of those areas. It will do no good to attempt to pump up a colony if it's constantly being knocked down by pesticide exposure. I know it can be difficult to find a yard with all the right attributes and still avoid a chemical hit. With some compounds, the results can be nasty. If bees store the stuff in pollen, such chemicals can cause residual kills that are hard to identify. Skunks and Such. If anything short of a bear is harassing the colony, do something. If you have bear problems, this list won't do you any good. Skunk signs are obvious. Besides the odor, there are telltale little skunk foot prints all over the front of the hive and the grass in front of the hive will be matted down. Parts of dead bees and feces containing bee parts will be littered around. At the very least, move the colony up higher off the ground or, if necessary, move it completely away. Nectar and Pollen Sources. Though bees can fly great distances to collect pollen or nectar, the closer the sources are to the hive, the easier it is for bees to produce a surplus crop. Alternatively, moving colonies is stressful for them. Since the colony is convalescing, I don't know if I would recommend moving it too much just to get a bit closer to a nectar source.

**8. Robbing.**

Nature can be a harsh mistress at times. Large colonies have no qualms about overrunning smaller colonies if the opportunity arises. Here I am - suggesting that you do the things on this list - most of which require opening the colony. If robbing gets going, it can be hard to stop. A form of robbing called "Progressive

*Continued on Next Page*

*GIVE A HELPING HAND ... Cont. From Page 353*

Robbing" is particularly insidious. The robber bees have invaded the victim's hive so often that they have acquired the odor of the second hive and are no longer challenged by guard bees. I suppose it's a bit like freely going to your neighbor's refrigerator as you please without the neighbors noticing. Reduce the entrance down to about two inches and always watch for signs of robbing behavior.

**9. Drifting.**

Colonies on the ends of rows of bees tend to acquire bees while colonies within the middle of rows tend to lose bees. Consider alternating entrances or don't put colonies in long straight lines.

**10. Standardization of all Hives.**

A quick and relatively easy way to build up a weak colony is to add bees and brood to it. The colony receiving the donation should have an acceptable queen and appear to have potential for development. Bees from brood frames can be shaken into another colony if smoke is used and the number being added is not much more than 50% of the bees that are already in the colony. Most of the older bees will leave the new colony and return home while most of the younger nurse bees will stay. Frames of brood can be transferred readily. Capped brood is a better gift to a weak colony than uncapped brood. To make this procedure a bit safer, consider caging the queen until the colony has settled down. A second way to add bees to a small colony is to switch colony positions on a day that forager bees are flying freely. In this way, the larger field force returns to the smaller colony while the larger hive gets the smaller field force. Standardized hives generally produce more honey than an equal combination of big and small hives. Adding bees and brood to another colony is a guessy business. Be sure you feel comfortable with this procedure or you can successfully screw up two colonies.

**11. Swarming.**

I think we're really dreaming here, but let's suppose that things have gone along very well and the colony has increased considerably in size. Just to be on the safe side, watch for swarming tendencies. It's a remote chance, but it would be a real shame to build a colony up only to have a late season swarm eat up all your investment.

**12. Supering.**

If you knock off the top of the colony and the inner cover is stuck to the super with wads of thick honey and white combs, you missed part of the crop that you and the bees worked so hard to get. Tend to over-super as the flow starts and then tend to under-super as the flow wains. House bees need room to spread nectar around the hive to allow for passive moisture removal. You can super as the hive requires (I suppose that could be called, "Just-in-time supering,") or you can bulk super where you put on three or four supers at once. Some authorities have indicated that there is a bit larger honey crop obtained with the bulk supering procedure, but it does require a larger super inventory.

A final comment - as much as possible leave the colony alone. Much like someone taking a physical examination, the little colony has been poked, prodded, and manipulated. Every day you can leave the colony alone is a day that it can use to recuperate. Good luck and try to better prepared for spring, 1997. BC

*James E. Tew is State Specialist in Apiculture, The Ohio State University, in Wooster, OH.*

# FRAME MANAGEMENT

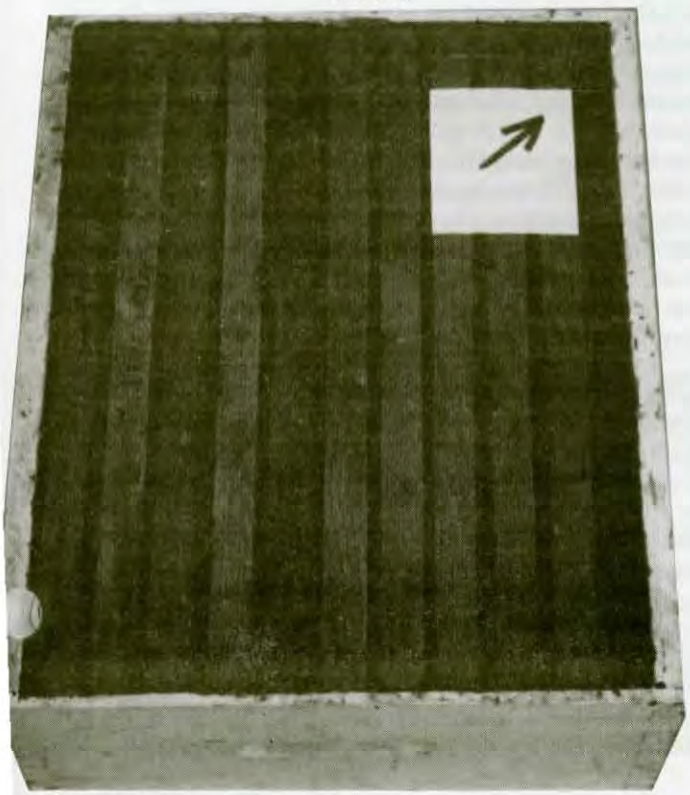
## Using 8, 9 or 10 frames in a 10-frame super makes a difference in wax and honey produced, but you need to manage them differently.

Bill Sames & Ernest Caldwell

Honey production is a very important aspect of beekeeping, and management techniques that improve your ability and efficiency to produce honey should be important and of interest. One management technique is to use either eight or nine frames, rather than 10, in a standard 10-frame hive box.

There are several advantages and some disadvantages to using eight or nine frames per box and some of these are readily apparent. For example, when using an eight or nine frame configuration, the comb drawn out by the bees extends farther beyond the edge of a wood or plastic frame, and this makes uncapping and extracting easier. You'll also have to handle fewer frames when extracting an eight or nine frame box and fewer frames also allows easier frame manipulations when inspecting a colony. Material and labor costs may also be reduced, especially in large operations. A possible disadvantage is the suspected amount of honey required to produce the extra cell wax for eight- and nine-frame configurations. Other aspects of using eight or nine frames involve management strategies to produce perfect combs and larger amounts of honey and wax. These include techniques for drawing out foundation, spacing frames and the removal of frames to increase the honey storage capacity of the box.

*10 clean frames don't completely fill a box. There's some manuevering space left over.*



Drawing foundation into combs is usually done with 10 frames per box. This is not always necessary, but a very good practice. Bees usually work the center of a box first. Therefore, you may find it helpful to rotate partially drawn combs from the center to the outside of the box and the undrawn combs from the outside to the center.

Some success can be had starting with nine frames of foundation per box, but a heavy honey flow must be present for the bees to produce "perfect" combs. Otherwise bees may build the combs crosswise so two frames are joined together – a mess and a half nd a waste of wax and time. Foundation should not be left on a hive during a dearth as this requires the bees to regulate a lot of empty space, and the foundation may become damaged.

Frame *spacing* is also very important. In a new 10-frame box, spacing is usually easy. However, after the bees have put propolis and wax on the end bars, it may be difficult to squeeze the 10th frame back into the hive. Scraping the end bars corrects this problem and the 10th frame should slide in easily. When 10 new frames are pushed to one side, of a 10-frame box, there is still some room left (2 cm or 3/4 inch, about two bee spaces) in the box. The bees will work the outsides of the two outside frames better if the frames are squeezed together and a bee space is left between the outside of the last frame and the wall of the box on both sides.

Spacing nine-frame boxes is more difficult because you must do more than just stick frames into a box to ensure they are equally spaced. Three common methods of ensuring equally spaced nine-frame boxes are – 1) the use of Stoller frame spacers, 2) a frame spacer tool or 3) the "eyeball" technique.

The Stoller frame spacer is a segmented metal bar that is nailed onto the frame rest (rabbet) of a box. The raised portion of this metal bar equally separates the frames. This is a very easy method of spacing frames, but it does have several disadvantages. Once the spacer is installed it is difficult to clean (scrape) the frame rests. In some boxes, the frame spacers may cause the top of the frame to be almost flush with the top of the box. If this occurs, the bee space above that frame may be too small and the bees may propolize that frame to objects above it. When the top board or the box above that frame is removed, the frame may stick to it. This can be very aggravating and on some occasions, as the bees become agitated, exciting!

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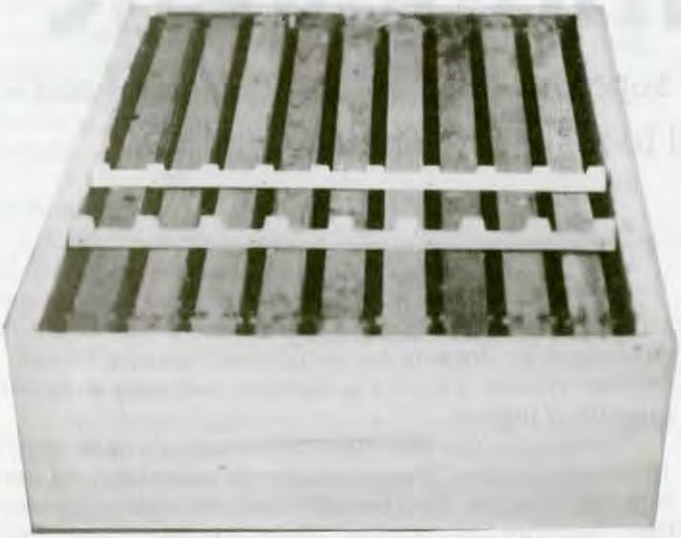

*A Stoller frame spacer. They're good because they're exact, but if you want to change the number of frames you use, you have a problem.*

*FRAME MANAGEMENT ... Cont. From Page 355*

But we all work our bees in different ways at different times. You may slide a frame across the frame rest, or manipulate a colony such that some are in ten-frame boxes for awhile and then nine. Frame spacers may not be right for you if the bees are worked in this manner, especially if the you rotate boxes between the brood chambers and the honey boxes. However, some beekeepers swear by frame spacers and they wouldn't be without them. As a compromise, some do not use frame spacers in their brood chambers, but they do use them in their honey boxes.

Another method of equally spacing frames is the frame spacer tool which looks like a large comb. The "teeth" of this comb are inserted in-between the frames,

*A manual frame spacer. Muscle is needed, and a rope, but they work well.*

and they are equally spaced as the tool is combed through the box. A major disadvantage of this method is that you must keep track of the tool. To correct this problem, a rope or cord can be tied to the tool (most have a hole for this purpose) and then tied to you. Several bee supply outlets sell these spacers.

When using the frame spacer method, the frames may also get knocked out of place if the box is moved before the bees have propolized them into place. When the boxes are full of capped honey, this frame movement may knock the combs together, which damages the cappings and causes the honey to run down the combs and out of the box.

The frame spacer method does require a conscientious effort on your part and perhaps a little extra time, but with a little practice and patience equal frame spacing can be achieved.

The "eyeball" technique is used by some beekeepers and is nothing more than equally spacing the frames based on eyesight and judgment. This method does work, but it is perhaps the most time-consuming and the least exact of all the methods. Other disadvantages include the possible production of unequal combs due to slightly unequal spacing. Occasionally, you may leave too large a space and the bees may decide to fill it with burr comb.

Eight-frames in a 10-fame box can be spaced the same way as nine-frame boxes. The eight-frame tool is harder to locate, but recently Lapp's Bee Supply Center, Reeseville, Wisconsin, advertised it for sale. Check with your favorite bee supply dealer to see if they carry it.

Finally, is there really a difference in honey or wax storage capacities in an eight-, nine- or 10-frame configuration? Dadant (1975) states that "supering frames are reduced to nine and sometimes eight per unit, theorizing a thicker comb, more honey and substantially more beeswax." Many beekeepers insist that using one method or the other is the best way, but this is once again based on opinion rather than on a controlled, measured test. Keith Delaplane, Extension Specialist from GA (1990), mentioned that he couldn't find information as to the difference in honey production when using eight-, nine- or 10-frame configurations in the honey boxes, and this magazine's Editor, Kim Flottum (1991), tried to instigate a debate on the subject by running an informal survey of beekeepers to see what size of box they were using for surplus honey. And Eric Erickson et al., from Arizona, (1990), added another dimension to the debate by discussing the cell-size differences used in commercial foundation.

Finally, I proposed several methods for mathematically estimating the storage capacity of honey and wax within eight-, nine- and 10-frame configurations. From the tables below, you can see that an eight-frame box does have the potential to hold more honey than a nine- or 10-frame box, and while these results have not been tested, they can still be used to estimate honey production in your hives. This information represents the estimated maximum production that could be attained in standard beekeeping equipment using the parameters and conditions stated in the above mentioned paper. The parameters can be changed, and changes will give different estimates. For parameters concerning foundation cell sizes, Erickson et al. (1990) listed some of the cell

sizes for foundation based upon foundation type and manufacturer. These can be used to approximate the cell size for a beekeeper's combs.

**Table 1**
**Pounds of honey per hive box by frame configuration.**

| Cell | Deep | | | Medium | | | Shallow | | |
|---|---|---|---|---|---|---|---|---|---|
| Size | 8 | 9 | 10 | 8 | 9 | 10 | 8 | 9 | 10 |
| 700 | 76.14 | 73.52 | 70.87 | 49.03 | 47.34 | 45.64 | 41.23 | 39.81 | 38.38 |
| 750 | 76.10 | 73.48 | 70.83 | 49.00 | 47.31 | 45.61 | 41.20 | 39.78 | 38.35 |
| 800 | 76.01 | 73.39 | 70.75 | 48.94 | 47.26 | 45.56 | 41.16 | 39.74 | 38.31 |
| 857 | 75.96 | 73.34 | 70.70 | 48.91 | 47.23 | 45.52 | 41.13 | 39.71 | 38.28 |
| 900 | 75.89 | 73.28 | 70.64 | 48.87 | 47.18 | 45.48 | 41.09 | 39.68 | 38.25 |

**Table 2**
**Pounds of wax per hive box by frame configuration.**

| Cell | Deep | | | Medium | | | Shallow | | |
|---|---|---|---|---|---|---|---|---|---|
| Size | 8 | 9 | 10 | 8 | 9 | 10 | 8 | 9 | 10 |
| 700 | 0.55 | 0.40 | 0.29 | 0.35 | 0.26 | 0.18 | 0.30 | 0.22 | 0.16 |
| 750 | 0.56 | 0.41 | 0.29 | 0.36 | 0.26 | 0.18 | 0.30 | 0.22 | 0.16 |
| 800 | 0.57 | 0.41 | 0.29 | 0.37 | 0.27 | 0.18 | 0.31 | 0.22 | 0.16 |
| 857 | 0.58 | 0.42 | 0.29 | 0.37 | 0.27 | 0.19 | 0.31 | 0.23 | 0.16 |
| 900 | 0.59 | 0.42 | 0.29 | 0.38 | 0.27 | 0.19 | 0.32 | 0.23 | 0.16 |

You can estimate your honey production for a given set of hive boxes by multiplying the box weight by the number of extractable hive boxes. If more than one type of box is used, add the multiplied sets together for total production. For example, suppose you have 40 boxes of honey to extract of which 10 are deep, 10 are medium and 20 are shallow. They all have foundation with 857 cells/dm$^2$, but the deeps are in a nine-frame configuration, the mediums are in an eight-frame configuration and the shallows are in a 10-frame configuration. What is the total maximum honey and wax production that you could expect? Look in Table 1 and extract the poundage for each box type and configuration. For the deeps the estimate is 73.34 lbs, for the mediums the estimate is 48.91 lbs, and for the shallows the estimate is 38.28 lbs. Multiply these estimates to the number of boxes in each group and add them together for the total estimated honey production.

10 deeps x 73.34 lbs. = 733.4 lbs,
10 mediums x 48.91 lbs. = 489.1 lbs,
20 shallows x 38.28 lbs. = 765.6 lbs
Total estimated honey production =
733.4 + 489.1 + 765.6 = 1988.1 lbs.

For the estimated wax production use the results in Table 2 and apply them in a like manner to the equations above.

10 deeps x 0.42 lbs. = 4.2 lbs.,
10 mediums x 0.37 lbs. = 3.7 lbs.,
20 shallows x 0.16 lbs. = 3.2 lbs.
Total estimated wax production =
4.2 + 3.7 + 3.2 = 11.1 lbs.

Unfortunately, scientists do not know exactly how much honey is used to produce the extra wax that is found in honey boxes with fewer frames, so the advantage of more honey per box may be countered by a higher, hidden cost of honey-to-wax conversions. However, some scientists have observed that bees of the wax producing age will produce wax whether it is needed or not. If it is not needed, they say it is discarded and ends up outside or on the bottom board . . . once again, more research opportunities!

While questions still need to be answered about the efficient use of eight- or nine- in addition to 10-frame configurations, the advantages of using eight- or nine-frame configurations as part of a complete hive-management program are warranted. I encourage you to experiment with frame management techniques so that you can be as efficient as possible and produce as much honey and wax as possible. BC

*Bill Sames is a graduate student and beekeeper in College Station, TX. Ernest Caldwell is a commercial beekeeper from San Antonio, TX.*

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# MOVING BEES I

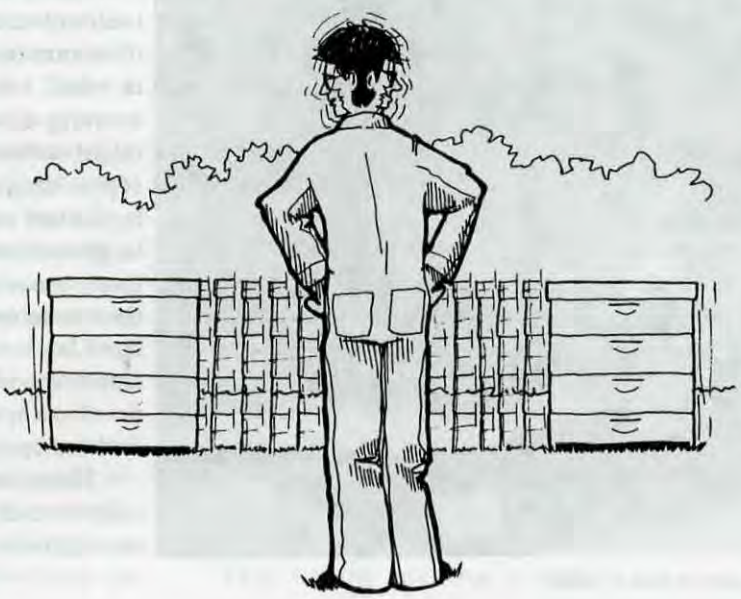
## Moving Colonies A Very Short Distance

Richard Dalby

Moving hives across the country is a way of life for migratory beekeepers. For us hobbyists and sideliners, the typical move is more likely to be from one corner of the backyard to the other. For this we don't need a diesel truck, pallets or a forklift. But moving a hive of bees a distance of less than a couple of miles does require attention to one potential problem – the possibility of the field bees returning to their old location. In a populated area this can create a public relations problem because such homeless bees can, and usually do become downright cross. This we want to avoid. Specific advice follows, but first an explanation of why bees moved a short distance sometimes return to the site of their old home.

The phenomenon has to do with honey bee orientation. Those young bees seen hovering in the air in front of their hive on a warm afternoon are taking a "play flight." But they're really not playing. Besides sharpening their flying skills, these young bees are very carefully "marking" the precise location of their particular hive. They do this by noting in minute detail the look of their hive and its location in relationship to other nearby objects such as trees, fences, houses and so on. Once the hive location is "imprinted" on a young bee (or an older bee emerging from the hive after a long confinement), the bee will always return to that exact location.

This is a wondrous thing. But as noted, it can lead to problems if a hive must be moved. Fortunately, a hive of bees moved a short distance can be made to relearn their location. Once imprinted with their hive's new location, such bees will not return to the site of their former home. So the trick is to force the moved bees to mark their new location. There is a number of ways to do this. And, depending on the time of year a hive is moved, you may have to do nothing at all. For example, a hive moved in Winter or early Spring, when the bees will be confined by cold weather for at least two weeks, will cause no problems. When the bees emerge, they will mark their location as a matter of course.



On the other hand, moving bees that have been flying freely, particularly during a honey flow, requires attention to detail lest many of the field bees return to their old location.

One foolproof method, found in many of the standard sources, is to move your hive or hives from their present location to a spot at least two miles away, leave them there for a couple of weeks, then move them back to their new location. Bees moved in this manner will learn their new location as a matter of course. But this method involves a good deal of time, effort and equipment and is often not practical.

Another old method is what might be called the "shake-em up" approach. Here's how it works. First, the bees are smoked well at the hive entrance. Then the hive is loaded onto a wheelbarrow and jounced about in a rough manner while being moved to its new location. It is important that the bees get a good shaking-up for this gets their attention and causes them to mark their new location. The hive is then unloaded in the desired spot, the entrance smoked again, and a handful of grass thrown at the entrance to further put the bees on notice that they have been moved. This method works best when there is no honey flow in progress – and when neighbors are quite a distance away.

Another quaint method is what might be termed the "incremental movement" method. This method works best when you want to move a hive just a short distance (say 10 feet or so) and there are no other hives nearby that might attract returning bees. Here's how it's done. Each day (or evening, if you prefer), you move the hive in question about a foot toward its new location, until you have reached the new site. Returning bees seem less likely to be disoriented when their hive is moved backward or forward in this manner as opposed to sideways movements, which perhaps should be no more than six inches each day. (It is

*Continued on Next Page*

*MOVING BEES I ... Cont. From Page 359*

of interest to note that races of bees vary in their ability to find their hive if it is moved a short distance, the old black bees doing it the best, the Italians the worst.)

Now, one last method for a successful short-distance hive relocation. This is what might be termed "the glass is always cleaner" method and it's my favorite. It requires a piece of glass or clear plastic such as Plexiglas. Here's the way it works. First, you move the hive in question to its new location in the evening when all the bees have stopped flying. Then, with the hive in the desired spot, you place the glass or plastic in front of the hive, the bottom side on the ground and the top side leaning against the hive, so as to form an angle of, say, 25 to 35 degrees relative to the front of the hive. The glass should project four or five inches beyond each side of the hive entrance so bees leaving and entering the hive must fly around the glass. With the glass in place, all bees leaving the newly moved hive are forced to note that something is radically different. Something is blocking their normal straight in-and-out flight path. This gets their attention and causes them to mark their new location, which is just what you want them to do. I like to leave the glass in place for at least a week to make certain all the flying bees reorient themselves to their new location. The bees soon learn to fly in and out of their hive by going around the glass barrier with little loss of time and effort, even during a honey flow. (For this method to work best, you must make certain that all flying bees enter and exit the hive through the front entrance, so seal all other holes and cracks before the hive is moved.)

A few more caveats. No matter which short-distance moving approach you use, make certain the hive (or hives) is securely strapped (best) or stapled together, and smoke the entrance a reasonable amount before and after the move to get the bees' attention. And, if you notice more than a few bees flying confusedly around their old hive location, you can place a hive there containing just a frame or two to catch these stragglers, then come evening, shake the clustered remnants at the entrance of the newly moved hive. And remember, glass can break or cut, so wear gloves when handling it and be careful. Tempered glass is preferable. A piece of clear plastic is best of all.

So if you have a hive or two that must be moved to the other side of the garden, the other side of the house, or the other end of the field, there are various ways to do it without losing your field force and perhaps creating problems. Knowledge and attention to detail are the main factors in a successful hive relocation, as they are in all beekeeping activities. BC

*Richard Dalby moves bees, carefully, all around his home in Levan, Utah.*

# MOVING BEES II

## Moving Lots Of Colonies A Long Way

Roy Hendrickson

*One-ton truck with trailer and EZ loader on back of trailer.*

One difficulty most beekeepers eventually face is how best to move their colonies when the need arises. If the number of colonies to be moved is small, recruiting a friend for an evening of adventure and mishap might suffice, with the added benefit of providing some good-old-days tales for future use. On the other hand, large commercial operations routinely use semis and forklifts to move their colonies. It is the in-between-sized beekeeper that fits neither example who must become creative and develop a system to fit the needs of a midsize operation.

There are any number of truck and/or trailer options suitable for moving bees; the same holds true for

loading systems. The number and size of the colonies, the frequency of moves, and available labor should determine the most efficient and practical method in each case. After weighing the various options, I determined that a lowboy trailer along with a motorized loader were the most practical choices for my one-man operation.

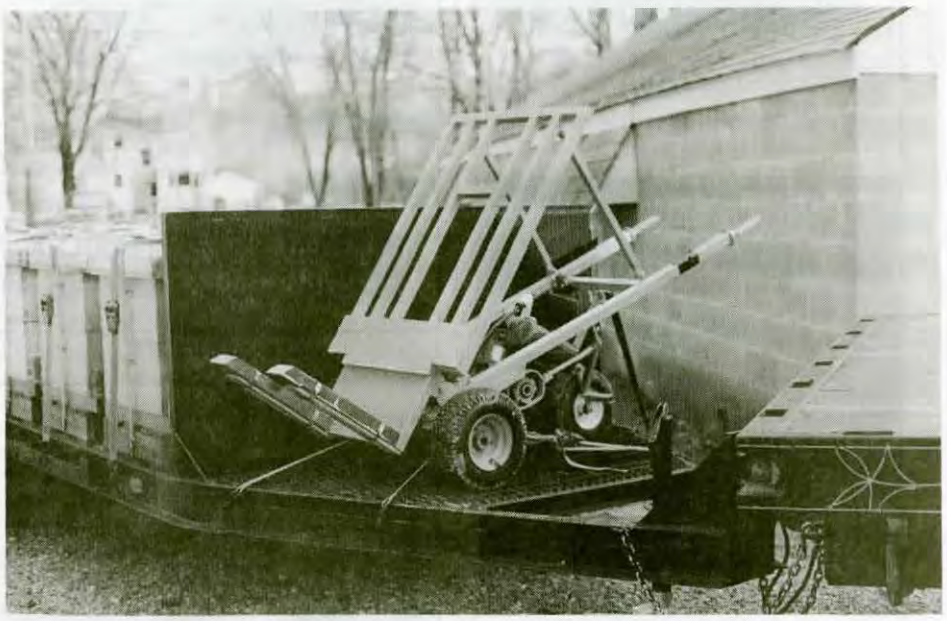
The trailer, a standard 16-foot, 10,000 lb. car hauler, was purchased through a local dealer and modified to haul bees. The initial modifications included a wind barrier (deflector), loading ramps, tie-down rails and additional lights. The trailer has a six-foot tongue forward of the wind deflector, to which a platform was added for loader storage when the trailer is fully loaded with bees. A tailgate to aid in loading the back row and a bee net are part of the plan.

When fully loaded, the trailer will haul 32, two-hive-body colonies with up to two medium supers, or just about any combination of stacked singles. The only requirement is that each row of four colonies across be the same height for tie-down purposes.

Colonies are transported on standard shipping pallets cut to the required size, 36" long x 21" wide. Each pallet holds two colonies with bottom boards and telescoping covers and has wood guides attached to prevent colony side-shift. The colonies are spaced to allow the telescoping covers some side play. Covers are pushed together when being moved and slip apart when on location. A 1" x 4" x 3/4" board is placed across both covers to protect and provide stability when the colonies are strapped down. Kev-Lock straps with pallet hooks are used in place of standard banding. They are quick and easy to use and do a superb job of holding hives and pallet together. A second ratchet strap then holds two pallets per row securely to the trailer.

The loader is used to load/unload the pallets. It was purchased used, rebuilt and modified for this specific use. The original Grover-Vaughn or double-wide mast was shortened approximately two feet to improve visibility, and 2" x 4" wood fillers were added to the loading forks to better accommodate the pallets. With a few minor adjustments to the pallets and loading ramps, the whole system worked as planned. In fact, it worked better than planned, primarily due to the superior moving capacity of the E-Z loader. This machine has an abundance of power and excess colony weight poses no problems what-soever.

*Trailer nearly loaded.*



*Loaded with E-Z loader stowed on trailer tongue.*

This colony moving system works very well for me and is but one example of how a specific problem can be solved with a little planning and experimentation. I am sure there are many other solutions to the same problem. Moving bees is now something I almost look forward to. It's certainly a far cry from the early days of adventure and mishap, and much easier on the back. BC

*Roy Hendrickson moves bees all over northeast Ohio for honey crops and pollination.*

# BEE BALM

## It's Not the Flowers They Like

B.A. Stringer

What's in a name? Bee balm, Lemon balm or Bee-herb – these names all refer to the plant *Melissa officinalis*, an aromatic, perennial herb that has been associated with bees for centuries. This plant is native to regions of the northern Mediterranean, and the ancient Greeks called it *Melissophyllon*, which means "beloved by bees." Despite claims in many older books, the white flowers of Bee balm do not attract honey bees to any great extent, as the flower tubes appear to be too long and narrow for them to reach the nectar. (However, bumble bees may busily imbibe from the blossoms.) Instead, it is the aroma of the leaves that appeals to honey bees, a characteristic which has been documented through 20 centuries.

Virgil, a Roman poet who lived in the first century B.C. wrote in his fourth *Georgic* of sprinkling crushed balm on a specific place to attract swarms there. Pliny the Elder, who was born in Verona in A.D. 23 and wrote a lengthy work on natural history consisting of 37 books, noted the attraction of the plant to bees: "The hives of bees being rubbed with the leaves of balme, causeth the bees to keepe together, and causeth others to come unto them." Also, "when they (bees) do strain away, they do finde their way back home againe by it."

An English herbalist named John Parkinson wrote of the curative qualities of "balme" in his *Paradisi in sole paradisus terrestris*, 1629. He mentioned beekeepers of the time rubbing the insides of hives with *Melissa* to attract bees as "they think it draweth others by the smell thereof to resort thither." Hives so treated essentially became bait hives. Some claim that rubbing the hands with Bee-balm leaves will help prevent stings. It is said that if branches of trees near an apiary are rubbed with the plant during swarming season, swarms will settle there, although its effectiveness in attracting swarms is debatable. In Britain and Germany, it has been reported of no value, but beekeepers in Yugoslavia have apparently used the balm treatment with some success, which may indicate that it is less effective in cool and humid climates. Before the newspaper method of uniting colonies (a "paper marriage") became common practice, beekeepers sprinkled the bees with balm-scented water, made by mashing and soaking the leaves in water, when combining colonies. *Melissa* oil, extracted from Bee-balm leaves, as well as being used in perfumery, was also a component of a scented syrup used in queen introduction.

Are the lore and uses of *Melissa officinalis* simply tradition? Apparently not. There seems to be a scientific basis for their applications. The fragrance of the Bee-balm plant contains aromatic compounds that closely resemble some in the Nasanov pheromone, which is released by the Nasanov gland at the end of a bee's abdomen and is dispersed by fanning the wings. This pheromone is important in orientation and swarm clustering as it attracts other bees and is used to guide bees into their new home when swarming. *Melissa* oil, produced in glands in the leaves of the plant, contains very small amounts of geraniol, which is the main element of Nasanov pheromone. In addition, citral is present in both plant and pheromone, and there is a close chemical resemblance between the balm's nerol and the bee's nerolic acid. It is not merely coincidence that the plant, containing some scent components identical to the honey bee pheromone, has been used for more than 2,000 years to attract bee swarms.

What else is in the name? "Balm" is an abbreviation of *balsam*, the scent of which the plant resembles. (Another unrelated plant, *Monarda didyma*, is also commonly called Bee balm or Bergamot.) *Melissa* is the classic Greek name for honey bee, and *officinalis* refers to being kept in stock, as in a pharmacy, usually applied to plants with medicinal attributes. In Elizabethan times, the lemon-scented leaves were used in garlands, in wine and as a furniture rub. Bee balm was also the principal component of *Eau des Carmes*, a fragrant water produced by Carmelite monks in 17th-century Paris. Later versions of this scented water, containing alcohol and various aromatic oils, were developed in Germany and became known as *Eau de Cologne*.

Whether you call it Bee balm, Lemon balm or Bee-herb, *Melissa officinalis* reflects a long intriguing history affiliated with bees and their keepers. BC

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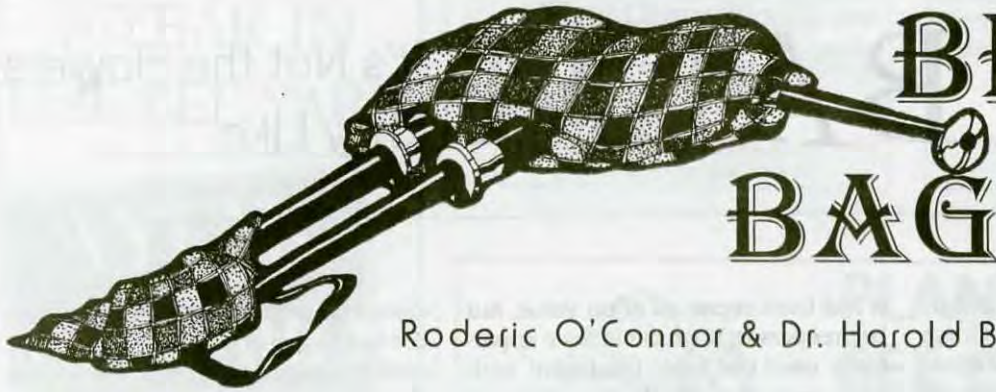
*B.A. Stringer grows her plants and writes about them from her home in Blodgett, OR.*

*Bee Balm leaves smell much like a honey bee pheromone, at least to honey bees.*



# BEES & BAGPIPES

Roderic O'Connor & Dr. Harold Burnham

Roderic O'Connor (9 years old)

When I was 8 years old, I began to do two things: beekeeping and bagpiping. So, I'm a beekeeping bagpiper.

One reason I like beekeeping is that the bees remind me of the bagpipes, except the drones in the hive are a lot quieter than the drones of the bagpipe!

When we practice, Mr. McDicken, our pipemaster says that we all have to sound like one chanter. In the beehive, the queen says, "We all have to sound like one hum."

My other teacher, Dr. Burnham, knows a bit more than me, so I'll let him tell you more about bees and bagpipes.

Dr. Harold Burnham (older)

"B" is for bees, and also for bagpipes. There must be other things that bring bees and bagpipes together.

You have heard busy bees droning around beautiful and fragrant summer flowers, as they search out the nectar that will become one of the world's favorite foods – honey. Most people think of the Scottish Highland bagpipes whenever the image of bagpipes comes to mind. There are many other sorts of bagpipes throughout the civilized world, just as there are many kinds of bees. When the Scottish bagpipes are being played, they are known for their droning sound created by the presence of one bass drone and two tenor drones, all carefully tuned to lower octaves of the note low A on the bagpipe chanter. Pipers work for a long time to learn how to play the Scottish bagpipes. They first learn the basic fingering and later develop the special movements needed to play the music.

Before becoming proficient on the full set of pipes, the pipers play a single "pipe," or practice chanter. The drone quality of bagpipes is generated by a single reed set at the base of each drone, and the various musical notes of the chanter come from a double reed set at the top of the chanter. A blowpipe completes the list of "pipes." The piper blows air into the blowpipe, and through his skill is able to keep the bag filled with air under the pressure of his arm, placed alongside the bag.

Let's get back to some other points about bees and bagpipes. In ancient times, and well up until today, many pipers kept their bags in good condition, thanks to the honey bee. Honey is one of the most commonly used ingredients found in the sugary liquids that were combined with various other things, such as oils, to help keep the traditional elk skin of the bag well-treated and supple. A certain amount of bagpipe "seasoning" is placed into the bag and worked into the elk skin, making it supple and airtight.

Another product of the busy bees is beeswax. It is applied to the sliding surfaces of the tuning parts of the drone. Beeswax is also used to provide a reliable airtight seal between the base of the pipe and the stocks, which are tied firmly into the bag. The quality of sound produced by the chanters during the playing of the pipes, along with the constant droning sound, results in an unusual combination of sounds which is not much different from the sounds of many bees busily humming away while doing their work.

Bees usually evoke a picture of sweetness and contentment while working among the flowers. Bagpipers, although many seem to be extremely serious while playing their instruments, are generally happy and content playing alone or in groups.

Sometimes bees and bagpipers become upset and frustrated when things do not go properly. They would probably never change from their chosen ways, and therefore keep on working hard. The work of a bee is demanding and seems to be almost endless. Becoming a good bagpiper takes a great deal of hard work and years of dedication. Learning to play the bagpipes is not easy.

Yet, when both bees and bagpipers have done their work, they reap much satisfaction with the results of their efforts.

The common endpoint of bees and bagpipers working hard is distinguished by the happy sounds of humming and buzzing. Just think, the next time you see a busy honey bee flying around your garden flowers, she is probably one of nature's own little bagpipers herself, impatient to be on with the music in the air. BC

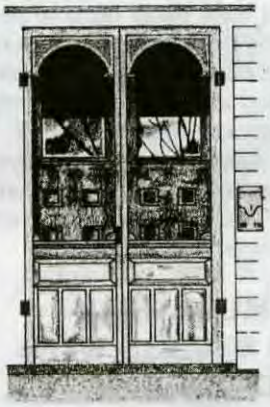
# ?Do You Know? Answers

1. **True** A true allergic reaction to a bee sting is when the victim suffers reactions in different body regions away from the sting site. Symptoms associated with normal (non-allergic) reactions occur at or near the sting site with some localized pain and swelling which may remain for several days. No abnormal pain or side effects are experienced from the stings in other areas of the body.
2. **True** Stinging insects as a group consists of several thousand species of ants, bees, and parasitic wasps. The majority of these species, however, are not responsible for causing individuals painful or damaging stings. Most sting allergies are restricted to the social species because a sting allergy usually requires at least two stings separated by a period of time. With extremely rare exceptions only social species defending their colonies ever sting humans. Solitary bees and wasps do not defend nests and will only sting if actually held or trapped against the skin. Solitary species are rarely ever encountered by man in situations in which they are likely to be stung on several separate occasions.
3. **True** Older people are more susceptible to a sting allergy than younger individuals because their bodies are no longer as strong and able to deal with severe challenges as they were when younger. The important factors are: 1) how long the body has had to experience previous stings and develop sensitization, 2) how well and how normally the immune system functions, and 3) how the rest of the body reacts during an allergic reaction. Increased age adversely affects all of these factors.
4. **False** In sting-induced deaths, the venom toxins, themselves, are of no direct consequence in causing death. The toxins do not directly poison the body, rather death results from the body's immune system reacting to the venom as a foreign material introduced into the body.
5. **True** The venoms of most stinging insects consists of proteins, peptides and a variety of smaller molecules.
6. **False** Mortality data indicates that fewer than 50 individuals die annually from insect stings and fewer than 20 die from honey bee stings in the United States.
7. **True** Allergic reactions require at least one "sensitizing" sting prior to the sting that induces the allergic response. An allergic reaction typically occurs after the second or subsequent stinging event by the same or closely related species.
8. **False** Venom is a bitter blend of proteins with a basic pH that is used by stinging insects for defense.
9. **True** In theory any stinging insect species can cause allergic reactions in humans. This is because an insect sting introduces venom which essentially is a blend of foreign proteins, into the body where it contacts the immune system and can induce production of allergy-causing antibodies. The first sting(s) induces the production of the allergy causing antibody, immunoglobulin E (IgE), by the body resulting in the sensitization of the individual to the venom. Later when the now hypersensitive individual is stung again, the venom causes an IgE-mediated allergic reaction. In a normal, non-allergic reaction "blocking" IgG antibodies are produced. IgG quickly binds with and inactivates foreign antigens such as venom proteins. In allergic individuals the body typically reacts to sting venom proteins by producing too much IgE and not enough IgG. The balance between these two antibodies appears to be a factor in the cause of allergy.
10. B) Poison sac
11. G) Melittin
12. A) Epinephrine
13. I) Immunoglobulin E (IgE)
14. C) Immunoglobulin G (IgG)
15. F) Phospholipase A.
16. When an individual is stung, melittin and mast cell degranulating peptide in the venom is involved in the release of histamine from mast cells. The rupturing of red blood corpuscles and release of histamine, results in pain and swelling. Antihistamines are often administered following a sting to help reduce the release of histamine and swelling. These treatments are especially helpful for individuals known to have large local reactions who take the medication as soon as the sting occurs.
17. Yellow jackets
18. Application of ice to the sting site will prevent rapid dissemination of the venom and relieve, at least to some extent, the immediate burning sensation and pain as well as reduce the swelling that typically follows.
19. Reactions of the body at the time of the sting include: pain, burning, redness around the sting site, swelling, white area (wheal) immediately surrounding the sting puncture mark, and tenderness to touch.
20. Non-allergic stinging symptoms that are experienced within a few hours or a day following the sting include: itching, residual redness, swelling that is warm to touch and a small brown or red spot at the puncture site.
21. Body conditions associated with a sting-induced allergic reaction include: rash, hives, massive swelling and redness of skin away from the sting site, abdominal cramps, vomiting, weakness, shock, fainting, lowered blood pressure, difficulty breathing, and unconsciousness.

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

Ann Harman



# Home Harmony

## BBQ Hints, Tips and Secrets - all with honey

### This Summer Try Honey When You Cook Out

Spring arrives with Dandelions and Jonquils - and ads for the latest in barbecue grills. During a stroll through the newspaper or the stores, you will see everything from a tiny hibachi, adequate for one steak or a couple of chops, through assorted portables, to those that resemble a kitchen stove, complete with burners and self-cleaning features. You can even find some that smoke your meat, then, by shedding a section, can be used for grilling that smoked meat. Standard black for grills has been replaced by "gourmet colors." The outdoors, whether by patio, deck or a place beside the flower bed, is our Summer kitchen.

Actually, if we enter the past through one of the working antique farms, we will see some homes with both a "Summer kitchen" and a "Winter kitchen." That made sense back then, since the kitchen consisted of a large fireplace which not only cooked the food but also anyone trying to prepare it. Nice in the Winter, especially if some of that heat could help heat the rest of the house. The Summer kitchen was frequently removed from the house and constructed as a single room to receive any cooling breeze.

Today we may have cooling breezes and even air conditioning, but food cooked on a grill has both a special flavor and a special character. Even if a thunderstorm chases you indoors to eat, the barbecue chef will happily accept offers of an umbrella to prevent the dinner from being drowned and ruined. Nobody offers to transfer the cooking to the indoor stove – the character of the food would be totally changed, and not nearly as delicious.

The popularity of grilling can be easily discovered by driving down a road – any road – on a Summer weekend afternoon. Leave your car windows open so you can savor the different aromas of the steaks and hamburgers being grilled in countless backyards.

Although barbecue tools tend to be rather standard, that is, a fork, tongs, basting brush and spatula, all with handles entirely too long to fit in a kitchen drawer, the potholders and aprons feature clever pictures and slogans. Some of them are so nice it seems a shame to splatter sauce all over them. Perhaps they are designed to be hung on a tree for all to admire. More and more gadgets and grill items are appearing to make your outdoor cooking truly versatile. Vegetables can be put into a roaster pan with a perforated bottom to take advantage of the grilling flavors. Racks and baskets help prevent fish and small pieces of meat or vegetables from falling into the fire, and griddles are available so that you can cook bacon and eggs for breakfast. With the quick ignition systems on some grills, cooking breakfast on a grill is no more difficult than cooking it on an ordinary stove. Have you seen the "chimney starter" for charcoal briquets? It looks like a hive smoker that lost its top. Perhaps the inspiration for that gadget came from a beekeeper.

The flavor of the barbecued food comes from several factors. One is, of course, the smoky grill fire itself, enhanced by the drippings from the meat. Another comes from our choice of flavor-enhancing hardwood chips, soaked and added to the grill bed. And still another flavor is from the barbecue sauce or marinade carefully painted on by the barbecue chef.

Cookbooks accompany the purchase of a grill, but the bookstores are full of books to suit everybody's tastes. You will find grill recipes, during the summer months, in newspaper and magazine food sections. You can send coupons away for specialty grilling cookbooks. You probably can gather together enough grilling cookbooks to rival your assortment of general cookbooks.

No matter which barbecue cookbook you like, remember that you can substitute honey, one for one, in any recipe that calls for sugar or brown sugar. Yes, your food is apt to burn more quickly than when using all sugar, but with a bit of care and practice, the end result will be wonderful. In making such a substitution, you can choose a strongly flavored honey since that can compete with the smoke and sauces. A distinctly floral taste, such as orange blossom, may not be the best choice for grilling; save it for a dessert. Of course, a wildflower honey is always suitable. In order to help prevent burning, you can precook thick pieces of meat in a microwave or regular oven, then transfer them to the grill, slather the sauce on and finish cooking. The flavor will still be just great, but the danger of burning is much reduced. In addition, the sauce can be added after the food has been partially grilled.

Hardwood chips, such as oak, hickory and apple, can be used, as well as mesquite. Do not use soft woods or wood from evergreens which can gum up the grill and give the foods a bitter flavor. Each source of chips impart its own distinctive flavor. Try each one to find your favorite. You might choose one for beef, another for chicken or fish.

Here's a selection of grilling tips,

*Continud on Next Page*

*HOME ... Cont. From Pg. 367*

gathered from a number of sources. If you have any to add, let me know and we'll share them with the readers.

- Use square skewers, not round ones, to anchor pieces of food.
- For easy cleanup, use square wooden skewers soaked in water for 30 minutes.
- Keep a spray bottle with water handy for flare-ups.
- Moisten fresh sprigs of herbs and place directly on coals for added flavor; bay leaves, rosemary, thyme, oregano, marjoram and sage are good.
- Brush grill with oil to prevent sticking.
- Use tongs, rather than a fork, to turn meat to keep juices from running out.
- Use aluminum foil to wrap vegetables.
- Trim excess fat from meat to avoid flare-ups.
- Carefully cut through any membranes on the outside of meat so it does not curl up.
- Cook split chicken bone side down at first, then finish bone side up.

Grills can be a mess to clean up. Most instructions tell you to clean off the rack as soon as possible after cooking. But – at that point you want to eat what you've cooked. Here's a great tip that really works and does not take away from eating time. As soon as the food is taken off, remove the rack and cover both sides with wet newspaper or wet paper towels. Just let it sit until you are finished eating and ready to clean up. Most of the stuff stuck on the rack should wash right off.

For those with portable grills and others that use briquets, you can determine how hot the coals are with a simple test. You need to allow 30 to 45 minutes before briquets are ready for use. If you try to hurry things up, you will find that flames quickly burn the outside of the food, leaving the inside raw. Hot coals are barely covered with gray ash; medium coals glow through a layer of gray ash; low coals are covered with a thick layer of gray ash. Now for the "hand test." Very carefully hold the palm of your hand about four inches above the coals. Count the number of seconds you can hold your hand there before you pull your hand away. Hot - two seconds; medium-hot - three seconds; medium - four seconds; low - five seconds.

Beef cooks best at a medium heat. Watch your food carefully on a grill since cooking temperatures and times are a bit more difficult to judge than with other means of cooking. However, more gadgets have come to our rescue. You can purchase an "instant read" meat thermometer which can be inserted in a chunk of meat. In this way you can roast turkeys, chickens and large cuts of beef, pork or lamb and have them done to perfection. Meats, even hamburgers, can go from nicely cooked and juicy to overcooked and dry very quickly. Don't distract the barbecue chef!

What? After all these hints, you want a recipe to try out? Here's one. Next month you will have many recipes for all sorts of grilled foods.

## HONEY MUSTARD GLAZED STEAKS WITH GRILLED ONIONS

1/3 cup coarse-grain or regular Dijon-style mustard
1 tablespoon chopped parsley
1-1/2 tablespoons honey
1 tablespoon cider vinegar
1 tablespoon water
1/4 teaspoon hot red pepper sauce
1/8 teaspoon coarse grind black pepper
2 well-trimmed boneless beef top loin or sirloin steaks, 1 inch thick
1 large onion, cut into 1/2-inch thick slices

Combine mustard, parsley, honey, vinegar, water, pepper sauce and pepper. Place beef steaks and onions on grid over medium coals. Brush both sides liberally with glaze. Grill steaks and onions 15 to 20 minutes for rare (140°) to medium (160°) or to desired doneness. Turn steaks and onions once during grilling and brush with glaze.

*Great Grilled Beef*
Beef Industry Council

Get your grill ready for July. And tell your bees their honey will be a feature of lots of grilling recipes. Also you might want to make some honey ice cream for dessert next month.

Richard Taylor

# Bee Talk

## "I've learned my lesson. Treat for mites, and do it right."

I have a sad story to tell. The ending is yet to come, and I hope and trust it will be a happy one. Meanwhile, the words 'live and learn' never had more meaning. The story is one that lots of beekeepers could tell, and meanwhile, perhaps readers can learn from my own sad tale.

It begins with last Spring. My bees had come through the Winter in wonderful shape, almost no Winter loss, and all the hives good and heavy with honey. That is a wonderful portent. Heavy hives mean big bee populations about to emerge and that means lots of early, first-grade honey. Then we got hit by the drought, and honey dew, but that is not the point of my story. As the season advanced, the bees began storing up a huge crop of the very best honey, and in August, when I usually expect very little in the way of honey flows, the nectar was coming in so fast I could hardly keep up. I went out to the E.A.S. 'Year of the Hive' meetings that Summer in the highest of spirits, and relished the goodness of life all through September.

Even at the beginning of September, I was considering adding supers, which is a great departure from my usual schedule. I decided not to. A beekeeper friend came to visit on September 9th, and I proudly showed him one of my apiaries. The supers were filled again, and the hives so strong bees were clustered all over the fronts of the hives. Things had never looked better for going into Winter. And meanwhile, I had such a huge crop of comb honey I was going to have to really hustle to get it sold.

But appearance can be misleading, and the awful truth was about to be disclosed. I went off to my yards in October, to 'put the bees to bed' for the Winter, and discovered that every hive was in decline. A few, so strong a few weeks before, were dead.

What was going on? *Varroa!* Maybe tracheal mites too. The hives were still heavy with honey, but in most of them there were few bees and almost no brood.

So what about their overwhelming strength just the month before? All those bees clustered on the fronts of the hives had not been a sign of colony strength after all. What was happening was that the bees were being driven right out of their hives by the mites.

Now April has come, and I have only two live colonies, in three apiaries, that have squeaked through. I got my order for package bees – lots of them – off early, and it is a good thing. The suppliers of package bees were not able to meet the demand this Spring.

And that means that I am not alone here. Indeed, I learned last Fall that *Varroa* had hit heavily all through the Northeast. And now I have met outstanding beekeepers, with decades of experience, who lost every colony this Winter. On the other hand, one of the beginners in our bee club lost only one colony and, even more impressive, another, who has about three hundred colonies, lost only three. How come? Well, they did things right.

Now I've learned my lesson, and that is to treat for parasitic mites, and do it right, and do it on time. And that is where the hope for a happy ending to all this lies. I've talked with people who know a lot about this problem and I think I know what to do. There probably is much more to be learned, as our experience with mites grows, but meanwhile, here is what to do.

First, tracheal mites. Menthol is, in this latitude, not practical. You need several weeks of warm weather prior to the honey flow in order to use menthol and we don't have that. You can't use menthol when supers are on the hive. And as for late Summer, it is a waste of time and money to use menthol, even if you get some warm weather then and the supers are no longer on the hives.

In the South, on the other hand, menthol, used early in the season, can be useful due to the temperature difference.

It has been found that grease patties are effective in controlling tracheal mites. There are different theories as to why they work. Some have suggested that they mask the pheromone that attracts the mites to certain bees, while others believe that the presence of these patties may impart something to the bodies of the bees that tends to repel tracheal mites. In any case, the important thing is that they do seem to work.

A grease patty is simply a blob of Crisco mixed with sugar. If Terramycin is added, as a preventive of American foul brood, then the patty is called an extender patty; that is, it extends the time that the terra is in the hive, inasmuch as the bees consume the extender patties slowly.

There are several different recipes for making grease patties, and this has caused some confusion. I do not believe that it makes much difference what formula you use. Beekeepers I know just mix the sugar

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*BEE TALK ... Cont. From Pg. 369*

and Crisco two-to-one – that is, two pounds of sugar to one pound of Crisco. Some formulas call for powdered sugar, but I personally prefer granulated. The Crisco must be warmed a bit in order to mix with the sugar. Some beekeepers use a microwave for this. About two minutes per pound is about right, but you can experiment here.

If you want the grease patty to be an extender patty, simply add Terramycin. About a quarter cup of TM-50 for each three pounds of Crisco and six pounds of sugar should be about right. If what you have is TM-25, then double the amount. And if you don't know which you have, here is the way to tell: If the packet is 6.4 oz., and contains 10 grams of Terramycin, then it is TM-25; that is, it contains 25 grams of terra per pound.

To use this mixture, you simply put a blob of it on the top bars of the brood chamber, using your hive tool. Normally, it will go between the two stories of the hive; that is, down where the brood is. A blob about the size of a small hamburger should do it. Some beekeepers make up the patties in advance, pressing them between two squares of wax paper, or, as some prefer, paper towel, but this is more work.

Two additional points: Crisco is a food, and therefore not a pesticide. The bees do not add it to honey or nectar, so it does not contaminate the crop. And second, you will find that while most colonies consume these patties, a few will ignore them. I do not know the explanation for this.

Now let's turn to *Varroa*, which I consider by far the worse problem. I think that you should simply assume that your colonies have *Varroa* mites. They are everywhere now, and there is little point in testing for them. A simple test, if you want to do it, is to uncap a few drone cells. You'll see the *Varroa* if it is there. And if you have it in one hive, then assume it is in all your hives. Once a colony gets *Varroa* it is, I think, but a matter of time until the colony is dead – until, that is, we get truly resistant strains of bees, which we do not have yet. We'll have resistant bees sooner or later. The bees in Brazil are *Varroa*-resistant and beekeepers there do not even consider it a problem. But those bees are Africanized.

Until then, you've got to use a miticide. And that means Apistan strips.

The Apistan strips must be used correctly, or they will not be effective. They kill the *Varroa* mites by contact. That is, the bees must come into contact with them, constantly, and over a period of time. The strips do not work like moth crystals, by exuding pesticide.

So what you have to do is insert the strips down between the combs of the brood nest, where the bees are. It does no good to lay them on top of the combs. You'll need two strips for a colony of average strength. And if it is very strong, with bees and brood in both stories, you'll probably need four. The thing to bear in mind is that you must get them down into the cluster, no matter what number you use, and that must be a matter of judgement, not just routine following of directions.

The other important factor is timing. And this is where so many beekeepers – me included – have gone wrong, with resulting heavy loss.

Get the Apistan strips into the hives early in the Spring, as soon as the bees become active and brood rearing is well underway. Remove them before you put the first supers on. And then – here is the important point – get the supers off the hives in August – mid-August at the latest, I would say, and put the strips in again.

Now we must make the following important points. First, note the Apistan strips do not eradicate the *Varroa* mites from a colony. They merely reduce them to the point where they are not a serious problem and do not significantly reduce the honey crop. So as soon as the strips are removed, the *Varroa* mite population begins to build up again, and if you don't do something about it, you'll find your colonies in decline by September, and probably dead by next Spring.

But, second, this means that you have got to get your honey crop off the hives in August, which is very much at odds with traditional beekeeping practice. The Fall flows will be for the bees. I have long thought that this is the best practice anyway – that is, leaving all the Autumn honey for Winter stores – but I won't go into that here.

Third, you should not re-use Apistan strips. Do not save over the ones you used in the Spring to use again in August. They lose their effectiveness as the pesticide gets rubbed off from them.

Fourth, should you leave the strips in the hives all Winter? Not if you go strictly by the directions. Some think that leaving them there can cause the mites to become resistant to them. On the other hand, I have found that many beekeepers do leave them there. The wisdom, or folly, of this is, I think, debateable.

And finally, should Apistan strips be used in colonies just established with package bees? No, because the packages (usually) come with a strip in them, and can be assumed to be relatively free of mites, at least for several weeks. And the hives into which you introduce package bees are not contaminated by any prior mite infestation. When the bees are gone, so are the mites, in all stages.

This past year has, I think, been the most disastrous in the history of American beekeeping. We individual beekeepers have a challenge to meet. Bee inspectors cannot help us much with these problems. But I am not going to be discouraged. I am persuaded that wonderful beekeeping days and years lie ahead. And it is worth remembering that recent years have seen, at least in my own case, truly bountiful honey crops, notwithstanding the parasitic mites. We have a future, and it is a bright one. BC

*Richard Taylor is a philosopher & lifelong beekeeper who lives in the Finger Lakes region of New York. You can reach him at Box 352, Interlaken, NY 14847.*

*Comments and questions are welcomed. Use Interlaken address (not Medina) and enclose a stamped addressed envelope for response.*

# Questions?

## Clean Up

**Q** **Two questions: First, can rubbing alcohol disinfect your gloves and hive tool to kill AFB spores? And second, I was told that mites can spread AFB. How is that possible? If there is no foul brood in the area, then how can it be spread by mites?**

**J. B. Barrett**
**Gaston, Ind.**

**A** Yes, alcohol is adequate for disinfecting gloves and hive tools. With respect to the other question, mites can induce AFB by weakening the colony and making it vulnerable to the infection. Any kind of stress on a colony that weakens it makes it more vulnerable to foul brood. The AFB spores are very common. A colony does not become infected merely by the introduction of the spores. In fact, colonies have been fed sugar and honey that was deliberately infected with AFB spores without their becoming infected. The best defense against AFB is simply strong colonies.

## Catalpa Trees

**Q** **Are Catalpa trees a nectar source? Some of the members of our bee club insist they are great as honey plants, and some have even set them out for this purpose, but I am skeptical. I have never seen a bee working these trees. Can you set the record straight?**

**John H. Runnels**
**Bartlesville, OK**

**A** This is a question to which I'd like to know the answer. An article in the April 1996 issue of this magazine describes both Catalpa and Horse Chestnut as great honey plants. In my many decades of beekeeping, I have often been drawn to these species, in bloom, for they certainly look like bountiful sources of nectar, but I have never seen bees foraging on them. I, therefore, long ago concluded that, like so many plants that seem promising to the eye, such as Forsythia, they are of no use to bees. If any readers have actually seen (as distinguished from having heard of) bees foraging on these blooms in significant numbers, then I would like to hear from them, and I will publish the results.

***Editor's Note:*** *Catalpa, like many plants, seems to be fickle in it's attractiveness to honey bees. Here in Northeast Ohio Catalpa was used along roadsides many years ago so there are hundreds in my area. About five years ago I made it a point to notice, and that year they were absolutely alive with bees all during bloom, and afterwards on the extra-floral nectaries. In the years since visitation has been erratic, but never with the intensity of that spectacular time. I suspect it is a function of weather, competing floral sources, actual bee availability and my attention span. The bees I saw were usually busy in the morning, so am I, and may be missing the bulk of the bees.*

*Nevertheless, Catalpa should be considered a good (here in NE Ohio) nectar source, but not a dependable one.*

## Bottom Supering

**Q** **Following your advice, I would like to super my colonies from the bottom. Should a queen excluder be used? When should the super be put in place?**

**Ernie Huber**
**Carlisle, MA**

**A** I'm afraid I have been misunderstood. I have never suggested bottom supering for honey. My hives, which are always top supered – that is, honey supers put on top – consist of a shallow super on the bottom and a deep on top of that. This is simply for ease of making up splits and nucs and similar manipulations. The shallow super on the bottom is used for brood rearing, like the deep above it. Bees always store honey above their brood nest, so honey supers must always go on top.

***Editor's Note:*** *The term bottom supering is often used when empty honey supers are placed beneath nearly full honey supers, but still above the broodnest.*

## Locating Hives

**Q** **I have my hives close together, about ten inches above the ground. I have noticed in the bee magazines that hives are always shown spread out, twenty or thirty feet apart. What is the reason for that?**

**Fred Schwarz**
**Clark, NJ**

**A** I have always considered the best arrangement to be having the hives in pairs, a few inches apart, with perhaps five or ten feet between each pair. There are many advantages; for example, you need only one simple stand for two hives; you have a place to set your smoker, or whatever, while working one of the hives; if you move one of the hives, the stray bees can go into the other, etc. I know of no advantage to spreading them out. On the other hand, if hives are set in rows of five or more hives, then the bees tend to drift to the wrong hive, unless they are of different colors.

## Old Foulbrood Spores

**Q** **Is there any danger of getting foul brood from equipment fifteen years old? If so, how do you clean it up?**

**George Rush**
**Troy, KS**

**A** I wouldn't worry about this unless you have reason to think that the hive may have harbored foul brood. In that case, yes, it can become active again, even after fifteen or more years. It is probably not worth trying to clean up frames, but if you have lots of them, they can be put in boiling water, with a bit of lye, with extreme caution. Hives and supers must be scorched out on the inside by sprinkling a little kerosene in them, piling them up,

putting a piece of flaming newspaper in the stack, then covering to smother the fire after a few seconds of inferno.

## Requeening Swarms

**Q Having gathered and hived a stray swarm, can you then requeen it, with a Buckfast queen, for example?**

**John Weil**
**North Stonington, CT**

**A** Yes, but I think it would be both pointless and risky. A better plan would be to let that swarm go ahead and make a crop of honey, then requeen it the following Spring.

## Honey Production

**Q An old bee book I have says that per colony honey crops average 235 lbs., in 1909, and the figure is 250 lbs. for 1916. Our average now is about 60 lbs. This suggests that, in spite of all the efforts to improve honey bees, by searching all over the world for better bees, there has been no improvement at all.**

**Arthur Young**
**Norwalk, WI**

**A** The declining per colony yields have been due to changing agricultural practices. The early part of this century is sometimes referred to as the 'golden age' of beekeeping, largely because sweet clover was then so abundant. Still, good beekeepers, in good areas, can average over 100 lbs. per colony.

## Cleaning Frames

**Q How do you clean old frames to make them ready for new foundation?**

**Donald Steinke**
**Wapakoneta, OH**

**A** You can clean two or three at a time by putting them in a solar wax melter and scraping them while the wax and propolis on them is still warm. If you have a large pile of such frames, they can be dipped in hot lye water, several at a time, then piled up in the yard and rinsed with a hose. Lye is very dangerous, can boil up suddenly and, if it gets in your eyes, can cause blindness. Read directions and be careful.

## Pollen Storage

**Q When you put your supers on the bottom and brood chamber on the top, where do the bees store their pollen?**

**Dan Hendricks**
**Mercer Island, WA**

**A** The rule about pollen storage is this: Bees store honey above their brood nest and they store pollen between brood nest and honey, with considerable overlapping. It is very unusual for bees to store pollen above where they are storing honey, or below their brood. The brood nest, in turn, is usually located fairly near the top of the hive when the season begins, in the Spring, and then it moves downward as the brood up there begins to be replaced with honey and pollen. Thus, a two-story hive is likely to have its brood nest in the top story in the Spring, but most of it in the bottom story a few weeks later. When supers are added to a hive containing brood right up to the top of the combs of the upper story, then pollen is likely to be stored in them, along with the honey, but if there is quite a lot of honey in the top story when the supers are added, then little, if any, pollen will appear in the supers. This is especially important for comb honey beekeepers. As for supering under the brood nest, this seems to me a bad idea from every point of view.

## Which Foundation?

**Q Do you need thin foundation for producing chunk honey, or will medium brood foundation work?**

**George Rush**
**Troy, KS**

**A** Use thin foundation, by all means. It goes farther because there are more sheets per pound, and foundation is sold by the pound. You also get a better result. Heavier foundation, such as medium brood foundation, will work, provided the weather is hot. Bees do not draw foundation out very well if the days are cool, and the result is too much waxiness in the product.

## When To Harvest?

**Q I've been keeping bees for twenty years, but this last one was disastrous. At the end of the Summer, the hives all appeared strong, I got a good crop from them, and they were building up stores for the Winter. In October I returned to find them all empty of bees and their honey stores still intact. I had treated these colonies with Apistan in the Spring. Should I have taken my honey crop sooner and treated the hives again, perhaps in September?**

**Andrew A. McKinnon**
**Cuyahoga Falls, OH**

**A** Your experience exactly duplicates my own and, I believe, the experience of practically every beekeeper in the Mid-West and Northeast and probably beyond. Beekeepers are all telling the same story: Good crops, strong colonies at the end of the Summer and then, in October, collapse. Yes, the only solution I see for now is: Apistan in the Spring, early harvest, then Apistan again in early September. And it is important to note that the Apistan strips, if they are to do any good, must be right down into the brood nest, where the bees are, so that the bees will be in more or less constant contact with them.

*Questions are eagerly welcomed. Send them to: Dr. Richard Taylor, Box 352, Interlaken, New York 14847 (not to Medina), enclosing a stamped, addressed envelope for response.*

# Answers!

Richard Taylor

# Gleanings

JUNE, 1996 • ALL THE NEWS THAT FITS

# KELLEY CO. OPENS NEW WAX PLANT

*Kelley's new 8,000 sq. ft. wax processing facility in Clarkson, KY houses all new processing equipment. It sits on the same spot as the one that burned.*

*Sarah Manion, President of Kelley Co., welcomes the over 500 visitors to the open house hosted by the Company. Kelley employees gave tours of the new plant and showed visitors the many historical displays on hand.*

The Walter T. Kelley, Co. officially opened their new wax processing facility in early May. The 8,000 sq. ft. building replaces the 7,000 sq. ft. structure that was totally destroyed by fire in August, 1995.

The new plant houses a small amount of wax storage, a large melting tank, two sheeters, a roller and, eventually will have three foundation mills.

After melting, foundation sheets are stacked and dried in a humidity controlled storage room, then boxed directly or moved to the wiring machine, where reinforcing wires are embedded in the sheet.

Beeswax constitutes nearly half of the Kelley business, with more than a quarter million pounds passing through their hands each year.

Besides beeswax, the Kelley Co. manufactures supplies for beekeepers in both wood and metal, and ships finished equipment worldwide.

The Kelley Co. was founded in 1924 by Walter T. Kelley in Houma, LA. In the mid-30s it moved to Paducah, KY, and in the early 50s it relocated to Clarkson, KY. They currently have 39 full time employees. Sarah Manion is the president.

# BEEKEEPERS AGAINST MITES

Relying on 20 years of breeding experience, we have put together a group of values that gives us an image of what a mite tolerant bee is. Now we have a simple question sheet as a tool for sorting to find needed qualities to enhance the tolerance of the available stock to the mite. To locate possible breeding stock, we must ask beekeepers to help us by asking for, and returning to us the completed question sheets. This will tell us if you have a hive that we may want to check. We will call and ask for one young brood frame and the queen mother. All instructions and questions are simple and directed to the hives that were in service for two or three years. We are paying $15 for each package we request to be mailed to us. This is a private, low budget, project.

The Project "BAM" will be a three year mite tolerance enhancement breeding program after this year of stock selection. Without participation from a good number of beekeepers, the true goal of this study will not be realized. To start, we need your name, address, and phone number. Then we will need the question sheet answered and returned to us for sorting, and finally your willingness to send us one frame of brood and their old queen mother for observation and evaluation.

We beekeepers are working to make a profit. How can we make a profit when we have acquired two new silent killers of our bees? HELP!

Contact BAM at 288 Kennedy Ave., Schererville, IN 46375. Call (219) 865-2898.

**READ THE LATEST BEEKEEPING NEWS IN GLEANINGS**

# INDUSTRY SUMMIT SUMMARY

Representatives of five distinct groups of the U.S. honey and beekeeping industry participated in an industry summit meeting convened by the American Beekeeping Federation in Reno, NV, on February 15.

In an all-day session, led by Washington attorney Wayne Watkinson, a veteran counselor to ag commodity groups, representatives put the industry under a microscope and examined it to answer these questions:

Where are we now? Where do we want to be? How do we pay for it?

**Key Quality Issues:**

- Increased incentive for adulteration with the increased honey prices.
- Lack of an official Food & Drug Administration standard of identity for honey.
- Honey being rejected by one packer for adulteration and/or contamination and subsequently being offered to other packers by the seller.
- Unclear honey labeling standards.

**Research:**

A need for industry-directed, goal-oriented, practical beekeeper research was highlighted, including:

- General honey research.
- Research on pesticides and bees.
- Cooperation with international researchers.

**Marketing Concerns**

- Packaging improvements attuned to the evolving market requirements.
- Promoting honey in other countries – both U.S. honey and the general increased consumption of honey.
- Continued ability to supply market demands and obtain honey under long term contracts.
- Need to market value added honey products.

**Industry Condition**

Despite the recent dramatic increase in honey prices, the participants recognized that long term depressed prices had left the producers, especially, with a need to "catch up" financially. Other issues relating to industry condition include:

- A lack of understanding of the impact the National Honey Board has had on the marketing of honey and the perception that the current market situation is totally due to the antidumping action.
- The need for development of young leaders in the industry and the elevation of general beekeeper knowledge of industry conditions and market forces.
- The perception that any honey assessment would fall on beekeepers.
- Industry fragmentation and distrust, including the perception that honey packers are making all the money in the sales of honey.

**National Honey Board**

The National Honey Board was closely examined, especially the NHB scope and structure and organization. Should the Honey Board's role be expanded to address some of the needs which had been identified? Is the Honey Board organized so as to be most beneficial to the industry? Are those who benefit from the Honey Board contributing their proper portion of the NHB cost? Among the items discussed in this area were:

- The nominating process - Secretary of Agriculture's role and the National Honey Nominations Committee's role.
- USDA involvement and oversight.
- Packers serving on the Board when they don't pay assessments.
- Importer representation on the NHB does not reflect their percentage of contribution.
- Should the NHB promote domestic honey only?
- If packers were assessed, could they receive credit for their own advertising efforts?
- Refunds of assessments.
- Should only producers comprise the Honey Board?
- Can/should the Honey Board be involved in beekeeping research?
- Can/should the Honey Board be involved in honey quality assurance?

**Where To Go?**

The participants at the Summit Meeting agreed that the National Honey Board is the proper vehicle to address most of the needs identified. The participants agreed that the following changes should be pursued:

**Beekeeping Research** – 8 percent of the Honey Board's annual assessment revenues would be allocated to beekeeping research.

**Quality Assurance** – The envisioned plan would include a program of testing honey voluntarily submitted by producers, packers, and importers; testing for enforcement purposes; and the development of a "seal of approval" program for companies participating in the voluntary program.

**Packer Assessment** – The cost of the expanded Honey Board program would be paid by an assessment on honey packers equal to that levied on producers and importers – one cent (1¢) per pound. All assessments would be mandatory, as they are now. Producer-packers would pay assessments relative to their activity; i.e., 1¢ per pound on their production activity; 1¢ per pound on their packing activity.

Every honey packer – whether an independent packer, a cooperative, or a producer-packer – would be eligible for a credit for a portion of its qualified advertising expenditures against its assessments.

**Board Representation** – In recognition of the assessment on honey packers, the Honey Board would be expanded to 14 members; the public member position would be dropped and cooperative representative, four packers, two importers (one of which can be an exporter).

**How To Get There?**

All the changes to the National Honey Board outlined above would require changes to the Honey Promotion, Research, and Consumer Information Act. The industry trade organizations would work with Congress to make the changes and put them into effect as quickly as possible. A referendum of affected parties – producers, importers, and packers – would be held before the changes are implemented.

**Summit Participants**

Participating in the Reno Industry Summit Meeting were:

- The American Beekeeping Federation;
- The American Honey Producers Association:
- Sioux Honey Association:
- The National Honey Packers & Dealers Association:
- and Package Bees & Queen Breeders.

## Organic Problems

# CONTAMINATED WAX IN EUROPE

Scientists at the Specialists meeting of the 34th Apimondia Congress were in general agreement that the use of Apistan over the past 10+ years for the control of Varroasis has brought about a situation in which every kilogram of beeswax in Europe is contaminated with fluvalinate (the active ingredient).

It is most likely that recycling contaminated wax for the manufacture of foundation is largely responsible for the increase in residue levels. Scientists who spoke informally to the session, however, drew back from asserting that if the present usage rates continue the time must come when all beeswax has no value due to unacceptably high residues.

However, they did note that importing foundation from countries with no fluvalinate usage could help stabilize the situation and may possibly reduce the problem and if the use of Apistan was also curtailed. A return to non-residue wax was possible after the next 50+ years!

Many beekeepers only recycle their combs through a 10 year period and if wax recycling for foundation continues it will take 50+ years to get down to unreadable levels and this still assumes an almost complete lack of chemical usage commencing immediately.

*From Australin Bee Journal*

CORRECTION: In the April issue we published an article on pesticide use. Due to an editorial error the decimal point was moved in the figures, enlarging those figures. We regret any inconvenience this may have caused.

# Consumers Confident In Ag Community
## SURVEY MEASURES MARKETING PROGRAMS

Production agriculture is a demanding business, leaving little time for farmers to look beyond the tasks at hand. Mother Nature, market prices and issues within the industry are a few of the challenges farmers look to commodity marketing programs to reach customers and the public.

Commodity organizations work to promote consumption and educate consumers about specific products. However, since farmers are at the beginning stages of the marketing process, it is difficult to determine what factors will influence consumer choices in the end. That is why commodity organizations are so important. They serve as the vital link between farmer and consumer by communicating the farmer's message to consumers and the consumer's response to growers.

Recently, the Agricultural Issues Forum, an organization comprised of 15 different California commodity organizations, conducted a study to assess the strengths and weaknesses of generic marketing programs. Consumers, farmers, public policy leaders and retailers in California were surveyed to determine how much people, namely consumers, appreciate the benefits of marketing programs. Dr. Dennis Tootelian, a professor of marketing at CA State University Sacramento and facilitator of the study, speculated that growers who pay assessments for programs are probably a more critical audience.

"It's undoubtedly harder for farmers to step back from their own commodity groups to assess the cumulative impact of all these programs," said Tootelian. "Through this research, we found out that functions of marketing programs were important to all respondents."

According to Mark Houston, Ag Issues Forum chairman and California Kiwifruit Commission president, the study was timely in light of recent legal challenges facing commodity organizations.

"We wanted to find out what people thought about the impact of the programs," said Houston. "Consumers, for example, don't really grasp the details of how commodity organizations work. But the survey respondents told us that they strongly support the goals and results of the commodity programs."

In a telephone interview of 300 consumers, the vast majority believed there is a need for an entity(s) to develop minimum standards for agricultural products, inspection programs and nutritional safety information. Consumers also said they benefited most from commodity programs that promote product quality, grade and size regulations (95%) and consumer education (67%).

While most consumers believe that standards are a governmental responsibility, more than 25 % thought they should be controlled by growers. In addition, nearly nine out

*Continued on Next Page*

# NEW ABF OFFICERS FOR 1996

*Bill Merritt*

Bill Merritt, a commercial honey producer from Sopchoppy, FL, was elected president of the American Beekeeping Federation at its annual convention in Portland, OR, Jan. 17-22. Mr. Merritt, who had been vice president for two years, succeeds David Sundberg of Fergus Falls, MN.

Elected vice president was Dave Hackenberg of Lewisburg, PA. Also a producer and pollinator, Mr. Hackenberg operates bees in Florida, Maine and New York, as well as his home state.

Fred Rossman of Moultrie, GA, will complete the final year of Mr. Hackenberg's Executive Committee term; he was the alternate from the 1995 Executive Committee election. Mr. Rossman is a veteran package bee and queen breeder and had become involved the manufacture and sale of bee supplies in recent years.

Danny Weaver of Navasota, Texas, joins the Executive Committee, replacing Gene Brandi of Los Banos, CA, who had served his two-term maximum. Clint Walker of Rogers, TX, was re-elected to a second two-year term. Both Mr. Walker and Mr. Weaver are involved in queens and package bees and honey production.

The 1996 Executive Committee is comprised of Messrs. Merritt, Hackenberg, Sundberg, Rossman, Weaver, and Walker and incumbents Judy Gulleson of Britton, SD, and Bruce Beekman of Hughson, CA. The Executive Committee retained Troy Fore of Jesup, GA as secretary-treasurer.

## Nuts To You!
## PER CAPITA CONSUMPTION

| | | | |
|---|---|---|---|
| Almonds | 12 oz. | Macadamias | 1 oz. |
| Walnuts | 7 oz. | Other types* | 9 oz. |
| Pecans | 6 oz. | | |
| Pistachios | 2 oz. | | |
| Filberts | 1 oz. | | |

*Brazil nuts, pine nuts, chestnuts, cashews, etc.

*USA Today*

## Smokey Dents



"Let's see, according to the bee's dance . . . about a mile north-by-northwest . . . Whoa! That's the middle of Lake Superior!"

# CALENDAR

♦INTERNATIONAL♦

**The International Arab Beekeepers Congress** will hold their first meeting Aug. 16-19, 1996 at the Aquarium Hotel in Jounieh, Lebanon.

For more information, contact Rashid Yazbek, P.O. Box 90-1404 Jdeidet Beirut, Lebanon. Tel: 01-890644 FAX: (961) 1888678.

**The Seventh International Symposium on Pollination** will be held in Lethbridge, Alberta, Canada, June 23-28, 1996.

For more information contact K.W. Richards, Lethbridge Research Center, Lethbridge, Alberta, Canada T1J 4B1, Ph. (403) 327-4561. FAX (403) 382-3156.

**The 43rd Annual Beaverlodge Beekeepers' Field Day** will be held on June 14th at the Beaverlodge Centre in Beaverlodge, Alberta , Canada.

For information contact Don Nelson, Northern Agriculture Research Centre, Box 29, Beaverlodge, Alberta T0H 0C0, Ph. (403) 354-2212 or FAX (403) 354-8171.

♦COLORADO♦

**The Colorado Beekeepers Association** will hold their summer meeting June 29, 1996, at 9:00 a.m., at the Senior Citizens Center, 305 F. Street located on the corner of 3rd and F Street in downtown Salida, CO.

For further information call (719) 254-6321 or (970) 848-5501.

♦GEORGIA♦

**The Fifth Annual Young Harris College/ University of Georgia Beekeeping Institute** will be held on the campus of Young Harris College, Young Harris, GA on June 14-15.

For information Tracy Coker at (706) 542-8954.

♦HAWAII♦

**The WAS invites you to join them in Hawaii in August of 1996** on the big island of HI.

For information: Western Apicultural Society, P.O. Box 681, Woodland, CA 95776 or call Program Chairman for WAS-96, Michael Burgett, Department of Entomology, Oregon State University, 2046 Cordley Hall, Corvallis, OR 97331-2907, (503) 737-4896, email: burgettm@bcc.orst.edu.

♦ILLINOIS♦

**The Illinois State Beekeepers Association** Summer Meeting will be hosted by the Heart of Illinois Beekeepers Association, on Saturday, June 22, 1996 at 9:00 a.m. at The historic Temple in the Woods at Funks Grove, IL. 7 miles SW of Bloomington on I-55.

For more information contact Tom Elston at RR 1, Box 346-D, Bloomington, IL 61-704-9752 or phone 309-378-2871.

♦IOWA♦

**1996 The Iowa Honey Producers Association and the Central Iowa Beekeepers Association** will be sponsoring a Field Day at the Lime Creek Nature Center on Saturday, June 22, 1996.

For information contact Bob Cox at (515) 281-5736, FAX (515) 242-5015 or Gordon Powell at (515) 278-1762.

♦MICHIGAN/INDIANA♦

**Indiana & Michigan Beekeeper Assn.** will hold a joint meeting Saturday, July 13, from 10:00 a.m. to 4:00 p.m. at Mendel Center, Lake Michigan College, Benton Harbor, MI.

For information call Dave Laney (219) 656-8701 or Paul Johnson (616) 926-6532.

♦MINNESOTA♦

**Queen Rearing Short Course** July 5-7, 1996, includes queen and drone biology, queen rearing in northern climates, stock selection, mating yards, record keeping grafting larvae and raising your own queens. Taught by Dr. Marla Spivak and Mr. Gary Reuter on the St. Paul campus of the University of MN.

For further information call or write: (612) 624-3636, University of Minnesota, Department of Entomology, 219 Hodson Hall, St. Paul, MN 55108-6125.

♦NEBRASKA♦

**Mid-West Master Beekeeping Workshop,** August 1-3 at the University of Nebraska Apiculture Laboratory near Mead, Nebraska. 3 days of classroom and hands-on training. Registration is $60. and includes lunches, notebook, and refreshments. Trainers include: Dr. Marion Ellis, Dr. David Keith, Dr. Ackland Jones, Charles Simonds, Bob Cox, Gary Ross, Joli Winer and Cecil Sweeny.

To register contact Dr. Marion Ellis, University of Nebraska, Department of Entomology, 209 Plant Industries Building, Lincoln, NE 68583-0816. Additional information at http://anrwww.unl.edu/ianr/entomol/beekpg/beekpg.htm

♦NEW JERSEY♦

**The Joys Of Beekeeping** advanced course will be held July 19-20 (& 21st optional, 1996. Rutgers State University, NJ Department of Agriculture and the NJ State Beekeepers. Contact Grant Stiles (609) 292-5440 or Rutgers (908) 932-9271.

♦NEW YORK♦

**The Empire State Honey Producers Association** will hold their summer picnic at the John Earle Family Honey Farm and Meadery on Saturday, July 27 starting at 11:00 a.m., near Locke, NY on Tucker Hill Road. All beekeepers are invited. Dr. Nick Calderone, will speak.

For information contact Roger Morse at (602) 255-5443.

♦NORTH CAROLINA♦

**The North Carolina State Beekeeper's Association** summer meeting will be July 18-20 at the Ramada Inn, Burlington, NC.

For information call Dr. John Ambrose, Extension Apiculturist at (919) 515-3140

♦OHIO♦

**An intensive three-day course on the technique of instrumental insemination and bee breeding will be offered at the Ohio State University Rothenbuhler Honey Bee Research Laboratory in Columbus, Ohio,** Wednesday through, Friday June 19, 20, and 21.

Classes are taught by Susan Cobey, and knowledge of queen rearing experience is required.

For more information contact Susan Cobey, Dept. of Entomology, 1735 Neil Ave., Columbus, OH 43210, Ph. (614) 292-7328, FAX (614) 292-2180, e-mail: scobey@magnus.acs.ohio-state.edu.

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**The Ohio State Beekeepers Association** summer meeting will be July 27, 28, 1996 at the OARDC Campus, Wooster, OH. Friday night certified beekeepers classes 3 & 4 will be held.

For information contact Dana Stahlman, 3045 Mann Road, Blacklick, OH 43004 (614) 855-1656.

♦OKLAHOMA♦

**The Oklahoma State Beekeepers Association** will hold there annual spring meeting on June 1st, in Guthrie, OK in the Fellowship Hall at the First Presbyterian Church. Registration starts at 8:00 a.m., the meeting at 9:00 a.m.

For more information contact Mr. J.B. Shepherd (405) 824-6044, Harold St. Clair (918) 272-1317.

♦PENNSYLVANIA♦

**Tri-County Meeting (Berks, Lebanon & Schuylkill)** June 25, 1996, in Bethel, PA. Speakers include Dr. Scott Camazine. Contact Dennis Keeney or Paul Ziegler at (717) 933-8565.

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**Advanced Short Course** in beekeeping will be June 27-29, along with another program at Delaware Valley College, Saturday, June 22.

For information contact Dr. Bob Berthold, at Delaware Valley College, 700 E. Butler Ave., Doylestown, PA 18901, ph. (215) 489-2285.

♦SOUTH CAROLINA♦

**The South Carolina Beekeepers Association** hosts its summer meeting at Clemson University, Clemson, SC on July 11-13, 1996. The meeting will be held in the Poole Agricultural Building Auditorium on campus.

For information call Frank Blanchard, President- SCBA, at (803) 345-3463 or Mike Hood, Executive Secretary - SCBA, at (864) 656-0346.

♦TEXAS♦

**The Texas Beekeepers Association Delegates Summer Meeting & Clinic** will be Saturday, June 8, 1996 at the John Milam Honey processing Facility Moore, TX.

For more information contact Dave Grinnan at 210-367+2168.

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**The 9th International Palynological Congress** will be held in Houston, TX June 22-29, 1996 at The JW Marriott Hotel.

For more information contact Sarah P. Damassa, 3 Ridge Street, Winchester, MA 01890.

♦VIRGINIA♦

**The annual EAS conference will be** held July 29-Aug. 2, 1996 at James Madison Univ. in Harrisonburg, VA. A 2-1/2 day, 3-level short course, apitherapy, workshops and a 2-1/2 day conference are scheduled.

For more information contact Bob Wellemeyer, 120 Mill Run Lane, Castleton, VA 22176, 540-937-5742.

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*SURVEY ... Cont. From Pg. 377*

of 10 respondents expressed support for growers working together to promote their products and industries. These results combined with other findings, indicate consumers have confidence in the agricultural community in deciding activities that are in the best interests of the public.

The mail-in survey to farmers and public policy leaders found that 81 % of respondents said mandated programs were either "very important" or "important." This was especially true for research (93%) and advertising (72 %).

Overall, both farmers and policy leaders were pleased with the current functions of mandated programs. This was especially true for quality standards, industry information and dissemination and production research. The vast majority of both groups indicated that these programs were important to their industries.

The survey of 177 retailers and allied industries found 68 % felt commodity groups represented by these programs were better off than those that were not. Most also said the commodity groups would be worse off without the existence and operation of these programs.

Retailers and allied industries indicated commodity boards were especially helpful to them in the areas of research, quality control, size and grade and responding to regulatory/legislative issues. In addition, generic advertising campaigns were rated favorably by 62% of respondents and 58% said programs were effective in increasing product sales.

Based on the strong support expressed in the three surveys, there is tangible evidence that the work of commodity marketing programs is not going unnoticed.

"The functions of marketing programs were considered important to all groups of respondents," said Tootelian. "Respondents felt the work of marketing orders, boards and commissions is important and are providing quality services."

The Agricultural Issues Forum was established to assist commodity organizations in the communication process and better serve grower-members. The Forum represents approximately 90% of California's fruit industry and works proactively and collectively to manage issues facing commodity programs.

The future of commodity programs could be determined this year as the U.S. Supreme Court reviews a challenge to their constitutionality.

# Display Index

Sylvia Plath (1932-1964) wrote many distinguished poems on the subject of beekeeping in her collection, "Ariel: Poems by Sylvia Plath." In the first of four poems, "The Bee Meeting," Plath describes a group of regular townfolk (including Plath) with dissimilar vocations coming together for a common purpose; to tend honey bees. It is Plath's first walk into a local beeyard: "Who are these people at the bridge to meet me? They are the villagers – The rector, the mid-wife, the sexton, the agent for bees. In my sleeveless summery dress I have no protection. And they are all gloved and covered, why did nobody tell me? They are smiling and taking out veils tacked to ancient hats."

Throughout the poem, Plath's subtle descriptions of the beeyard moves the reader in a single direction; closer to the phenomenon, the living organism inside the white boxes piled one on the other. Smoke rolls in the beeyard, the honey bees react and Plath is apprehensive, a still figure among the hives hoping to fool the creatures into thinking she is cow parsley. The beekeepers go on to open the hives, to look for the queen, "Is she hiding, is she eating honey? they ask. The work is exhausting, but finally, "The villager's are untying their disguises, they are shaking hands." Plath's sojourn is over and she is left wondering, "Whose is that long white box in the grove, what have they accomplished, why am I cold."

Inspired partly by her fear of honey bees Plath's next poem, "The Arrival of the Bee Box" is one all beekeepers should come to know. It brings to bear an amusing, highly imaginative collection of thoughts on the author's initial contact with honey bees, her first package. She is nervous, even intimidated, staring inside the box she sees as, ". . . dark, dark, With the swarmy feeling of African hands." At the same time, she's too curious to hold back. The individuals, the animal inside groping for a way out, captivate her thoughts. She brings her ear close and listens to the "unintelligible syllables" being uttered near the entrance. Like the words of an angry crowd. She sees the little black movements within, the chaotic scrambling, the falling over one another and so reasons, "I have simply ordered a box of maniacs."

Will they forget her, ignore her, if tomorrow she sets them free? she asks finally. There is the cherry tree, afterall, and the sweet laburnum. "Tomorrow," she writes, "I will be sweet God, I will set them free."

"Stings," the third poem, follows from "The Arrival of the Bee Box." Here, Sylvia becomes a true beekeeper. This, shown by that long standing mark of the non-amateur, the discarding of the gloves. The first stanza reads: "Bare-handed, I hand the combs. The man in white smiles, bare-handed, Our cheesecloth gauntlets neat and sweet, The throats of our wrists brave lilies." With this poem too, more clues to Plath's fascination with beekeeping become apparent. She has herself immersed. She writes of, "Brood cells grey as the fossils of shells . . . What am I buying wormy mahogany? Is there any queen at all in it?" Her question is answered in black images, but cleverly as the last few stanzas show. Here, the search for the queen is ended, "Now she is flying. More terrible than she ever was, red Scar in the sky, red comet Over the engine that killed her – The mausoleum, the wax house." Overall, "Stings" is a dark poem, quite like the last, titled "Wintering."

The subject of "Wintering" is an obvious one, however, Plath's observations are not predictable. It is her beekeeping experience, much like our own, though it is set apart from the commonplace by a skillful use of language. She is a master of metaphor. This is evident in all of her poetry and particularly "Wintering": ". . . Now they ball in a mass, Black-Mind against all that white. The smile of the now is white. It spreads itself out like a mile-long body of Meissen, Into which, on warm days, They can only carry their dead. The bees are all women, Maids and the long royal lady . . ." In the previous passage, the subject lies plainly with the bees, and it would be easy to think only this if one didn't know the author's background. Plath was born of German parentage, this having a profound affect on her subsequent work. "Wintering" is a good example. ". . .They ball in a mass, Black" refers, no doubt, to the women of the east-central German city of Meissen (a city of the Dresden district) in black dress during a funeral procession. This, during World War II, when Dresden and it's outskirts were fire-bombed by the Allies. The women would come out on warm days (rather like the bees) carrying their dead . . . .And so the poem goes. This is Plath's genius at work. An outstanding read.

More of Plath's beekeeping poems may be found in "The Colossus: Poems by Sylvia Plath" and "Collected Poems (1981)" (Pulitzer Prize-winner, 1982), a volume edited by the British poet Ted Hughs.

# Sylvia Plath ... Beekeeper & Poet

Franjo Goluza