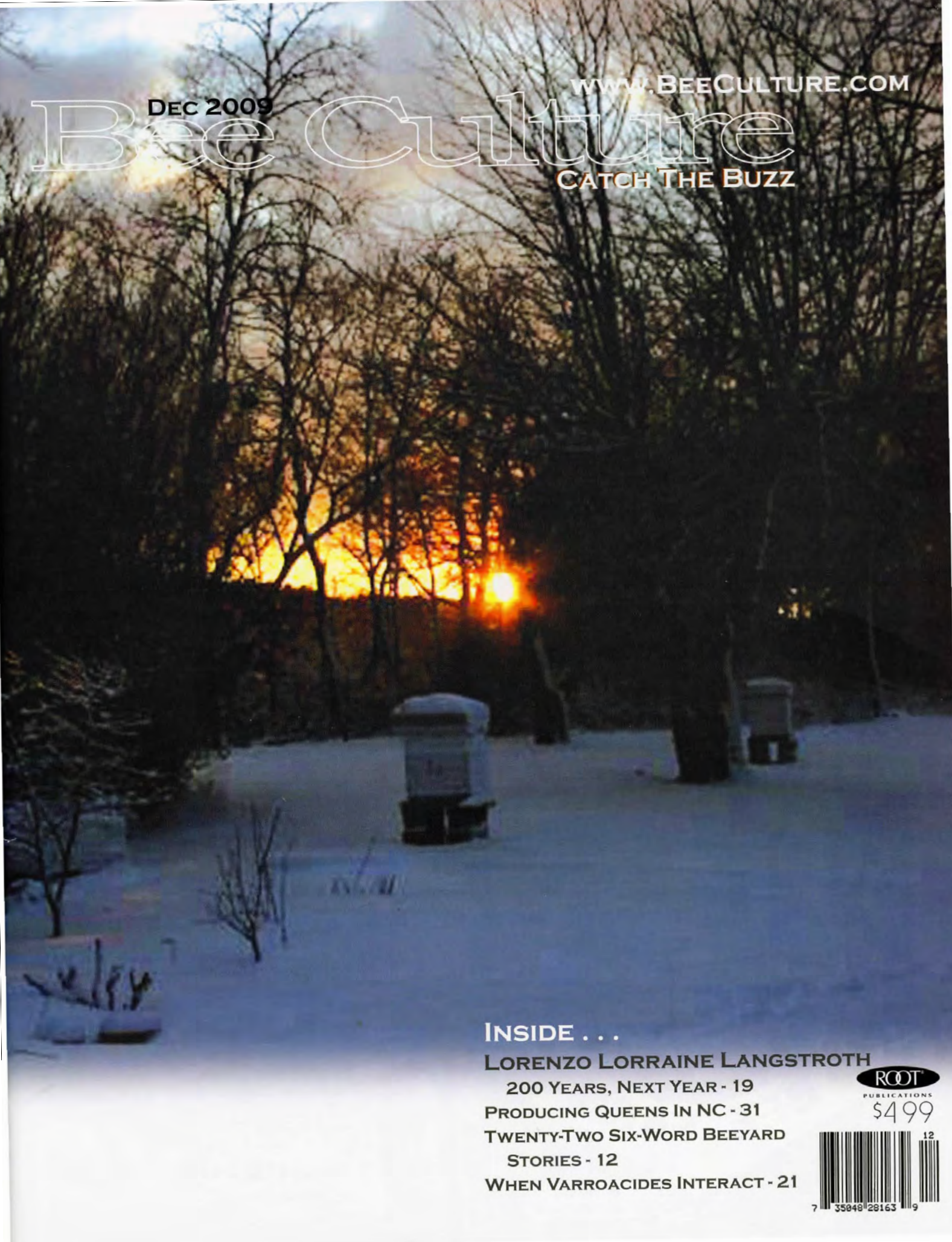

DEC 2009

Bee Culture

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CATCH THE BUZZ

INSIDE . . .

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This quiet evening scene masks the ongoing turmoil inside. Our bees within must heal from the poisons and pests of Summer, survive the winds and wiles of Winter and grow and gain momentum for yet another charge. Pray for them, for they are greatly outnumbered. Photo by Helen Miranda Wilson from Wellfleet, MA, on the north end of Cape Cod.

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Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

DECEMBER 2009 VOLUME 137 NUMBER 12

FEATURES

DEPARTMENTS & COLUMNS

Annoy Your Neighbors

Dr James Tew writes in his "My Lawn – My Bees – Revisited," *Bee Culture*, July 2009, "I will intentionally annoy my neighbors and friends. " Well, Dr Tew, I've done the same thing, in about the same way, though unintentionally – so far

My husband and I live in the Virginia countryside, where I keep a few hives. Farmers here have gone the more profitable route of forsaking fruits and vegetables for the ubiquitous three-crop rotation of corn, soybeans and Winter wheat. This trio threatens my bees by introducing all the dangers of pesticides and GM crops. When the Black Locust or Tulip Poplar trees fail to provide Spring nectar, my colonies struggle while I toil to keep them fed.

As a hedge against starvation in my hives, I planted a small "meadow" of native Virginia wildflowers and grasses. I followed the guidance of agents from the USDA and USDF, who visited my proposed meadow site early this year In the picture you see me in my 5,000 square foot meadow amid a riotous growth of Fall Shore Mallow – the end of a profusion of wildflowers that's lasted the entire Summer The bees have worked the meadow the entire season, along with butterflies, dragonflies and many species of birds. One of my special treats is seeing Goldfinches perching lightly atop a vivid magenta Mallow I see my little plot as an oasis for wildlife in the middle of monoculture.

Yet neighbors ask what it's for I hear, "Why has the yard been left to go wild?" or "Is it going to stay that way?" As if wildflowers are an unacceptable landscape! A neighbor complains bitterly from his fence, some 50 yards away from the meadow, that it's ugly and ruins his view. "View of what?" I asked. The view of our formerly all-mowed front yard was his implication. Wait 'til next year, I think to myself, when those 5,000 square feet become 10,000 – intentionally!

Lynn Kallus
Merry Point, VA

Legalizes Bees

The Allendale NJ Borough Council voted unanimously in October to rescind a ban on apiaries.

The bee ban had included honey bees along with ocelots, pot bellied pigs, and pigeons along with any animals deemed to be dangerous to humans. This ordinance was drafted in the 1980s after a man was discovered raising 200 cobras in his garage and one of the cobras escaped.

Dianne DiBlasi, a beekeeper whose hives are now located in neighboring Upper Saddle River, thanked the council for considering the ban and drafting a new ordinance that balanced the desires of beekeepers and the council's environmental support for bee pollination with fears that some neighbors might not want apiaries near their property

The new ordinance allows a single hive on properties of a quarter acre, up to a maximum of six hives on land more than an acre in size, but denies permission if any neighbor within 200 feet registers an objection when the beekeeper applies for the annual permit. The New Jersey state apiarist will provide inspection gratis, and only four beekeepers may operate non-commercial hives in Allendale at any given time.

John Koster
Allendale, NJ

Guttation And Bees

Guttation is the latest buzzword in beekeeping circles. It was discussed at Apimondia 2009 and has been the subject of numerous recent emails. Plants exude guttation water (GW) under certain temperature and humidity conditions. Soil moisture and root pressure are also involved. Guttation water is produced on plant leaves during night and early morning hours – do a search for *guttation wikipidia* for a more informed discussion of the subject.

Guttation water (GW) can have and likely does have a significant sugar content (from sugar stored in plant roots) thus making this water attractive to bees as both a nectar source and a water source. As several people have pointed out to me, GW from plants, esp. corn, grown from imidicloprid-treated seed contains this pesticide in amounts greatly in excess of lethal levels to bees (see Italian study in the October J of Econ. Entom., available with a search for *guttation honey bees*).

Past studies have shown that plants grown from pesticide treated seed do not harm honey bees – the pesticide is felt to have dissipated (or been greatly diluted) by the time the plants flower thus leaving the nectar and pollen "clean" (or close to clean) – virtually all canola seed is treated with imidicloprid yet bees thrive on canola nectar and pollen. GW from plants in the early or seedling growth stage would be hazardous to bees if the bees collect significant amounts of such water (assuming treated seed was used).

Is GW a significant nectar (or water) source for bees? That is the $64 question. Plant species vary greatly in their proclivity (or ability) to produce GW Grasses are more prolific producers of GW than other crops; corn is a grass crop. Because production of GW is dependent on temperature, humidity, cloud cover

and soil moisture there are wide seasonal and geographic variations in GW production. If there are young corn plants in your area, check them early in the morning for guttation water (GW can be confused with dew, which is made from moisture in the air; a refractometer should be able to distinguish between GW and dew). If GW is found, check later in the morning to see if bees do indeed use this water as a nectar and/or water source and see how long this water remains before it evaporates later in the day If GW production is a common occurrence on young, seed-treated corn plants in your area and if your bees are collecting significant amounts of GW from these plants, you can likely assume your bees are being adversely affected.

Joe Traynor
Bakersfield, CA

Winter Cover

In the October 2009 issue the article "Winter Cover" by Dave Hemendinger sounds like a good idea. It raised several questions, though.

If you leave an opening between short ½" x ½" strips around the inner lid, why do you need a groove in the particle board?

The whole concept should also work to keep the hive cooler and better ventilation in the Summer, but would need a screen to keep moths out. Also how can you keep mice out in the Fall when you put it on for Winter?

I assume an outer lid covers the inner and intermediate covers and needs to be large enough to allow bees to exit and enter the top opening. Am I correct?

I enjoy your magazine and look forward to each issue. I really am interested in the articles on plants for honey bees. With the clearing of woods and fencerows for today's large farming equipment we need to plant flowers for bees.

LeRoy Miller, Jr
Galion, OH

Organic Beekeeping

Concerning your article on organic beekeeping:

Did the researchers do any research on organic beekeeping methods already in use?

There are organic methods of dealing with *Varroa* mites. The researchers did not utilize any methods involving essential oils. We use Essential Oil of Thyme, Eucalyptus, and Menthol. One can buy essential oils separately and/or there are commercial products having these ingredients.

We cannot imagine that when doing research on organic beekeeping, the cost of organic sugar and protein sources meant that the colonies were provided with minimal supplemental feed. The idea of not using organic sugar and protein in the same quantities as other beekeepers would use non-organic sugar, corn syrup, etc. is wrong.

Btw, we have always used Italian bees. (This does not mean that we are opposed to other strains.)

We urge the researchers to inquire about the organic methods that are being used in beekeeping. Then do the research again.

Sky and Basil Campbell
Athens, GA

Genetic Diversity

In Clarence Collison's article on genetic diversity he explained about the research that supported the idea that greater diversity increases the fitness of the hive. I also read an article, I believe in Discover magazine, that suggested that many of the problems with bees, like CCD, might be the result of a lack of genetic diversity resulting from our selective breeding.

I was wondering if some of the organizations that are doing research and are using instrumental insemination could put out a request to beekeepers around the country to send them drones, especially from hives with a high survival rates, so they can have a greater selection of drone genotypes to use in their research.

Peter Leighton
Jackson, NJ

Wasps In The UK

During the last few months, I have had trouble with wasps round the bee shed and equipment. Managed to find a coupla nests and kill 'em off but the wasps kept coming. Last week was looking at the tiles on the roof through binoculars and noticed some wasps entering under the tiles. Went up into the attic. See what you get when you come here! You can get an idea of the size from the wasps on the surface. Absolutely marvelous construction and a thing of beauty

Peter Smith
Great Missenden, England

Small Hive Beetles

As first reported Spring 2009 (see Mailbox, May 2009 issue) on passive refugia open ended trap (much like corrugated plastic sheets), the objective was to reduce adult beetle population to a background level throughout Spring and Summer

Observations: Placement of refugia (two per hive) over top bars, center of clustered bees resulted in catch of significant number of overwintered adult beetles. Each refugia was tapped to dislodge and dispose of beetles weekly, weather permitting. Refugia continued to catch declining number of beetles late February to April 1 Once cluster broke as brood nest expanded, no further beetles were caught.

Refugia were left on hives throughout Spring and early Summer, no beetles caught. The original plastic corrugated refugia were supplemented in half the hives with a drinking straw refugia (smaller diameter size that bees

could not enter) which consistently captured more beetles on a side by side test. Design was simply a flat piece of metal flashing cut 3" x 1½" to which a double stack of drinking straws (13), cut to size were made into a single unit by pouring carpenters glue over Spring and Summer inspections resulted in negligible numbers of beetles. In previous years the 36 supers I extract in early August would average one to two beetles per super This year (2009) only nine beetles total found.

Conclusion and Suggestions: The refugia trap when placed over clustered bees in cool or cold weahter consistently attracts beetles. They should be disposed of every seven to 10 days. I intend to employ them and suggest other beekeepers also try from late October to early December and again late February to April 1 to significantly reduce SHB adults. While it is possible that climatic and other factors may have been responsible for minimal and non-existent populations of SHB in Summer of 09, my belief is the Fitz Refugia is a valuable tool in control of this potentially devastating pest.

Joe Fitzpatrick
Blue Bell, PA

Kinder, Gentler Bees

Are bees getting gentler? I haven't used a veil or any protection except smoke for three years. Bees don't seem to want to sting anymore! It's got me kinda worried.

I have anywhere from 30 to 70 hives depending on what time of year it is. In the Spring probably 30+ in the Fall 70+. Out of these you would think a few would be mean, not the case. I don't buy bees but acquire them from natural swarming and bait hives scattered over 20 miles.

I first noticed the non-aggressiveness three years ago when I was going to put escape boards on. The price of gas was well over $3 per gallon. I thought I'll have to make two trips to get my supers off. One to escape, then another one the next day to remove them.

I decided to shake the bees from the combs. I mistakely left my bee suit home, but did have my smoker I proceded to remove a super I then placed it upside down on top of a up turned cover (it was full of bees), with my hive tool I pried the frames away from the box, and lifted it off of the frames. I banged the box on the ground, knocking bees off, and gave a little smoke. I placed the empty box on my truck tailgate, and took each frame and banged it inside the up turned cover and did this with all nine or 10 frames. Never once did the bees act nasty I did this with four more hives and got stung twice from pinching a bee while lifting a frame.

I might add these were strong colonies. Has anyone else noticed this in their bees?

Also after removing the supers from the parent colony I took them about 20 feet away before removing frames. You've got to be careful not to have brood in the supers as the queen might get lost!

Jim Cowan
Aberdeen, WA

Bottom Board Question

I had been in the process of making new bottom boards with mesh when I read the article in *Bee Culture*, August 2009 by John Hoffman. At that time I figured I would use ¼ mesh to finish them off. I am a hobby beekeeper with about 10 hives. When I showed my wife the mesh I had planned to use she asked me if bee's could get through the mesh and I said yes, I guess they can. My wife is an interested beekeeper in that she is interested in staying away from my bee's as far as possible but she does know a lot about a hive and how it functions. When I read Julie Pierzina's letter in the September 2009 issue it brought me back many years ago when I had one or two of my hives devastated from robber bees. What was left after the robbing was something to see and I really don't want to go through that again. I had already installed some ¼ mesh on a few boards and I decided to remove it and put on the 1/8 mesh instead.

I think I'll feel a lot safer with the smaller mesh.

Hank Groth
Hamden, NY

In response to 'Screen Bottom Boards' in the Mailbox section of *Bee Culture*, August 2009, John Hoffman is promoting open bottom boards with ½" mesh screen.

I have been making splits and the last two years I ran out of screen on the homemade bottom boards that I make for my own use. So I just installed the splits on bottom boards without any screen for the time being. Well, by the time I got more screen, they have built their nice oval shaped comb on the bottom of the bottom super Now I have to tear the whole hive apart to cut out that comb so I can install the screening. I like to see them draw comb if they put it in the right place. But it is aggravating to have to cut out all their hard work. Also the bees start going in and out through the open bottom. This Spring I got six mesh instead of eight mesh and now the bees are squeezing through the mesh instead of using only the full front entrance and landing board.

So my question to Mr Hoffman is, how do you keep the bees from using the open bottom as their entrance? And will they not draw comb through the ½" mesh if they get crowded? Or don't you have strong enough hives?

Enos Miller
Ogdensburg, NY

Exciting Diseases!

I've been working on an idea for a couple of years now and want to find someone who would like to partner. I am after a) film of diseased comb b) a web developer. If you know of anyone or want to broadcast the idea to see if we can get some response, feel free.

For lots of additional information and a pdf of the work done so far, please contact me at david@bancalari.fslife.co.uk.

David Bancalari
Norfolk, England

Continued on Page 11

INNER COVER

This past Summer our crew here at the magazine put on a meeting. Well, our crew and a whole bunch of other good people who helped out. It was the annual Eastern Apiculture Conference, known mostly as EAS, and it was held the first week of August at the Holiday Valley Resort and Conference Center in Ellicottville, NY About 450 beekeepers, speakers, vendors and volunteers showed up for one of the two Short Course sections we had, the Conference, the pig roast, the BBQ, or the banquet. If you've read this magazine even once in awhile during the past year you saw the promotions and advertisements for this week. It turned out far better than expected, for which all of us are grateful. But it wasn't an accident that it turned out that way and I'd like to point out some of the good people who made sure it happened that way.

Bob Brachman got all this started a couple of years ago when he invited me to speak to his local beekeeping group. He set up a meeting with the Holiday Valley people and the rest is history. But Bob didn't quit there. We used his bees during the conference in our beeyard – 20 of his colonies were used and abused for a whole week – and we visited his breeding yard during the week to see how his part of the Russian Breeder's program worked, and Barbara, Bob's better half, designed our logo that we used for two years. Bob, and Barbara, thank you for all that you did, and all that happened because you raised your hand and said, sure, we can do that.

Andy Glenn, Wes, and Crystal Card and Kitty Kiefer and all the crew at Merrimack Valley Apiaries opened their doors, their beeyards, their whole operation for us to explore and experience several times during the week. They also had a crew from the Baton Rouge Bee Lab visiting and taking samples because they are investigating a variety of factors associated with ongoing breeding and honey bee health programs, so we got to listen and learn from them also.

We held a pig roast for 350 people in their parking lot and listened to information on honey production and marketing in their honey house. Andy, Glenn, and Crystal Card and Kitty Keifer all gave talks on aspects of this large commercial operation, while Wes was holding down the fort in their southern location. The entire operation turned out to make our meeting a success and we are indebted to all of them. Thanks guys.

Bob's local group, the Western NY Honey Producers turned out in force and many helped set up or run the meeting. Steve Mead and his wife Cindy are good examples...helping out wherever and when ever...and there were many more. Thank you all.

There were more of course...speakers, short course instructors, workshop leaders, beeyard masters, Master Beekeepers...when you run a volunteer organization, you have a lot of volunteers. And you need a lot of volunteers. And it all came together this year With lots and lots of good people.

I hope you get to attend an EAS meeting some time. It's an experience like no other you will ever have in your beekeeping life. Better yet, I hope you get to volunteer at an EAS meeting at some point. It's the best time you'll ever have. I guarantee it.

The next meeting is in Boone, NC next August. Watch for details. Be there.

I also went to the North American Pollinator Protection Campaign (NAPPC) meeting in D.C. recently. My first with this almost-ten year old group. The two day meeting covered lots of ground...everything from a bomb scare at the caterer's to ice cream bars from Hagan Daz. But I want to mention just a few things that rose to the top of the pile.

First, highlights from the opening speech, given by The Honorable David Anderson, the former Canadian Minister of the Environment. One aspect of his talk was the question of where was the 70% increase in demand for food going to come from by 2050, with the global increase in urbanization and population, and the decrease in farmland coupled with the continuing effects of global climate change.

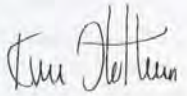
Further what role do native pollinators play in that food production? Hardly anything is known of these insects, birds and bats, and how can you measure change when you don't have a baseline to start with. Pollinators are not a glamorous subject, and trade measures to protect pollinators will be restrictive on international trade. See food, above. The upcoming Copenhagen Conference will address these issues...again...to see if anything can be resolved.

The old CREES government agency (Education and Extension) has been changed to the National Institute of Food and Agriculture...NIFA...and they will have an additional $3 million for CCD and pollinator decline research for 2010. Part of the current NIFA Grant administered by Keith Delaplane consists of Extension Information, and can be found at **www.BeeCulture.com**, under Links We Like.

There was a report given by Dr Jamie Ellis, University of Florida, who gave a report on a research project he has been conducting, funded by NAPPC. It has to do with how honey bee larvae react to pesticides commonly found in beehives, including chlorothalonil, mycobutanil, simazine, glyphosate, chlorpyrifos, coumaphos, fluvalinate, imidacloprid and amitraz. Bees showed an erratic response to coumaphos and fluvalinate, so perhaps there's some resistance going on with those it is thought. Chemicals in pollen and wax were looked at, and combinations of any and all of these are being studied. Many were found to be toxic to the test larvae being raised in the lab when exposed to levels that are commonly found in beehives. 350 beehive pollen samples from hives in Florida found 98 pesticides, with an average of 6.7/sample. Of 259 wax samples taken, 120 pesticides were identified with an average of 8/sample. Most common, not surprisingly were fluvalinate, coumophos, chlorothalonil (a fungicide), and chlorpyrifos (an ag pesticide). Our bees live, it seems, in a cesspool of chemicals...many of which we are responsible for But then we knew that, didn't we.

Finally, the EPA in early November is supposed to put up a new guideline for comments on spray drift. It's supposed to be in the Congressional Record right about the time I'm writing this, but I haven't found it yet. Check it out at **http://www.regulations.gov**, click on the pesticide link and go from there. Read it. If you have a thought one way or another let them know. It's your bees this stuff is drifting on, you know. NAPPC has an oversight organization that has one of the best, most informative web pages imaginable. **www.pollinator.org**. Check it out.

December Holidays. Winter Maybe there's a new smoker or a hive tool in your stocking this year In any event, keep your veil tight, that new smoker lit, and your hive tool sharp, in that order And all of us here at *Bee Culture* sincerely wish you and yours a wonderful Holiday Season!



Meetings

Editor's Note: *David has a pretty amazing program going. If interested contact him.*

A Different View

In the article about the White House Bees (August 2009) you state Charlie has a screened bottom board and visitors can see a beehive from an angle not common to most of us.

I too have found that fellow beekeepers and friends visiting my beeyard are also impressed with the unique view thru the open bottom board up into the brood chamber However, none of us can stand underneath my hive because the opening of the bottom board is only nine inches above the concrete hive stand pad, so we use a mirror!

John Hoffman
Mt. Holly Springs, PA

Lyme Disease

This pertains to the recent article and letter about Ticks and Lyme Disease.

A myth about Lyme disease is that there is always a bull's eye or rash. In 30 to 40% of the cases there is none. Even if there is a bull's eye you may be sick from full blown symptoms before it manifests itself. Even if there is a bull's eye early on it may be on a part of the body not easily visible.

Do not look for a bull's eye! Immediately on feeling ill seek medical attention. Get a prescription for antibiotics from your doctor and get tested for Lyme disease.

Even if you have only mild fatigue, seek medical attention immediately If not treated early, Lyme can develop into a chronic life threatening health condition.

An excellent source of information is *Beating Lyme* by Constance A. Bean, MPH with Lesley Ann Fein, MD, MPH.

A Concerned Reader

CCD

Enclosed is a copy of the Susquehanna County, PA Farm Bureau newsletter of September 2009 with a short blurb about CCD based on your letter of April 2009 which I submitted to them. I am concerned that your September '09 Editor's column reviewing CCD research does not mention Imadicloprid or neonicatinoid chemicals, especially since your April letter was so damning of them. So are you backing away from the April stance? If so you've left a lot of people like me how are trying to get the government agencies interested in the problem.

Also, the most prevalent answer I have had from people I talk to is – Well if this is a systemic chemical that disorients the brains of insects from eating the pollen and nectar wouldn't it also be present in the fruit which is consumed by people also? If so, does that mean that soy products, cottonseed and sunflower oil, corn and high fructose corn syrup, etc, etc, might be laden with these chemicals also extrapolating to a greater degree could they be a potential cause of brain disorientation in humans – particularly Alzheimer's disease?

Please make these thoughts known as they are not just mine but come from many

Robert Helmacy
Hop Bottom, PA

Editor's Note: *The role of pesticides in beekeeping, and specifically in the murky world of Colony Collapse Disorder, remains just that...murky. There is no doubt that the neonicitinoids in particular have created havoc with bees, particularly with the sublethal effects they are having on honey bee larvae. .and by default in all probability all insect pollinator larvae. Does this obscene attack on our bees cause CCD? The strong anecdotal evidence says it certainly plays a role...here's what I'm hearing from the beekeepers in the field and from the scientists who are measuring these effects.*

When colonies are exposed to these chemicals. .from corn pollen, apple pollen, soybean fields and other crops, the minutely contaminated pollen is returned to the hive and both fed to existing larvae, and stored for larvae in the future to consume. If Nosema ceranae is present in the hive, spore counts in adults exposed to both the poison and the nosema display an incredible increase in spore counts and the effects of the disease, reducing their lives dramatically. Neither by themselves. the disease or the poison, have the same dramatic effect, though both do harm, certainly. At the same time, adults exposed to both this disease and this poison seem to develop extreme ill effects from viruses. Which are the most lethal? I don't know, but scientists have their opinions and data...so adults exposed to both this disease and this poison and then a virus seem to have a death sentence. Meanwhile, in colonies not suffering from this disease, the poison lurks in the pollen carefully fed to the young. who in turn are affected, and become susceptible to future infections of the disease, virus, or both. So. .from what folks tell me. it's the cocktail that counts..disease, pesticide and virus. So, do these chemicals cause CCD. ? Does Nosema cerenae cause CCD? Do these or this virus cause CCD? Have all of these beekeepers missed something that the scientists missed too, or haven't missed, but haven't published yet? I can tell you that beekeepers who are keeping their bees away from the poison, and are making absolutely certain that their bees are getting enough to eat of the right foods and are having far, far fewer problems than those who are not. So keeping bees healthy seems to be a cocktail also. .good food, lots of it, and no poison.

Beeyard Stories In . . .

Six Words. No More. No Less.

We asked this a bit ago...tell me a beeyard story in six words, just to see how it would go and if readers thought it would work. Well, they did...and below are the musings of some of them. We have more, and more from some of these folks and will share them next month. I've included the state the writer was from if they told us...we didn't ask so some didn't, and that's OK. Next month we'll try this again with another topic...

Some were simply stories...

An interesting observation, probably learned the hard way...
Bees don't sleep in the night.
Greg Carey, Maryland

We've all had this one...
Happy hive except one angry worker.
Joel Kahling, Illnois

Very good advice for all of us...
Try to avoid woulda, shoulda, coulda.
Bob Bowerman, Indiana

Some were mere observations...

Sound familiar...?
Pollen loaded bees, hard winter ahead.
Frank Mitch, Ohio

Fingers crossed in a beekeeper's prayer...
Boxes full of wonder, please survive.
Gigi Flynn

Here's one we all know...
Lots of honey, lots of friends.
Jean Mancini

A sad story..
Cobweb shimmers. The bee's flight ends.
Franclyn Heinecke, Washington

Another oops.
Suddenly my homemade hivestand fell apart.
Mike Southern, Rhode Island

The trouble with outyards...
Forgot an excluder, gasoline is expensive.
John Knobeloch

It happens...
Queen left through excluder with colony.
Jay Moss, Pennsylvania

There were lots of management tricks and ideas, and lots of beeyard stories we've all learned over time...

Good advice again...
Save the bees. Make July splits.
Mel Disselkoen, Michigan

Ugly...
Hive was fine, then beetle slime.
Laurence Cutts, Florida

Oops...
Shocking truth about electric bear fences!
Michael Salnicky

Good question...
Fumagilin, Miteaway, Apiguard, Terramycin. Pure honey?
Paul Howard

So true.
No nectar. Even Itialian bees irritable.
Kitten Reames, Maryland

Fact of life...
Bee Swarms, More hives, Buy sugar.
Karla Eisen

Plays on words..
Tilted tall hive toppled in turbulence.
Alice Eckles, Vermont

We know why..
Needed immediately. Electric fence, or rifle.
Ross Conrad, Vermont

I'll bet she's more careful next time...
Mower hit feeder, beekeeper ran fast!
Debbie Bohannon, Florida

Ohhh, sorry ..
Robbing bees, queen dead out front.
Penny Manners

Watching the sky
Remove cork. Queen disappears under rainbow.
Rusty Burlew

Fence in order here.
Cow Pasture. Colony row tipped over.
Roger Hoopingarner, Michigan
(but this happened in Wisconsin)

So this ends our first efforts. What do you think of these?

Beeyard stories. Six words. No more. No less.

DECEMBER – REGIONAL HONEY PRICE REPORT

A year makes a little bit of difference overall , but for some products in some regions, it's a real big change. Posted here are the December 2008, and the December 2009 prices for all products in all regions. Take a look at yours.

REPORTING REGIONS - 2008

	1	2	3	4	5	6	7	8	9	10	11	12	SUMMARY Range	SUMMARY Avg.	History Last Month	History Last Year
EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS																
55 Gal. Drum, Light	1.50	1.59	1.51	1.54	1.42	1.43	1.45	1.50	1.51	1.45	1.38	1.45	1.38-1.59	1.48	1.46	1.17
55 Gal. Drum, Ambr	1.41	1.35	1.41	1.33	1.28	1.23	1.43	1.40	1 18	1.41	1.37	1.40	1 18-1.43	1.35	1.33	1.01
60# Light (retail)	120.00	124.50	130.00	117.88	120.00	125.00	117.60	108.00	127.00	118.34	123.00	129.75	108.00-130.00	121.76	122.92	114.33
60# Amber (retail)	120.00	113.50	130.00	115.92	120.00	112.50	114.00	117.50	112.50	117.82	118.00	68.00	68.00-130.00	113.31	116.49	111.29
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS																
1/2# 24/case	52.08	51.10	43.20	47.82	64.56	37.50	43.81	64.56	64.56	42.00	49.00	63.00	37.50-64.56	51.93	56.95	48.94
1# 24/case	65.52	68.21	72.00	67.36	86.00	64.60	70.02	73.12	70.00	94.44	92.94	95.00	64.60-95.00	76.60	79.91	67.62
2# 12/case	69.72	64.08	64.80	57 14	83.00	57.00	62.46	81.00	62.00	69.24	60.00	78.00	57.00-83.00	67.37	71.81	60.28
12.oz. Plas. 24/cs	64.32	62.63	52.20	62.09	78.00	54.00	56.52	56.64	54.00	53.28	51.00	68.67	51.00-78.00	59.45	63.34	53.40
5# 6/case	89.55	75.98	75.00	66.40	96.00	60.00	74.10	96.00	70.00	74.82	100.00	93.00	60.00-100.00	80.90	74.32	67.46
Quarts 12/case	137.00	100.35	68.00	94.33	78.00	83.70	90.00	88.80	102.12	120.00	95.94	120.00	68.00-137.00	98.19	102.31	100.01
Pints 12/case	71.30	51.95	85.70	64.54	58.00	60.25	59.00	54.90	66.00	69.00	70.50	69.50	51.95-85.70	65.05	62.01	61.59
RETAIL SHELF PRICES																
1/2#	2.88	3.06	2.57	3.03	2.39	2.76	2.69	3.00	2.78	3.00	2.53	4.60	2.39-4.60	2.94	2.99	2.68
12 oz. Plastic	3.75	3.84	3.62	3.62	4.66	3.65	3.53	3.77	3.89	3.75	3.92	4.50	3.53-4.66	3.88	3.74	3.47
1# Glass/Plastic	4.23	4.25	4.44	4.53	4.88	4.66	4.24	4.73	4.81	5.25	4.85	4.95	4.23-5.25	4.65	4.73	4.34
2# Glass/Plastic	8.25	7.50	7.73	6.80	7.37	7.00	6.85	8.25	7 14	7.20	7.44	9.75	6.80-9.75	7.61	7.46	7.15
Pint	7.62	7.38	6.50	6.31	5.26	6.58	6.31	5.98	9.00	7.50	6.36	8.19	5.26-9.00	6.92	6.45	6.42
Quart	12.00	9.48	9.75	10.03	8.75	9.88	9.76	9.75	11.29	13.00	9.16	12.50	8.75-13.00	10.45	10.90	10.08
5# Glass/Plastic	17.25	15.24	18.33	17.63	20.00	14.50	16.87	18.00	18.00	15.55	17.42	20.50	14.50-20.50	17.44	16.99	16.11
1# Cream	5.25	5.15	5.50	5.44	5.87	6.00	5.30	5.07	4.09	6.28	6.08	6.85	4.09-6.85	5.57	5.10	5.31
1# Cut Comb	5.50	4.99	6.50	5.75	7.48	6.87	6.90	6.00	7.48	10.00	10.00	8.25	4.99-10.00	7 14	6.84	6.53
Ross Round	6.67	5.05	5.88	5.25	6.67	6.67	5.60	4.85	6.67	6.67	8.00	8.45	4.85-8.45	6.37	6.11	5.75
Wholesale Wax (Lt)	3.67	4.00	2.50	2.62	2.15	3.00	2.70	3.00	3.92	4.06	3.57	3.70	2.15-4.06	3.24	2.93	2.65
Wholesale Wax (Dk)	3.00	3.48	2.43	2.47	1.90	2.00	2.77	2.75	3.00	3.36	2.80	2.00	1.90-3.48	2.66	2.65	2.23
Pollination Fee/Col.	80.00	94.00	57.50	42.50	155.00	42.50	50.00	60.00	87.65	87.65	23.00	125.00	23.00-155.00	75.40	73.77	70.03

REPORTING REGIONS - 2009

	1	2	3	4	5	6	7	8	9	10	11	12	SUMMARY Range	SUMMARY Avg.	History Last Month	History Last Year
EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS																
55 Gal. Drum, Light	1.50	1.65	1.57	1.55	1.55	1.54	1.61	1.70	1.43	1.55	1.50	1.53	1.43-1.70	1.56	1.56	1.48
55 Gal. Drum, Ambr	1.40	1.53	1.40	1.36	1.45	1.41	1.49	1.43	1.20	1.40	1.42	1.40	1.20-1.53	1.41	1.48	1.35
60# Light (retail)	125.00	124.50	130.00	123.25	120.00	133.33	130.71	129.75	120.00	137.54	148.00	145.00	120.00-148.00	130.59	137.35	121.76
60# Amber (retail)	125.00	115.00	130.00	121.60	120.00	121.00	127 17	130.00	110.50	127.09	128.00	150.00	110.50-150.00	125.45	138.02	113.31
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS																
1/2# 24/case	52.08	61.98	55.00	47.50	66.03	55.45	48.56	85.15	66.03	59.55	55.00	86.90	47.50-86.90	61.60	58.64	51.93
1# 24/case	65.52	84.28	72.00	66.20	101.33	78.83	71.70	74.56	69.50	97.44	76.48	95.50	65.52-101.33	79.44	78.60	76.60
2# 12/case	69.72	64.08	66.60	58.33	106.50	65.45	65.57	75.00	65.00	75.00	55.67	83.80	55.67-106.50	70.89	68.83	67.37
12.oz. Plas. 24/cs	69.66	74.98	52.95	68.47	60.00	65.50	54.43	60.64	54.00	57.60	67.07	70.50	52.95-74.98	62.98	64.73	59.45
5# 6/case	80.82	75.98	78.00	72.25	77.80	90.00	73.67	85.60	72.00	80.40	73.00	92.00	72.00-92.00	79.29	79.19	80.90
Quarts 12/case	113.96	133.44	113.96	101.92	90.00	92.57	94.99	95.50	120.00	107.94	93.00	125.00	90.00-133.44	106.86	97.54	98.19
Pints 12/case	70.23	67.48	70.23	67.40	61.75	60.00	68.92	57.81	84.00	69.30	65.00	69.75	57.81-84.00	67.66	65.19	65.05
RETAIL SHELF PRICES																
1/2#	3.13	3.27	3.05	3.08	3.98	3.16	2.88	2.75	2.99	3.00	3.19	4.50	2.75-4.50	3.25	3.27	2.94
12 oz. Plastic	4.13	3.90	4.50	3.57	4.19	4.06	3.34	4.27	3.65	3.50	4.15	4.58	3.34-4.58	3.99	3.90	3.88
1# Glass/Plastic	4.31	4.55	5.54	4.60	5.76	4.98	4.13	4.48	3.95	4.40	5.42	5.50	3.95-5.76	4.80	4.75	4.65
2# Glass/Plastic	9.00	7.30	8.93	7.06	9.50	7.50	7.17	7.75	6.93	7.25	8.02	9.15	6.93-9.50	7.96	8.13	7.61
Pint	7.90	8.25	7.90	7 13	6.48	7.95	6.69	6.93	7.85	7.87	7.75	10.31	6.48-10.31	7.75	7.43	6.92
Quart	13.10	14.48	13.10	10.41	11.50	10.25	10.93	11.04	11.00	12.41	10.64	15.00	10.2-15.00	11.99	11.66	10.45
5# Glass/Plastic	16.85	15.24	21.10	17.00	23.50	16.00	16.59	17.50	18.00	18.75	19.81	23.25	15.24-23.50	18.63	18.35	17.44
1# Cream	5.50	5.86	6.50	5.33	8.43	5.00	5.31	5.56	5.75	8.34	6.66	6.87	5.00-8.43	6.26	5.68	5.57
1# Cut Comb	5.50	5.34	7.25	5.56	7.06	6.38	6.94	5.99	7.06	7.33	8.00	9.13	5.34-9.13	6.79	6.76	7.14
Ross Round	6.96	4.99	6.50	5.00	6.96	6.50	6.57	4.89	6.96	6.96	7.50	8.41	4.89-8.41	6.52	6.48	6.37
Wholesale Wax (Lt)	3.83	4.00	4.25	2.77	3.15	4.63	3.38	4.00	4.50	5.00	3.75	3.67	2.77-5.00	3.91	3.51	3.24
Wholesale Wax (Dk)	3.25	3.32	3.50	3.55	3.00	3.40	3.15	3.75	4.00	4.15	2.88	2.50	2.50-4.15	3.37	3.18	2.66
Pollination Fee/Col.	80.00	91.67	70.00	44.20	127.50	58.75	50.33	89.62	89.62	89.62	70.00	122.50	44.20-127.50	81.98	81.06	75.40

a closer look

Parasitic Virus Vectors

Clarence Collison
Audrey Sheridan

Varroa, and now small hive beetles vector viruses in a beehive.

Varroa mites (*Varroa destructor*) are serious ectoparasites of honey bees and have been implicated in the transmission of several honey bee viral diseases (Kevan et al. 2006). Three potential roles of *Varroa* mites in relation to viral diseases in honey bees have been proposed. 1) *Varroa* mites activate latent viral infections in honey bees; 2) *Varroa* mites vector honey bee viruses; and 3) *Varroa* mites suppress the immunity of honey bees, causing them to be more susceptible to viral infection. The mites transmit viruses to their hosts through their saliva when feeding. The feeding habits of the mites, sharing and repeatedly using the same wounds (Kanbar and Engels 2005), increases the incidence and severity of infection. It is also reported that the saliva of mites may contain substances that interfere with the bee's immune system.

A putative iridovirus infection was found in *Varroa* mites sampled from a moribund colony of bees in Pennsylvania (Camazine and Liu 1998). This was the first time that virus particles had been associated with the mite. Kleespies et al. (2000) also found virus-like particles in *Varroa* mites. Examination of mites from several parasitized colonies revealed mites with characteristic internal black-colored changes of the gut and of the fat body In symptomatic *Varroa* mites, myriads of spherical virus-like particles were observed primarily in the nuclei of the fat body and muscle tissues. Similar virus-like particles were also found by Liu (1991) in the body cavity of the tracheal mite *Acarapis woodi* Rennie.

Bowen-Walker et al. (1999) was able to show that *Varroa* mites are effective vectors of deformed wing virus (DWV). First, it was proven that mites feeding on deformed bees are capable of acquiring DWV from their infected hosts when all the mites tested positive for the virus. They also discovered that a bee was more likely to die or emerge deformed if the mite feeding on it had previously fed on a dead infected bee. This would not have been possible if the mites were incapable of transmitting DWV between hosts.

Varroa mites mainly feed on the bees during their pupal stage. The mites consume bee hemolymph (blood), which may cause reduced adult body weight and protein content of the host bee. In association with DWV some of the *Varroa* -parasitized pupae develop into adult bees with deformed wings, and the rest of the parasitized pupae develop into normal-winged bees, regardless of the number of parasitic mites. Under *Varroa* -free conditions, deformed wing virus (DWV) exists at low but detectable levels within bees without causing disease symptoms (Yang and Cox-Foster 2005).

Yang and Cox-Foster (2007) looked at the impact of *Varroa* mites on survivorship, viral incidence and physiological traits of newly emerged worker bees. First, by using real-time PCR (polymerase chain reaction), they showed that *Varroa*-parasitized bees with deformed wing symptoms all carried high levels of DWV RNA (Yang and Cox-Foster 2005, 2007). They were then able to demonstrate that *Varroa* mites have a significant negative impact on bee survivorship, especially following a pathogen challenge to DWV-infected bees. Mite free (MF) bees exhibited a long-time survivorship curve, normal winged (NW) bees from *Varroa*-parasitized colonies displayed a medium survival curve and a short survival curve was seen with deformed winged (DW) bees. It is believed that the short lifespan of DW bees is related to high levels of DWV (as demonstrated in PCR) and immunosuppression (i.e. the expression of genes encoding antimicrobial peptides and immunity-related enzymes is suppressed in *Varroa*-parasitized bees (Yang and Cox-Foster 2005)). Furthermore, the mite parasitized NW and DW bees lived a significantly shorter time than the MF bees after all groups were challenged with live *Escherichia coli*. This indicated an impaired immune response of mite-parasitized bees at whole-body level. Under *Varroa*-free conditions, DWV exists at low but detectable levels within bees without causing disease symptoms (Yang and Cox-Foster

"When bees are parasitized by Varroa mites, combined with an exposure to microbes, DWV can replicate to a level of 10^5-fold higher within 10 hours which may directly cause bee death."

2005). However, when bees are parasitized by *Varroa* mites, combined with an exposure to microbes, DWV can replicate to a level of 10^5-fold higher within 10 hours, which may directly cause bee death.

Deformed-wing, mite-parasitized bees died within an average of one day, even without an *E. coli* challenge. This was explained by the absence of an important enzyme activity in insect immune response –phenol oxidase – which was lacking even in those bees challenged with immuno-eliciting bacteria. The lack of inducible phenol oxidase activity indicated that the DW bee's immune system is not fully competent upon adult emergence. The gene encoding phenol oxidase in cellar immune functions is normally expressed in newly-emerged worker bees; however, the expression of this gene is suppressed at transcriptional level in the *Varroa*-parasitised bees (Yang and Cox-Foster 2005). *Varroa* parasitism also significantly reduced body weight of the parasitized bees, but body weight was not significantly correlated with the survivorship of mite-parasitized bees. In summary, the research elucidated that the combination of mite parasitization, the interaction of DWV and microbes, and a developmental immune incompetency attribute to decreased worker survivorship and have a negative impact on colony fitness.

Deformed wing virus can be transmitted horizontally during trophallaxis between colony members (Yue and Genersch 2005) or when *Varroa* mites feed on bee hemolymph (Bowen-Walker et al. 1999) and vertically through infected eggs and semen (Chen et al. 2006, Yue et al. 2007). Under field conditions, *Varroa* mites were shown to be highly effective vectors of deformed wing virus (DWV) between bees (Bowen-Walker et al. 1999). *Varroa* mites can also activate DWV virus replication (Shen et al. 2005). Adult female mites obtained from honey bee pupae naturally infected with DWV contained virus titers many times in excess of those found in their hosts.

To determine the roles of *Varroa* mites in activating or vectoring viral infections (Shen et al. 2005) performed quantitative comparison of viral infections between bees with and without mites. Under natural and artificial mite infestations, bee pupae contained significantly higher levels of Kashmir bee virus (KBV) and deformed wing virus (DWV) RNAs and KBV structural proteins than mite-free pupae. Also, DWV had amplified to extremely high titers in mite infested bee pupae. A positive correlation between the number of mites introduced and the levels of viral RNAs was found. The detection of viral RNAs in the nymph and adult mites underline the possible role of *Varroa* in virus transmission. However, most groups of virus-free adult mites were associated with bee pupae heavily infected by viruses, suggesting that the elevated viral titers in mite infested pupae more likely resulted from activated viral replication. Based on these observations, in addition to research demonstrating suppressed immune responses in bees infested with mites, they concluded that parasitization by varroa suppresses the immunity of honey bees, leading to activation of persistent, latent viral infection.

Recent research has shown that small hive beetles (SHB) may also be a potential biological vector of honey bee viruses. Eyer et al. (2009) studied the interaction of the beetle with the deformed wing virus (DWV). There are several different potential contamination pathways for oral uptake of honey bee viruses by the beetle. One example is that the beetles can exploit trophallaxis feeding (food/pheromone transmission between bees) within the host colonies (Ellis et al. 2002b). As a defense strategy against the SHB, honey bees construct cells of propolis into which they drive the beetles and imprison them (Neumann et al. 2001). Through behavioral mimicry, SHB can induce trophallaxis feeding from the honey bees (Ellis et al. 2002a), which is the only way for SHB to obtain food in such prisons except in rare cases of cannibalism (Neumann et al. 2001). Other potential infection avenues include: adult beetles become infected with the virus by feeding on dead adult bees with clinical symptoms, feeding on infected honey bee brood, feeding on virus contaminated pollen, and by being associated with contaminated beeswax. Viruses, once ingested by the beetles, may replicate in the SHB, similarly as they do in *Varroa* mites (Yue and Genersch 2005).

An illustration of DWV transmission in SHB was given in Eyer et al. 2009. Deformed wing virus was detected in adult small hive beetles that were fed dead worker bees with

deformed wings (97% of the beetles), DWV-positive brood 100% of the beetles) and were associated with DWV-contaminated wax (91% of the beetles). No virus was detected in SHBs that were supplied with DWV-infected pollen and sugar water (negative control). DWV was also detected in 41% of the adult SHB after trophallaxis with infected workers. This study provides the first evidence of honey bee viruses in small hive beetles. Furthermore, SHB identified as DWV-positive, 40% of beetles carried negative stranded RNA of DWV indicting virus replication (Eyer et al. 2009). These results suggest that small hive beetles can be infected by honey bee viruses via trophallactic transmission and have the potential of being a biological vector of honey bee viruses. The occasional incidence of adult SHB with deformed wings within honey bee colonies, suggests that natural symptomatic infections occur in the field. BC

"Varroa mites can also activate DWV virus replication. Adult female mites obtained from honey bee pupae naturally infected with DWV contained virus titers many times in excess of those found in their hosts."

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Managed Pollinator CAP
Coordinated Agricultural Project

When Varroacides Interact

Reed Johnson

When humans get sick, they go see a doctor More often than not the doctor prescribes a pharmaceutical to treat the illness. When a dog gets sick, his owner takes him to a veterinarian. Just as medical doctors do, the vet often prescribes a veterinary drug to treat the problem. When honey bees are sick the beekeeper diagnoses the problem, and just like doctors and veterinarians, they might apply a chemical treatment. The honey bee pharmacy may look different from the local drugstore, but the intended outcome is the same: restored health from the judicious application of a remedial chemical.

Honey bees suffer from diseases that have no corollary in human medicine and therefore require drugs quite different from those given to sick people. *Varroa* mites, in particular are responsible for widespread bee death because they suck blood, reducing bee vigor, and transmitting or activating viruses. While it may seem strange to consider as drugs treatments like Checkmite+ and Apistan, beekeepers use them like drugs to maintain bee health by reducing *Varroa* mite infestations. Apistan was the first anti-*Varroa* drug to be marketed in the U.S. in 1990. Treatment consists of two plastic strips impregnated with the pyrethroid pesticide tau-fluvalinate which are hung between brood frames for six to eight weeks. As bees rub up against the strips they pick up small doses of tau-fluvalinate which is largely non-toxic to bees but murder on mites.

It's obvious that this kind of use treads a fine line between killing mites and killing bees. In the case of tau-fluvalinate, its success as a varroacide is somewhat surprising since the class of pesticides to which it belongs, the pyrethroids, contains many pesticides that are exceedingly toxic to bees. One of them, cyfluthrin (Baythroid) has an LD_{50} – the dose at which 50% of the bees in a group will die (when exposed to a label-rate dose for the appropriate time) – of just 62 nanograms (the smaller the LD_{50} the more toxic). Yet tau-fluvalinate, just a few chemical tweeks different from cyfluthrin, has a generous LD_{50} of 9450 nanograms making it 150 times safer to bees. The utility of tau-fluvalinate as a miticide depends on the robust tolerance bees have for this pesticide.

As it turns out, bees tolerate the large quantities of tau-fluvalinate present in Apistan because they are very good at detoxifiying it (Johnson et al., 2006). The main workhorses for doing this are the so-called cytochrome P450 monooxygenases (P450s), a class of enzymes important for degrading all sorts of toxins in humans and all mammals. You can appreciate their importance when P450s are experimentally blocked, when honey bees receive a P450 blocker their susceptibility to tau-fluvalinate increases almost 1000 fold.

Unfortnuately, the effectiveness of tau-fluvalinate began to wane in the late 1990s as *Varroa* mites evolved resistance (Elzen et al. 1998), though the mite's resistance appears to occur through means other than detoxification. As tau-fluvalinate was beginning to fail in 1998, Checkmite+ was added to the beekeeper's anti-varroa arsenal. Similar to Apistan, Checkmite+ consists of two plastic strips which are hung in the brood chamber, but these strips contain the pesticide coumaphos which belongs to entirely different class of pesticides: the organophosphates.

Organophosphates, like pyrethroids, are generally very toxic to honey bees. For example, methyl parathion (PennCap-M) has an LD_{50} of 111 nanograms per bee. Yet bees can tolerate the presence of Checkmite+ strips in the hive, each of which contains over a gram of coumaphos. The toxicity of coumaphos is 180 times less than methyl parathion, with an LD_{50} of 20,300 nanograms per bee. It isn't clear why coumaphos is so benign when other organophophates are so deadly but, again, detoxification through P450s seems to play a role. Coumaphos becomes four times more toxic to bees when a P450 blocker is used.

Bees' tolerance of both coumaphos and tau-fluvalinate depends, at least to some extent, on rapid detoxification by P450s. If both pesticides are present in the hive at the same time there may be a problem if these chemicals compete with each other for detoxification through P450s.

Students in pharmacy and medical schools spend a lot of time learning about the potentially deadly consequences of mixing drugs. There are many examples of drugs that are safe by themselves but deadly when used in combination with another Over 15,000 scientific journal articles have been published on the subject since the year 2000. The large number of drugs on the market today and the potentially fatal consequences of mixed uses have propelled drug interaction into the research limelight.

Many human drugs are detoxified by human P450s in the same way ➢

that coumaphos and tau-fluvalinate are detoxified by bee P450s. One common human drug that interacts with P450s is the over-the-counter drug acetaminophen (Tylenol). Taken alone, acetaminophen is extremely safe and has been used for over 50 years to alleviate headaches and other pains. Read the label on a bottle of Tylenol, however, and you will see this dire warning: "If you consume three or more alcoholic drinks per day [.] acetaminophen may cause liver damage." The problem is that alcohol, a recreational drug, interacts with P450s too. While neither of these drugs would cause great harm alone, the result of the two interacting with P450s can cause damage to the liver and possibly death.

Similar things may be happening in honeybees and given the recent reports of honey bee deaths associated with Colony Collapse Disorder we were concerned about the potential for bees to die from the combinations of drugs present in the hive. Of particular concern are coumaphos and tau-fluvalinate, both widely used as *Varroa* mite treatments, and both reactive to P450s.

To test for interactions between tau-fluvalinate and coumaphos we collected newly emerged adults bees off of a frame of brood stored in an incubator These new bees were allowed to mature for three days in the incubator with only bee candy for sustenance. The bees were then knocked out with carbon dioxide and given a range of low non-lethal doses of either coumaphos or tau-fluvalinate. The bees recovered within an hour, then were knocked out and treated again with a range of doses of the other anti- *Varroa* treatment. Bees were returned to the incubator for 24 hours, then classified as either alive or dead and statistics were used to calculate an LD_{50} value.

A strong interaction between coumaphos and tau-fluvalinate was found in bees that were first treated with low doses of coumaphos then dosed with tau-fluvalinate. Pre-treatment with as little as 300 nanograms of coumaphos doubled the toxicity of tau-fluvalinate and pre-treatment with 10,000 nanograms of coumaphos increased the toxicity of tau-fluvalinate 32 times (Figure 1). Reversing the order of application also revealed an interaction: bees receiving 1000 nanograms of tau-fluvalinate as a pre-treatment becoming three times more susceptible to the toxic effects of coumaphos (Figure 2; Johnson et al., 2009).

But how realistic are the dosages we used in this lab experiment? How likely is it that a bee will contact enough of either compound from Checkmite+ or Apistan strips to cause death? While real insight into this problem would require chemical analysis of the bees, it is possible to get an idea of the bees' exposure with a few calculations. Each Checkmite+ strip contains about 1.4 grams of coumaphos. Assuming that 10% of the coumaphos present in the strip escapes from two strips in a hive of 20,000 bees over six weeks, that works out to a daily dose of 330 nanograms of coumaphos per bee – enough to double the toxicity of tau-fluvalinate. If similar assumptions are made about a pair of Apistan strips (each containing 0.7 grams of tau-fluvalinate) in a similar hive for 8 weeks, each bee would receive a daily dose of 125 nanograms – a dose insufficient to change the toxicity of coumaphos. However it is likely that nurse bees, which spend their time in the brood nest working next to these miticide strips, receive a larger dose of coumaphos or fluvalinate than the forager bees.

So it seems possible that treatment with both Checkmite+ and Apistan would cause some bees to die. We have not tried simultaneous treatment with both miticides since it seems like a foolish and unrealistic thing for any beekeeper to do. However, even in the absence of miticide strips, most bees in the U.S. are being exposed to low doses of both chemicals right now. Many pesticides, including coumaphos and tau-fluvalinate, are extremely wax soluble, meaning that these compounds move into the wax component of the hive where they can reside for many years and potentially build up with repeated Apistan or Checkmite+ applications. Both compounds can survive the wax recycling process and can be readily found in the wax of new foundation (Martel et al. 2007).

It should come as no surprise that chemical analysis of brood wax samples collected from CCD and healthy colonies were always found to contain both coumaphos and tau-fluvalinate (Frazier et al., 2008). Both miticides are ubiquitous in modern beekeeping. The unanswered question is whether sufficient quantities of these chemicals can escape from the wax and enter the living bees where they may cause unwanted interactions with each other or with newly applied miticides.

This work was performed at the University of Illinois at Urbana-Champaign as part of my dissertation work with May Berenbaum. After graduation, I joined Marion Ellis at the University of Nebraska at Lincoln to continue looking at drug interactions in honey bees as a part of the multi-university USDA CAP Colony Collapse Disorder project. Bees are treated with many drugs beyond coumaphos and tau-fluvalinate and we are looking at the potential for drug interactions between the many drug treatments beekeepers use to maintain bee health. Work so far has only examined interactions between the miticides that result in bee death, but it is likely there are more subtle non-lethal effects in bees exposed to lower doses of miticides – effects that might be especially important in queen and drone health. We are looking forward to sharing our findings with beekeepers so that we can all become better bee pharmacists. BC

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Reed Johnson is from the University of Nebraska Lincoln. Reed received the prestigious Student Award from EAS in 2009.

Picture This!

Dan Stiles

Rupert, during one of his evening visits. This is the quality of the infrared flash and photo.

When I bought it a couple years ago, I had no idea I'd be so pleased with my new digital "game" camera. I'm talking about a camera that automatically takes pictures of anything that triggers its motion detecting mechanism, in both daylight and in total darkness! We are all familiar with motion detecting devices that turn on lights, for example, but this camera system, upon detecting motion, takes a photograph instead. People also call them spy or trail cameras.

I have a camera near my cabin in West Virginia, watching anything and everything that moves – day and night. I had no idea there were so many wild animals (and on rare occasion people) moving around our property out there.

This modern game camera of mine can record 1,037 good quality digital pictures on its one gigabyte memory card. (I understand four gigabytes memory cards are available now). It is powered by six "D" batteries that last six months or more. It has an infrared "flash" that is really a soft reddish glow that you can only see at night looking directly at the camera when the shutter closes – no more blinding white flashes. Photos taken at night are of surprisingly good quality, and the "intruder," man or wild critter, is not at all likely to be aware he has been photographed. And, anything that moves up to 45 feet away from the camera will cause its shutter to snap with a barely audible sound. Since you can not conveniently "aim" the camera while it is strapped to a post, tree or whatever, there is an infrared beam of light that can be switched on to determine the center of the camera's field of view. My camera is programmed with a number of options – it will record a five second video, it will record one, two or three photos when triggered, and the quality of the pictures can be selected – I like the "enhanced" option.

I would never have guessed that there is a small bear roaming around in the night, but there he was, photographed in late August.

I did get two photos of my marauding bear, Rupert, when he raided our honey bee hives on May 29, at exactly 3:39 a.m., when the temperature was 60°F – all this information (along with the phase of the moon) is printed on the bottom of each photograph.

I guess if I were to choose just one photo from the thousands the camera has recorded, it would be of the curious nine point white-tailed buck that looked straight at the camera. This big fellow passed by the camera on September 5 at 6:10 a.m. when the temperature was 59° I never would have known he was around, and unfortunately I have not seen him again.

If you worry about human prowlers skulking around your home or apiary – day or night – a thoughtfully hidden game camera can be used as a surveillance camera. I sometimes hide my camera in a custom made birdhouse. It works like a charm and every vehicle on our driveway, upon arriving and departing, has its picture taken. It has been said that a single picture is worth a thousand words, and I know from personal experience that the first question law enforcement officials ask of a robbery victim is, "Do you have surveillance cameras on the premises?"

Game cameras can be useful for a wide range of purposes. When my bees suddenly became ill tempered it never occurred to me that they were being harassed by a skunk in the night, but there he was. For me, a game camera provides detailed, current information on exactly what's happening in and around my apiary, and occasionally out there in the natural world where no one else is looking. Game cameras and beekeepers are a natural fit I think. BC

Dan Stiles is a retired wildlife biologist in West Virginia.

A daylight deer strolling by.

I set the camera up so it photographed the activity around the carcass of a dead deer. Turkey vultures by the dozen were there, but so were deer mice, crow, raven, red tailed hawks, possoms, raccoons, fox, and rare fishers.

Larry Connor

Changing The Way We Train New Beekeepers

A look at bee biology and how it affects colony management

Food requirements for survival

When foraging conditions allow, honey bee colonies systematically search and collect the essential materials they need to keep themselves alive and to increase in size. Their ultimate biological objective is to swarm, so the entire colony is reproduced. This is the challenge of a superorganism like the honey bee, where one individual bee is unable to survive without the colony but is a working component of the whole and needed for the colony's survival.

The forager on the left has opened her mandibles and has regurgitated a drop of nectar obtained in the field. The nectar-ripener on the right has extended her proboscis to take up the nectar Both bees add enzyme to break apart the sucrose in nectar. The ripener will help reduce the moisture content.

Pollen foraging and use by bees

Of the forager bees issuing from a hive, one portion is dedicated to the collection of pollen from various floral sources. Others are dedicated to the collection of nectar, and only a small group, between one to five percent, collects *both* pollen and nectar Specialized pollen foraging behavior is often quite different in appearance when compared to nectar foraging. The pollen foragers may visit each flower rather quickly, moving over the top of the flower where the floral anther's are positioned, and pack pollen between flowers. These bees are often called *pollen scrabblers*. Pollen foragers can be observed leaving the flower, hovering near it, and scraping their bodies to pack the pollen. Nectar foragers are often much slower as they carefully probe for nectar at the base of the flower like slow-motion needles of a sewing machine. In composite flowers nectar foragers may be seen working from floret to floret in the center of the flower This can be seen on common compound flowers like dandelion, fleabane, sunflower, asters, and goldenrod.

Each pollen forager grooms her body as she visits the flowers and moves the pollen to the rear legs, rubbing her hair-covered body with her legs to remove as much of the pollen and using a series of rakes to scrape the pollen onto the pollen basket, or corbicula, of each hind leg. These large balls or pellets of pollen are highly visible when the bees return to their hive. Inside the hive foragers inspect a number of cells before they back into the cell to remove the pollen by a reverse packing or kicking action. The pollen pellets are deposited, in pairs, into cells already containing pollen, or next to them. Older house bees use the top surface of their heads to compact the pollen into the wax cell; the shape of the head of the bee is approximately the same shape as the angle of the hexagon cell. This efficiently more than doubles the pollen storage capacity of the comb[1] During the foraging and packing of the pollen the bees add honey and nectar to the pollen. This liquid contains microbes that are responsible for pollen fermentation and preservation.

Pollen filled cells are usually located just above or beside the youngest brood of the hive on the brood frames. Some strains of bees deposit pollen into cells surrounded by eggs and larva, providing the nurse bees a fresh supply of protein-rich pollen to feed upon and digest in order to produce royal jelly to feed the developing brood during the first two days of larval life[2]. Later the food supply is changed to a worker (or drone) jelly that is chemically different from the Royal jelly

During periods of queen change (supercedure) colonies will fill every cell (plug out) in the brood nest with pollen. As the queen returns from her final mating flight and her body starts to swell with developing eggs, the nurse bees respond to her chang-

In a neglected nucleus hive that had not received any attention or food, all brood has been consumed by the bees as they start to prepare for starvation. This is late October. The evidence of the brood cells can be seen in the difference in the tops of the wax comb.

In another nucleus colony that has been receiving 2 to 1 sugar syrup, the evidence of continued brood rearing is evident with the sealed brood. As the brood emerges, the bees are filling the brood cells with syrup. This photo was taken the same day as the photo on the previous page. The difference is the beekeeper.

ing chemical signature by consuming the pollen in the center of the future brood nest, digesting the pollen to produce royal jelly to feed the queen's new brood. They also 'polish' the cells with their tongues (perhaps adding a chemical signal for the queen), so when the queen inspects the cell she will lay into it. Queen producers use the pollen removal as a way of knowing that the queen has mated, but just has not yet started to lay eggs.

There is undoubtedly variation on the food requirements of colonies depending upon their genetic race *(carnica, mellifera, scutalatta, ligustica)* as well as the climate and energy demands placed on the colony for survival. Working in the Northeastern United States, Cornell University's Dr Thomas Seeley summarized the requirements for survival for the average colony in a bee tree in *The Wisdom of the Hive*[3] Natural hives of unspecified genetic origin required the following:

Material	**Metric**	**US**
Pollen	20 kg	44 lb
Nectar	120 kg	264 lb
Water	25 L	26.4 qt
Resin	200 g	7 oz

Pollen collection

With some simple math, it is very helpful to convert some of these numbers into the needs of a colony from a beekeeper's perspective. Using the fact that it takes 130 mg (0.0046 oz) of pollen to produce one bee, the bees must collect 130,000 mg (4.6 oz) of pollen to produce 1,000 worker bees. Since the average pollen load weighs 15 mg, it takes 130 15= 8.6 pollen loads to produce one bee, or 8666 pollen loads to produce 1,000 worker bees[4]

If we leave the natural colonies studied by Seeley and consider beekeeper managed colonies, we know that one deep brood comb with a coverage area 17 inches wide by six inches deep (102 square inches) will yield about 2500 worker cells per side, or 5000 worker bees per frame. To produce that one frame of brood, the bees must collect 43,330 pollen loads. This represents 22 oz of pollen 1.3 lb) of pollen.

20 kg is 20,000,000 mg, so dividing 20 kg by 130 mg gives us an estimate of the number of worker bees produced by a colony over the entire season, or just over 150,000 bees. If brood frames produce an average of 5,000 worker bees each, this means that our colony produces about 30 frames of brood during the course of the entire season. Brood production in a colony is continuous, so there is never a stop to the brood rearing unless there is a natural break in the brood rearing cycle, as there is in the Northern climates, or where there is an extreme dearth of natural food, and the bees shut down brood rearing

If you consider the brood rearing that takes place in beekeeper managed colonies you quickly see that many bee colonies are expected to be more productive than the natural colonies reported by Seeley Continuous stimulating feeding of pollen or protein products in combination with common colony manipulations (splits, increase with new queens into new colonies) results in a much higher protein or pollen requirement in a managed hive than in a hive in a bee tree.

Let's use the 30 frames of brood per year for further discussion. We can see the impact of poor forage conditions due to cold or rainy weather and how it will reduce pollen foraging and bee production. This leads us to the area of simulative feeding of colonies with protein substitutes. Few beekeepers risk feeding bee pollen anymore unless they collected the pollen from their own disease-free colonies. As mentioned above, bees store pollen in the cells and add honey that contains microbes that help preserve the pollen. Some beekeepers call this stored pollen *bee bread* to differentiate it from beekeeper stored pollen. Many beekeepers harvest bee pollen using pollen traps. This pollen is briefly air dried and cleaned (screening or seed cleaners are often used). In an ideal situation, this cleaned pollen is then stored at 0°F to preserve the protein content so it is useful to the bees. Unfortunately much of the pollen collected commercially is not kept frozen, but air dried and stored under warehouse conditions. Pollen that has been stored this way looses much of the nutritive value within a few months, and certainly by the next season. The pollen is still attractive to the bees when added to a protein feed mixture, in part because it works as a *phagostimulant*, or feeding stimulant. This is like the plate of fried potatoes that are appealing to the eyes and nose and tasty to eat. But they may not be the best nutrition for the body The same happens with pollen, especially dry pollen. It works like a phagostimulant for the bees, and added to mixtures of various proteins (soy flour brewer's yeast) that are by themselves less attractive, the bees will feed on that mixture. Many commercial protein patties are premixed with sugar – large sugar content will ensure that the bees consume the protein mixture. The challenge with pollen free protein feeding mixtures is to provide all of the essential nutrients needed by bees for sustained brood development over a period of time.

There are now a number of protein mixtures on the market that are beneficial for brood development and maintenance. The careful beekeeper watches pollen storage in colonies and adjusts the protein feeding accordingly Nutritional shortages are commonly blamed as one of the major contributing aspects of Colony Collapse Disorder (CCD) along with possible interaction of new insecticides, interactions with a variety of pathogens, and a list of other suspected areas. The management

of protein feeding of colonies is one area where beekeepers can control their hives, and since CCD many beekeepers have adapted a very aggressive protein and carbohydrate feeding program that gives the bees sugar and protein patties at times of the year when most beekeepers previously never considered feeding. These include feeding programs that start in the middle of the Summer as the natural forage declines, and continues into the Fall until the bees end their normal brood rearing. The feeding may start again in January when the increasing day length (a photoperiod response) stimulates brood rearing. By late February and March the need for large amounts of protein in the colonies is greatest, when the colony is rapidly producing new bees but the natural supply of food may be shut off by cold weather This is especially needed if the beekeeper plans to make new colonies from the colonies that are being fed.

Nectar collection

Bees collect a great deal of nectar each year to feed developing brood and to store as honey for the winter months. Nectar sources range from about 20 percent sugar to 60 percent, with a peak around 40 percent. Every colony of bees always has some scout bees out searching for richer (higher sugar content) nectar Some flowers, like pears and onions, are known to have low sugar concentrations, and pollination studies reveal that most of the pollination is performed by bees gathering pollen and not nectar

When they return from a nectar collection trip, foragers carry about 30 mg of nectar This material is a combination of mostly sucrose but also contains some fructose and glucose. The bees add an enzyme secreted by the salivary glands called invertase to break apart the sucrose molecules into the fructose and glucose molecules, which are easier for the bees to utilize through digestion. The second part of the honey conversion and ripening process is to reduce the moisture content to under 20 percent. This is done by exposing nectar to the air within the hive using the bee's mouthparts. *Food-storer bees* are middle-aged bees that take nectar from the foragers and process it into honey When the returning forager enters the hive, the food-storer bees respond to offers by the foragers to take up the nectar The forager regurgitates the nectar while the food-storer extends her tongue to lap up the nectar This allows the nectar forager to return to the field and gather more nectar If she is not able to empty her honey stomach to a waiting food-storer, the nectar forager will not return to the flowers.

When the ripening process has reduced the moisture content, the food-storer deposits the honey into a cell with nectar from other food-storer bees. Some bees are digesting the incoming nectar and newly produced nectar and will sit on the warm honeycomb and secrete scales of beeswax. These they manipulate and chew with their mandibles to help form the comb. On a comb of honeycomb during the nectar flow it is expected to find both food-storer bees as well as wax producers working side by side. Both are employed by the incoming nectar collected by the flower-visiting foragers.

Water collection

Some returning foragers do not carry a liquid with 20 to 60 percent sugar content, but with zero or just a trace of sugar These are water gathers. When they return to the hive they may offer water to bees actively engaged in brood rearing, or deposit the water into cells within the brood nest so the water evaporates and helps cool that area of the hive.

Honey is converted by house bees to wax honey comb. Here a number of comb building house bees are keeping the brood nest at the right temperature for wax working. A single bee has resin (propolis) on her hind leg.

Resin collection

A few bees search for resin from tree buds. This material, called propolis by beekeepers is used to seal cracks and holes inside the hive. It may be used to reduce the entrance of the hive during the winter The resin is placed on the walls of the hive, and is sticky at first, but as the material ages it will dry and harden. The resin acts as a mechanical sealant, like a coat of paint on the walls of a room in the house. It is also biologically active, as it contains anti-microbial compounds that help protect the bees' nest. These compounds are used by humans as anti-bacterial, anti-fungal and anti-viral agents.

Observation hives

Dr Seeley has used observation hives for many years as one tool to help him observe bee to bee interactions as well as to document foraging behavior All beekeepers benefit by spending time in front of an observation to watch the activity of the bees within the local neighborhood. Observations on pollen collection, bee dances for food recruitment and other a myriad of other behaviors will help educate the careful observer This is an excellent way to watch queen behavior and replacement. BC

Dr. Connor has completed his latest book, Queen Rearing Essentials, *which is expected to ship later this month or in January. Contact www.wicwas.com for details. In January Dr. Connor will conduct the Fourth Serious Sideliner Symposium for the American Beekeeping Federation meeting in Orlando, Florida.*

References

[1]Alphonse Avitabile, Personal communication

[2]Inexperienced beekeepers often make the mistake of placing the protein patty in the wrong place in the hive. For maximum utility to the bees, protein patties must be placed immediately next to or above the developing brood, usually on top of the brood frames.

[3]Thomas D. Seeley, The Wisdom of the Hive. 1995. Harvard University Press.

[4]There is variation in the protein content and other nutritional values of different floral sources; some pollens are very low in protein, and the bees must consume much more of it for the same protein benefit. The pollen sources, like dandelion, lack certain amino acids and must be supplemented by other pollens to provide full nutrition to developing bees.

To Requeen . . . Or Not

Ross Conrad

There are two approaches to this question which do you prefer?

The act of requeening a hive by removing a colony's queen and replacing her with a new queen has long been a recommended practice in beekeeping circles. The primary reasons for this are that colonies headed by younger queens are less likely to swarm and younger queens tend to lay more eggs than older queens. The resulting larger colonies are more likely to produce bumper honey crops. By requeening a colony with a mated queen instead of allowing it to naturally supersede the old queen, the beekeeper will tend to have more control over the genetic make-up of the hive and will avoid mating issues due to inclement weather, or an insufficient number of drones in the mating area.

On the other hand beekeepers who requeen their hives find that it can be a laborious task that is time consuming and it can be expensive. Making matters worse is the fact that requeening efforts will often fail, even when carried out by an experienced beekeeper These disadvantages to requeening may encourage some beekeepers to pursue a different approach.

Rather than requeen, some beekeepers will allow their hives to go through their natural cycle and allow each queen to live out her life fully and in accordance with her own timetable. This may mean that hives will supersede or swarm more often (though there are a number of management techniques that will introduce space into the brood area and deter the swarming instinct without requeening). However the time and money saved by not having to raise and/or purchase replacement queens and introduce them into the hive, more than makes up for such inconveniences in most cases. Unless you are doing research, keeping bees in Africanized bee territory, or trying to breed a pure strain of honey bee, requeening is an option – not a necessity

These two divergent approaches tend to be guided by differing world views. One perspective tends to view life as a ladder or pyramid with dirt at the bottom, humans at the top and everything else filling in the hierarchy somewhere in between. From this perspective those at the top of the hierarchy have dominion over those below This leads to the contemporary concept of ownership that allows one to do what one will with whatever one owns. This unfortunately seems to perpetuate a system that encourages the use of force to obtain resources. Even the term "resources" is a result of this view Referring to the land, the trees, the minerals, bees, etc., as "resources" assumes that they are here simply for our use, and don't have a right to the freedom of expression that is uniquely their own for their own sake. From his viewpoint, it is perfectly normal and expected that one would "pinch" a queen bee that is not performing to our standards and replace her with one we expect will do better The bees in most cases however, are not trying to get rid of their queen and in fact may try to protect her from our requeening efforts. When we purposely kill a hive's queen and replace her with a new one, we tend to be acting on behalf of our own interests and not necessarily the bee's. What gives us the right to treat our hives this way? The kind of world view outlined above that would define a hive as mere insects or property

On the opposite end of the spectrum is a circular world view in which there is no top or bottom. All beings

coexist in a community of life in which everything supports everything else. In this world view the tree, the blade of grass, or the honey bee colony is no more, and no less important than the human being. From this perspective, everything in nature has its own right to life, liberty and the pursuit of happiness.

When one considers the reasons that might cause a beekeeper to requeen a hive, the majority of the reasons are centered around the desires and needs of the beekeeper· not enough brood or honey production, the age of the queen, or the temperament of the hive. Little if any consideration is given to the desires and needs of the bees. To be fair this attitude is typical throughout our agricultural industry and is not limited to keeping bees. As part of the industrial model of agriculture, we have a tendency to impose our ideas of how things should be upon the animals, plants, and land we are responsible for rather than let things unfold in a more natural way By acting this way as beekeepers we are implying that we know better than the bees, what is best for the hive. This interventionist way of thinking reveals itself when beekeepers clip the wings of a queen in an attempt to stop her from flying off with a swarm, install a queen excluder to limit the area in which the queen can lay eggs and raise brood, or remove honey that the hive needs to get through a dearth and feed sugar syrup back to the hive as a replacement.

Now I must confess that all this is coming from a person who has never requeened a hive. The main reason for this is because this is the way I was taught by the Mraz family, of Champlain Valley Apiaries who mentored me in my early years of beekeeping. My tendency, as was the tendency of the Mraz's, is to allow each hive to prosper or decline according to its own abilities and fate. Sure I'll do what I can to try to assist the hive by attempting to keep it as pest- and disease-free as possible, and take pains to see that each hive has enough honey to see it through Winter, etc. The ultimate decision as to whether the queen lives or dies, and thus the ultimate fate of the hive however is left to the bees. The only time I find myself introducing a mated queen into a hive is when the hive has gone queenless (and I have caught it *before* it has become a drone layer), or if I have made a nucleus colony and don't want to wait for the hive to raise their own queen from an unhatched, or very recently hatched egg.

Over time the wisdom of not requeening my hives has subtly influenced my beekeeping management style. I have noticed that sometimes a hive that is weak and must be nursed along all year will surprisingly survive the Winter in good shape. The following season such hives will typically produce a respectable crop of honey for harvest. Why this happens I am not certain. However, I have to admit that the reason the hive, from my perspective, was performing poorly in the first place may have not been due to any fault of the bees, but because of something that I did, or did not do as their keeper If the trouble the hive is having is caused by me, how does my killing the queen and replacing her improve things? Contemplating such things injects a sense of humility into my beekeeping.

In addition, sentencing a queen bee to death based solely upon her age, or the size and shape of her brood laying pattern, ignores a whole host of other characteristics that may or may not be readily observable. Although a particular queen may not possess certain characteristics that are deemed important to us, such as high honey production, she may harbor traits that are extremely beneficial, but not as obvious. Resistance to mites and diseases are two examples. Out of respect for the bees that provide so many benefits for the rest of us that share this wonderful blue-green planet, I find myself resistant to purposely killing a queen mother and replacing her It does not matter what the queen's age is, or whether or not she expresses certain traits that I consider worthwhile or valuable, it's simply a matter of stewardship and an approach to apiculture that I prefer to practice.

By cultivating the change in attitude that will allow us to treat the honey bee with greater reverence and respect, we nurture the same mind-set that provides hope for the future of human culture. In essence, if we want to create a different world to live in, the place to start is by changing our minds. Once our minds have been made up, it will affect how we interact with our hives and the rest of the world. BC

Ross Conrad, author of Natural Beekeeping, *regularly conducts organic beekeeping workshops, classes and consultations in between taking care of his own bees. Dancing Bee Gardens, P.O. Box 443, Middlebury, VT 05753; www.dancingbeegardens.com, dancingbeegardens@hotmail.com.*

Producing Queens In North Carolina

Aen Lassiter

Rick Coor is serious about bees. Located near Goldsboro, North Carolina, he and his son, Colin, operate Spring Bank Apiaries and have been rearing queens and selling package bees for five years. Rick has quickly gained a reputation around Eastern North Carolina as an excellent source of hardy queens and package bees. He and his son are among a growing number of "micro-breeders" in North Carolina who produce queens from home grown stock. I recently attended one of his queen rearing.

History and Focus

Rick started raising by reading Contemporary Queen Rearing by Dr Harry H. Laidlaw Jr a practice he highly recommends.

Preferred Methods

Rick's demonstration showed three techniques. First, the swarm box method. He uses five pounds of young bees confined in a five frame nuc box that was extended on the bottom with wooden ends and screened on the lower sides. Second, the starter/finisher method. This uses a single story queenless starter colony and a two story queen-right finisher colony Third, using a modified swarm box using principles of the first two techniques combined to produce cells with one two-story colony The basic principles of the three methods – abundant resources of pollen and honey, the proper amount of nurse bees, larvae which are less than 36 hours old and healthy colonies of bees. Each starts with a queenless environment to start cells and ends with a queenright colony to finish and seal the cells.

Getting Started

Rick uses a standard deep frame modified to hold three wooden cell bars, each with 15 wax cell cups attached using a paint brush and melted beeswax. He uses burr comb beeswax to limit the presence of pesticides in the wax. His grafting room is small, clean, and well lighted, held at about 80° when grafting. There's a small table with a task light and grafting stand at the right angle to allow for easy transfer of the larvae with a grafting needle. Rick emphasized that cleanliness is critical to successful grafting. He explained that he always sterilizes his needles in boiling water between uses.

Grafting Cells

To graft, first prime the cell cups with a small drop of royal jelly to prevent the 24-hour-old larvae from drying. Rick described how to pick the larvae with your grafting tool from the outside of the 'C' shaped curved edge. Don't injure or turn the larvae over, and place them in the wax cell cup in exactly the same position.

The Modified Swarm Box

To use a modified swarm box begin with a strong two-story hive with a low Varroa count, treat for nosema with fumagilin-B if necessary and reduce hive beetle populations as much as possible. To set up a cell finisher he first moved open brood frames up to the second story, placed a frame of foundation in the center of the second story and a pollen frame on either side of the foundation frame, with division board feeders along the outside edges. Colonies need to be continuously fed during the cell building process. Confine the queen in the first story below an excluder and place a couple of clean, drawn combs below with the queen to allow room for her to lay eggs. A third hive body is modified to give the bees extra working room below the frames by adding one inch to the bottom of the hive body by tacking on one inch wide wooden strips. There's a double screen board attached to the bottom. In the center he left a space for a cell bar frame with a frame well filled with pollen on either side, and next to those he placed a division board feeder Use nails to keep this group of five frames tightly together in the center of the hive body. The remainder of the hive body is open to give the bees space to festoon. Rick uses a piece of burlap as an inner cover, stapling the edges and cutting a split in the middle of the cloth to allow for placing the cell bar frame in without losing so many bees.

After this set up he allows the colony to settle a few hours, then shakes three or four pounds of nurse bees from the second story into the third hive body which takes six well covered frames. These bees may also come from another hive if necessary Don't overdo though, as too many bees may suffocate. He confines the bees in this hive body on top of the two story hive. The double

A screened, five-frame swarm box.

Frame with cell cups, ready to be grafted, then placed in the starter colony.

Top box of the queenless starter colony. Feeders on the outside, open brood next, pollen next and cells in the center.

Grafted frames are removed from the third story after they are started and placed below to be finished.

screen board allows the bees below to help regulate the temperature and moisture above. Rick allows the bees to settle a couple of hours, then places a graft of 30 cells in the third hive body and leaves it for 24 hours. The bees confined in the third hive body realize they are queenless and start the cells.

After 24 hours, move the cell bar frame out of the third hive body and into the second story by removing the foundation frame from the second story and replacing it with the cell bar frame. Release the confined bees and allow them to rejoin the hive. The colony feeds the started cells and seals them in three days.

Rick said to leave the cells in the finisher until they are transferred to the mating nucs. Place the cells in the mating nucs 10 days after the graft. Virgins emerge 11 days from the graft or the cells can be placed in an incubator on day nine to prevent virgins that might emerge early from damaging the other cells.

Rick's Mating Nucs

An awful lot of bees and combs are required to operate mating nucs if you use the deep, five frame variety To reduce the bees and equipment required, he uses a smaller homemade double baby nuc that he constructs from rough cut cypress lumber Rick's box has room for two medium half-length frames and a homemade division board feeder in each side. He places the brood comb next to the partition that divides the nuc, for warmth, the resource comb between the feeder on the outisde and the brood comb. Frames can be spaced about a finger width apart, to allow for easier placement of the queen cells, and to avoid injury to the queen when the nuc is opened. One advantage of using a baby nuc is that just three pounds of bees are used to set up six small colonies.

To set one up he places the two frames and feeder in the nuc and closes the entrance. He stocks the colony with bees by lifting up the brood frame and pouring in about two and one-half cups of bees. He then replaces the brood frame, closes the lid and allows the bees to settle and cluster Then he places a queen cell between the brood frame and the resource frame. Two days later he opens the entrance. The virgin should have emerged by then and be in the cluster Once the queen begins to lay Rick cages her, places a new cell in the nuc and the process begins again.

Proper Timing is Essential

A key to Rick's success are the routines he follows to avoid confusion and unnecessary rework. The time between the process of grafted larvae to laying queen to be 21 days. It works well for him to graft on Monday afternoons. This allows him to place cells in nucs 10 days later, or Thursday of the following week. He cages the

Finished cells, waiting for the mating nucs.

The two-sided mating nuc. Feeder removed and lying on top, resource comb being examined, brood comb in center. Queen cells are placed in the space between the brood comb and resource comb. The queen will emerge, mate, and begin laying in the brood comb.

Catching a mated queen and placing her in a queen cage, ready to go.

The mating yard.

queens on the Wednesday before to make room for the next day's cells. This means that each week Monday's job is grafting, Tuesday's is inspecting for eggs, Wednesday's is queen caging and Thursday's is placing cells in nucs and Friday's is shaking bees in packages.

Final Thoughts

The last photo shows one of Rick's queen yards on his farm. After the class, I watched as Rick, and his son Colin worked in this yard to pull the queens that I had ordered. It was interesting to watch this father and son team working to cage the queens I was to take with me. I learned a great deal just by watching this experienced father son team work together I was also reminded of the importance of staying in a routine and working in an organized manner It the excitement of setting up one of his demonstrations, Rick misplaced his veil. He borrowed one that did not zip onto his suit. As he was working with his nucs, a bee stung him on his neck. I was surprised to see Rick jump around a little, as I would have. I somehow believed that sort of response was reserved for amateurs like me! BC

*To contact Rick Coor, 919.778.0210, **RickyDCoor@bellsouth.net**; Spring Bank Apiaries, 298 Spring Bank Road, Goldsboro, NC 27534*

THE PARIS BEEKEEPING SCHOOL

J Jonnes

The Jardin du Luxembourg in the 6th arrondisement is the quintessential formal Parisian park, with its broad graveled paths, well-pruned trees, geometric flower beds, fountains, and almost one hundred 19th-century statues of France's queens, saints and important personages scattered throughout. What few guidebooks mention, however, is that tucked away in this historic park's southwest corner is the *Rucher-École* or Beekeeping School.

First opened in 1856, the school shut down a decade later when Baron Haussman's grand re-making of Paris eliminated many of the woods nearby But in 1872, the present rustic brick building (renovated in 1991) opened and has been holding an annual beekeeping course ever since. The school's 20 Dadant wooden hives are located about 100 yards away in a grove of trees surrounded by a thick hedge. And, it turns out, for good reason. The black bees of Paris are rather feisty Ignoring the sign warning against walking on the lawn near the hives (I wanted to get some close-up photos), even at 10 feet away a vigilant guard bee stung me. Others followed up, but I retreated swiftly!

The classes, run by the Central Society of Apiculture, are held every Saturday morning starting in January in the building's classroom. In mid-June when I came round at 10:30 on a sunny Saturday, about a dozen students and their teacher, Alain Levionnois, were just donning their beesuits and heading to the hives. But first, perhaps knowing they would be riling up the already grumpy black bees, they cordoned off a pretty wide swath to protect passers-by

As for the course, one student, Yuri Endo, said, "First we learn about the anatomy of bees, and technical aspects of beekeeping, about disease, botanicals and flowers, and by Spring we are working on the actual practice. And we harvest at the end of June or in July " One of the school's more famous graduates is Jean-Jacques Schakmundès, proprietor of "Les Abeilles," the only Paris store offering beekeeping supplies. No one knows how many hobbyist-beekeepers have hives in Paris, but the usual guess is 300 to 500 hives. There have been hives atop the Paris Opera House for the past 25 years, and this past Summer one beehive was installed with great media fanfare on the roof of the Grand Palais, a major exhibition hall built on the Champs-Elysées for the 1900 World's Fair If all goes well, more hives will follow

Monsieur Levionnois, the day's instructor at the Jardin Luxembourg, kindly lent me a straw hat and veil and allowed me to come in to see the Dadant hives more closely – they look pretty much like Langstroths, but are reportedly two inches deeper These Jardin du Luxembourg hives have elegant Chinese pagoda-like slanted metal roofs, topped with round knobs for lifting. The hives all had screened bottom boards to counter *Varroa* mites, as much a plague in France as here. Since thick streams of bees were zooming in and out, the hives seemed to be prospering mightily, despite what all lamented had been a very rainy Spring.

Some of the school's beekeeping and teaching supplies are kept under a white wooden pavilion in the bee-yard, including a couple of straw skeps. One of the original goals of the Central Society of Apiculture was to outlaw skeps, as harvesting from them destroyed the bee colony One current student said that as part of their practical instruction, they were also raising queens.

The French government began actively encouraging urban beekeeping in 2005, according to a 2008 *New York Times* article. The owner/managers of The Eiffel Park Hotel, who kept bees at their country place, responded by placing several hives on one of their Paris hotel's terraces. The hotel now serves its own *Miel de Paris* honey at breakfast or presents it as gifts to guests. In that article, a number of urban beekeepers who maintain hives at their country homes, said the urban bees are doing far better The general belief, also expressed to me by several beekeepers, is that the bees in rural France are suffering significant losses because of pesticides.

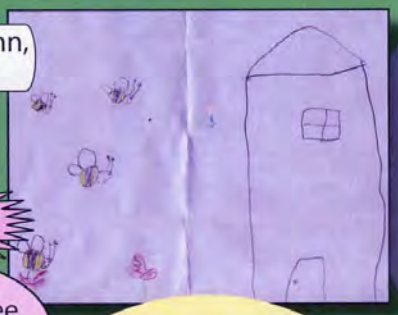
But for the bees of the Jardin du Luxembourg, life seems good. In September the Bee School hosts its annual Honey Festival at the park's Orangerie, and that famously delicious Paris honey will be on sale. If anyone needs an excuse to go to Paris, this may be just the reason. BC

All The Buzzz in...

Hello Friends,

I love all the cards, letters, pictures, and poems you've shared. You are so special to me. I hope you have a wonderful holiday season.

Hugh Spann, 5, WI



I am Buzz the bee.
I am soft and fluffy.
I eat honey.
I like the sun.
The beekeeper likes the sun too.
I live in a beehive.
I am the worker bee.
I do not like enemies.

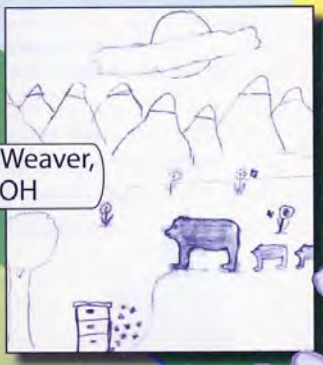
Heidi Issac, 8, NS Canada

Bee B. Queen Challenge

Make a snow bee and send me a picture.

What do you call a dog coming out of a car?
A disembarking

Ryan Meshulam, 8, CA



Albert Weaver, 9, OH

Decorated Cupcakes

Cupcakes are easy to make but it's the decorating that is the fun part. Invite your friends over for a cupcake decorating party. Use colored icing or provide marshmallows, candy, and anything else you can think of to make bee decorations. Thin cookies can be made into wings. Licorice can be legs. Other things to use: fruit leather, gumdrops, pretzels, lifesavers, or dried fruit.

Dried apricots and a banana slice make a flower. The bee is a candy fruit slice with chocolate chip eyes and almond slices for wings.

Holiday Gifts

Here are a few bee related gift ideas to get you into the holiday spirit. It's fun to receive but even more fun to make something and give it away. Better yet, have a bee related party for your friends and family using some of these projects.

Decorated Honey Bears

Honey is a great gift to give to your family and friends. Instead of a plain jar, try decorating honey bears. You could make a Santa Claus, cowboy, princess, or alien. You could even dress up a honey bear to look like you! Play and have fun.

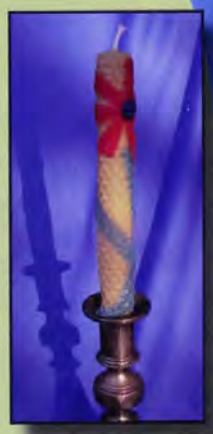
William Atkinson, 12, TX
Notice the earmuffs for cold weather.

Mary Brice, 16, TX
Takes art to another level.

Phoebe Atkinson, 10, TX
Leapard skin pockets really make a fashion statement.

Christian Atkinson, 8, TX
Every bear needs a black cape.

Rolled Candles



This is an easy way to make beautiful, inexpensive beeswax candles. This project is so easy even a three year old can do it. Adults have fun with this project too. Cut a sheet of beeswax in half. Lay a piece of wick on one end and press it into the wax. Tightly roll up your candle. Decorate with pieces of colored wax. Remember to light your candle with adult supervision.

You can buy beeswax sheets and wick from any beekeeping supply house. If you are overwhelmed by the choices, call them and someone will be happy to help you.

Answers: cake, ham, bread, syrup, dip...bee happy

...Bee kid's corner

Produced by Kim Lehman -www.kim.lehman.com
www.beeculture.com
December 2009

Audree Shaughnessy, 4, ND

Bailey Miller, 9, IN

Busy, busy, busy bee.
They are busy you can see!
Fly, fly, fly around,
They also make a lovely sound!
Pollinate, Pollination.
Thank you bees.
You help this nation!

Madeline Hudgens,11, FL

Jessica Miller, 6, IL

Honey Time

(Tune: Jingle Bells)
Words by Kim Lehman

Thrashing through the yard,
In a one horse pick up truck.
To the hives we built,
I hope we don't get stuck.

Robbing all our hives,
Honey for our friends,
What fun to see the bees
that thrive,
On nectar and pollen.

Honey time, honey time,
Sweetness everyday,
Oh, what fun it is to eat.
It's goodness I must say.

Honey time, honey time,
Sweetness everyday,
Oh, what fun it is to eat.
It's goodness I must say.

Honey Scramble

Unscramble the words. Each word is something that can be made using honey. Take the letters that appear in the ☐ boxes and unscramble them for the final message.

CAEK ☐☐☐☐

MAH ☐☐☐

RADBE ☐☐☐☐☐

PYSRU ☐☐☐☐☐

PID ☐☐☐

Something I always say ☐☐☐ ☐☐☐☐☐

In England, it is said that animals can talk at the stroke of midnight on Christmas Eve including bees that hum or sing Christmas Carols.

Bee Buddy

Ceci Spann, age 8, lives in Wisconsin. She and her younger brother Hugh help to work the family hives. Ceci helps in the bee yard by smoking the bees, and then helps with the honey extraction. She also loves reading, art, and riding horses.

Ceci made this bee out of a popsicle stick and chenille sticks.

Beecome a Bee Buddy

Send two self addressed stamped envelopes and the following information to: Bee Buddies, PO Box 2743, Austin, TX 78768. We will send you a membership card, a prize and a birthday surprise!

Name: _____

Address: _____

City, State, Zip code _____

Age: _____ Birthday: _____

E-mail (optional) _____

Send all questions, photos and artwork to: beebuddies@hotmail.com or mail to the above address.

What New Beekeepers Should Know About Old Beekeepers

James E Tew


Pre-1975 60# honey tins.

We really do mean to be helpful.

Jumbled thoughts

I know what I want to say, but my thoughts are tumbling over each other Let me start like this, *"When is one an old beekeeper with vast experience or when is one an old beekeeper who lives in the past too much?"* For instance, consider five-gallon pails. An experienced beekeeper could say *"Yeah, I certainly remember those old 60# tins we used to put honey in. Remember those small, painful wire handles? Remember how the solder joint could break on those handles and drop a 60# can of honey on your foot? But having straight sides, they sure stacked nicely."* Or an old beekeeper could say, *"I remember those 60# honey tins, but I think these plastic five-gallon buckets are much better Better handles and much easier to clean and pour honey from."* When is information from an experienced beekeeper really helping a new beekeeper and when is just a walk down memory lane?

Why these thoughts at all?

I'm having these thoughts because everything changes and during the past two decades, things have really changed in beekeeping. Mites, small hive beetles and Africanized honey bees have amalgamated to completely restructure beekeeping. So much has changed in management, equipment, bee stocks, honey production and pollination services as to make many established recommendations uncertain. For instance, right now I should be writing an article for beekeepers describing what they should be doing for spring management. Roy Hendrickson[1] discussed Spring management in an excellent recent article and I did a piece entitled, *"A fresh look at the principles of spring management of bee colonies"*, in April, 2007 In September of this year, Larry Connor[2] when referring to the 1960s beekeeping hauntingly said, *" ..That was a time before tracheal mites, Varroa mites, small hive beetles, CCD, neonicotinoids, and African bees. "* Good grief! That's pretty much what I said just a few sentences ago. We seemingly are stepping all over ourselves trying to advise new beekeepers when I sense that old beekeepers need help as well.

Today, the penalty for mistakes is much greater.

As a beekeeper trained in the '70s, I commonly made mistakes but the effects of my errors were rarely severe. Accidentally killing a queen was paramount to a bad day, but queens were readily available and not very costly Not true for today's new beekeeper Colonies still died during the Winter but only a few and so what – you could readily make up the difference by picking up swarms the next Spring. Not true for today's new beekeeper Mature colonies were hardy and could reach large populations with little to no intervention by the meddling beekeeper Splits were easier to make. Today's colonies are more delicate, more fragile. I don't know why Good colonies can suddenly fail.

It seems to me that the new beekeeper is more stressed to get things right more quickly and without errors. Increasingly, I have become huffy about new beekeepers trying to implement all of the old management recommendations – plus all the new ones. Reversing brood chambers, frequent requeening, mite treatments, pollen substitutes, feeding medications, tearing down swarm cells.... It's a conundrum. The new beekeeper needs to learn to manage bees, but the new beekeeper is punished for making mistakes. *(Just so you know, today's experienced beekeepers are also penalized mightily for making mistakes.)*

But I'm ahead of myself – Today, getting bees is much more difficult

All of my penalty comments above assume the new beekeeper was even able to acquire bees. While I am not a

[1]Hendrickson, Roy. 2008. *Spring Management of Overwintered Colonies.* Bee Culture, Feb. 2008. Vol 136, No.2

[2]Connor, Lawrence. 2009. *Changing the way we train new beekeepers.* Bee Culture, Sep. 2009 Vol 137 No. 9

fossil beekeeper I have paid less than $2.00 for a new queen. Today's new beekeeper can easily pay ten times that low price for a queen – if any are even available. Package bee producers were everywhere. The U.S. Postal System readily shipped them to me. Or, I could buy established colonies or splits. They were advertised in farm papers, bee club newsletters, or by word-of-mouth. Now, a swarm call is a rare thing. Bees are difficult to get. Today's new beekeeper must make careful plans to order packages and arrange to get them, probably through a club or through a bulk order Heaven forbid that anything go wrong with the package installation process. Oh, your package queen died? Hope you can find another one because the package producer is probably not sending extras the way they once did. So here we are again.... making errors in installing packages today has greater penalties than it did a few decades ago.

When computers and computer systems were young, I could contact my "university IT people" and they would come troubleshoot my 8088 chip, dual floppy drive computer Invariably they had to reset some of my dip switches or some such. Does anyone think that I have that kind of support today? Only catastrophic issues are addressed (for pay) but for software or general hardware questions – go on-line and search for answers. Today, I am on my own if my computer system hiccups. Years ago, honey bee queens were *kinda* guaranteed by the producer Something went wrong – call them up. This past season, I had about 20% of the queens in my packages die. A couple were dead in the cage before I even released the package. It was not my fault, but I got no free queen replacements. That guaranteed queen thing has nearly passed. I ended up with several six-pound packages when I had to combine queenless three-pound packages with queen-right packages. Let the new beekeeper beware.

Don't try this at home – yet.

For this reason and several others, I accidentally worked out a procedure that I am planning to try again next Spring. This is not a recommendation for you and may never be one. Of the three-pound packages I had, I took two for a novel release procedure. I released one of the packages in the typical way, but I also opened the second package and released about two pounds of the bees in with the first unit. I used the remaining queen and the last pound of bees to establish a nucleus colony. So I essentially had a five-pound package and a one-pound package.

As I expected, the five-pound unit developed quickly. If queen problems arose, I had one (somewhat) in reserve. No problems arose. As the season progressed, I equalized the colonies and currently all is well with the two colonies. The question you should be asking and it's a question I cannot yet answer, ***"Did I have more bees because I used this process?"*** *I don't yet know, ergo the reason why this is not a recommendation. If I try it again, I will give you an update. Stand by.*

Beekeeping information technology then and now.

The old system of information dispersal is still alive and somewhat well. Bee education classes are still offered, scores of bee books are available and it seems there is a bee meeting somewhere nearly every night. Interested people talking, looking at pictures, and people reading – all about bees – that hasn't changed, but other things have changed. There was a time when I was confident that I knew more about bees than most people in the room but not anymore. The new beekeeper can go to the web for literally anything concerning beekeeping (or anything else). I simply cannot read the thousands of bee-related web pages. But here's the new responsibility for the new beekeeper – not all web-based information is accurate. For instance, it is not a viable procedure to move a colony having laying workers a few yards away shake the bees from the colony and replace the hive on the original stand. The idea is that the laying workers will not be able to find their way home, but that is not true. Laying workers can find their way home very well. Yet, if you Google the descriptor *"shaking bees for laying worker control"* many hits are presented that give instructions for this process. Let the new beekeeper beware.

Bee industry compartmentalization

The beekeeping industry has always been an assemblage of sub-groups that came together on bee meeting days. Hobby beekeepers, sideline beekeepers, commercial beekeepers, equipment vendors, regulatory people and university/USDA bee professors were some of the typical sub-groups that comprised the audience. Today's new beekeeper will still be exposed to a segmented industry, but different segments than from a few decades ago. Hobby and sideline beekeepers seem to have been combined. Commercial beekeepers are now rare at most meetings. In many states, it is common to have no commercial beekeepers at all present in the sessions. Their numbers are smaller and they have become so specialized as to nearly be in a different industry than the new beekeeper

Hobby beekeepers – new and old

Several years ago, when Colony Collapse Disorder was in its most recent infancy, I was in a meeting with an Ohio legislative representative

A dead queen – more of a problem today.

when, in reference to hobby beekeepers, he abruptly said, *"Don't ever use the term, hobby beekeeper, again."* He continued that either you are beekeeper or you are not. No government funding agency is going to fund hobbies. I was completely stunned. This one individual had abruptly made a term commonly found in hundreds of bee books obsolete. My very first reaction was to think that the *"hobby"* term simply could not die but after considering the thought for a few minutes and seeing the opinioned firmness of the representative, I realized that, in Ohio at least, I had probably just witnessed the death of a time-honored term. Since that time, I have been in attendance at two state meetings far removed from Ohio where the presenting speaker admonished the group to delete the hobby word. Whether or not that Ohio meeting actually started something or not, today's new hobby beekeeper is just a beekeeper The term "sideline" beekeeper was always a forced fit. So today, within the bee industry, there are essentially beekeepers and commercial beekeepers. Now I sense that the population of beekeepers has been loosely divided into pre-*Varroa* (old) and post-*Varroa* beekeepers (new). However, even if this is a designation, as old beekeepers pass, the post- group will take over

Academic beekeepers

Bee professors past were as much a beekeeper as they were a scientist. They commonly attended bee meetings even if they were not speakers on the program. Dr Walter Rothenbuhler and Basil Furgala are examples of scientists from this era. USDA scientists were governmentally funded and not encumbered with the obligation to get funded grants. They were encouraged to work on problems that had immediate and direct effects on the industry B.F Detroy was a USDA beekeeping engineer who worked on projects like developing steam-heated uncapping knives, insulating beehives and pollen traps designs. For many legitimate reasons, academic beekeeping today is nearly completely removed from the practical bee industry Rarely are these individuals at bee meetings other than as speakers – if you can even get them to speak. The studies they implement are specialized and conclusions drawn are complicated. In eras past, academic beekeepers were simply doing their jobs when working with the bee industry Today's academic beekeeper is stressed to get outside funding and to succeed inside the scientific community That internal success can have little to do with the day-to-day life of the typical beekeeper This is not a good or bad thing, but it is a different thing from way beekeeping was way back when.

Still jumbled

My thoughts are still muddled, but I know what I was feeling as I stood before the group at a county bee meeting last week. It was a modern group made up of new and old beekeepers (the new grouping). Those of us in the old group have paternal feelings and want to help these new people at every turn. Even this magazine recently had articles on how to nurture new beekeepers. That sounds like current recommendations for helping bee colonies. We have the best intentions but our aid programs frequently harm our colonies more than they help.

True, old beekeepers can help with the mechanics of beekeeping, but today's bright-eyed, eager new beekeeper never knew bees without mites, CCD, poor queens, and imported honey They don't expect bee professors to grace their meetings. Instead, they will keep bees in town more often than the countryside and when they need information, they will search the web, or blog and twitter In a pinch, they will use old-fashioned email. When requesting information, they will rarely use a land-line phone and will never, never write an actual letter (Well, almost never, but we still get handwritten letters – daily in fact, but far fewer than five, and certainly 10 years ago – Ed.)

Finally, my thought

Due to mites, insecticides, African bees, beetles, bee diseases and imported honey, we are ***ALL*** new beekeepers. Old beekeepers know more about the mechanics and fundamentals of beekeeping but the new group knows more about today's way of communicating and implementing modern beekeeping principles. They're not living in the past. To survive and thrive in this changing bee world, old beekeepers probably need new beekeepers as much as the new needs the old. We are all in the same boat and it's a very new boat. BC

Dr James E. Tew, State Specialist, Beekeeping, The Ohio State University, Wooster, OH 44691, 330.263.3684; Tew.1@osu.edu; http://beelab.osu.edu/

Integrated Top Bar Hive Management, Part I

A Story Of Rebellion And Cohesion

Melanie Kirby

In my neck of the woods of northern New Mexico, there is a growing trend to house bees in top bar hives. For those who are unfamiliar- a top bar hive is a single level, horizontal hive body system which does not have side comb supports as do vertical Langstroth frames. My interpretation of both Top Bar and Langstroth systems spans over a dozen years whereby I first learned on one, came to appreciate the other; and have come to terms with working and keeping bees in both. I have also come to develop my own system (with respect to efficiency and conscientious beekeeping management) whereby I utilize the "best" of both systems to incorporate and adapt the diversity of each into a usable, workable and standardized method.

I have wanted to put this method and its reasoning to paper for some time now being that when I first started meeting top bar enthusiasts here in the United States (in plethora these past few years), I found that their interpretation of top bars was more of a contendership battle: top bars vs. Langstroth. With the manifestation of CCD and

A little history on my part: I was first introduced to beekeeping and to top bar management as a volunteer for the US Peace Corps in Paraguay South America back in 1997 I had no previous beekeeping experience and recall the day I received my assignment. It was the middle of summer and I was working as a science instructor for the Desert Sun Science Center in Idyllwild, California. I had been teaching elementary to high school age kids about meteorites and Mars rovers. I had just graduated from St. John's College in Santa Fe, New Mexico that May with a BS degree and my goals included enlisting in the Peace Corps to better serve my country as a cultural and technical ambassador- wherever and however they needed me.

I had been working on my Peace Corps application throughout the year and had taken my time in getting the final paperwork in being that I was hoping to enjoy a full Summer in the U.S. after graduation before being shipped out like a few other of my fellow graduates had already been (one to Ghana for teaching French and another to Nepal for teaching Math). We had all graduated with the same degree so it was a real surprise to me to find that I had been assigned as an Agriculture Sector Beekeeping Extensionist! I guess I was one of a few who marked the application form as "willing to work with stinging insects" – funny how happenstance or divine intervention works! Little did I know that the bees were making sure to find me, and thankfully- I have found myself in them- both professionally and spiritually.

I did what I could at the time to prepare myself. I was up in the mountains between Palm Springs and Los Angeles working all week and there were no beekeepers around. I went to the local library and checked out beekeeping literature- what little they had; and scoured it for details as to how a hive worked and what I would be required to do. Internet availability as we know it today did not exist at that time, so I was left to the findings at the local library Luckily for me, I was scheduled to have a three month training session on beekeeping and cross-cultural teachings in Paraguay before heading on my way out into the "bush."

Due to the economic and infrastructural composition of Paraguay, top bar beekeeping was the most common since it involved little monetary investment which the campesino farmers I worked with had very little financial means. "Campesino" refers to "one from the campo" also known as peasant farmers. They are subsistence farmers and work alone and together in committees as forms of cooperatives to get their crops in, harvested and to market (what's left after they feed their own families).

My assignment entailed recruiting those interested in keeping bees for both honey production as medicine for them and their families and also for selling to fellow community members as a diversified income. It was quite interesting attempting to work with the men campesinos whose cultural dealings with women and "Norte Americanos" excluded some interactions. I did begin working with several men who were interested in beekeeping, but by the time my service was done, I was working more with women and women committees. Women in rural Paraguay are known as "Amas de la casa." We equate that to housewives. They are responsible for caring for all the children, the home and all small animal husbandry – from chickens to rabbits and pigs and milking cows. Beekeeping fell culturally into their domain.

I must add that at this time, my newness to beekeeping was very evident to me (and I am sure to my in-country counterparts). How was I, a very new female beekeeper supposed to help establish and teach beekeeping to those who had more animal husbandry experience than me? And in multiple languages? I must admit that I learned more my first year from my in country counterparts than I could have imparted on them. I thank them immensely for the experiences they shared and taught me and know that despite our physical distance – there are bonds that were forged there that will exist as long as we live – learning to keep bees together has definitely been one of these bonds.

My initial training with honeybees in Paraguay mostly consisted of learning to work with Africanized Honey bees. Having no preconceived

its correlation to "modern" agricultural and beekeeping management practices as foes, there has been a rise in the misconceived notion that top bars are "more natural" or "better" and more "respectful" for housing bees than Langstroth colonies.

Their presumptions that Langstroths are only for greedy commercial producers is, rather unfortunately, ill-conceived. I have had to deal numerous times (more than I can count and recall) with sharing the pros and cons of each system. Neither Langstroth nor top bars are perfect. Humankind's bond and appreciation with honey bees requires that all who want to truly be sincere bee stewards be open to what was, is and will be, in regards to preserving honey bees, their habitat and continuing the established and respectful symbiosis between keeping/caring for bees and managing them in this ever-changing world.

I don't really care to turn this story into a pros and cons list of Langstroth and Top Bar hive attributes. What I would really like to do is to share how I have come to fuse the two together and how that has worked for me and my interpretation of being a bee steward and also how to encourage more and more newbees and oldies to be open to the diversity of honey bee management in its myriad of forms. I will mention a few unique qualities of each system to better understand their individual and fused forms and how they work alone and with each other

One of my top bar hives, with a frame on top. With no side support typical extraction is difficult, but the hive can be made from basic material with a minimum of tools.

First and foremost- the "modern" Langstroth system is over 150 years old. Not much has changed since ➢

notions about working with bees – I assumed all bees were ornery and I found a real sense of self-challenging competition within myself to learn to work with this type of honey bee. While many may think that this was crazy or undesirable – it should be noted that you work with what you have and this is the type of honey bee most prevalent in Paraguay. U.S. Peace Corps promotes appropriate technology so learning to work with materials the locals have access to on a regular basis is essential. This included learning and teaching to keep bees that are present there – AHB.

Training started with the basics – honey bee physiology, terminology and seasonal cycle assessment. There were four other Beekeeping Extensionists in my group. We learned how to make our own top bar hives with machetes, catch wild swarms and manage them in the top bar hives we built. We also learned how to harvest bee products (by hand) and to market them. For those with little to no money to invest in establishing hives, such as in Paraguay, the appropriate technological method was to make all their own beekeeping gear- including veils and foundation.

We also learned about Langstroth systems as well but we mainly focused on top bars being that we were stationed out in el campo (the bush) and would not have the funds nor access to any apiculture stores from abroad. Funny thing – many campesinos who have hives, really wanted to look "modern." So they would make their top bar boxes square and paint the boxes white so that from the outside they looked like Langstroths, but on the inside they were top bars (and actually looked more like Warre hives). This diversified concept of top bars in a Langstroth looking box was the first that I would encounter and I can honestly say that it has most likely been this experience that has helped to mold and shape the method I now use for my integrative top bar management.

I was convinced that making one's own box from wood that they personally felled and prepped; and housing bees that one captured from the wild was the only "natural" way to deal with bees. I believed this sincerely for several years. But like many things in life, new experiences, teachings and research has broadened my perspectives – and rightly so. Many advances that mankind has manifested have been positive improvements; not only to man's livelihood, health, well-being and efficacy but also with respect, dignity and courtesy to various other organisms.

At the start of year 2000, I returned to the land of "the free and the brave" and went to work for several commercial operations. I knew the mechanics of Langstroth management but never on a large scale. I was so impressed with how efficient, how durable and how idiosyncratic working with honey bees in Langstroths could be. I also noticed though that there was also a clear distinction between working with bees and just plain working them.

This distinction is something that I am continuing to work on in my own beekeeping management and in the development of mine and my partner's small-scale queen breeding/rearing and honey production enterprises. I am trying my best to learn to work with bees, not just working them over It is a developmental process that will take time and I believe will also show me and my fellow beekeeping associates – close and far, that we can keep bees in a conscientious fashion while also making a respectable living and providing our communities with essential benefits.

A few years after my initial Peace Corps service, and after having employment with several commercial beekeeping operations in the U.S., I returned to Paraguay as the Beekeeping Extensionist Technical Trainer for new volunteers. This trip allowed me the opportunity to learn more. In 2003, I met and visited with a fellow Returned Peace Corps Volunteer by the name of Lester Moore who moved back to Paraguay to live and keep bees. He started Panales de Oro (Honeycombs of Gold) based out of Concepcion, Paraguay He demonstrated modified Top Bars with standardized Langstroth measurements which worked well for AHB and his South American beekeeping operation. I must credit him for allowing me to see a workable, standardized top bar hive operation that incorporated Langstroth measurements.

Now, there are both Langstroth and Top Bar hives in our operation.

its inception. There have been recent introductions of "newer" materials, such as plastic frames and motorized extractors. The Langstroth system was and still is a sincere advancement over skeps by allowing beekeepers in-depth insight into hive mechanics, review and health while preserving the hive organism as a whole.

The uniqueness of the Langstroth system is that it allows for the extraction of honey to be accomplished without destroying the honeycomb; whereby the honeycomb can be returned to the hive for further use by the bees themselves. Honeycomb is the honey bees' biggest asset – without it there is no place to raise progeny, no place to store their food, and essentially – no home.

Since top bars do not have side comb supports – it is virtually impossible to extract honey using an extractor without having it blow apart. Thus, extraction is done by hand (or hand tool) to mash and squeeze the honey out of the comb. The comb can then be used for other purposes but it is not reusable to the honey bees in its mashed form.

Both systems require – by right of sound beekeeping management- rotating out old brood combs and honey combs in a timely fashion. This is healthy management. To do this every time one harvests, some may find overkill as well as hard on the bees since they do not make honeycomb all season long unless warranted (high nectar flow). To never remove old comb is just as disconcerting in that honeycomb is a sponge and can harbor toxins detrimental to hive health. Thus, it is reasserted that comb be rotated out every few years at least for healthy hive mechanics – regardless of which system is being used.

My partner is totally pro-Langstroth. He first learned with a few friends and a book. He took a class with Dr Marla Spivak on how to keep bees in northern climates and found himself hooked after a couple seasons as a hobbyist. Since I first learned to keep bees in top bars and with peasant farmers, I cannot say which is better or worse for initial learning. I do know that in hindsight- had I learned to keep bees in Langstroth first, it would have been easier to focus on learning honey bee behavior vs. trying to repair their hive and causing damage every time I visited them in their top bar abode. So, perhaps first learning their behavior with fewer incidents of hive damage in a Langstroth, could have sped up my initial learning process.

I myself do not choose one single system to swear by but have found awesomeness in both Top Bar and Langstroth systems; so much so, that I found their fusion to be quite fulfilling and enlightening. Having first learned to keep bees with top bars – they do have a very fond place in my heart. But, also having witnessed and worked the benefits of standardized Langstroth management, I have an acknowledgement and respect for this standardization and efficiency that Langstroth allows- not only for me, but also for the honeybees that I keep.

So, my integrative take on these two systems is one of grey – not black or white, but definitely grey A metaphorical example of this sort of fusion can be seen in my home state of New Mexico. The Land of Enchantment's official question is "Red or Green?" This is in reference to our cuisine with chiles. Some folks answer one or the other and then there are those of us who ask for both (also known as x-mas and rainbow). This fusion of both chiles in our local cuisine allows the taster the opportunity to taste their enchiladas (or whatever other delectable bite) with both flavors.

I see my integrative Top Bar/Langstroth fusion to be similar By developing a design that incorporates both systems with a few of my colonies, I have bees that I get to see and interact in both Top Bar and Langstroth fashion. This integration is without taking away the essential core – honey bees! BC

*Melanie Kirby and Mark Spitzig operate Zia Queenbee Co. in New Mexico and Michigan – **www.ziaqueenbees.com**.*

IMMUNITY & RESISTANCE IN THE BEE WORLD

Joe Traynor

Immunity: When a harmful bug has no effect on an organism

Resistance: An organism tolerates a harmful bug but with little or no economic damage to the organism (100% resistance = immunity)

Humans are immune to a number of bugs, either through long-time exposure or by vaccination. Antibodies (developed through either exposure or vaccination) protect us from being overcome by a disease. The introduction of new diseases into the indigenous populations of the New World by disease-carrying Europeans decimated native populations – some historians make a good argument that these diseases changed the course of history (just as *Varroa* has changed the history of beekeeping). With time, the natives developed requisite antibodies and their populations rebounded. Visitors to Mexico (and some other countries) often get sick if they drink the local water but this same water has no effect on the local population because they have built up an immunity (or at the very least a high degree of resistance) to the bugs in the water through generations of exposure.

Home schooled children are more likely to get sick in college because they have had limited exposure to the myriad of bugs prevalent in public schools – their systems have limited antibody resources. Conscientious mothers that spray home surfaces with disinfectants may be putting the brakes on immune system development in their offspring. And makers of these anti-germ sprays (and of hand sanitizers) may be doing more harm than good by neutralizing a tried and true method of boosting immune systems (just as chemical treatments for *Varroa* and other pests and diseases impede resistance development in honey bees and increase tolerance to the chemicals in the target pest). Currently, health officials tell us that older people are less likely to get the H1N1 flu virus because their systems contain antibodies developed years ago by exposure to similar viruses back then. For young people that come down with H1N1 it's not all bad: they could well be protected from succumbing to a super-virus 50 years hence.

Compared with humans, honey bees have a relatively fragile immune system. A less than robust immune system means greater susceptibility to pests and diseases. A highly developed immune system, however, diverts resources that might otherwise be used to benefit an organism – in the case of bees, more brood rearing and more foraging for pollen and nectar; there is no free lunch. Honey bees use a number of strategies to compensate for deficiencies in their immune systems:

1 When sick, bees altruistically die in the field so that they do not infect their housemates.
2. House-cleaning bees remove dead or dying bees (inoculum sources) from the hive.
3. Bees are good house cleaners, a trait that can be amplified (e.g., hygienic bees).
4. The anti-microbial properties of propolis protect bees.
5. House bees are relatively healthy, nutrition-wise. Old foraging bees die, depleted of nutrients. Nutrient reserves are diverted to young bees, and these reserves provide house bees and over-wintering bees a degree of resistance to diseases.

Honey bee caretakers (beekeepers) also allow bees to perform at a high level by providing bees with good pasture (easier said than done) and/or supplemental protein feeding (although no supplemental feed is as beneficial to honey bee health as a multi-colored variety of natural pollens). Beekeeper control of pests and diseases – foul brood, tracheal mites, nosema and especially *Varroa* mites – also allows honey bees to remain healthy in spite of their relatively fragile immune systems (providing beekeepers rotate comb on a regular basis to prevent a buildup of harmful chemicals).

Like humans, honey bees have been challenged by viruses for eons. All bees carry viruses and this virus complex changes over time as new viruses enter the system and old viruses mutate. In 1980 BV (Before *Varroa*) when a new virus entered a honey bee population, the spread of the virus was gradual, allowing bees ample time to come up with methods of neutralizing the virus, includ-

Compared to humans, honey bees have a relatively fragile immune system.

ing incorporating resistance into the bee genome. *Varroa* mites, acting as contaminated hypodermic needles, short-circuited this natural disease-fighting mechanism, overwhelming a colony by rapidly spreading viruses throughout the colony and then throughout an apiary Honey bees had no defense against *Varroa* mites and current *Varroa*-control measures are less than stellar

Without an effective transmission agent it is difficult for a disease to establish a toe-hold in a population. The most effective method of controlling some diseases is by attacking the vector that transmits the disease, e.g., killing mosquitoes to control malaria. A consensus is forming that the combination of a virus (or viruses) + *Varroa* (and possibly *nosema ceranae*) is the cause of current problems with honey bees. Add a robbing environment into the mix and you compound the problem. Without the *Varroa* vector, viruses would cause far less damage. For example, IAPV (Israeli Acute Paralysis Virus) is widespread in Australia but is not considered a major threat (Australia does not yet have *Varroa*). Some feel that the combination of IAPV + *Varroa* represents a threat to U.S. bee colonies and they make a good case for banning the importation of Aussie bees (too late now). Viruses are constantly mutating and some feel that the Aussie strain of IAPV is less deadly than other strains and therefore Aussie imports are not a problem. Or, perhaps, incremental exposure to IAPV by Aussie bees gave them sufficient time to incorporate immunity, or at least some degree of resistance, into their genome. There will always be new viruses coming down the pike; develop resistance (or a vaccine) against one, and another will pop up and take you down.

Some viruses inflict considerably more damage on a population than others. The 1918 flu virus was a superbug that killed millions of people and on a scale of 1 to 10 (10 being most severe) would rate a 10. Most flu viruses would rate a 1 or 2; H1N1 might currently rate a five (subject to change after it has run its course). Past honey bee viruses that caused disappearing bees or collapsing colonies could be similarly rated. Assuming a virus caused CCD in 2007-2008, affected beekeepers might rate this virus a 10. Apiaries that did not (or have not) come down with CCD in recent years likely either were isolated from a virus source or enjoyed robust health when exposed to the virus (and yes, pesticide exposure would compromise colony health). Like humans, honey bees carry chronic viruses and such viruses flare up when the health of a population is impaired. DWV (Deformed Wing Virus) appears to be a chronic bee virus and one that is often associated with collapsing colonies (and with *Varroa*).

How severely a virus affects a population – whether humans or bees – depends on three factors:

1 The degree of exposure to (or isolation from) infected individuals.
2. The general health of the population (esp. nutrition-wise).
3. The age distribution of the population (in general, the elderly are more susceptible).

For honey bees, the population of a vectoring agent – mainly *Varroa*, possibly nosema – is also a factor In the presence of *Varroa*, honey bees must wage a battle on two fronts. An analogy is a man holding his own against a bear attack but succumbing when he is simultaneously attacked by a pack of wolves. Fighting both a virus and *Varroa* is a daunting task for honey bees. In the case of honey bees, a frontal attack on *Varroa* should be more productive than attacking viruses themselves.

Any breeding program that incorporates resistance to mites and diseases comes at a cost. Take an extreme example: posting a guard bee by every brood cell to immediately target and kill *Varroa* could develop a *Varroa*-free population, but at a significant cost – those guard bees would otherwise be foraging bees. We all face tradeoffs in life – work vs. family, mind development vs. body development – honey bees are no different: invest too many resources in combating *Varroa* and colony production will suffer One strategy for bees to develop *Varroa* resistance is by producing minimal amounts of food – bee brood – for the mites. Reduce brood too far though, and consequent lower worker populations will mean much lower honey production. Biologist Raphael Sagarin put it succinctly: *"organisms inherently understand that there is risk in life. The idea that we can eliminate these risks would be selected against quickly in the natural world since any organism that tried to do so would not have enough resources left for reproduction or feeding itself."* (New Scientist, February 9, 2008, p.49). Building a bee with total immunity to pests and diseases would come at too great a cost to the bee.

The Holy Grail in the war against *Varroa* – immunity (or 100% resistance) – is likely impossible. U.S. bee breeding programs aimed at *Varroa* resistance have been hampered by the ever-narrowing number of genes in

U.S. bee populations to the point where some feel that our bees are excessively inbred (assuming the relatively recent introduction of African and Australian genes has not been beneficial). The recent importation of drone semen from promising stock in other countries should greatly improve our gene pool* The current success of Marla Spivak's Minnesota Hygienic stock shows that good *Varroa* resistance (and resistance to brood diseases) can be obtained without significantly sacrificing honey production. MN Hygienic bees recruit potential foragers for cell cleaning (and mite-biting) duties but apparently not in great enough numbers to affect honey production.

Hygienic bees don't eliminate mites but reduce mite numbers to levels that can be more easily controlled with minimal (or no) use of chemicals. Yes, these few mites can still carry and transmit viruses, but hopefully mite numbers will be low enough to prevent a virus epidemic in an apiary Currently the best method of protecting bees from viruses is the same as protecting humans from the H1N1 flu virus: isolation from others that might be carrying the virus. Admittedly, this is far easier said than done for both bees and humans.

Rather than developing 100% resistance (or immunity) from *Varroa*, a frontal attack on this insidious pest is preferable. Promising work on *Varroa* control includes using odors to lure *Varroa* to their doom or to confuse them so they cannot locate brood cells. Breeding non-pathogenic *Varroa* or inserting a suicide gene into the *Varroa* genome would certainly have benefits. Work to develop additional chemicals to control *Varroa* should continue (although formic acid treatment for *Varroa* control is not new, the new, quick-release, formic acid strip shows promise here; some essential oils also show promise). Until such offensive measures bear fruit, a combination of resistant bees (e.g., hygienic bees), chemical treatments, supplemental feeding, isolation (where possible), nosema control, drone larvae removal and regular comb rotation will continue to be the best methods of keeping healthy bees. BC

Resistant bees, chemicals, feeding, isolation, drone brood removal, nosema control and comb rotation are still our best tools.

**Sue Cobey and Steve Sheppard invested significant resources in battling bureaucracies to allow the importation of this semen and in so doing, they have attained a degree of resistance to these same bureaucracies. No one in the history of our country has ever achieved total immunity from bureaucracies but give credit to Cobey and Sheppard for trying.*

Joe Traynor is a crop pollination specialist and colony broker in Bakersfield, CA.

Objection To The Double Deep

Walt Wright

There are several reasons not to use these big, heavy boxes!

Over the years, this maverick beekeeper has injected his dislike of the double deep wintering configuration in different articles, sometimes by innuendo, and sometimes by a flat statement. The intent of this article is to compile all those reasons into one place to help beginners make a rational decision when starting out. I am dismayed at the number of beginners who set out to fill two deeps on their first colony I would like to head them off for the simple reason that once they start down that road, changing direction is much more difficult. This discussion is not directed to those beekeepers addicted to the double deep – they are not going to change – it's all they know. If they see the following "problems" with the double deep (DD), they are considered normal and are taken in stride. I wouldn't change either under those circumstances. The surge in lady beekeepers is all the more reason. The ladies, both old and young, can have less muscle power than that necessary to cope with a deep of honey In today's beekeeping, access to the brood chamber is mandatory

Weight is a good place to start. It's something you can see and feel. Back problems are almost a given with long-time beekeepers. And the fingertip grip doesn't help. If I'm going to lift a deep of honey, one hand at a time gets a good grip on the bottom of the box before lifting, but that doesn't do much for the basic weight problem.

There is a movement of beginners to use all mediums – both brood chambers and honey supers. The practical advantages are less weight and the interchangeability of frames. One size fits all.

I recommend a intermediate between the double deep and all mediums. My overwinter configuration is a single deep for the basic brood chamber and the rest all shallows, both upper brood nest and honey supers. Selection of this configuration was not an accident. The bee's preferences and instincts drove me there. This article is intended to describe those considerations.

To understand the weight of a typical deep brood chamber it's important that you recognize that cell usage affects the total weight, so in ascending order

Open brood is the least heavy Even if the cell is occupied by an upended adult cleaning or feeding, it weighs less than any cell with stores at static levels.

Bee bread and capped brood are in the same range of cell weight. Long-term pollen (bee bread) does not fill cells to brood-rearing depth, and the mature larva has been fattened for the capped period.

Fresh pollen for feed is normally filled to brood-rearing cell depth and is roughly equal to feed nectar in weight. Nectar is lighter than cured honey and fresh pollen is not "pickled" for preservation, and therefore less dense.

Capped honey is heavier than any of the above. With cells extended from brood-rearing depth to honey-capping depth and the moisture removed from the nectar there is little comparison with the cells used for other purposes. All this to point out that a deep of honey may weigh twice the deep dedicated to brood.

We don't need to contend with handling a deep of honey Two shallows of honey contain almost exactly the honey weight as a deep.

Back to the weight thing: The typical brood box has a frame of reserve honey on the outside, a frame of feed pollen in the next slot in. Depending on where we are in the brood in the active season, the ratio of cells for brood is constantly changing: brood increases in Spring; decreases main flow through Summer; increases in early Fall; ending with total close-out in late Fall. At no time does weight of the basic brood nest deep approach the weight of a full deep of capped honey

The weight of a deep of honey was not the reason that I shifted away from that configuration. The nuances of my reservations about the double deep are that

1. The bees have a prejudice against the more than an inch break in functional comb at Langstroth box joints. It disrupts their instinctive comb usage patterns.
2. The queen does not make judgments on where and when to deposit eggs. She doesn't get a vote. She is limited to whether or not to lay a fertilized egg in the cells to which she has been directed by the workers.
3. The colony has a distinct preference for rearing brood on the deeper frames of the deep box, when the alternative is a shallow frame. Wintering in a lower deep, the early Spring build up expands the brood nest into an upper if it's there. Brood volume decrease begins during swarm preparation or a few weeks later when swarm season is over for that colony, and the emptying brood nest fills with honey In my area, typically there is only a couple months out of twelve that the upper deep is not at its full capped honey weight. In today's beekeeping, where periodic brood nest inspection is mandatory on a regular basis, that's a lot of grunt work.

Spring

The overwintered colony's primary objective is to generate a reproductive swarm in the season. The double deep colony that winters in the lower, expands into about half of the upper A dome shaped addition reaches nearly to the top bars at the top of the upper then swarming preparations start. The DD with the brood cluster in the top and a basically empty lower is reversed early Reversal of an empty gets their brood volume up to 1½ deeps quicker – they didn't have to consume the honey for brood nest expansion. Reaching the expansion limit sooner helps them

meet swarm requirements. Swarm prevention in the DD is difficult. In either case above, when the colony reaches the 1½ deeps brood volume, they shift to swarm preparation and start brood nest reduction by backfilling with nectar at the top. Options open to the beekeeper are periodic reversal, or adding yet another deep of comb at the top to break up the honey reserve that limits expansion and starts swarm preparation.

There are three problems with reversal for swarm prevention. First, the colony does not generally build more than the 1½ deeps of brood. That delays meeting the backfilling requirement and commitment to swarm by starting swarm cells. That delay tends to overpopulate. The second adverse effect is that the colony gets overcrowded and generates a later swarm. Early supering with drawn comb will often relieve the overcrowding condition.

The third item is not related to swarming. They seldom get the natural pollen reserve stored below the brood nest. It's no problem on the continuous comb of the wild brood nest, but you won't see much of it in the DD.

An under-recognized feature of the DD is that the colony that backfills the upper deep in the early season accumulates less surplus honey. Surplus honey is just that. It's the difference between colony needs and colony capability. When the colony backfills the survival needs of nectar accumulation in the swarm prep period, their motivation is reduced and continued brood nest reduction is evidence of that "complacency." Having met survival requirements, the emphasis shifts to population reduction to reduce the erosion of stores by excess consumption.

We all know that the swarmed colony produces minimal surplus. The honey production loss is not so much because they lost the bees to the swarm, but because the emphasis shifts to preservation of the stores – rear fewer bees.

Midsummer

Locally, this period is harvest time for the beekeeper and adjustment time for the bee colony The beekeeper in a beetle area needs to process his honey as quickly as possible to prevent damage.

The colony needs to reorganize for less population and brood nest consolidation. Briefly, the colony needs to organize the brood nest into one brood chamber or the other to prepare for Fall. They don't want the brood nest spanning the gap in comb between the two chambers. Selection of which deep to prepare is not a problem if the upper was filled during the main flow with capped honey or the lower contains mostly bee bread – most of the brood is automatically in the other The problem is more severe where both chambers contain scattered brood, honey, and pollen. Scattered comb usage is okay in warm weather, but Fall and clustering is coming – time to select which chamber and get it prepared. Note that hive body reversal can contribute to scattered use of both deeps. Also note that whichever box they choose to establish the wintering nest in, the Fall brood nest will be impacted by frames of irregular content.

Fall

The bees do not use our calendar to govern activities. Fall build up to rear young wintering bees starts in early August – more than a month ahead of Autumn on my calendar Their processes are slow and methodical and the early brood nest expansion can easily go unnoticed by the beekeeper, but become more obvious in September. The typical late September brood nest is nearly a full deep of brood. Having struggled to get to this point in the DD, now it's time to change directions in October Gradual brood nest reduction to the close-out is the order of the day Some problems develop in this period.

In my area where the climate and forage are similar to Europe, the colony normally gets the brood nest prepared for Winter by backfilling the brood cells with nectar.

In more northerly areas, where clustering weather comes while there is significant brood volume, freezing doesn't let them get it done. The cluster is not going to try to Winter over empty cells. Their only recourse is to relocate the cluster up into the upper deep in early Winter The northern beekeeper is certain they ate their way up there. I doubt that. But then, I'm a southern crackpot. What do I know?

So, how does the DD influence the above scenario? Recognize that colony aversion to spanning the gap in comb with the wintering cluster is a very real thing. In the wild brood nest on continuous comb the colony does not have to relocate upstairs. They only have to shift upward a little. They can migrate the cluster upward as the need dictates. The break in functional comb between boxes of the DD interferes in the process, and that prompts the relocation.

Another Fall problem with the DD is the reluctance of the colony to move the established brood nest down into the lower box on the Fall flow Key word: "established." The colony that has been getting the upper deep set up for the Winter for a month or two is fairly well committed to wintering in the upper Reluctance to "jump the gap" contributes some to remaining in the upper The northern beekeeper, interested in acquiring Fall honey adds another factor With honey accumulation in supers above the DD, the colony has a false sense of security They have no way of knowing that the overhead honey is going to be removed. The result of harvesting Fall honey is that the colony goes into Winter without adequate overhead honey reserve and an almost empty lower deep. They are at the mercy of late Fall syrup feeding. Most can survive a long Winter if the brood nest is full, backfilled with heavy syrup.

The section on wintering in the *Hive and The Honey Bee* says that there has not been much improvement in wintering losses over the years. Can you postulate from the above that perhaps not supporting colony instincts could be a major contributor to known losses? The writer hasn't had a Winter loss in 10 years. Not only no losses but no weaklings in the Spring. I must be doing something right.

The referenced articles and a description of my wintering configuration can be found at **www.beesource.com** click on Point of View.

We can't quit without identifying some of the advantages of a single deep and the rest shallows.

All Season

The brood nest is maintained for the full active season in the basic brood nest deep. The colony preference for rearing brood in a deep anchors the brood nest there and insures that you will know where to find the brood at any time. That's handy

for inspection, medication, leaving wintering honey, etc. In contrast, the all-medium stack often causes the brood nest to climb into what should be honey supers, leaving empty comb at the bottom.

With a simple manipulation in the early season (moving a shallow of brood to the bottom board) you can insure storing of the pollen reserve. That maneuver supports fall build up and improves wintering.

The commercial operator who has a vested interest in shipping compact hives on a semi typically uses DD. He could easily substitute two shallows for the extra deep, and only gain a few inches in height of the layer stacks.

Spring

Swarm prevention is simplified. The two shallows of reserve honey overhead provide more flexibility for opening up the overhead honey reserve to prevent swarming.

Colony build up does not seem to be impeded by shallows overhead. The colony is driven by the urge to reproduce. In my area, they often achieve the equivalent of three deeps of brood (one deep and four shallows.) During the "main flow," the brood nest recedes down through the shallows by backfilling toward the basic deep. In contrast the DD seldom has more brood than 1½ deeps. Checkerboarding encourages more brood, bees, and honey

Midseason

No problems with colony indecision on locations of the brood nest. If you want maximum harvest you can take the capped and leave them the partial or unfinished frames for feed. Easy to consolidate with shallows. Just leave them sufficient honey to maintain brood through the period.

Fall

You have but to confirm in late Fall that the brood nest deep gets properly backfilled for Winter at brood nest closeout. If not, feed through brood nest closeout.

Conclusion

As you can see from the above cryptic comments, most of my reservations about the double deep are offset by simply replacing the upper deep with two shallows. Costs a little more in up-front woodenware, but the benefits go on and on. I normally get nearly twice the honey in the tanks as standard management where colonies are overwintered in double deeps. This extra production is the result of yielding to colony instincts and preferences. In short: the double deep comes in third (bronze) behind all mediums (silver) and single deep and shallows (gold). Take it from there. BC

Walt Wright is a student of honey bee biology, and a sideline beekeeper, living in Elkton, Tennessee.

It's Time For A Change

Ann Harman

If your association has a constitution and bylaws you have to actually follow them.

We need to continue with the theme of revamping beekeeper meetings if the East Cupcake Beekeepers Association is going to survive. Panic has set in. Someone read the Constitution and Bylaws. "If this club has a Constitution and Bylaws we have to stick with what they say to do."

Uh oh. When were those written? Twenty years ago? Or more? It's time for the current officers to sit down and read those documents. In the interest of efficiency and time involved ask them to read them at home. Each officer needs to make some notes while reading. Look for everything that simply does not fit the present time. Take a careful look at sections labeled "dues" and "meetings."

Unfortunately sometimes dues are set in the Constitution and Bylaws at a particular amount – suitable for 20 years ago – but insufficient for today However, in the meantime dues have been raised to keep up with postage and expenses but nobody changed the Constitution and Bylaws. A change in dues can be made and submitted for approval by the voting membership without stating a definite amount in the Constitution or Bylaws. In that way the cumbersome process of changing the governing documents does not have to be addressed every time dues need to be raised.

Now take a good look at the Meetings sections. Whatever the ancient Constitution and Bylaws state, I'll bet those words have become too restrictive and definitely dated. Give your association the freedom to arrange meetings, rearrange meetings, special events, workshops, picnics, trips, fun and games, and other miscellaneous activities when and where the desire arises. These do not have to be run in accordance with Robert's Rules of Order

Yes, every association needs one scheduled business meeting a year to take care of elections and any other pressing business, including adopting a new set of Constitution and Bylaws. That one portion of the meeting needs to follow Robert's Rules of Order That's all. Really Publish the secretary's minutes and annual treasurer's reports in a newsletter to all paying members. Acceptance or changes by a vote at the annual business meeting. Quick and simple.

Yes, the officers should review the minutes and treasurer's reports before publication. After all, the officers have been elected by the membership to take care of various things. We, the numerous citizens of the U.S, elect our members of Congress and trust them to take care of an assortment of matters. No, we won't always agree with everything Congress does – or even everything your association's elected officers do. Judge the efforts by increased membership and interest in attending the meetings.

Have you ever sat through an endless Business Meeting part of a meeting while waiting impatiently for a noted speaker's presentation on some new beekeeping information? Think about the speaker waiting and hoping for the allotted time. Making a well-planned presentation shorter can be difficult. The Business Meeting part sometimes involves trying to decide on some basic trivial issue (should we have donuts or Danish with the coffee break?) that could have been solved by the officers with a few phone calls or e-mails. Think back on those Business Meeting parts of every monthly meeting. Were they necessary? Probably not.

If your local association does not have a newsletter, perhaps it is time to start one. It does not have to be pages and pages long. You can start with just one sheet of paper, using either one or both sides. But also offer it by e-mail. That saves the costs of having it copied and buying stamps. However it is interesting to note that in 2008 an estimated 55 percent of U.S. adults had high-speed (broadband) access but only 41 percent of rural households did. To make a newsletter a useful tool, in your area, to simplify your association's business meetings you may need to determine how effective an e-mail newsletter would be. In areas with limited hi-speed a newsletter has to be rather plain and simple.

A newsletter can be used to alert members of important topics to be discussed and voted on at a business meeting. A bit of information ahead of time can save numerous questions and endless back-and-forth discussion during a business meeting. In addition a newsletter can notify members of changes in plans, bad Winter weather cancellation policy, as well as upcoming requests (be ready to sign up to help at the county fair – names are needed three weeks from now).

Members will begin to appreciate the change from endless business meetings to information via newsletter Yes, some will never read the newsletter However, you can always tell them the information was sent. They are the ones who probably arrived late at every meeting just to miss the business part.

Oh! You do have a newsletter – but it comes out four times a year But your meetings are monthly You can still have your informative newsletter Just add a one-sheet letter that really does not have to be sent every month. It can be an occasional one to give members something to consider, advance notice that there will have to be a short Business Meeting at the next monthly meeting to vote on something important. If most of your members have e-mail – and open it frequently – choose this method for your announcements and updates.

By the way, as you are updating your Constitution and Bylaws be sure to include electronic communication to inform members. Our antiquated documents probably refer to "mail," meaning snail mail. I am using the term electronic communication in a broad sense. Just today I heard that growth of e-mail usage has slowed but communication by cell phone and other forms are growing, with new ways to communicate just waiting on the horizon. With the speed communication technology is advancing, keep your terms broad and vague so your Constitution and Bylaws stay current, at least for a while.

After you have straightened out the Constitution and Bylaws you need to examine your meetings, whether monthly, every other month, and what months you do not meet. You can start with looking at the attendance. Does it fluctuate from almost overfilling the meeting room to hardly filling the front row of chairs?

What months have a high attendance and a low attendance? Did it have something to do with the choice of speaker? The speaker's topic? Weather – fantastic or poor? The month? Sports on television? Too close to holiday time?

Don't be afraid to ask your members for their reasons for attending and not attending. All you are looking for is a pattern. "Too close to the 4th of July." Attendance was nine. "Weather was fantastic so spent the day digging in the garden – too tired to come." Attendance was 12. "Pouring rain – don't like to drive at night in such rain." Attendance was 17 "Great speaker – been waiting to hear that information." Attendance 43.

Well, we can't do anything about the weather But if bad weather seems to fall in a pattern over several years then perhaps a change could be made. Next month we'll consider alternatives. Summer vacation time may also be a good reason for an alternative. The increase in interest and attendance for a great speaker should then cause you to look around your area for some speakers. If the treasury cannot afford a special speaker from time to time, perhaps your club could consider a small registration fee to help cover costs. If your association is not used to a registration fee you need to give them some reasons: transportation and meals and possibly an honorarium for an out-of-town speaker; cost of renting A/V equipment; renting a larger room to accommodate a neighboring association that you invited. An alternative to that registration fee could be a fund-raising event, but more on that next month.

Never confuse announcements or statements with business. A statement that two more people are needed to staff the booth at the county fair does not require a vote. It is simply a statement. You do not need to open a formal business meeting to take care of the problem.

You may be asking why Robert's Rules of Order are being downplayed. Well, if you review your club's meetings and what you really need the Rules of Order for you may realize that they are necessary for only a very few instances during your meeting year

Next month we are going to discover some new programs for your association. Programs that do not need Robert's Rules of Order Everyone nowadays is asked to "think outside the box." For beekeepers we need to change this to "think outside the brood box." BC

Ann Harman continues to work with associations to improve their meetings and keeps her bees from her home in Flint Hill, VA.

NATURAL REMEDIES

Acerola, Aconite, Globe Artichoke

Abbas Edun

ACEROLA

Botanical studies have suggested that this shrub or small tree in the family Malpighiaceae is probably native to the Yucatan. Also known to botanists as *M. punicifolia* and *M. emarginata*, its common names are Barbados or West Indian Cherry, Wild Crape Myrtle and Manzanita.[1]

Malpighia glabra is grown in Brazil, Central America, Hawaii, Mexico, Puerto Rico, the Guianas,[2] and to a lesser extent in the frost-free regions of Florida, primarily in home gardens as a hedge. It is also cultivated in India. A mature tree can survive brief exposure to 28°F(-2.22°C). However, a young plant may die if the temperature goes below 30°F (-1 11°C). Its light requirements are full sun to partial shade, and it does best in a well-drained soil.

Acerola grows up to 15 feet (4.5 metres) tall with many strong, wide spreading branches which culminate in a dense, thorny crown. The leaves are evergreen, simple ovate-lanceolate, two to four inches (five to 10 cm.) long, with an entire margin. Raised white lenticels or breathing pores are visible on the bark of the tree.

Small, red, rose pink or white flowers are produced in copious amounts in umbels of two to five together, each one being about a half-inch in diameter They occur in a forked cluster in the leaf axil, in 25-day cycles from April or May to late in the Fall. There are five petals, one of which is fan-shaped and larger than the others. The 10 erect stamens are shorter than the petals and the style. Two of the stamens are thicker and have longer filaments than the others. Three styles point outward with the stigmatic area on the inner angle. Nectar, secreted at the base of the anthers, is inviting to honey bees. However, pollination and subsequent fruit yield may be reduced if there are competing sources of nectar which the bees find more attractive.

The flowers produce light orange to dark red fruits when the trees are about two years old. The trees fruit well and do not need much care. The fruits are soft, thin skinned, and juicy and look somewhat like small, flat tomatoes; they become ripe three to four weeks after flowering; they are then very perishable and may be damaged quite easily Some are sweet, whereas others may be tart. They may be borne singly or in clusters of two or three. The fruit usually has three rather large, triangular seeds with fluted wings. If the fruit is picked daily, yields of up to 26 tons an acre may be obtained. Most plants are harvested three or four times a year but some may bear six or seven crops.

The active compounds in *M. glabra* are ascorbic acid, calcium, dehydroascorbic and diketogulonic acids, dextrose, fructose, furfural, hexadecanoic acid, iron, limonene, I-malic acid, niacin, pantothenic acid, phosphorus, potassium, protein, riboflavin, sucrose, thiamine and 3-methyl-3-butenol.

When it comes to vitamin C, its small berry tops the list of most fruits except for the virtually unknown Kakadu plum. [3] The Acerola fruit contains about 32 times more ascorbic acid than an orange, gram for gram, i.e., about 2,500 mg. per 100 grams, and nearly double that amount when it is a mature green fruit.[4] It is also very high in vitamin A, calcium, iron, magnesium, niacin, phosphorus, potassium, riboflavonine and thiamine.

Acerola topically will also **lighten skin** naturally, safely and effectively, and mineral salts in the plant increase its dermatologic benefits. Its mucilage and protein have hydrating properties which promote capillary conditioning. It is also used to lower cholesterol levels,[5] and to treat anemia, bowel inflammation, breast disorders, colds, diabetes, diarrhea, dysentery, fever, heart function, hepatitis, inflammation, influenza, liver disorders, rheumatism, tuberculosis and wounds.

ACONITE

The Common Monk's Hood (*Aconitum napellus*) is an herbaceous perennial of the family Ranunculaceae (Buttercup), native and endemic to the mountainous parts of the northern hemisphere, particularly western and central Europe and northern Asia. It is found throughout the United States. Its common names are Auld Wife's Huid, Blue Rocket, Friar's Cap, Fuzi, Monk's Blood and Wolf's Bane.

The plant is found mainly in moisture retentive but well-drained soils in mountain meadows; it can grow in calcareous, heavy clay and very alkaline soils. It would probably grow luxuriantly in moist, open woodlands, and would yield returns with little or no trouble. It thrives in the light shade of trees.

The erect stem grows from a fleshy, fibrous, spindle-shaped root; it is about three feet (one metre) in height. The bark is pale colored when young, but subsequently acquires a dark brown hue.

Aconite's dark green, glossy leaves lack stipules. They are broad, rounded, and two to four inches (five to 10 cm.) in diameter They have a spiral or alternate arrangement and are deeply divided in a palmate manner into five to seven lobed segments, each one having coarse sharp teeth. The lower leaves have long petioles.

The flowers are in a raceme that is eight to 20 inches (20–50 cm.) tall; they are attractive mirror-symmetrical (zygomorphic). Their shape is specially designed to entice insect visitors. The sepals are purplish-blue and so are especially attractive to honey and humble bees. The flowers are distinguishable by having the posterior petaloid sepal called the galea, fancifully shaped, in the form of a cylindrical helmet, hence the English name monkshood. In the galea there are two nectariferous staminodes. The petals are represented by the very curious nectaries within the hood, somewhat in the

form of a hammer The upper petals are large; they are placed under the hood of the calyx, are supported on long stalks and have a hollow spur at their apex which contains nectar The other seven or eight petals are small and scale-like. Three to five carpels comprise the gynoecium, they are free or partially fused at the base. The subtending bracts are narrow and stalkless.

Numerous stamens lie depressed in a bunch at the mouth of the flower They are pendulous at first, but rise in succession and their anthers are put forward in such a way that a bee visiting the flower for nectar is dusted with pollen, which she then carries to the next flower visited. This fertilizes the undeveloped fruits, which are in a tuft in the centre of the stamens, each carpel containing a single seed. The fruit is a follicle.[6]

A familiar garden plant, Aconite is widely valued as an anodyne, diuretic, and diaphoretic. It is a homeopathic remedy used for painful nervous disorders and is considered to be of therapeutic and toxicological importance. Externally, a liniment made of Aconite is employed for local application to the skin for moderating the pain of lumbago, neuralgia and rheumatism. It may also be mixed with chloroform or Belladonna liniment in the two latter cases. A tincture of Aconite taken orally for a diminution in the rate and force of the pulse in the first stages of fevers and slight local inflammations, laryngitis, pneumonia and erysipelas.[7] It has been used successfully to prevent cardiac failure and to relieve the pain of aneurisms, neuralgia and pleurisy Children with acute tonsillitis have been well treated by a dose of one to two minims for those who are five to 10 years old; the dose for adults is two to five minims, thrice daily

The roots have been used ethnomedically in Traditional Chinese Medicine to treat general debility Such a use has been shown in some cases to have a negative effect upon the cardiovascular and central nervous systems, including documented instances of poisoning and death.[8]

GLOBE ARTICHOKE

Cynara scolymus is an herbaceous perennial of the family Compositae (Daisy) closely related to the thistle, and has been cultivated since Roman times. Its common names are Alcachofera (in Brazil), Artichaut and Tyosen-azami.

It is not clear where the plant really originated, but a good guess is that it came from the central and western Mediterranean, because that is where its existence is first recorded. However, Sicily is often said to be the specific point of origin.[9] It is apparent that the perennial which the ancient Greeks called Kinara (Cinara in Latin) is identical to the modern Globe Artichoke.

C. scolymus is a frost sensitive plant which flourishes in areas with mild Winters and cool foggy Summers. It is deep rooted and when grown in such climatic conditions during the productive season, it can produce compact, tender buds for a long time; however, it will require up to 15 inches of water, some of which may have to be provided by irrigation.

In the United States the plant is grown primarily in a narrow coastal area of California where the temperature is between 55°F and 75°F It is not well adapted to Florida's hot weather because the buds open quickly and become too tough to eat. Argentina produces a large crop, and in Peru, it is being successfully cultivated in the Central Sierra.

Artichoke is at home in a well-drained, deep, fertile, loose loam that affords an area adequate for the penetration of its taproot; the soil should also be a bit salty The root, which is the only part that survives into the second and later years, grows down to the same depth as the stem grows upwards in height, with the addition of another six or seven inches; thus, a five-foot plant may have a six-foot taproot.

The plants may be grown on gently sloping hills where climatic conditions and soil are satisfactory, but those on slopes usually require more fertilizer and careful management of irrigation than the ones which are on level ground. However, if properly done, the former may be just as productive as the latter

C. scolymus grows to about five feet (1.2 to 1.5 m.) in height and is almost as wide, creating a rounded form. The stem is erect, branched, and two to three feet in length. The radical, silvery green leaves are three to four feet long; they are somewhat spiny and pinnatifid, [10] and emerge from the base of the stem.

The edible part of the plant is the tender immature flower bud which arises on the terminal portion of the main stem and on the lateral ones. Each unopened flower bud resembles a deep green pine cone, about five inches 12 cm.) wide, round, and slightly elongated. The flower heads are enclosed in an involucre of edible, light green bracts that are imbricated. If the buds are allowed to mature and open, the resulting bluish thistle-like flowers are large and fragrant; they ➢

secrete abundant nectar and so are quite attractive to bees.

Artichoke is a good source of potassium and is high in folacin.[11] Its calorie content varies according to size and length of storage. Modern medical research has discovered that phytochemicals, namely caffeoylquinic acids and the acid derivatives, cynarin and luteolin, mainly in the leaves, and to a lesser extent in the buds and flowers of the plant, detoxify the liver, fight free radicals, stimulate the secretion of bile and have a beneficial effect on the gallbladder In addition, extracts of the plant are used to reduce blood fats such as cholesterol and triglycerides. BC

"Artichoke derivatives" "gallbladder disorders"

Artichoke derivatives are currently being used both by herbalists and by medical practitioners to treat some types of gallbladder disorders, and for the prevention of gallstones. They are also useful for liver diseases including those related to alcoholism, anemia, arteriosclerosis, high cholesterol, diabetes, dyspepsia and chronic proteinuria.[12]

An herbal tea may be prepared by pouring boiling water over some leaves and allowing the mixture to steep; one to three cups are usually taken daily.

References

[1]In the West Indies it was called "the tree of life" because the fruit was considered beneficial for many of the ailments listed in this article.

[2]Three territories on the northeast coast of South America: British (now called Guyana), Dutch (now known as Suriname) and French Guiana, an overseas department of France.

[3]A fruit from *Terminalia ferdinandiana*, a tree localized in the boreal regions of the Northern Territory, and its neighbors Queensland and Western Australia.

[4]In 2008, a comparative analysis of the antioxidant activity, ascorbic acid and phenolic contents of 10 exotic Brazilian fruits, showed that Acerola had the highest content of vitamin C and the most potent antioxidant activity. The development of a chemical method of producing vitamin C has reduced the need for fruit juices.

[5]Acerola also potentiates the actions of soy and alfalfa in their cholesterol-lowering benefits.

[6]That is a dry, unilocular many-seeded, fruit formed from one carpel and dehiscing by the ventral suture in order to release seeds.

[7]Also known as *Ignis sacer*, Holy fire and St. Anthony's fire, erysipelas is an acute streptococcus bacterial infection of the dermis, resulting in inflammation. It is most common among the elderly, infants, and children.

[8]Aconitum Napellus is a very poisonous plant. It has several highly toxic compounds; it contains the chemical alkaloids aconitine, mesaconitine, hypaconitine and jesaconitine. Aconitine is one of the most formidable poisons which have yet been discovered: it exists in all parts of the plant, but especially in the root. See Ohno, Y Feb 1998. The experimental approach to the murder case of aconite poisoning. *Journal of Toxicology: Toxin Reviews*. 17: 1-11.

[9]When grown in the north of Europe in the 16th century, it was reputed to have the effect of arousing or intensifying sexual desire. It's universally, but erroneously acclaimed efficacy as an aphrodisiac was possibly due to its use by Henry VIII (1491-1547), the polygamous King of England.

[10]So called because they resemble pinnate leaves having a featherlike arrangement, with narrow lobes whose clefts extend more than halfway to the axis.

[11]Also known as folic acid, it is a water-soluble vitamin belonging to the B-complex group. It helps the body to break down complicated carbohydrates into simple sugars to be used for energy.

[12]Also called albuminuria, it is a disorder resulting in an abnormally high amount of protein in the urine; the main protein in the blood is albumin. This condition is a sign of chronic kidney disease, which can result from diabetes, high blood pressure and diseases that cause inflammation of the kidneys. For this reason, a test for proteinuria is a routine medical assessment that all of us should undergo.

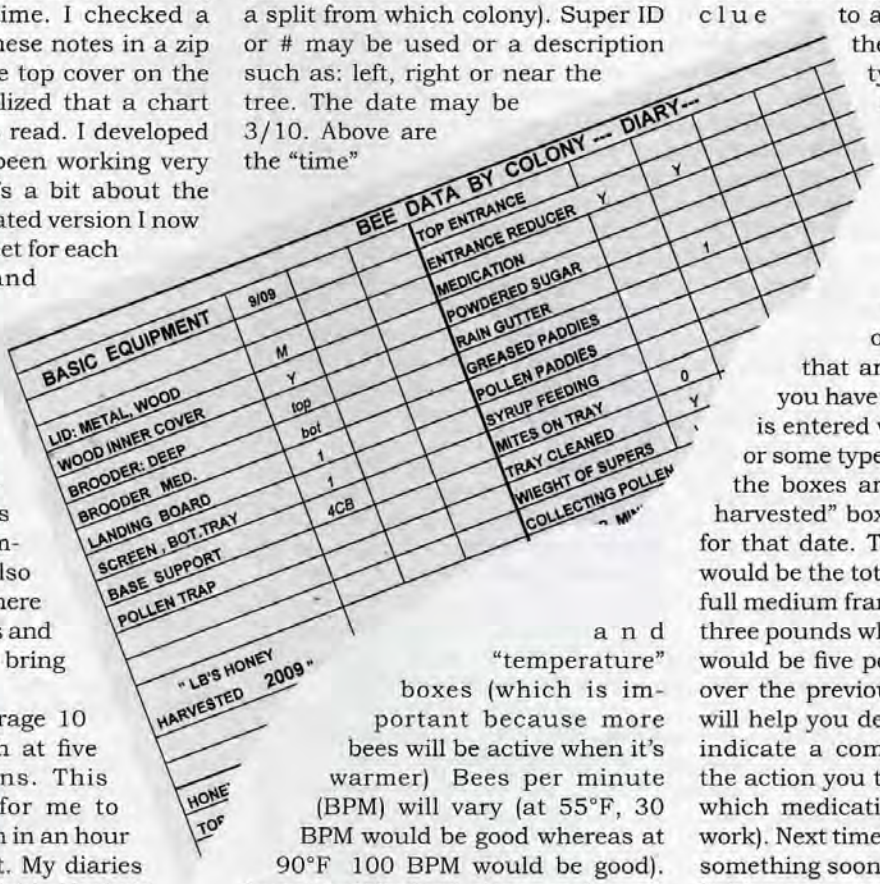
Diaries Aren't Just For Girls

Leonard Riepenhoff

To be a good beekeeper you have to keep good records!

Our colonies are mostly girls in the winter Drones (male bees) are only useful for mating in the warm months and just eat food reserves in the Winter so the ladies give the drones an eviction notice.

I thought that keeping records of what I do and don't do for my bees would help me learn what was good or not so good bee keeping practices. At first I kept a written log adding comments each time. I checked a colony and kept these notes in a zip lock bag under the top cover on the Super Soon I realized that a chart would be easier to read. I developed a chart that has been working very well for me. Here's a bit about the current latest updated version I now use. I have one sheet for each of my colonies and keep them all on one clipboard. In this manner I can review all colony charts at my leisure anywhere; decide which colonies may need to be combined or split. It also shows what and where all my equipment is and what I may need to bring on my next visit.



I keep on average 10 colonies, two each at five different locations. This makes it easier for me to check each location in an hour or two at the most. My diaries have six sections divided by bold lines. Starting at the bottom and working up, since these sheets are kept on a clipboard it's easier to fill them in from the bottom up.

Starting a new diary in September in the top left section, I enter the date and below in that column I list the equipment at that location and the total honey harvested in the current year Then I start filling in the blanks in the first part of the upper right section after indicating the day next to the month. The lower four sections and the last part of the upper right section are used for the coming year· the rest is for the current year-end. The bottom lower section I usually start filling in about March. The lower section is filled in without lifting the cover and is used to identify the location and where the colony started (like a swarm from what location or a split from which colony). Super ID or # may be used or a description such as: left, right or near the tree. The date may be 3/10. Above are the "time" and "temperature" boxes (which is important because more bees will be active when it's warmer) Bees per minute (BPM) will vary (at 55°F, 30 BPM would be good whereas at 90°F 100 BPM would be good). Inserting Y for (yes) always makes me happy in the pollen box. The weight I determine by lifting first the front end, then the back end (there can be a big difference if the supers aren't mounted on a flat foundation). I use L for light, H for heavy and VH for very heavy Cleaning the tray below the screened landing board Y for yes, and hopefully ZERO for the mites box (and wax moth droppings which are small, longish, and black). I may put (1 pt 2-1) if I fed two parts cane sugar to one part water in a pint jar at the entrance feeder I don't use top feeders in the cold months because all the heat in the brood goes up into the top feeder; we need to keep the heat for the brood.

The second section from the bottom requires removing the top cover but not necessarily any frames. Lots of bees and fairly heavy supers are my clue to add a honey super in the Spring or do some type of mite control if there are mites on the bottom tray

The third section up from the bottom will require removing frames for inspection, which would only be done on days that are 70° or warmer As you have noticed most box info is entered with a letter, number or some type of abbreviation since the boxes are small. The "honey harvested" box is a rough estimate for that date. The total for the year would be the total from left to right. A full medium frame of honey would be three pounds where a full deep frame would be five pounds. Looking back over the previous months hopefully will help you determine which signs indicate a coming problem and if the action you took worked (such as which medication worked or didn't work). Next time you may decide to do something sooner or a colony getting lighter may suggest combining two weak colonies or feeding them. Often I add a note on the back of the sheet when I don't want to use a whole column or may make a note suggesting the next time to bring something for the ants or a honey super etc. Diaries like this may help you to plan a diary to your liking. BC

Leonard Riepenhoff is a hobby beekeeper from Santa Rosa, California.

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Ed Colby

Vandals In The Apiary

First, my beeyard got vandalized. Somebody turned off my bear fence solar charger and tipped over my 12-volt battery

After that, things got really weird.

I wasn't sure what to do. This is a pretty empty valley A lot of the land belongs to the state of Colorado, and people hunt here. But this was mid-Summer not hunting season. There are only a couple of dozen homes in the whole valley

When I talked to neighbors, they said, "Maybe those kids on four-wheelers who like to make trouble."

I considered putting up a sign on the county road: "$1,000 reward for information leading to the arrest and conviction of anyone vandalizing beehives."

I didn't figure I'd ever have to pay out, but maybe I could scare those juvenile delinquents!

I definitely didn't want to move my bees. They were on a wicked honey flow.

I called the landowner, but the phone just kept ringing. He's a little different, and always hard to reach. He never visits the bee property He lives out in the boonies, and I am not to drop by his house unless I call in advance, because, in his words, "The wife, she might be home alone."

I moved the fence charger so that you not only had to reach way over the electric fence, but you practically had to stick your hand into a beehive to switch it off. I wedged the battery between two hives. I crossed my fingers and tried not to worry

A week later I met a family of dirt bikers on the private road that leads to the yard. Even the seven-year-old girl was in full body armor When I introduced myself, the man never even took off his helmet. He looked like Darth Vader "You're trespassing!" he proclaimed.

I explained that I'd kept bees on Buddy Aragon's land for years.

The man said, "Who's Buddy Aragon? Nathan Oswald owns this land. He owns clear up to that mountaintop. He lives in Texas, and I watch over the place for him. He just comes out to hunt. I told him there were bees up here, and he said to run your *&@# out!"

I said, "Well, I know Buddy owns the land below the ditch, because that's where he told me to put the bees."

"That may be," the man said, "But you can't use this road. I built this road for Nathan, and you don't have permission to use it. Your friend can build his own road to his property You're lucky you didn't run into Buster because he'd have pulled a gun on you."

"Buster?" I said. "Who's Buster?"

"He lives in that big house up the road. He sold this land to Don, and he has a temper," he said.

Brandishing a gun at a trespasser on somebody else's land sounded way too outlandish to be even remotely plausible. Who'd be willing to go to jail for something that crazy?

I said, "Look, I guess I'm caught in the middle of a right-of-way dispute. If you give me Nathan's phone number; maybe he and I can straighten this out."

"You don't call Nathan," he said. "You go through me."

"Well, let's talk about it," I said.

He said, "You bee guys pay honey to landowners, right?"

"You want honey, you got it," I said.

I now owed honey rent to two people – Buddy, plus this gatekeeper extortionist, who could have vandalized my hives, for all I know. But I didn't want to move those bees.

As I write this, it's October Buddy called and asked where his honey rent was. I told him that I'd called him to tell him I hadn't forgotten him, but that I couldn't get through. I told him I could deliver in a week, if that would be soon enough.

"Not really," he said. "We're out."

"I'll pack it in the next couple of days and get back to you," I said.

When I told him about the right-of-way controversy, he said, "Nathan Oswald doesn't own that land – his dad does. I have every right to use that road. That guy you talked to doesn't know what he's talking about. I'll get this cleared up. You bet I will."

When I mentioned the part about Buster and the gun, Buddy said, "Buster!? Buster's dead."

I would have liked to have known that before, because, all right, I'll admit it – I did occasionally fantasize about how a chance meeting with Buster might go.

The apiary at Buddy's is downhill and across a ditch from where I park the truck, so unloading and especially loading bees with a hand truck can be challenging. I use this place as a staging yard in the spring. After the lower elevation dandelions are finished, I bring bees up here, just as the whole valley turns yellow Later, I move some to even higher ground on the Flat Tops, but others stay here for the alfalfa and sweet clover bloom. After a certain point, they pretty much *have* to stay, because they get too heavy to load onto my truck.

For a little migratory operation like mine, the loading problem is a big drawback. Plus, the landowner situation is creepy no? But it's a free country, and I have options.

I got Buddy's honey packed on schedule, and I left a message at the cell phone number he gave me. I told him to call me, so we can make delivery arrangements – sometime when the wife isn't all alone up there – although I didn't actually say that.

I know he's out of honey, and I phoned him a week ago, but he still hasn't called back.