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DEC2003

Bee Culture

'Twas The Night Before Christmas . . .

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Happy Holidays 2003

Don't forget your winged friends this season. And check out the rest of the poem on page 4 & 5.

by Lela Dowling

Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

DECEMBER 2003 VOLUME 131 NUMBER 12

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'Twas the Night Before Christmas
or 'Account of a Visit from the Apiarist'

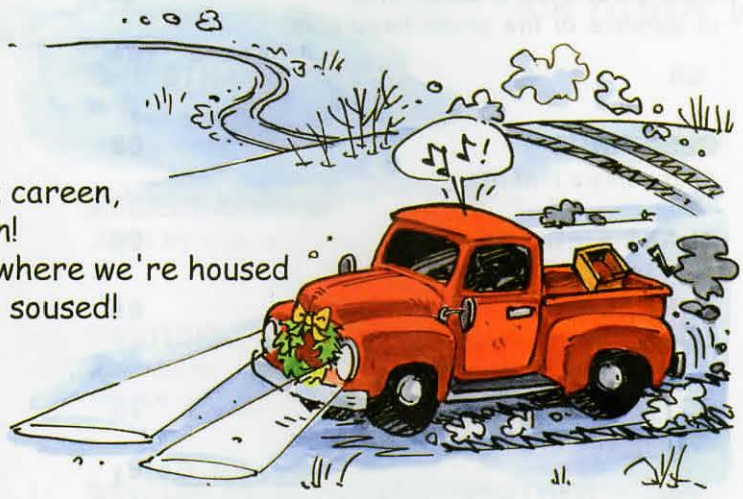
(by Lela Dowling, with apologies to Major Henry Livingston Jr.)

'Twas the night before Christmas and all through the super,
Not a creature was stirring, we were all in a stupor
The hive entrances blocked for the winter with care,
And the drones booted out (much to their despair.)

The grublings and pupae were snug in their beds
With visions of bee bread in their tiny bug heads.
The queen on her brood comb, and I at my station
Had just settled in for a long hibernation.

When out in the bee yard there arose, I declare,
Such a ruckus as sometimes was caused by a bear!
Away to the landing board I flew like a flash!
Shoved aside the dead workers (and some other old trash.)

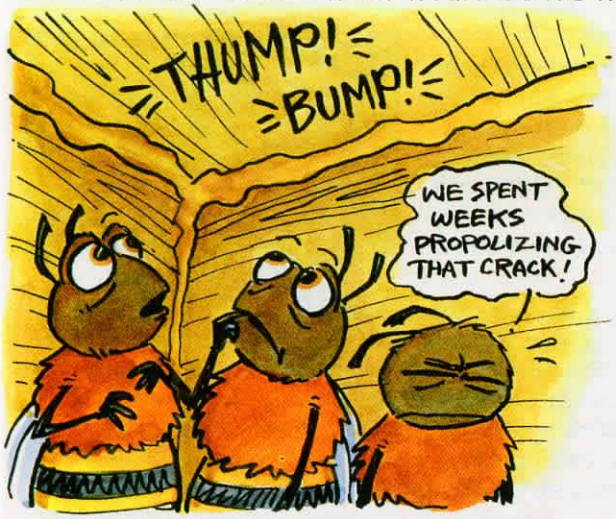
The moon on the breast of our snow covered lot
Gave the lustre of mid-day to objects I'd spot
When what to my quivering antennae should appear
But that bee-suited moron who'd caught us last year!



From the way he was making that old truck careen,
I figured he must have been at the canteen!
More erratic than swarming he bore down where we're housed
And he yodeled a carol, and clearly seemed soused!

"Hey hive one! Hey hive two! Hey hives three and four!
I've caught you, I've boxed you, cared for you and more!
But now it is winter and I'll feel remiss
If I don't give you hard workin' girls a Christmas!"

With a grinding of gears and blue cloud of exhaust,
And clatter of bee gear that was tumbled n' tossed,
He parked his old truck right at the hive's front
And we waited to see what would be his next stunt



And then in a twinkling I heard on our roof
The pawing and fumbling of the well-meaning goof
Didn't he know it was fifteen degrees?
Didn't he realize how the cold bothers bees?

He was dressed in a bee suit that was liberally smeared
With propolis n' beeswax acquired through the years.
With a sack full of junk and a grubby hand-lamp
He looked like a transient scouting out his next camp.

His eyes, how they twinkled! His dimples, so neat!
His nose (stung so often) resembled a beet!
He rooted around in the dark with his pack,
Then into our midst he upended a sack.

There was Apistan perfume and nectar cologne,
Box of chocolate royal jellies for Queenie alone,
Big tasty grease patties sugared up to the max,
Heck, even the malingering waxmoths got snacks!

Then he sprang to his truck, threw the old heap in gear,
That's the last that we saw of him 'til the next year.
From out of the night a last greeting he'd fling,
"Happy Christmas to all, I'll be back in the spring!"

END

NEW NEXT YEAR

Dadant

888.922.1293
Dadant@dadant.com

American Foulbrood (AFB) is an infectious brood disease caused by the spore-forming bacterium *Paenibacillus larvae* var larvae. It is the most destructive and widespread of the honey bee brood diseases.

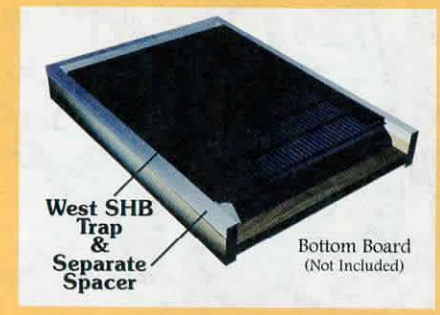
AFB disseminates rapidly through the colony and, if left unchecked, spreads quickly to other healthy colonies both in the same apiary and those nearby.

AFB Field Test Kit

EFB Field Test Kit

European Foulbrood (EFB) is a bacterial brood disease caused by several agents the main being the bacterium *Melissococcus pluton*. It occurs most frequently in the Spring or early Summer during brood rearing and is thought to be caused by stress in the colony and lack of pollen.

Symptoms can be variable which makes EFB difficult to identify with certainty; frequently disappearing once there is a nectar flow. But EFB can seriously effect brood development and needs to be identified in a colony as soon as possible.



The West SHB Trap was designed to sit on the bottom board just where SHB naturally like to hide. The Trap consists of a tray that you partially fill with a small amount of vegetable oil and a specially designed lid that is covered with almost 300 small slots.

Rossman Apiaries INCORPORATED

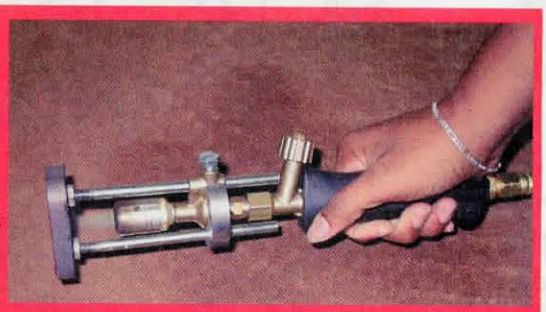
800.333.7677

5 Frame Nuc Excluder

Five-frame Nuc. with *NEW* Queen Excluder. Joints screwed, heavy duty wire for excluder and extra wide Cypress frame for stability. This goes with the screened bottom board (not shown) and migratory cover for five-frame nucs.

BrandNew Industries, Inc.

800.964.8251
www.brandnew.net



BrandNew Industries, Inc. has recently introduced their propane-powered brander called the Model 1021 PORTO-PRO. It helps prevent theft of hives and equipment because the branded impression is not easily removed. The unit is light weight, inexpensive, easily portable, rugged in construction and is ideal for field applications. It comes with a 10-foot hose and connects to an ordinary 20-pound propane BBQ tank (which the customer furnishes).

Bee-O-Pac

519.586.8289

www.aginnovation.ca/profile

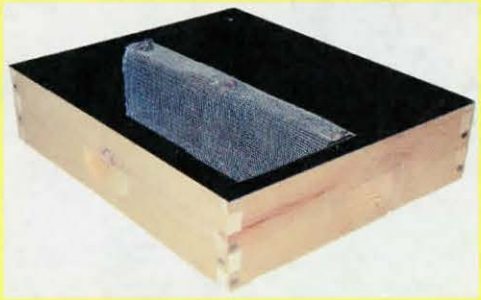
According to beekeeper and co-designer, Andrew Sperlich, the Bee-O-Pac is unique in that it consists of two virgin food-grade plastic frame havles which can be snapped together and inserted as a group of eight directly into a standard half frame without any modification. A comb foundation is embossed directly into the plastic containers so wax foundations are not needed for the bees to create the comb. At harvest time the frames break apart into 16 marketable units along preformed perforations, a lid is snapped on, and the combs can be sold without modification or repackaging.

Mann Lake Ltd.

800.880.7694
www.mannlakeltd.com

The 120-frame extractor designed specifically for the commercial beekeeper! Industrial strength, 16-gauge stainless steel tank; segmented stainless steel reel to keep combs properly spaced for proper extracting flow. 3-Point opening for easy access when loading and unloading; full wash-down 1½ HP gear drive motor with no belts to slip or break efficient side-wall flow and easy drainage. Also offered in smooth reel to accommodate more frames! Manual or auto speed control available.

Mann Lake's new Kwik Start Smoker Pellets have got to be seen to believe! Simply light with a flame, blow it out and watch the smoke roll (if using to start your other smoker fuel, leave the flame going for fast fire starting action!) These can be used alone for checking a hive or two, or used as a starter for any other smoker fuel. Takes the work out of starting your smoker!



The new Mann Lake Top Feeder comes completely assembled and ready to use. Holds over three gallons of syrup and features a galvanized steel safety screen to prevent drowning! This feeder is constructed of a heavy-duty, single piece plastic to provide a no-leak reservoir! Wooden surround measures 4½" by 19-5/8" and fits all standard 10-frame equipment. There is no comparison to the strength and durability this feeder provides over foam top-feeders.

Brushy Mountain introduces a new, no-hat-needed square folding veil. Made of 100% cotton cloth and bonding, black screen and white nylon mesh, it comes with a handy chin strap to keep the veil from shifting, and traditional string and front 'D' ring for securing around the neck.

800.233.7929
www.beeequipment.com

BRUSHY MOUNTAIN BEE FARM, Inc.

A redesigned, smaller and lighter vaporizer has been introduced by Better Way Wax Melter Honey Processors Ltd. There is an all welded steel chamber allowing more square inches for vaporation. This vapor chamber has a 240 cubic foot capacity blower that pushes the vapors into every nook and cranny of the colony.

This machine works best on two deep or one deep and shallow. Also the entrance must have three fourth opening and full width of bottom board. The machine comes in 220 volt or 110 volt.

Honey made treats available. Honey glazed beef jerky, smoked and made with Oregon honey. Plus, Marion berry jam, Marion betty sauce and Jalepeno, habenero, garlic and sweet onion mustards – all made with honey.

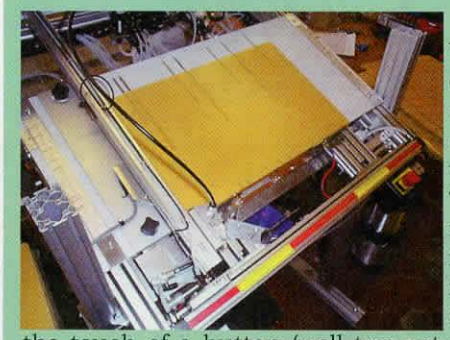
Ruhl Bee Supply
503.657.5399

Better Way Wax Melter
515.967.4952

Continued on Next Page

Thorne Beehives

www.thorne.co.uk



Automatic Wiring Machine – Developed for our own use as well as resale. This automatic machine is fully adjustable for all sizes of foundation. At the touch of a button (well two actually, one of its safety devices) this machine will weave, tension, heat, embed and cut wire into sheets of foundation in a zig-zag pattern.

The machine is pre-programmed and is based around a table with compressed air cylinders in an x/y formation. The wiring head moves rapidly over the surface of the foundation weaving itself around adjustable pins. Capable of wiring 2500 sheets per day depending on size.

Illuminated Grafting Tool – Grafting is made so much easier with this illuminated grafting device. Complete with its own carrying case with several compartments. This lightweight device makes grafting a pleasure. Battery operated with a magnifying lense mounted on the handle.

Nimrod Smoker Lighter – A great little single handed tool ideal for lighting smokers. Ergonomically designed for ease of use, at the flick of a switch you have an instant 1300°C flame. Powered by a simple refillable butane cigarette lighter (not supplied). Safety lock to prevent accidental ignition. Continuous running time of 30 minutes. Stays alight in the windiest of conditions.

GloryBee Foods

800.456.7923
www.GloryBeeFoods.com

These suits were manufactured for the Brazilian beekeeping trade and were designed to help Brazilian beekeepers deal with the problem of Africanized bees. They are made of 73% Acetate and 27% Polyester. This unique combination of material is flame retardant and sting resistant. The material does not lend itself for the bee to land upon or to grab hold of the material. It features: elastic at wrists and ankles; front, back hive tool pockets; plastic zipper and drink hole covered by Velcro; non-detachable veil with a rigid hat with an adjustable plastic head piece. Sizes available – small, medium, large and extra large in full suits or half suits (pullover)

The Ventilated Leather Gloves are made of cowhide and acetate/polyester blend and have elastic sleeve to prevent bees from entering. The gloves are available in small, medium, large and extra large.

Betterbee Inc.

800.632.3379

Shoulder Veil – This handy hat-veil combination is just the thing for those quick hive checks. It features a wide brim, and excellent visibility. It covers the shoulders and is tightened by a long string that wraps around your waist just as our regular veils do.

Styrofoam Bottom Board – This bottom board features a built in tray under the built-in *Varroa* screen. This tray is accessible from the back of the bottom board and can be used to check for *Varroa* mite or it can be used to close the hive bottom in the Winter. This bottom board is the same size as a Polystyrene hive and features raised nodes on all corners to center the hive and keep it in place.

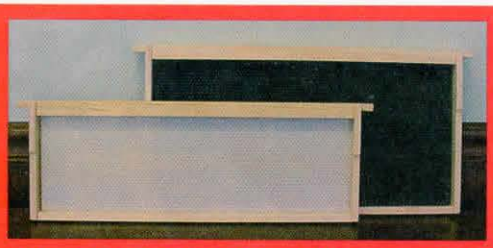
Frame Holders – Desirned to hold one frame while you inspect the hive, this two piece unit is light weight and rust proof and is easily transported to the beeyard along with your hive tool. It comes in two sizes, one for wooden hives and one for polystyrene hives.

The Walter T. Kelley Company

800.233.2899
www.kelleybees.com

Pollen Cleaner – A fast and easy way to clean your fresh pollen. The small electric fan blows across the pollen as it is fed through the funnel, allowing the chaff and debris to be removed just before the pollen falls into the collection box.

Gor Honey? – Process honey from start to finish, all in one convenient, compact location. Begin with an *Uncapper*, go through the entire process of extracting, filtering, warming and bottling, plus melt the cappings. This unit features a single frame *Uncapper*, 12-frame *Extractor*, *Jacketed Sump*, *Honey Pump* and fittings, *Jacketed Bottling Tanks*, plus a *Multi-Purpose Tank* for melting the cappings, and a variety of other tasks. When you are done, use the *Power Spray Washer* (included) for eash clean-up! The entire unit is mounted to a moveable, steel sled. Ideal for local clubs or for a personal honey house operation.



You asked for it! – While Kelley's 100% beeswax foundation sheets continue to be very popular, many have requested the plastic foundation. The Kelley Company will be offering the beeswax coated, Pierco foundation for both brood chambers and supers. Their excellent white pine frames featuring grooved top and grooved bottom bars make for easy snap-in of the plastic foundation sheets.

B&B Honey Farm

800.342.4811

Plastic Bee Pallet holds four hives (Telescoping covers can only be used on two spots). Virtually indestructible. Ultra-violet treated so the sun can't break it down and will not rot or decay and is lightweight (28 lbs). Made out of 100% recyclable plastic.

Pastic Honey Pallet – Same qualities as the bee pallet except this one is made for harvesting, transporting and storing honey supers. It collects all the drippings as they do not end up on your truck bed, or honey house floor. All drippings are reclaimable. All these attributes and one more key one. They are absolutely sanitary. A quality that is becoming more important in this industry.

Rip Stop Heavy Duty Honey Pallet Cover – This cover will fit either a four stack unit or a six stack unit of honey supers. Keeps your honey clean and dust and dirt free while transporting or storing. Made out of rip stop material which makes it virtually impossible to rip or tear. Side straps tighten cover to stacks.

Beehive Botanicals

800.233.4483
www.beehivebotanicals.com

Certified by the Chicago Rabbinical Council Beehive Botanicals offers bee propolis and bee pollen supplements, plus Lip Balm Kosher products in their branded line. They also offer many Kosher custom manufacturing services as well.

Services include encapsulation, tableting, custom formulation, private label, liquid extraction, bottling, labeling and raw materials. Beehive Botanicals services focus on shorter lead times and lower minimums.

Certified by Midwest Organic Services (MOSA), Beehive Botanicals provides organic encapsulation services which incorporates the use of certified, preservative-free vegetarian capsules.

With a focus on shorter lead times and lower minimums, Beehive Botanicals' services include encapsulation, tableting, custom formulation, private label, liquid extraction, bottling, labeling and raw materials.

KEEP IN TOUCH

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FAX: 330-725-5624
EMAIL: KIM@BEECULTURE.COM

MAILBOX

Ants & Bees

In the October *Bee Culture* there is an article by James Tew, "Up Close & Personal) which was very interesting.

The part about ants, brought back some memories.

I had picked up a swarm on the way to the ocean beaches, about 20 miles from home as the crow flies. I shook it in front of a hive and watched. When I spied the queen I guided her in with my index finger. This works quite well on prime swarms, but virgin queens are more excitable and will sometimes take to the air if you try to rush her. After she went in I started for home. Upon passing an old logging road I suddenly remembered I had left a decoy hive on top of a large fir stump. That was in 1998, five years ago. The reason for leaving it was, upon taking the cover and inner cover off it was completely filled with red ants (the kind that bite). I threw the inner cover on the ground and replaced the outer cover. I left, smashing ants that were on my hands and arms.

I thought "I wonder if that hive is still there." I walked up the road to where the stump should be, but in five years it was grown up pretty bad. I finally peered through the brush and there it was. It was quite dark with all the vegetation around it. I was then amazed to see bees coming and going from the corner of the old cover. And there on the ground was the inner cover right where I threw it. I tried to get the cover off but the comb had been built from it.

I decided to come back with a new box and some empty frames to salvage these "free bees."

The next day I set all my gear on the ground about 50 feet from the stump and lit up my smoker. I didn't put on a veil or gloves deciding to see how mean they were. I proceeded to extract the cover cutting the comb away as it came off. I was amazed to see there was still a large ant nest in with the bees. But these were large black carpenter ants. There were lots of eggs that resembled puffed rice. The ants were frantically hauling them around. The ants were crawling on me, but didn't bite. The bees were even better – no stinging. I proceeded to cut the comb which was full of brood, so I knew these bees hadn't been here long.

I brought eight or nine narrow frames with some red rubber bands. I then cut the comb to fit the frames putting three rubber bands in place. I put these into a deep hive body and ended up with five frames of brood which wasn't much considering the size of the frames, and also about 10 pounds of honey which I planned on feeding back to the colony.

As you can imagine when I was done everything was sticky and covered with ants. Most of the bees went into the new hive, after I had done this. I put the hive back on the stump. I left them alone for nine or 10 days and then moved them to a beeyard 20 miles away. There were still ants when I moved them but a week later they were gone.

The bees are doing well and filled a super for Winter.

I thought the same thing as the Ohio beekeeper in Tew's story – that maybe the ants and bees had a symbiotic relationship.

I'm sure the ants were there when the bees chose this for their home. This hive was almost completely full of duff and debris. I'm sure the bees had to make room for expansion, thus making less room for the ants.

Jim Cowan
Aberdeen, WA

Honey Board Continues

With the positive vote in the recent referendum, the honey industry has given the National Honey Board the green light to continue the multiple tasks of researching, promoting, and protecting the image of honey for another five years. The fact that leaders of some honey industry groups are working toward establishing a packer/importer funded board (that may supercede the National Honey Board at some point in the future) will not deter the Board from the tasks at hand. I congratulate the honey industry for having the vision to allow the NHB to continue working on behalf of the industry. I also thank the NHB staff for their professionalism, dedication, and continued focus on the job at hand: to maintain and increase the demand for honey.

As a honey producer, I am extremely grateful that market prices for honey have remained at a profitable level for well over a year. There are many reasons for this, but one fundamental reason is that consumers perceive honey as a pure, natural product that is good for them. This positive perception is the basis of the strong demand for honey, and strong demand is the foundation of our market. We should not take this positive image for granted. We must all work together to help ensure that honey's wholesome reputation is not tarnished.

In order to more effectively plan future NHB programs, a discussion of the threats and opportunities facing our industry took place during the September 2003 meeting of the National Honey Board. There were 45 threats identified during the half day session, a number of which could negatively impact the honey industry severely if not dealt with in an effective and timely manner. Opportunities for the NHB to deal with these threats were identified as well. Although current NHB programs are already addressing many of these issues, the discussion helped the Board prioritize and consider new and additional means of addressing those issues with which

Continued on Next Page

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it is capable of dealing.

In the area of research a number of projects funded by the National Honey Board continue to focus on honey and health. The Board views the FDA's newly announced policy to allow "Qualified Health Claims" on product labels, as a great opportunity to possibly capitalize on NHB research. The NHB Staff is exploring whether our research supports certain qualified health claims for labels on honey containers. In addition, NHB research projects pertaining to economic adulteration and identification of "ultra-filtered sweetener derived from honey" are also vitally important to the industry. The Board is also investigating funding research projects that assist producers maintain healthy bee colonies which are able to produce high quality honey.

Many exciting marketing and promotion programs continue to comprise the major portion of NHB program spending including:

Rebecca Kolls (The Gardening Channel, Good Morning America) has been a very dynamic NHB spokesperson on radio, newspapers, and television. She has also made personal appearances at public markets in seven major cities across the country. The fact that she is a hobby beekeeper and loves bees and honey makes her a natural for this role. Watch for Rebecca this holiday season as she promotes honey during a television and radio satellite media tour that will air on morning and noon time television shows.

Syndicated newspaper placements, run of press and mat releases to the media this year resulted in an estimated ad value of nearly $1.5 million for a cost of less than $100,000.

There will be a supermarket promotion in approximately 3,800 stores in 12 major markets from coast to coast in November. The promotion will feature floor graphics and recipe pads set in the honey aisle.

The NHB continues to work with Chef Mani Niall who has traveled around the country educating chefs about the many uses of varietal honeys.

Food service is a major focus of NHB marketing efforts and work continues with restaurants such as Tony Roma's, Applebees, Fresh Choice, Quizno's, Darden (Olive Garden, Red Lobster, etc.) to include honey items on their menus. Honey is being promoted in "Buzz Drinks" and as a pizza ingredient or topping throughout the food industry as well.

In the area of Industry Services the NHB provides many different helpful tools such as: cookbooks, recipe leaflets, hang tags, and seed packets for planting nectar and pollen producing plants in the garden. The seed packets have a picture of Rebecca Kolls on them and are great for giving away with location rent honey along with recipe leaflets or cookbooks. The NHB "Honey Locator" (honeylocator.com) is an excellent way for industry members to let the world know what type of honey they have to sell.

These are merely a few of the many NHB research, marketing, and promotional programs which are designed to maintain and increase the demand for honey. For further information on these or any other Board programs, check out honey.com, nhb.org, read the "Nucleus" NHB newsletter, sign up for "Bee Mail," talk to a National Honey Board member, or call the NHB office toll free at 1-800-553-7162.

We are a small industry that can accomplish a great deal if we work together. There are multiple challenges we face as an industry and multiple opportunities. The NHB continues to address both in a prudent, professional manner so that all of us in the honey industry can have a brighter future.

Gene Brandi, Chairman
National Honey Board

Bucket O Bees

As the yellow jacket season progressed on into October, I have had my share of "'can you get these bees" I happened to be too close to the phone after work and fielded one of those calls. This guy said he has bees in his tree stand. Trying to put a picture together in my mind, I ask "where are they in your tree stand?" "They're in a bucket." "In a bucket?", I echo. "Yeah, they're in a 5 gallon bucket." "You're sure they're not yellow jackets?", I asked. Nope, he was sure they were honeybees. I said I'd be there at dark, when they stop flying. It wasn't too far, so I went, still thinking they were yellow jackets. He drove me out around the field, into a wood lane and stopped. On the deck of his tree stand was a metal bucket he used for a seat. Before I tipped it over, I could see honeybees around the rusted edge of what would normally be the bottom. Sure enough, it was FULLL. Edge to edge, top to bottom. He told me he normally had to shake out a mouse nest, but it was heavier this year. When he tipped it over, he was face to face with a whole lot of bees. This was by far the easiest colony removal anybody could ask for. Just pick it up by the handle and go. Being so close to winter, I'm going to try putting the bucket in a stack of hive bodies, pack it and put some extra honey on top.

Charlie Vorisek
Linesville, Pa.

Hooked On Bees

I am a small time beekeeper in Waitsfield, Vermont. I look forward to your magazine each month. I have been involved with bees for the past six years. When we bought this farm here in Vermont, the bees and the beekeeper (Bob Tracy) came with it. Having no previous experience with bees, and actually ending up in the emergency room from a bumble bee sting to the lip, and again for over 80 stings from white

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faced hornets, I was not that anxious to get involved. But within a few days Bob had me hooked.

Bob who is in his 70s has been involved with bees his whole life and his knowledge and experience has helped me more than any book could. This past Summer Bob and I bought five new hives. (Due to last year's extremely cold Winter, foulbrood, and Nosema, we lost all our bees, and started over again with all new equipment.) Through our state bee inspector we contacted a beekeeper who was getting out of the business due to health issues, and went and picked up our hives. Arriving at the beeyard late in the afternoon we could tell that these were a healthy bunch of bees. The hives consisted of two deeps, three mediums, and one shallow. We strapped the hives together with a ratchet strap, covered the opening with hardware wire, and bent over to pick them up. They weighed about 200 pounds each! Bob said "You ready?" and I said, "Are you sure you want to try and lift this?" and the next thing I knew we had the hive up in the air and running for the truck tailgate! We loaded three more hives the same way, paid for the hives and headed home with headlights of the truck pointing up in the trees!

The next morning we took the hives apart super by super and placed them in our beeyards. It was a great experience for me, from the ride to get the bees, talking with Bob about bees, to listening to Bob and Mr. Devina (the man selling the bees) talking about bees, and bears, and skunks, and mites, and chalkbrood. As a "new comer" to the business I enjoy every moment involved with bees and the old timers who have done so much, and seen so many changes over the years.

I also had a great opportunity to go out and check six different hives this Summer with our state bee inspector and Bob Tracy and I recommend anyone interested in bees do this, the hands on experience and knowledge is unbelievable.

Finally, shortly after reading one of your issues this Summer, in particular an article about hives being destroyed by bears or storms, a bear got into one of my hives. Bob has these "Bear Boards" that he has made, that consist of a piece of plywood or pine with sheetrock screws screwed up through them every two inches or so. He sets them out all around the hives (with the screws up) and he swears by them and now I do too! I had them set out around almost all my three hives except for the one the bear got. It wasn't as bad as it could have been, he only took the two top mediums off and destroyed one. Again after just reading your article I loaded up the smoker and put gloves on, (which I normally don't wear) and put the hive back together. I then strung electric fence around the beeyard and put in a good ground rod and had that fence "snappin"! The entire time I was putting up the fence those bees were not at all happy, and stayed unhappy for a week or so! The bear came back, but didn't get by the fence, he did come down to the house and pulled the remaining broken hive parts out of my pickup bed.

So, for those of you who have a "Bob Tracy" in your town don't pass him up, because his knowledge and the adventures can be priceless.

Thanks for a great magazine.

Gib Geiger
Waitsfield, VT

Other Chinese Pests

As a backyard beekeeper of 40 years standing, one of my main concerns about Chinese honey is not the honey itself but the wood pallets on which the barrels are transported to this country.

Such pallets were supposedly the agency for introducing two highly destructive pests from the Orient – the Asian Long Horned Beetle and the Emerald Ash Borer, both devastating to trees. In Michigan the budget this year for attempting to control the latter is $44 million! It will take a lot of cheap honey to make up for that expenditure. Such are the blessings of Free Trade.

We need to become much more skilled at asking the Ecologist's Question" "And then what .?"

John H. Tanton
Petosky, MI

Very UnCOOL

In October's *Bee Culture*, Alan Guebert accused USDA managers of conflicts of interest, blaming them for the current reconsideration of "Country Of Origin Labeling" (COOL) underway in Congressional hearings.

Blaming USDA managers for the actions of Congress is as bizarre as blaming the cat when you get a bee sting.

It should be no surprise that lobbyists lobby Congress, and that some elected representatives listen to them. The good news is that all attempts to delay or eliminate COOL requirements have failed. Congress apparently also listens to their constituents, who like the idea of COOL.

The House is holding hearings, attempting to make sense of both the merits and the burdens of the COOL mandate. The USDA has no influence over Congress. USDA employees are prohibited from doing more than answering direct questions from Congress. This is required by the "separation of powers," a concept so basic to good government that it is outlined in the first three articles of the U.S. Constitution.

While the USDA did make cost estimates based upon silly assumptions like $50-an-hour paper-pushers, the General Accounting Office made it clear to the USDA that non-governmental paper-pushers can be hired for much less. (It is amusing to see a group of $100-an-hour paper-pushers tell a group of $75-an-hour paper-pushers that $50 an hour is excessive, but I digress.)

Yes, the USDA does have a habit of hiring people with agribusiness backgrounds. While this is painted by Mr. Guebert as sinister, a more rational explanation is that the USDA hires successful managers with track-records in large-scale agriculture, rather than falling victim to

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cronyism and patronage. Would the USDA hire managers without agricultural backgrounds, or hire ranchers whose only "management" experience consisted of herding cows? I hope not.

Of course the meat-packing industry will try anything it can to slow down or stop COOL regulations. No surprise there, as they like imported meat for the same reason some honey packers like imported honey – low cost. They also know what consumers do when given a choice between clearly-labeled local food and food from far away. They buy local.

But let's not blame the USDA for things over which it has no control. If COOL ends up lukewarm, it will be due to Congressional action or inaction, rather than a conspiracy within the USDA to undermine legislation proposed by the USDA.

We should certainly criticize the USDA when they deserve it (remember the lack of funding for the Bee Labs?), but let's not make rabid accusations based upon nothing more than where people used to work.

James Fischer
Farmageddon, VA

INNER COVER

In the Spring of 1878, A.I. Root found himself with a cash surplus of about $7,500 – $3,000 profit from his business, the rest from the sale of the far-too-small building he had been using as a store and factory.

But he needed another building to continue his business, and he was insistent that it be as near the railroad as possible. After negotiations with the city of Medina he purchased the then county fairgrounds on the far west side of town. That 17½ acre lot cost him $3,500, leaving only $4,000 to build his new factory.

He needed yet an additional $4,000 for the building, the new machinery to be put inside, and an enlarged printing press for both his magazine, and the books he was printing – *ABC* certainly the most prominent.

By Fall he had used all of his saved money, a loan he had taken out and his profits, and still had to pay the man who had made all of the bricks for the original structure. He had, during the Summer, related the delicate financial position he was in, in his normally candid and forthright manner in his monthly column in *Gleanings*. He kept his readers informed of all of his activities, just so they would know.

Well, it was the 12th of December, and the brick man wanted his money on the 20th, and A.I. had eight days to find the money.

On the 13th a stranger came to visit. Though busy, A.I. showed him around, and eventually the conversation turned serious. The stranger admitted to being impressed with what A.I. was doing, and how he was doing it. But A.I.'s recent articles had eluded to the financial situation looming on the 20th, and he thought he could help. He offered A.I. a loan, at lower-than-bank interest, without security. The loan came through, the brick maker was paid and shortly the factory finished.

A deeply religious man, A.I. credited the events to prayer, and to what the Bible says about *entertaining angels unaware*. You just never know.

Dr. Keith Delaplane is the Extension Specialist in Apiculture at the University of Georgia, in Athens. He's been there about as long as I've been here I believe, something pushing 20 years. During that time he has hosted many meetings, visited hundreds of others, and served the University, and the Georgia Beekeepers in many educational and academic ways.

One of those tasks involves answering questions when beekeepers call, or taking their questions and having discussions at meetings. This is, as you know one of the most visible tasks an Extension Specialist has. Always know your stuff and always have a smile and the people love you. Don't, and they won't.

One of the people often in Dr. Delaplane's audience was a fellow named Myron Schoer, a hobby beekeeper who expanded to a sideliner after he retired. Not ever calling attention to himself, he was easily overlooked in a crowd, but he was always around. He used to attend meetings, ask questions and on rare occasions call Dr. Delaplane for additional information.

A scientist himself for 30 years, Mr. Schoer appreciated the science and technological skills required to keep bees, and when confronted with obstacles beyond his understanding he naturally consulted another scientist. Always, according to Dr. Delaplane, were his questions informed, short, to the point, thank you and good-bye. Not unlike a thousand other questions and answers every day, every week, every year.

Mr. Schoer passed away a year ago, but his undying curiosity and concern for the future of bees and beekeeping, and his apparent satisfaction with the University of Georgia's program, led him to leave many thousands of dollars to Georgia's Apiculture program to support graduate students and post-doctoral scientists studying honey bees and pollination.

Entertaining angels unaware. You just never know.

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Some thoughts on buying bees this Spring. Plan ahead this year, even earlier than in the past. Here's some of what's happening that will cause problems if you wait.

First, there will not be enough bees next Spring. This year's drought has stressed bees, resistant mites and lousy honey crops haven't helped. Midwest commercial operators will be looking to restock because the price of honey is still high.

Queen and package producers I've talked to are, or are nearly booked for early season. They'll have later season packages (the best, anyway), but early are going fast.

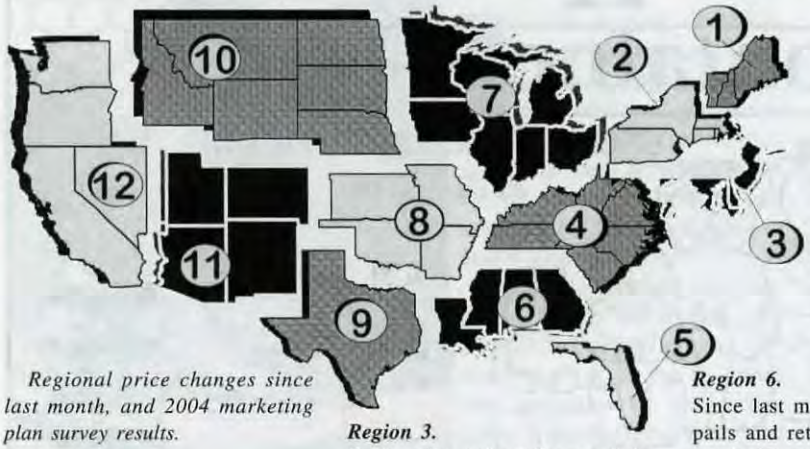
Fewer people are making bees to sell. The price of honey and price for pollination (rumors of $65 for an 'average' colony in almonds are already common – $75 for boomers, even $25 for five-frame nucs) are pulling them away from shaking packages.

There are an increasing number of people industrious enough to head

Continued on Page 62

Angels, Queens & Beetles

DECEMBER - REGIONAL HONEY PRICE REPORT



Regional price changes since last month, and 2004 marketing plan survey results.

Reporters were surveyed about demand, prices, profit, growth plans for next year, product line and the sales/price ratio.

Region 1.
Bulk prices steady, pails, wholesale and retail down. Demand steady to up a bit, prices set this year up to steady, profit steady, little expansion planned, product lines steady, and the mood cautious!!

Region 2.
Bulk steady, pails and retail down, wholesale up. Demand steady to up, prices set up this year, profit about even, little expansion planned, products steady and the mood positive.

Region 3.
Bulk, pails and retail up, wholesale down. Demand up, prices set steady this year, profits steady to up, little expansion planned, along with product lines and the mood positive.

Region 4.
Bulk, wholesale and retail prices steady, pails up. Demand up to steady, prices set rising to steady, profits even, expansion plans cloudy, and product lines steady, and the mood is bright.

Region 5.
Bulk and pails and wholesale down since last month, retail up. Demand mixed, prices set up a little, profits even, expansion plans steady, as is product line expansion, mood guarded.

Region 6.
Since last month bulk prices up, pails and retail down, wholesale steady. Demand this year steady to up, prices set steady to up, profits even, expansion plans mixed but product line expansion up a bit, mood positive.

Region 7.
Since last month pails up, bulk and wholesale prices unchanged but retail down. Demand steady, prices set steady to up strong, profits even to down a bit, expansion plans negative, but product line steady. Mood strongly positive.

Region 8.
Pail prices up, bulk and wholesale steady but retail down. Demand steady to up this year, prices set up, profits strong, expansion plans, and product line not moving. Mood cautious.

Region 9.
Pail prices up since last month, steady for the rest. Demand mixed, but prices set up to steady this year, profits guarded but up. Expansion plans weak, and product lines shrinking, but mood good.

Region 10.
Pail prices up since last month, all others unchanged. Demand uncertain, but prices set steady to up a bit, however profits definitely down, expansion plans mildly positive, product lines unchanged. Mood cautious but good.

Region 11.
Since last month bulk prices unchanged, all others up. Demand increasing a little, prices set unchange to up, profits strong but expansion plans on hold and product lines unchanged. Mood uncertain.

Region 12.
Bulk up, pails steady the rest down. Demand mixed but prices set higher than last year, profits unchanged, expansion plans on hold all over, and the mood is barely upbeat.

	Reporting Regions												Summary		History	
	1	2	3	4	5	6	7	8	9	10	11	12			Last	Last
Extracted honey sold bulk to Packers or Processors													**Range**	**Avg.**	**Month**	**Yr.**
Wholesale Bulk																
55 gal. Light	1.44	1.25	1.44	1.25	1.40	1.41	1.52	1.44	1.50	1.51	1.35	1.25	1.25-1.52	1.40	1.38	N/A
55 gal. Amber	1.20	0.95	1.33	1.27	1.23	1.29	1.39	1.33	1.10	1.45	1.34	1.33	0.95-1.45	1.27	1.22	N/A
60# Light (retail)	88.67	89.19	95.30	91.20	75.00	105.00	110.14	102.05	108.33	100.00	107.50	105.00	75.00-110.14	98.12	95.95	90.88
60# Amber (retail)	83.00	84.44	91.61	86.10	89.80	93.00	110.20	95.00	102.50	80.00	111.67	84.00	80.00-111.67	92.61	92.69	89.06
Wholesale Case Lots																
1/2# 24's	37.57	40.12	42.16	36.29	42.06	25.50	44.85	32.25	41.80	35.76	32.00	62.06	25.50-54.95	37.18	36.52	38.86
1# 24's	51.39	54.78	58.77	50.17	55.60	56.00	55.61	58.96	53.20	67.08	77.40	63.00	50.17-77.40	58.50	58.95	51.35
2# 12's	47.31	51.41	46.18	46.67	46.18	43.00	49.93	58.52	48.33	55.92	59.75	57.00	43.00-59.75	50.85	51.43	43.63
12 oz. Plas. 24's	43.49	38.78	45.85	40.76	45.85	47.00	43.68	46.56	44.73	47.82	55.40	46.80	38.78-55.40	45.56	46.67	41.14
5# 6's	52.75	53.99	55.99	50.85	55.99	60.00	54.30	66.10	55.99	56.43	50.00	66.00	50.00-66.10	56.53	54.46	52.80
Quarts 12's (**NEW**)	65.00	72.12	75.72	64.75	75.72	81.33	76.54	66.33	74.67	97.90	79.70	84.00	64.75-97.90	76.15	76.92	
Pints 12's (**NEW**)	49.00	37.35	44.58	37.94	44.58	49.33	43.37	43.00	43.88	50.60	45.00	48.00	37.35-50.60	44.72	44.25	
Retail Honey Prices																
1/2#	2.32	2.18	2.64	2.19	2.29	2.75	2.20	2.66	2.40	2.62	2.68	2.64	2.18-2.75	2.46	2.41	2.19
12 oz. Plastic	2.88	2.26	3.26	2.66	3.30	3.52	2.73	3.36	3.18	3.41	3.44	2.85	2.26-3.52	3.07	3.22	2.73
1 lb. Glass	3.31	2.89	3.52	3.21	3.25	4.13	3.32	3.27	4.00	3.90	4.16	3.85	2.89-4.16	3.57	3.70	3.15
2 lb. Glass	5.89	4.91	5.75	5.54	6.49	6.50	5.63	6.53	6.03	6.47	6.14	5.75	4.91-6.53	5.97	6.07	5.16
Pint (**NEW**)	5.00	4.55	6.21	4.83	5.99	5.74	5.14	6.65	5.03	5.29	6.51	6.21	4.55-6.65	5.59	5.29	
Quart (**NEW**)	8.00	6.65	11.06	6.80	7.29	7.69	8.72	8.59	8.48	10.80	8.12	10.19	6.65-11.06	8.53	8.48	
5 lb. Glass	13.04	10.22	11.57	12.04	11.25	12.75	12.26	11.22	11.57	13.59	13.06	13.90	10.22-13.90	12.20	12.30	11.85
1# Cream	4.58	4.16	4.33	4.30	4.33	3.80	3.82	3.97	4.33	4.48	4.60	4.02	3.80-4.60	4.23	4.21	4.11
1# Comb	5.05	5.16	4.56	5.07	4.56	4.30	4.39	4.50	4.56	5.50	5.55	5.00	4.30-5.55	4.85	4.53	4.98
Ross Round	4.25	4.19	4.85	4.77	4.85	3.75	4.43	4.00	5.99	5.00	5.55	4.85	3.75-5.99	4.71	4.64	4.29
Wax (Light)	2.19	2.41	2.17	1.62	1.75	1.37	1.02	2.18	2.25	1.60	1.65	1.50	1.02-2.41	1.43	1.52	1.51
Wax (Dark)	1.45	1.60	1.62	1.40	1.00	1.17	1.06	1.80	1.58	1.62	1.50	1.00	1.00-1.80	1.10	1.26	1.78
Poll. Fee/Col.	46.25	37.33	33.00	35.67	35.00	42.50	42.31	40.00	44.00	41.81	55.00	35.00	33.00-55.00	40.66	38.42	37.99

RESEARCH REVIEWED

Explaining • Defining • Using

Steve Sheppard

"So many choices – so little time."

There are many times in the life of a worker bee when it may be necessary to make a decision. Whether to continue foraging on a particular patch of flowers, whether to sting an intruder detected near the hive or whether to feed royal jelly to a particular larva in the colony. The latter decision, especially as it relates to choosing which larvae to feed a diet leading to queen formation, is the subject of this month's paper.

Within a honey bee colony, one of the peculiarities of the relationship among workers is that there are asymmetries in relatedness. Considering that all the workers in a colony have the same mother, these differences in worker relatedness hinge on whether two particular workers share the same father. Since the queen has mated with many males, some of her daughters will share the same father and have an average of 75% of their genes in common and some will have different fathers and have an average of only 25% of their genes in common. The group of workers that share a father are said to belong to the same "patriline" and, thus, the population of workers within a colony can be thought of as a collection of numerous patrilineal groups.

Differences in genetic relatedness among workers from various patrilines create the potential for "conflicts of interest" when it comes to the important task of queen replacement. The theoretical basis for this is that a queen that is reared from one particular patriline provides much more of a genetic legacy to workers who belong to the same patriline than to workers from other patrilines. Thus, if workers have the ability to discriminate between members of their own patriline vs. non-patriline half sisters in the larval stage – there may be some opportunity for workers to help themselves (i.e. best contribute their own genes to future generations) by producing the next queen from within their own patrilineal group.

In a recent paper, Chaline et al (2003) examined the distribution of patrilines in emergency queens and the workers that produced them. To set up the experiment, the queens were removed from two colonies and the workers were allowed to rear emergency queen cells. When the queen cells were capped, the authors removed them, together with a frame of emerging worker brood. The old queen was then reintroduced to each colony and, after five weeks had passed, the experiment was repeated. One of the colonies was used for a third round of emergency queen cell production, but the other was removed from the test when the old queen was not accepted after the second round of emergency cell production.

The researchers characterized the patrilines of both the adult worker population (from the bees that emerged from the worker brood frames) and the various emergency queens by using genetic markers known as microsatellites. Altogether, Chaline and colleagues analyzed 348 adult workers and 100 emergency queens from the two colonies. They found 13 distinct patrilines were represented in one colony and seven in the other colony. In one of the colonies, there was a significant difference in the distribution of patrilines between workers and emergency queens. In this colony, a particular patriline was found in 19 of the 66 queens produced (29%), although the same patriline was found in only 8% of the workers in the colony. In the other colony, no significant differences were found in the distribution of patrilines between queens and workers.

The authors conclude "...the proportion of emergency queens and workers can differ in their patriline composition, but ...the pattern is not consistent among colonies." They point out that even if there was a difference in the rearing of queens from a particular patriline (as was the case in one out of two colonies), the experimental set up did not allow them to address the question of "why?" Thus, in the colony where differences in patriline composition were noted, it could be that workers of the overrepresented patriline preferentially reared queens from their own group or it may be that there was a higher degree of "attractiveness" as potential queens in the overrepresented group that was perceived by workers in general. This latter possibility would support the alternative idea of the existence of "royalty alleles" (an allele is a particular genetic variant).

The authors demonstrated that reproductive competition could exist in the rearing of emergency queens (based on one colony), although this was not necessarily the case (based on the other colony). They point out that the lack of a clear answer in this study is paralleled by previous investigations of the ability of honey bee workers to discriminate between closely and dis-

Continued on Next Page

RESEARCH ... Cont. From Pg. 21

tantly related sisters. Overall, the literature on this topic remains somewhat ambiguous. What does this mean to the scientists involved? Although individual scientists will vary (as did the colonies in this study), one might predict that the motivation to solve the mystery is heightened ever so slightly and we will see more research in this area in the future. What would the solving of this mystery mean to beekeepers? Although it is early in the game, one might predict that better understanding of how workers choose and nurture their prospective queens could produce useful applications for improvement in selection and queen rearing down the road. BC

Chaline, N., G. Arnold, C. Papin and F.L.W. Ratnieks. 2003. Patriline differences in emergency queen rearing in the honey bee, Apis mellifera. Insectes Sociaux 50:234-236.

Dr. W. Steve Sheppard, Thurber Chair, Department of Entomology, Washington State University, Pullman, WA 99164-6382, shepp@mail.wsu.edu; http//apis.wsu.edu

Mark Winston

The Secret Recipes of Apprentice Queen Bee Wannabeekeepers

"Over 1700 entries popped up, all books with "bee" or "beekeeper" in their titles."

I must have too much time on my hands. I was surfing the Web in an orgy of time-wasting the other day, twiddling my thumbs at Amazon.com to be precise. Idly, I typed in a search for the word "bee." Over 1700 entries popped up, all books with "bee" or "beekeeper" in their titles.

Most of the books were, of course, straightforward texts about some aspect of bees or beekeeping. You know the genre, "*How to Rear Queens Using the Whatchamacilit Method,*" "*Swarms for Fun and Profit,*" "*Ten Easy Steps to Better Honey Production,*" and so on.

But, a surprising number of books were in the "bee as metaphor" category, works in which the authors used bees and beekeepers as allegories for the human condition. Apparently bees arouse deep thoughts in civilian authors who are not otherwise involved or experienced in beekeeping, inspiring writers to probe both the darkest and the most inspiring corners of humanity using bees as their guides.

One of these titles jumped out at me immediately, because my wife and I have been raising our own girl bee for 19 years, with some success I might add. But I'm not sure how we succeeded without "*Queen Bees and Wannabes: Helping Your Daughter Survive Cliques, Gossip, Boyfriends, and Other Realities of Adolescence.*"

Judging from the high sales rank and 33 reviews, Amazon.com customers have been pretty excited about the author's child-rearing tips. Apparently we're all easily classifiable, with parents being "Lock Her in the Closet Parents" or "The Loving Hard-Ass Parents" types, and daughters falling out into categories such as Queen Bee, Messenger, Target, Torn Bystander, or Sidekick.

Rosalind Wiseman, the author of this travelogue through adolescent angst, finds analogies with queen honey bees that she thinks are deeply revealing of the human teen condition. From her post as teen therapy maven, she declares your daughter a "queen bee" if she persuades her peers to do anything she wants, can argue anyone down, is charming to adults, deploys affection in the context of rejecting other girls, and won't take responsibility when she hurts someone's feelings.

Let's see, persuasive, charming, affectionate, irresponsible, doesn't sound much like any queen honey bees I know. Could we have a severe case of anthropomorphizing the animal kingdom here, as in reading things into bee societies that just are not there? Did Wiseman spend enough, or any, time in the apiary?

I admit to a personal aversion to pop psychology, and also admit that Rosalind Wiseman has the best of pop therapist credentials. She's been profiled on *Oprah*, interviewed on *CBS Evening News with Dan Rather*, and runs her very own nonprofit organization, the *Empower Program*.

Still, in spite of my own more modest achievements in the public therapy arena, I do wonder this: If she can't get some simple bee biology right, how trustworthy are her pronouncements about the considerably more complex world of human teenagers?

It was with some relief that I turned to another entry that popped up in my bee search on Amazon.com, *A Recipe for Bees* by Gail Anderson-Dargatz. Don't be fooled by the title; this isn't a cookbook with recipes for bee stroganoff, quiche apicultura, or drones a-la-mode. It's a novel, and a good one at that, with vivid characters, some unexpected plot twists, and a few insights into rural life, farms, love, and independence.

And bees do play an important role, although no one actually eats a bee during the course of this delightful read. Bees pop up in various ways, most repeatedly as a pendant of a bee frozen in amber, a gift from a mysterious, handsome, and seductive fella.

Late in the book, the main character Augusta finds some of her mother's old equipment in a barn, and takes up beekeeping. She orders a package of bees through the mail, but augments that by catching swarms. The swarm-catching provides some bonding opportunities with her daughter Joy, a familiar experience for any beekeeper who has had the opportunity to chat slowly and randomly while alongside a relative or friend during a day of swarm-catching and hiving.

There are some nice descriptions of beekeeping here, as the

"Kidd did her homework, and spent quite a bit of time working at the Pot o'Gold Honey Company in South Carolina."

writer Dargatz uses the motifs of swarms, honey, and different seasons in the beeyard to carry her Augusta into a more settled old age in which she grows to accept decisions she made in a young, tumultuous youth: "*She found beekeeping meditative, relaxing. It was work that involved her completely; she lost herself in the concentration required to handle the bees, and soon learned that if she entered into the work fearful or upset, the bees would smell it on her, and read it in her suddenly clumsy actions, and sting her. But if she worked in a calm manner, keeping her movements slow and deliberate, she was stung much less frequently.*"

Dargatz had spent some time learning about bees and beekeeping, and her experiences in Alberta, Canada beeyards come through clearly in her writing. To her credit, she does not make more or less of the bees than they deserved, but lets beekeeping as it really is establish a mood to draw the reader more deeply into the frame of mind of her characters.

Laurie R. King, author of *The Beekeeper's Apprentice*, also uses bees to draw the reader into her story of the now-retired detective Sherlock Holmes as he takes on a new partner, the young woman Mary Russell.

We meet Mary and Sherlock on a Sussex Downs hillside in England, where Holmes is observing bees and Russell is walking and contemplating her adolescent life. Sherlock Holmes has been painting foraging bees with blue and red dots on their thoraces, and his soon-to-be sidekick Russell brilliantly discourses on where the bees came from with just a very few clues about their behavior.

The Beekeeper's Apprentice is certainly more accurate about bees than *Queen Bee Wannabes*, although not quite as lyrical as *A Recipe for Bees*. It does, though, invoke beekeepers as detectives, and the clues we need in order to determine what is right, or wrong, in our hives.

Indeed, beekeeping is much like private eye work, in which an unusual brood pattern, the hum and feel of the bees, and observations about what is in bloom need to be assimilated and processed in order to make wise decisions about our next management steps. The metaphors work both ways, and this book delighted me with how clearly the author linked beekeeping and detective work through the common thread of deductive reasoning.

Sue Monk Kidd, another author who popped up on Amazon.com, really best nails the bee-as-metaphor in her fabulous book *The Secret Life of Bees*. Kidd did her homework, and spent quite a bit of time working at the Pot o'Gold Honey Company in South Carolina, as well as immersing herself in a wide range of writing about bees and their keepers.

She begins each chapter with a quote from the bee literature, quotes that establish the mood and upcoming plot. Her book, like Dargatz's, uses bees to redeem the main character, a young girl named Lily who also needs to grow into accepting a difficult past. I won't reveal much of the plot, but as Lily's involvement with bees increases, she begins to listen to her own heart with a deepening understanding.

Most of you can relate to what happens to Lily as her time in the beeyard grows: "*Still, if you have the right kind of ears, you can listen to a hive and hear the story somewhere inside yourself. You can hear silent things on the other side of the world that no one else can.*"

The quotes that start each chapter are perfect, both in drawing out the essence of bees, and drawing us into a better understanding of what it is to be human. For example, this quote from *The Queen Must Die, and Other Affairs of Bees and Men*: "*Her true role is less that of a queen than mother of the hive And yet, this is something of a mockery because of her lack of maternal instincts or the ability to care for her young.*" This apt, stark description of a queen honey bee leads to Lily's beginning to understand her own mother, a woman who for various reasons was unable to care for her own offspring.

Or this quote from *The Dancing Bee*: "*A bee's life is but short Threatened by all kinds of dangers during their foraging flights, many workers die before they have reached even that age.*" True for bees, and just as true for humans, where child rearing is a precarious and dangerous art.

And one more from *The Queen Must Die*: "*Honeybees depend not only on physical contact with the colony, but also require its social companionship and support. Isolate a honeybee from her sisters and she will soon die.*"

Just as true for Lily and all of us, who need community, friends, and family to thrive. Good writing about bees recalls those links, and provides an important reminder of how important the web of contact is for all social creatures.

And bad writing about bees? It, too reminds us of something: bees are not people, and we diminish our befitting awe of nature when we blur too far the boundary between the animal world and our own. BC

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Nutritional Management In Honey Bees

Malcolm T. Sanford

"A large part of a beekeeper's responsibility in caring for a colony of honey bees is to help manage both carbohydrate and proteinacous resources. This is much easier said than done."

Allen Dick's discussion of pollen patties (HiveLights[1], Canadian Honey Council, May 2003) reminds me again that for many beekeepers, nutritional management is problematic. He concludes, "Careful attention to nutrition has become even more important in recent years because adults and brood are often parasitized by mites."

Honey bee nutrition can be divided into two generalized categories; carbohydrate and protein. The former is responsible for providing the energy a colony needs to carry out its activities. The latter the building blocks needed to rear brood. Carbohydrate is an easily shared resource that can be passed around quickly within a colony. Mr. Dick concludes, "Most beekeepers know how to feed syrup and honey successfully, but far fewer understand protein supplementation."

A large part of a beekeeper's responsibility in caring for a colony of honey bees is to help manage both carbohydrate and proteinacous resources. This is much easier said than done. That's because the bees are actively foraging in the field under most circumstances and their nutritional status is often not apparent. Unlike confined livestock, it is impossible to measure exactly the nutritional inputs needed by and/or being provided to bee colonies because the insects operate in an "open system," over which there is little control. The practical result of not knowing exact nutritional status is that the beekeeper must learn to "think like a bee," using his/her experience to judge when colonies are stressed because of nutritional insufficiency.

It is relatively easy to estimate a colony's need for carbohydrates. A simple examination of a colony can often reveal that there is not enough stored honey (two standard frames is recommended at all times). Another method is to simply "heft" a colony to determine its weight. If it does not weigh what it should in the beekeeper's experience, the colony is fed.

Generally, it is easy for the beekeeper to supplement carbohydrate or sugar levels in a honey bee colony. There is a good deal of research and information on this and many beekeepers have developed their own approach to delivering the feed. An article in *Bee Culture* by Dr. Jim Tew (September 1996) gives a comprehensive list. It includes: open feeding in drums, Boardman feeders, division board feeders, hive top feeders (pails, cans, re-sealable plastic baggies), trough feeders, sprayers, dry sugar and candy boards.

Recent advances in sugar manufacture have resulted in a variety of carbohydrate feeding options for beekeepers. Not only is sucrose widely available for feed, but so is a variety of fructose syrup products, many now made from corn. Because of this, the beekeeper can manipulate bee colonies more through carbohydrate feeding than in the past. For maximum population buildup, for example, diluted sucrose syrup is used because it best emulates the natural food of a colony, nectar. A less-diluted sucrose syrup could be substituted in colder climates where an excess of moisture might be harmful and buildup is still the goal. Bees do not build up population as well on high fructose syrup (HFCS) as when stimulated by sucrose sugar syrup, but it can be used, although it is best employed in energy maintenance.

Unlike the situation for sugar, determining when or if supplemental protein feeding is needed for a bee colony is difficult if not impossible. The concept of looking to see if pollen is stored in a colony and/or being brought in by foragers, though an indication, does not necessarily mean that a colony is well nourished. The kind of pollen and where it is stored can make a big difference. Research shows that pollen stored as bee bread near brood will be preferentially used by a colony. Stored and fresh pollen will generally have different nutritional values.

The protein needs of a colony throughout the year have not been studied in all areas where honey bees reside. Most of the work on the nutritional value of pollen was done over thirty years ago. It revealed that pollen from various sources had varying amounts of protein, as did similar plants growing under different conditions. Generally it was found that fruit trees had the highest level of protein, whereas pine (e.g *Pinus* sp.) trees had the lowest. The protein amount varied from as high as 40 percent to as low as 8 percent. This research, however, was mostly done in Europe.

Mr. Dick says protein supplement patties are usually made of inexpensive ingredients such as brewers yeast or soyflour. He concludes: "Both must be suitable

"In queen rearing activities, a lack of protein can lead to fewer larvae being accepted by both starter and finisher colonies."

for bees – see a bee supply specialist." Pollen and sugar make patties more attractive to bees, according to Mr. Dick, especially pollen in patties with low sugar content. However, using enough sugar ensures consumption even without pollen being added.

Mr. Dick says that stimulating brood rearing is often the stated goal, but causing early brood rearing by using supplements can be tricky. Once bees are induced to raise (seasonally) unnatural amounts of brood, food must be supplied continuously and never allowed to run out until natural pollen becomes available. He concludes that inducing large amounts of early spring brood is not the best use of pollen supplements. Rather he concludes, it is better to use patties to nourish adult bees that will put them in better nutritional condition to raise brood when natural pollen is available.

A lack of protein and other essential nutrients can also lead to poor development of the pharyngeal (brood-food) glands and shorter life spans for worker bees. This can result in stress in bees, leading to other diseases. And in an effort to collect more pollen, workers may collect other substances that have the same size as pollen, but may not be as nutritious, and in some cases, may be harmful.

In queen rearing activities, a lack of protein can lead to fewer larvae being accepted by both starter and finisher colonies. Other conditions may result, including low larval weight, early supersedure, failure of queens to mate and lack of drones.

Most supplementary patties are fed in the spring, but Mr. Dick thinks that fall protein feeding reduces winter loss. I believe this might also be the case even in more tropical climates.

Mr. Dick says that how much of a supplementary pollen patty a hive consumes is a good indicator of colony strength. Queenless or weak hives, he concludes, will eat less. A beekeeper can quickly and easily decide which hives in a yard to work on by looking at how much of the supplementary patty is consumed.

Making patties is a big, messy job, according to Mr. Dick. Labor costs can mount up and mistakes are all too often made. Thus, he contracts out the job to Global in Airdrie.[2]

In conclusion, while carbohydrate monitoring and feeding are standard beekeeping practice, the protein nutritional status of a honey bee colony remains an enigma. There has been little research on determining the actual needs of a colony throughout the year with reference to pollen availability in localized areas. Although plenty of pollen may be seen either collected by workers or stored in the colony, this alone is no proof that protein levels are adequate. Given that protein deficiency may lead to many conditions (disappearing disease, spring dwindling), as well as be contributory to stress placed on a colony by parastic mites or disease, one piece of advice is to supplementary feed pollen supplement/substitute whenever there is doubt about any particular colony's nutritional status. BC

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DRONE FEEDING AND HOLDING COLONIES

"The obvious use for drone-holding colonies is for saturation with your desirable drones."

Larry Connor

By following a relatively simple series of colony manipulations, commercial beekeepers and queen breeders may successfully produce, hold and utilize drone populations in very large numbers. These large numbers are very beneficial in mating programs, where extreme numbers of desirable drones are increasingly needed for successful mating. In this article, I will describe two types of colonies beekeepers may use to accomplish this.

One is the **drone-feeding colony**, which is to developing drones what a cell builder colony is to developing queens. It is a colony that biologically favors the development of large numbers of immature drones. It serves as a colony to emerge the drones and allow them to feed and mature prior to mating flights. It is also a 'safc home' for drones after mating flights, bringing them back to a drone-friendly environment at the end of mating attempts.

These drone-feeding and -holding colonies will be called **drone-holding colonies** for the rest of this article, since to hold the drones, they must be properly fed. Drone-holding colonies may be adapted from any colony of above average-strength headed by a drone mother that will produce drones of a genetic type suitable for mating with the virgins being produced in other colonies.

A second type of colony, a type I find quite useful to work with, is a **drone-holding and -increase colony**, which I will describe below.

The Drone-Feeding and -Holding Colony

For drone production, most commercial beekeepers and breeders use **drone-comb foundation**, manufactured four cells per inch by the wax foundation supply firms. [Worker foundation is about five cells per inch]. Drone foundation may be used as super comb during a nectar flow so the comb is drawn out. However, during a nectar flow, a single frame of foundation may be placed in a strong colony, directly into the brood nest, usually off center of the middle of the brood area, where it will be drawn into drone cells. This only happens during a good flow or very strong feeding by the beekeeper. Otherwise the foundation may be ignored, chewed apart, or rebuilt into worker-sized comb (which is a total mess).

A few beekeepers let the bees construct drone combs from starter strips of foundation at the top of the frame, but I have had less success in getting them drawn correctly and more problems during extraction to remove excess honey. Use whatever works for you, but make sure your bees are producing drones.

About 40 days prior to the date of the first graft for queens, **drawn and empty drone combs** should be placed into all **drone mother colonies**. [See Article 4 for a discussion on timing the introduction of drone combs and the number of colonies and combs you may need]. One comb should be removed from the side of the brood nest, either an empty frame, a frame of honey or honey-pollen mixed. The drone comb should be placed in the brood area and the colony fed a 1:1 sugar solution to **stimulate the queen** to lay eggs. This is vital if the nectar supply is unsteady, which often is a problem during the spring buildup period and during periods of cool and/or rainy weather.

About five days later, a second drone comb should be added. The first comb should have eggs and larvae. If there are none, the bees may not be ready to produce drones. If all colonies fail to produce drones, you must delay grafting, and should supplement the number of nurse bees in the colony by adding one or more frames of **emerging worker brood** from disease- and mite-free colonies. These additional bees should stimulate the queen and colony to produce drones. Always continue to feed a thin, stimulating sugar syrup.

Usually at the fifth day there are eggs and larvae in the first comb. This may be removed and put into the second brood chamber and a second drone comb put into its place. On the 10th day, a third comb may be added, and on the 15th day a fourth comb added, but *only* if the colony seems able to support this level of drone production. The oldest drone brood should be raised above a queen excluder (providing the drones an upper entrance for flight), stimulating the bees to produce more drones below the excluder, while caring for the developing drone larvae above the excluder. In a way, you are manipulating the colony by removing the drone brood, and stimulating the colony to produce even more.

Now the colony is on a cycle of producing drones, and you can either move the emerged-from drone comb down into the brood nest, or replace the comb with one that is drawn and empty. Usually the combs in the

Continued on Next Page

upper super will have honey stored in the corners, which should be extracted before the comb is reused.

With a queen excluder separating the developing drone larvae, the worker bees will complete the feeding of the larvae above the excluder and the queen will be stimulated below to lay more drone eggs. This maximizes the drone production for the colony. Frames of open worker brood moved next to the frames of open drone brood attract young nurse bees up through the excluder and away from the queen. One benefit of this is to add laying room in the lower super, and reducing swarming instinct.

Once sealed, drone combs should be moved to other locations, and used to supplement drone numbers in the mating yard without adding large numbers of full-sized colonies, which often stimulate colony-to-colony robbing during the early season. Such robbing can be very stressful or even lethal to mating nuclei colonies. If you do move drone brood into colonies in the mating yard, do not add too many frames. No colony will support more drone brood or young drones than reasonable. One sure sign is to watch for drone mortality – dead drones at the entrance being pulled out of the colony is a good sign that you've pushed the colony beyond its drone production capability. However, immediately find out why – pests or disease, food shortage, worker loss to pesticides find out before you add more later

At times when large numbers of drones are needed in a few colonies, a strong drone-holding colony may be turned queenless by removing the queen. A caged virgin queen placed in the colony will reduce (but not eliminate) queen cell production from worker eggs and larvae. After the worker larvae are past the point of cell production, the introduction of a caged virgin provides the 'biological trigger' for good drone-feeding and maintenance, and three or four drone combs of sealed drone brood may be emerged in one queenless colony. Feeding is essential in these colonies, using a 1:1 sugar solution. Feeders should be top feeders or division board feeders. Front feeders are discouraged. Also, yard feeding in open buckets will not support these colonies correctly.

Drone-Holding and -Increase Colonies

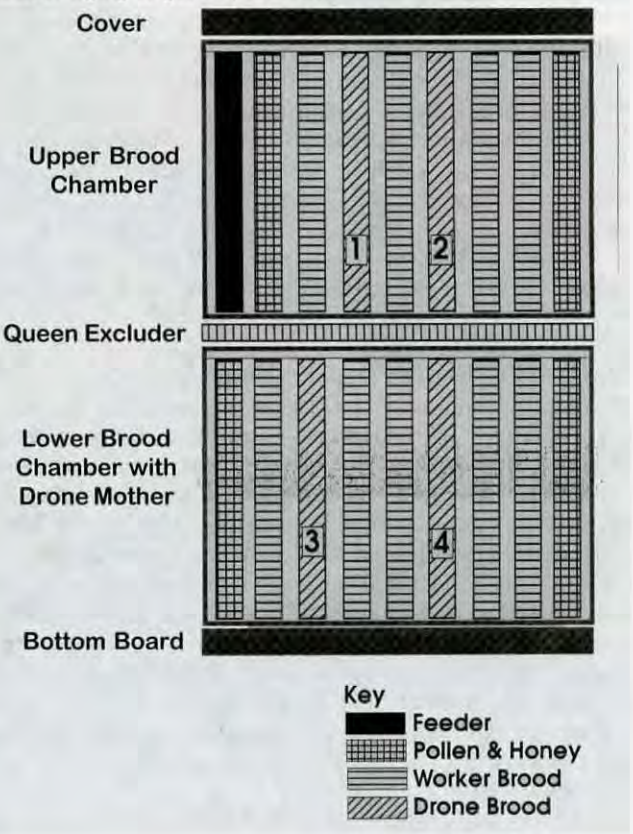
This method consists of making up increase colonies that start their life as drone-holding colonies. I routinely used these colonies as a way to hold drones of known genetic type in specific colonies. It was also a means of making up increase colonies during the spring, effectively serving as a swarm control method.

Enter the apiary with deep hive bodies fastened (stapled) together with a queen excluder and bottom board. We used the queen excluder because we were using the drones for instrumental insemination. However, queen producers and commercial beekeepers would not need to use the queen excluder unless they had some need to keep their drone lines separate. However, sometimes 'stray' newly mated virgin queens fly into queenless colonies – especially near mating areas – and are successfully introduced to the colony. For this reason, you may wish to keep the queen exclude in place until the drones have reached adulthood and are ready to fly. Then the queen excluder should be removed.

Each hive body had nine frames of drawn comb, both worker and drone sized foundation, plus a solid lid. Sometimes we used only eight frames in these colonies when there were many thick frames with drone pupae and thickly sealed honey that might damage the drone brood or adult drones during colony manipulations.

As we worked colonies with drone mothers, we removed drone combs that had been started by the colonies. All cells did not need to be sealed, although a 14-day rotation to each apiary will generally give you mostly sealed drone brood. A seven or 10-day visit rotation would give you older open brood that would be finished in the drone colony. Do not move frames of drone eggs and young larvae, since they will often be destroyed in the new colony. I advise you to move mainly sealed frames of drone brood, with some open

Figure 1. *Drone-Feeding and -Holding Colony (in cross section). Headed by a drone-mother queen confined to the lower brood chamber, this colony was given an empty drawn drone comb at five day intervals for a total of four drone combs. At each hive visit, the beekeeper moves the oldest drone brood above the queen excluder: the oldest drone brood is in frames 1 and 2, while the youngest drone brood is in frames 3 and 4. Sealed worker brood is moved above the excluder as well, so all drone brood is surrounded by worker brood. A division-board feeder containing a thin (1:1) syrup is in the upper chamber, and is refilled by sliding over the cover. The colony contains combs containing abundant pollen. As drones and workers emerge, empty combs are moved to the lower chamber, shaking the bees off the frames so all drones are kept above the queen excluder. This colony prevents drone flight (as needed in bee-breeding programs) but may be given an upper entrance by a hole in the upper chamber or some type of top entrance. Once drones start to fly, they must be monitored, or they will pile up on the queen excluder trying to get out, and die.*



brood being permitted.

As we removed the drone comb, we checked for queens on the frame, but we did not remove the worker bees. Since we were working during the day, most of the workers in the brood-nest were house and nurse bees and we wanted some of these bees to move with the drones. We then found a frame of emerging worker brood, and we removed it and the adhering queen-free bees to the drone-holding colonies.

Working through the colonies in the yard, we harvested frames of drones, frames of brood, and the adhering bees. We either brought out frames of honey and pollen (on the same frame) or we pulled extra frames out of the strongest colonies. By doing this, we may make up several new colonies loaded with drones, depending on the size of the apiary and the strength the colonies.

While we mixed workers from several colonies to make up these colonies worker-to-worker fighting was not seen. These are mainly young nurse and house bees, being placed into strange equipment. We usually worked with the lids off the colonies, and there is something about open bee hives which prevents the robbing instinct from starting.

In assembling the increase colony we used the following order as we made them up. This is based on nine frames:

1	2	3	4	5	6	7	8	9
PH	W	D	W	D	W	D	W	PH

PH = Pollen and Honey
W = Worker brood
D = Drone brood

The outside frames are pollen and honey frames. Inside those two frames are frames of emerging worker brood (positions two and eight). Then we had two frames of drone brood (three and seven) with two more worker brood frames (four and six) and a drone brood frame in the center (five).

When finished with the colony and working the yard, we put on the cover(s) and moved the bees to a holding yard several miles away. There were few field bees in this mix, so we lost few bees when we moved the bees during the day. To make sure, we screened the entrance and removed the screen at the end of the day. At the new apiary site, we added a virgin queen, securely caged so she would not be released—we used a cylindrical wire cage with a wood plug with queen candy at the end. A jar or can filled with 1:1 sugar syrup went over the top bars of the combs, plus pollen substitute if pollen supplies were short. A empty super box was placed over the single box of bees and brood to allow space for the syrup and pollen substitute.

We used natural bee pollen to stimulate drones with horrible results. Considerable chalk brood is found in some bee pollen, (sometimes as rubbery pieces of dead bee pupae mixed with the pollen) and feeding patties made with such pollen will lead to wholesale death to drone brood. Entire frames of drone brood were lost due to stimulative natural pollen feeding.

We checked these colonies for queen cells and surprise problems every week. As the drones matured, we checked on their development, looking for dead drone bodies on the queen excluder (the workers cannot pull drone thoraxes through the excluder). Dead drones could mean a number of different things.

If the caged virgin was dead, it usually meant we missed a queen when we put the colony together. We would look for the queen and remove her. If she was a marked drone mother, we returned her to her old colony and reintroduced her there. In our operation all queens were clipped and nearly always marked, since this is the only way you can be sure you have the queen you installed and not a daughter queen.

We attempted to raise a minimum of two thousand drones on each comb, so three combs gave us six thousand drones in one drone-holding colony. Unlike a natural colony, these drones are all much closer in age, and may be timed in mating as a result. For example, if we worked the colonies on a 14-day cycle, the was a difference of 14 days between the oldest and the youngest drone.

When the drones were sexually mature, we would harvest them for instrumental insemination. In a commercial beekeeping or breeding program these drone-holding colonies could be moved to the mating yard to help supply and saturate desirable drones in the area. Once the drones were depleted, we removed the old virgin from the cage and killed her, for she was too old to mate successfully. We then installed a newly laying queen in a push-in cage, removed the drone combs, and moved the colony to a new apiary location.

We made up dozens of these drone-holding colonies every week as part of our drone production program, and by the end of the season, we had many new bee yards with developing colonies headed by young queens. Along the way, we had produced hundreds of thousands of drones of known heritage. Swarming was rarely seen from colonies used this way.

Uses For Drone-Holding Colonies

In the fourth article in this series on drones and mating, I discussed the need for large numbers of drones in areas where there are "Competitive" or undesirable drones. While these may be African colony drones, they may also drones from a particular genetic stock you do not want to mixed with your bees (perhaps from your 'evil' beekeeper neighbor!). So the obvious use for drone-holding colonies is for saturation with your desirable drones.

Saturation: If you are trying to supply over six square inches of drone brood for each queen cell at the time you graft, you will need a huge number of colonies if you are mating large numbers of virgin queens. While that may sound fine in theory, too high a density of colonies will compete for forage and rob out weak colonies, especially mating nuclei units! If you could bring in the necessary number of groups of 10 to 20 drone-holding colonies and surround the mating area for two-three miles in all directions, you will have supplied between 60,000 to 120,000 nearly same-aged drones in each area. Keep in mind these are desirable 'target' drones that will compete with non-desirable competitive stocks.

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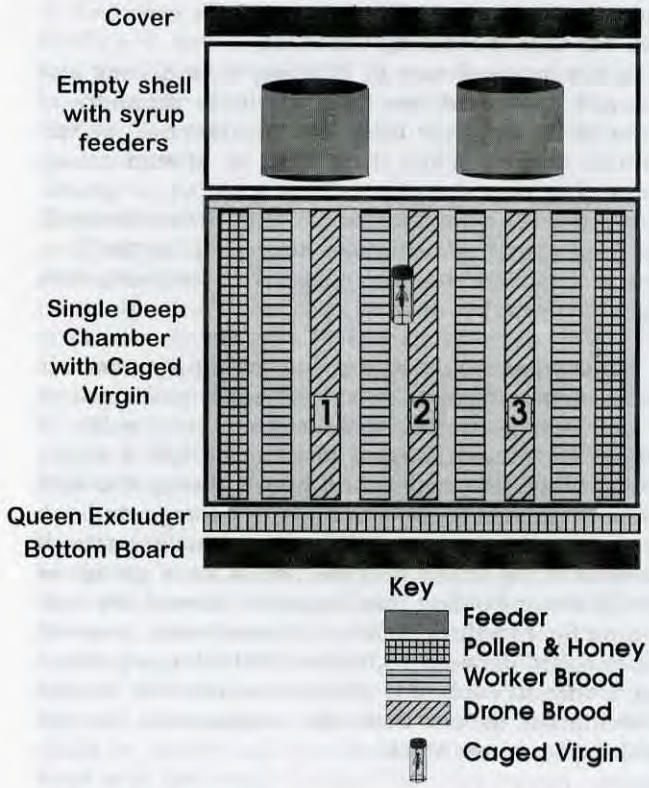
DRONES ... Cont. From Pg. 31

Migration: Since many commercial beekeepers and queen breeders have migratory operations, I see a high possibility of mass production of desirable drones considerable distances from the mating yard. I know from experience that drone-holding colonies can be moved short distances: 30-40 miles, just like normal colonies, so I suspect drone-holding colonies could be successfully moved considerable distances, perhaps very long distances, from pollination areas to mating areas for example. (Even using the pollination area as the mating area!). I am making some major disease, parasite and regulator leaps here, but I have not seen anything biological that would stop drone holder movement. We also shipped packages of drones and workers for instrumental insemination use, and on a small scale, others have done this for years.

Timing: If drones are portable, then we can play with time a bit, at least the seasons. It is well accepted that queen production is possible most of the season, but the availability of drones and good mating weather are the restrictive factors. If we had suitable mating conditions, but poor forage for colonies, we could intensively feed colonies for queen production during the early or late season and then supply drones *from somewhere else* to do the mating. This way we may accomplish early season, dearth and/or late season matings with a good program of stimulative feeding and robbing prevention.

Figure 2. *Drone-Holding and Increase Colony (in cross section). In an outyard location stocked with drone mother breeders, single deep colonies are assembled by taking frames of emerging worker brood and sealed drone brood with attached bees, and arranging them as shown. Frames must be checked carefully for the queen bee. Using nine frames per colony to prevent damage to drone cells, each unit contains two frames of pollen and honey/nectar, four frames of worker brood, and three frames of drone brood. A newly emerged virgin queen is placed in a wire cage to encourage drone holding by the bees. A queen excluder is placed at the bottom of the colony to prevent in-flight of undesirable drones and stray virgin queens; the excluder must be removed when target drones are ready to fly, or given a top entrance. Thin sugar syrup is fed to keep the bees in a 'light flow' environment. Once drones are depleted from this colony, a new queen may be introduced (discard the unmated virgin and replace the drone comb) and the colony used for increase.*



Out-crossing and Stock introduction: In the first article in this series, I mentioned the problems with inbreeding. One possible method to solve an on-going inbreeding problem—even a suspected one—would be to introduce drones from an unrelated genetic source for mating. Drone-holding colonies from an outside source could provide a genetic mix, a method of adding new genetic material, trying new crosses, and then packing the colonies up and moving them off. In theory you could have two or more groups of drones being mated to the same group of queens, with the drones from group A allowed to fly on days that one group of queens were being mated, while drones from group B were behind bars, bars of the queen excluder on the bottom of the colony. Then when a second group of virgins are ready to mate the drones from group B could fly, while the group A drones were confined.

The movement of large numbers of European drones into areas of partial Africanization will pay a huge benefit in European stock maintenance.

Mite Control in Drone-Holding Colonies

I am encouraged by Dr. Marion Ellis' team's work on the use of powdered sugar as a means of controlling *Varroa* mites. Bees are heavily coated with fine sugar powder, which causes *Varroa* mite drop and mortality. While the method does not eliminate all the *Varroa* mites following treatment, it reduces the population significantly. If we use the powered sugar method in drone mother colonies and then again in the drone-holding colonies, we could develop a technique to reduce mite 'loads' to a level where drones can mate normally. The elimination of miticides from drone-rearing and –holding colonies will significantly reduce a huge stress on the colonies and the resulting drones.

Powdered sugar dusting or some other type of mechanical and non-chemical method of mite control would be beneficial in the mating process. Any reduction of the use of chemicals during reproductive biology of any organism is a desirable goal.

Standard Cautions Still Apply

We must have disease-free and mite-controlled colonies in any good mating program. Vigorous, healthy colonies of good genetic composition will provide success in rearing drones in large numbers so they will be available to mate with virgin queens. Anything that interferes with the vigor or health of the colony will deter from good drone production. BC

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Past Pieces

Subtle Changes in the Clark Smoker: A Glimpse Into An Innovative Past

Wyatt Mangum

In the previous article, we saw the meteoric rise of the Clark smoker's popularity. However the Clark smoker did have some operational problems as noted by the beekeepers of that time. In trying to solve these problems, Root made different versions of the Clark smoker.

Figure 1. A Clark smoker as seen in an A.I. Root Company bee supply catalog, issued in 1886. Laying on the bellows, note the strange littl wire with a loop at one end. That's probably Churchill's cleaning tool.

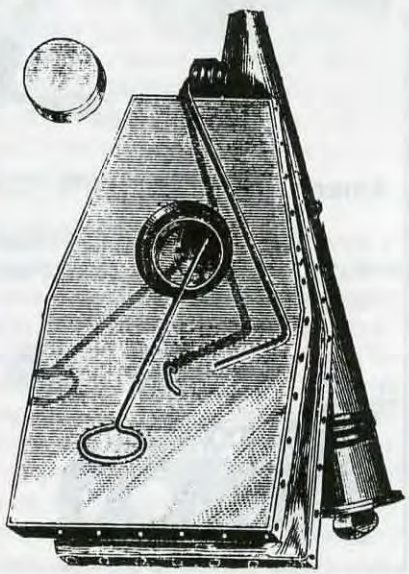
Now over a 100 years later, when we look at Clark smokers, superficially they all look the same. But upon closer inspection, some of those smokers are a little different from others. So why the changes? Without some first-hand historical record, we would be left only to wonder and guess. And that's hardly satisfactory.

But thankfully Root described the changes he made in his version of the Clark smoker. Those changes were published in his *Gleanings in Bee Culture* articles. Now hidden away among thousands of those old pages, which have turned brown with age and are bound in numerous journals, is an intimate look at the smoker's problems and the reasons behind those obscure modifications.

The most pressing problem concerned the gradual clogging of the smoker's blast tube, the small pipe conducting the air from the bellows to the narrow part of the funnel. When the bellows expanded, soot was drawn into them and gradually accumulated in the tube. That restricted the airflow and the smoker's ability to quickly eject its smoke. Remarkably, one of my Clark smokers, which happens to have working bellows, has this restricted air flow problem. It's amazing how slowly the air comes out of the funnel – far too slow to control irritable bees. (In a modern smoker, the gap between the bellows and fire-

Figure 2. Moving the valve on the bellows. On the left, the valve is near the back end of the smoker away from the blast tube. On the right, the valve is moved toward the front of the smoker. Note also the springs on the outside of the bellows, as was typical of early Clark smokers.

Figure 3. Cleaning the blast tube in an 1887 Clark smoker. With the valve in its new forward position, Churchill's cleaning wire was inserted through the bellows and into the tube. Note the removed cap and the external spring shifted to one side.



box lets air into the bellows without drawing it back through the fire.)

In the January 1885 *Gleanings in Bee Culture*, Root published an article describing a device for cleaning the blast tube. The idea came from E. P. Churchill of North Auburn, Maine and consisted of a straight wire with a loop on one end. The wire was inserted through the narrow end of the funnel and into the blast tube. The opening of the blast tube pointed towards the end of the funnel, which happened to make the wire's insertion easier. Working the wire back-and-forth helped rid the blast tube of the hard sooty deposits that accumulated in it. The loop on the end of the wire made it easier to hold while breaking up the deposits. I would imagine, however, that a lot of those deposits were shoved into the bellows, where they rattled around in it like bits of gravel.

As we have seen before with beekeepers submitting their ideas to *Gleanings in Bee Culture*, Churchill did not claim any patent on his cleaning tool. Nevertheless Root thanked him and paid him $5.00 for his idea and began including the tool with the smokers. Interestingly in the old literature, some Clark smokers are shown with a curious wire on its bellows. That wire looks like Churchill's cleaning tool (see Figure 1).

Then in February 1887 another technique was published for keeping the blast tube clear of soot, except that it was much more drastic, requiring a design change in the smoker's bellows. Usually only a leather flap covered the valve hole in the board of the bellows (to let air return into it). This valve was moved so it aligned across from where the blast tube entered on the other side of the bellows (see Figure 2).

The middle part of leather valve was punched out and fitted with, of all things, a screw-on cap. The elaborate blast tube cleaning procedure is shown concisely in Figure 3. First, part of the external spring over the valve cap was pushed aside by slipping it out of the staple holding it against the bellows. Then with the bellows fully compressed, so the leather valve would not be twisted and torn, the cap was carefully unscrewed. Next Churchill's cleaning tool was inserted to clean out the blast tube. The advantage here is that now the sooty deposits were pushed out of the smoker, instead of into the bellows as when the wire was inserted from the outside of the smoker. Two of my Clark smokers have these cleaning caps (Figure 4). shows the cap removed exposing the base of the blast tube (Figure 5). shows the leather valve flap with a hole in it to receive a threaded piece of metal, which is next to the hole in the board. When in place, the threads protrude a little to the outside so the cap can be screwed on. The cap is next to the threaded piece of metal. Also see how the position of the valve hole would align with the blast tube (on the other board) when the two boards are brought together upon compressing the bellows.

Figure 4. The cleaning cap removed showing the blast tube ready for cleaning.

Figure 5. The parts of the cleaning cap dissaembled and seen from the inside of the bellows. The threaded piece of metal would be flipped over and inserted in the hole in the board. The original fabric of the bellows had deteriorated away and unexpectedly revealed the inner workings of a virtually unknown smoker design.

Moving the valve to make it perform two jobs (letting the air return to the bellows and for tube cleaning) was a very creative idea. Dr. C. C. Miller, the famous comb honey producer from Marengo, Illinois, and some other beekeepers suggested moving the valve. J. T Calvert, an employee of the A. I. Root Company designed the screw cap. But the cap could be difficult to remove, as I can attest when trying to remove mine. Adding to this burden was the recommendation to clean the blast tube "daily," that is, after each use. That obviously makes for a high maintenance smoker. So in the very next year, in 1888, the smoker's design was changed again (which helps date those smokers). In the next article, we will explore those changes as the story of the Clark cold-blast smoker continues. BC

Acknowledgments

The author thanks Suzanne Sumner for her comments on the manuscript.

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James E Tew

EXPOSED HONEY BEE NESTS

Beehives vs. Bee Trees

Most beekeepers are completely engrossed with their bees. We have been told that due to mite predation bees are remarkably dependant on our aid. We provide well-manufactured boxes that any sensible bee should eagerly occupy. If we find a nest not in a traditional beehive, we do what we can to put it in one. Seems proper doesn't it? Yet a frustrating number of times a swarm will move from a location in the "high rent" district and acquire a non-descript cavity in a tree – or even worse – nest outside. In spite of our best efforts, bees are still essentially wild and will express their natural instincts. Perfection for us is not necessarily perfect by bee standards.

Bees are smart

Only last week, a somewhat-bee-smart citizen made the comment that bees were remarkably intelligent. *(As do you, I get a lot of "bee-small-talk" at the barber shop, church, kid's functions, essentially anywhere I go.)* In general, bees are good at what they do, but I must admit that they make mistakes – sometime serious mistakes. Look at the radiator of your car. I'll bet you will find at least one smashed honey bee that incorrectly calculated the speed of your vehicle. It is commonly said that bees come rushing back to the hive just before a rain shower starts, but actually, a lot of bees get real wet when it rains. And no, all bees don't make it home as night approaches requiring them to camp out until the next morning.

Departing swarms are notorious for screwing up. Frequently they leave the hive only to come roaring back. Sometimes a swarm leaves with a virgin queen – part swarm and part mating behavior[1]. Dramatically, a colony sometimes build outside of any cavity and is therefore exposed to the elements. In most of the U.S., this is a serious screw-up that will result in the colony's Winter death.

Honey bees are tropical animals

Honey bees (apparently) developed in very warm climates and even though they have adapted to other climates – some very cold – they seem to still carry the instinct of their warm weather ancestors. Even in cold climates, with nest cavities available, honey bees will occasionally nest outside.

We can on guess why

"Well, I guess they couldn't find a nest site." "Indecisive scouts" "They must have thought that the dense foliage was an appropriate cavity." "Maybe rain came for several days and prevented the swarm from finding an appropriate cavity so the bees began building comb on the limb." I suppose any of these could be correct at one time or another but I sure don't know what the bees are thinking (if in fact, bees think at all).

Just yesterday, we got a call to come look at an exposed honey bee nest. Presently it is Autumn and we get a lot of insistent calls about honey bee nests that are really hornets or wasps, but these were honey bees. They had built an exposed nest high from the ground in a residential neighborhood. It was a big nest. As I surveyed the surrounding community I felt that if I were a bee from that nest I would have voted for nearly any other site other

A nice nest, but having an uncertain future.

[1] Swarms that depart with virgin queens are called mating swarms, after-swarms, or secondary swarms.

Continued on Next Page

than the limb the colony was on. Maybe under the eve of the nearby shed, beneath the hot tub deck, maybe in the large cavity in the Oak that shaded the house, or even beneath the hood of the inoperable car that was parked by the garage – anywhere but exposed on the limb. Whose idea was that[2]?

"Exposed nests appear to be a mistake."

When is this behavior considered normal?

In warm climates bees vive reasonably well in an open nest. In fact, proper nest cavities are frequently in short supply in savannah environments and open-nesting (or nesting in ground cavities) is a common option. Bees of Africanized heritage frequently nest in the open in Arizona and the other Western states they occupy. Though I could see nesting in the open being a more viable option than not swarming at all, even in warm climates, open nests have a more difficult way to go. At the very least, open-nested bees need to be exceptionally defensive of their nest in order to survive – as the dead squirrel referenced in the footnote may or may not attest.

Good bees in a bad location.

Why did the exposed colony reject this nearby location?

Without much science to support my guess, it would appear that open nesting may be a viable survival strategy for warm-climate bees that are highly migratory. Rather than spend valuable time and energy looking for a protected site, simply build nearly anywhere, gather a few stores, cast a few swarms, and move on. Wild honey bees of this sort are not trying to make massive honey crops for a future non-existent Winter, but are simply attempting to survive the moment.

Another survival consideration is that tropical honey bees need not find as large a cavity nor have as large a colony for successful survival. There is no need for large cavities for Winter honey stores nor is a cavity as important for temperature regulation. Actually, a large cavity with multiple entrances would be more difficult to defend. Finally, not needing as many nest resources, if a smaller colony is preyed upon, possibly the residual survivors could rebuild a nest elsewhere and recover from the attack[3]. As I discuss in another article in this issue of *Bee Culture*, the biggest colony is not always the best colony.

Interestingly, it frequently appears that the open-nested colony will have moved at least once before deciding to nest outside for there is no obvious parent bee nest in the vicinity. They don't necessarily build comb where the swarm originally hung. Why bees would have chosen an exposed site is unclear I have personally seen both situations – nests in the open in beeyards and nests in the open with no obvious parent nest located nearby.

But none of this fits the needs of bees in the northern-most tier of the U.S. or any part of Canada. For bees, what works in very well in warm climates will get you killed in cold climates.

What can be done with an exposed honey bee nest? What's your climate?

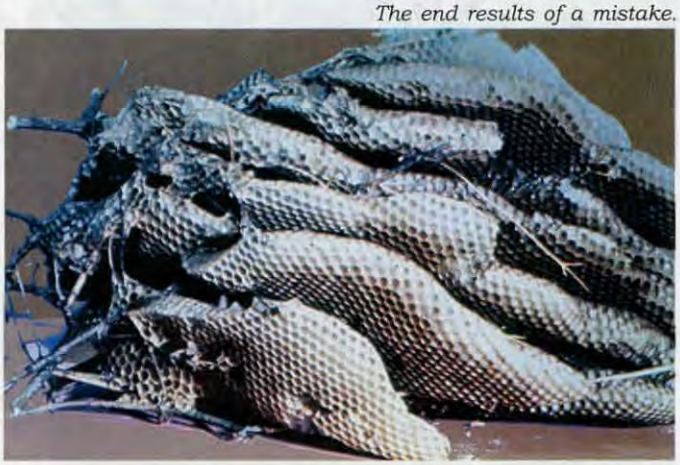
If you are keeping bees in a warm climate you can transfer an open colony to a beehive at nearly any time, but the best time – in any climate – would be to make the transfer during Spring or Summer. There are very few places in this country where colony transfers could be made with disregard for the season.

[2] The exposed nest mystery only deepened. A dead squirrel was on the ground beneath the nest, which was hanging about 30 feet up in a spruce tree. Did the squirrel die of old age? Did the animal fall from the tree? Did the squirrel attempt to procure a free lunch only to be seriously stung? If I were a squirrel experiencing a bee attack, I would run like crazy. If death befell me, would I not die some distance away from the nest? So, why was this dead squirrel laying directly beneath the bee nest? Like bees, do squirrels also make serious mistakes?

[3] Winston, Mark. 1987. *The Biology of the Honey Bee*. Harvard University Press. Cambridge, MA, 281 pp.

An abandoned exposed Africanized honey bee nest in Arizona.

The end results of a mistake.



Transfer them

Using selected principles from swarm collecting procedures and techniques for transferring colonies from a wall or tree, brood comb is cut and temporarily affixed into empty frames. Post Office rubber bands work just fine. Ideally, worker bees would be vacuumed into a cage and the entire colony and hive transferred to a new location several miles away where the bees would be dumped back onto the improvised brood combs. If a vacuum is not available, positioning the new hive containing the brood combs very near the old nest location would work well. If this procedure is performed early enough in the year, the colony will recover from the transfer shock and evolve into a standard colony in a standard beehive. From then onward, traditional bee keeping principles apply.

If it's too late to make the transfer

In cold climates the colony is likely doomed. Reassure the homeowner that the nest will die during early Winter. Sometimes, the homeowner is so concerned they to insist the transfer be made anyway. At that point you need to be a capitalist and suggest an appropriate fee for your time and effort. Often the drama subsides As is the common case with hornet nests, most open honey bee nests are not noticed until leaf-fall occurs in Autumn. By that time, you will be very limited in what you can do to get such a late season colony through the upcoming Winter.

So, is it a mistake for a colony to nest in the open?

Not always in tropical climates, but in temperate climates, open nesting is nearly always a bad choice for a colony. Such a nest is an obvious example of a biological fluke of nature or maybe a residual instinct from bygone times. Nature is hard on this decision and systemically removes that behavior from the gene pool, ergo, most self-respecting colonies would not consider open nesting as an option in temperate climates. Yet, it happens over and over again. Keep bees long enough and you will finally see an exposed nest yourself. If possible, transfer it. If transferring is not possible, at least photograph it. The aberrant nest will become one of your many beekeeping stories. BC

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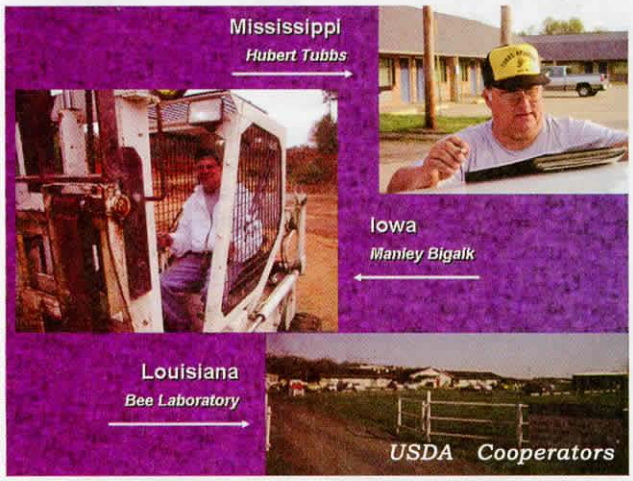
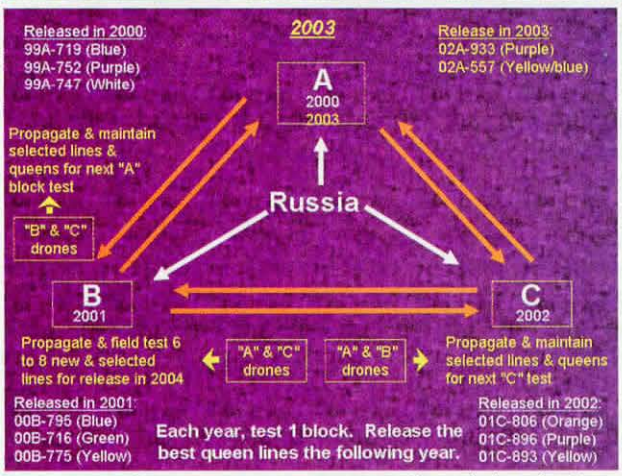
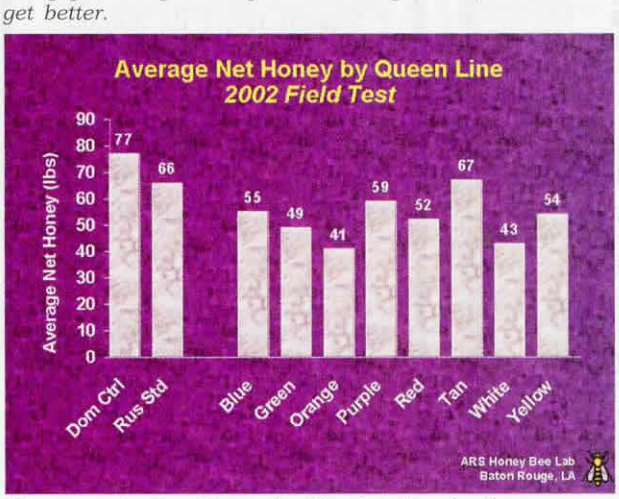
Russian Bees
Look At The Numbers

Kim Flottum

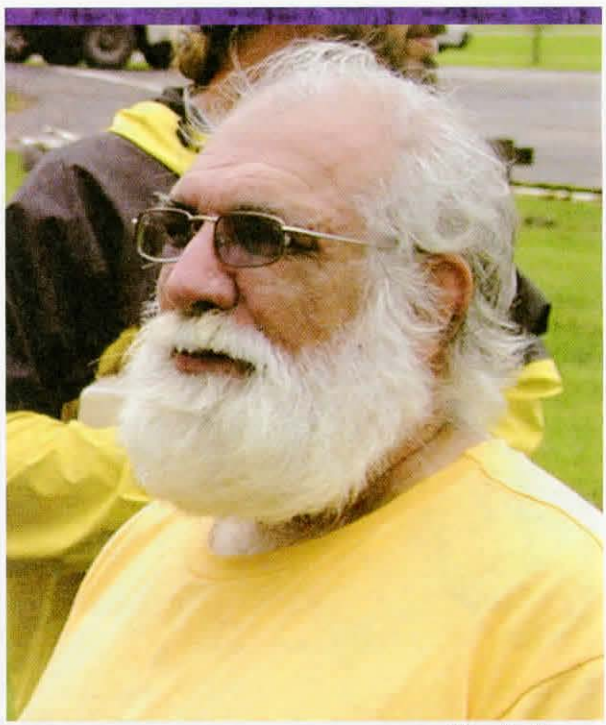




Every year the process gets more complicated, but the bees get better.



Honey production. Domestic, Russian Standard, new Russian lines.



Charlie Harper

Charlie Harper looks a little bit like Santa this time of year. That's because it gets cold in Louisiana and he wants to keep his chin warm. He runs about 1,000 colonies there, and this year he has become the USDA producer/cooperator of Island Mated Russian Queens. He produces the breeders that queen producers obtain to produce the production Russian queens that you and I will buy next Spring.

Charlie and I were at a meeting recently, and he shared everything that's new, and not so new about the Russian bees.

2004 begins the fourth year that Russian queens have been available, and much has been learned about their mite resistance, their management and their productivity.

The Baton Rouge Bee Lab spearheads the research, and Charlie, who is in the middle of all of this have shared their most recent field trial data here this month. The charts and graphs are pretty enlightening.

But it's been the management of these bees that has been the most controversial, and needs the most attention.

These are *not* Italians. Get used to that bit of reality. Their behavior is very Carniolan-like in terms of small to medium Winter clusters, low food consumption, quick to build in the Spring when food is available and quick to shut down during a Summer dearth.

You can get used to that. It's the rest that's different.

For one thing, they aren't Carniolans, but rather a closely related race – Macedonians. And they are different, and they haven't been in the U.S. before this. Here's what you have to watch out for, according to Charlie and the rest of the cooperators.

First, introducing a Russian queen to a non-Russian colony. Not easy. Not fast. But certainly possible. Why? They're different. It takes longer, up to 12 days, for the colony to accept this queen. Be patient. *DON'T* use a three-

hole cage with candy. Use something *you* control. The three-holer, but with the candy cork left in is one, not very good, choice. A push in cage over empty comb is better Again, be patient. If the colony is already mostly Russian it may work faster, and it may not. Be careful.

Once established, do not underestimate their capability to explode in numbers and thus in brood and honey production, and needed *room*! A day late and you'll be a swarm short. Be early, and be generous with honey supers.

Probably the most disconcerting aspect of these creatures is that they absolutely insist on having swarm and supercedure cells going almost all season long. Apparently, in their previous environment abrupt queen loss was common, and constantly having replacements, and investing the energy raising them, proved successful. Get used to it. Supercedure cells are common. But check for eggs anyway.

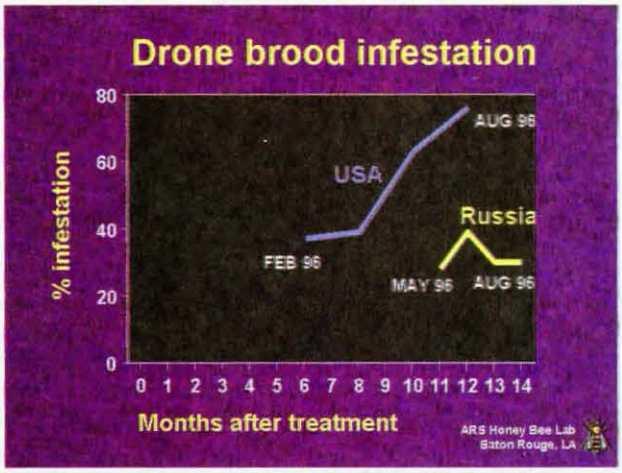
Queens can be nearly invisible if your stock is very dark. Keep colonies in the sun if at all possible. You'll have even fewer mites and drier honey. But, the population in individual beeyards is important. If you keep all colonies in a yard Russian, the whole yard will have fewer *Varroa*. Separate and not equal is the rule.

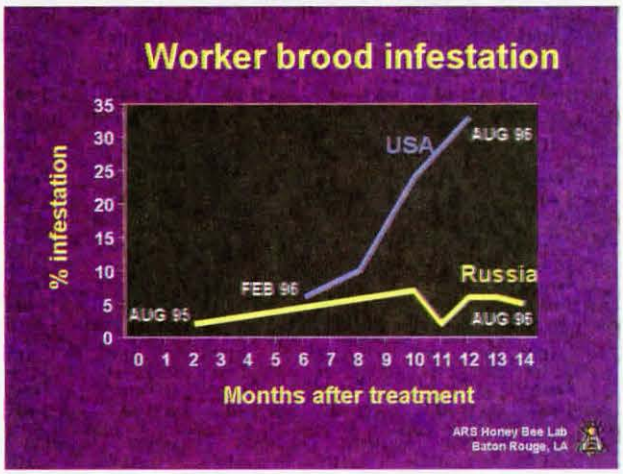
Fewer *Varroa* is the rule, though. Look at the data. The domestic producer in the control is one of the best I know – and they are good honey producers. The numbers show the production of each, but look at the mite numbers. The Russians have essentially no tracheal mites. One of the cooperators has gone almost 1,500 days without treating for *Varroa*. All have fewer *Varroa* than the control.

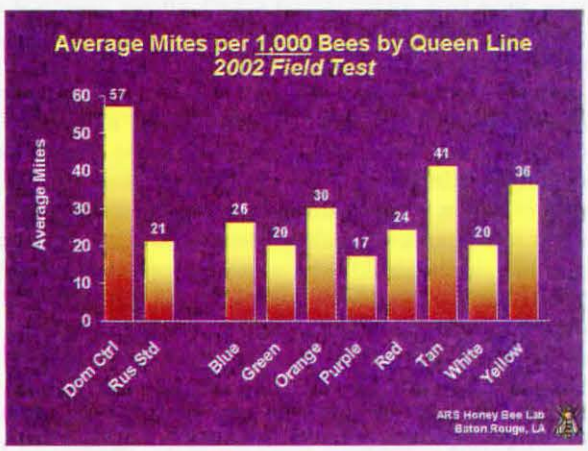
Where do you get them? Crossing a Russian and almost anything, but especially Italians, gives a less than ideal *hybrid*. Try to find the closest to pure as you can. That's a producer who's been raising Russian queens, and drones, for at least two years. Ask and find out the producer's history, and make sure they are using a true breeder queen.

Russian bees aren't perfect, but they offer management options worthy of consideration. Timely management will reduce swarming behavior, and increase honey production. Nothing new, but maybe the timing is different. Lots of swarm cells, all the time. Reduced *Varroa* treatments. Reduced or no tracheal mites. Good overwintering in the north, and south. But longer, and iffier queen introduction procedures. Somebody you know swears by them, and somebody else probably swears at them.

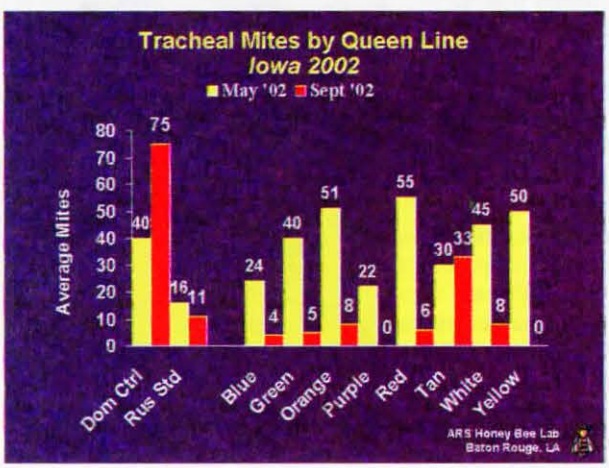
There is absolutely no doubt to me that the road to profitable, safe and enjoyable beekeeping starts with better bees, not better chemistry. Find better bees. BC







Mites/1,000 bees, Domestic, Russian Standard, new Russian lines.



Seasonal Tracheal mite infestations, Domestic, Russian Standard, new Russian lines.

DON'T RESIST RESISTANCE

Varroa Resistance Another View

Roger Hoopingarner

When I visited Macedonia about 10 years ago I was very interested in learning from each beekeeper their experience and thoughts concerning *Varroa*. Everyone that I talked to expressed the same thought, and that was that *Varroa* was much worse when it had first arrived. *Varroa* had entered Macedonia about 15 years before I visited the country. It appears to me that this trend is also happening here in the U.S., that is, the devastation is not as bad as 10 years ago. No we don't have 90 percent of our colonies regularly surviving the Winter, at least without treatment with some miticide. However, we do have more colonies surviving Winter, or at least lasting until late Winter before they die – all signs that there is some resistance developing within our strains of bees. Not enough to get our bees regularly though a northern Winter, but I think we are making progress. Natural selection ***is*** at work even though we don't see the end result that we desire.

Beekeepers, like most of agriculture, have become addicted to the simple, quick-fix pesticide application. I suspect we learned that addiction with our long love affair with Terramycin. (As a biologist I am amazed at how long this affair lasted when all my training in genetic selection said Terramycin should not have been as effective as long as it was.) If I were a large commercial beekeeper I would be most anxious for the chemical industry to give us another "silver bullet" to control *Varroa* and AFB. This is because the economics of large-scale production almost demand such an approach. It is easy and simple to just drop a pesticide strip into a colony and not know how many mites are actually in the colony. To monitor even on an apiary basis, for an economic-loss level of mites, is still another operation that takes man hours which add up to money lost. Yet when we use a pesticide or antibiotic without monitoring we mask any positive resistance traits that might be present. We would never know that the colony was actually controlling the disease, or mites, without the treatment. And also, by allowing colonies that should die to survive we deny the powerful agent of natural selection.

This brings me to comment about Dr. Marla Spivak's wonderful, J.I. Hambleton, talk to the Eastern Apiculture Society in August, 2003. She basically said that *everyone in the room* (mostly small or hobby beekeepers) *had to stop using pesticides now. We need to be the leaders in the process of selection for* Varroa *resistance because we can take the hit of losing colonies for a few years until progress is sufficient for the Winter losses to end.* However, I will add a small caveat to that statement. I think that we need to stop using chemical treatments without monitoring our populations. We should watch our colonies and along about mid August to do a sticky-board count of the mites in a colony. Those that are high in mite counts should be destroyed to eliminate the transfer of mites to the other colonies. Then those that show promise should only be treated if the number of mites is at a level where they maybe would not make it through the Winter, but the colony could have some genetic resistance that would be lost if the colony died.

The surviving colonies should again be sampled in the Spring and the lowest mite-count colonies used for breeding stock for the rest of the colonies. All the remaining colonies would produce drones that should carry some resistance in their subsequent mating with the queen from the selected colonies.

This brings me next to the SMR and Russian *Varroa* resistant strains of bees. When we first started the selection that led to the SMR strain, I had many talks with Dr. John Harbo relative to ultimate release of the strain. I did not want everyone in the nation to use the SMR strain exclusively, as this development had proven disastrous in the corn breeding industry in the early 1970's when all varieties came down with a new strain of corn blight. It seems that all inbred strains of corn carried a common gene used for cross breeding. We (John Harbo and I) saw the SMR strain as being the vehicle of the resistance gene(s) that should be incorporated into the beekeeper's own stock. It probably means that to get the gene incorporated into your stock that you would need to buy selected SMR queens for several years before the trait is uniformly fixed. Most beekeepers think they are buying a strain that will persist – much like buying a cow. What many beekeepers don't realize is how often a queen is superceded within the colony and by so doing the new queen will mate with local drones. This mating effectively wiping out the resistant trait. The SMR trait has to be incorporated sufficiently in the apiary to be in the majority of the drones, and hopefully all of the colonies within the flight range of a virgin queen. This process of incorporation can take sev-

Dr. Roger Hoopingarner, retired Extension Specialist from MI State University

eral years. Most beekeepers think that by buying a SMR, or Russian queen, they again have a magic bullet. It just doesn't work like that! Selection is a long and continuous process. The SMR strain was designed as a vehicle for the resistant gene(s) and not a super, holistic magic bullet that would instantly solve all our breeding problems. I can not speak for its current status, but it was never originally selected for honey production, temperament, color or any other trait other than *Varroa* resistance.

As long as I am on the subject of selection for resistance, get, buy or select for hygienic behavior within your bees as well. It is another tool for combating AFB and *Varroa* and once incorporated will increase the colony's ability to withstand these pests. But again, it can take several years before the trait is fully incorporated. In 2004 the beekeeping community will have known about hygienic behavior for 40 years. It is a wonderful tool, yet has been abysmally slow in being incorporated into beekeeping lore. It is a technique that we should have been teaching to all beginners for all these years. It is not a hard technique to do, and the results of selecting colonies that have hygienic behavior is too beneficial for it not to be used. I suspect that we (the apiculture industry) did not use the selection for hygienic behavior was because we did have the wonderful antibiotic Terramycin. Now any new drugs for the control of AFB can not be used like we used Terramycin as a prophylactic. Any new drug will only be allowed to be used once the disease is seen, that is, as a control. This use of the antibiotic, only after the disease is detected, takes away much the economic advantage when it could be used as a prophylactic treatment, and makes selection for hygienic behavior that much more important.

This brings me back to Dr. Spivak's talk where she entreated all of us small and hobby beekeepers to become the leaders of the new method for treating for diseases and mites. When we show the rest of the beekeeping community that such selection is possible, and because we no longer have to treat with chemicals is also profitable, the rest of the beekeeping community will be quick to follow suit. BC

Dr. Roger Hoopingarner is Extension Specialist for MI, in East Lansing, retired.

QUEEN RESEARCH

Commercially reared queen bees often had a low survival rate when introduced into hives, or they may have a satisfactory introduction success rate but followed by poor performance by the established queen.

Alan Harman

New Australian research has found the most suitable age to introduce queen bees into established honey bee colonies is between 24 and 35 days of age. This gave the highest survival and performance rates for introduced queen bees.

A report by John Rhodes and Doug Somerville for the Rural Industries Research and Development Corp. said there was no significant difference for queen survival and performance between queen bees held in mating nuclei for 24 or 31 days or a queen bank to 31 days.

All three methods were superior to queen bees held in a queen bank to 24 days of age. Queens were caught from mating nuclei at 17 days of age and placed in the queen bank.

The report said survival 14 days after introduction may be related to queen mandibular and head gland pheromone levels with increased levels of the pheromone HVA showing the closest relationship with increased queen survival at introduction.

The research followed commercial honey producers reporting over a number of years that commercially reared queen bees often had a low survival rate when introduced into their hives, or they may have a satisfactory introduction success rate but followed by poor performance by the established queen bee.

A pilot project carried out by New South Wales Agriculture in 1997-8 found significant losses of commercially reared queen bees occurred within 15 weeks of being introduced into established hives. Losses of spring reared queens were higher (30.3%) than autumn reared queens (12.2%).

In 1999 NSW Agriculture received funds for a three-year project to investigate introduction and early performance success rates of queen bees caught from their mating nuclei or taken from a queen bank and introduced into commercial honey hives at between seven and 35 days of age.

A recognized commercial queen bee breeder based in Queensland provided sister queen bees produced from one or two sister instrumentally inseminated breeder queens.

Each year's test queens were grafted on the same day, reared in colonies in the same cell raising apiary, and mated in the same mating apiary at the same time.

Batches of test queen bees were caught from their mating nucleus or from a queen bank at a range of ages seven, 14, 21, 28 and 35 days of age from mating nuclei for Years one and two; and at 17, 24

Continued on Next Page

QUEEN ... Cont. From Pg. 45

and 31 days from mating nuclei and 24 and 31 days of age from a queen bank after being placed in the queen bank at 17 days of age for Year three.

All queens were dispatched by mail service to two commercial honey producers based in different areas of NSW who provided apiaries for field evaluation and to the Commonwealth Scientific and Industrial Research Organization for examination of those queen bees.

This allowed sister queen bees of the same age when caught and dispatched to be examined under commercial apiary field conditions for introduction success (number of queens surviving 14 days after introduction); early performance success (number of queens surviving 15 weeks after introduction)' and satisfactory performance success (field evaluation for satisfactory performance by queen bees surviving 15 weeks after introduction).

Transport effects on queen bees were monitored by enclosing data-loggers in the envelopes with queen bees during transit and recording temperatures and humidities queens were subjected to each 10 minutes during transport between the queen bee breeder and the honey producer.

The groups of sister, same-aged queens sent to the CSIRO Laboratories were examined for characteristics considered relevant for interpreting survival and performance data obtained from the field trial.

Measurements made on each queen bee at the laboratory included number of sperm present in the queen's spermatheca; number of ovarioles in one ovary; Nosema disease spore count; identification of the number and levels of pheromones present in the mandibular and head glands of each queen bee for each age group; weight of queen; spermatheca diameter; presence of semen in the oviducts.

Climate, nutritional, and general apiary conditions were assessed and recorded by the NSW Agriculture apiary officer associated with each apiary for the field projects.

Nosema disease status of colonies used during queen production and Nosema and Brood Disease status of colonies test queens were introduced into were assessed by visual inspection and/or sampling.

The number of sperm in the queen's spermatheca did not influence queen survival at introduction. Early research suggested that less than two million sperm/queen was associated with low survival rates of queen bees following introduction but this was not supported by subsequent data.

Although the number of sperm

Perhaps this queen was harvested too soon, was poorly mated, or was damaged in transit.

in the queen's spermatheca could be expected to be influential in extending long-term survival, it did not influence queen bee survival for the period 15 weeks after introduction.

Attention was paid to the number, strength and position of drone mother colonies in relation to the mating apiary However, average sperm counts for each group of queen bees examined were generally low and in all cases there was a wide range of counts between the highest and lowest counts within each group of similar aged queens examined.

Examination of physical characteristics and disease levels in queen bees used in the project indicated that queens were of a high standard and no queen problem was identified which may have contributed to the overall low sperm counts recorded.

Low sperm counts and the wide range of sperm counts within each group of queens examined require further investigation and may be related to problems with drones at mating apiaries rather than with the queen bees being mated. The source of this problem, whether it is a queen or a drone problem needs to be identified, the report said.

Transport data over three years showed low numbers of deaths on arrival of queen bees (2/300) and escort bees (26/800) and no significant difference between survival rates for queen bees surviving 14 days after introduction.

This data indicated minimal damaging transport effects on queen bees on arrival and within 14 days following arrival.

Commercial honey producers who rear their own queen cells, or who purchase mature queen cells from commercial queen bee breeders and mate them in their own mating apiaries, based on observation, consider that queens produced under these conditions are more readily accepted into commercial honey hives and fewer queen failures result once the queen has been accepted.

The report detailed the main difference between honey producer's management and queen bee breeder's management:

* Queen bees are often left in the mating nuclei of honey producers for a longer period, usually 28 days or longer. Commercial queen bee breeders usually catch queen bees from mating nuclei at between 14-21 days of age,

* Queen bees caught in the honey producer's mating apiary are not subjected to being consigned through the mail where damage may occur to queens.

* Honey producer's mating apiaries can be expected to have access to a larger drone population than a commercial apiary due to the smaller number of queen bees being mated at any one time. BC

Alan Harman is a free lance writer from Australia.

This report was gleaned from a paper written by John Rhodes and Doug Somerville for the Rural Industries Research and Development Corp.

FDA & Customs Issues NEW FOOD REGS

HHS Secretary Tommy G. Thompson announced in early October the issuance of two Food and Drug Administration regulations that will bolster the safety and security of America's food supply. The new regulations will enable better targeted efforts to monitor and inspect imported foods and will allow quick identification and notification of food processors and other establishments involved in any deliberate or accidental contamination of food.

The two new regulations will implement key provisions of the **Public Health Security and Bioterrorism Preparedness and Response Act of 2002**, which provided FDA new authority to protect the nation's food supply against actual or threatened terrorist acts and other food-related emergencies.

The first regulation requires food importers to provide the FDA with **advance notice** of human and animal food shipments imported or offered for import on or after **Dec. 12, 2003**. This will allow FDA to know, in advance, when specific food shipments will be arriving at U.S. ports of entry and what those shipments will contain. This advance information will allow the FDA, working with U.S. Customs and Border Protection (CBP), to more effectively target inspections and ensure the safety of imported foods. The FDA expects to receive about 25,000 notifications about incoming shipments *each day*.

The second regulation requires domestic and foreign food facilities that manufacture, process, pack or hold food for human or animal consumption in the United States to *register with the agency by Dec. 12, 2003*. As a result, FDA will have for the first time a complete roster of foreign and domestic food facilities. The requirements will enable the FDA to quickly identify and locate affected food processors and other establishments in the event of deliberate or accidental contamination of food. The FDA expects about *420,000 facilities* to register under this requirement.

Under the prior notice regulation, prior notice of imported foods must be received and confirmed electronically by FDA *no more than five days* before its arrival and no fewer than:

- two hours before arrival by land via road;
- four hours before arrival by air or by land via rail; or
- eight hours before arrival by water.

In addition, for international mail shipments, notifications must be made *before the shipment is mailed*. Also, when an individual carries or otherwise transports foods subject to the new requirement, advance notice of two, four or eight hours is required – depending on the mode of transportation. The food must also be accompanied by confirmation of receipt for FDA review.

The advance notice to the FDA may be submitted electronically in most circumstances using Customs' existing ABI/ACS system, making it easier for importers to comply with the new law. In addition, the FDA will operate a new Prior Notice System Interface that can receive such notifications.

The second regulation requires the owner, operator, or agent in charge of a domestic or foreign food facility to register with FDA, providing information about the name and address of each facility at which, and all trade names under which, the registrant conducts business, and information about certain categories of food the facility produces. For a foreign facility, the registration must include the name of the U.S. agent for the facility.

Registration is required for domestic facilities whether or not food from the facility enters interstate commerce. Domestic facilities are also required to provide emergency contact information. All changes to such information must be reported within 60 days.

Except for specific exemptions, the registration requirements apply to all facilities that manufacture, process, pack or hold food regulated by FDA, including animal feed, dietary supplements, infant formula, beverages (including alcoholic beverages) and food additives.

Registration would not be required for private residences of individuals; certain food transport vehicles; facilities that manufacture food contact substances and pesticides; farms; restaurants; other retail food establishments; nonprofit food establishments in which food is prepared for or served directly to the consumer; non-processing fishing vessels; and facilities (such as meat and poultry slaughterhouses) that are regulated exclusively by the U.S. Department of Agriculture. Also exempt are foreign facilities if the food from the facility is to undergo further processing or packaging by another facility before it is exported to the U.S.

The registration may be submitted electronically, via the Internet, or by paper through surface mail or by fax. Registrations may also be submitted on CD-ROM by mail. The FDA will be able to accept electronic registration from anywhere in the world 24 hours a day, 7 days a week, beginning Oct. 16. Filling out registration online should take about 15 minutes if a facility has its paperwork ready. A registering facility will receive confirmation of electronic registration and its registration number instantaneously once all the required fields on the registration screen are filled in. ***There is no fee associated with registration.***

The rules take effect Dec. 12, 2003, in accordance with the Bioterrorism Act. To assure that the regulations can be implemented efficiently and with minimal disruption, FDA intends to exercise broad enforcement discretion for the prior notice rule for the first four months after implementation.

Both the new regulations were published as interim final rules in the October 10 issue of the Federal Register. The FDA is requesting further public comment on the rules. The complete regulations and supporting data and legislation can be viewed at www.cfsan.fda.gov/

issued by the FDA

Inside Mann Lake Ltd.

Kim Flottum

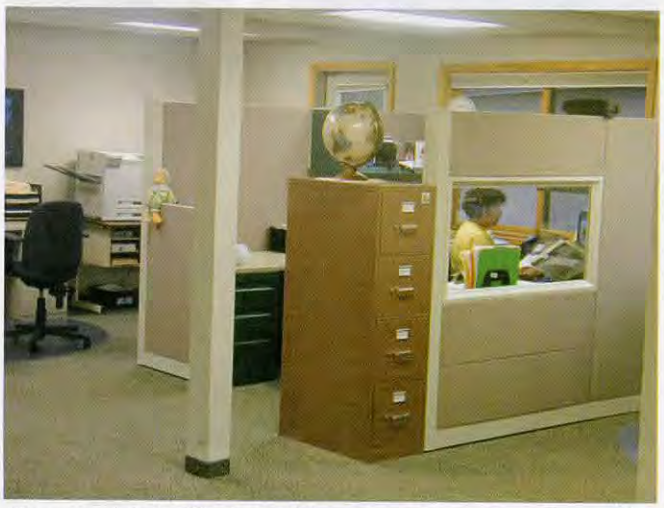
From their catalog, this air photo shows the layout of the complex. The new building is going up just below the parking lot with the red pickup.

Last Summer, the folks at Mann Lake Ltd. hosted the Summer meeting of the Lake Region Beekeeper's Association. They've been doing this for a decade now, and, from their humble start with 20 attendees, this meeting had over 250 people appear. Lots more than the local group show up though, and for good reasons.

Start with lots and lots of good food – and a little entertainment. There's a quick business meeting, a couple of short talks, and the rest of the day is set aside as an open house for the whole facility. Look at the air photo for a feel of the layout.

The tour started at the sales office where orders are taken and entered. From there you'll wander through the showroom, which has essentially most everything in the catalog. During the tour several sales people were on hand to answer questions and help out.

From there, past accounting, MIS and purchasing, and stock shelves to shipping. The day I was there you could see out the loading door, and watch trucks being loaded, and people helping park the 100 or so cars and trucks that showed up.



The remodeled office has eight or so stations for sales people.

What started as a hobby for Betty and Jack Thomas nearly 20 years ago has grown to this large and energetic business. Their four managers, Dave Heem, production; Stu Volbey, sales; Dave Berglund, finance; and Dan Skelstad in MIS oversee the 48 people (adjusted up or down a bit seasonally) that work here. And it's not a bad place to work. It is an employee owned company, with a matching 401-K plan, health insurance and paid vacation.

"We've always been customer centered," Betty said. "When we first started it was on the road, visiting our customers, or beekeepers who weren't our customers to see what they needed and what we needed to do to be a better business." And every employee knows it.

Almost every person there can take an order, and sometimes does. Which means that every person then knows the product line. If the phone rings twice, you pick it up on the third ring. No exceptions. Anybody counts. Along with that – no voice mail system. Nights and weekends? An answering service is employed who can take orders, and handle emergencies.

The tour continues toward the shipping area, where most of the orders are processed and loaded. UPS works closely with them in upgrading software and hardware for new projects.

Past shipping, you head into the old, the new and the newest warehouse complex. Primarily, this is where both the single and smaller items are shelved, and the pallet sized items are kept. Orders are filled, checked and sent to either the shipping area, for LTL (less than load) shipping, or to one of the other docks for truck loading.

In the production area is the menthol room, where that product is organized, and the candle mold room. Next to these is the area where the BeePro patties are made.

One other area in this building is the Trucker's Service area, where truck drivers can shower and rest

Continued on Next Page

Heading toward shipping, and, below the shipping department with a truck in place.

The new warehouse with pallet racks to the ceiling.

Prepared pallets of knocked down wood are shrinkwrapped and stored in the alley, waiting to be picked up on the dock. Looking the other way, at the far end of the alley is the truckers area.

up while the truck is loaded.

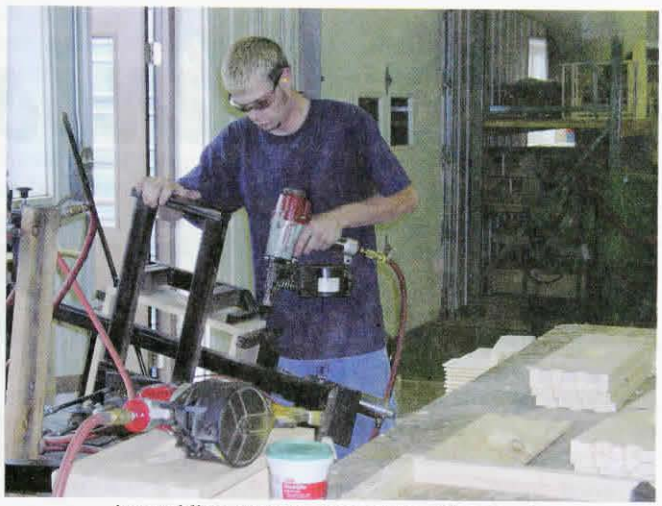
The most recent addition is the wood shop, a 15,000 square foot building, where everything wood is made and assembled. Boxes, frames, bottoms and tops are all cut here. And, with the increased demand for preassembled equipment, that, too, happens here.

Certainly the most intriguing machine on the floor was the new frame assembly unit. Three people load and unload it, as it kicks out 16 glued and stapled-all-ways frames a minute, complete with a sheet of waxed foundation.

The assembled equipment business has taken off lately for a couple of reasons. First, commercial operators cannot put this stuff together as inexpensively as they can purchase it, *including freight*. Second, the baby boom generation is more demanding of higher quality

Candle molds are made in the production area of the new warehouse. A complex of materials are mixed, poured, baked and finished.

BeePro patties come together in this machine where raw materials are blended, mixed, formed, sheeted and boxed.



Assembling supers, one every 40 seconds.

Frame assembly machine, everything in one end, and out comes the finished product.

Top bar cutter makes between 7 8,000/day.

equipment, and less prone to enjoy spending time whacking nails. (Sound familiar?)

Generally, materials and products are only purchased by Mann Lake by the semi-load. Wood especially. U.S. white pine and ponderosa pine make up the bulk of what they buy, and they use about one truckload every four days.

Other products come in partially assembled and finished on site, or raw materials arrive bulk and are manufactured in house.

If you get the chance next Summer, wander on up to Hackensack, MN for the Summer meeting. The food is great, the people friendly and helpful, and the tour outstanding. And by then, the new 20,000 square foot addition will be complete, so there will be even more to see. BC

Making super sides. Some of the machinery was purchased at the A.I. Root Company auction, then completely rebuilt.

Christmas Wish List

Ann Harman

Well, I do not know what you are doing right now but I am getting ready to write my annual letter to Santa Claus. I make my list rather long in the hopes that I will get at least some of the things I wish for. So here I sit with the beekeeping equipment catalogs close at hand just to make sure I don't overlook something. I have a nice stack of bee supply catalogs; I hope you do, too. Although many items in them are the same, each has some different items. And each has some wonderful, frivolous gift possibilities.

Do you have the catalog from Swienty? If not, contact them at www.swienty.com and view their nice line of possible gifts. By the way, you might wish to investigate the web pages for Thorne at www.thorne.co.uk. Both of these companies have unusual things.

We tend to go through our beekeeping year thinking about frames and foundation, pounds of sugar and other such mundane items. But, let's face it, Christmas is also the time for a totally beautiful bee-related gift.

So you think a stroll through the shopping mall will lead you to something with bees. I seriously doubt it. Clothes? Jewelry? Housewares? Home decorations? I think you'll find that dragonflies are "in;" butterflies are always "in;" bees are almost never "in." Go ahead, and if you find something let me know.

Before you go any further check out the new products that the bee supply companies have described in this issue. There might be something that you cannot live without. There might be some new gadget or piece of equipment far better than the one you presently have. Just think – you can sell the old piece of equipment and start out the New Year up-to-date.

I assume that since you are reading this article that you have a subscription to a beekeeping magazine. Or did you just borrow this copy? What about those beekeepers on your gift list? Every beekeeper, large or small, should be keeping up with current information and a magazine will do just that. Don't listen to comments that someone "does not have time to read all that stuff." Nobody said you have to read every article in every issue. With all the problems beekeepers have today, new information is vital, and can actually save you money.

If you enjoy reading about beekeeping and already subscribe to the American journals, you might wish to put some different ones on your wish list. A membership in the International Bee Research Association (IBRA) will bring you a copy of Bee World. If you are interested in what is going on in other parts of the world you will really enjoy this magazine.

A nice gift for a beginning beekeeper is a year's membership in the local beekeepers' association, especially if the association has a nice newsletter full of helpful hints for better beekeeping.

Bee books make super gifts. Which ones are in your letter to Santa? A library of bee books will give you relaxation in the winter and vital information during the beekeeping months. Now is the time to ask Santa for the astonishing book, Form and Function in the Honey Bee. This book, by Lesley Goodman, is available from IBRA, ordering information at www.ibra.org.uk. The illustrations in this book open up a new world of the honey bee – how they are made so they can work so efficiently. It is a great book to be read on a nasty winter day.

Don't forget honey cookbooks. They are valuable, too. One can never have enough honey cookbooks. I think I have a standing order to Santa for any and all new honey cookbooks. If you have never made any candles, put one of the candlemaking books on your list. I love making candles and find the lists of candle molds really important. Mann Lake just sent a flyer listing some new molds, but almost everybody has them now. I must put some in my Santa letter. If you are interested in a bee-related hobby you might explore soap making. Many beekeepers have found it not only fun but also a way to augment honey sales. A look through the bee equipment catalogs and magazines will show you books and a big supply of items for making beautiful soaps. Not interested in candles or soap? How about hand creams and lotions? Wax and honey have many uses.

Hive tools are in the same gift category as socks. Necessary but mostly boring. True, one can find socks with bees on them from time to time, but can you find a really exciting hive tool? If you know someone who never, ever loses hive tools you could be absolutely outrageous and give one engraved with their initials, but what about your friend who constantly loses them. (Some archaeologist will find all our hive tools 2000 years from now and really wonder why these occur only in certain places.) Since you need a gift, why not give several hive tools, several different styles. Your gift will certainly be appreciated at least for a few months until all are lost. You can repeat the gift next year and it will be appreciated again.

If you are handy at sewing, stop by the fabric shop to find some appropriate fabric. Clothes made with bee-related designs are great gifts, for you, for your family and for friends. I have seen many attractive shirts and vests at beekeeper meetings. And they are perfect to wear if you are visiting schools and definitely for selling honey at fairs and markets. A vest to display association badges and pins would make a nice gift.

How about putting a banner or windsock on your wish list? Sometimes they are difficult to find but keep looking. A beautiful banner would enhance your sales table at a craft fair or farmers' market. Besides it will look nice on your porch at other times.

Check out the local antique shops and always stop by flea markets. Sometimes you find junk. For some reason smokers appear as "antiques" just because they are dented and gunked up. The dealer selling such a smoker thinks it's old and precious. You, as a beekeeper, know that every smoker looks that way after a few trips to the beeyard. Sometimes you find something really nice, perhaps a comb honey dish, or a honey pot, or perhaps something with a bee. The visit is worth the chance. Secondhand bookstores are also a good place to look. Always ask about bee books. Sometimes they get stuffed on a back shelf "because who in the world wants a book about bees?" I always appreciate the gift of an old bee book, large or small. Yes, you can go on eBay and have a look there. Sometimes the books seem a bargain, other times outrageously priced.

By the way, I have never seen any Christmas cards with bees. Have you? Well, I must admit that bees do not come out in the snow and most cards seem to feature snow.

Honey pots make a super gift, especially when filled with honey. I have seen various kinds of honey pots in shops and in catalogs of housewares. Some beekeepers collect honey pots and have a remarkable collection. Sometimes they will sell duplicates, in which case you have a unique gift to start someone's collection.

A very nice present to give or to keep and put on your own table is a cake in the shape of a skep. This is a fairly large cake, standing about seven or eight inches tall. I discovered the source of the pan – it is called a beehive cake mold (that's the important word to remember) and costs a king's ransom from www.marthastewart.com. I would love to put the cake mold in my letter to Santa but I would have to have been awfully good this whole year to find that under the Christmas tree. Still, a skep cake would certainly be a treat for an association meeting. One could enter such a cake in a honey cookery contest. That would be fun!

Christmas is a time for food – all kinds of cookies make their appearance during holiday time. Giving a friend, even a beekeeper, a batch of homemade cookies or a cake all made with honey is an ideal gift. A jar of homemade honey BBQ sauce or salad dressing is a great gift and one that surely won't be duplicated.

For a beekeeper who is interested in honey from other countries, try looking around in fancy gourmet food shops for some fancy imported honey. Yes, I know your honey is the best in the world but beekeepers love to sample different honeys. Perhaps that is to convince them that local honey really is the best. The jar of imported honey may well be expensive, compared to your local honey. But no matter – it makes quite a nice gift.

What about gift certificates? Sometimes these are ideal presents. There is no point in giving someone a honey pot when all they eat is comb honey. A gift certificate allows the recipient to choose something really wanted. It can be something frivolous like a stuffed bee toy or something hugely practical like foundation. Whatever the choice, it is sure to be appreciated. You can purchase gift certificates from the various bee equipment suppliers.

In most parts of the U.S. Christmas is not a good time to plant something outdoors except perhaps a living Christmas tree (dig the hole before the ground freezes). But a plant or shrub useful to bees makes a wonderful gift. If you have a computer you can make a nice gift certificate, or use a Christmas card, for a bee plant to arrive in the spring at planting season.

How about giving a gift certificate for a queen, perhaps of a stock your beekeeper friend has wanted to try. It might be a good idea to subtly inquire about queen bee preferences, just to be sure of the choice of stock.

Too many goodies to eat at Christmas? Well, give a gift certificate for a batch of cookies or a cake in February after all the Christmas stuff has been eaten up and forgotten. In fact some honey cookery may be better appreciated then – without competition from the other Christmas foods.

The best Christmas gift of all may be your own, homemade gift certificate. For what? For "help with extracting," "2 hours of bottling and labeling," "help moving hives," "help installing the queen of your gift certificate," or whatever else you can think of to give a friend a helping hand during the year. You can make a simple "gift certificate" on your computer or write it on a handsome Christmas card.

Once you have given someone this idea, you may well be surprised to receive one yourself. It's a great gift! And Santa would approve. It's one less package those reindeer have to pull. BC

Ann Harman is busy writing her Santa Letter at home in Flint Hill, VA.

Secret RECIPES

Peter Sieling

I think it's great when my wife tries old honey recipes. We may someday find something really useful to share with our honey customers.

One day in late Fall I came into the house, poured myself a cup of coffee and sat at the kitchen table. Nancy stood over the woodstove wearing a ruffled apron. Watching my wife looking so domestic always gives me a pleasantly chauvinistic feeling.

"Peter, didn't you say you scraped pine pitch off some lumber last year?"

"I saved it to make grafting wax some day with beeswax and charcoal."

"Could I use maybe just a tablespoon or so?" There was just enough casual flippancy in her manner to make me suspicious.

"What do you need it for?"

"Just a recipe I'm trying."

"I'm not eating honey and pine tar fruit bars..."

"Don't be obstreperous. Here, look at this." She handed me an old book opened to the back:

Honey Tar Cough Medicine (*Fifty Years among the Bees* by Dr. C.C. Miller)

Put a tablespoonful of liquid tar into a shallow tin dish, and place it in boiling water until the tar is hot. To this add a pint of extracted honey, and stir well for half an hour, adding to it a level teaspoonful of pulverized borax. Keep well corked in a bottle. Dose, 1 teaspoonful every one, two, or three hours, according to severity of cough.

"Where the heck did you come up with borax, the high school chemistry lab?"

"The laundry room – Twenty Mule Team."

"Well, I can guarantee I won't have a cough ever again as long as this is in the medicine cabinet."

I noticed a jar on the table. It looked like scrapings off a bottom board. I picked it up. "What's this? Are you sending this to the Beltsville Bee Lab for analysis?"

"That's Honey Cereal Coffee."

"Honey what?"

"Cereal coffee. You're drinking it now."

"Thppptuey!"

"Peter Sieling! You wipe that table off this instant!" She threw me a wad of paper towels. "Your mother told me I'd never tame you. I should have listened. You didn't drool on that other booklet, did you?"

I picked up a brittle old book and opened it up to the bookmark:

Honey Cereal Coffee (The Use of Honey in Cooking, published by the A.I. Root Company)

One egg, one cup honey (preferably dark), 2 quarts wheat bran. Beat the egg; add honey, and lastly the bran, and stir until well blended. Put in oven and brown to a dark brown, stirring frequently, being careful the oven is not too hot. To prepare the coffee, allow one heaping tablespoonful to a cup of hot water, and boil for at least ten minutes.

"All it needs is a little caffeine and an aroma and it would taste pretty good, I guess." I started leafing through Dr. C.C. Miller's book. "This looks interesting, kind of like a fruitcake."

"Is it something we could share with honey customers?" Nancy asked.

"I was thinking more of something to kill mites, or driving the bees out of the honey supers," I replied.

I read Nancy the recipe. "**Honey Nut Cakes;** *8 cups sugar, 2 cups honey* – it should be sweet enough. *4 cups milk or water, 1 lb. almonds, 1 lb. English walnuts, 3 cents worth each of citron, candied lemon and orange peel* – that would be about three chunks each in today's money. *5 cents worth citron (the last three cut fine), 2 large tablespoons soda, 2 tsp cinnamon, and 2 tsp ground cloves.* That's it, no flour?

"*Put the milk, sugar, and honey on the stove to boil 15 minutes; skim off the scum* – ah, scum! I wonder what I could do with that? - *and take from the stove. Put in the nuts, spices, and candied fruit. Stir in as much* – oh, here's the flour - *flour as can be done with a spoon. Set away to cool, then mix in the soda (don't make the dough too stiff). Cover up and let stand over night, then work in enough flour to make a stiff dough. Bake when you get ready. It is well to let it stand a few days, as it will not stick so badly* – I'll bet it starts to ferment. *Roll out a little thicker than a common cookie, cut in any shape you like. The cake will keep a year or more.*"

"I guess that cake would last more than a year around here." I said. "How about a Christmas gift for your mother? We could include a copy of '1001 Uses for Fruitcakes'."

"That cake wouldn't last you a year," Nancy retorted. "You'll be slicing it into rings on the band saw and garnishing it with holly berries and pine cones, or cutting it up for smoker fuel, then wonder why all your bees are dead next Spring." Nancy likes to threaten me with dead bees. I changed the subject and turned the page.

"This looks interesting – **Muth's Honey Cakes**." I suggested.

"The one that takes one gallon of honey, 15 eggs, and 18 lbs. of flour? I would have tried it but it requires ammonia. You could eat it I'm sure, but I don't think the children or I would care for it."

I wish my wife would stop trying old honey recipes. She could poison somebody. BC

Peter Sieling produces pine pitch in his lumber business in Bath, NY.

From PEI
PESTICIDE PROBLEMS?

Kathy Birt

Heavy losses of honey bees over the past three years in Canada's smallest province has left Prince Edward Island beekeepers in a quandary. The question posed – more often than not – is, Can those heavy losses be attributed to the overuse of the pesticide Imidacloprid? This pesticide, more commonly known as Admire, is highly used in PEI's huge potato industry. To attempt to answer this question and allay what seems to be a reign of fear for beekeepers, Bayer, Inc., the makers of the pesticide, launched an international research campaign in 2001. Some preliminary results of this research, which was headed up by Dr. Jim Kemp, a pollinating biologist at the University of Prince Edward Island (UPEI) and Dick Rogers, an entomologist of Wildwood Labs in Kentville, Nova Scotia, were released last year.

Island beekeepers were on hand for the release of the information last year, as well as the Canadian Honey Council in Banff, Alberta, the Canadian Association of Professional Agriculturists (CAPA) and Environment Canada. As well, Bayer representatives from Toronto, Ontario, Kansas and Germany were present. "This study is being watched nationally and internationally," notes Dr. Kemp.

He points out that the decline in honey bees is both a national and international problem as numbers are still declining in France, despite a ban on the use of Imidacloprid four years ago. And no where was it more evident than right in their own backyard over the Winter of 2002-2003. Stan Sandler, the largest beekeeper on the PEI, had losses in excess of 800 hives when Spring counts were done. Sandler, who keeps upwards of 1300 hives at his bee plantation in the rural community of Iris (PEI), has no solid explanation for the heavy losses. "When we counted the dead, we tested all hives for mites, but found the levels to be low," explains Sandler.

The apiarist keeps bees in what he terms "Summer yards" where they are used to pollinate the island's ever-growing blueberry industry (and other farm crops). He points out that all bees were gathered at the same time (from the Summer yards). But, he maintains that some bees taken from certain yards "die out completely" while others showed normal levels of loss.

He indicates that it seems to be a location factor. Sandler says he believes the problem is environmental, and notes the research project into Admire hasn't really put the pesticide in the clear.

Although the study found pesticide residue in the soil three years after application, the evidence shown at the time demonstrated that no detectable levels were found in the plants grown in the fields tested.

Sandler disagrees. He says he believes the residue found in clover leaves and in the soil is significant enough to warrant grave concern.

Dick Rogers, however, indicates the study has not picked up any evidence that the losses can be contributed to Admire. He points out that the research shows there was no residue found in nectar or pollen of plants that the bees forage on (or in the honey). "We are now screening for other pesticides, as well as Imidacloprid.

Focusing on Admire was a starting point, but there is no evidence that it is at fault." The entomologist says there could be many factors involved in these high losses and direct kills, "It could be pesticide," he states. He says the final results is still being worked on, and adds, "I don't expect to see any residue in hives. However, if we do, it would be a reason to raise the red flag."

Stan Sandler examines a frame from a queen production colony.

Continued on Next Page

"Losses are twice as high as in the past."

Rogers sites several possible reasons why PEI bees are dying. "It could be (poor) forage which would impact nutrition. It could be a clean water source. PEI is notorious for water problems and bees may have access to a water source – but is it clean? Does it contain pesticide?"

Answering these questions is all part and parcel of the study. Some preliminary results of the study did indicate that bee pest and disease incidences were greater than originally suspected. It was also noted in the study that shortages of clean water sources and adequate nutritional forage could be part of the problem. The possibility exists that there is a lack of education on the part of the beekeeper(s) for dealing with the many challenges they (beekeepers) now face.

It has been determined that if pesticides are not the major cause of the decline in honey bees, the only way to resolve the issue would be to correlate spray records with other kinds of data being collected. With all this in mind, Rogers points out that the study found that each beekeeper had their own unique situation. "Management may be a factor."

Rogers says the multifaceted, unbiased research project is in the final stages of putting all the bits and pieces together. "The research has been extended to allow us to tie up loose ends." Rogers releases information regularly on his Website, www.wildwoodlabs.com and points out that the study has a great cooperation from PEI beekeepers, as well as Nova Scotia and New Brunswick beekeepers. "These beekeepers are very appreciative of our research."

For some beekeepers on the Island, finding a solution to Winter losses may be afoot. Dr. Robert Coffin, a plant pathologist with an Island potato processing plant, and his wife, Joyce, keep a minimum of 30 hives on the Graham's Road (on PEI) and have over-wintered their bees indoors for the past two years. "Over-wintering bees indoors has proven to be successful, and we've had less than 10 per cent loss." Dr. Coffin says "Whether a beekeeper has 30 hives or 100, the probability of loss shouldn't be any different."

He says there is various reasons why some beekeepers have higher losses. "Some of these reasons could be management techniques, the bee's genetics and their origin."

The part-time beekeeper says combining weak hives with stronger ones in the Fall, could reduce the losses. "The population of the bees is determined by the strength of the hives." And, He suggests that there is no long-term record of bees surviving the northern Winters. "It's not like Florida where bees can be outdoors all year long."

Dr. Coffin says he believes there is no strong evidence, to date, that would suggest Admire is killing bees. "The pesticide is being defamed without credible data. Admire hasn't been given a fair trial. If bees are managed well, there is no reason why Island colonies couldn't consistently have only 10 per cent losses."

Dr. Coffin points out that his losses were about the same when he over-wintered outdoors. He says that good ventilation is the key to over-wintering bees indoors.

Bragg Lumber, a company in PEI's neighboring province of Nova Scotia maintains the status of being the largest blueberry grower in the Maritime provinces and keeps upwards of 8,000 hives. With an experimental 500 over-wintered indoors last Winter, they were not as lucky as the Coffins. Graham Wood, farm manager for the blueberry operation, says they had 50 per cent losses and he could only attribute those losses to Winter-Spring weather (conditions). "Spring played a very important role in the losses. It was a cold, wet Spring and bees need to come out into a warm climate. That's one factor."

But, he says there could be others. Whether losses are big or small, Sandler is still not convinced the researchers have the answers.

He believes there is a certain group of symptoms or some "sick hives" on the Island. With Winter losses never more than 200, Sandler says the Winter of 2002-2003 was "so black and white." "There has to be other factors, than weather and forage." When he went into the bee business 28 years ago there was upwards of 200 beekeepers on the PEI. That number has fallen to about 40. With bees his sole source of income, Sandler is presently working about 1,000 hives.

PEI bee inspector, Claude Clement points out that over-wintering losses were definitely heavier than usual, noting, "Losses were twice as high as in the past. Most of the large commercial operations lost 50 per cent." He says that at least nine beekeepers had losses of 100 percent, adding that the (lost) bees were imports from New Zealand and Nova Scotia.

Clement inspected 35 of the 40 beekeepers on the Island and found that out of 2,652 hives in the Fall, there were 1,335 still alive in the Spring. He indicates that losses have been attributed to disease, genetics, and climate. For Sandler and others who want to stay in the honey bee business, and have some sense of hope for the future of the (bee) industry on PEI, these figures are disturbing. Having replaced 500 of his lost hives last Spring, Sandler says frankly, "I can't do it again. It was a very large expense and if there is another major loss over next Winter, I'll be out of business." BC

Kathy Birt is a Certified Newspaper Report specializing in farming, fishing, forestry, gardening and conservation in Cornwall, PEI.

?DO YOU KNOW?

Year End Potpourri

Clarence Collison
Mississippi State University

As the beekeeping year closes down, beekeepers need to reflect on the past year and what was good about it and what problems continue to plague the industry or more specifically, what changes need to be made within their own operation. Certainly one bright spot for the year was the high honey prices, especially if you were successful in producing a large crop of honey. Unfortunately, in many areas of the U.S., honey crops were negatively impacted by the abundance of rain and cooler temperatures. The industry continues to be concerned with chemical residues in wax and honey, quality of queens, and the future and direction of the National Honey Board. There is also a lot of interest in several of the new lines of queens that are becoming available and how they will aid beekeepers in the ongoing battle with parasitic mites. We must continue to increase our knowledge in beekeeping basics, promote nature's original sweetener "Honey" and stay abreast of what is happening on the regional and national fronts.

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

1. ___ The presence of grease patties within the hive seems to enhance small hive beetle infestations.
2. ___ Tracheal mites are as serious a problem in the United Kingdom as they are in the U.S.
3. ___ Africanized honey bees typically have lower *Varroa* mite infestations than European honey bees when maintained under similar conditions.
4. ___ *Paenibacillus larvae*, the causative organism of American foulbrood, produces a potent antibiotic (Larvasin) that eliminates competition from other bacteria.
5. ___ It is unlawful to treat a colony with Terramycin anytime within four weeks of a nectar flow that produces honey for human consumption.
6. ___ Both queens and workers have two ovaries each.
7. ___ The worker caste of the Cape honey bee normally have more ovarioles/ovary in comparison to the European honey bee worker.
8. ___ If a cordovan queen mates with normal drones, all of the workers will have cordovan coloration (reddish blond or purplish bronze).
9. ___ The dance language (dialect) performed by one race of honey bees is often misinterpreted by another honey bee race.

Multiple Choice Questions (1 point each)

10. Female *Varroa* mites can live on bees for up to ___ days.
    A. 100
    B. 50
    C. 75
    D. 150
    E. 175
11. When nailing a frame together, it is recommended that ___ nails be used to insure that you have a sturdy frame.
    A. Eight
    B. Twelve
    C. Six
    D. Nine
    E. Ten
12. ___ This well known cave painting depicting the harvesting of honey by man is located in:
    A. Germany B. Spain
    C. Austria D. Yugoslavia
    E. Portugal

13. Please name the basic equipment required to make hand-dipped beeswax candles. (3 points)
14. When making dipped beeswax candles, why does the first dip last approximately a minute while in succeeding dips, the potential candles are inserted and withdrawn in one smooth continuous motion. (1 point)
15. Give two reasons why beeswax candles may sputter when they burn. (2 points)
16. How would you explain worker cells with bullet-shaped cappings and adult worker- sized drones in a colony? (1 point)
17. Please explain one way in which drone-size and worker-size cells are similar. (1 point)
18. Please explain how laying workers of the Cape honey bee differ from European honey bee laying workers. (2 points)
19. What is a "mating sign"? (1 point)

Based on the following symptoms, please identify the problem the colony is experiencing.

20. As an infestation develops, the honey ferments and bubbles out of the cells. The fermenting honey is said to have the odor of decaying oranges. (1 point)
21. You can sometimes see the white tracheal tubes showing through the brown skin of a dead larva. (1 point)

ANSWERS ON NEXT PAGE

?Do You Know? Answers

1. **True** While we are unable to explain this phenomenon, observations and research has shown that the presence of grease patties within the hive is associated with much higher small hive beetle numbers. Within one week, after grease patties were added, beetle numbers increased rapidly.

2. **False** Tracheal mites are not as serious a problem in the United Kingdom as they have been in North America since their introduction. Undoubtedly, this difference can partially be explained because the United Kingdom is where the honey bee tracheal mites were first found in about 1920 and it is probably where the mites have evolved. In the early 1900's, a disease ravaged colonies in the United Kingdom and circumstantial evidence now suggests that the mites were the problem. The result was that many colonies died and the surviving English bees are apparently tolerant (resistant) to the mites. Tracheal mites can usually be found everywhere in the United Kingdom. While they do weaken some colonies and kill others, the losses are never as serious as they have been here.

3. **True** Africanized honey bees tolerate *Varroa* mites better and support fewer mites than European honey bees. Worker bees can detect *Varroa* mites inside infested brood cells and remove them. They can also rid themselves of mites on their own bodies or groom their nest mates, disturbing and sometimes killing this parasite. The tendency of the bees to recognize and remove mites on their bodies is inherited and is more frequent in Africanized than in European honey bees. Africanized bees are also more efficient at detecting and removing worker brood infested with *Varroa*.

4. **True** Antibiotic production by microorganisms associated with diseased honey bee larvae is common. *Paenibacillus larva,* the causative organism of American foulbrood, produces a potent antibiotic (Larvasin) that eliminates competition from other bacteria. *Paenibacillus larvae and Melissococcus pluton,* the causative agent of European foulbrood are never found in the same larva probably because of Larvasin. In fact American foulbrood and European foulbrood are rarely found in the same colony.

5. **False** To be sure that Terramycin residues are not found within honey that is used for human consumption, the label requires that Terramycin treatments not occur within six weeks of a nectar flow.

6. **True** Both queens and workers each have two ovaries. In a queen an ovary is pear-shaped and consists of 100 to 200 long tubes called ovarioles. In workers, the ovaries are tubular in shape and each ovary is composed of two to four ovarioles.

7 **True** The Cape honey bee, from South Africa is different than the European honey bee. Cape honey bee workers normally have more ovarioles in their ovaries than is found in the European honey bee worker caste. Cape bees normally have an average of about 16 ovarioles per ovary, whereas, the European honey bee has two to four ovarioles.

8. **False** The gene that causes bees to be cordovan is a body color mutation affecting the exoskeleton of the adult honey bee. When this recessive gene is introduced into Italian stock, the gene results in a blondish-red bee. When introduced into dark stock, such as Carniolans or Caucasians, the result is a purplish bronze body color. If a cordovan queen mates with normal drones, all the workers will have normal coloration. The only way to get workers that are cordovan is when a cordovan queen mates with a cordovan drone.

9. **True** It is not uncommon for two or more races to be sisters within a single hive, but communication between hive-mates of different races may be misunderstood. Forager bees communicate distance and location of a food source to their hive-mates. Different races perform slightly different dances to indicate a food source. The dialect of the dance language performed by one race of bees is often misinterpreted by another race.

10. D) 150

11. E) 10

12. B) Spain

13. Frame that holds the candle wicking taunt while you dip the wicking into the melted beeswax (Stretching Frame)

Candle wicking

Dipping vat full of clean melted beeswax

14. The longer dip lets wax fully penetrate the wicking and forces out air pockets.

15. The wax is not completely clean and the foreign matter does not burn at the same rate as the wax.

Wax has not fully penetrated the wicking and contains air pockets.

16. There is likely a queen problem in the colony; either a drone layer or laying workers.

17 Both worker- and drone-size cells within the hive are constructed in a horizontal orientation and are hexagonal in shape.

18. When Cape honey bee laying workers lay eggs, a large number of them, and sometimes virtually all of them develop into females (workers or queens) whereas, European honey bee laying workers produce only drones.

19. A "mating sign" is the drones severed endophallus remaining in the queen's sting chamber. The detached endophallus, partly protruding from the tip of the queen's abdomen can be seen when the queen returns from her mating flight to the alighting board of her hive. The mating sign is embedded in mucous and forms a plug which prevents the escape of the spermatozoa.

20. Small hive beetle

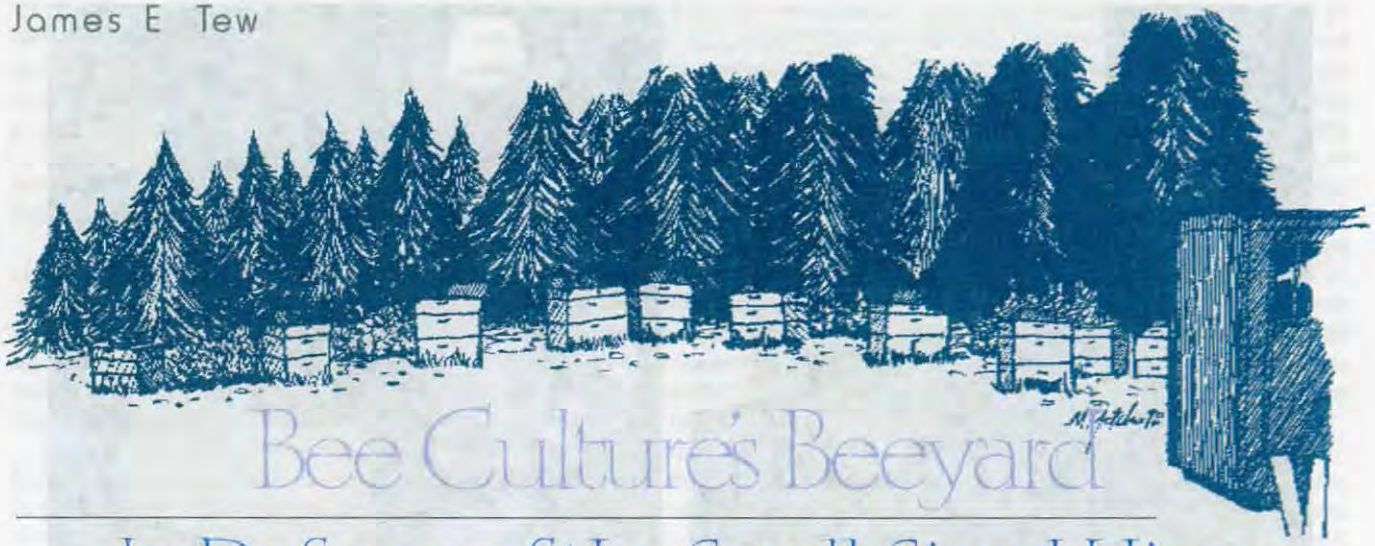
21. European foulbrood

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

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

Clarence Collison is a Professor of Entomology and Head of the Department of Entomology and Plant Pathology at Mississippi State University, Mississippi State, MS.

James E Tew



Bee Culture's Beeyard

In Defense of the Small-Sized Hive

In Bee Culture (August, 2003), I spent some column space discussing "runty" colonies and what to do with them[1]. Rereading that piece may be helpful as you read my current comments here.

What is our goal?

Initially, I may sound like I am committing serious beekeeping heresy as I discuss the positive attributes of small colonies, but there is a place for small colonies in our overall beekeeping scheme.

Is our futuristic beehive population goal to have a single beehive that is as large as a pickup truck? How large is large enough? An analogy - I have 10 apple trees and four pear trees in my backyard right now. I make several thousand undersized, wormy apples that drop to the ground and attract yellowjackets in the fall. The same fate befalls most of my pears. Even though the trees are semi-dwarf, I would probably be better served by smaller, less productive trees that I could spray and maintain, but I cling to the dream of innumerable ripe, plump apples and pears hanging from limbs of healthy, pruned trees just as I have dreams of tall hives, filled with honey, in maintained equipment. My actual fruit trees and my bee hives are considerably different.

I suppose it's the honey.

I suppose it's the honey crop that draws all of us to large hives. Maybe we have a concern for increased pollination activity – but beekeepers like large hives with large populations. Large hives are impressive. They are vibrant and a clear sign of beekeeping success. But crashing our dream perception, many of our hives are less than large – even small. By default then, may I assume that small hives are not impressive and are not considered to be successful? People like me tell anyone who will listen how to grow small hives into large ones. It's apparently the proper thing to do.

The small voice inside me

But there is a small voice inside me that quietly asks if a healthy, productive small hive is really all that bad. For the most part, I am not in the business to sell all my honey. As do most of you, I sell some honey and give some away (when my colonies make a crop). How many apples do I need and how much honey do I really want to produce? Part of me says that I would love to get 300 pounds per colony, but another part of me says 300 pounds per colony would total thousands of pounds in total crop weight from all my colonies and many hours of strenuous work. My house needs painting. In warm months, my grass always needs cutting. I have promised to build my daughter a bookcase. I have plans to remodel one of my bathrooms. I need to visit my parents in Alabama. Do I really want a large honey crop with the concurrent supering, hive managing, extracting, and bottling every year? I can't answer that question definitively. Actually, not getting a great honey crop every year is probably a good thing. It gives me a respite – a season off. If I got a great honey crop every year, great honey crops would then become average. Getting nothing, as I nearly did this year, makes an average crop look good and I still have some time to work on my project list. So, I ask again, for some of us, how bad are small, but healthy colonies that produce smaller but respectable honey crops?

What is my point?

The point I am exploring is one that bothers me. When I go into a beeyard, I find that I unconsciously shy away from the colony with 70,000 bees, three deeps and four supers. It's a big colony and is clearly all right. That particular beehive does not need me. The small, weak – even diseased – colonies are discouraging and depressing. Though quick to work, I am not greatly rewarded by the experience of working such a sickly colony. But the medium-sized colony that is healthy and productive and easier to inspect is a joy to inspect. I don't work myself to death. I can get satisfaction from looking at my bees and I can learn from the event. I acquire beekeeping experience and satisfaction. My point? If

Continued on Next Page

[1] Tew, James E. Saving Runty Colonies, Bee Culture, August, 2003, www.beeculture.com/beeculture/months/03aug/03aug3.htm

Same beekeeper but different hive inspection demands.

large colonies are so great, why don't I preferentially go to them when I am in the yard? If all my colonies were large, would I still open them up and have a look? Therefore, I am forced to admit that I subconsciously am drawn to the medium – even small colony. These are the hives that teach and stimulate me. The big hives just make me work and get me stung.

In the attached photo, which hive am I more inclined to open. It should be obvious.

Some advantages of the smaller populated hive

More portable

Though standardized and traditional, the common beehive is not perfect. I have discussed this subject in articles past and will not delve into that again. But the important point here is that a full-sized hive requires two people to move it. While still not a cakewalk to move, I can move a one or two deep hive by myself without imposing on friends and relatives.

More neighborhood friendly

Honestly, I am more anxious than I would like to admit about my backyard beehives. On both sides of me, I have tolerant, non-beekeeping neighbors. I suspect that they, too, are more anxious than they admit about the four hives in my yard. They tolerate my bees. I occasionally wish that my hives were not the usual giant size and were more modest in population. (Maybe I wouldn't have several thousand bees visit my neighbor's bird waterer every summer.)

More user friendly

For both the experienced and novice beekeeper, the moderately populated hive is more friendly to inspect. There is less equipment to move about and fewer bees to admonish you when you screw up. The chances of actually finding the queen are greater and the opportunity to see various hive attributes is improved. On many occasions, people who like bees, but are not beekeepers, have told me that they would be more inclined to keep smaller colonies. Competent gardeners are a good example. They want bees – but not a lot.

Less costly

Though a minor point, it is still one worth mentioning. Smaller populated hives use less equipment resulting in lower initial investment, maintenance, and storage costs.

Obvious disadvantages to smaller populated hives

They outgrow their space

By design, we have always bred queens to head large colonies. Sixty thousand is the common worker population number ascribed to large bee hives. Simply putting a productive queen in a small colony will not assure you that the colony will stay small. Such crowded hives swarm a lot and they beard on the front of the colony, which probably concerns my neighbors more than a large colony.

They don't make as much honey or pollinate as much

It logically follows that since there are fewer bees, the colony can't make as much surplus honey nor pollinate as much. This may or may not be a negative point for you.

They may not Winter as well

This is relative. If a large colony has inadequate honey stores, it will die as quickly as a smaller colony. It would appear that a larger cluster, with ready access to ample honey stores, would be better able to withstand the rigors of an average Winter. Having said that, at my lab, we routinely have abnormally small colonies that we are expecting to die during the Winter, survive and prosper later in the Spring. I wonder if wintering physiology is more important than we realize more than simple cluster dynamics.

If the population is small, there is something keeping it that way

Diseases, pests, pesticide exposure, and poor queens come to mind as common reasons for a colony being undersized. In my entire discussion here, I have lauded

the attributes of a healthy, but undersized colony. If some pathogenic agent is the cause, that is not a positive attribute. Diseases and pests should be treated.

How can I maintain smaller populated hives?

I can only suppose that some of you will be interested in colonies with a population size less than large. How can you do it? After all my diatribe in this piece, I can't tell you how to routinely keep your hives less than booming.

No doubt, a breeder could select for colonies with less population size, but that flies in the face of common beekeeping principles. Larger hives are always considered to be better. Several years ago, I approached a USDA researcher with queen breeding skills asking why beehives only came in one size – extra large? The US technological system is noted worldwide for being able to miniaturize everything but beehive populations. I could not even get to first base with the researcher who argued that we had spent 200 years developing large colonies. Why would anyone what to go backwards. *(At this point, I realized that we had a fundamental philosophical difference. I didn't see breeding for productive bee strains with a smaller population size as going backwards but rather being a beehive that would be more appropriate for many urban backyard beekeepers.)* I gave up the fight and moved on to other subjects.

Hives with large populations are the norm

Let me be clear. I don't want general colony populations to go down. Commercial beekeepers and many hobby beekeepers need to get all the production from individual colonies they can get. If I routinely had access to queen stock that would produce smaller populations, I would not adopt it universally. I realize many of you may think I have gone daft for even taking time to write this piece. But I still admit that when entering a beeyard, I am drawn to the healthy, but smaller hive as being the one that I enjoy working. Am I the only one? BC

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Beware Bees, Bearded Brother

Jimmy Reed

Because hairy creatures have raided their hives since the dawn of creation, honey bees hate hair. The preacher's face was covered with it.

The sign on his car read, "Rev. Thaddeus Isaiah Sichensich, Thunderbolt Of The Deep South," but we just called him Brother Love. His Sunday morning singing and sermonizing radio show, "Don't Let The Devil Ride," was far more entertaining than enrapturing, and we obliged him when he made his rounds, soliciting donations.

He wore a white suit, bow tie, stacked heel shoes and a wide straw hat. The huge pewter cross swinging from his neck inscribed an arc just below the scraggly ends of his Old Father Time beard.

I always tended my bees early in the morning, and the sun was a blood-red egg yolk on the horizon when I saw the pious man of the cloth wheeling his long white Lincoln down the driveway.

"Mornin', Brother Love," I said, smoking a hive prior to looking inside. "Sho' enjoyed yo' show Sunday."

"Bless you, my child, bless you," he said. Among our sometimes shepherd's ceaseless repertoire were such beatific benefactions as "bless you," "praise the Lord," and "amen, Brother." "Hell's fire" was as far as he went in the other direction, but what happened that day demonstrated he had a thorough knowledge of vernacular likely to be evoked by that fire.

"Harvesting honey, I see," he said, bending to get a better look as I lifted the hive's top. "One of our Maker's bountiful blessings," he rhapsodized. "Sho" hope you'll give me a jar." Which I'd planned to do...until I noticed countless squadrons of bees gathering in attack formation, wings vibrating, humming in higher and higher octaves, menacingly drawing themselves up to their fullest extent, as they balefully eyed his holiness' hirsuteness.

"Oh, my Heavens!" preacher shrieked, frantically combing bony fingers through scraggly strands, "I do believe one of those little fellows is in my beard! Lawd have mercy! Bunch of 'em's in my beard...down my shirt...up my britches legs...ooh, ow, oh, #*#*#*#*#*!" The volley of vituperative, venomous vehemence spewing from his mouth as he streaked slapping and swearing toward his car, bee-baubled beard flowing behind, definitely earned him no high marks in Heaven.

Off he flew, cursing and praying simultaneously. The prayers went unanswered as his swarming, buzzing passengers gave their last full measure in Kamikaze suicide stings. Suddenly, the door flew open, and reverend and ride parted ways. Across a cotton field he sprinted as the car eased off in a ditch.

"Brother Love, I'm terribly sorry about those bees stinging you," I said, after pulling the Lincoln back on the road, "Here's something that'll make you feel better." I held out a jar of fresh honey.

Sopping with sweat, looking disgustedly at his ruined shoes and clothes and gingerly touching the array of swollen nodules adorning his face, he said, "No, thanks. If I ever wander the wilderness 40 years, surviving on honey and locusts like John the Baptist, I'll just survive on locusts." BC

[This story was originally published as a "Voice of the Delta" column in the August 2003 issue of Cotton Farming Magazine.] Jimmy Reed is a freelance writer.

INNER ... Cont. From Pg. 16

south, or west, and pick up large loads to sell locally. This reduces the number available to ship, but gets them closer than zone four for you to pick up. Only you have to know where they are, and when they will be there. If you don't – no bees.

How many thousand colonies were lost in the California fire? Once source told me 10,000 he knew about. And the sage that burned won't be back for years. Bees lost for pollination for sure, that will need to be replaced, or pulled from somewhere else.

Another tough Winter? Some say for sure. Most are guessing. If we guess wrong and it's easy, the demand will be reduced, somewhat, but if not .!

And, who knows 'till Spring anyway, and who orders replacements *before* the bees die? There will be the typical Spring rush, no matter what.

What will you order this year? The same 'ole, same 'ole, from the same 'ole supplier? Get in line now. Something, or somebody new? Get in line even sooner, because they already have a heap of customers from last year that they are working with.

What about the local guy, who went south, or had truckloads delivered. Here's what's been the routine.

He says, "I get my bees from _____, down south. You want something else, I can't help you." Too often it's a take it, or leave it situation. Here's the *BEST* way to work with that. First, work *with* your local supplier. He's an ally, not an enemy. But, order a *queenless* package, and get the exact queen you want, from the queen producer you know and trust. Timing may be tricky, but you can manage that.

Oh, how do you find that local supplier? Well, start locally – your bee club, local keepers, state extension or state inspector. They'll most likely know. "Who's bringing bees into my state?" will probably get you a couple of answers.

If that doesn't work, call your supplier and ask if anybody locally has made plans for pickup. In fact, smart suppliers should be spreading the word that *Their* bees and queens can be purchased in *Your* area from _____.

That, I think, would get the most bees into the hands of the most people at the best time of year.

•

Small hive beetles haven't gone away, in case you were wondering. Like a swarm drawing comb across a sheet of foundation the beetle has been steadily spreading across the south and southeast U.S. filling the environmental niche it so easily fits in.

So completely unknown were its habits and traits and subtleties when it first arrived that nearly everything it does in this new land is unknown and needs discovering.

USDA, University and industry people have waded in and are now finding answers to some of the questions, and finding more questions at the same time.

Here's some of the basics. The larvae goes through six instars, stages before it becomes an adult. They are omnivorous, meaning they will eat anything. Larvae do not have a web like wax moths, and, they're tough, and not repelled by light. When populations in a hive are fierce, the larvae will cover a frame like maggots covering the body of a dead animal. That analogy is close in many ways.

Bees tend toward dealing with these pests in the hive, some more than others. You read here last year about their behavior that imprisons adult beetles behind walls of propolis. The irony is that once the beetles are confined, they coax the bees to feed them. Go figure.

The beetles are migratory and travel in, sometimes, literally swarms, (called protoswarms) I'm told, and can move into a beeyard of two, 20 or 100 colonies. They have an aggravating pheromone that acts as the glue for the migratory hordes travelling about.

Once the adult population reaches about 600 in a colony, the number of bees required to deal with them reaches a critical mass and guarding begins to sap the foraging population – essentially the beetles are causing no physical damage, but negative economic results begin to show.

Females puncture the cappings on brood cells and lay as many as 10 eggs directly on brood. The emerging larvae destroy the bee. Larvae tunnel through, over and around the comb, leaving an exodate that causes honey to violently ferment, literally boiling from a cell, off the frame, and out of a super.

The larvae leave the hive and pupate in the soil, where some controls enter the picture – Gardstar as a spray, and fire ants as a biocontrol.

Restricted entrances have been tried, various vegetable/fruit baited traps, and inhive traps have been looked at. Some work, some don't and some do sometimes.

Bees with strong hygienic behavior exhibit some control in removing brood with eggs on it. They seem to be cuing in on the eggs.

Honey house problems are reduced by extracting in two, or at most three days after pulling supers. Keeping the humidity very low radically slows egg hatching, and larvae problems.

The general consensus is that these pests are scavengers. A colony that is stressed by nutrition, mites, disease, queenlessness or other problems are the best targets. Add one more stress, the presence of adult beetles, and the colony defences essentially collapse. The smaller the colony, say a mating nuc, the faster that collapse occurs.

Right now the best defense is a good offense – strong colonies, healthy and growing, with hygienic bees, and a honey house hygienic program by the beekeeper – no slumgum, no cappings, no honey supers sitting off in the corner and low, low humidity.

At the moment that's the best there is, but there's more on the way. Some of these questions are getting answered. Stay tuned.

•

2003 has been another interesting year, hasn't it? We hope its been more good than not, for you and yours. From all of us here at *Bee Culture*, may next year be better, and the holidays be grand.

GLEANINGS

DECEMBER, 2003 • ALL THE NEWS THAT FITS

High Honey Prices

HIVE THEFTS INCREASE

The high price of Australian honey has seen thieves target hives in the south coast region of New South Wales.

The wholesale price of honey has risen to about A$1,500 for a 660-pound drum from A$400 as honey production plunged 70% during the worst drought since European settlement in Australia in 1788.

The drought has also resulted in beekeepers traveling longer distances to find flowering plants and having to leave their hives unattended for longer periods.

That has grabbed thieves' attention with the prospect of earning around A$100 for the honey in a stolen hive.

Up to 50 hives have been stolen, all from around the tourist town of Bateman's Bay.

State police detective senior constable Greg Mercer, the region's rural crime specialist, said the theft of working hives indicated the thefts were committed by "somebody in the industry familiar with bees."

Bateman Bay beekeeper Pat Roberts, who had 20 hives stolen, said there had been at least four other thefts of hives in the area three hours south of Sydney in the last few months.

"A lot of bees are disappearing," he said.

Mercer said hive theft is a difficult crime to solve because the evidence is usually quickly destroyed.

"We hope to catch people in the act but that's difficult because of their locations – or we hope members of the public will report something," he said.

Alan Harman

FRENCH FRIED BEES

French beekeepers are struggling after Europe's summer-long heatwave.

Many of the country's 80,000 beekeepers have been forced to feed their bees this summer and honey production has fallen more than 50%.

The French National Bee Surveillance Unit is also researching a rising death rate from 10 to 60% for bees in winter.

One theory is a massive increase in the use of pesticides. Another is a change in beekeeping methods that has seen local bee species replaced by local bees crossed with imported bees to produce a less hardy variety.

QUEBEC HELPS

The Quebec agriculture department was cited as announcing a $1.9-million program yesterday to help Quebec beekeepers whose hives have been devastated this year by the parasite mite *Varroa destructor*.

In announcing the program, Agriculture Minister Francoise Gauthier was cited as saying that Quebec's 200 beekeepers have 37,000 hives, and *Varroa destructor* has wiped out "no less than 50 per cent" of them this year. Denis Pellerin, of the beekeepers association, was cited as saying the damage is even worse in terms of honey production. For 2003, honey production in Quebec is between one-third and one-quarter of the usual amount.

An Update

EXPLOSIVE SNIFFING BEES

The Defense Advanced Research Project Agency, the government's think tank for radical ideas like the Internet and stealth technology, wanted to investigate insects – especially flying ones.

Jan Walker, an agency spokesperson, said they are interested in learning if ordinary honey bees are able to help human investigators detect nuclear, biological or chemical weapons.

Jerry Bromenshenk, a biological sciences research professor at the University of Montana, served as the team leader for the three-and-a- half-year study. He said there are two modes, or ways, bees can be used for detection purposes.

One way is to send bees into an area of interest to collect data. A honey bee's body has a natural static electricity cling that collects air particles, including dangerous particles from an explosive device.

"We have demonstrated bees can be trained to prefer certain odorants over their usual food sources and this training persists for a useful amount of time," said Dr. Alan Rudolph, Defense Advanced Research Project Agency's Controlled Biological and Biomimetic Systems program manager. "In field tests, bees clustered at locations where we had placed explosives. We have measured probability of detection and false alarm for bees finding targets in the field and have found that they are quite robust. We are also investigating the passive collection of bees and other insects to determine environmental presence of chemical or biological threats."

"Bees can be trained to go to 'odors of interest' when associated with a food source – similar to [Russian psychologist Ivan] Pavlov's theory," said Walker. "Bees fly around an environment, collect pollen and then go back to the hive. We can put instruments in the hive that detect molecules other than pollen – like molecules one would find in explosive materials."

Bromenshenk said the static electricity also collects toxic metals, industrial and military chemicals, diseases and anthrax.

The other way to use detection bees is to train them to use their highly sensitive receptors to locate harmful chemicals. Bee handlers use either cameras or binoculars to see when their flight patterns change.

"We've trained bees to fly in a sharp 'zigzag' fashion when they detect a possible bomb," said Bromenshenk. "A colony of bees will fan out and search as far as two miles away. We convinced them an explosive device's vapors are desirable, like pollinating a new type of flower they've never been exposed to. They have a great ability to thoroughly canvas an area quickly."

A Defense Advanced Research Project Agency consultant, Bob Cartledge, told several publictions recently that bees have better sensors than humans and make looking for landmines a lot easier than searching "inch-by-inch with a knife."

Bees do, however, have some drawbacks. Like other detection animals, bees have trouble seeking explosive materials in heavily-sealed containers. A bomb needs to have a leak or a ventilation system for the bees to properly 'hit' on the device, the professor explained.

Bees also won't work in the night, when it's cold or during wetness, and, he added, research so far indicates bees are most likely unable to detect radiation.

Bromenshenk said his team was

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SNIFFING ... Cont. From Pg. 63

initially concerned bees may have problems when faced with multiple hits in an area, like a field heavily-saturated with landmines. He wondered if the whole bee colony would converge on the device with the strongest scent or biggest plume.

He said bees are actually easier to train than dogs and are equally reliable, if not more so. The professor claims bees are 90 to 98 percent reliable and have only a 1 to 2 percent false positive record. Bees, he added, can accurately find a cluster of landmines, drugs, biological spores and even decomposing bodies.

"They have an incredible sense of detection and can find particles ranging from a few parts per trillion, and possible even a few parts per quadrillion," he continued. "They are very reliable, very accurate and are on par with [the detection ability] of dogs. But, unlike dogs, bees don't feel the need to bond with their handlers."

A major strength of detection bees, as opposed to dogs, is that bees don't need a leash. Bromenshenk said the bees love their home hive and almost always return.

"Sending a whole colony of bees is more effective than one or two dogs," he said, explaining how his team trains the bees in bulk – hundreds of thousands of them at a time.

Some critics have argued through various media outlets that bees trained in America may not be able to find weapons of mass destruction in Iraq because of differences in the environment and climate. They also argue importing American honey bees into a foreign area, like Iraq, could disrupt fragile ecosystems.

Bromenshenk said it was never a consideration to train only a certain number of bees to detect chemicals and then transport them into foreign territories. His research involved creating a method to train the bees. Bee trainers, he said, can travel and collect native bees to perform searches – meaning bee handlers would train Iraqi bees to help search for chemicals and other types of weapons.

Most of the technology and research was developed at the University of Montana and the Southwest Research Institute has been called on to validate Bromenshenk's findings.

"Bees," he said, "will help find needles in haystacks."

GM SAFE?

A New Zealand researcher reported trials had found that genetically modified plants have little or no impact on bee health.

HortResearch scientist Louise Malone said a bee can only be affected by a GM plant if the plant expresses a new protein in pollen, nectar, resins and honeydew of plants.

The institute's researchers developed a system where the possible effect on honey bees could be studied without using GM plants.

This was done by feeding adult and larval bees purified proteins identical to those produced by GM plants.

The researchers found Bt toxins – designed to control caterpillars – and biotin-binding proteins used for general insect control had no effect on bee health. Protease inhibitors used for caterpillar and beetle control had a slight effect on bees at high concentrations, shortening their life-span by several days.

Alan Harman

Richard Taylor
1919 2003

Richard Taylor passed away October 30 after a long battle with cancer. Richard was loved and respected in this industry, by many. We will have a tribute to Richard in the January issue of *Bee Culture*.

OBITUARIES

Donald W. Whitehead, 74, a Republican lawyer who was the former federal co-chairman of the Appalachian Regional Commission, died Oct. 24 at his home in Beltsville after a heart attack.

Mr. Whitehead, a lifetime member of the Republican National Committee and a member of the National Republican Lawyers Committee, was director of Richard M. Nixon's Presidential Committee for the Mid-Atlantic States in 1968 and co-chairman of Nelson A. Rockefeller's Presidential Campaign Committee in Massachusetts in 1964.

He also worked for the campaigns of Sen. Edward W. Brooke III (R-Mass.) and Republican Gov. John A. Volpe of Massachusetts.

Mr. Whitehead, who was born in Auburn, N.Y., graduated from Williams College in 1951 with a bachelor's degree in English. In 1955, he earned a law degree from Northeastern University.

He worked as a lawyer in Massachusetts for a life insurance firm and economic development firm until 1962, when he became an administrative assistant to Rep. Hastings Keith (R-Mass.) The next year, he became a Massachusetts assistant attorney general. From 1964 until 1971, he was a partner at the Hahn & Whitehead law firm in Boston.

He moved to Washington in 1970 when he became general counsel to the Appalachian Regional Commission. The next year, he was appointed by President Nixon as the federal co-chairman through 1977.

He returned to private legal practice in 1977, working for the now-defunct firm of Anderson & Pendleton in Washington and then in private practice until retirement in 1995.

He was a consultant to the governments of Portugal and Nigeria and was president and chairman of the International Agency for Apiculture Development, which promotes beekeeping in the Third World.

He also volunteered his legal services to Good Bears of the World, which gives teddy bears to hospitalized children and nursing home residents.

Survivors include his wife of 53 years, Margaret S. Whitehead of Beltsville; two daughters, Donna L. Shabin of College Park and Karen A. Graybeal of Laurel; three sons, John L. Whitehead of Upper Marlboro, Robert S. Whitehead of Mechanicsville and Donald W. Whitehead Jr. of Ellicott City; two brothers, Richard Whitehead of New York and Louis Henry Whitehead of Ohio; 10 grandchildren; and six great-grandchildren.

Carl M. Johnson, 95, of Harrison, TN passed away September 13.

Carl was a long time active sideline beekeeper and kept bees until the last few months of his life. He started beekeeping as a very young boy. He kept his first colony in a "chalk box" that had been used to supply chalk for the school room blackboards.

He was a past president and teacher of the Chattanooga Area Beekeepers Association. He helped many a bee-ginner and other beekeepers and also sold bee supplies, including high quality "bee" woodenware that he made for himself and others. He was also featured as a beekeeper in the local newspapers and on TV.

He kept many apiaries in the local area, processed and sold honey to many local stores, and at craft fairs and for a short while, by mail order. He was a born beekeeper among other talents.

He is survived by his wife, Alda, friends and family.

William R. Jones passed away October 26 at the age of 84. He was born January 26, 1919 to William and Mary Ann Rowley Jones in Wellington, UT. He married Olive Lewis in 1945 in Spokane, WA. At 15 he joined the Civilian Conservation Corps where he learned surveying and participated in work projects that made him want to be a civil engineer. He got his degree in Civil Engineering at UT State University. He served in the 408 Engineering Battalion during World War II. He worked for the U.S. Bureau of Reclamation, participating in government service for 30 years. He then discovered his passion for raising bees. He ran Jones Bee Co. for 40 years. He is survived by his wife Olive, his children William (Nancy) Jones, Marion (Kathy) Jones, Stephen (Joylyn) Jones, David (Marj) Jones, Elizabeth (Steven) Goold, daughter-in-law Kathy Jones and 15 grandchildren and 13 great-grand-children; also his sister Vera Jones Lockwood and a brother Aaron (Thora) Jones and numerous nieces and nephews.

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Every beekeeper's worst nightmare is the complaining neighbor. I should know. Before I became a beekeeper, I was the neighbor.

In 1991, when our adjoining neighbor Joanne said she planned to keep honey bees in her townhouse attic, I claimed I was allergic and might die if a bee stung me. To my amazement, Joanne, who is a nurse, accepted this without question and said she'd find another place.

I lied to Joanne because our townhouse was for sale. Her attic window – the one she proposed to use as a bee entrance – was only a few feet from our own. I worried that bees from her attic would come over to our place and scare off prospective buyers.

We had problems enough unloading our home. It languished on the market. Bargain hunters pitched us low balls and expected us to finance the deal.

The gentrification of Carbondale had already begun, and one nearby neighbor thought the community in danger of losing its blue-collar character. He wrote letters to the paper advocating a junk-car fleet at the edge of town so that fancy-pants folks would shudder and stay away. He also practiced what he preached. He apparently never threw anything away, and his own yard morphed into a sort of Smithsonian of junk.

This guy – a city councilman, believe it or not – had done me a favor or two over the years. Plus, I generally don't mind a certain amount of stuff lying around, so under different circumstances I might have found his yard merely amusing. But as our unit sat unsold for two years, my good neighbor's eccentricity wore on me some. Then Joanne announced her honey bee project. Forgive me for losing it. Maybe you would have, too.

You have to admit that Joanne had an ingenious idea – keep your bees at home, but out of the backyard where neighbors would be sure to complain. Don't some New York City beekeepers keep their bees on rooftops?

In hindsight, I suspect Joanne's attic would have actually been a poor place to keep bees. Those south-facing attics got hot, even in winter, and warm bees fly – a fatal mistake on Christmas Day in Colorado.

Anyhow, for her 40th birthday, her boyfriend John gave Joanne the complete beginner's bee outfit – a couple of hives, a couple of books, boxes of unassembled frames, foundation, a hive tool – everything. At her birthday party she celebrated by donning her new bee suit, gloves, and veil, and dancing around the yard merrily "smoking" her guests.

The tequila flowed. After awhile nobody even noticed that the birthday girl was wearing a bee veil and coveralls. By midnight Linda and I had had enough and went home. We put in earplugs before we went to sleep. When we stopped by Joanne's the next day, the place looked like a frat house the morning after. John was still asleep in the bathtub. And all Joanne could talk about was her bees.

She put her two hives next to an alfalfa field outside of town. Sadly, the little darlings never made it through the Winter, and Joanne's long-term dedication to beekeeping never matched her initial enthusiasm. She moved on to other pursuits, but her brief foray into that ancient and honorable craft changed my life forever.

Of course the townhouse eventually sold, and Linda and I found paradise in Peach Valley. Sometimes we call it "No-Peach Valley," because in the Spring Jack Frost normally takes the whole crop. The first year we harvested sweet cherries – big Bings and Lamberts – but then for a couple of years we got none. At first I blamed the frost. But you see, the same weather that brings Spring frosts – snow followed by clearing skies and cold temperatures – also keeps bees in the hive.

I began to suspect that maybe it wasn't so much those 29-degree nights as poor pollination that lay at the heart of the no-cherry problem. I decided that instead of relying on feral bees, or somebody else's bees, I should put my own beehives right in the orchard. That way if there were any break in the weather during the bloom, my trees ought to get pollinated.

Normally when I get an inspiration like this, I procrastinate until it goes away. But this time fate intervened. On a snowy January night, I bumped into Joanne at the hot springs pool. I seized the moment, sort of.

First I came clean. When I confessed my fib about being allergic to bees, Joanne only laughed and scolded me. After all, it had been a few years. Then I pushed my luck and inquired if she still had her beekeeping equipment. She said yeah, maybe we could work a deal. We left it at that.

A year later in April I called her. She was in a big hurry to go somewhere. She was a bit agitated, you might say. She said, "I've got a new roommate moving in tomorrow, and I need some attic space. I was going to call you. You can pick up that bee stuff, or I can haul it to the dumpster. But I need it out of here by tomorrow."

That's how I got started beekeeping. All I had to buy were the bees. Now I never have to worry about pollination. And you know what? Linda and I still hardly ever get sweet cherries, but we get honey every year.

Joanne and The Bees