Nov 2012

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Bee Culture

The Magazine Of American Beekeeping

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Bee Culture

FEATURES . . .

DEPARTMENTS & COLUMNS

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Contributor to Mother Earth News

First Place Winner

Thanks to the May 2005 cover of *Bee Culture*, I won first place at the Kansas State Fair for my wax art design. It was in 2005 that I got into beekeeping when a swarm landed in the cedar tree in my yard. Have never bought a bee (do replace queens) and probably all those bees are dead but hope their progeny will continue to live on. Currently have four hives and extracted honey also won a blue at the fair.

I learn so much from *Bee Culture* and want you to know I appreciate the magazine.

Rose Lee
Atchison, KS

Mites & AFB & Winter

In the September issue I read a short letter by Alan Buckley that spoke volumes. His problems mirror my own and possibly thousands of other beekeepers here and around the world. He also asked for comments.

So here goes. I believe the *Varroa* mite is the biggee for so called CCD. When Dave Hackenberg came out several years ago with CCD I thought to myself, "this has been going on for 10 or 15 years already. Where has he been."

Then all the studies started, trying to find the answer. I believe most of the stuff that was thought to be the cause has been present in honey bees forever, but nobody needed to look before CCD. It's that simple.

Alan states his bees dwindle to about 40 bees, a queen and uncared for brood – exactly right! We all know or should, that the queen will only lay as many eggs as the bees can cover, so there were that many bees when she laid this uncared for brood. What happened?

I would guess the time of year was early February, maybe earlier where Alan is from. The nurse bees that were supposed to take care of this brood were hatched in August to early September or six months. Now go back to July – the queen quit laying drone eggs, the preferred site for *Varroa* reproduction. So the only place to go is the worker brood. These are Winter bees. The difference is ability to survive for six months instead of six weeks (Summer bees). The *Varroa* saps the brood of this ability and shortens their life considerably and when they go out for a cleansing flight through the Winter a lot don't come back. CCD – perhaps?

I wrote a letter to *Bee Culture* over a year ago titled "Curing AFB" that wasn't printed. The main premise was how well these bees wintered, not the "curing" of AFB although it solved both problems.

In a nutshell, treat with Terramycin when AFB is found, kill the queen the first week of July. Wait 25 days, shake bees onto foundation in new box, feed syrup, use old frames for kindling, scorch old box. New queen will lay like Spring bee as long as you keep feeding – these are your Winter bees. If you have a late flow so much the better. Come out of Winter strong, mites about gone, no AFB.

Jim Cowan
Aberdeen, WA

Planting For Bees

I enjoy reading your articles in *Bee Culture*. I have also read you book *Better Bee Keeping*. I like your straight forward approach without a lot of fluff.

I am very interested in your ideas of planting habitat for honey production. I have often thought of planting some under used land to make an ideal honey producing area. I have read in several places that it is not economically feasible to plant for a large number of hives. I live in northern Utah and have 200 hives. I have only been keeping bees for two year so I lack experience. Utah has an average honey production of 45 lbs per hive while other neighboring states are much higher. If my math is somewhat correct if I could spend $100-$150 per acre to plant and produce high nectar plants for my bees they would offset the cost plus more with a better honey crop. I am just getting started pulling my honey this year but I am averaging around 53 lbs despite the dry year. The yards near irrigated ground are helping the average, this makes me think that well planted and managed habitat should be able to pay for itself.

My question is: Do you know of anyone who is doing this on a large scale? And if so would it be possible to talk to them to get their thoughts. I would appreciate any information your readers can send my way and appreciate your time.

Gary Cook, UT
Gacook4@juno.com

Water Issue Solved

I keep bees in an urban area of Walnut Creek, CA and have what I think is a good solution to the bee water issue. In my yard, about 20 feet from the hives, I dug a 6' x 16' x 1.5' hole in the ground for a fish pond. I lined it with rubber roofing membrane and put gold fish in it. It was a modest source of interest and water for the bees until I put six water hyacinth plants in the pond. Since then the bees cover the floating plants from dawn to dusk. Interestingly while some of the bees land on the plants clearly to dip their tongues into the easily accessible water, most of the bees covering the plants seem to be more interested in licking the leaves. It makes me wonder if the leaves are producing something that the bees find nutritious or tasty.

I would be curious if anyone else has had this experience or has any thoughts on why this might be. Whatever the attraction, the number of bees I see makes me think that this proximate water supply with its attractive foliage is keeping most of my bees away from the neighbor's swimming pools.

Norris Childs
Walnut Creek, CA

Catching Swarms

I'm a backyard beekeeper. I enjoy catching swarms and hiving them. More than eight of them this Summer. I keep what I want and give the rest to other beekeepers.

My swarm box works quite well. I have five frames, some drawn, mounted on a board which slides out of box. I take board with frames and set it in hive box then unscrew frames and remove board. Check for queen, put five more frames in box close up. Another colony!

I have been keeping bees about five years and love it.

Bob O'Neil
Clinton, NY

More About Chemicals

In the September 2012 edition of the *Bee Culture* an article by Paul and Linda Hendrichs on Ag chemicals caught my attention. I will be attempting to add to their observations. First, a short history. I am by no means a large commercial beekeeper. I've only been in beekeeping a few years and am still fascinated with the world of bees and their plight. My story begins in early August 2012 with an Ag chemical spray plane spraying chemicals on cornfields within a quarter-mile of my hives. My inquiries to the Montana State Department of Agriculture revealed some unexpected results.

Starting with my conversations with the department of agriculture regarding what chemical was being used. I discovered a commercial spray operator need not report his operation or chemical. According to information provided me earlier by the MT Dept of Agriculture, I was under the assumption that if hives were registered with the state, large spraying operations would be able to contact beekeepers and advice them to what was going to happen – this was incorrect. In fact, the Department of Agriculture denied ever having stated that once I registered my bees they would inform me of spray operations in my area. How such information had been relayed was a mystery and reportedly could have never come from the Dept. of Ag. However, I must give credit to the people I dealt with at the apiary division of the Ag Dept., they appeared to be concerned but expressed they had no authority to assist in my situation. Perhaps through their pesticide division I may get some assistance. I was given the name of the local pesticide representative and I made contact. At first is the general attitude was it was the beekeeper's fault if bees were contaminated but he did eventually contact the operator of the plane who, in turn, did call.

Eventually, after several attempts to obtain the name of the chemical, the operator provided the name of Sniper by Loveland. He would not provide a safety data sheet however and stated I should be able to find it on the Internet. At that point the problems began.

The safety data for Sniper had some interesting material:

- Do not use within 10 feet of a water way, this includes ponds, rivers, streams and marshlands etc..
- This pesticide is extremely toxic to fish and aquatic invertebrates.
- This product is highly toxic to bees to direct treatment or residue on blooming crops and weeds. Do not allow drift to blooming crops or weeds when bees are actively visiting the treated area.
- Do not feed treated forage to livestock for 30 days.
- Do not apply in areas where endangered species exist.
- Do not apply to food plots. (areas for wildlife)

The problem, as I saw it, was the timing for such a broad spraying operation of such a toxic chemical could not have been worse. The bees and other beneficial insects were actively seeking out pollen in the newly tasseled corn and the irrigation ditches around the cornfields were full of water and plants in full bloom, Sweet Clover, sunflowers and many others. With sweet corn being planted in many fields of field corn and ready to harvest and sell to the public, was it safe? Cows could not eat the foliage for 30 days, what about humans. How many hundreds of hen pheasants and chicks were sprayed and how will that affect their egg lying in the future or did it simply kill some of the chicks and hens?

When it appeared the operation was in the area where I had several hives at a friend's garden I preceded to the area. I watched the plane spraying two apiaries belonging to Beartooth Apiary, 90 some hives. I do not know how many hundreds of other hives were sprayed. I saw cornfields that were being irrigated at the time of application. This certainly appeared to be a violation of the label instructions.

So the inquiries began. The Montana Department of agriculture did appear to be concerned but made it clear in some states the authority had been granted to assist but not in Montana. One question was, "Is the sweet corn safe to eat?" I was provided the manufacturer's rhetoric but no one would say yes or no. Keeping in mind cows cannot eat the treated forage for 30 days and sweet corn was being harvested within a week.

After the corn had been treated, the aerial spraying began on the alfalfa fields. Inquiries into whether the same pesticide was being used in the alfalfa fields was met with, "We do not know, call the applicator." Several calls were attempted with no results.

Now for my bees, the numbers in two of my eight hives have dwindled dramatically and the others were barely increasing honey in any of the supers. I'm sure that the ag chemical people will blame colony collapse or *Varroa* for my problems, it certainly can't be the chemicals. Dr. Scott Bretthauer, in his article, believes the aerial operations are safe. As with the Hendrichs, I too question his knowledge base.

The long and the short of it comes down to this – I'm quite sure if I had poisoned 40 of my

neighbors calves or cows (90 some hives, at current market prices, not including lost revenue, are the equivalent of about 40 calves) all hell would need to be paid.

Lonnie Larson
Huntley, MT

Silent Spring

There is a process in the discipline of science to study, evaluate and either confirm or dismiss the findings of someone's research. This was done with Carson's manipulative (truly stated by the reviewer of *Silent Spring*) science. It was weighed in the balance and found wanting.

I find it distressing that science has become hijacked by, for want of a better word, religious fanatics (their issue is their religion, forming and informing their world view). Carson's *Silent Spring* science has proved to be at least suspect if not fraudulent. The ozone hole; we were all going to be toasted to death. There was never found a mechanism for transporting HFC to the ozone layer, but drastic action to ban HFCs was taken on this suspect science. Alar, saccharine were fatal. Who cares if the 'science' fed it in doses it would take 1,000 lifetimes to cause tumors. We were on the verge of new ice age when I was in high *school. Then it was global warming. Now just the generic climate change moniker is all that's needed for the 'agenda scientists.' The list could go on exponentially. Soon the study on GMO and rats will be all the rage with action being demanded. This kind of science does a great disservice to humankind. Rather than searching for truth in service of humanity, it becomes a tool for oppression and control.*

Beekeepers are people concerned about good stewardship of the natural resources given to us. But we must be reasonable and rationale, not twisted or turned by the manipulative song of an agenda driven scientist. Let us ask ourselves, are these conclusions based on sound science or agenda science? Let the scientific method take its course.

Jeff Singletary
Lebanon, IN

Editor's Reply: *The 50th Anniversary of Rachel Carson's book has brought to the surface again much of the distain and criticism that it enjoyed when first published. An article by Bryan Walsh, in* Time Magazine *summarizes some of this...*

*"In fact, in its initial review," Walsh says, "*Time *itself said that Carson's writing, though graceful, was an emotional and inaccurate outbust, and was hysterically overemphatic"...which Walsh interpreted as 'the Lady writer let her feelings get the best of her.'*

Perhaps.

William Souder, in an autobiography of Carson relates that chemical companies threatened her with lawsuits after she argued that pesticide overuse was ruining the environment and threatening human health. Moreover, they went on, "If man were to follow the teachings of Miss Carson, we would return to the Dark Ages, and the insects, disease and vermin would once again inherit the earth."

Today, the claim is that her rantings against DDT, and the then new EPAs subsequent banning of that chemical led to the deaths of hundreds of thousands of people from Malaria...bitten by mosquitoes not killed by DDT. That argument still exists but the effectiveness of DDT in the wilds of Africa – the isolated villages and vast spaces between . . . would have been much less effective than in urban and populated areas of the western world.

What finally emerged from the criticism of Carson's book was the policy and procedure of how an industry...chemical, tobacco, asbestos, pesticides, air pollution, take your pick...organizes itself to rail against environmentalism: Question the science, attack the scientists' credibility and warn of the unbearable costs.

Please note. This tactic has never worked. It has stalled progress. It has diverted attention. It has cost us Billions of dollars. But as Walsh states finally... "The U. S. has become a cleaner and healthier place since Silent Spring *in part* ***because*** *of* Silent Spring, *and the Dark Ages have not returned." But the battle continues.*
– Kim Flottum

For All The Beekeepers On Your List –

Apicultural Literature Published In Canada And The United States. Toge and M. P. Johansson. Originally published 1972. Reprinted. Black and white, 103 pages, 6.5" x 9.5". $22.50, Northern Bee Books, **sales@recordermail.demon.co.uk**, or your local bookstore.

A useful volume for those interested in research reports, books and other publications published before 1972. These include: Books and pamphlets published by private individuals and companies; Canadian Federal and Provincial publications; U. S. government publications; individual state publications; International, National and regional Beekeeping associations; beekeeping journals; trade catalogs; Bibliographic sources including library collections, indexes to periodical articles, theses, museums and films and film strips. An author index is included, and is very helpful.

A simple paragraph that Toge included in the introduction explains far better than I ever could the value of the information included in this book:

"At the first American Beekeepers' Convention in Cleveland, Ohio (March 15, 1860), L.L. Langstroth, read excerpts from Columelle (60 A.D.), and Charles Butler (1634) to support points of argument. And when Langstroth sent A. I. Root a copy of Thomas Wildman's Treatise On Bees, (1768), and John Keys' Ancient Beemaster's Farwell (1796), Mr. Root was surprised to find material that he thought had been discovered only recently – the use of contrasting colors on hives to minimize drifting."

"Is it really true that there is nothing new under the sun?" asked Root.

Of course there are new things under the sun. But beekeeping, and beekeepers have a tendency to reinvent the wheel, or the beehive, or the hive tool on generational increments. Surely time and energy misspent. And then there's all that about learning from your mistakes; those who don't study the past are bound to repeat it...

Toge would be glad to see this work again. He was a teacher, and he had a healthy respect for what came before.

And just so you know, the cover photo is a part of my ABC & XYZ collection. I too, have a healthy respect for what was here before.

Caspian Solution is a combination of drone and larval pheromones along with royal jelly. Boosting the level of pheromones present in the hive stimulates the bees to consume large amounts of pollen and honey, and therefore stimulates the hypopharyngeal and mandibular glands to produce large amounts or worker and royal jelly. This powerful effect gives the Caspian Solution many uses. It contains Royal jelly, Pheromones and Irradiated pollen. To make 10L of Caspian Solution (Cost: $1/litre) take 30g dry Caspian Solution powder and add 8L mixed syrup (2 parts sugar to 1 part water) plus 60g pollen and 60g honey and 1.2L warm water. For best results feed Caspian Solution directly into empty comb, filling up the cells. This is especially useful in cold climates. Some of the solution can be poured in between the frames, lightly coating the bees and giving a calming effect.

To find out more about Caspian Solution, how to use it and what it can do for your bees visit www.caspianapiaries.com, or see the ad in this issue.

Beetle Jail Baitable. Based on the original, the new, improved Bee Jail trap is shorter so it fits queen mating nucs, and has a baitable compartment to attract beetles, but the beetles are unable to get to the bait... they can only smell it. It is deeper to reduce oil spills and to hold more beetles. The top surface, as it sits between frames, is lower than the tops of the top bars, enticing beetle to enter. And it has tabs on the ends for easy hive tool removal, after being propolized down. Made from durable polypropylene. Available at **www.beetlejail.com**

New Video

Well, it's not exactly new, since it came out last Spring, but we are finally getting it reviewed here. ***The Quest For Local Honey***. Produced and directed by Karin Meadows and Jen Winders, is the story of two honey enthusiasts from Nevada County, in northern California who begin a search for local honey because they wish to support bees and beekeeping, and just really like local honey. They start in their home town, but travel far and wide in their search, finding many things along the way that are entertaining, educational, tasty, and fun to watch. With the plethora of films out of late that decry the plight of the honey bee, it was refreshing to watch, and listen to the excellent music, a film that wasn't depressing and scary and with the doomsday message so many of them have. Not that that message isn't worthy of telling, but this is a pleasant change.

And the people they meet and see, Ann Harman, Dave Cowen, past Honey Queen Rachel Seida, Larry Connor, Dave Westervelt, Kathy Kellison (who leads the Bee Friendly Farm program, that is the beneficiary of part of the proceeds from each of these sold), Janet Brisson of screened bottom board fame, Randolph Ferber from the Bahamas, Randy Oliver plays an impressive role...after all, he is from Nevada County, plus Eric Mussen and lots and lots and lots of local, urban and other just regular beekeepers making their version of local honey. You get to visit roof top apiaries in San Francisco, the Mellisa Garden, Ethnic Sacred Bee Rituals and dances and songs, along with a trip to Mount Vernon and a ABF meeting and the pollinator garden at UC Davis, along with Sue Cobey and many, many more.

It truly is 62 minutes of fun, education and entertainment. You can see the trailer at **http://www.youtube.com/user/WhirledBeetFilms**, and purchase the movie, or the soundtrack, or both at **www.questforlocalhoney.com**. Both are $20 cheap . . . worth every penny.

Kim Flottum

INNER COVER

Ohio has a mandatory apiary registration law, so every year I pay my $5.00 to the Department of Agriculture to register my one and only apiary. It doesn't matter how many colonies are in that apiary – one or 100 – it's still only $5.00. Sometimes the Medina Beekeepers have bees on some unused A.I. Root Company property they let us use, and those, too, get registered. Sometimes they are registered in my name, sometimes in the Medina County Beekeepers name, and sometimes in the Company's name. It changes because we don't always have bees here, and when they are reintroduced I can never remember how I got them into the system the last time. So sometimes the Department of Ag thinks I have two apiaries, one at my home, and one here. I like to keep them guessing.

That $5.00 registration fee helps fund the State Inspection Service, which oversees everything honey bees in the state. This will show you how old I am. It used to be . . .

When I started here there was a State Apiary Inspector who answered directly to the big cheese in the Ag Department. He in turn had three regional inspectors (one in the north, south and east parts of the state) that answered to him, and were sort of in charge of all the county inspectors in their respective regions. There were nearly 80 counties that had inspectors back then, if I recall. Sometimes the regional inspectors would do routine colony inspections, especially if a county was inspectorless, or if someone wanted a permit to sell locally raised queens or a migratory beekeeper came to stay awhile. Sometimes the county inspector would get overwhelmed or had to deal with a pigheaded beekeeper – local or migratory. Plus, the State and Regional inspectors occasionally got involved in local politics, especially when zoning or some other dispute came up.

Regional inspectors also trained, or checked out anyway, the county inspectors in their regions. County inspectors in Ohio don't work for the state so aren't hired or paid by the state. Those actions occur at the country level. But the county inspectors answer to the Regional inspectors, and if a county has a problem, it's the Regional guy who gets called to fix it. And because most county commissioners don't have a clue about the skill set needed by a bee inspector, they mostly defer to the Regional or sometimes State level inspectors (and sometimes the local beekeeping group would get involved) to make good recommendations, to train them well, and to make sure all is right in the beeyard. Back in the day Ohio had at its peak something like 10,000 beekeepers, four regional inspectors and at least one and very often two county inspectors. The goal, seldom achieved, but often close, was to make sure every colony in the state got inspected at least once every year.

So it was the county inspector most beekeepers knew and had to put up with, or got to work with, or watched and learned from – all depending on the inspector, the beekeeper, the bees and the year.

There's a couple of things about inspection in Ohio you should know. The Department of Ag pretty much has their way with inspecting your bees. You can, if you want, file a 'no visit' form and an inspector won't visit...unless there is strong suspicion and good cause to believe you are harboring something dangerous and need to be found out. In that case the inspector will get a search warrant from a local judge and will go and inspect your bees. And he'll bring large, mean people with him, or her, if they feel safety is an issue.

And then there's this provision: *No person shall maintain an apiary located on premises other than that of his residence unless such apiary is identifiable by an* ***apiary identification number*** *assigned to such person by the director. Such identification number shall be posted in a conspicuous location in the apiary. The moving, raising, and production of bees, beeswax, honey, and honey products shall be deemed an agricultural pursuit.*

What this means, quite simply, is that if you have an outyard that isn't identified as specified, it is in violation of the law...and no matter what happens the owner of the bees and equipment has no recourse...spray it, bulldoze it, do what you want, it's in violation of the law and doesn't have a legal leg to stand on. That rule has been in place since 1989.

Well, that was then, and this is now and it isn't quite the same anymore.

Last year in Ohio 4,001 beekeepers registered 6,293 apiaries (I suspect that's about 80% of Ohio's beekeepers or so) and there's just short of 33,000 colonies in the state. Ohio has 51 inspectors now, no regional inspectors at all, and our State Apiarist is only a part time position. However, those county inspectors inspected 3,527 apiaries, 14,907

colonies (average 300 per inspector), finding 134 with AFB, 4,217 with *Varroa* and 516 with small hive beetles.

I've had bees in my backyard for many, but not all of the 25 years I've had that backyard. I have one on the side yard, and I usually keep one on the front porch, too. And in all those years, I've been inspected, I'm pretty sure, just twice. Once, when a friend was an inspector for a couple of years, and he just wanted to stop by and have a cold one after a long hot day – but not until he was off the clock mind you – and then again in mid-September this year.

Now mind you, I hadn't been in them since the first week in August, when we harvested our crop and added an empty. Then there was EAS, a still busted up foot, a couple weekends on the road – and on the 11th the county inspector calls and says he can be there on Wednesday – any problems?

Well . . . so . . . OK, I guess. What choice do I have?

Medina hasn't had a full time, steady inspector for quite awhile and this year nobody raised their hand again, so Dustin, who is from Columbus, comes up here routinely to do the job. He comes up and camps for a week, inspects all day every day then heads back home. It's one way to make a living I guess.

So just after lunch on the appointed day, Dustin arrives, right on schedule.

He gets his stuff ready, smoker lit, hive tool and off we go. No veil. We walk to the back of the lot to see the two 10 framers, five eight framers and the five frame nuc. That nuc is hotter than I like because it was a split in June and I walked away...I put in bees and brood from several of the colonies there and let them raise their own queen...just to see how it worked out. They made a boat load of cells, which is what I wanted to see, one mated with local drones and that was that. It worked fine, even with the drought this summer and it was in two deeps and a medium...yeah, I need to move them up, but time is, you know.

That nuc had the one bee that got Dustin, right on the lip. It was the only sting of the day I think, but it blew up real nice. I was right beside him, moving frames, taking things apart and putting them back together. If there was anything to find, I was going to find it first I thought . . .

After the eight we looked at the topbar, something he'd not seen before. And there weren't any frames stuck, so that was good. Then to the BeeHaus – a long hive of British origin – and he hadn't seen one of these before either – and finally the hive on the porch, which was just fine. They were all just fine.

Deep sigh of relief now.

I mean, in six weeks all heck could have happened – and it'd be embarrassing if we had found something. But I get a pretty clean bill of health – there are *Varroa* after all – and fill out the report, sign here and Dustin is on his way. Off to another adventure in bee inspector world.

•

The CAP article . . .

My God People!

Pogo said so long ago, "We have met the enemy and it is us".

Well... Friends, Americans, and Countrymen. We have fouled our nest, messed our pants and it is time to pay the piper. We are screwed.

Everything we use is contaminated with the chemicals WE use, and that our bees are exposed to on a daily basis. The wax, the pollen, the honey and the bees are poison and poisoning us. It's all there in the CAP article. Read it. We have done this to ourselves because beekeepers have only two choices – treat with something or die, the regulatory government is bought and paid for, and the chemical companies are beholden to stockholder's demands for profit at any cost.

Who are we trying to kid? We cannot control Varroa with the legal tools we have on a scale larger than two or three beeyards. The advocates of Natural are correct but they offer only small scale solutions. To feed a world you cannot pollinate almonds, apples, alfalfa, avocados, blueberries, cranberries or any crop at all on a commercial scale with a couple dozen hives in the backyard and a pickup. You need thousands, millions...and they cannot be found. They cannot be had. They are dead or dying.

The Scientists have not, in 25 years, developed a truly resistant strain of bees (sadly, the Russians are close but much neglected). Rather, they have chased, at the bequest of the industry they serve, mostly silver bullets. None work, or none work for long.

If the CAP work published here this month, and nowhere else I'm told, does not stir men's souls, government agencies, and YOU, then we are doomed.

Commercial beekeepers are replacing every colony they have at least once a year...most more than once. And queens...criminey, commercial queens are mostly a disaster or worse. Not mated, not mated, not mated...and less. Drones are dying, tongues extended, dead on the landing board. No drones. No mating. No queens. No bees.

Queen producers, package producers, commercial pollinators and honey producers...everybody is at the mercy of Varroa...and nobody has an answer. Nobody has a solution. Nobody has a choice. Nobody.

My God, people. We cannot afford more wrong decisions. More bad choices. More poison. Somebody has to say this out loud. Well, here it is.

What are the scientists doing? What is our industry doing? Where is the money going? Why haven't we solved this problem? Are we so slow, so poor, so controlled we cannot see the way?

But we have seen the enemy, and it is us.

Amen.

NOVEMBER – REGIONAL HONEY PRICE REPORT

How Big Is The Crop This Year?

It's time again for *Bee Culture's* annual honey crop prediction. We surveyed our reporters asking how much honey they made this year – not total pounds, but average per colony – separating them into average honey production for all colonies, including those that made no honey, or hardly enough to count, but are still a part of what would be counted as total colony count by USDA, and those that actually made honey, which, on average is going to be a higher average. So it's kind of hard to compare the two numbers. We have been low every year, according to USDA figures, but we've learned how to manage the survey so our numbers this year seem a tad more realistic.

Colony count, too, is an issue. How many colonies contribute to this total? We certainly don't have the resources USDA NASS does for that level survey (and we continue to be glad the funds for that enterprise were not cut last year), so we begin using their colony count from last year, and then adjust that to fit colony numbers we are hearing from the field.

The drought this year was stressful, no doubt. But drought has a tendency to fool us sometimes when honey production is concerned. Lots of hot, sunny days mean bees can fly more and gather more. So a short drought can actually be a short term gain. This year, with easy winter, early Spring and then dry, dry – it wasn't quite the same, but close. Swarms, of course took a toll because beekeepers weren't ahead of the curve way too often, so that, too, hampered seasonal production – but just as often, there' wasn't much of a flow after that early Spring – so go figure.

Anyway, our Annual Honey Crop prediction this year is based on colony numbers – and we're figuring colony count up a hair this year to accommodate the ongoing almond pollination business to 2,550,000 colonies in the U.S. So, now comes the hard part. Our report has two figures. One number is the average production for all colonies, no matter if there's honey in them or not, and the other is for just those that produced honey . . .

For the Every Colony counted number, figuring total honey produced by total number of colonies was 48 pounds/colony. Whereas, if you figure the average from just those colonies that made honey, the average is 62 pounds/colony. Given those averages then – our somewhat fuzzy prediction is that the 2012 U.S. honey crop with be somewhere between 122,400,000 and 158,100,000 pounds.

3234 61 42 33 14 30 27 85 50

Honey Production/Colony 2010

Regions	1		2		3		4		5		6		7		8		9		10		11		12		*Total*	
	A	H	A	H	A	H	A	H	A	H	A	H	A	H	A	H	A	H	A	H	A	H	A	H	A	H
2009	30	-	37	-	37	-	33	-	70	-	72	-	32	-	57	-	83	-	57	-	54	-	83	-	54	-
2010	40	26	26	17	46	35	53	34	63	58	82	59	45	27	75	48	51	44	76	62	58	39	77	54	64	41
2011	46	35	58	35	42	34	34	26	54	30	78	64	45	34	78	65	41	33	52	32	42	28	61	38	53	38
2012	42	36	45	15	28	20	45	29	65	50	91	69	70	60	82	68	131	105	53	36	47	36	44	38	62	48

74 45 38 36 53 46 66 57 60 35 21 17 31 26 49 36

A = all Colonies Counted
H = Only Honey Producing Colonies Counted

REPORTING REGIONS	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	1.85	2.10	1.85	1.60	1.95	1.81	1.95	1.85	1.88	1.95	1.87	1.93	1.54-2.10	1.87	1.87	1.82
55 Gal. Drum, Ambr	1.74	2.03	1.74	1.56	1.90	1.71	1.75	1.85	1.58	1.74	1.72	1.78	1.45-2.03	1.73	1.80	1.75
60# Light (retail)	168.33	175.00	150.00	148.00	160.00	158.33	153.40	158.33	120.00	150.00	127.00	201.67	100.00-240.00	158.93	159.50	146.10
60# Amber (retail)	168.33	185.00	150.00	164.67	160.00	145.00	146.50	152.50	125.00	153.00	112.00	182.50	90.00-215.00	152.90	152.76	142.47
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS																
1/2# 24/case	74.36	64.61	48.00	66.80	63.89	54.00	52.55	63.89	63.89	49.92	75.84	79.80	37.20-91.20	63.58	62.16	62.51
1# 24/case	113.29	89.79	114.60	87.60	90.00	106.13	83.32	92.00	72.00	110.53	95.94	119.05	72.00-156.00	101.46	100.13	90.27
2# 12/case	98.48	74.61	77.70	80.00	84.00	84.53	84.24	96.00	66.50	88.09	109.50	111.36	63.00-180.00	89.57	86.46	73.81
12.oz. Plas. 24/cs	110.28	75.50	65.40	80.00	72.00	78.50	71.44	80.80	66.00	64.08	87.60	81.40	52.50-144.00	80.31	78.07	73.76
5# 6/case	132.15	92.76	94.50	83.75	210.00	104.25	95.98	97.15	72.00	88.98	112.00	109.50	72.00-210.00	105.81	97.00	83.44
Quarts 12/case	135.00	128.88	123.18	118.25	108.00	111.08	122.00	106.00	123.18	129.65	115.53	124.40	90.00-166.00	118.35	114.62	111.20
Pints 12/case	85.00	70.95	85.80	81.75	72.00	66.38	90.00	57.20	55.00	111.00	67.20	78.00	48.00-115.00	75.01	72.58	76.29
RETAIL SHELF PRICES																
1/2#	4.35	3.96	2.55	3.79	3.99	3.66	3.20	2.57	3.99	3.25	3.73	5.00	2.15-6.50	3.65	3.66	3.33
12 oz. Plastic	5.70	4.78	3.65	4.39	4.75	4.70	3.95	3.82	4.99	4.02	5.14	5.10	2.99-7.50	4.57	4.42	4.06
1# Glass/Plastic	6.43	6.05	5.97	5.32	6.50	6.55	4.94	5.21	5.99	5.73	5.47	8.08	3.00-9.99	5.88	5.87	5.40
2# Glass/Plastic	11.40	9.17	10.60	8.75	10.50	9.52	9.11	7.87	7.50	9.67	8.02	12.00	5.68-14.00	9.54	9.37	8.99
Pint	7.75	7.35	9.07	6.87	7.00	7.65	8.68	6.21	5.00	7.52	7.90	8.11	4.00-12.00	7.62	8.05	7.38
Quart	15.00	11.82	11.89	11.78	13.00	12.94	11.76	9.75	9.00	13.82	11.28	16.33	10.15-20.00	12.45	12.86	12.63
5# Glass/Plastic	24.63	19.71	25.06	19.08	21.96	26.50	20.36	20.50	18.00	18.19	16.65	25.00	12.00 -35.00	20.43	20.39	20.62
1# Cream	8.50	5.93	8.10	6.50	7.17	5.50	7.02	5.49	7.17	5.80	9.00	8.25	4.99 -10.00	6.85	7.32	6.10
1# Cut Comb	8.25	6.48	8.35	7.50	9.32	6.50	7.58	10.25	9.32	9.67	9.75	13.00	5.00-15.00	8.63	8.20	9.28
Ross Round	9.63	6.82	8.19	5.40	7.34	7.00	8.00	9.50	7.34	7.34	9.25	7.60	4.50-11.50	7.67	7.89	7.00
Wholesale Wax (Lt)	5.30	6.95	4.60	4.25	3.10	5.40	3.91	4.33	5.00	6.00	3.61	4.00	2.00-8.00	4.57	4.42	5.01
Wholesale Wax (Dk)	4.67	6.95	4.60	4.13	2.90	5.50	3.58	4.00	4.25	3.00	2.50	4.00	1.85-7.00	4.08	4.00	3.97
Pollination Fee/Col.	95.00	96.67	83.33	54.60	60.00	61.67	54.50	75.00	89.29	60.00	120.00	103.33	35.00-165.00	78.58	73.73	80.28

It's Summers Time –

Fall and Chickens

Fall in Ohio is beautiful. It's one of my favorite times here. I love the color, the changes that go on all around – cooler nights, shorter days, Fall flowers. Growing up in Texas and California I didn't experience the change in seasons like we do in the Northeast. This year we had an incredibly hot and dry Summer so Fall is even more welcome.

We harvested the last of the tomatoes this past weekend. There was a frost last night. So that tells me that Summer is officially over. But I still got a whiff of the goldenrod this afternoon when we checked one of our observation hives.

The garden did fair this year. Like I said it was very hot and dry. We got lots of tomatoes, enough zucchini to make several batches of bread this Winter and not much else. It was hard to keep enough water on everything this Summer.

Because of the drought during the Summer some things are missing now in the Fall. We have three big Osage Orange trees and usually about now you start to notice the fruit and shortly they'll start to fall to the ground. Have you ever seen an Osage Orange. I'm not sure where the name came from, because they're not much like an orange? And don't be standing under the tree when they fall, it will hurt. If you haven't ever seen one do a google image search. The fruit is not edible and difficult to cut open. I tried once because I wanted to see what was inside. The only value I've heard about the fruit is that if you put them in your basement they'll keep the spiders away. Our neighbors came and grabbed a few out of the yard last year for that reason. I have been told the wood is wonderful for building.

And now starts the well laid plans of getting ready for Winter. There's the plan to pull up all the dead plants and till the garden so it will be ready for next Spring. There's the cleaning out the garage so we can fit the car back in when it starts snowing. And bringing in the plants that we want to save, cleaning all the leaves off the deck from the sycamore trees. Swapping out the Summer wardrobe for the Winter wardrobe and finding the electric blanket. And this year there is the extra chore of making sure the chickens are warm and safe this Winter. And we should check the bees one more time and wrap them.

We'll get to most of these before that first snow, but we never seem to get to all of them. The bees and the chickens of course will take top priority.

Last year we did such a good job winterizing our beehives. We wrapped, we piled hay bales around the top bar hives, made sure everyone had enough food. And then, we essentially had no Winter – very little snow and not that cold. So we'll do it all again this year, in the hope that we have no Winter again. But we'll be ready. So far I've heard completely opposing predictions on what this Winter will be like – science says warmer and dryer, but tradition (Farmer's Almanac) says colder and wetter. I guess we'll know in just a little while.

And we still have three pails of honey sitting in the garage that will make nice Christmas presents if we ever get it bottled. Life is busy during the Summer and I actually look forward to the peace and quiet of a Winter day when you can use the weather as an excuse for staying inside and keeping warm, watching an old movie or reading.

The chickens are seven months old now. We're getting about 10 eggs a day. Yesterday, 11 – two of them blue. And I'm having as much fun as ever with them. They are people chickens, especially attached to me, but friendly with most anyone who comes along and will talk to them. There are a couple of bossy ones and a couple of shy ones. Like children they all have very distinct personalities. There is the ever curious one who makes a break for the door every time you open it. The coop is attached to the garage so she can't go far, but she'll wander around in there just talking quietly the whole time, as if she's really interested in what's going on. She's also one of the tamest. I pick her up and hold her and she just talks and talks. She'll sit on my shoulder as I walk around cleaning and gathering eggs.

Each morning when we let them out they literally fly out the coop door to the outside fenced in area, so happy to just be outside. These birds don't know about Winter. They've never seen snow. One morning soon Kim will open the coop door and oh my what a surprise it will be.

We've been working on getting the coop ready for Winter. We've piled some bales of hay around the outer walls to keep out the draft and keep in the warmth, we'll put plastic on the windows and we do have the warming lights we used when they were babies. We've had a couple of pretty cold nights already and they don't seem at all bothered by that. They snuggle together, fluff out their feathers and are just as happy as can be.

I tell you if we were all as happy as these chickens, life would be grand.

I wish you all a Happy Thanksgiving and a hope for a not too harsh Winter wherever you are.

Hardy Summers

A Closer Look

DRIFTING BEES

Clarence **Collison**
Audrey **Sheridan**

Drones drift more than workers, and end colonies collect more bees than center colonies.

Drifting is a behavior in which bees, both workers and drones, return to the wrong hive after leaving their parent colony (Free 1958). It is a common occurrence in apiaries, especially when hives are placed in rows with few landmarks or orientation cues for the bees. Drifting of honey bees is influenced by many environmental and apiary layout factors (Free 1958; Free and Spencer-Booth 1961; Jay 1965, 1966a, 1966b, 1968; Jay and Dixon 1988). If no suitable steps to reduce drifting are carried out, drifting may lead to spread of diseases and mites, loss of bees to other colonies and reduced honey production (Goodwin et al. 1994; Jay 1969a, 1969b; Traver and Fell 2011). A model developed by Pfeiffer and Crailsheim (1998) indicated that the population in an apiary consisting of unmarked hives standing in a row can consist of up to 42 ± 6% drifted bees. This indicates a high intermix of an apiary's population when no precautions to reduce drifting are taken.

Drifting depends on various environmental and apiary layout factors such as wind (Jay 1965), height of hives and height of entrances above the ground (Free and Spencer-Booth 1961) and the space between hives. Drifting can be reduced significantly when the space between single hives is at least nine meters and between two rows of hives at least 18 meters (Jay 1968). Drifting is always greater between hives standing in the same row than between hives in two different rows (Jay 1966a). Further reduction of drifting can be obtained by some specific apiary layouts, such as U, V, and sigmoid forms, by arranging the apiary in squares, circles, or by orienting entrances in different directions (Free 1958; Jay 1966b, 1968; Jay and Dixon 1988). Drifting is also influenced by the position and the apparent movement of the sun (Jay 1971; Jay and Warr 1984).

Bees are able to distinguish between related and non-related individuals so Pfeiffer and Crailsheim (1998) set up an experiment to determine if the level of drifting is dependent on the relatedness of individual bees and whether there are differences in survival of drifted and non-drifted bees. Two strains of non-related bees were used. The colonies stood in rows and each of the colonies had two non-related neighboring colonies, except for the colonies on the ends of the rows. From each colony, 200 newly emerged bees were marked individually and 100 of them were reintroduced into their original colony (native bees) and 100 into a non-related neighboring colony (foreign bees). The marked bees were examined for presence on their 2nd, 6th, 9th, 16th, 25th and 34th day of life. Experiments were done in Summer and Fall. There was no difference in survival and the amount of drifting of native and foreign bees. They also found no differences in the number of drifting bees for the two non-related strains. Many bees changed colonies more than once. The bees never preferred related colonies when drifting. Bees of strain one did not show any preferences. In two experiments significantly more bees of strain two drifted into colonies of strain one. Most bees drifted into the neighboring colony next to the colony they left. In Summer significantly more bees that had drifted until their 9th day of life, survived until the 25th day than bees that did not drift until that day. In Fall, they did not find this difference. This was true for bees of both strains. Drifting did not shorten the lifetime of the bees. This indicates a great tolerance against drifted bees. Similar to Jay (1965), they found that more bees drift from a center colony to the end colonies of a row than vice versa.

"More bees drift from a center colony to the end colonies of a row than vice versa."

The behavioral patterns of nurse bees that had drifted into a neighboring colony differed from those of non-drifted sister bees of the same age living in the same colony. Drifted bees spent significantly more time inactive and performed brood care tasks less frequently even though the time spent in the brood area was not significantly different between the two groups (Pfeiffer and Crailsheim 1999). Drifted bees were found to be slightly more aggressive than non-drifted bees. They found that drifted bees contribute less to the benefit of a colony but have no lower individual benefit, and partly explain a prolonged longevity of drifted bees due to reduced brood rearing activities and increased idle time.

Drones drift two to three times more frequently than workers with anywhere from three to 89% drifting with an average occurrence of 50% (Free 1958; Witherell 1965; Currie and Jay 1991a; Neumann et al. 2000). Marked drones of known age were introduced to queenright colonies of equal strength in five different apiaries arranged in different patterns in Manitoba, Canada. The extent of drone drifting was measured by counting marked drones in each colony (Currie and Jay 1991a). Most drones began drifting when six to seven days old when initiating mating flights. The proportion of drones that drifted increased with age to a level of 50% at 15 days old. The proportion of drones older than 15 days that had drifted from the parent colony remained fairly constant (50-60%);

"Drones drift two to three times more frequently than workers with anywhere from three to 89% drifting with an average occurrence of 50%."

21% of the drones drifted more than once. Drones continued drifting after they had left their parent colonies, with the level of drift fairly constant in all age groups of drones. At distances greater than 50 m, drone drift decreased with increased spacing between colonies. No drones drifted between colonies that were spaced more than 150 m apart unless other colonies were present at intermediate distances. Drone drift between hives with colored entrances, offset entrances or laid out in horseshoe formations did not differ significantly from colonies arranged in straight rows. Drift between hives in a pair was significantly lower than that within rows of five hives, when drones were seven to 10 and 14-16 days old. Drift from colonies at the ends of rows was not significantly different from drift from colonies in the middle of rows. There was no apparent tendency for drifting drones to collect in the colonies at both ends of a row. There was, however, a significant directional effect in which more drones drifted towards the south than towards the north, in west-facing rows. None of the apiary designs tested can be recommended for reducing drifting of drones in commercial apiaries.

Little is known about how a colony's queen state can influence the behavior of its own drones or the drones from neighboring colonies. Drones were marked individually with numbered tags and introduced into pairs of hives that were spaced one meter apart facing south. The queen state of one colony in each pair was altered (i.e. with a caged-virgin queen, caged-mated queen, mated-laying queen, queenless or pheromone trans-9-oxodecenoic acid) and the other member of the pair remained queenright. Drifting of four independent age groups of drones (five to 10, 10-15, 15-20, and 20-25 day old) was studied (Currie and Jay 1991b). A higher proportion of drones drifted to colonies with caged-virgin queens or to colonies with lures containing a component of the virgin queen's pheromone, trans-9-oxodec-2-enoic acid, than to either queenless colonies, queenright colonies or colonies with caged-mated queens. The proportion of drones that drifted to colonies containing virgin queens increased with the age of the drone. There was a tendency for drones from queenright colonies to drift westward. This appears to have masked the attraction of drones to pairs of hives that had the pheromone or virgin queen-treated colonies in the westerly position. Drift of drones away from colonies with virgin queens was not significantly lower than drift from either queenright or queenless colonies.

The mating flight is the riskiest period in the life of a honey bee queen.

"Drifting of honey bees is not a particularly important cause of the spread of AFB."

A major cause of queen mortality in apiaries may be the drifting of queens to foreign colonies. Perez-Sato et al. (2008) investigated the effects of distance between hives, entrance orientation and worker activity on queen drifting. Only 4.4% of queens (seven of 160 queens) drifted in their experiments, all during their maiden orientation flight and all to the closest neighboring hive. Neither drifting nor the length of time it took queens to relocate their hive was significantly affected by either entrance orientation or distance between hive stands (two m or five m). Queens drifted slightly more often when the hive entrances within the pair were facing in the same direction (5/80; 6%) than when they were facing in the opposite direction (2/80; 3%). However, queens took significantly longer to identify their hive and were more likely to drift when the number of workers at the entrance was lower than that at the neighboring hive. Their results showed that drifting can be low even when hives are placed in pairs with only two m between pairs, and that worker activity has an important role in guiding returning queens on their maiden orientation flight.

The impact of drifting workers and drones on evaluating performance data of honey bee *(Apis mellifera carnica)* colonies was studied using DNA microsatellites. Colony size, honey yield and colony *Varroa* mite infestation levels were evaluated from 30 queenright colonies. Individual honey bees (1359 workers from 38 colonies and 449 drones from 14 colonies were genotyped using four DNA microsatellite loci. Maternity testing was used to identify drifted individuals (Neumann et al. 2000). The drifting of workers ranged from 0 to 14% with an average of 5 ± 0.7%. The amount of drifting drones was significantly higher ranging from three to 89% (average of 50 ± 6.8%). No significant correlations were observed between the amount of drifting and colony sizes. Likewise, the correlations between drifting workers and drones with the phenotypic variance for colony honey yields and levels of *Varroa* mite infestation were weak and in no case significant. Thus, the low levels of drifting workers (due to performance apiary layout) and the high levels of drifting drones did not interfere with performance testing in this study.

Twenty-five pairs of honey bee colonies were established with the hives in each pair touching and the entrances facing the same direction. One colony in each pair had a light American foulbrood infection (less than 50 larvae with clinical symptoms) while the other (control) was uninfected. The colony pairs remained together for 5-388 days (average 103 days). Any heavily infected colonies were removed from the trial. Only two of the control colonies developed AFB. In a separate trial with two pairs of colonies established in the same way, an average of 5.72% of marked bees were in the wrong hive after two days (Goodwin et al. 1994). Trials where 20 uninfected nucleus colonies were fed 50,000, 500,000 or five million AFB spores in sugar syrup indicated that the control colonies were not particularly resistant to AFB; four of five colonies fed five million spores developed AFB. The results suggest that drifting of honey bees is not a particularly important cause of the spread of AFB. BC

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Managed Pollinator CAP
Coordinated Agricultural Project

From The Front Lines – The War Against *Varroa*

Sara **Ashcraft**, Chris **Mullin**,
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Chemicals Are Not The Answer. Here's Why.

Varroa mites have been a significant and consistent problem for honey bee colonies in the United States for the past 25 years. By using hard and soft chemicals and IPM practices, beekeepers have attempted to keep mite levels down and colonies healthy. Much effort has been devoted to study the life cycle, behavior and control strategies for *Varroa destructor*, and this information has led to the development of new management techniques beekeepers use for this pest. However, for the most part, many of these new practices have not resulted in adequate control or are impractical due to excessive labor, time, and/or cost of application and this has pushed some beekeepers to investigate alternative methods and products. One strategy has been to return to the old varroacide, amitraz which is currently registered for use in Canada and Europe in the form of impregnated plastic strips, under the trade name Apivar®.

Apivar® utilized for in-hive *Varroa* control is a product of Veto-pharma – France composed of 3.33% amitraz active ingredient and 96.67% inerts – ingredients that do not have to be disclosed. Apivar has emergency registration in Canada for use from July 1, 2011 to June 30, 2012. Label instructions state that honey supers need to be removed before two suspended strips are applied in each brood chamber or bee cluster, and then removed after six weeks. Honey supers cannot be added back to the colony until 14 days after strips are removed. The strips cannot be used longer than 56 days. This product is similar to Miticur® which was approved in the United States as an in-hive miticide from 1992-94.

Miticur®, a product of Intervet Inc., was registered for use in over-wintering and non-honey producing colonies for treatment against tracheal mites and *Varroa* mites. This formulation was composed of 10% amitraz and 90% inert ingredients and like Apivar® was applied in the form of impregnated strips. The label instructions were similar to Apivar®: remove honey supers, apply three strips in each brood chamber when bees are not producing honey, and leave for six weeks. Strips had to be removed before adding honey supers. The label also restricted the user from applying more or less than three strips per brood chamber. As to be expected, this product was more potent than Apivar, considering the higher % active ingredient, coupled with the use of three instead of two strips.

Amitraz, while formerly used on cotton and pear crops to control mite and whitefly pests (EPA, 1995), is currently only registered in the United States for use on beef and dairy cattle and swine to control ticks, lice, and mange mites, and on dogs to control ticks (EPA, 2006). The EPA registered amitraz as a pesticide in 1975 and it was conditionally registered for use on pears in 1979, and later registered for cattle and swine in 1986 (EPA, 1995). It was not until 1992 that it was approved for honey bee colonies as a miticide formulated in impregnated strips, but the registration was later cancelled (1994). The reason given by the manufacturer that led to cancellation of Miticur® was insufficient profits to maintain the registration (Kegley et al., Accessed 2012). Nevertheless, alternative and more effective varroacides such as tau-fluvalinate were already available to compete with the amitraz market. Formulations of fluvalinate, beginning with the nonregistered use of the flowable liquid Mavrik® available 1987 in the U.S. followed by release of Apistan® strips in 1988, became the mainstay for *Varroa* control along with coumaphos impregnated plastic strips (CheckMite®). Intensive use of these miticides has led to widespread mite resistance to fluvalinate, coumaphos and now amitraz among European strains of honey bees (Pettis et al., 1998; Elzen et al., 2000; Sammataro et al., 2005). The absence of novel, efficacious active ingredients to mitigate mite resistance to fluvalinate and coumaphos has led to the use of alternative off-label formulations of miticides in the U.S. by some beekeepers (Oliver, 2007). This and the over use of a few registered miticides has led to a toxic build-up of these in many hives and also in manufactured foundation (Mullin et al., 2010).

Taktic® is an emulsifiable concentrate miticide/insecticide produced by Intervet for the control of ticks, mange mites and lice on cattle, and swine, consisting of 12.5% amitraz active ingredient and 87.5% inert ingredients. This formulation is registered for use as a spray or spray-dip on cattle and as a spray on swine. There are currently no registered amitraz products for use in honey bee colonies in the United States. However due to limited options and desperation to keep colonies alive in the presence of *Varroa*, amitraz is finding it's way into U.S. beehives, likely in the form of Apivar® and/or Taktic®.

Amitraz and its degradates in the hive

While Bogdanov (2004) showed that fluvalinate and coumaphos are highly persistent in the hive, amitraz residues were not assessed. There are three major metabolites ⇨

of amitraz: 2,4-dimethylphenyl-N-methyl formamidine (DMPMF), 2,4-dimethylphenyl formamide (DMPF), and 2,4-dimethylaniline (DMA) (EPA, 1995,1996). Amitraz is easily degraded in the acidic environment of the beehive to primarily DMPF and DMA (vanEeden et al., 2004), especially in honey and beebread (Mullin et al., 2010). The non-target and mammalian toxicity of the degradates DMA and DMPF and the classification of amitraz as 'suggestive evidence of carcinogenicity' have caused the EPA to seek further reductions in amitraz use and to maintain a very low tolerance (acute reference dose of 12 µg/kg or 12 ppb) for its residues in foods (EPA 2006).

We have investigated pesticide residues found in hive matrices (Mullin et al., 2010) and while we have not detected amitraz in any of the samples analyzed, we have frequently seen its major, rapidly formed metabolites DMPF and DMA (Table 1). Almost 50% of the 242 wax samples analyzed have DMPF residues and 25% of those samples have DMA residues; both have relatively high average residue levels in the wax (2230 and 742 ppb respectively). Nearly 25% of the 426 pollen samples analyzed had residues of DMPF. DMPF and DMA were not as frequently detected in bee samples but the average residues for both were high: DMPF had an average residue level of over 1000 ppb while DMA had an average residue level of over 2500 ppb. DMPF was also detected in honey samples with an average similar to that in pollen; there were only 31 honey samples tested. In 2007 the USDA Pesticide Data Program added honey to their list of foods screened for pesticide residues. Out of 186 samples analyzed, amitraz and DMA were not detected, but DMPF was in 4.3% of the samples ranging from 4.2-27.5 ppb (USDA, 2007). In 2008, of 558 samples analyzed, amitraz and DMA were not detected, but DMPF was in 13.1% of the samples ranging from 4.1-85.1 ppb (USDA, 2008). The former EPA tolerance level for DMPF or total amitraz and its metabolites in honey was 1000 ppb.

Table 1: Samples analyzed for DMPF and DMA residues, including number of samples analyzed, number of detections, frequency of detections, range of detections, average of detections, and median of detections are shown in four different types of samples.

Sample Type	Metabolite	# of samples analyzed	# of detections	% Frequency	Range (in ppb)	Average (in ppb)	Median (in ppb)
Wax	DMPF	242	114	47%	9.2 - 26800	2230	251
Wax	DMA	242	60	25%	120 - 3060	742	437
Pollen	DMPF	426	99	23%	6.1 - 1117	126	75
Bee	DMPF	190	17	9%	6 - 9040	1101	197
Bee	DMA	190	2	1%	275 - 4740	2508	2508
Honey	DMPF	31	4	13%	7.4 – 555	126	34

Adult honey bee toxicity: Active ingredients versus formulated materials

We used laboratory bioassays to compare honey bee toxicity to the most prevalent active ingredients we found in our 2010 survey and their commonly used formulations (products that can be purchased consisting of active plus inert ingredients). One of the combinations tested was amitraz and its formulation, Taktic®. After finding an appropriate range of formulation doses to test, we used these same six doses to test for honey bee mortality with amitraz alone. The amitraz data were combined, the corrected percent mortality was calculated, and a probit analysis and proportion of survival were determined. The formulation data were treated the same (Figure 1). The estimated LD_{50} for amitraz is 103 ìg/bee, which is almost four times higher than that of Taktic® 28.5 ìg/bee. This means that Taktic® is nearly four times more toxic to honey bees than amitraz based on our results. The corrected percent mortality for amitraz and Taktic® were compared for each dose using independent t-tests. There was no significant difference detected in the Taktic® and amitraz control data for each experiment (t-value=0.00, P>0.05, df=10). There was a significant difference detected at the 54.5 ìg/bee dose for the Taktic® and amitraz experiment data (t-value=5.98, P<0.05, df=10). The other doses could not be compared statistically because there was no mortality in any of the

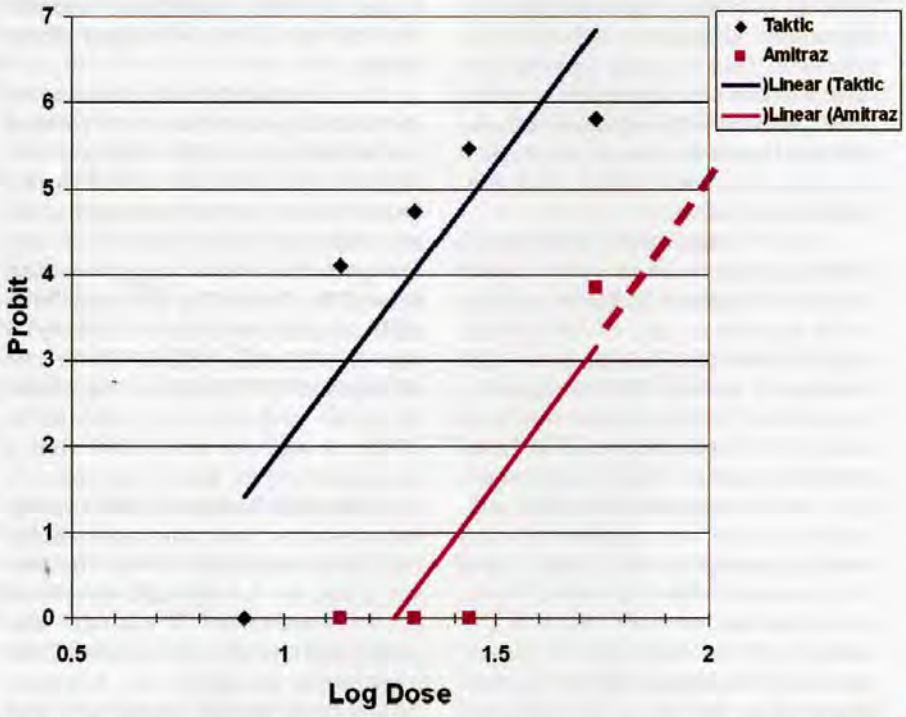

Figure 1. 48 hour probit analysis for Taktic® (diamonds with solid blue line) and amitraz (squares with dashed red line). for Taktic® fed orally to honey bees, the LD_{50} = 28.5 µg amitraz equivalents/bee. for amitraz fed orally to honey bees, the estimated LD_{50} = 103 µg amitraz/bee.

Continued on Page 28

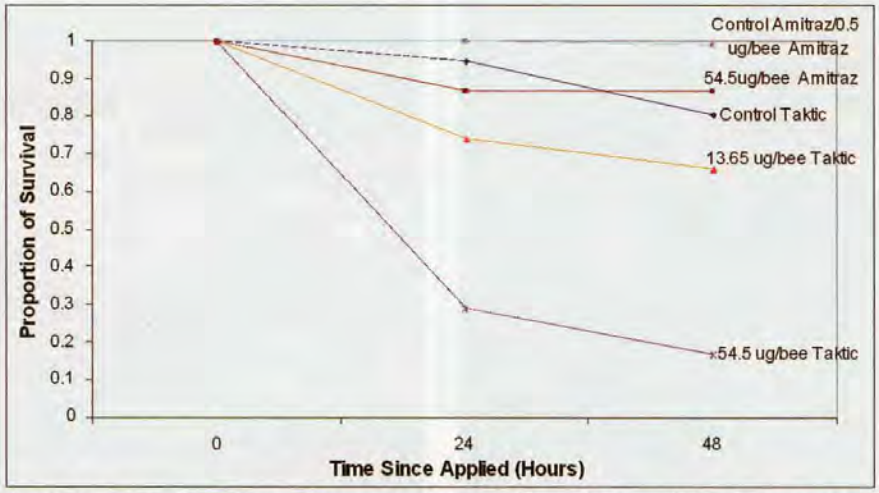

Figure 2: Proportion of honey bee survival over 48 hours for two of the six doses (high and intermediate) of Taktic® and amitraz compared to the control.

lower amitraz doses. However, an overall dose comparison showed a significant difference between amitraz and Taktic® (t-value=5.80, P<0.05, df=82). This is also shown by looking at bee survival (Figure 2). The two Taktic® doses showed decreasing bee survivability over time when compared to controls. The amitraz doses showed little effect on survivability over time, and the high doses had better survivability than the control for Taktic®.

The trouble with amitraz

The key here is to recognize the difference between the active ingredient amitraz incorporated into a solid resin strip, and a surfactant-rich liquid formulation such as Taktic®. The formulated product not only contains amitraz, the active miticide, but also includes inert ingredients designed to increase its efficacy against pests. These inerts include detergents, penetrant and spreading enhancers that help the active ingredient to get to where it could do the most damage to the targeted pest. A product designed for veterinary treatment of large mammal skins to control mites and ticks, like Taktic®, is not optimal for small invertebrate cuticles. The ability of the active ingredient to be spread throughout the hive and penetrate the bee cuticle with the aid of the formulated materials in Taktic® can result in increased mortality to mites but potentially to bees as well.

Amitraz use for mite control in honey bee colonies has other problems. Amitraz interacts with octopamine neuroreceptors either directly (Orr et al. 1990) or through degradation in honey and beeswax to the potent octopamine receptor agonist DMPF (Jimenez, J.J. et al. 1997; Korta, E. et al. 2001). While it is unknown if honey bees can bioactivate amitraz to DPMF, this amitraz metabolite together with DMA remain the major residues that bees are exposed to through nectar, pollen or wax after treatment of colonies with amitraz. The amitraz degradate DMPF was one of the contaminants in brood comb associated with delayed development and shortened longevity of honey bees (Wu et al., 2011). Octopamine is a primary neurohormone for bee behavior and is known to have roles in the bee dance (Barron et al. 2007), adult foraging (Giray et al. 2007), and heart rhythm (Papaefthimiou and Theophilidis 2011). Using amitraz to replace coumaphos and fluvalinate for varroa control due to mite resistance is thus likely detrimental to bee health. In addition, amitraz can synergize the bee toxicity of fluvalinate, further compounding the colony impact of interacting miticide residues (Johnson, 2011).

The USDA-ARS Carl Hayden Bee Research Center in Tucson, AZ has examined the resistance of *Varroa* to three in-hive miticides: fluvalinate, coumaphos, and amitraz (Sammataro et al, 2005). They often found that mites tested for susceptibility from colonies previously and repeatedly treated with different miticides were generally resistant to all treatments, especially in the fall. This could be from overuse or misuse of miticides in the hive, which could in turn result in higher mite loads within the colony. Resistant mites can easily move from colony to colony infecting an entire apiary and further vectoring bee viruses which can devastate bee health.

Lindberg et al. (2000) investigated the efficacy of 22 natural *Varroa* treatments, and found that thymol, clove oil, Magic3, and methyl salicylate had mite selectivity similar to formic acid, thereby killing *Varroa* at lower dosages than what causes bee mortality. Loucif-Ayad et al. (2010)

found that Apivar® had an impact on the nutritional homeostasis of 0, 7, and 21 day old honey bees, decreasing the amount of protein, carbohydrates, and lipids in the hemolymph compared to controls. Furthermore, the high chronic and other toxicities noted for amitraz in mammals including humans (Elinav et al. 2005) is likely to retard any additional registrations for its use in beehives for mite control in the United States. This probability is based on EPA's current review of amitraz that is requesting much additional toxicological data from the manufacturer to support its re-registration decision in 2016 for what is now a small market share (EPA, 2010). In addition, given the ability of mites to quickly develop resistance to synthetic miticides and the significant build-up of these materials seen in wax and pollen, we recommend that more emphasis be placed on the development and use of resistant stock and the use of soft alternative chemical control treatments. BC

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The Story Of Z

M.E.A. **McNeil**

It's a family business – from left, Amina Harris, who runs the office with son Josh Zeldner; Shoshana Zeldner, who works trade shows, and Ishai Zeldner the founding spirit who manages and fills in. (photo courtesy of Zeldner and Harris)

Everyone's story twists and turns; the trick is to create a path that satisfies. Ishai Zeldner's path has happily arrived at a warehouse full of honey, and the compass that guided him there has been a gift of generations before him: call it adaptability. In short, he created Z Specialty Food from a synthesis of his jones for star thistle honey and a knack for marketing bison. The result is a thriving business that surrounds him with family and products of the bees – all his loves.

On a typical day at Z, in Woodland, California, the warehouse is a purposeful bustle with a hive mentality – employees Daniel Rackett pasting labels designating light amber wildflower on gallon buckets for a baker, J.P. Marcelino De La Paz humming along on a forklift carrying honey drums to the warming room – guys "like family", according to Zeldner, who fills in where he is needed. Amina Harris, Zeldner's wife, is working in the adjoining office with their son Josh, who pops into the warehouse to prepare a shipment. The recycled packing material he uses is evidence of a company commitment to sustainability that comes with choosing a natural product: 90% of packaging is reused, they generate less trash than a house, and they ride bikes to work.

Josh and his sister Shoshana, who works trade shows, are fifth generation food merchants. This day, Josh wears a tee shirt with a buffalo graphic that could be read as a pictograph of the family history in a couple of ways: his parents' hometown is Buffalo, New York, and bison is a product that informed the work they now share.

In a way, the genesis of Z was with the adaptability of Zeldner's great grandparents, who fled the oppression of czarist Russia in the 1860s where they were forbidden to own land. They started a grocery store first in East London and then in America, "die goldene medina" – the golden country – in 1910, when his grandmother was a teenager. In Buffalo, the family grocery store evolved with the neighborhood – from Jewish before World War II to black. His father, said Zeldner, "began to cater to the new tastes: first raccoon and possum and later any kind of wild game that was legal. Bison, elk, moose, or bear – we bought and sold game meat from all over the country. We had everything, even whale meat until 1964. We also sold soul food we imported from the South. I didn't know it at the time, but it became a basis for this business."

To that business acumen, add a dash of wonder. A young man's wanderlust landed the young Zeldner, who had just graduated from the University of Buffalo, on an Israeli kibbuz called Beit Hashita. As it happened, he was asked by the beekeeper to help move some bees, and he was swept into the heady experience of loading a buzzing truck. "It was a remarkable night driving from the kibbutz, which is in the Jezreel Valley in the north of Israel," he said. "I'll never forget it, driving up the road to Nazareth – a long series of switchbacks. I remember Nazareth opening up before us; it looked like a bowl of stars." Then, with beekeeper Yusuf Gidron, he turned to working the bees full time. "I didn't know much. I had an opportunity to learn beekeeping from one of the top, if not the top beekeeper in Israel."

Zeldner learned the craft over various return trips from 1969 to 77. During the Arab-Israeli War in 1974, "all the men went to war and the high school kids ran the kibbutz. It was pretty impressive. I got to do things I had never done before – like plowing from midnight to 8 am." When the bee truck was needed at the front, he rigged a cart to a tractor to move colonies. That kibbutz had the highest concentration of losses from the war, and Zeldner remembers caring for the bees of a neighboring beekeeper who was killed.

In 1973, Ishai Zeldner worked on Clarence Wenner's queen catching crew. It was there that he found the star thistle honey that he so loved that he eventually started a business selling it. (photo courtesy of Zeldner.

Zeldner mops up at his first small location in the 70s. (Zeldner photo)

The hives of Ishai Zeldner supply the chunk comb honey sold by Z. (Zeldner and Harris photo)

This flexible division of kibbutz labor may have piqued the interest of the young Gene Robinson, another volunteer in the apiary, now a professor at the University of Illinois researching the social behavior of honey bees. "We both started as smoker boys. I was there for his first sting," said Zeldner, with amusement, since he says of his own continued devotion, "I was stung."

During his last year working in Israel, 1977, he was a government bee inspector, traveling the country. The major problem during those years was American foulbrood, and he recalls the burning of piles of frames and laborious scorching of boxes.

Because they have similar Mediterranean climates, beekeeping in Israel was modeled after California, where Zeldner subsequently went to further his training. He worked for Clarence Wenner, a respected queen breeder in Northern California, who was also mentoring Sue Cobey and Tim Lawrence, now at the University of Washington.

After five years of beekeeping experience, Zeldner decided to widen his education under Harry Laidlaw at UC Davis, where he studied for two years. During that time, he returned often to visit the Wenners. "I fell in love with yellow star thistle honey and would bring some back with me. I ended up giving away more than I could afford, so I decided to start a business. I bought some canning jars and drove up to the Wenners and bottled it. I developed about a half dozen accounts – mostly in Davis. We still sell to the Davis Food Co-op and Nugget Market, a local chain. I was sure I would be selling truckloads of honey within a year."

"We still aren't selling truckloads," said Amina Harris, who has known her husband since grammar school in Buffalo. She had become intrigued with cooking with honey when they met at a mutual friends' wedding, and their paths converged.

"Well," laughed Zeldner, "We sold one." Z does not sell to the mass market, although they have clients in Singapore, Japan, and China – where, they have learned, people distrust the Chinese product. "We keep everything in stock in minimal quantities because 80% of our customers are small. Then we can ship to them immediately within a day or two of receiving the order . . . We also sell to quite a few local beekeepers who need to fill in from their own crops to maintain their markets."

In 1979, when he started, "The gourmet shops I saw all carried imported honey. There was no one really marketing U.S. honey," he said. Wenner had some other honeys, and "a beautiful sweet clover honey from the High Plains" brought back by migratory beekeepers. "I believe that we were the first people to start selling varietal honeys and the quality of the honey. We like to see ourselves as the leader in that. Now it is pretty common."

Their sources and varietals have grown in number over the years. "Before the internet, it was get on the phone, talk to a beekeeper, call the associations – the same way we used to track down wild game. It was a lot more legwork in the days before the National Honey Board Honey Locator. Now we buy honey between Hawaii and Florida. We get comb honey from Idaho. We get pollen from Colorado and a couple of other places. We buy from migratory beekeepers like Ray Oliverez and Dennis Lohman, once they have finished selling in the Midwest, where prices are higher. We have been working with some of our suppliers for 25 or 30 years. I buy all our honey over the phone or by handshake – by trust, a lot of trust." said Zeldner. "Last week someone was trying to sell me several containers of Chinese honey for something like $.70 a pound. I'm glad we made the decision 33 years ago to stay away from imported honey, so it's not an issue for us."

The family has developed a keen enough ability to discern varietal characteristics that they don't need to test for floral source. "When we taste the honey we can tell what flowers are in it predominantly," said Harris. "You can really taste the differences, and over the years we have all learned the major characteristics. Yellow star thistle has a specific candy flavor, a very different flavor from any other honey; it always has a color that's a little bit green. If I was going to have candy made that tasted like honey, this would be my flavor. There are different scents: orange blossom has a scent of orange flowers. Flavorwise, the most complex honey that we have is lehua honey from Hawaii. It is unique, a tropical honey that

Ishai Zeldner with the pump that moves honey from the warming room into the bottling room, through a light filter at the Z facility.

comes from the ohia blossom – different from anything else we have tasted."

Honeys that pass their highest standard for color, bouquet and flavor make up their Gourmet Honey Collection, bottled under Moon Shine Trading Company, and labeled with a picture of the flower. This design originated with the family and has been widely copied. Those that make the cut are: light Northwestern Fireweed from the Cascade Mountains of the Pacific Northwest; High Plains Sweet Clover from the Mid-West, noted for a cinnamon flavor; amber Christmasberry with a butterscotch taste; Eucalyptus; light, mild, non-granulating Black Button Sage from the Southern California coast; Florida certified White Tupelo collected along the Apalachicola River in northwest Florida, also non-granulating; Southwestern Desert Garden, mostly from mesquite with catclaw and other spring blooms of the American Southwest; Oregon Blackberry; California Yellow Star Thistle; Southern California Orange Blossom, Hawaiian Lehua.

Josh Zeldner prepares a shipment with reused packing material. Customers recycle bubble wrap and styrofoam for another go-round out of the landfill. (McNeil photo)

Z sells a second line of honey, Island of the Moon, a more competitive grocery line: Alfalfa, Sage, Orange, Clover, and Wildflower. It might include, for example, a darker orange blossom honey, but it is still eligible for the varietal name. "The legal definition is too loose as far as I'm concerned," said Zeldner. "As long as the predominant percentage is the varietal you are naming you can call it that. In other words, you can have five kinds of honey, and if the orange blossom is 21%, you can call it orange. We don't do that."

"We don't blend our honeys," said Harris. "It's more expensive than it would be if we even did a little bit of blending." She added that regulations on blending may become more restrictive in the future.

Some honeys are sold by Z in bulk, like blackberry, raspberry, and meadowfoam, a flower that grows mostly in southern Oregon, which looks like a meadow of foam with a flavor like marshmallow or vanilla. They also sell creamed honeys, comb honey in Ross Rounds, propolis, royal jelly, and four kinds of pollen – some of which comes from elevations above industrial agriculture. In honey straws, Z packs 25 drums of nine varietals per year. Chunk comb in honey comes from Zeldner's own hives.

Honey is important to the Jewish New Year, Rosh Hashana, and Z is certified kosher to supply it. "Ironically," he said, "We run into competition with Israeli honey. A few years ago the government opened regulations to allow packers in Israel to import foreign honey from eight or nine select countries for a window of three months. So some of the honey coming out of Israel may not be Israeli honey."

As for the growing market for organic honey, Zeldner is skeptical: "We are offered organic honey from questionable sources – from China, from the Himalayas, from Nepal. How do you know it's actually organic unless you are going to test every drum?"

On another popular notion, he said, "When I first started, I occasionally heard the idea of using local honey for allergies, and over the years it started ramping up. It became once or twice a month, and now it is almost daily. There is science to show that it doesn't work." The reason he pointed out, is that allergies are mainly to wind-carried, not forager-carried pollens. He believes, though, that natural honey is beneficial to health independent of where it comes from.

"The darker the honey the higher the antioxidants in most cases," said Harris." Examples they cited are cultivated buckwheat, which is dark and rich with a high mineral content, and eucalyptus, which also has a high mineral content.

"We are diversifying. We were in Winters for 18 years, which is a center for almonds and apricots. Those are the first two things that we added, an almond butter and a honey fruit spread made from apricots and honey, that's all it is. And then we created small product lines around those," Zeldner said. They include six different kinds of nuts in honey – almonds, cashews, walnuts, pecans, filberts, and macadamia nuts – as well as a chocolate nut spread. They also sell a salsa-like condiment called cowboy caviar. "It's hard to make a living just selling

The bottling room at Z has a tiny door in the wall shared by the warming room, through which a hose brings the honey through a filter into the stainless steel tanks. The operation does not pasteurize or microfilter. (McNeil photo)

Ishai Zeldner with the chunk comb honey that comes from his own hives. An American, he was trained as a beekeeper in Israel and did post-graduate study under Harry Laidlaw at the UC Davis bee lab. (McNeil photo)

honey," he said, "That's why we branched out to other products. We recognized early on that honey consumption was somewhere between a half pound to a pound per person per year."

"We are becoming more of a one-stop shop," said Josh Zeldner.

Z is housed in a 4,000 square foot office and warehouse, coincidentally in the same building with Mann Lake, a beekeeping supply house. Big rolling doors open to a space full to the high ceiling with honey drums holding varietals from all over the country. "We do five to 10 drums per week," said Zeldner.

From the storage racks, designed by Josh Zeldner, drums are moved to a small warming room. The temperature is kept at a constant 120°, and air is circulated by a large fan. "The best way to liquefy honey is with hot water, and the second best is with hot air," said Zeldner pere.

"Most of the honey in America has been overheated and over filtered," said Harris. The enzymes and the pollens have been removed from it so that it stays perfectly clear on the shelf. Without pollen it's not really honey . . . There is something in the pollen that seems to help us."

"It is heated to 160°, which kills the enzymes, and they put it through micro filters, usually diatomaceous earth that removes the pollen, added Zeldner. "Our honey is filtered, but it is not put through micro filters or diatomaceous earth. We pump directly from the warming room." A small door in a common wall accommodates the pump hose that fills three stainless steel spigoted tanks. "It's a simple operation as you can see."

"We are not very big, but we have had a lot of impact," said Harris. The National Honey Board has recognized Z's Honey Apricot Spread as Best Honey Containing Product. Another award for their line came from the National Association of the Specialty Food Trade, and theirs was

Amina Harris with an award for their line from the National Association of the Specialty Food Trade. Their clover honey was named best in the U.S. by Food & Wine Magazine as well. (McNeil photo)

named Best Clover Honey in the USA by Food & Wine Magazine.

"The trick is, what is the level of creativity, what is the level of knowledge that keeps us ahead?" said Harris.

"When nature doesn't cooperate, like it's not cooperating this year, it gets harder. It's too dry," said Zeldner.

"The prices are going to be higher everywhere," she added. "We are cutting out some products, like some of the nut butters; getting good quality nuts is expensive. There is a lot left to do. People who buy from us are constantly looking for new varietals, and this year we are adding new ones." They are finding sources for blueberry, basswood, and cultivated buckwheat. They have new clients – beer companies and meaderies, and restaurants now order comb honey for a current vogue in cheese and fruit platters.

Perhaps, with the company dedication to sustainability, the testing of their pollen for pesticides could reveal some clean sources from non-agricultural areas – a potential market advantage.

You can meet these bright, personable, dedicated people at their next open warehouse tastings in December. Details of that and the Z products can be found at: **www.moonshinetrading.com/**. (Even the webmaster is part of the family – niece Erin Harris.) They write: "We are still able to marvel at the beauty and simplicity of nature's finest sweet each time we prepare and bottle our honey." The visitor leaves with a heady dose of their marvel. BC

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Swarms, Packages & Nucleus Colonies

Larry **Connor**

Sixth In A Series . . . Examine The Similarities Of These In This Instruction Guide

Last month we discussed the natural hive and it's many aspects. In this session I want to explore the relationship between two species, honey bees and humans. We start with a discussion about domestication of animals, and how honey bees fit into this process. Then we explore the natural reproduction of bee hives via the swarming process. We end with two methods beekeepers use to 'reproduce' a beehive, either through package bees or with smaller nucleus colonies.

Pre-teach: Is the honey bee domesticated?

In a discussion with your students, quiz the group about examples of domesticated animals – cattle, chickens, dogs, cats are good examples. Ask the students what would happen if humans suddenly disappeared, and these animals had no human to feed, shelter and care for them. How many of them would revert to what scientists call the 'wild type,' a more naturally-adapted variation of the animal. Ask students some of these questions for the purpose of discussion:

1. Would dogs become wolfs or just become more wolf-like?
2. Are cats really domesticated or just opportunistic – doing well with human care?
3. Would fancy chickens and gold fish retain their unique features or would they lose their fancy feathers or fins in a few generations in the wild?

Of all the insects, the honey bee has one of the longest relationship with humans. First the colonies were hunted for their honey and wax. Then some humans found that they could put bees into containers and exploit them for food, and place the bees closer to human dwellings. Look at different cultures in Africa and Asia and see how they deal with bees. Do they hunt them exclusively (like the honey hunters of the giant honey bee) or do they manage them in special structures (log hives, clay tube hives etc.)?

Bees swarm throughout the foraging season. Here is a swarm flying over my hives in mid-September during a heavy nectar flow. Undoubtedly the source hive was honey bound and the bees were stimulated to split and some of them find a new hive (an empty colony I hope).

Establish that the simple act of putting an animal in a cage or box does not domesticate the animal. A lion in a cage at the zoo is not a domesticated animal, one you would let out in the house like you might do with a dog or cat. The same is true with bees, the simple act of putting honey bees into a container does not make them domestic. They survive well without humans, and many do around the world. Humans are engaged in the care of these insects in a form of animal husbandry, where the animal benefits from the care and attention give by the human.

What would it take to make honey bees domesticated? There is no clear answer to this, but propose to the students that the natural act of dividing one hive into two or more, by swarming, has been con-

sidered the indicator of true domestication. If a colony never swarms, and relies only on humans for colony reproduction, then the bees would probably be considered domesticated. Would this be a good development for bees? For humans?

Swarming

It will be extremely difficult to coordinate a hive of bees so it will naturally swarm when you are teaching your class, so search the Internet for video clips of bees actively in the swarming process. Here is a partial list of facts or bits of information your students may gather from these clips:

1. Swarming is the hive's natural method of reproducing the social unit. Since individual bees and/or queens cannot live alone, there must be a method of the colony division to create new bee colonies. Swarming is that method.
2. Swarming tends to be associated with abundant food coming into the hive, in the Spring and again in the late summer, depending on the natural abundance of food in the area. In tropical areas, swarming is associated with flower development following a rainy period, stimulating plant growth and flowering. In some areas, bees may swarm more than once per year if the food supply is that copious.
3. Swarms are often very gentle and do not pose a hazard from stings.
4. Swarms have an elaborate method of deciding where the new colony will go and start its own home. Dr. Tom Seeley's Honey Bee Democracy is a discussion of this fascinating topic.

Package bees and nucleus colonies

Before 1850, most beekeepers obtained new colonies by catching swarms and putting them into an empty container – a basket, a box, or some other structure. Even today many beekeepers unintentionally let their colonies swarm when the conditions are correct. They may forget to give the bees plenty of room to put pollen and nectar as they bring it in from the field. Since it is part of the hive's instinct to swarm (they are not domesticated, agreed)?,

Are Honey Bees Domesticated? Yes? No?

then it is often nearly impossible for beekeepers to stop swarming unless they perform major manipulations to the bees to counteract this strong instinct. Whole articles and even books have been written about the battle beekeepers fight to prevent swarming!

Package bees developed out of the human urge to duplicate swarming, but to control the make-up and use of a colony. Packages of bees are usually made with two to four pounds of bees shaken from brood frames of strong hives, once the beekeeper has found the queen and makes sure to set her aside so she is not put into the package. To these bees, kept in a cage of wire and wood, the beekeeper adds a newly mated queen honey bee, but rarely, and usually only accidentally from the colony from which the bees are shaken.

This package may be moved long distances, by truck or by airplane. They are even moved from one country to another when allowed to do so. Quite often they are produced in a warmer climate and shipped to an area where the weather is just staring to warm for the Spring and Summer, when there will be nectar for these bees to gather.

When the package bees arrive they are put into a box. How? Quite often they are just shaken out of a box into empty beekeeping equipment. The queen bee is in as special cage and she is positioned so the bees will assemble around her because of her chemical scent or pheromone. A candy release plug keeps the queen confined for a day or two until the bees eat out the candy and liberate their new queen.

Once the queen is released by the bees, she should start to produce eggs and begin the new season with this 'artificial swarm.'

Nucleus hives

Beekeepers often favor the nucleus or increase colony

A package hive. The beekeeper is removing the wood and screen cage to install the queen in the hive before shaking the bees over her.

as a method of increasing their colony numbers. Like the nucleus of a cell, the beekeeper starts a small hive with the key parts of a hive: frames, honey, pollen, bees and brood. To this they add a queen bee, either laying or as a queen cell or virgin queen. The colonies are often made in the spring when queens or queen cells are available. If queen cells are purchased, make sure there are drones in local hives ready to mate with the ladies?

Nucleus colonies are usually made with:

1. One or two frames of sealed and emerging brood and bees to cover the frame.
2. One frame of honey and pollen, plus bees to cover the frames, or two partial frames
3. One or two frames of drawn empty comb or foundation.
4. A queen (laying, virgin or queen cell)
5. A food supply (jar or can of sugar syrup) above the hive where the bees are able to obtain the food and take it down even if the weather is cold.

Class activities

1. Order and install a package bee colony, either in the class apiary or at a beekeeper's private apiary. Have the students do some research on how to do this and develop a plan for who does each step of the installation process.
2. Monitor the package colony for a time to make sure it has adequate food (or feed the package colony), and monitor the egg laying by the queen and the production of new bees by the entire colony.
3. Predict the strength of the colony by determining the number of eggs the queen is laying each day and projecting the number of bees that will emerge in the hive 30 and 60 days after the package is installed. Compare this with what actually happens to the hive!
4. Go to a beekeeping operation and observe (and help) in the process of making an increase nucleus. Most beekeepers find the queen in a colony and set her aside in a cage or in a safe box. Then they select two frames of bees and brood (some with bees emerging) and place this into the new box. They add one or two frames of honey and pollen, and leave at least one frame for the bees to work on as they emerge.
5. Monitor the development of the increase colony.
6. Compare the development of a package of bees with the

Nucleus colonies are often used to increase colony numbers. Each box contains one queen and 5,000 to 15,000 bees.

increase colony set up at approximately the same time. Which builds faster? Which produces more honey at the end of the season?

Final discussion and Report

Remind the students of the question: is the honey bee domesticated? Have they changed their opinion now that they have worked with bees? Have them each write a report on the swarming process and how humans attempt to duplicate that behavior by using package bee colonies and nucleus hives. BC

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Vocabulary

Pheromone, swarm, package bee colony, nucleus colony, increase nucleus, domestication, feral bees or animal (cat, dog, chicken), colony division, nest-finding, food frame, brood frame, emerging bees

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Check out the new website www.honeybeespeak.com. This offers a matching service for folks who speak about bees and beekeeping, and the groups who seek their services. You may sign up both as a speaker and as a person who will receive notices of speaker activity.

January is time for the Serious Sideliner Symposium, held as part of the American Beekeeping Federation Convention in Hersey, PA. The SSS is held on Thursday and Friday of the convention. If you are a small scale, sideline, or semi-commercial beekeeper, come and join us for the two-day event.

Two new Wicwas Press titles are Beekeeping Equipment Essentials, *by Ed Simon, who has written for* Bee Culture, *and* Bee-sentials: A Field Guide, *by the author of this article. Go the PayPal bookstore at* **www.wicwas.com** *for further information.*

GORMANSTON

Meeting Ireland's Best

Jennifer **Berry**

Over the past 15 years, I've attended and presented at numerous beekeeping meetings from Georgia to California, Maine to Texas. I've also had the privilege to attend meetings held internationally in places such as Bolivia, England, and more. There is no doubt that these opportunities have been the highlight of my extension duties while at UGA, however, some of these meetings were better than others, and sadly there were a few that left me feeling unfulfilled to say the least. That said – what is it that separates the great meetings from the not-so-great? I'm of the opinion that good folk, good food, good drink, and good music are always a good start. I understand that most meetings, especially at the local level, are unable to put out the red carpet for just an hour, once a month. In contrast, the larger state meetings, often lasting a few days, have more flexibility.

Planning a meeting is much like planning a party – first and foremost you want your guests to enjoy themselves! In both cases it is often beneficial to employ an overarching theme. Is it a costume party, birthday party, cocktail party, shower, backyard BBQ, formal sit-down dinner, or casual shin-ding celebrating your bosses' retirement. For a beekeeping meeting, your "theme" is pretty much decided for you: it's a beekeeping meeting. However, depending on the length of the meeting, you may be able to play around with the individual evenings to spice it up a bit. For instance, at our 2006 EAS meeting here in Georgia, the Friday night banquet's theme was a "southern ball," where folks dressed up in their finest "Gone with the Wind" attire.

Next, one must decide who to invite to lecture at the meeting. Most topics allow for plenty of qualified candidates to choose from; however schedules do fill up fast so it's often smart to extend invitations at least a year in advance. I'm *already* working on speakers for 2014 for our Young Harris Bee Institute. If the meeting calls for multiple speakers try to select ones with varied backgrounds and expertise. You don't want five lecturers all talking about honey bee biology or mead making.

After your speakers are in the bag, start planning what food and drink will be provided. You may be able to use the theme of the meeting to help determine what and what not to serve. For instance, you wouldn't serve

Gormanston Castle.

kegs of beer and hot wings at a baby shower, but for an outside BBQ, it would be just fine. Another indulgence which should not be neglected, is the presence of *appropriate* music. Music adds background elegance which immediately sets the mood and relaxes folks, unless of course it's Guns and Roses or AC/DC.

Our primary reason for attending these meetings is to learn more about bees, however, it also offers the opportunity to establish new connections, see old friends and make new ones, or discuss the latest new widget or converse about some innovative management practice. Though facilitating information is the predominate priority, one should not do so at the cost of eliminating a chance to enjoy the company of others within a group linked by a common interest. Therefore, make sure to devote attention and planning to help cultivate a social atmosphere at your meetings as well.

As mentioned earlier, I've attended my fair share of meetings over the years, but one in particular truly exceeded my expectations. The Federation of Irish Beekeepers' Association, Gormanston Summer Course, in my opinion, sets the standard for what makes an enjoyable, informative, and well-rounded meeting. Not only is it held in Ireland, (which doesn't hurt) but it's hosted by Gormanston College, which touts a beautiful campus amongst a breathtaking landscape. Additionally, the college is equipped with its very own castle (it is Ireland folks . . .), not to mention the feral colony inhabiting one of the castle turrets. All of that aside, what really separates this meeting from the rest is the people. Both the organizers and attendees all seem to ooze with excitement and passion – you can't help but recognize they are really enjoying themselves.

The Gormanston Summer Course maintains a superior reputation not only among Irish beekeepers but throughout Europe as a whole. The college gets its name, Gormanston, from a tiny village located in the County of Meath, where the Summer course is held. Roughly 20 miles north of the Dublin airport the town consists of no more than a few homes, the college, and two pubs; the Huntsman and the Cock, of which the latter claims to be the oldest pub in Ireland. The college campus makes up the majority of the town and encircles the Gormanston castle located at its center. It's a fairly new castle by Irish terms, built only a *few* years ago back in the 14th century. The castle was constructed by the Preston family, who managed to hold onto their estate and the surrounding lands until the 1950s. The original patriarch of the Preston family was awarded the title of Viscount Gormanston. Viscount or Viscountess (for female) is a title given to European nobility, which according to ranking, is above that of a Baron but just below an Earl. The title is currently held by Jenico Preston, the 17th Viscount Gormanston, whom resides in London. However, the family sold the castle in the 1950s to the Franciscan Order of Friars, who founderd Gormanston College initially to serve as a boarding school for boys. After the Franciscans purchased the Castle they soon built a large addition which is now a public, coeducational, secondary Catholic school under the trusteeship of the Franciscan Province of Ireland. When school is out for the Summer, the college is open for groups and organizations to hold various camps or courses.

Lecture hall at Gormanston.

The first Summer course was organized in 1947 by the Federation of Irish Beekeepers' Association (FIBKA) and was held at the University College Cork (UCC) with Mr. H.J. Wadey, editor of *Bee Craft*, as guest speaker. Between 1947 and 1960 the host-site for this annual course hopped around the country until finally settling at Gormanston in 1961. Since that time, the FIBKA has held their annual Summer course solely at this location,

Judges at the Gormanston Honey Show.

Richard Jones of IBRA and Jennifer Berry.

Cows and castles.

Single women in search of men.

now totaling 52 years!

Every year since its inception, the organizers of the course extend invitations to international guest speakers. This list includes individuals from all over Europe, Canada and the United States. To mention a few, past speakers include: Dr. E.E. Edwards, Mr. A.S.C Deans, Dr. Colin Butler, Mr. C.C. Tonsley, Mr. Robert Couston, Dr. G.F. Townsend, Mr. Ted Hooper, Mr. Adrian Waring, Dr. Francis Ratneiks, Mr. Norman Carreck, Dr. Mark Winston, Sue Cobey, Mr. Clive de Bruyn, Dr. Keith Delaphane, Dr. Dewey Caron, and Prof. Robert Pickard. Their guest speaker for 2013 will be Mr. Fleming Vejsnaes from Denmark and 2014, Dr. Thomas D Seeley, of Cornell University. I had the privilege of serving as their guest speaker for 2012, an honor I will cherish for years to come.

The course spans an entire week, starting on a Sunday evening with closing ceremonies commencing Friday afternoon. Attendance currently ranges from 300-350 participants, and seems to generate an ever increasing audience. The first course had only 60 people. Attendees often take lodging in the dorm rooms on campus (no Holiday or Hampton Inns around here . . .). The campus contains a cafeteria capable of accommodating even the largest of crowds. They provide breakfast, lunch and dinner, each of which is served with a bowl of boiled or fried potatoes. The presence and availability of the cafeteria was a valuable resource as there aren't many other local places to eat, other than the pub. Absolutely no fast food chains, which was a pleasant change. Actually driving through a good portion of Ireland, I only saw one fast food joint, a Burger King. What a pleasure it was to stop in a town, find a local pub, have a warm bowl of soup, yummy brown bread, and cup of tea and not have it taste exactly the same as the previous pub's food. The Irish haven't homogenized their cities and towns yet and I for one believe they are all the better for it!

Jennifer with Gormanston hives and beekeepers.

The weeklong program was structured to benefit the needs of beginners to even the most advanced of beekeepers. Each afternoon was devoted to various workshops including: queen rearing, bee anatomy, morphometrics, wax-working, mead making, etc. The course also offers the Federation of Irish Beekeepers' Association examination, which is quite similar to our Master Beekeepers certificate, with entry levels leading up to 'Lectureship', which equates to our Master level. Last but certainly not least the course includes the Irish National Honey Show, often including participates which also take home top awards at the London Honey Show every October.

To reiterate, I believe the attention devoted to creating evenings filled with lively social banter is what really gives this course its unique charm, and separates it from the pack. Following a full day of listening to speaker after speaker, isn't it refreshing to have an unstructured, though guaranteed, hang out session to 'chew the fat' with a group of likeminded folks? Each night there was always a source of entertainment, from table quizzes to discussions, to competitions and music, song and dance. And let me tell you, the Irish love to sing! My favorite night consisted of the entire college meeting at the pub and having spontaneously generated a table vs. table singing contest; one person stood up and belted out a tune, upon their completion someone from the next table over jumped up and followed suit, and then the

next table and so on. Some songs were funny, some sad, some historic and yes, some even a bit bad, but all in all it was just what everyone needed! When it was my turn to sing, I shamefully resorted to "Home on the Range." Perhaps not the best choice, I admit, but in the heat of the moment I couldn't remember the first stanza of "Georgia on My Mind" and had to improvise. At the conclusion of the course I departed feeling I had learned so much, met some amazing people, and obtained so many wonderful memories.

There was a legend told to me while at Gormanston I feel I must share. Myth holds it that when a family patriarch is in his final hours, the foxes of County Meath, with the exception of nursing vixens, emerge from their earths and make way to the door of the Gormanston Castle to keep vigil until his passing to show thanks for the deliverance and protection from marauding predators provided by the previous Lords.

Following the conclusion of the conference I traveled to visit a few friends. My first stop landed me in Hillsboro, Northern Ireland to visit with Michael Young, MBE and his lovely wife Rae. Next I ventured across to Gallway and Liscannor for a hike along the ocean and then southeast to Tipperary where I initiated the beekeeping side of the trip.

I stayed with Mary and Gerry Ryan, who both hold the equivalent of our Master Beekeeping Certification and are wildly involved in all aspects of beekeeping. They live outside of Dundrum, in the county of Tipperary. And yes, it is a long way to Tipperary with roads no wider than a mid-sized car, squeezed between sheep pastures, rock walls, hedges, and cliffs. I must admit, however, once I was finally able to pry my white knuckled fingers from the steering wheel, I was completely entranced by the scenic landscape. When I arrived at the Ryan's farm, I came to find Michael Gleeson and Jim Ryan there as well. It was a like a mini Gormanston reunion. The duration of my visit featured a whirlwind of touring castles, abbeys, pubs and apiaries.

One fond memory of mine is visiting Micheál Mac Giolla Coda's bee breeding operation. Micheál is the chairman of the Galtee Bee Breeding Group (GBBG), a group dedicated to the study, improvement, conservation and propagation of the native dark European honey bee, *Apis mellifera mellifera*. Impressively, they have been at it now for over 20 years. In the beginning, there were only four members: Micheál Mac Giolla Coda, Redmond Williams, David Lee and Johnny Carrigan. Over time, membership has grown along with the implementation of a few program objectives: a simple system of colony evaluation, record keeping, culling and selection. Any colony showing undesirable traits such as over-aggressiveness and excessive swarming are re-queened at once while colonies with the desired characteristics (gentleness, decreased supersedure, longevity, productivity and purity of strain) are selected.

Each year improvements are made to the local stock via selection methods coupled with morphometric analysis. Additionally they utilize instrumental insemination from selected queens and drones to produce numerous combinations for queen-distribution to members who are then encouraged to keep records. Queens selected to stay in the program are allowed to propagate drones in order to saturate not only the breeding apiary but the whole of

Philip McCabe PRO FIBKA, Gerry Ryan Summer Course Convenor, Seamus Reddy President FIBKA, Jennifer Berry, Eddie O'Sullivan, Past President FIBKA, Mary Ryan Summer Course Convenor, Terry Clare President BIBBA, Alan Jones Executive BIBBA.

Galtee/Vee Valley. Just for reference, the Galtee/Vee Valley is located in southern Tipperary County. The Galtee/Vee valley is positioned between the mountain ranges of the Galtees and the Knockmealdowns and runs about 15 miles long and five miles wide. In the center of the valley, the GBBG has established a breeding apiary, which serves as the headquarters for most of their activities.

Education and training is another endeavor of the GBBG. Workshops devoted to honey bee improvement and queen rearing, winter discussion groups, along with a quarterly newsletter called "The Four Seasons" are all ways they facilitate information to beekeepers.

On a side note, and a cause of concern to the GBBG, up until several years ago, the Emerald Isle was off limits to the importation of exotic (non-endemic) honey bee stock. But recently the Northern Ireland Ministry of Agriculture has reversed their original ruling and now allows the importation of queens from different parts of the world. The members of the GBBG, along with other Irish beekeepers, fear that if this trend continues it may have deleterious effect on the purity of their native bee which they have tried so hard to preserve.

If you are searching for a vacation opportunity that includes a bee meeting, look no further, you must attend the Gormanston Summer Course! I can't imagine you will

Singing contest.

Micheál Mac Giolla Coda and his daughter Aoife examining mites under the scope for bite marks, a sign of grooming behavior.

From left to right, Michael Gleeson, Jennifer Berry, Mary Ryan, Jim Ryan and Gerry Ryan.

leave disappointed. And if you're a president, board member, or on a planning committee that organizes meetings of your own, take notes while you're there. These folks really know how to put on a top-notch meeting.

I want to extend thanks to all my friends in Ireland that contributed to this amazing adventure. Michael Gleeson, thank you for inviting me to be a guest lecturer at Gormanston 2012, and for the information you provided for this article. Kevin Lincoln, thank you for permitting use of your beautiful photos. Mary and Gerry Ryan as well as Michael and Rae Young, thanks for your generous hospitality. Jim Ryan, Eddie O'Sullivan, Eamon Magee, Seamus Reddy, Richard Jones, Micheál C. Mac Giolla Coda, Aoife NicGiolla Coda, Ben Harden, Terry Clare, and Dennis Ryan thank you for your gracious help, beekeeping wisdom, guidance and friendship. And to Brother Kennedy, a spry 80-year-old veteran beekeeper and author, whose first words whispered to me were, "When it comes to bees, there is always more to learn . . ."

And learn more I will! BC

Jennifer Berry is the research director at the University of Georgia Honey Bee Research Lab.

My Grandkids And My Bees

Living On The Edge

My Grandfather

My grandfather, born into this world in 1898, taught me to drive a standard shift vehicle. Being the oldest grandson, it was a learning experience for both of us. Due to a genetic condition, *Grandpa* was unable to walk. During hot, Summer months, we would sit beneath tall pecan trees that 60 years earlier, he had planted. As a nine-year old, I would sit behind the steering wheel of his 1951, half-ton Dodge pickup[1] – that was ***not*** running – I would disengage the clutch and pull the shift lever and shout to him, *"Grandpa, is this first gear?" "No, Jimmy, that's high gear. First gear is above high. Come down and then up to get first gear."* These episodes with my grandfather occurred on long, slow, hot Summer days. I didn't have much more to do other than practice my standard gear shifting lessons. Over time, and with a lot of gear grinding, I became a proficient standard shift driver – thanks to my Grandpa.

Aside from the truck, he taught me how to make a figure-4 trap trigger[2] for catching live quail (I never caught a single bird, but I loved trying). We made sling shots from pecan branches outfitted with long strips of inner tube and a re-purposed shoe tongue as the stone holder. He taught me primitive whittling with a pocket knife that he kept razor sharp. He introduced me to shooting his single barrel, 12-gauge shotgun. At night, we sat on the dark front porch, surrounded by all the night sounds, and he told me stories of his youth. Most of his stories involved a mule or a bicycle that he called a *wheel*. We did all this while sitting.

During all these episodes, I do not remember a single time when my grandfather and I talked about honey bees – *not once*. We talked at length about "stings" but they were always administered by wasps and hornets. During nine months of the year in south Alabama, these stinging insects were everywhere. Stings were common and the remedy was easy and (I hope) effective. Grandpa would take a strip of chewing tobacco from his "*Beechnut*" pouch and rub the tobacco on the sting site. Even today, the folk medicine literature is replete with this recommendation[3]. Over time, we both grew older and now it's my turn.

Now, I'm grandfather

Now, I am *Pop-Pop* or *Grandpaaaa*. I only had one grandfather, my other one dying long before I was born. My only grandfathering experience is what my mobility-limited grandpa saw as being his job description. To my knowledge, there are no books on being a proper *Grandpa*. Since I was last a young grandson, all kind of things have changed. To date, I have introduced my grandkids to: my Erector set, my Daisy BB gun, simple woodworking, and tractor riding. But what about my rabid interest in honey bees. When are my grandkids ready for exposure to my bees? I have no experience in this area. I am stumbling through the event. What has been your experience?

Grandfathers are also fathers

I am at once a father and a grandfather. As a beekeeping father, I suppose, I didn't make the grade. None of my daughters have shown a significant interest in bees. They have literally been exposed to beekeeping since they drew their first breath. At this very minute, none of the three can tell you the difference between a super and a frame. They have been to innumerable bee meetings and sat through hundreds of bee discussions. Clearly, simply going to meetings and being around beekeepers will not always make one a beekeeper. So, no sense it trying the same with my grandkids. Obviously, changes need to be made.

But there are restrictions when making changes. A Grandfather must follow the rules laid down by the daughter (or the son – there are three daughters in my case). So there are limits to how much Coke and Oreos these kids can have – even if I want more. When I felt that the two oldest could be exposed to bees, I broached the subject with one of my daughters. *"Hmmmmm, are you **sure**?"* How can anyone ever be sure about bees? I was *"pretty sure."* The unspoken nuance was, *"If you take my kid to that beeyard, nothing bad had better happen to them – nothing."* Help me here. We are all beekeepers. How could I possibly guarantee that absolutely nothing bad would happen? If something does go wrong, there is a real chance that this young person will never care for bees. Yet, I work bees all the time. I write articles like this one. I knew I just had to try.

Each of my three daughters has a kid or two. Presently, I have five grandkids – two boys and three girls. The oldest two – girl (eight years old) and boy (six years old) are the ones who seem old enough to have a bee interest. I am no role model for other grandfathers, but I have had some luck in the following areas.

[1]More on the old Dodge. My brother fully restored the vehicle. It was featured in "Classic Pickups of the 1950s" by Mike Mueller. A photo can be seen in: **http://goo.gl/rZ3x4** It is the red and black truck on the last page.

[2] Figure-4 trap trigger design **http://www.wildwoodsurvival.com/survival/traps/figure4/figure4.html** (Mine was not a deadfall, but a wooden cage.)

[3]For example see: Online Archive of Folk Medicine, **http://www.folkmed.ucla.edu/** (search "sting")

My oldest daughter about 35 years ago. She's still not a beekeeper.

Incidental short trips

Quite accidentally, I invited my grandson to come along as I set a few colonies off in an apple orchard for Spring pollination. It was raining so the weather was cool thereby making the bees very quiet. You know the drill. Even when the bees are quiet, things can quickly spiral out of control so I partially suited up. That gave my unsuited grandson the impression of pending danger so he opted to safely sit in the truck cab. After preparing for the unload, all seemed normal so I asked him to stand on the trailer for a quick photo moment. He was diffident, but he did the deed. All went well and the photo served as proof that he was involved in the bee operation. From this experience, I sensed that I could slowly move to other phases.

Kid-sized bee suits

These full body suits are pricey and the kid will soon grow through it, but I plan to use the suit for as many times as I have grandkids. Even the smallest suit hangs on the kid, but a combination of safety pins and duct tape and all has been made to work well.

Oddly, something good happened with the bee suit project. Suiting these kids up in a kid-sized suit seemed to give them a sense of "ownership" or something. This was not just an improvised protective outfit, but a *real* bee suit so they could perform *real* bee work. I don't know how long this will inspire them, but for now, just buying the suit was a significant move in the right direction.

While it has been fairly simple to improvise rain boots as protective foot wear, I have had problems finding tight fitting leather gloves for my grandkids. To date, it has been simpler just have them pull their hands into their sleeves and hold the sleeves closed. Am I unintentionally teaching these kids to work bees without gloves? Let me get back to you after they take a sting or two.

Laying worker colonies and secondary swarms . . . and kids

Though my grandson is standing beside a productive colony in the photo, I actually introduced him to his first beehive – a fine specimen of a laying worker colony – one that had a high population of non-stinging drones and a few demoralized workers and no queen. The absence of the queen was not lost on him as he dutifully searched for her. I didn't have the heart to face my subterfuge and tell him there was not one there. I simply said that we could not always find the queen. To his young eye, he was staring danger in the face and was winning. I felt pretty good, too.

In another episode, I had a small, secondary swarm that had been recently relocated from an inconvenient site. It was a kitten of a colony, but headed by a young queen and surrounded by a cup of bees. In order to bolster confidence and add some zip to an otherwise humdrum beehive event, I videotaped our hive examination. I edited it just a bit and posted it on YouTube. As he was so inclined, he could show the short clip to his pals – just to prove he truly is an advanced bee man. The video is posted at: http://youtu.be/oaxgr2bCx4I.

Not a lot of help but a lot of company.

Presentations at Day Care and grade school

A guaranteed success event is to show up at the kid's classroom (with prior arrangements of course) and present a lively discussion on honey bees. I always give my grandson and granddaughter full billing on everything. They get to choose who tries on the veil and who gets to puff the unlighted smoker. I let my assistant pass around the beeswax cake for touching and sniffing. If practical, I will take in an observation hive for review.

Strangely, I have found these events to be the least bit stressful. I want it to be a memorable time for my grandkid, and I want all to be entertained and to be safe around the observation hive. The kids are usually hyper-charged and I am not the best disciplinarian. I depend on the teachers to bail me out should I need it. For instance, many years ago, after describing the function of the Mother Queen and all her workers, a pre-school girl with golden tresses asked if the Mother Queen was crying because some of her children bees were dead. There were a few dead workers on the bottom of the observation hive. I told the little girl that the teacher would answer her question after I had left. I don't know how that story ended.

Anything to do with bees and magnification devices

I have good luck entertaining my charges with simple microscopes and magnifying glasses. They always like looking up-close and personal at the bees. Additionally, I too, like to look at the bees through the glass. Till now, I have not tried to open the bees up for internal viewing. This project depends on what magnifying equipment you have.

My grandson sporting his bee suit. Note that his hands are pulled inside his sleeves.

My two-year-old granddaughter's first sting.

The next phase

Pending some major change, I plan to take my grandkids out to the real beehives more often. I don't know what else to do other than help them gain confidence in and around the hives. I know the first sting will be pivotal. Some kids and some adults simply have no interest in developing a tolerance to bee stings. I can only wait and see.

A harbinger of things to come

In early September, I was swinging my two-year-old granddaughter in her kid swing when she began to get fidgety and antsy – then outright crying. She was struggling with her leg. I stopped the swing and had a look and was surprised to see the clear indications of an insect sting. Yellowjackets. And then, they were everywhere. We evacuated the scene. In classic occurrence, they were coming out the ground near the base of the swing set. They have been there all Summer and I never noticed. We played there. I mowed there. I did not notice them. Though they were only defending their nest, stinging my granddaughter was a serious move for them because *they annoyed grandma.* You must know that nest is now gone.

But even though I made no big mention of the hornets, my two-year-old knew instinctively that these insects had caused her this pain. Grandma consoled and coddled. We put some ice on it (no tobacco or onion juice) and reassured her. Nope – she did not like those insects. Two years old or not – she was incensed. She has no interest in learning more about "*bees*" right now.

That's where I currently am.

I am not pushing any of them, but, over time, I am assertively exposing them to the bees. Bees have meant so much to me that I wish just one other person in my family could feel the passion. My grandson – out of the blue – recently said that when he was a granddad; he was going to teach all of his grandkids to keep bees just like I taught him. He really said that. Is it okay with you if I cling to that small moment as a possible indicator of a future success? BC

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BIGGER PICTURE

Outside The Box Of Beekeeping By The Wannabe Homesteader

Jessica **Lawrence**

As November rolls into the last days of Fall, most people think the outside work is slowing down. We beekeepers are finished for the season, with our honey bottled, our bees in their best Winter coats and we're left to dream of new equipment for the next bee season. On the gardening end of the spectrum, this is the time for planning.

Our bees go through a lot in the course of their short lives. They are exposed to the common pests and predators, rush by hungry birds, narrowly escape bear attacks, fly through a recently sprayed field, and are subject to the whims of their beekeeper's ideas on medication. I personally am not big on pesticide use in my bees or in my garden, although a lot of that is my lazy streak. It's a lot of work to properly apply chemicals! I do not believe that the majority of people set out with the intentions of hurting bees when they treat their gardens or crops – they just want to stop pest problems. However, sometimes things happen, and there's not a lot you can do about it. I like to focus on the parts that I *can* control, so I start with my own garden – the closest food source for my bees.

One day's worth of vegetables.

Again, people use chemicals in their garden to make it better. We're not just talking about pesticides here. There are a myriad of products available to apply to your plants to increase production, such as fertilizers, hormones, inoculants, etc. All of these things have the possibility to end back up in a hive. Don't get me wrong, I don't necessarily think any or all of these are bad, I just want people to understand what they use.

My first concern here is happy plants. The best way to achieve this is through proper soil. My property is not what I'd call "useful dirt." It is basically rock soil with 1" of top soil at best. Soils like mine are terrible for production and need a lot of amendments to have even marginally good plants. My remedy is an "occasionally on fire" compost heap with raised bed gardening. If you have a nutritious base for your plants, you can virtually eliminate the need for pest control later in the year. I am forever visiting friends and family and leaving with a bag full of their "trash" to throw in the compost pile. I will clean out rabbit cages to take home everything in the pens (that one is popular with rabbit owners) and use in my compost. You want to try to layer nitrogen with carbon, and having shavings with rabbit droppings is an excellent combination. All of our poultry litter goes into the compost, as well as kitchen scraps, cardboard, dead plants, paper anything, junk mail, etc. Some things, like cardboard and junk mail, can have ink that is not so great for the plants. Often, I use this to line the bottom of my raised beds or wherever I want to stop weeds. With a good layer of cardboard or junk mail, it will kill off grass or weeds without having to dig them up or spray. By the time the layer is decomposed, the plants above will be able to take advantage of the deeper soil without having grass emerge on top. Also, the dead root system from the weeds will add airways in the soil to help with healthier roots.

How can this help you in November? Well, my Winter projects are usually something to prepare for the upcoming season. My raised bed plan takes a lot of time to design and build. I also continue to compost throughout the Winter. My biggest compost fire happened on a very cold day, so I know it is still working on the inside! Remember, the reason compost works so well is that it is heating everything up so it all breaks down into that rich, black earth that we all crave in our gardens. You always need to be careful and turn your piles regularly, or you'll be like us: running back and forth with buckets until someone can get the water hoses all hooked together and hoping the neighbors think the smoke is coming from the chimney.

We are coming into the holiday season, a time when most people want to enjoy being with family and slow down a bit. This is my favorite time for composting because there's so much available! I like to use paper plates at gatherings, so I can throw them all into a bag and bring them home with the wasted food. You may say that if I was being really good, that I would use normal dishes and wash them . . . but I have a large family and I'm not washing all those dishes! I also keep wrapping paper, boxes, and any other paper products floating around back with me for linings or re-use if it's still pretty. My grandpa is known to use comics from the newspaper for all of his wrapping, so I definitely raid his leftover newspaper pile.

To make sure we're all on the same page here, I'll list some of the best and worst additions to a compost pile. This is by no means comprehensive, but happen to be my favorite pieces or things I have had a problem using in the past:

Good List

Most fruits and vegetables
Bread
Tea bags
coffee grounds (in the filter is okay)
poultry litter
rabbit droppings
grass clippings
leaves
straw/hay
sawdust (dry not fresh)
soda cartons

Bad List

Citrus anything (acid)
Pet waste (salmonella)
Magazines (I still do it, but it's bad!)
Metal (like staples in magazines)
Meat (attracts wildlife)
Plastic (hey, sometimes it happens)
Wood pieces (do not disintegrate)
Thick stalks (do not disintegrate)
Cana lilies (do not disintegrate)
Ashes (small quantity is okay)
Dryer lint (flammable!)

You will see in just a short time that your giant pile will turn into a small load of compost. This is the amazing part of composting – if this stuff were going in the trash, it decomposes in a landfill where it just takes up space and isn't usable, so you're helping out on that side as well.

Let's talk tomatoes for a second. They are hungry plants. If you plant them in May, by July your soil will be depleted of most of its nutrients. Around this point in time, you'll need to add a new layer of compost, or make a compost tea by steeping compost in water until the nutrients are in liquid form. Then, you can spray the tea onto the garden. Give it about a week and you'll be able to see the difference! I also do this with my seasonal decorative plants, like a bougainvillea. Potted plants need to be re-energized at least once a season for maximum growth and flowering. The raised beds can vary, depending on the demanding nature of the inhabitants. Fields can be a different story, but where there's a will, there's a way!

In general, my raised beds are (will be) around three

Lauren with a turnip haul.

foot across so it can be easily reached from either side. They range from four to 10 feet long. Let's say for a second that you want to plant a field of buckwheat to feed your bees and harvest at the end, but you want super-awesome buckwheat. What can you do? My recommendation is to take a truck or trailer (or both!) down to your nearest stable. Horse people are always trying to give away manure. If you are using this sort of method, you always need to stick to animals that have a plant-only diet. Sometimes, plant waste grows better plants (I guess like calls to like?) but manure can be easier and faster (and larger quantities!) so not a bad option. If you want to do something like this, you can broadcast it over the field and till it into the ground. Another option available is something I have honestly never considered, but I didn't know it existed until last year. If you contact a waste management facility that deals in sewage, they will come spray your fields with sewage for free! What a deal! I am sure that most of you reading have now confirmed that I am nuts, but I am telling you that this is an excellent way to fertilize a crop that you aren't going to eat. I would use this on a field of clover or other cover crop. A lot of people use it in grass or hay fields or things such as that. I promise you have never seen grass so green!

I like composting because I have to take less trash to the dump and also it is free other than time. I am a big fan of free things, particularly when they are useful and can contribute to my plans. It is a bit of work, but the benefits far outweigh any cost in time. This year, I did not use a single spray on my garden (I did hand-pick a few squash bugs though) but my Facebook friends can attest to the multitude of tomatoes, cucumbers, turnips, chard, basil and everything else that came out of my garden this year! I only had to weed twice, and prep time was approximately one day, including planting. I am aware that my bees are foraging far beyond my little piece of the world, but I take comfort in the fact that they are at least safe on their home territory. BC

Jessica Lawrence is a Research Entomologist for Eurofins Scientific, an avid gardener, beekeeper and tattoo collector.

Father Time Tes
Mother Nature App

Melanie **Kirby**

The term "Survivor" is slightly subjective. And in regards to beekeeping, it can have relative terms. To some, it connotates site-specific beekeeping. While to others it poses a hope of pro-active trans-regional honey bee stock management and production. Though survivor stock is initially developed in a specific area and bred based on that specific location's environment and conditions, there are case studies across the nation that demonstrate the beneficial impact of trans-regional survivor stock introduction and rotation. The initial protocol of establishing and rearing survivor stock is what ultimately determines the quality of the stock AND its ability to transcend its initial locational boundaries. This will be described at length shortly.

To begin, what does the term survivor really mean? Let's develop an encompassing definition that can be used by those interested in practicing survivor stock rearing and breeding, and what are its broader ramifications. Finally, how it is that survivor stock can transcend regional boundaries for the better of the bees and the beekeepers who choose to incorporate them into their apiaries?

"Survivor" or "the ability to survive" means that an organism is able to withstand various conditions over time. For the purpose of queen rearing and breeding, "survivor" should mean bees that are able to endure the normal seasonal transitions and the dynamic, changing interface of Mother Nature and man-induced circumstances, along with various pests and diseases encountered through time. And of course, these conditions are broad spectrum – ranging from the best of seasons to the worst. And for those making a living off of bees, this means survivorship to the degree of potential self-sufficiency or sustainability which includes overhead and profit. Bottom line is the need for bees that can pay for themselves and potentially produce lucrative hive products for their caretakers, or at least cover their own expenses (including equipment, feed, time required of management, etc).

The key to surviving, and the actual crux of the survivor concept is *time*. Father Time is and will be. He fails to cease and keeps many, including beekeepers, racing to get things done in order to match Mother Nature's calendar and cycles; which of course, all vary depending on location and circumstance. This makes keeping bees a dynamic endeavor, one which requires flexibility and motivation. When rearing and breeding bees, time is a crucial aspect of the natural calendar of reproduction. Time dictates learning how to work and manage bees within this natural calendar.

Father Time unfurls many secrets of Mother Nature's seemingly whimsical ways; what we can comically call the "Mars & Venus factor"[1]. He does this by repeating incidences that we can try to determine as patterns or cycles. We see Mother Nature's cycles through the seasons, from Spring to Summer, Summer to Fall and Fall to Winter and Winter to Spring. These four seasonal changes give beekeepers the chance to allow both Mother Nature and Father Time to test their bees. Testing bees means giving them the time to develop and present their capabilities.

Bonnie Bollengier and Gary Mo
Adapted Survi

Dr. Marla Spivak in her "Keeping Bees in Northern Climates" workshop states that it takes 18 months for *Varroa* to infiltrate and kill a hive. It is therefore plausible that survivor bees must be able to overcome that threshold – meaning survive past 18 months. To merely survive would mean to hang on – to have some semblance of life. But with the necessities of making beekeeping sustainable and perhaps even lucrative, it is then necessary for a colony to not only survive past

[1]In reference to Men Are from Mars, Women Are from Venus: The Classic Guide to Understanding the Opposite Sex" by John Gray Ph.D

ted
roved

the 18 months, but to thrive, remaining productive and healthy. The goal of this article is to explain the ability of bees to do so without a lot of chemical intervention.

Research supports that *Varroa* are vectors of various pathogens, so it is pertinent that beekeepers find and establish bees that will not succumb to *Varroa* induced deaths. This means that the minimum age for establishing any lineage of survivor stock should be at least 18 months and I recommend even older- at minimum two years of age. This passage of time not only reflects the ability of a colony to deal with *Varroa*, but also its ability to establish its Overall Lifetime Merit, the OLT as I call it, which tells how well a colony holds up to other various pests and diseases, maintains gentleness and productivity.

By establishing the OLT a colony is capable of presenting a "pedigree" of longevity. The history of its longevity needs to be recorded, as with any selection factor. This history of longevity is heritable and is to be considered the umbrella trait – one which uses the history of the bees to fully develop their demonstrated capabilities, i.e. gentleness, productivity, pest/disease resistance, hygienics. This ability to carry on quality genetics is not to be taken lightly as we can see that it does indeed take time. So by selecting older colonies, and more specifically older queens, from which to breed off of, the standards of selection have increased exponentially. Not only are daughters grafted from these older queens considered jewels, but the drones from these older queens are to be considered crown jewels. Drones reflect the nature of their mother – their ability to produce quality progeny that can withstand the dynamic interface of Mother Nature through Father Time.

s of BonnieBee with their Marin mating nucs.

There are many ways to improve stock performance and durability, and a multi-disciplinary approach is necessary to successfully work alongside Mother Nature & Father Time. Right now, most backyard beekeepers and commercial beekeepers have experienced questionable performance of their bees and queens. The many variable circumstances and environments make it all the more complex and perplexing. The need for quality stock is of an all-time necessity. It is pertinent for those of us wanting to promote the continued existence and quality of habitat and performance for our bees, to be proactive. We cannot necessarily wait for Father Time to figure it all out. But we can surely work alongside- by allowing time to facilitate the process and to test Mother Nature's dynamic interface.

Many want a quick fix- but in reality, no band-aid will suffice. It will take a "holistic"[2] and internal healing methodology (meaning interconnectivity with all aspects involved in how an organism presents and relates to the world in which it is a part of). This takes time AND changes through time. For queen production to reset itself and establish a new protocol for quality production – we need to focus on local. This is key in establishing bees and their relationship with their varied surroundings. This has the potential to then "survive and thrive" in its given location and to also translate to other regions. This is demonstrated by knowing the history of longevity and by rearing and promoting production methods that enhance that unfurling of the genetics as they are exposed to varied conditions.

This holistic approach relys on quality nutrition. And quality nutrition relies on the environment. The main requirement of nutrition is diversity and saturation, but,

[2]http://www.merriam-webster.com/dictionary/holistic: relating to or concerned with wholes or with complete systems rather than with the analysis of, treatment of, or dissection into parts <holistic medicine attempts to treat both the mind and the body> <holistic ecology views humans and the environment as a single system>

The key to surviving, and the actual crux of the survivor concept is time. Father Time is and will be.

another crucial aspect of nutrition is dearth and compromise. Hives that experience a nectar dearth in nectar and a change from warm to cold season, have an opportunity to minimize the amount of brood available for mite reproduction. Where supplemental feeding takes place during a dearth then "tropical" like circumstances are encouraged and brood nests remain larger than normal for the time of year. *Varroa* may find these colonies more hospitable. The quality of the supplemental and natural food must be assessed regularly. Poor food equals poor performance. If the surrounding landscape forage has been poisoned or modified, then poor performance, again, will occur. When these occur mites' success is almost guaranteed, and will continue unabated.

However, I believe there is hope. With the introduction of survivor stock the bees already know how to deal with *Varroa* pressure and can enhance their genetic "story" by dealing with *Varroa* – continuously, as long as nutrition is positively maintained.

What is meant by genetic "story"? Bees, like seeds, have a memory. They are impressed with this memory over time through the Mars & Venus factor (Father Time + Mother Nature). The longer bees, or seeds, are able to gather and "experience" the more profound their repertoire so they are able to recall certain environmental scenarios and react accordingly. I saw this first hand this 2011 bee season which was a doozy here in Arizona. The fluctuating weather caused the bees to react to the different environmental conditions in ways that we hadn't noticed before.

Angela Lewis with a frame from her nominated RM breeder – Hondo Dog.

Veil-less Mark Spitzig of ZQB hel one of their MA

The season was marginal and conservative. The bees in turn altered their schedule reflecting the changes. Large colonies behaved "normally" and made the best of the available forage-producing honey, but not as much as in a good season. Smaller colonies maintained, but did not grow. The bees "knew" what would work for them. We had to interpret what appeared to be "new" bee-havior. I came away from this season with the interpretation that, the bees do know best and it is up to me, as their caretaker, to learn to interpret the season and how it is affecting them so I can assess my role for their optimum health. As an aspiring bee breeder how can I promote production but maintain quality in a changing environment and rather odd season?

Nurture or Nature

The bees are continuously "learning" how to interpret and react through their genetic "story," and through its enhancement how to deal with a season. I am following their lead, learning to observe and interpret their behavior. The Father Time and Mother Nature factors lead to a larger concept of Nature vs. Nurture. And the ultimate reconciliation is that Nature isn't contra Nurturing or vice versa, but in actuality, *nature does the nurturing.*

The Nature vs. Nurture concept not only affects bees' immediate responses but also their long-term actions and reactions. The bees' diet affects their DNA and determines whether they will express certain genes in reaction to an environmental stimulus. This includes hygienic, gentleness, their pest/disease resistance, and their productivity/behavioral genes. Professor Maleszka from The Australian National University conducted some profound research on the integration of environmental and genomic signals in honey bees and the critical interplay of nutritional, brain and reproductive networks.

Maleszka said, "This study represents a giant step towards answering one of the big questions in the nature-nurture debate, because it shows how the outside world is linked to DNA via diet, and how environmental inputs can transiently modify our genetic hardware"[3].

This means that diet and nutrition can and will affect how the bees behave- how well they react & how they maintain, grow and perpetuate (or dwindle and perish). This behavior becomes "learned", or at least "conditions" the bees to react and act accordingly. Diet, as it affects behavior becomes a large factor in the genetic display. "Bees are what they eat": diverse and healthy or stunted

[3] Bees Reveal Nature-Nurture Secrets: Extensive Molecular Differences in Brains of Workers and Queen **http://www.sciencedaily.com/releases/2010/11/101102171606.htm**

nnie and Gary of BonnieBee review eding contenders.

and unhealthy.

As for morale? Well, when bees are sick, there is confusion- in their actions and reactions. If their diet is compromised, then their processes for interpreting their "world" can also be compromised and confused.

Why should we worry about colony morale? Well, if our bees are "confused" and their actions and reactions are compromised, then we will see the negative effects by their inability to transition environments, cope and deal with ailments, to produce well, and the collapse of their health network and queen. It is with the gamble we make with Mother Nature and the passage that Father Time deals that we can either prosper or be broken. There is no one single "super bee" that will work in all environments. But when an environment is compromised, and the nutrition marginal, then our bees will continue to be stressed and won't be able to recuperate without added intervention and invasive management. We will not be able to realistically expect them to adapt and prosper when transferred without acknowledging the risks of induced stresses.

The minimum age for establishing any lineage of survivor stock should be at least 18 months and I recommend even older – at minimum two years of age.

Rocky Mountain Survivor Queens

Perhaps two Winters for testing is setting the bar unrealistically high. However, there are numerous studies that demonstrate that extended time testing is required to develop hearty and adaptable stock. Funded in part by a Western Sustainable Agriculture Research Education grant, the newly established *Rocky Mountain Survivor Queenbee Cooperative* is one such case study. It was nine beekeepers, spans close to 500 miles through two states from Santa Fe, New Mexico to Fort Collins, Colorado ranging in altitude from 5000' to over 8000 feet. The RMSQB Cooperative was initiated by an all-women team – Meg McGee of Mora, NM (co-founder), Resa Sawyer of

Buena Vista, NM (co-founder), Kate Whealen (founder and coordinator of the Sangre de Cristo Beekeepers) of Santa Fe, NM, Moira O'Hanlon of Arroyo Seco-Taos, NM, Angela Lewis of Arroyo Hondo-Taos, NM, Janet Fink (founder and coordinator of the Spanish Peaks Beekeepers) of Walsenburg, CO, Marygael Meister (DenverBee.org founder and coordinator and RMSQB Secretary) of Denver, CO, Kris Holthaus of Fort Collins, CO, and myself, Melanie Kirby (co-founder) of Truchas, New Mexico. It is a Langstroth and Top Bar cooperative for exchanging hearty, tested survivor stock. The cooperative is creating a network of survivor stock beekeepers throughout the Rocky Mountain terrain focused on extensive longevity breeding selection and also on conscientious production methods. This includes establishing a survivor stock pedigree protocol for selection and rearing based on remaining chemical free. A manual with these protocols is being written and will be available in January 2014. To follow the progress of The RMSQB Cooperative through participating beekeepers' blogs, visit **www.rmsqbcoop.org**.

Another case study is *The Marin Adapted Survivors* based out of San Rafael, California, located north of San Francisco. *MAS* was initiated by Bonnie Bollengier and Gary Morse of BonnieBee (**www.bonniebeecompany.com**). Their efforts to connect with hobby beekeepers and to share quality stock deserves recognition. Their continued efforts to monitor nominated breeding contenders, test for hygienics, secure isolated mating zones, and to follow the bees' natural calendar shows promise for urban beekeepers.

There are more and more beekeepers and clubs looking to try survivor stock and willing to assist in its establishment and sustainability. Their efforts and the continued efforts of established survivor stock producers will be highlighted at a new website that is currently under construction. WWW.SURVIVORQUEENBEES.ORG will be up and running come January 2013 as a one stop resource for information on survivor stock breeding, suggested rearing protocol and case studies from across the nation.

Regional fortification in all directions- north, south, east, west, and the intermediary zones is critical for the long term sustainability of bee husbandry. By utilizing Mother Nature's dynamic interface through the passage of Father Time, we can appreciate just how profound the real-world/living laboratory circumstances enhance our bees. We can complement research with reality for better bees AND better beekeepers. BC

Melanie Kirby has run Zia Queenbee Co. based in Truchas, NM at 8300 feet in the southern Rockies for 12 years. ***www.ziaqueenbees.com; www.rmsqbcoop.org; www.survivorqueenbees.org***

Group on Page 51 – left to right: Kate Whealen, Janet Fink, Moira O'Hanlon, Meg McGee, Resa Sawyer, Marygael Meister, Kris Holthaus and Melanie Kirby.

DOWNTOWN

If you are a beekeeper who cares about what is happening inside your hives, here's some news: you are an ecologist. You are no longer required to chain yourself to an ancient redwood or throw your body in front of a bulldozer (not that you are forbidden, either) but any beekeeper who has kept a colony or two alive for a couple of years or more is probably an increasingly keen observer of the interplay of animal, plant and weather that constitutes a habitat: the one you live in. You have probably come to know an awful lot more about the ins and outs of that habitat than today's Jane or Joe Average. Be proud of this!

All beekeeping is local, and you are the resident expert for your slice of the planet. If your "local" is a few square miles of city blocks, however, there is at least one universal environmental principle: In an urban ecology, don't cheese off the dominant species – people.

Many urban beekeeping articles hint at this principle. Pointers about hive placement, fecal trails, and swarm prevention are completely valid, though too often they are put forward by beekeepers without a hive in a congested zip code. However, if you do live in such a zip code, it's necessary to sharpen these points.

Urban ecologies are full of hundreds of thousands of people, and your bees' routine foraging can easily take place in the gardens, yards, green roofs, parks and window boxes of thousands of households. If only one in 100 people is an irreconcilable honey bee freak-a-phobe, that means your bees are buzzing by a couple of hundred of them every day. Have you ever given a presentation about beekeeping? My experience is that a group of 10 will feature at least four (and up to seven) who all are *dead* certain that they are the epidemiologically unlikely bearer of anaphylactic allergy to honey bees. So the point is that the freak-a-phobe factor in your community is probably way larger than one percent, and you can bet at least some of them have your City Council member on speed dial.

Toni **Burnham**

In my city and others, there have been several unfortunate incidents where urban beekeepers have practiced openly, or been found out, and frightened neighbors have "successfully" demanded that the hives be removed, usually forthwith, and usually to the detriment of the bees.

Watching discussions of these events online, the advice seems to run to "Make 'em deal with it!" "Tell 'em to pound sand" or "#@%&* them!" with a bunch of associated pontifications about the value of honey bees with which we all agree. Does anyone think any of this actually helps? Plus, our city has more lawyers than baristas, and the former are more likely to live next door.

What *does* help? Would you be surprised to learn that none of it is easy or instant? The short version is outreach, self-education, alliances, and awareness, practiced over time. And unfortunately, you should also have a Village Idiot Emergency Response Plan, for the inevitable unmanaged hive next to a day care center that acquires an Africanized queen while the hive owner is off finding themselves (or just really, *really* stressed).

Most of us are probably familiar with some form of outreach, either as givers or receivers. If you want to keep a beehive in a city, it seems to me that you owe it to yourself and your neighbors to move into the presenter category. It is easy to get into this business: all around you are garden clubs, elementary schools, churches, and community gardens that have an enthusiastic session planner who would be happy to schedule 20 minutes of beekeeping presentation followed by 20 minutes of Q&A. And even though 40-70% of the participants will walk into that session giggling with fear, 90% will leave as friends of bees. If you are an awkward speaker, bring an observation hive and let your curious attendees drive the talking. If you can, get to kids before their parents teach them to be afraid: in our area the elementary schools have

a pollination unit every Fall, and the teachers flip for a beekeeper presentation. Bring a pumpkin, and explain that every seed was once a pollen grain moved by a honey bee from one flower to another. Hold up a strawberry and ask whether it has a few seeds on the outside or a lot, and how do the kids think they got there? Collect thank you letters from your hosts, and have them ready if you ever have to have a meeting with that City Council member.

If you care about your bees, the *self*-education piece is probably a no-brainer, but you may not have connected it with making your bees fit more smoothly into an urban ecology. My belief is that books, club meetings, online discussions, and even mentoring is fine, but it takes chunks of pure, unadulterated time to really get to know your bees, and to get that undeniable gut feeling that "something is up!" early enough to be able to do something about it. Like swarming, or robbing, or drinking from the next door pool – the top three reasons why neighbors will make you move your bees.

Try to plan to visit your bees with a mug of coffee in hand, just to watch them, keep good records, look at the latter, and have a schedule based on the norms of your local habitat for inspections, hive manipulations, harvesting, and winter prep. If your colony is really a family soap opera in a stack of wooden boxes, could you provide a synopsis of the plot? If you can't, what do you need to know to catch up?

By now you may be just about overwhelmed. But you are not alone, and with a plan, there are *months* of the year when you do not even have a weekly chore.

Beekeepers have many hidden friends and resources in the city. Here and elsewhere, it turns out that urban arborists (the "tree guys" who probably work for some major department for which they are a footnote, except during storms...) are really curious about honey bees, and they frequently encounter feral colonies when culling dead trees. These practical biologists usually wish they could do more to save bees. From a city beek's perspective, one lovely thing about working with the tree guys is that, once ties are established, they come to emergency rescues bearing chain saws and bucket trucks, and their bosses get all kinds of eco-credit for every save. Whenever we take down a downtown bee tree, and hive the colony inside, we make sure the local residents know that the bees will be saved and that "the city" is helping us do it, and "the city" is more likely to lend a hand next time. We do related work with the public parks folks, and continually identify ourselves as "solution providers" to people who are working in community jobs on environmental issues.

Every time we show up as a solution, rather than a problem, the more we make ourselves a welcome and crucial part of the ecosystem. Which is pretty much all we wanted to be in the first place.

Every time we present friendly beekeeping as a chance for the non-beekeeper to be on the side of all that is good and green without doing anything more than accepting

Taken from an observation window, notice the Capitol Building in the background.

beekeeping, we make everyone – bees, beekeepers, and average joe – a happier, sweeter citizen. And that is a habitat where anyone would like to live.

Finally, things do go wrong sometimes, and if you have invested some effort in being a solution to problems in the past, you are likely to get a call and an opportunity to stave off disaster when something – like a huge public swarm or significant stinging incident – does happen. Do some of your downtown beekeepers know how to respond to a swarm call, do the public or authorities know how to reach you, and do you know how to reach each other if a call comes in? How many of us know how to do a structural extraction of bees in inconvenient places, and do we all know how to prepare folks for the expectations (time, damage, repairs, responsibilities) of such a removal?

Do you live in an Africanized bee area, and do any clubs in your area have advice about emergency response or working with first responders should the Africanized colony turn out to be downtown?

This can all seem pretty scary, but it is *way* scarier to people who are unfamiliar with and frightened of bees. If you show up in a veil and the outlines of an answer, you could be the hero or heroine of the day. If you are just an absentee beekeeper with no clue about how to respond, don't expect a medal. And don't expect the consequences to affect you alone: every beekeeper in your city will have to deal with the aftermath of an event that rocks the local ecosystem, and gets the attention of the media.

Bees do belong everywhere people do, but everything in an ecosystem does interact, sometimes in unexpected and surprising ways. By being the best possible beekeeper, and connecting that to the community and the habitat in which you keep your hives, you will harvest the sweet rewards of sustainable beekeeping, a healthier environment, and a less stressful relationship with your fellow citizens. And as the resident expert on the tiny slice of human dominated habitat where you keep your colonies, you will reap joy and wonder and connectedness that our fellow beeks who never worry about the neighbors may never know! BC

Toni Burnham keeps bees all over her city.

The Cultivated LEGUMES

Connie **Krochmal**

Many of the cultivated legumes provide nectar and pollen. Some of the best species for bees are the clovers, beans, and alfalfa.

Alfalfa *(Medicago sativa)*

Of unknown origin, alfalfa was likely native to Asia. Grown in China for centuries, it was brought to America by colonists. This animal feed when it is allowed to bloom, is a top honey plant, especially in the West and Northeast. Tolerating dry climates, this prefers a fertile, well drained lime-rich soil.

This erect, much branched perennial is 2½ feet tall. The purplish-violet blossoms appear in dense cylindrical clusters from June through September.

Hot and dry weather brings excellent nectar flows. Beekeepers can get 200 pounds of honey per colony. The honey can be water white to extra light amber with the shade differing widely, along with the flavor. Of premium quality, this thick, heavy table honey granulates with smooth grains. It has a delicate mild to slightly peppery flavor. Alfalfa is also a source of pollen.

Beans *(Phaseolus spp.)*

Three New World beans are reliable nectar sources. They can yield up to 150 pounds of honey per colony. The twining vines have elongated flower clusters from Summer to Fall.

Suitable for all regions, most beans prefer a well drained soil with a pH above 6.0. Plant after frost has passed and the soil is sufficiently warm. The Mexican bean beetle is a common pest.

Alfalfa

Kidney bean (*Phaseolus vulgaris*)

Domesticated over 5000 years ago, this has been grown in South and Central America since prehistoric times. These bushes or vines can grow to 12 feet in height. The flowers, opening in axillary clusters, are yellow, white, or blue tinged.

A reliable nectar source, this yields a mild flavored light to white honey. Slow to granulate, this develops smooth grains.

Lima bean (*Phaseolus lunatus*)

This has been cultivated since 6000 B.C. in South America. There are numerous varieties, including bush and pole types.

Lima bean honey is nearly water white with an excellent flavor. Granulating fairly rapidly, it develops fine grains.

Scarlet runner bean (*Phaseolus coccineus*)

This is native to Central and South America. The plants withstand drought and heat. Either climbing or bushy, scarlet runner beans can be 15 feet in height. The seed color matches that of the blossoms-either red or white. The flowers open in axillary clusters.

This yields lots of nectar and pollen. The honey quality varies from premium to average. Light colored, it has a good flavor.

Broad bean (*Vicia faba*)

Since ancient times this has been cultivated in Europe. After 3000 B.C. they were taken to China. Introduced to America from England and Europe, it sometime escapes from cultivation.

Plant as soon as the ground can be worked in Spring. In the South, this can be sown in the Fall. Broad beans are frost tolerant.

Related to vetches, this coarse, erect plant can be six feet in height. It lacks tendrils. The large, sweetly scented flowers feature a white corolla with black spots. The stipules have extra floral nectaries that produce more nectar than the blossoms.

Broad beans bring 100 pounds of honey per colony. This is white to dark amber. If the honey contains honeydew, it will be darker. With a mild, pleasant, rich flavor, it granulates, forming medium to coarse grains.

Black eyed pea (*Vigna sinensis*)

Also called cowpea, this bean has been cultivated since ancient times. Native to Africa, it was introduced to America around 1700. Grown for human and animal food,

these require a growing season of two to three months. Adapted to poor soils, they have few pests and diseases other than stinkbugs. The twining or bushy plants are non-climbing.

Black eyed peas yield lots of nectar. The good quality, light colored to dark amber honey granulates rapidly.

Several related species are also cultivated, including the yard long bean or asparagus bean. Snail vine (*Vigna caracalla or Phaseolus caracalla)* is grown as an ornamental.

Clovers *(Trifolium spp.)*

These annuals and perennials are major honey plants, especially in the North Central states. They're suitable for all regions.

Alsike clover (*Trifolium hybridum*)

This disease resistant plant was originally from Alsike, Sweden. Grown as animal feed, Alsike clover reaches one to three feet tall. This smooth perennial or biennial has hollow, soft, erect or spreading stems. The dense, loose flower heads, 1¼ inch in diameter, are pink or white. These bloom from May through September.

Grown for over a century in America, Alsike clover adapts to most soils provided they aren't too acid or wet. Suited to most regions, this very reliable honey plant provides 200 pounds of honey per colony. The premium quality white honey is mild tasting.

Crimson clover (*Trifolium incarnatum*)

Grown for animal feed, this goes dormant over the Winter and blooms in the Spring. An erect, unbranched annual with soft hairy stems, it is two feet in height. The showy, terminal, slender conical flower heads are 2¾ inches long. Opening May through July, the blossoms are red, pink, cream, or white.

Introduced around 1822, this has naturalized. It is suitable for the Mid-Atlantic, Southeast, and South. The light colored honey resembles other clover honeys.

Persian clover (*Trifolium resupinatum*)

Grown in warmer regions, this annual blooms in April and May. Persian clover likes a heavy moist rather infertile soil. Beekeepers can get 150 pounds of light colored honey per colony. This plant also yields pollen.

Red clover.

White clover.

Red clover (*Trifolium pratense*)

Grown for animal feed, this tolerates a pH of 5.0 to 6.0. Suitable for poor soils, this short lived, fast growing perennial or biennial is spreading or erect. It is three feet tall. The dense, globe-like flower heads, over an inch long, are red, purple, or white. This blooms from May until frost.

The fast and heavy nectar flow brings 100 pounds of honey per colony. The premium quality, thick, heavy honey is water white or light amber, sometimes with pink or red tinges. With a pleasant, mild, very sweet flavor, it granulates to a coarse or mealy texture. Bees also collect pollen and honeydew from this plant.

White clover (*Trifolium repens*)

Grown for animal feed, this creeping or spreading perennial is a foot tall. Opening May to October, the pink or white, dense, globe-like flower heads are over an inch long. Introduced from Europe, this naturalized in many regions. Well suited to the East, it tolerates acid and gravelly soils.

When it comes to honey production, this is the most important clover species. Warm temperatures and high humidity bring lots of nectar. This typically yields 200 pounds of honey per colony. The honey's body and color depends upon growing conditions. The color ranges from light amber to bright yellow. It becomes darker when stored or if the nectar flow is sporadic. This premium quality honey granulates with fine to coarse grains. With a sweet aroma, it has a delicate, mild, sweet flavor. This plant also yields pollen.

Bush Clover Lespedeza *(Lespedeza spp.)*

Several species are grown as fodder and ornamentals. With three leaflets, these are typically shrub-like perennials or shrubs. If hit back by frost, it will develop new shoots in the Spring. They're adapted to poor soils. Some have naturalized in the U.S. The small blooms, often purple, can be showy.

These flowers provide nectar for several weeks, and are favorites among bees. Considered excellent honey plants, they can provide 50 pounds of honey per colony. The delicate flavored honey is often bright yellow.

The cultivated and/or naturalized species include the following. *Lespedeza cyrtobotrya* was introduced from Japan. Native to Asia, *Lespedeza daurica* is a short lived perennial. *Lespedeza cuneata* was also introduced from Asia as well.

Peanut flower.

Thunberg lespedeza or shrub bush clover (*Lespedeza thunbergii)* is grown as a landscape shrub. Hardy to zone five, it blooms quite late in the year – August and September.

Peanut *(Arachis hypogaea)*

First grown in Peru during pre-Inca times, this reached the U.S. in the 1700s. It prefers a loose, well drained soil with a pH of 5.0 to 6.0. Wait until the danger of frost has past before planting. It needs a long growing season of four months or so.

This low growing plant has reclining stems. Opening from late June into the Fall, the yellow blossoms, over an inch long, form long spikes in the axils. Later, the flowering stems are thrust into the soil so the pods develop underground. The peanut escaped from cultivation in many regions.

Other than heavy rains, the nectar flow is unaffected by weather. The good quality, thick bodied, mild flavored honey resembles that of clover, but is darker.

Soybean *(Glycine max)*

Of unknown origin, the soybean was probably native to Asia. It was likely domesticated in China by 3000 B.C. Initially, there was little interest in America until World War II. It has naturalized in some regions.

Plant after the danger of frost has past. Grown just like beans, this erect, non-climbing, hairy, bushy annual can be five feet tall. Rather inconspicuous white or violet flowers open in small clusters in the leaf axils from June through October.

Soybeans provide nectar and pollen. The best nectar flow is when the days are hot and the nights are warm. High humidity also helps.

Soybean can bring 100 pounds of honey per colony. This premium quality honey has a thin to medium body. The colors range from water white to light amber. Tending to granulate fairly quickly, the older varieties, if grown in the hot south, produced a bland, easy-to-blend honey. However, the newer, GM varieties tend to be darker, with a hint of flavor.

Sweet clovers *(Melilotus spp.)*

Two species of sweet clovers are commonly cultivated. These are excellent honey plants.

White sweet clover (*Melilotus alba*)

Native to Asia, white sweet clover has been cultivated for centuries. Suitable for the Eastern and North Central regions and the Plains, it prefers hot dry Summers.

Raised as animal feed, it is a very reliable honey source. This large biennial or annual is 4½ feet tall with slender, erect, smooth, branching stems. The very small white blooms open in axillary spikes from May through October.

After being introduced from Europe in 1738, this naturalized throughout the U.S. It adapts to various conditions, including wet spots.

Beekeepers can get a hundred pounds of honey per colony. This premium quality table honey is water white or light amber, sometimes with green tinges. With a medium to heavy body, this granulates quickly. The taste varies from mild to peppery.

Yellow sweet clover (*Melilotus officinalis*)

Unsuitable for acid soils, this typically blooms the second year. It is six feet tall. A biennial often grown as an annual, it has branched, upright to spreading stems. The small yellow or white blooms open in slender, loose clusters from May through September. Recommended for the East, it has naturalized throughout the country.

It provides 200 pounds of honey per colony. With a medium body, this is white to amber. Granulating rapidly, it has a delicate aroma and mild peppery flavor. Bees also collect pollen from this plant.

Vetch *(Vicia spp.)*

With tendrils, the vetches are climbing. The axillary flowers have extra floral nectaries. Several species are grown as fodder.

The premium quality honey has a pleasing, rich, somewhat strong flavor. With a heavy body, it can be hard to extract. The colors range from white to dark amber.

Hairy vetch (*Vicia villosa*)

After being introduced from Europe to the U.S., hairy vetch has naturalized. This annual or biennial adapts to most areas with mild winters. It attracts bees the second year from May to October. Usually violet and white, the blossoms are an inch long. Bees also work the extra floral nectaries found on the leaves.

This brings 200 pounds of honey per colony. The mild flavored honey is water white to light amber. With a heavy body, this granulates rapidly.

Spring vetch (*Vicia sativa*)

Branching at the base, this annual or biennial is grown as a Winter annual for animal feed. From Spring through September, the inch long, showy blossoms open mostly in pairs from the upper leaf axils. They're either purple or rose-pink. Introduced from Europe, this sometimes naturalizes. It provides 70 pounds of honey per colony. This plant also yields pollen.

Another related species, Gerard vetch (*Vicia cracca*) is an excellent honey plant. BC

Connie Krochmal is a writer and beekeeper in Black Mountain, NC.

A Different Kind Of Beekeeper

Michael Thiele came from Germany to California and discovered beekeeping.

Judith **Adamson**

There are so many beautiful things about honey bees and many reasons why they are in our lives. They fascinate us and can even touch our hearts. That's the quality I think every beekeeper knows. Many say they can forget the sorrows of their lives and relax into some kind of happiness without words when they go to the bees.

I came from Germany to California for a retreat after my wife died of cancer. Death brings so many things to an end; I didn't know what would come next, but my life opened up again in a way I would never have imagined. I started practicing Zen at San Francisco Zen Center in California. There I met my second wife, we raised our two children, and I entered the world of honey bees. We lived there for almost 10 years until we moved six years ago to Marin County.

One of my family members in Germany kept bees, so I had been exposed to them from an early age. One Winter while I was living at Zen Center, I started having dreams about bees, and that Spring, when swarms kept coming, I thought, *Well, I guess it's time for me to start beekeeping.*

A friend lent me an empty hive, which I put behind my house. One day I was working in the garden across the pond and heard people calling me because there was a huge swarm circling our tiny house, trying to get into the hive. It wasn't open enough for them to get in, but, of course, they smelled it. So I opened it a little more and it was like the genie going into the bottle; they all moved in, and I became a beekeeper.

I didn't know much about bees, but I had a real feeling for them, and out of that emotional relating many, many things began unfolding. I felt drawn to their wisdom and allowed them to express that wisdom in their instinctual, natural way. I began to truly understand that the single bee is only one individual part of the bigger entity of the entire beehive. This can serve as a beautiful metaphor or mirror for our own existence – that we humans are just one individual part of a bigger entity – the earth's ecosystem and the entire universe. Bees are an indicator species, reflecting the health of our environment as well as the interdependency and interconnectedness of all life on earth. Traditional beekeeping understood and acknowledged the natural life forces of the bees, but modern beekeeping practices have lost this ancient knowledge, and this loss has taken its toll on the bees. I believe that we need to know who the bees are; only then can we serve them through our actions and do the best we can to support them in these times. In order to help the honey bees, we need to open our senses to understand them and shift paradigms.

It's very tricky, however, because the main tool we have is language, and language is always seated in a certain paradigm. For example, the way we currently describe bees within that paradigm is by distinguishing between three elements, which we call the queen, the worker bee, and the drone. I began to wonder if language reflects the nature of those elements or does it rather reflect our intentions and our world view? The problem is that language can limit our senses and our understanding, which in turn can prevent us from true understanding.

Take the queen. Is the queen truly a queen in the human sense of one being ruling or having control over others? Well, when we look at it, we find that the queen is so interwoven within the entity of the whole hive, so intertwined that she is actually not at all in charge. She may be the carrier of a certain soul element – and the particular scent of that one colony, but it is the female bees who make the two different sized cells in which the queen puts the eggs. The small cells are for the female bees; the larger cells are for so-called drones. So who decides which size cell to build, when there are over a hundred bees on average being part of the construction of one single cell? The queen will come and lay an egg. She is actually quite choice-less, because if she finds a

Golden hive.

The whole comb – especially the rims of each cell – are coated with a fine film of propolis, which has antifungal, antibacterial properties.

small cell, she has no choice but to lay a fertilized egg, which will be a female bee; in a larger cell, she will lay an unfertilized egg which will be a male bee.

Now take the worker bee. I find that label very challenging. It's unfortunate, because it doesn't serve our understanding. Isn't it a shame that we reduce that little creature to something which works, meaning produces, meaning produces honey for *us*? There's so much more to her. They're the females, but they're doing all the physical work. They carry the stinger and have venom, so they have this aggressive potential, and yet they redefine that potential through the fact that if they use it, they will sacrifice their own life because they will die. So the use of their stinger is absolutely defensive, and I find it so beautiful to look at how the energy is used within the bee, how it's attached to that condition of sacrifice. Suppose we humans knew if we used our aggression offensively we'd die. Aggression, traditionally a typical male attribute, is here in the female energy, used *only* to defend the wholeness of the colony. Then, of course, we have this beautiful nursing of the offspring within the nature of the females; those same bees are caring – it's all about service, caring for the offspring, protecting the hive and being an essential element for the fertility of the earth.

Then we come to the drones. The negative connotation of the word is that the drone is a plump, useless nuisance. I discovered that the word drone also describes the deep humming sound they make when flying. But the first connotation is the one we use to say they are useless, not only because they are not out foraging for nectar, but also because inside the hive they're being fed honey. They're eating "my" honey. Once we call them "drones," our mind may close. We are not curious to find out what they really are or what they really do. What important roles do they play?

The drones don't have a stinger. They are very round, usually a more feminine characteristic. When you look at their head it consists almost completely of those two large eyes. Drones grow up in the cells that are all the way around the brood nest, which is in the center and contain the females. It's almost as if there's some shielding, some protection happening, or maybe it's a warming quality.

The really interesting thing about those drones is they leave the hive mostly in the early afternoon, especially in the springtime, and go to so-called drone congregation areas where they wait for queens to come, then chase them to mate. Once they've mated with a queen, they die. They did what they needed to do; it's part of their life, and then they die.

Those drone congregations are bees from many different hives. I feel like part of their life is about communicating and networking, because drones can go back to their own hive, but also they can go to other colonies or "families." Each family has its own scent. The world of bees is so much about scent. If a foreign female bee arrives at the entrance of a hive, they won't let her in, but drones can go in. So just imagine, those drones starting out in one hive and perhaps ending up in different hives many, many miles away. There's this networking quality about those drones, and I believe we still don't know all the ways, all of the functions, and all of the features they serve.

We say the drones are "pushed out of hive" at the end of the Summer after the queen has been mated and the remaining ones are no longer needed. It sounds brutal. Again, language. Another way of describing what's happening is that the male energy knows that it doesn't have to be incarnated in the Winter months. So it will let go of its embodiment. It will let go of its physical form, retreat and perish, only to come back in the Spring when it's time to play its role again. In fact, male energy is giving its life at this critical time for the Winter survival of the colony. The drones sacrifice themselves because it's critical for the colony to have enough food throughout the Winter.

The life span of the Summer female bee is maybe seven weeks, and her work is not for herself, but for all those generations down the line. Everything in the colony is communal; everything is shared. No bee has her own little honey cell or her own little pollen cell or her own children; she is completely dedicated to give and to serve the community. A bee's entire life is dedicated to the wholeness. I find that very inspirational on a heart level. Most religions are centered on love and service. Maybe that goes too far, but somehow, don't we all yearn for that sense of being able to happily give and serve and recognize how deeply we're all connected and dependent on each other, instead of just our own little separate individual beings? The hive has the palpable quality of service. It's serving through pollination. It's huge to the planet and us humans, too. The bees touch our limbic system, and inspire us to serve. They can instill in us a new vantage point, one that sees the interdependency of all living beings.

It's so rich. We see 50,000 bees in a hive, and yet there's a feeling of oneness. When you go back to what defines an organism, one essential element is that there's a membrane, something which separates what is called the inner environment and the outer environment – just like our skin – and within, we can control warmth, the flow of energy, and many more things. When you apply that definition to a bee hive, you find that there is an invisible membrane that makes it into a oneness, a super organism – that which goes beyond the individual organism. I like to call it "Bien." Thousands of bees are integrated into a higher-order entity, whose ability far transcends that of the individual bee. Their communication and networking capacities, non-hierarchical decision processes, and an understanding of service to the greater web of life are pointing to a higher level of development and awareness. As such, the bees are a vital part of human culture and an inspiration to the soul.

I want to say something about comb because it is fascinating and mind-boggling. I am passionate about it because beekeepers often ignore it, and it's so integral to the colony. Comb is made from wax that comes out of the bees' bodies. Bees hang from each other, the gravity always pulling on them, and therefore, comb is built with gravity. They know exactly where's up and where's down. That's why comb always goes straight down, because the

"I mainly use the Golden hive, which was designed to provide an environment that's sustainable to the energy and life force of the bees, but also enables us to be apiculturists. The dimensions of the one-room-hive are set according to the "Goden Mean," or "divine proportion" – a universal principle within all forming forces in nature also found in art, architecture and ancient philosophy."

And this is a sun hive, another unique work.

wax is created by those hanging bees.

They start building out round cells. Through body warmth, they heat them up to 107.6°F, at which point the properties of wax change as the fluid properties become more dominant. Suddenly those rounded cells literally pop into place and join each other. Imagine two completely round soap bubbles floating in the air, but when they meet, their common wall becomes completely straight. This has to do with properties of fluidity and surface tension. When the bees are in the middle of creating comb, they heat the wax to its critical threshold for becoming more fluid, round meets with round creating a straight edge and that's when those hexagonal cells form.

The whole comb – especially the rims of each cell – are coated with a fine film of propolis, which has antifungal, antibacterial properties. Bees keep the hive at around 93-95°F whether it is freezing outside or stiflingly hot. At this temperature the wax can resonate with vibrations from the bees. The beauty is that during the waggle dance, they not only do this figure eight form, but as they dance, they hold on to the rims of the cells and vibrate 250 hertz per second. Warm comb produces the best resonance at 250 hertz, so it's part of their communication system and an example of how comb is really an integral part of that being.

Beeswax has a certain scent, and it changes over time. The life of bees inside the hive is happening in darkness and as they walk across the comb, their antennae sense the wax. They know where they are, what kind of wax it is, how old it is, and the whole history of that hive.

In a natural hive, comb grows downward. Langstroth frames are horizontal and shallow. You have a frame, then free space, then a frame, etc. so you have interrupted comb, not a unified structure. The Langstroth system adds additional space by supering on top of the existing hive. It's very challenging for bees because they then need to generate a critical mass of bees to make that leap up and build comb downward.

Modern beekeeping with plastic foundations does not allow for drone rearing (unless drone comb or an empty frame is used) and this practice removes a very important element of the bee nest. That's huge. We're taking away that male element. Only a very few drone cells may be built in small niches of the hive.

With plastic foundation, vibration doesn't work anymore. That right there already interferes with their communication system. We haven't even talked about the components of the foundations and how with some plastics, polystyrene with the benzene is carcinogenic. Eggs are laid in partial plastic. What are the logical implications of that? Plastic is an implant; we should not call it foundation. It's an implant, and it should be regulated according to implants, but that's not done.

I mainly use the Golden Hive, which was designed to provide an environment that's sustainable to the energy and life force of the bees, but also enables us to be apiculturists. The dimensions of the one-room-hive are set according to the "Golden Mean," or "divine proportion" – a universal principle within all forming forces in nature also found in art, architecture and ancient philosophy (1:1.168). The bees live in one room with twenty tall frames that allow for the natural downward flow of comb and the development of a large brood nest, which is a protected space. The top bar of each frame is beveled. It's a rounded shape that ends up in a very thin edge, a beautiful surface for them to start building comb, and they naturally go there. Honey can be received from the sides of the hive, and we do not put supers on. A wax cloth lays on top of the frames and protects the inner climate of the "Bien." So for us apiculturists, you're entering the interior of that being. I think about how intimately bees are connected with their comb, so by having that wax blanket in place and peeling it back slowly, it protects them from a sudden draft and from losing that integrity right away. It's a gentle, respectful way of entering the hive, and the benefit for the apiculturist is that the bees are so much calmer. When you open a Langstroth hive, you create a draft, and all the warmth, the scent, and the humidity is disrupted. Then you have to rip the frames apart just to look into the box.

With a Golden Hive, you take the honey out by lifting one of the frames. The bees have built the comb from top to bottom. It's so beautiful. Since long, regular extractors do not work, you either keep it as comb honey, or you crush it. I crush it because it enriches the honey, but even more importantly, I believe it's very, very important

for bees to rebuild comb. There are all those worrisome studies about how pesticide traces are building up in comb. Nowadays even conventional science is suggesting letting them build new comb, otherwise you'll end up having contaminated comb in the nursery and the baby bees will grow up in that toxic environment. It's another paradigm shift. In the olden days, people were proud of having these black comb frames – 10, 20 years old – and today some beekeepers feel the same way, but it's not working any more. We are living in a different world.

It's extremely rare that I would use a bee suit. Sometimes some of those tools are necessary, and it's definitely good to go with one's comfort level because the bees sense our anxiety, but the tricky part is when we suit up, we don't have to pay attention to them anymore. We can do whatever we want, and all that armor will prevent us from understanding who honey bees are on a deeper level. We've already set up not only a physical barrier, but a mind barrier. So we march in and take them apart and do all of those things, and the sad part is that we truly lose. We lose those beautiful ways – slow and gentle – of being with that creature. We lose the possibility of empathy. We lose the opportunity to touch the pulse of life, to touch the pulse of our own heart.

Honey bees let a gentle beekeeper go in peacefully; they're opening themselves in a way. You read signs. You approach them slowly; you look at the entrance; you listen – how do they sound? Are there a lot of guard bees? Are they nervous? You get to know them in a different way. You open up all of your senses, and then you know when you have to smoke and when you don't. I remember one hive we didn't smoke. We opened the wax blanket a little bit, and they seemed nervous. We closed the blanket, and maybe a minute later, we started again, and they were calmer. One thing you can do is smoke yourself, especially your hands, and then put the smoker away and go to the bees instead of smoking *them*. It will cover any kind of funny scent on yourself.

I founded Gaia Bees to create an educational platform and resource for a new approach to living with bees. "Api-sophia" forms the core of this new way of living with bees, which is based on a heart-centered approach, and includes consciousness studies, contemplation, introspection, and biodynamic methods. The "Bien" (the oneness of the hive) is understood as a catalyst in times of tremendous changes on earth, and as an inspiration for cultural, emotional, agricultural and spiritual renewal.

Also, I co-founded The Melissa Garden (**www.themelissagarden.com**) in California, one of the first Honey Bee Sanctuaries in the U.S., an innovative apiary and global resource center for biodynamic and holistic apiculture.

I have my own hives at home. I sell Golden Hives and other alternative hives. The designs are based on the needs of the bees and promote a sustainable and wholesome approach to apiculture. I also help people set up their apiaries. Some people want me not only to set them up but also to tend them.

Honey bees touch me on my heart level in a way I want to say only whales can. I've seen whales, and just the sheer sight of them made me cry. I now feel like that with bees, but its taken time to let the restrictive language disappear, to stretch my range of perception and to open up. A dualistic world view is so ingrained in us. There's you, and there's me. Maybe I'm trying to say we have to shift back and dedicate our life more to find the unity, what really connects us. I'm saying anybody can learn to feel that with honey bees. Could that connection become a window to a different kind of understanding of life and the world as we know it? Could it be a doorway to another aspect of consciousness? BC

For information please contact Michael Thiele at ***gaiabees@gmail.com; www.gaiabees.com****. Story excerpted from* Backyard Beekeepers of the Bay Area *by Judith Adamson.* ***www.BackyardBeekeepersBayArea.com.***

CROWDFUNDING

Crowdfunding refers to the collective efforts of individuals who pool their resources through networking to support efforts initiated by other people or organizations.

Ross **Conrad**

Need money to expand your beekeeping business? Perhaps you want to build a honey house, expand the number of hives in your apiary, or purchase a new piece of extracting equipment but just don't have the funds to cover it. Traditionally beekeepers who have found themselves in such situations have had to ask a bank for a loan. This approach to financing is becoming old-fashioned thanks to the new world created by the Internet, social networks, and networking technologies.

I find it somewhat humorous that I am writing this article since I am not well wired or connected to much of anything electronically. I live without electricity, and I dragged my feet for years before getting a cell phone. I did not go for the iPhone, or Android.™, just a basic phone, but apparently there is no such thing in the world of cell phones so my phone can take pictures, send text messages, and probably do a whole bunch of other things that I am totally clueless about. I don't twitter, and have no time for facebook. I can barely keep up with my email as it is. Thus, I am a very unlikely candidate to launch a successful crowdfunding effort, and yet that is exactly what has happened much to my surprise.

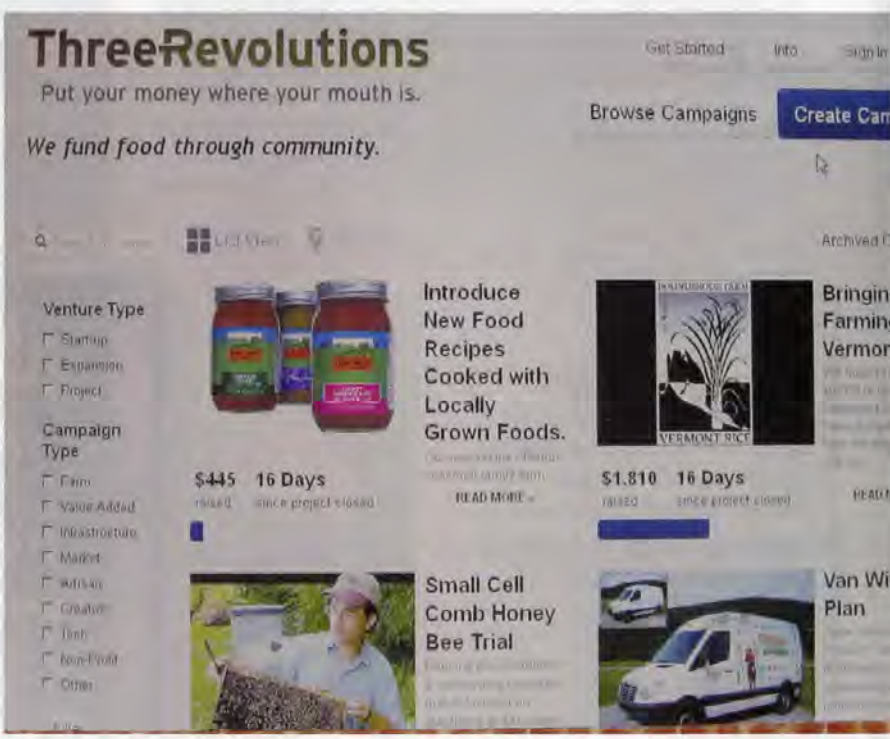
What exactly is crowdfunding? Also known as crowd financing or hyper funding, crowdfunding, it is just one of numerous alternative economic ideas that have taken shape since the global economic downturn that began in 2008. Crowdfunding refers to the collective efforts of individuals who pool their resources through networking to support efforts initiated by other people or organizations. Usually conducted through the Internet, crowdfunding got its start supporting musicians, but has since been used to support artists, writers, political campaigns, start up companies, and more. Kickstart is one of the most well-established and successful crowdfunding sites on the web.

I had overheard occasional conversations about crowdfunding but had never given it much thought until a couple Vermonters, Kevin Lehman and Chris Lindgren, established the crowdfunding site Three Revolutions (3R). With the slogan "Put your money where your mouth is", 3R seeks to combine food, friends, and finance by funding food related initiatives through community by connecting food innovators with those who want to back them. Folks who sow ideas by creating on-line campaigns are referred to as *Planters*. *Pollinators* spread the word, and *Cultivators* fund the *Planters* so they can grow their ideas to fruition.

Normally such efforts would have passed me by, if not for the fact that I know Kevin personally (we both serve on the Board of Directors of the Middlebury Natural Foods Co-op). Kevin, whose family publishes the Lehman's non-electric catalog and runs the Lehman's store that serves the Amish community and others in Kidron, Ohio, mentioned that he was starting this new on-line venture and was wondering if I, or someone I knew would be interested in trying to raise money through a 3R campaign.

It just so happened that I had been thinking about running a trial comparing the development time of honey bee eggs laid in combs built on small cell foundation to those laid in combs build on standard foundation. This trial (which I plan to report on in these pages in the fall of 2013) would not cost a huge amount of money, but the roughly $1,000 that I would need for additional equipment and the hiring of help was more than I was able to spare at the time. So I decided to give crowdfunding a try.

I discovered that the process of raising money for a project through crowdfunding, at least in my experience with 3R, was much easier and a lot more enjoyable than dealing with a bank. For most people, I think that being able to fill out the questionnaire to create an online



When a campaign is submitted, 3R reviews it to make sure it fits their agricultural related requirements.

campaign while sitting at your own computer makes crowdfunding much more approachable than traditional financial institutions as well. Crowdfunding also provides folks with projects like mine, that are not necessarily profit generating and therefore not of much interest to banks, a avenue to obtain funding. Rather than have a few institutional employees evaluate my project based on their own self-interest, Crowdfunding allows the public to have the final word on what gets funded. Ten percent of the total donated to successfully completed campaigns is used to fund Three Revolutions and the various companies that make their online campaigns possible.

When a campaign is submitted, 3R reviews it to make sure it fits their agricultural related requirements. Once the campaign is published online, you have 45 days to reach at least 80% of your goal in order to be successful and receive the funds. Donors that contribute to campaigns that do not raise at least 80% of their funding goal have their donations refunded. Thus, once a campaign kicks off, it is important to spread the word as widely as possible to your friends, family and customers.

Planters who launch a campaign are encouraged to offer gifts or rewards, small tokens of appreciation in return for donations, and the gifts are usually more valuable the larger the donation amount. It makes sense that folks who contribute (*cultivators*) would be interested in getting something in return for their donation and during my campaign I offered a signed copy of my book, "*Natural Beekeeping*" for donations of $50 while donors of $100 receive the opportunity to accompany me while I make the rounds visiting my apiaries and tending to the bees.

I was surprised when an accountant I spoke to informed me that donations made through crowdfunding efforts such as Three Revolutions were not taxable unless something significant and of established commercial value was given in exchange for the donation. Offering a key-chain for example, would not qualify a donation as being taxable by the recipient. As a result, I must report as income $35 of the $50 donation I received from those who received a book, but since shadowing me in the beeyard has no established commercial value, the $100 donations I received are not taxable at all.

Even more surprising to me was the number of people who qualified for a reward but turned down my offer to reciprocate their gift with my own. The typical comments I received included: "*I already have your book so please save the cost of the book and shipping to contribute to this or your future projects. I was just very pleased to help contribute to your work and also to show support for this type of funding initiative.*" *Being from California, a largely agricultural state, I understand the importance of bees in our natural and not so natural environment. Your project allows me to have a small vicarious role in helping to maintain the bee population.*" And, "*As a teacher in two sustainability programs, I am aware of the threats to the bees and to their importance. Thanks to wonderful folks like you, the rest of us have a chance.*" Such comments are enough to renew ones faith and belief in the goodness of mankind. Now I'm not claiming that everyone who launches a 3R campaign will have an experience similar to mine, but what do you have to lose in trying?

For more on the Three Revolutions crowdfunding platform, visit ***threerevolutions.com***. BC

Ross is the author of: Natural Beekeeping: Organic Approches to Modern Apiculture.

Master Beekeeping Programs, Part 4

Ann **Harman**

Could You Plan A Master Beekeeper Program? And Should You?

We have had a brief look at the various Master Beekeeper programs in the U.S. As far as I know 13 states and one regional association have programs varying from rather plain and simple to complex. Some programs are associated with a university; others are not. So let's give some thought about constructing a program that could be challenging, one that benefits beekeepers and is manageable.

Probably the first question should be *why* create a Master Beekeeper Program? Organizers may see this program as a way to educate beekeepers, to help them make a success of their beekeeping and to create a pool of those who could teach and be a mentor to beginners. Master Beekeepers also can reach out to the non-beekeeping public in many ways.

Next, think about what a beekeeper wishes to achieve. Certainly some will approach a Master Beekeeper Program as a way to improve beekeeping knowledge and skills. There are those who seek the challenge of being that good already. Others may seek becoming a Master Beekeeper simply for self-importance with no desire to teach or be involved in outreach or even help with the program after becoming a Master Beekeeper.

Since many states may not have universities with apiculture programs, professors or even Extension Agents, let us see if a high quality program could be planned and function without such assistance.

Then there's the dilemma of who within a state could construct a program and administer it. Could this person(s) receive qualification in another state? Not all the current programs accept out-of-state applicants. The one regional association, EAS, does and has certified Master Beekeepers from across America and from several foreign countries. So EAS could be a source of leadership for a state's program. However not every EAS certified MB wants to establish and construct an MB program.

The responsibility for organization, exams and the myriad details cannot rest with one person. Forming a committee immediately comes to mind. Here selection of committee members can be problematic (remember that the camel is a horse designed by a committee).

EAS MB Testing. (photo by Ray Hicks)

A MB committee is a place for someone who truly wants to raise the quality of beekeeping and beekeepers. A spirit of cooperation among committee members is necessary. Could assistance from an apiculture professor from another state be enlisted to serve as advisor? Remember – almost every state has at least one neighboring state. Such a choice would give credibility to a state's program and such help would be appreciated.

Designing a MB program is one thing. Maintaining it is a constant year-around job. Keeping the committee members interested and dedicated to the numerous tasks is difficult. Answering questions, keeping records and listening to an irate beekeeper who flunked by one point are just a few items that will occupy committee members time and patience. When designing an MB program go ahead and brainstorm – you need to think of all the nitty gritty items and think of who and how to take care of them.

It is important to make sure that applicants understand the entire program – what is required, costs, where to go for answers to questions about the program. Yes, someone has to answer questions about the program. No matter how carefully you have designed every part of your program and its publicity you can be sure of questions. So those who are the program coordinators must be reachable. Here is just one more addition to the tasks necessary to have a MB program.

It is possible to go to the websites of the state associations to find information on the MB programs but in many cases it is difficult, frustrating and time-consuming to find information. MB information should be informative, complete and **concise**. In planning your website make it user-friendly instead of user-surly.

Some states on the East Coast are small by comparison to those of the Midwest and West. The wonderful wide-open spaces may be good for bees but reality sets in with great distances to travel to take exams or attend courses. Such distances mean the program and applicants both have problems. Yes, definitely consider the wonders of the Internet and email. They could be extremely valuable.

Would it be possible to have small regions, perhaps several neighboring local associations, within large states to serve as stepping-stones to a statewide program? Such sub-groups actually have great possibilities. Those who passed a preliminary exam or exams would generate interest among beekeepers in that area. Would those who passed exams all go on to be

state-accredited MB? No. But they certainly would have improved their beekeeping knowledge, a definite plus for their bees.

Should courses be required or optional? Unfortunately people want a set course that directly "gives answers" to exam questions. Teaching to the exam, as it were. It's the "memorize it, spit it back on exams and forget it right after the exam" mindset. Therefore a course – giving exam answers – is a crutch or a panacea to relieving the exam-fear or success-desire, as well as an answer to the pleas to "give answers."

Anyone planning a MB program needs to keep that exam fear in mind since people a number of years removed from school do have a fear of exams. Just the idea of an exam, no matter the topic, produces panic.

So perhaps the thought should be emphasized that a course, or series of courses, makes a better beekeeper. And a better beekeeper will have the knowledge that can be tested on exams. Keep this thought firmly in mind as you plan a MB program and explain it to beekeepers again and again.

So if small in-state regions do lower-level MB teaching and exams, who is going to design those and will they be consistent throughout the state? They must be identical across the state otherwise the entire program creates distrust. Consistency means commitment on the part of a number of beekeepers all working on the exact same "wavelength" to prepare any courses, compose exams, and keep updating courses and exams to include new developments (e.g. new *Varroa* treatments, new information on queens, new pests). Questions arise, such as are there enough qualified beekeepers within a state to set up instate regional programs leading to the statewide exam(s) for the upper level(s)?

Some states have solved the problem of having qualified beekeepers by approaching a MB program in steps. Those who qualify at a given level and move up to the next become the teachers for the level passed.

What can be done with Internet courses? These are all fine and very useful for part of the education but I've never had an active colony sitting alongside my computer. Definitely in-hive work is essential, both for teaching and for giving exams. Fortunately much in-hive work can be done with only a few colonies. But when the upper levels of a MB program are considered, what about diseases and pests, queen rearing and any other advanced topics? The Internet can be used for giving of exams. Will everyone like the Internet approach? No, but its use for courses and exams is increasing.

One question might arise. Can those beekeepers using Top Bar hives participate in Master Beekeeper programs? It would be best to address this question during planning a program. Certainly bee biology would not be a problem but differences in hive management could be. Does a state have someone cognizant of Top Bar hives who could participate or advise in the MB committee? Interest in Top Bar hives is increasing at the moment. Other hive designs are in the minority but keep an eye on the future of these.

It is interesting to note what topics were included in the requirements of the various states. Most, but unfortunately, not all of the current programs require Public Service Credits and the applicants are given some choices of topics. Public Service requirements include beekeeping activities as well as topics for the non-beekeeping public. In some states entering and/or judging a honey show is required; in some other states it appears in the list of choices. In a few states an upper-level requirement is to participate in a university research project. A number of states require knowledge of other bees and other stinging insects. It is impossible to list the requirements and choices for all the current MB programs. However it is important to consider the variety of topics and select the most appropriate and meaningful.

One item that was sorely neglected by all the current MB programs is the suggested book list. A good book list would include ones suitable for beginners as well as those more advanced and also ones on specific topics, such as queen rearing. The list should be kept up-to-date since new books and new editions appear constantly. Furthermore if the list is annotated it is definitely more help especially in distinguishing beginning level books from the more advanced. Bee books are just not found in bookstores where they can be viewed before purchase. A separate section of a book list could include those worthy books that are not only out-of-print but also very expensive on the secondhand market. Some of these books, although interesting, are not essential to become a Master Beekeeper.

In closing, think carefully about the future when planning a Master Beekeeping Program. To have credibility a program must have a future. That requires interest and dedication on the part of those who run the program year after year. Can your state or association provide the beekeeper-power to do that? Good luck to those who design it and to those who strive to become Master Beekeepers. BC

Ann Harman was in the original group of EAS Master Beekeepers and she passed the first time.

GLEANINGS

NOVEMBER, 2012 • ALL THE NEWS THAT FITS

HEARTWOOD PURCHASES FREEMAN BEETLE TRAP RIGHTS

Heartwood, the leading USA company for quality cypress outdoor and nature products, announces it has acquired all rights to the Original Freeman Beetle Trap from Ashley Bee Supply, in order to enhance its Beekeeping Equipment line.

Heartwood will use the same design of the Original Freeman Beetle Trap invented by Jerry Freeman of Hamburg, AR. "The exclusive rights to the trap design will enable Heartwood to continue providing quality, cutting edge beekeeping equipment and excellent service, which our customers have come to expect," stated Larry Glass, owner of Heartwood.

For over two decades Heartwood has been manufacturing a premier line of nature products that expanded in 2010 to include beekeeping equipment. Their nature products are sold in birding and garden stores throughout the United States, as well as on many online web stores. Heartwood is one of the last companies in America to offer 100% USA MADE, handmade cypress nature products. For more information about Heartwood, visit its website at **www.eheartwood.com**

OBITUARY

Audrey Kathleen "Katy" Killion, 89 of Paris, IL, passed away September 10, 2012. She was a devoted homemaker and a partner in Killion & Sons Apiaries

She was born June 2, 1923 in Paris, IL to the late Daniel W. and Kathryn Humphrey. She married Eugene Killion May 24, 1947 in Paris, IL.

In addition to her husband of 65 years, other survivors include son Mark of Paris; a sister, Joan Craig of Fort Myers, FL and several nieces and nephews. She was preceded in death by two brothers, Ralph and Harold Humphrey, a sister, Helen Franz and sister Mary Humphrey.

Mrs. Killion was a 1941 graduate of Paris High School and was awarded the titles of May Fete Queen and D.A.R. Good Citizen. She was a devoted, lifelong member of First United Methodist Church of Paris. She was active as a Girl Scout Leader and a Cub Scout Den Mother for many years and was a member emeritus and former officer of Paris Garden Study Club. A talented singer, she sang with a Paris area dance-band during the 1940s. She was also a gifted and published poet, and was a past recipient of the National Library of Poetry's Editor's Choice Award.

Tanzania Sees Beekeeping As Way Out Of Poverty

Tanzanian Prime Minister Mizengo Pinda renews his call for more people to engage in beekeeping, saying it is the way out of poverty because it requires minimum capital and offers huge profits.

"If beekeeping gets enough boost so more people get involved, we will manage to rid many people of poverty," he says. "Starting up beekeeping does not need a large capital. Three beehives can get you going."

The Tanzania Daily News in Dar es Salaam says Pinda, speaking to a meeting of beekeeping and honey stakeholders, assured the beekeepers that honey and beeswax are in high demand in Japan, Germany, United Kingdom, Belgium and the U.S., beside regional markets such as the East Africa Community.

Tanzania is estimated to have the capacity to produce 138,000 tons of honey and 10,000 tons of beeswax a year, but only produces 9,000 tonnes of honey and 600 tons of beeswax.

Industries and Trade Minister Abdallah Omar Kigoda says the industry is growing every year and honey production has risen from 369 tons worth 521 million shillings ($333,760) in 2006 to 578 tons in 2011 worth 2.5 billion shillings ($1.6 million).

Pinda says the difference between what is produced and the potential production is too great and if 1.5 million people more engaged in honey production, each with 10 beehives, they could earn an extra 1.8 trillion shillings ($1.15 million) a year.

He advocated the use of modern beehives instead of traditional logs, saying this would allow the production of huge quantities of honey.

Pinda says because of the beekeeping industry's importance, the government has in place regulations, controlling quality of honey.

ABF TO GATHER BEEKEEPING INDUSTRY IN PA IN JANUARY

The 2013 North American Beekeeping Conference & Tradeshow is right around the corner and the excitement is building. The annual meeting of the American Beekeeping Federation (ABF) will be held in Hershey, PA, January 8-12, at the beautiful Hershey® Lodge. The ABF group rate is $119 per night single/double occupancy plus tax.

The ABF is excited to be in Hershey, home to some of the bestselling chocolate in the world. This event promises to be one "sweet" meeting you won't want to miss. In addition, the 2013 conference will be a very special one because the ABF will be celebrating its 70th anniversary.

With an anticipated attendance of more than 600 beekeepers from all over North America and beyond, this conference promises to offer something for everyone. From the new small-scale beekeeper to the seasoned professional, conference organizers have planned a schedule to incorporate educational sessions at all levels.

- Pesticide Impacts and Interactions for Migratory Beekeepers presented by Dr. James Frazier, Penn State
- Timing Varroa Suppression Measures presented by Dr. Marion Ellis, University of Nebraska, Lincoln
- Gauging the Reproductive Quality of Queens presented by Dr. David Tarpy, North Carolina State University
- Microbial Ecology of the Pollination Landscape: Environmentally Vectored Bacteria in the Alimentary Tract and Beebread of Honey Bees presented by Kirk Anderson, Tucson Bee Lab
- Panel Discussions on Urban Beekeeping and Small-Scale Bottling Regulations
- Serious Sideliner Symposium facilitated by Dr. Larry Connor

The conference begins with Tuesday evening's Welcome. Wednesday kicks off with the Opening General Session followed by Shared Interest Group meetings. The tradeshow opens Wednesday afternoon and remains open during conference hours.

The American Bee Research Conference opens Thursday morning, along with general sessions, and the Serious Sideliner Symposium, which, this year, will focus on "How I Do It." Interactive workshops take place Saturday morning. The week will culminate Sunday in an informative field trip to the commercial beekeeping operations of Brushy Mountain Bee Farm and Hackenberg Apiaries.

Additional information can be found at **www.nabeekeepingconference.com**.

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TOM SEELEY NEW PATRON

Bees *for* Development

Bees for Development Trust is delighted to announce that Professor Tom Seeley, eminent honey bee biologist, has become a Patron of the charity. Professor Seeley has studied the ecology of the honey bee for over 30 years and through his work, the beekeeping community has gained considerable knowledge of how the honey bee behaves in nature.

Professor Seeley said "I am delighted to become a Patron of Bees for Development Trust and support their endeavour to assist beekeepers in developing countries".

Director of Bees for Development, Dr Nicola Bradbear says, "Professor Seeley's research has great meaning for us as we work with beekeepers in developing countries. This is because beekeepers in poor countries rely on swarms and migrating colonies to occupy their hives and their understanding of how to attract bees – through hive design and placing of hives - resonates much with Professor Seeley's research. We are delighted to receive his endorsement and support".

In addition to Professor Seeley, Bees for Development Trust, enjoys the support from four further Patrons: Monty Don, Martha Kearney, Bill Turnbull and Sting. The Trust is currently planning for new projects to achieve their aims of alleviating poverty through sustainable beekeeping and is seeking additional Trustees to help. If you are interested in becoming a Trustee of Bees for Development Trust please enquire via our website **www.beesfordevelopment.org**.

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Little Darlings How Many Mites?

Ed **Colby**

Hauling four beehives down from the high country after dark on Labor Day weekend, we almost hit a bear just outside of Basalt. He crossed right in front of us. You wouldn't believe how fat he was or how fast he moved! He reminded me of one of those speedy giant NFL linemen.

I turned to my gal Marilyn. "Dearest," I exclaimed, " if we'd have hit that poor darling, wrecked the truck, and spilled bees all over Highway 82, I guarantee you we'd have the Channel 9 news truck in the driveway in the morning!"

Those bees struck out in the Little Annie Basin on the back side of Aspen Mountain at 10,300 feet. At this latitude and that altitude, you're on the edge of the envelope for honey bees, climate-wise. Just two seasons up there – Winter and the Fourth of July!

Anyhow, I wanted to get the little darlings home to Peach Valley to feast on rabbit brush pollen before Winter. I also needed to check them for mites.

I do the sometimes-maligned sugar shake test that Katie Lee taught me at Marla Spivak's queen rearing class a few years ago. I know some experts say it's unreliable. The doubters say that if you do an alcohol wash after you do a sugar shake, you'll find mites you missed in the sugar shake.

That hasn't been my experience. Maybe the experts just need more practice.

I test all my hives. I've got 70 right now, and it doesn't take long once I get the honey off. You hear things like, "Oh, test a few in each apiary, and if your mite count exceeds (some magic number), treat the whole yard."

Well, fine, but what if you test eight out of 32 hives, and the numbers for a 300-bee sample are all zero, or one, or two mites? Those are pretty low numbers. So maybe you opt to not treat. But let's say you miss the colonies with 10, 17 and 28 mites per 300 bees!

And that's what I find: generally low mite numbers most of the time, with a few out-of-control colonies. I practice drone comb removal, and the areas where I operate are largely saturated with hives headed by hygienic queens. I suspect those queens make a difference.

But I'm not inclined to sacrifice my few mite-infested colonies, just because they weren't lucky enough to have been led by a good queen, or maybe just robbed the wrong hive!

So if you only spot-check, and you have low mite numbers, the choice is to either not treat and maybe sacrifice some hives, or say to hell with it, and treat 'em all.

A lot of beekeepers take the latter route, or treat without bothering to test, which is why mites so quickly develop resistance to everything we throw at them. That's a fact. It's also a fact that when I run out of time I do the same thing.

The other challenge is deciding what's an acceptable number of mites for a 300-bee sample, in say, August. Depends who you ask. Conservative experts suggest that one mite is OK, two, maybe not. Other experts insist you could count 15 mites and still not need to panic.

But remember, mite numbers relative to bee numbers can double every 30 days, and really skyrocket when bee numbers decline in the Fall.

I'm not an expert. I'm twice-bitten, thrice-shy. The first time the mites got me good, I was as green as grass. I convinced myself that *Varroa* were somebody else's problem. That worked for the first year. The second time, I used Sucrocide but never checked to see if it worked.

Even if you treat, you'd better continue to monitor. Not all products work effectively, and our foe the *Varroa* mite constantly adapts to a hostile environment.

Thymol-based Apiguard 's been my go-to miticide for a couple of years, but in order to keep my mites from developing resistance to it, I need to rotate treatment with a different product.

Oxalic acid is hard on mites and relatively easy on bees. It's a natural component of honey. You can buy it at the hardware store as wood bleach. It's dirt cheap. The Canadians and Europeans use it. What are we waiting for?

Only problem is, it's not registered for use on honey bees in the U.S. But if it *were* legal, I'd knock down the mites in my worst hives with a 25 gram dose of Apiguard between the supers, right after I take off the honey in August or September. Then I'd treat all my hives that had two or more mites – this time with an oxalic acid dribble – when they go broodless in November. Then I'd rest easy until Spring.

That's what I'd do. But remember, I'm not an expert.