June 2012

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Bee Culture

The Magazine Of American Beekeeping

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Next to the bees and a big enough truck, a migratory beekeeper relies on a good orchard map and a working cell phone. David Winter checks his map, his bees and then calls home. photo by Kodua Galieti

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Bee Culture

FEATURES . . .

DEPARTMENTS & COLUMNS

GLEANINGS-73, CALENDAR-75, CLASSIFIED ADS-77

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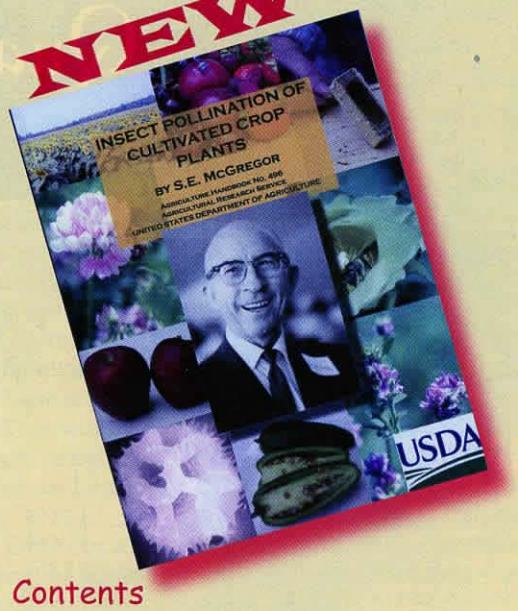
Contributor to Mother Earth News

NEW



Contents
Economics of plant pollination
Flowering and fruiting of plants
Hybrid vigor in plants
Pollinating agents & Pesticides
Beekeeping & Pollination & Contracts
The Apiary
151 crops

Insect Pollination OF Cultivated Crop Plants
By S. E. McGregor
Agriculture Handbook No. 496
First published in 1976 by ARS USDA, Republished in its entirety, 2011, by The A. I. Root Company
411 pages, Soft Cover, black and white throughout. More than 240 photos and drawings, 15 comprehensive tables.
ISBN 978-0-9846915-0-0. $34.95

Added to this edition is the original Book Review by Dr. Roger Morse, published in Gleanings In Bee Culture, November, 1976, plus S. E. McGregor's Obituary.

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More Almond Topics!

Your articles the last few months on the almond pollination have been great. Like reading a serial novel – what will happen *next* month!? Your picture on the front cover was incredible and makes me wonder how you got up so high to take the shot of those undulating fields in full bloom?

It has been interesting because pollination is a topic interesting to beekeepers, though often we seem only concerned with making more honey and money and keeping our hives alive through the Winter.

As to all the future topics you could write about from the third paragraph of your column, all would be fascinating. I find your column a first and must-read each issue. For me? I'd probably initially like to see articles on – water, beekeepers, fire ants, orchard growth opportunities/limitations, hullers (?), bartering, CCD, two hours in a plane, self-pollinating Independence, blue orchard bees, stolen hives, post-pollination escape routes and holding yards. What a fascinating array of topics!! Does that give you enough o write about for awhile?!

Always enjoyed Dr. Tew and Richard Taylor too. Good job!

Renée David
LaForge, WI

Ant Free Hive Stand

This is a stand I built in an attempt to keep crawling insects out of my hives. It has a groove cut in the pipe to allow me to add mineral oil to create a barrier for ants and such crawling insects. Being made out of plastic it allows me to weed eat against it and won't deteriorate in the weather.

Supplies needed are a utility knife, knife with a rigid six inch blade, tape measure, and a section of plastic *double walled* pvc culvert pipe 18 inches in diameter.

I measured down 12 inches on the culvert and made a cut all the way around it with the utility knife. After the initial cut you will use a knife to cut through the smooth inner layer using the initial cut as a guide. You should now have a twelve inch section of pipe assuming you measured correctly. Dad always said measure twice and cut once this statement often comes in handy.

I made my mineral oil ring on the first solid ring from the top. My reasoning is it will protect my bees from landing in the oil and allows me to bury the base a few inches in the ground. This will help protect from insects crawling up the inside of the pipe and entering the hive.

Using your utility knife cut all the way around this ring, be sure to adjust knife setting so that it doesn't cut into the inner layer. Now cut a second line approximately half an inch parallel with the first line. I cut a notch about four inches on the top line to make adding the mineral oil easier.

You now have a completed hive stand. The culvert I used cost me $14.49 per foot making for a relatively cheap stand. I am sure there are different types and grades but this worked for me. There are two drainage holes in each groove but I simply filled them with silicon caulk to seal them from leaking.

David Middleton
Cabool, MO

Love Those Chickens

I read in the latest *Bee Culture* that you're now dealing with chickens.

Good for you! I think you'll find that they really don't take that much time to care for and they are a lot of fun to watch. We've had eight since last year - six Rhode Island Reds and two Americaunas - and have found it is a good complement to our four beehives.

We let our chickens run free during the day and although we thought they would take up even more of our precious time it turns out the reverse is true. They eat just about anything so we've had to do no weeding around the yard. They do it for us and so our garden is cleaner than it has ever been.

Also, they eat all the dead bees and any burr comb I pull off the hives.

I think of them as goats with feathers.

Greg Smela
Vermont

Low Down Bait Hives

Upon reading the April *Bee Culture* I feel compelled to comment.

The first topic was by Tom Seeley – Using Bait Hives. I probably started using what we used to call "Decoys" before Tom did. But he went into it deeper than I did.

I never put my bait hives up high even though it might be better, but people will find them which could cause the trappers and the bees some problems.

In the early 40s if I put out 10 bait hives by April 15 I would have 10 colonies by July 4. Just

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that simple and all of these were no more than three feet off the ground, most were on the ground, and camouflaged for reasons stated above. When the mites came along, you couldn't find live bee trees or swarms. This was from 1990 to about 1995. It's better now (somewhat).

The second part of his article was when to pick these bait hives up – the ones with bees. If you pick them up the morning after they're in, you're OK and if it was a prime swarm it makes no difference when because you have a laying queen. But if a after-swarm went in it's probably best to wait until the queen starts laying before doing so. Reason – she will have oriented to this spot, and if you move the hive you have a good chance of losing the queen.

Jim Cowan
Aberdeen, WA

More To The Highly Filtered Honey Story

The following is from Vaughn M. Bryant, Professor and Director, Palynology Laboratory Department of Anthropology, Texas A&M University in response to the BUZZ sent out recently from Food Safety News regarding honey and pollen. See BUZZ archives at ***www.BeeCulture.com*** – Honey is from Nectar, Not Pollen, *and,* Filtered Honey is Honey, Ultrafiltered Honey is Not. *He sees The Rest Of The Story when it comes to the honey filter question. There's less than we imagined, and he offers the following . . .*

I look at about 150 honey samples a year for importers, exporters, and local beekeepers. What is said in the Food Safety News Release you put out yesterday in your BUZZ notice is true.

However, what is also true is that once the pollen is removed, and all honey does have pollen unless it is a pure honeydew, it is not possible to determine either the nectar source or the geographical origin of the honey. There have been some attempts to do this by using the isotopic signatures of honey, but thus far this has not proven effective or reliable.

Once honey is filtered, and we suspect the illegal Chinese honey that is still entering the US market is being highly filtered (but not Ultrafiltered), then it can no longer be traced to its geographical origin. Also, when any highly filtered honey is mixed with honey from another region, such as the local honey in a SE Asian country, then the only pollen that will appear in the honey is the pollen from the SE Asian country. However, by examining the pollen concentration values of those honey samples we can *still* determine that they are a blend of both filtered and unfiltered honey, but cannot determine the origin of the filtered portion.

Yes, the USDA does encourage honey to be highly filtered so it will appear crystal clear of any impurities, but that is the problem. Once any honey is highly filtered we can no longer determine where it comes from . . . whether from domestic sources or from foreign or illegal sources. *(Consumers, be careful what you wish for. Ed.).*

Another problem is that the majority of honey I have examined, which is currently being sold in supermarkets nationwide, contains no pollen. Jars of honey I have examined claim to be sage or thyme honey, orange blossom or tupelo honey, buckwheat or sourwood honey, and yet with no pollen present in those jars we cannot be certain of the true nectar contents. As such anyone can remove all the pollen and then call clover or rapeseed honey anything they might want to call it. With no pollen as proof, clover honey could be labeled orange blossom, sourwood, tupelo, or sage honey because there are no USDA or FDA rules that *demand* truth-in labeling in terms of the type of honey that is sold in the U.S.

In my many years of experience I have found that locally-produced honey is usually full of pollen and is most often authentic in terms of what it claims to be.

Vaughn M. Bryant
TX A&M University

Response: *I'm an investigative journalism student doing research on the transshipment of Chinese honey through India to the U.S. and as such I'm working with a lab to test various honey samples.*

I've been following Andrew Schneider's FSN work and your research as a result (most recently with this piece below), and have been told opposing information from what you have said about testing for origin in honey.

Sabrina Buckwalter, Reporter

Response: *In this article the writer states that with no pollen present there is no way of checking the origin of the honey.*

This is incorrect, the New Zealand company "Oritain" is able to determine if honey comes" from the stated Country and even the location within a country.

It is well worth contacting them, they have a data base of information and can authenticate claims of origin.

Michael Vercoe, Bee Honey
Otago, new Zealand

Response From Dr. Bryant: *If so, I would like to see the published results because I am unaware that this can actually be done on a worldwide basis . . . which can be done using pollen. I admit I am neither a chemist nor a soils expert and I rely on my botanical background and knowledge with working with honey (you can check my web site for more articles if you wish). However, from published articles I have read (granted I might have missed a few in chemistry journals that I rarely have time to search) the study of isotopes in honey (that result from soil or water sources in the region where the bees are foraging)* has been successful *at noting a specific point of origin, but those examples have been extremely few and are limited and work only in areas of the world where extensive isotope data already exist . . . which can then provide the database against which the honey isotopes can be tested. I am also aware of the recent protein testing and other types of tests being conducted in Europe on honey but to my knowledge all that those tests will tell you is whether or not highly filtered honey has been added to a sample or in a few cases the unifloral type of honey . . . not where that extra honey originated. V. Bryant*

INNER COVER

There's still a lot of ground to cover in the Almond Odyssey – a day spent with Randy Oliver, more on pollination brokers and inspectors, a visit with Olivarez Honey Bees, some time with Dan Cummings, a bit about our photographer Kodua Galeti, more with The Almond Board and Blue Diamond, and some time looking at colonies in the middle of collapsing from – something. But for now we'll let those folks rest, because this time . . . Did you Know The Beltsville Bee Lab is moving, not far from where they are and still in Beltsville (a suburb of Washington D.C.), but getting an 80 year upgrade in heating, air conditioning, lab equipment, offices and space? We visited recently, and here's what we found.

We were invited to visit the lab by Lab Leader Jeff Pettis, and had a chance to visit with many of the staff the day we were there and talk about their research. Space and time will let me visit a few of their activities, but some are easier to explain than others, so forgive me if we only touch lightly on some, while focusing more others.

The Lab Leader is Dr. Jeff Pettis, who lives just out of Washington D.C. with his wife and four sons, well one is still at home while the others are attending various colleges. His wife works for a non-profit organization that keeps her busy and enthusiastic. Jeff is originally from Georgia, and as an undergraduate at The University in Athens took a beekeeping course with Dr. Al Deitz, the resident honey bee researcher there at the time. Eventually Jeff worked for Dr. Deitz as his Technician, doing a lot with Georgia Queen Producers, especially Reg Wilbanks.

Jeff stayed at the Univ. Of Georgia for his Masters, then went to Texas A&M for his PhD with Dr Bill Wilson. After that he did post-Doc work with Mark Winston (a former *Bee Culture* columnist) in Canada, then came to the bee lab in1996 working on a variety of issues including pests, diseases, pesticides and the interactions of some or all of them. He became Research Leader in 2006 and directs a staff of – well, quite a few permanent, temporary and visiting scientists, technicians and support people.

There are, of course some major projects underway, some applied to help every day, and some service projects that aren't research, but answer a lot of questions for regular, everyday beekeepers.

Jeff Pettis, left with Kim Flottum, at the Beltsville Bee Lab.

The lab has, on average about 300 colonies in 10 apiaries located on the Beltsville Research land, and of those, they overwinter about 150. They have several outbuildings that house equipment, storage and assembly. Interestingly, as we toured the buildings, one stood out. It happens that it came from the Madison Bee Lab when it closed in the late 80s, shortly after I left there. I walked in and was magically transported back 40 some years – where I learned to inseminate queens, squeeze drones and more. Dave Emmett and Lester John and the rest suddenly came back in full light – it was truly déjà all over again. An interesting experience.

Just outside this building was a colony scale. The bee lab is part of the NASA colony weight program, and, interestingly, Bart Smith, who takes those daily weights, has seen some significant changes since he started doing this in 2007. The biggest change – no fall flow. By July the season is over, which lends itself to making life for African Honey bees darn near impossible in the DC area. A mixed blessing I guess.

Bart Smith

Bart is the chief cook and beekeeper at the lab. From 1975 until 2002 he was the chief apiary inspector for Maryland. When he retired he moved here to keep the lab's bees, and run the Disease Diagnostic lab – a service the lab provides for all beekeepers, in case you didn't know.

What the lab does is examine samples of bees and comb sent in by

From Beltsville To Wild Blueberries. Making Patties

inspectors or beekeepers to find out if there is disease or pests present. AFB is a common test, and is it resistant to antibiotics, but they check for tracheal mites, *Varroa* mites, and Nosema, too. For Nosema you get a spore count, not a species definition, which is very, very time consuming.

Many inspectors need to confirm a diagnosis before they can proceed with treatment options, or what they tell a beekeeper, and in some states – Ohio for instance – a diagnosis has to be confirmed by the lab before action can be taken. Often, samples are received from colonies that perished and the beekeepers want to know why they died. These samples are difficult to analyze. They can be sampled for mites, even disease, and the beekeeper will be told what was found – but what killed the colony? That usually remains a good question.

Most samples come from inspectors, but about 25% are from beekeepers. Last year the lab did 978 samples, but two years ago it was over 1800. That's changed because New York has lost inspectors, thus fewer sample are sent in.

If you are interested, see their web page **http://www.ars.usda.gov/Services/docs.htm?docid=7473** for instructions on sample preparation and mailing address.

The techniques used to ID these samples are for the most part pretty straight forward and even during the busy season take only a couple of weeks or less for results. Usually it's only a day or so.

There are some minimums for sample size so the analysis can be useful. *Varroa* mites per 100 bees, 30 bees for a Nosema sample and the like, so be sure to read the instructions. Also, how samples are sent in is important – wrapped in plastic bags is not good as mold and other organisms creep in and ruin the sample. This is, says Bart, your government dollars at work. It is a service to the beekeeping industry that we are proud to offer.

There are of course other scientists working at the lab – Jay Evans, 12 years at the lab and last year's EAS Hambleton Award winner, has been involved, along with 16 year veteran Judy Chen in ferreting out the honey bee's genome, along with other genetic studies, looking at what they already know is, and

Judy Chen

is there anything new out there we should be aware of. Looking at the genetic level of the Nosema complex and where it is bad, and isn't bad, and the many viruses that inflict honey bees are being studied too, to make the discovery of what's new before it becomes a problem. Analyzing *Varroa* genes, work on foulbrood resistance to antibiotics at the molecular level, immune systems at the larval and adult level, plus doing the virus ID for the surveys the lab is involved in – all valuable tools for bee breeders who choose to use them.

The lab is also involved in the ongoing BIP and APHIS surveys of beekeepers. The APHIS survey is checking on beekeepers from 35 states for samples. APHIS helps these states for financial support to collect the 24 samples/state, with each sample consisting of eight hives per apiary. These are sent to the lab and each examined for what's present, and not present. The next year only 10 targeted states will be sampled, with California and Florida on the list, and others rotated on a yearly basis. Each sample has a live bee contingent with the rest in alcohol. The value of this, of course is that it establishes a database big enough to count for virus, DNA samples, RNA samples and the rest.

But moving – which is why we started this. The new facilities have been completely redone. They took a 1930 something building and striped out everything but the bricks and added all new insulation, windows, plumbing, ventilation and air conditioning, offices, elevators, hard wired electronics, floors, walls, furniture, the works. The square footage is about the same as they have now, but it's all on one floor – the third floor of the building – so the whole thing is much more energy efficient. Plus, it is much closer to the front of the Beltsville complex so it is easier to maintain for snow re-

Beltsville Bee Lab's new home.

Continued on Page 71

It's Summers Time –

Easter In DC

This year for Easter we went to Washington DC for a week. It was an amazing week. If you haven't been there, or if you haven't been there for a long time I urge to find the time. It's a wonderful experience. Lot's of walking and maybe don't go in the Summer time unless you like it really hot.

We stayed in a hotel outside the city and rode the metro just about everyday. I love public transportation and they do it pretty well in DC. You can get close to all of the major sites you want to see. It even takes you very near Arlington Cemetery. Just remember if you happen to get on the wrong train you won't die, just get off at the next station and get back on the right train. Once you get past that feeling of panic, it's all good. No searching for a parking place and no dealing with traffic.

We had several tasks lined up for the week. Kim spoke at two different local bee meetings, which is what he loves to do. We spent a day at the Beltsville USDA Bee Lab (see Kim's Inner Cover for more about that). That was my first visit to any of the bee labs. It was a full day. A lot goes on and we spent time with each of the key people there. Then we spent most of a day at the White House Easter Egg Roll. The Howard County Beekeepers Association has an information table there each year, and they very graciously invited us to spend time talking about bees to hundreds of people. It's always fun talking bees, especially to kids who ask the greatest questions.

The weather was beautiful the whole week. So we also spent a day with our friend Charlie working bees. Just working his bees. We got an early start with a big breakfast and then headed to several of his beeyards. If you love bees like we do, there's no better way to spend a nice warm Saturday.

We did manage to do some sightseeing while we were there. Washington is an amazing place. The monuments, the museums, the Capitol Building. The Smithsonian alone would take a week at least, to see all of it. Kim and I managed to see a couple of buildings that we missed before. The most exciting one for us was the Air and Space Museum. If you like anything about airplanes, rockets, outerspace – you have to go there. There was a room that was of particular interest to both of us – The Wright Brothers exhibit. The original plane is there and you can find out all about their family and how they started on their adventure. If you've been reading *Bee Culture* for very long you've probably seen some reference to the fact that Amos Ives Root published the first article about the Wright Brothers. He became acquainted with them and witnessed their flight in Dayton, Ohio. The *Gleanings In Bee Culture* that the article was published in is on display at the Smithsonian. Well, how cool is that! So of course we posed and took lots of photos and looked like typical tourists. But we didn't care, it was way cool!

So much of our history is right there in one spot. It's incredible to see. I love the monuments, especially at night. It's all about us, and how we started and how we got this far. It doesn't matter how you feel about who's in the White House, it's all about what our ancestors went through to get us to where we are now. If you haven't gone please go. You'll love it. And if you're from a military family you'll love it even more.

We were treated one evening to a very special meal at the Fairmont Hotel in DC. The young chef there, Ian Bens, is a new beekeeper. So he and pastry chef, Rebecca Kinsella, prepared a meal for us that was out of this world. Three and a half hours, 20 courses – appetizers, drinks, main dishes, desserts – it was incredible. Most of the 20 recipes had either honey, pollen or propolis in them. He made some with Cherry Blossom – a risotto that was fantastic. It was the most elegant meal I've ever tasted. There were nine of us, most beekeepers, but not all. Great food, good company and good conversation.

We travel a good bit – Kim much more than me – and the majority of the time the travel involves a bee meeting of some sort. Sometimes it's just for a weekend and sometimes it's an entire week. You know leaving home is always complicated, especially when you have chickens and cats or dogs or kids. We have wonderful children and wonderful neighbors who take care of our place when we're gone. But even when it's complicated the travelling we do is always a good experience. We're always treated very generously wherever we go. And because honey bees cross the barriers of education, lifestyles, and personalities, we've gotten to meet some really interesting people that we wouldn't know if we stayed home all the time. Venture outside your comfort zone. Once you work out the details you'll have a great time. And remember nobody dies from getting on the wrong train.

I hope you're all having a good Summer.

Kathy Summers

JUNE – REGIONAL HONEY PRICE REPORT

So…how was Spring this year?

Region 1 Best in years. Mild, feeding, early bloom then cold. Built up fast, split early. Strong hives eating lots of pollen substitute to get built up for blueberries. March, maples and poplars bloom, healthy bees, then a cold snap. April no bloom left, swarms, drought, then rain, then packages and cool weather.

Region 2 Early, fast build up, then cold and loose clusters. Dry summer in March, hot, little pollen, feeding. Winter in April and nectar shut down, but capped honey and swarms. Mites, too.

Region 3 Too warm too soon, too dry for nectar early, then rain, but no blooms. Bees don't know if they are coming or going. Feeding, but no losses so far, lots of brood.

Region 4 Hot, dry, early but making honey. April cold and wet with a heavy frost. The best Spring ever with a mild Winter and nucs doing well. Queens never stopped laying so lots of brood, olive, locust and poplar very early…beekeepers looking good. Already Summer blooms starting early. Tough to raise queens for early splits. Bees not ready. Extracting in April. Swarms! Crazy!

Region 5 Back and forth from winter to Spring to Summer to Winter to Spring. Bees are confused. So are beekeepers. Early swarms. Dry early.

Region 6 Early, no clover yet, lots of rain some places, drought in others. Orange flow good, black gum froze, but bees are good. Queen rearing difficult, but no colony losses so far. Awesome! Swarms! April harvest for the first time ever. Best honey crop in years, but too early.

Region 7 Warm and early, unpredictable, too early fruit bloom for bees, and too early spring flowers so cold snap hurt plants and crops and slowed down everything. Feeding because of warm winter, but nectar and pollen out there. Happy Bees!

Region 8 Spring three to four weeks early, so bloom early and crops early and build up early and queens on time…so late. Swarming, honey crops, both excellent. Queens on time, so late for splits, so huge brood populations. Excellent locust flow.

Region 9 Mild Winter, early and warm Spring with ample moisture in some places made good crop early. Queens doing well and early. Work compressed.

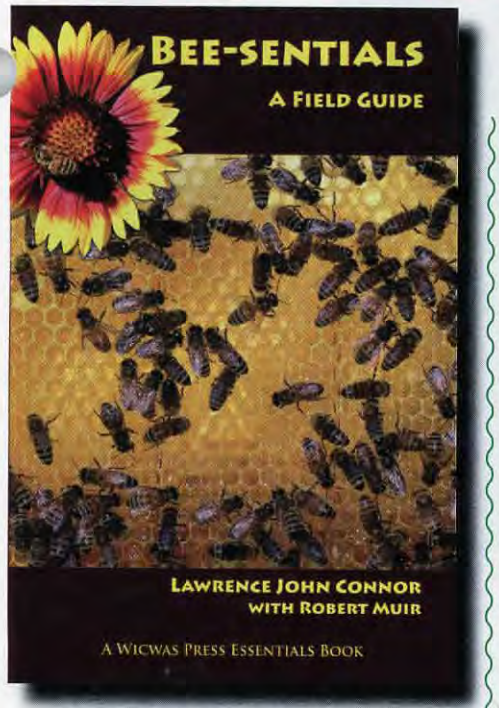
Region 10 Warm but dry, early. Swarms like mad. Bees and beekeepers confused, but too early for winter colonies to take full advantage of. Compressed bloom means missed pollination, honey crop and fruit and veggie crops. Bees in best shape in years, early splits, but what happens now?

Region 11 What Winter? But cooler than normal Spring. Not enough rain to relieve the drought in CO but swarms there are mixed…early, and late and fire a problem. Windy and dry in AZ. Bees good after almonds, build fast, enough rain in most of AZ…good honey so far. Overall about a month early.

Region 12 Crazy. Dry so light and late orange and sage crop, but colonies built up. Hot and dry early, then rain and cool up north so feeding, and too cold in eastern areas. Early swarms.

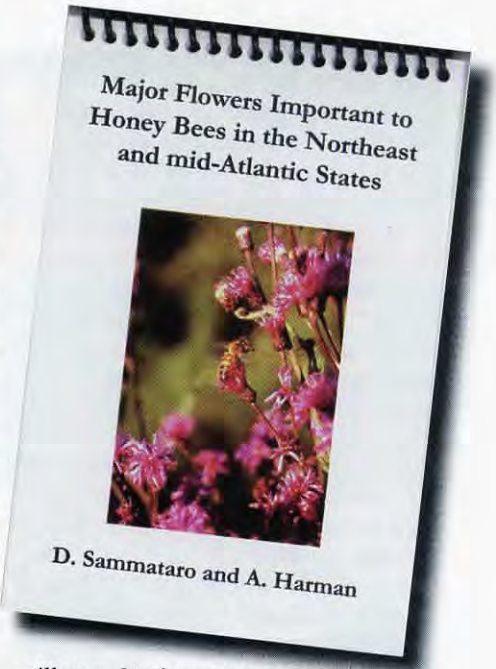
	REPORTING REGIONS												SUMMARY		History	
	1	2	3	4	5	6	7	8	9	10	11	12			Last Month	Last Year
EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS													Range	Avg.		
55 Gal. Drum, Light	1.74	1.95	1.74	1.57	1.85	1.78	1.66	1.73	1.80	1.85	1.81	1.80	1.52 -1.95	1.75	1.78	1.66
55 Gal. Drum, Ambr	1.66	1.75	1.66	1.53	1.75	1.66	1.60	165.00	1.60	1.60	1.62	1.68	1.40 -1.95	1.64	1.67	1.54
60# Light (retail)	147.50	180.00	149.00	152.80	150.00	170.00	145.67	160.00	110.00	159.00	161.67	157.00	110.00 -205.00	154.17	158.33	146.20
60# Amber (retail)	145.00	167.50	149.00	154.83	150.00	163.33	143.00	156.67	125.00	152.38	156.67	152.00	100.00-205.00	152.26	152.70	142.19
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS																
1/2# 24/case	69.79	73.23	50.40	64.53	61.70	60.00	46.18	100.20	61.70	49.92	57.00	77.80	37.20 -86.00	61.80	62.64	61.49
1# 24/case	92.85	101.25	100.20	83.44	84.00	103.86	82.58	93.00	72.00	120.80	95.12	110.08	45.00 -148.00	95.08	95.56	86.69
2# 12/case	101.40	84.68	75.00	74.33	78.00	82.16	76.86	97.20	73.50	86.16	54.50	89.80	34.00 -144.00	82.41	80.93	76.68
12.oz. Plas. 24/cs	81.12	91.70	63.60	74.17	67.20	76.00	66.09	79.83	66.00	64.44	82.40	79.84	48.00 -120.00	75.66	79.51	71.45
5# 6/case	135.67	101.32	88.50	81.93	96.00	120.00	82.05	98.77	72.00	78.99	59.09	100.00	38.68 -180.00	92.90	91.03	85.87
Quarts 12/case	138.00	128.88	111.57	114.40	102.00	99.16	108.90	109.50	111.57	137.45	105.39	128.50	52.00 -166.00	114.14	118.21	108.92
Pints 12/case	89.00	71.48	90.00	70.25	96.00	60.00	71.29	63.80	55.00	81.90	68.25	76.25	36.00 -115.00	71.69	72.66	71.04
RETAIL SHELF PRICES																
1/2#	3.50	4.33	3.23	3.37	3.50	3.00	3.02	2.96	3.50	3.18	3.37	5.00	2.25 -5.00	3.37	3.71	3.26
12 oz. Plastic	5.06	4.70	4.00	4.00	4.29	4.13	3.74	4.36	4.00	3.73	4.43	5.02	2.99 -8.00	4.28	4.52	4.08
1# Glass/Plastic	5.30	5.60	5.94	5.34	6.00	6.11	4.64	5.57	5.00	5.65	5.27	7.33	3.00 -8.99	5.52	5.95	5.25
2# Glass/Plastic	10.38	9.31	10.97	9.50	10.00	9.00	8.25	8.78	8.00	9.73	7.79	11.66	5.68 -14.00	9.34	9.36	8.31
Pint	8.75	6.98	8.88	7.17	6.68	7.08	9.35	7.44	5.00	7.34	8.12	8.78	4.75 -15.50	7.73	8.00	7.37
Quart	14.50	11.98	13.25	11.72	12.00	11.46	12.42	12.65	13.05	14.01	11.81	16.32	7.00 -19.99	12.60	13.31	12.24
5# Glass/Plastic	24.17	20.49	23.60	20.17	20.50	25.00	18.19	20.50	18.00	17.39	16.47	25.00	10.50 -32.00	19.76	20.92	19.25
1# Cream	5.00	7.39	7.40	6.40	6.69	6.00	5.51	6.50	6.69	6.08	6.79	8.00	3.99 -9.75	6.51	7.36	6.18
1# Cut Comb	6.75	5.73	7.80	7.00	8.92	7.00	7.90	6.75	8.92	9.50	8.50	12.66	4.50 -15.00	8.10	7.67	7.08
Ross Round	8.00	6.95	7.80	5.63	7.22	7.00	7.50	7.88	7.22	7.22	7.75	7.60	5.25 -9.00	7.32	7.45	7.32
Wholesale Wax (Lt)	3.00	5.98	4.38	3.74	3.15	5.40	3.40	5.00	4.50	6.00	3.48	4.33	2.25 -8.00	4.44	4.40	3.98
Wholesale Wax (Dk)	3.00	4.88	2.75	3.46	2.90	5.67	3.33	4.88	3.93	4.00	2.92	4.15	2.00 -6.00	3.86	3.74	3.40
Pollination Fee/Col.	87.50	112.50	77.50	57.17	55.00	58.75	53.00	75.00	93.92	60.00	62.00	133.75	35.00 -190.00	75.33	81.47	76.00

New For Summer 2012 –



BEE-SENTIALS A Field Guide. Dr. Larry Connor, with Robert Muir. Published by WICWAS Press, 1620 Miller Road, Kalamazoo, MI 49001. www.wicwas.com. ISBN 978-1-878-075-28-4. 6" x 9", 208 pages, 270 color photos. $29.95 including domestic post.

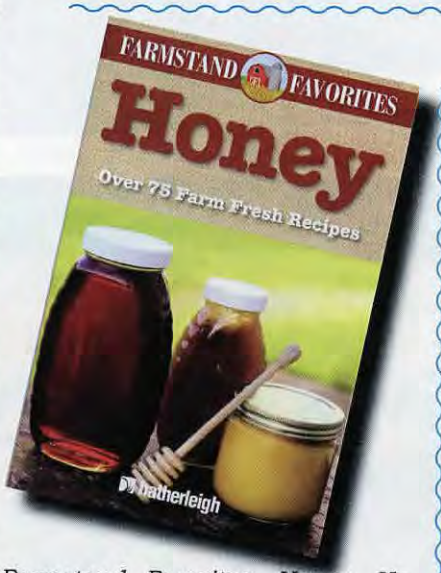
If you routinely read Dr. Connor's column in this or the other beekeeping magazine, then you know the depth and breadth of the topics he covers. This book is not like that. Well, not too much like that. There is no doubt he covers a wide, wide variety of topics in this work, but with only just enough information to give you what you need – not the whole 2000 word column you normally get. A little bit about lots and lots of things. There is some fundamental stuff on getting started and what equipment to use – all told about 35 pages. Then the beekeeper's year, honey plants, hive products, pest and diseases and some basic and some not so basic biology. This book is meant for those who don't think they are beginners any more, but need some refresher info. There are very, very few beekeeping books not meant for beginners – except the surplus on raising queens – and you can count them on one hand with fingers left over. This is one. – *Kim Flottum*



Major Flowers Important to Honey Bees in the Northeast and Mid-Atlantic States. Diana Sammataro and Ann Harman. Self published, available from Ann Harman, 1214 North Poes Road, Flint Hill, VA 22627. 40 pages, all color. Heavy, water resistant paper. $15.00 plus post. Group discounts available.

This isn't a book, as such. It's a field guide, a reference, a spiral-bound-at-the-top booklet that identifies 40 Spring, Summer and Autumn flowers that fits in your pocket, shows you the flower and tells you when it blooms (about), and a few details. But not many details, but then you don't need many when you're walking in the woods. It's only 5-1/2" x 3-3/4", and each two page spread covers a single flower or similar group of flowers...think willows. It gives you a spot to write the bloom date where you are and that's it. But that's all you need. It's about time.

Kim Flottum



Farmstand Favorites: Honey. Hatherleigh Press. ISBN 978-1-57826-406-3. 90 pages, black and white. 5-1/2" x 8". $9.50, but bulk purchases available at 800-528-2550.

There's nothing fancy about this book. It has a little bit about honey, and 75 recipes covering breakfast, soups and salads, dressings, meat and poultry, vegetarian entrees, side dishes, beverages and desserts. Resources are listed. The value is that it's an easy give away for a honey producer...or at least an inexpensive book to put on your Farm Market table or honey stand at the fair. More recipes mean more honey sales...it's that simple. – *Kim Flottum*

Country Rubes, makers of the Combo Bottom Board, have a couple of new products that are both useful and clever.

The first is a simple moving screen. Not earthshaking by any means, but well made, dipped in rosin and paraffin to keep it lasting, and double useful as not only a moving screen but as a sugar dusting screen. If you don't have one, try one of these. Available in eight or 10 frame size.

Moving screen.

The second item is clever. It's a two way robbing screen. It has moveable fasteners on the sides to hold it fast to the colony, and on one side it has, on the top, a narrow, but colony-wide gap useful even during a honey flow when there's high traffic. The bees inside have to exit up and away, and robbers simply sit on the landing board trying to get in. Very effective. It's also a guard against wasps in the fall when they come calling. The other side of the screen has a small opening on the top that can be closed with a swinging cover. This is even a better robbing screen as it has a small, easily defended entrance. This screen, with the wide entrance on top, can be left on all season and reduces front door confrontations to almost 0. When robbing, or wasps get rough in the fall, switch it around and you've got even more protection. Available in eight or 10 frame size. $16.00 plus freight or available from many suppliers. Find out more at **www.countryrubes.com.**

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A Closer Look

BROOD PHEROMONE AND E-β-OCIMENE

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

Brood pheromones with primer and releaser effects on workers have been identified.

In honey bee colonies, adults are responsible for the care of all immature stages – eggs, larvae and pupae. A lack of workers and especially nurse care leads to brood decline and death. There is evidence of a complex system of chemicals produced by the larvae to adjust the behavior and physiology of workers to the needs of the brood (Free and Winder 1983; Huang and Otis 1991; Slessor et al. 2005). Nurse bees must recognize the various brood instars (stage of insect from one molt to the next), age and sex of the larvae in order to provide the appropriate nutrition and environment for development (Maisonnasse et al. 2008). For example, the quality and quantity of the nutrient jelly provided by nurse bees determines whether a three-day-old (or younger) female diploid larva (possessing a double set of chromosomes) will become a worker or a queen. Although it is not clearly understood whether the brood cues influencing the behavior of nurse bees are primarily mechanical or chemical in nature, research supports that both types of stimuli are present (Le Conte et al. 1995a).

Brood pheromones with primer and releaser effects on workers have been identified (Slessor et al. 2005; Le Conte and Hefetz 2008). One pheromone named brood ester pheromone (BEP), is composed of a blend of 10 methyl and ethyl esters (Le Conte et al. 1990). This pheromone modulates the feeding and pollen foraging behavior of workers (Le Conte et al. 1995a; Pankiw 2007; Pankiw et al. 1998), inhibits the activation of the worker ovary (Arnold et al. 1994; Mohammedi et al. 1998; Pankiw and Garza 2007), induces workers to cap brood cells (Le Conte et al. 1990) and increases the rate of protein production in the hypopharyngeal glands of workers (Peters et al. 2010; Mohammedi et al. 1996). In addition, BEP modulates the behavioral maturation of honey bee workers (Le Conte et al. 2001), then inducing workers to take care of the brood rather than allocating energy to outside activities. Due to the relatively low volatility of the esters, this larval signal can be assimilated as a contact pheromone that targets nurse bees directly in feeding the larvae.

Maisonnasse et al. (2009) identified a new highly volatile molecule from the larvae, E-β-ocimene, (3(E)-3,7-dimethyl-1,3,6-octatriene), that inhibits worker ovary maturation. One larva produces in 20 minutes 2.84, 12.4 and 0.40 ng of E-β-ocimene at larval instars 1, 2-3, and 4-5, respectively. This compound is thus emitted in a significantly higher quantity by two to three larval instars compared to first and final instars. Older larvae have a lower level of E-β-ocimene production than first instar larvae despite being from 225 to 400 times bigger (Jay 1963). Additional studies by Maisonnasse et al. (2010) found that the production of E-β-ocimene per larva increased from larval stage L1 (3.9 ng/larva/20 min) to L2-3 (14.01ng/larva/20 min) and decreased at stage L4-5 (0.42 ng/larva/20 min).The production of E-β-ocimene per mg of individual gave different results. According to their weight the smaller individuals (L1-2-3) produced the highest quantity of E-β-ocimene; the other immature groups produced significantly less.

E-β-ocimene treatment significantly inhibited worker ovary development compared to workers exposed to untreated paraffin control. Thus, Maisonnasse et al. (2009) concluded that this compound acts as a volatile primer pheromone on workers by inhibiting maturation of their ovaries. By emitting E-β-ocimene, larvae may prevent workers (nurses) from allocating resources into egg production but rather take care of them. This compound also has been detected in mated honey bee queens (Gilley et al. 2006) and was present in lower amounts in queens who were rejected within the first week of their introduction into queenless colonies (DeGrandi-Hoffman et al. 2007). Queen-produced E-β-ocimene may

"Thus, E-β-ocimene is a primer pheromone with two actions on workers physiology: inhibition of worker ovaries and acceleration of workers behavioral maturation."

then play a role in her ability to regulate worker ovary development, and thus, help her to monopolize egg laying. Further studies are needed to test for the synergistic effects between E-β-ocimene, brood and queen pheromones on worker ovary activation.

Maisonnasse et al. (2010) also studied the action of E-β-ocimene on nurse bees. Nurses secrete 60 to 80 % of the brood diet from their developed hypopharyngeal glands, providing a secretion rich in protein for young larvae (Winston 1987). The larvae can stimulate the development of these glands in nurses in order to consume a diet richer in protein (Huang and Otis 1989). They investigated whether E-β-ocimene could mediate an increase in the size and protein production of the hypopharyngeal glands of nurses, like that seen with BEP, to produce a food richer in protein that would assure better development of larvae. The level of hypopharyngeal gland development and amount of protein produced by the glands was not significantly different between the bees treated with E-β-ocimene and the control bees.

In the presence of brood, workers initiate foraging earlier compared to broodless workers (Le Conte et al. 2001, Amdam et al. 2009, Tsuruda and Page 2009). Maisonnasse et al. (2010) also analyzed the global action of E-β-ocimene in social regulation and showed that E-β-ocimene is a component of the signal emitted by the brood accelerating the age at the onset of foraging for workers. Thus, E-â-ocimene induces workers earlier into the task of foraging, thereby optimizing food collection and processing for the colony as well as for larval feeding.

At the individual level, young and the old larvae emit different quantities of pheromones that have different volatilities. Taken as the amount of compound produced per gram of larvae, E-β-ocimene is emitted principally by the young instars (L1, L2-3) while BEP reaches a maximum value during the capping stage (L-4-5) (Trouiller et al. 1991). E-β-ocimene (boiling point 73°C), which belongs to the terpene family, is volatile so it has an aerial transmission (targeting all worker age classes), while the BEP (boiling point around 200°C), which belongs to the ester family, has a low volatility which is transmitted by contact (target workers close to the larvae cells).

Thus, E-β-ocimene is a primer pheromone with two actions on workers physiology: inhibition of worker ovaries (Maisonnasse et al. 2009) and acceleration of workers behavioral maturation (Maisonnasse et al. 2010). At the social level, E-β-ocimene is a compound controlling honey bee behavioral maturation within a complex process that ultimately maintains colony homeostasis. An overabundance of foragers leads to a lack of nurses in the colony, and thus a decline in brood care; conversely too many nurses cause a decrease in food storage in the colony and a subsequent decline in food for brood nourishment due to the scarcity of foragers. Consequently, a proper nurse-forager ratio is key to maintaining honey bee social homeostasis. Therefore, the regulation of honey bee behavioral maturation must be highly controlled, most likely through a colony-level feedback network. Queen, old brood and foragers produce pheromones, the queen mandibular pheromone (Pankiw et al. 1998), BEP at high doses (Le Conte et al. 2001) and ethyl oleate (Leoncini et al. 2004), respectively, which slow down the progression of young bees towards the tasks typical of older bees. But young larvae also contribute to the maturation process. In producing E-β-ocimene and low doses of BEP (Le Conte et al. 2001), they have the opposite effect of old brood on bee maturation, which is to accelerate worker age at first foraging. In this way, worker maturation occurs in a complex milieu of pheromonal compounds.

These two specific pheromonal signals have opposing effects on workers. By emitting a low quantity of BEP and a great amount of E-β-ocimene, young larvae are able to accelerate the age at onset of foraging of worker bees (Le Conte et al. 2001, Pankiw et al. 2004). In contrast, old larvae inhibit honey bee behavioral development by producing a high quantity of BEP (Le Conte et al. 2001). Thus young and old larvae play opposite roles in the behavioral maturation of worker bees according to their specific needs. Young and old larvae do not have the same workers needs. When worker eggs hatch, young larvae are provided with royal jelly from the mandibular and hypopharyngeal glands of the nurses until they reach an age of 3.5 days old (Winston 1987). Afterwards, old larvae receive brood food, a mixture principally made of the nurse's hypopharyngeal gland secretions, honey and pollen. This brood food mixture is given to old larvae by the nurses in higher quantities (Winston 1987, Brodschneider and Crailsheim 2010, Schmickl and Crailsheim 2002). After meeting the food requirement, old larvae need nurses to help in capping their cells, and then, still require nurses and hive workers for their thermoregulation, as they are very sensitive to cooling (Stabentheiner et al. 2010). As a consequence, old larvae by emitting BEP, keep nurses in contact with them for a longer time, develop worker hypopharyngeal glands (Peters et al. 2010, Mohammedi et al. 1996, Pankiw et al. 2004), and engage them in specific tasks like capping cells, nourishment or tending (Le Conte et al. 1990, Le Conte et al. 1995a, Le Conte et al. 1995b, Le Conte et al. 1994). On the contrary, young larvae by producing E-â-ocimene, accelerate worker maturation (workers become foragers earlier in life) thereby optimizing foraging and food collection. Thus Maisonnasse et al. (2010) considers BEP as a "specific worker caste signal", with a specific and local action in the colony: the tending of old larvae. They also propose that E-β-ocimene is a "non-specific worker castes signal" with a global action on the colony: increasing food provision. Therefore, by emitting E-β-ocimene and BEP, the young and old larvae signals are involved in enforcing different worker tasks; nevertheless they also have a common action in the nest: the inhibition of worker ovary activation (Mohammedi et al. 1998, Maisonnasse et al. 2009). This plays a major role in the productivity of the nest because as reproductive workers do not work as hard as sterile workers (Dampney et al. 2004), showing a reduction in both tending to larvae and foraging tasks, which decreases the inclusive fitness of the colony. BC

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ALMOND 'BROTHERS'

Kim **Flottum** (photos by Kodua Galieti)

The Almond Odyssey Continues

The Story Of Two Beekeepers In California

Two beekeepers fill the pages this time, two with different styles, equipment, business plans, and outlook, but they have honey bees, almonds, and honey in common. All beekeepers have some of those things in common...it's what keeps us close enough together to keep arguing about what's best for our bees.

Photographer Kodua Galeiti and I met David Winter in the parking lot of his hotel at 5:00 a.m. as he was getting ready to pull out and head for the orchard. David, a California beekeeper, is from Valley Center, and runs between 10,000 and 12,000 colonies, makes between 1,000 and 1,500 barrels of honey a season, is a Sioux member and pollinates, using about 8,000 of his colonies, almonds, blueberries and avocados.

He started with bees in 1961 as a teenager and never looked back. He built his business as a family operation and his children, and now his grandchildren have always had a place to work.

"If you don't like bees, you shouldn't have been born into this family", is what he tells them, and they all did yeoman's work.

It was David that said beekeeping is not the same – "mites drive the business, the climate has changed and orange honey isn't possible anymore where he is, water is of prime importance for almost everything, but I still enjoy every day."

Though not unique, David's operation, Chaparral Honey, specializes in using a boom to load and unload his trucks. What is special is that his operation works a lot of avocados in southern California, which tend to be on not so desirable farm land – mostly slopes. There was an avocado frenzy a few years ago and acres and acres of trees were planted – but the best avocado climate land was mostly the worst farming land, and trees went in wherever they could. Corporations, lawyers, doctors – people with more money than common sense it seems bought and planted and didn't realize what they'd need a few years down the road.

You mostly can't get semi-trailers and forklifts on slopes, especially steep slopes, even mule trails, but you can get smaller trucks with booms almost anywhere. And that's where David fits in. There was a company in California several years ago that was building these things. They were there before forklifts dominated the business and beekeeping operations were smaller and huge crews weren't the norm, but as industrial beekeeping took over, they went out of business. David saw a niche and bought the inventory and runs several trucks with them now. Over the years he's become quite adept at repairing and replacing parts and pieces of these and has kept them up to snuff.

They go, he says with a broad grin – where no forklift dares to go.

From the parking lot we drove for about an hour, finally turning off in the middle of an under repair stretch of road onto a dirt path that only a beekeeper and God could have found in the dark, down a hill, past a hulling plant and into the orchard, just as the horizon began to lighten through the cold, cloudy sky. It felt like it could snow, and there had been a freeze warning the night before.

He doesn't use pallets because of the booms but every box has what's called a cleat, a 1" x 2" wooden strip on both short sides, flush with the top of the box. Besides making each box much easier to lift by a beekeeper, these cleats serve as the handle for the boom's cradle, the two-pronged device that slides in so the box is between the prongs. The prongs snug up under each cleat and when the cradle is lifted by the cable it takes the box, too. Each colony consists of two deeps with a bottom board fastened to the bottom box.

The boom lifts the boxes by moving the cradle up and down from the boom arm using a cable that runs the length of the boom that's rolled or unrolled by a motor in the housing. This is turned on, or off remotely from a switch the boom operator controls on the handle of the cradle.

Night moves.

Unleash the net, unfasten the boom.

Getting the first load is always tricky.

Lift 'em up, swing 'em down.

Easy does it.

Walk it back.

Do it again.

Checking the bees.

David Winter

So, the cradle's prongs slide in on each side of the bottom box of a colony and the operator lifts the cradle ever so slightly to give it tension and settle it in, then he slowly lifts that colony and positions it so it sets on top of another colony, then removes the cradle from the cleats of the top colony and resets it on the cleats of the bottom box of the bottom colony so he lifts two colonies at a time, one on top on the other. Once the colonies are swung free of the truck bed the operator simply walks the cradle he holds towards the eventual spot the colonies will sit. As he moves the boom swings to follows him on the pivot and the cable holding the cradle slides back or forward on the boom with him. Once in the right place the colonies are gently lowered to sit on the ground. At this orchard most sets consisted of eight colonies, or four piles of boxes. Once unloaded, he moved the truck down the road to the next marked spot and, keeping the boxes out of the way of the irrigation spray, did it all again.

The whole load was complete in less than two hours, and we were off – on to the next beekeeper.

•

Ryan Cosyns works in the family farming business of grapes, almonds, bees and a hulling operation in the Chowchilla area of the central valley. Unlike most of the beekeepers that pollinate almonds, Ryan is from California, and his business is vertically integrated in the industry. At one time cotton was king in the area, but there's only a single gin now. Grape acres are increasing, as is dairy and to feed all those cattle alfalfa acreage is increasing too.

The family got into the bee business when it became apparent that getting good bees for the almonds was getting to be more and more difficult and renting bees was only going to get more expensive. The hand writing was on the wall, they felt, and Ryan became the beekeeper. Needing at least 2500 colonies for their 1200+ acres of almonds, in December of '05 they bought out a local beekeeper that had been pollinating for them. That hand writing seems to be right on because colony rentals in '04 were $40/colony, in '05 they went

Ryan Cosyns, on the cell phone, in the orchard. Right where he should be during bloom.

Heading North on Highway 5, out of Bakersfield toward Modesto...a very common sight.

to $50/colony, and in '06 they were $140/colony.

Four full time employees came with the operation they bought and they still extract at the original location. But the bee business doesn't stop with almond pollination. They own about 3200 colonies, renting the remainder out to other almond growers, but they broker another 9000 colonies, mostly from beekeepers from the Midwest. Because of Midwest winters, the bees arrive in October, from Wisconsin, Minnesota with some from Florida and Arizona. Bees go to storage yards near home and the huller plant, where the almonds will be piled after harvest. The whole storage area is piled about 15' deep in almonds for a bit, then, as they are processed, the hulls are piled there, too. However, the area is empty in the fall when the bees arrive. The huller area is 80 some acres, but they have other land where the bees can sit for the Winter, too.

The beekeepers usually accompany the hives in the fall, and come back in January to feed both carbs and protein and to check and sort and grade. Ryan does have a large tank to hold syrup that his beekeepers buy – the protein is brought by the beekeepers. Just before placing the colonies Ryan's crew checks 100% of the colonies, keeping those with eight frames or more and leaving the smaller colonies behind. He does offer a bonus for busters, but nothing for smaller colonies. The beekeeper can easily pick up those left behind when retrieving the rentals later in the Spring.

He's not looking to expand his beekeeping business greatly, but will pick up a grower who has had a bad experience with bees from somewhere else and is looking. Educating growers is a top priority because growers will pay for good bees, but after having poor bees will usually start checking. Word of mouth is his best promotion.

Labor – always in the discussion – isn't a real challenge. Finding employees is pretty easy, but they need a driver's license. An interesting observation is that some of the operations he's working with now are owned by former employees of the beekeepers who used to pollinate for his dad. These are hardworking, good beekeepers, but an observation Ryan's made is that the next generation isn't quite as ambitious as their parents were – not quite as eager to get ahead, to live the American dream...to take over when Dad retires. Not an uncommon event almost everywhere in agriculture anymore it seems.

After pollination he moves his bees to oranges for a honey crop, then trucks them to North Dakota for more honey. There, he leases them to a local beekeeper that runs them on shares. The North Dakota beekeeper has the incentive to do well because he keeps half the honey he harvests – a good year gets 250,000 pounds, so Ryan takes 125,000 which all goes to Sioux.

His management philosophy is take care of mites, nosema and fall nutrition and you'll do OK. He gets most of his queens from California producers, but is experimenting with Hawaii queens for early requeening because he's had trouble with really early California queens lately.

The hulling operation is actually owned by several farmers. They send trucks pulling bins to almond orchards during harvest and return with harvested nuts to the plant. There they are piled on the ground until they can be processed. A typical harvest produces seven to eight of these a day for a grower. Once hulled, the hulls are piled outside and

Equipment for moving bees.

Outside the main warehouse of Cosyns. The syrup tank on the left holds syrup used by his beekeepers while their bees are being stored nearby.

Inside a pretty well organized, and clean, warehouse.

The bins almond harvesters fill each day of harvest... several a day are filled to meet harvest schedule.

hauled away for cattle feed or other uses, and the nuts are put in boxes and moved to processing plants. After hulling they sell their crop to mostly the same people every year...price is pretty standard, but relationships are more important.

In his area of the valley you have to plant trees about 20 feet apart, but in some of his orchards, where the soil is sandier the trees will be small and they can be closer together – it's a water thing. Trees are watered with flood irrigation or mirco sprays – though precious, water isn't quite as expensive in the central part of the valley as it is in the southern areas. He does have wells for water, most about 700 feet, even though there's water at two to four hundred feet – the extra gives him room if the water starts to disappear from the higher levels.

When bloom is erratic, as it was this year, he uses pollen inserts on some of the colonies early on during bloom. These sit on the front door and bees leaving pick up freshly collected pollen on the way out – that way they are pollinating every flower they visit – they don't have to go to different trees to accomplish this task. This works OK, and lasts until the pollinator trees begin to bloom – which can be as little as a few days to more than a week. He uses the standard two colonies per acre and for large orchards he'll put 24 colonies per drop, but for smaller orchards it's 12. He is less concerned about the exact count as long as the colony per acre numbers are close – as long as everybody in the area is using two colonies, all the trees get taken care of is his thought. He sets his 24 drop at eight colonies in front of every other row allowing room for tractor and sprayer turn arounds. Or, if the rows are tighter or the roads are wider, he may set 12 colonies by every third row of trees, allowing more room for maneuvering.

When inspecting bees, both his and those he brokers, he starts by looking at the top box – if there are six to eight frames of bees and brood in the top box they don't have to look further. If not, they'll check below. He inspects 100% of his bees and about 30 - 40% of those he brokers for strength.

With Winter losses about 20% his management seems to be working – Nosema drench in the Fall, AFB treatments if needed – remember, he inspects all of his colonies – and a rotating mite treatment keeps them under control – for now.

Ryan Cosyns and David Winter are both part of this almond odyssey. They are similar in that they are both able to take advantage of a home-grown crop and traveling great distances isn't part of their program. But how they manage their businesses before, even during and after almond pollination is vastly different – yet both are successful. BC

A Couple Of Side Trips

On the way to a bee meeting one evening we stopped at the Tulare Farm Show. The biggest in California we were told, and definitely worth the trip. We had to pass right by it on the way so we took a couple of hours and took a look.

It was big. Acres and acres of display and demonstrations and vendors. Tents and tents full of people selling. Found a company that makes paper you can write on underwater with a pencil...great for taking notes in the beeyard, and met the staff from several of the farm magazines I get from out west on an exchange basis. Plus the equipment...hundreds of businesses displaying the equipment they make... from irrigation to tractors to picking machines to land levelers to straps to hold thing together to samples of food these machines harvest. It would take a week to see everything, and we only had a couple of hours, so we only saw the tip. But if you ever get the change...visit the farm show in Tulare.

That evening we headed to a meeting of the South Valley Beekeeper's Association. Joe Traynor, the pollination broker that handles about 30,000 colonies gave some of the basics beekeepers needed to be successful pollinating, there was a lot of discussion on the erratic blooming going on due to the cool and rainy weather...rain is definitely a mixed blessing during bloom because it hampers pollination, but you absolutely need the water... and the large experiment Pherotech was conducting, using their in-colony synthetic brood pheromone dispenser to measure pollination differences was mentioned too. Gordon Wardell discussed how Paramount Farming was improving the setting for beekeepers every year, a bit about their mason bee research that is on-going (see more about the later), and Frank Eischen, one of the researchers from the Weslaco Bee Lab discussed the nasty effects that spraying fungicide and carrier during bloom was having by driving bees out of the orchard due to the odor and the destructive effects the chemicals were was having on the actual almond blossom. The beekeepers here were certainly given a treat that evening.

RESEARCH REVIEWED

The Latest In Honey Bee Research

Steve Sheppard

"Protein consumption in adult honey bees"

The collection of pollen as a source of protein by honey bees is the singular activity that solidifies their position as the most important managed pollinator in agricultural settings. Older adult honey bees collect pollen from the flowers of the field and store it in the hive, where it is consumed primarily by young adult honey bees. These youngsters begin eating pollen within a few hours of adult emergence and continued consumption of this protein rich food for the first couple of weeks of adult life provides them the sustenance required to produce glandular secretions for feeding larvae, including royal jelly and worker jelly. Due to the variability in pollen quality available to managed colonies, many beekeepers feed pollen substitutes (PS) as nutritional supplementation. Historically, a number of researchers have reported the beneficial effects of PS feeding, as measured by brood production, adult bee longevity and colony population growth in the Spring. In a recent paper in *Apidologie*, researchers from Canada and China reported the effects of feeding different dietary protein concentrations to bees measured by additional indicators of worker "quality", including antioxidant status and protease activity of the honey bee midgut (Li et al., 2012).

The researchers designed their experiment with 30 colonies divided into six feeding groups of five colonies each. The control group received pollen of oilseed rape only and the other five were fed pollen substitute diets containing 15%, 20%, 25%, 30% or 35% crude protein. The pollen substitutes contained corn meal, soybean meal and corn gluten meal and, aside from the crude protein levels, were considered by the researchers to have "nutrient levels...similar to that of rape pollen." The materials were fed in 500 gram patties (replaced as needed) that consisted of 40% of the various dry PS or pollen materials, 50% sucrose and 10% honey. The experiment was set up with 12-frame equalized colonies, which were previously acclimated to their diets for eight days, and the data collection phase ran for 33 days. The researchers measured egg hatch, collected and weighed known age pupae, periodically measured colony strength and collected and froze emerging adult workers for later analysis. The frozen worker samples were analyzed for protein levels, antioxidant status and total proteolytic enzyme activity of their midgut.

Li and colleagues found that the control group colonies consumed significantly more of the pollen patties than did the colonies of any of the groups fed PS protein patties. Among the groups fed PS protein patties, there were no statistical differences in the patty consumption rate. However, total consumed protein was significantly higher in the 35% PS patty group than in the pollen patty (control) group. Total consumed protein in the pollen patty group was significantly higher than in the 25% PS, 20% PS and 15% PS groups. Even though the consumption rates of the PS patties were equal among the groups, the amount of total protein consumed by the bees increased in a linear fashion as the protein content of the patties increased. The percentage of eggs that hatched, the percentage of larvae that pupated and the weight of emerging adults all increased significantly as the protein concentration of PS patties increased from 15 to 35%. The control colonies fed pollen patties (23% crude protein) had developmental parameters similar to the 20% PS fed group. The researchers also found that the protein content of emerged workers reflected the differences in protein content of the diets, with control group bees (23% crude protein pollen patties) having similar protein content in their bodies as the group fed 20% PS patties.

The researchers also found that the antioxidant status of bees was improved in the groups of colonies fed protein above the PS 15% level. The two groups of bees fed patties with dietary protein levels of 30% and 35% had significantly more midgut protease activity than the groups fed less crude protein (including the pollen fed group). Li and colleagues interpreted these results to suggest that the bees fed PS30% and PS35% not only "ate more protein but also digested and absorbed more protein than others."

In conclusion the researchers noted, "PS with a protein level of about 30 to 35% were recognized as an excellent diet for promoting bee

The percentage of eggs that hatched, the percentage of larvae that pupated and the weight of emerging adults all increased significantly as the protein concentration of PS patties increased from 15 to 35%.

development." They went on to suggest that the use of pollen substitutes by beekeepers would be especially important during times when natural pollen was unavailable. This is clearly a valid statement and may be true even when natural pollen is available if the bees are placed on a large blooming monoculture that provides only a single pollen source. However, given the opportunity, honey bees collect pollen from a variety of floral resources (polylectic behavior). Other researchers working on the protein content of bee-collected pollen have reported that variation in protein content of pollen from individual plant species ranges from 12 to 61%. Thus, it would have been informative to include another control group that was fed a realistic mixture of pollen types, rather than only oilseed rape pollen. We might expect that a diverse mixture of pollens could have yielded higher protein levels and a wider array of amino acids, leading to performance parameters that were equal to or above those of the PS 35% fed honey bees. BC

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Li, C., B. Xu, Y. Wang, Q. Feng and W. Yang. 2012. *Effects of dietary crude protein levels on development, antioxidant status, and total midgut protease activity of honey bee* (Apis mellifera ligustica). Apidologie, DOI:10.1007/s13592-012-0126-0

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GUEST EDITORIAL

Jeremy **Barnes**

Time To Be Outraged?

Honey Bees Hold No Grudges. Their Health Is In *Our* Hands.

Napoleon Bonaparte, the victor of Austerlitz, Jena and Friedland, was finally dispatched by his wallpaper.

When the Orleans monarchy returned Napoleon's body from Elba 19 years after his death for burial at Les Invalides in Paris, French investigators found traces of arsenic in Napoleon's hair and finger nails, hence the rumor that he had been deliberately poisoned by the British military doctors on the island. In reality he spent the last six years of his life writing his memoirs in a relatively confined space that was decorated with a wallpaper known as Paris Green. The color came from mixing arsenic with copper and although not the only cause, the arsenic explains his ill health and relatively early demise – he was 52 years old.

Paris Green has another significance. In the 1850s a European farmer, in a fit of annoyance, reputedly dumped some green paint on potato plants and watched as the infestation of recently imported Colorado beetles died. The beetles probably arrived in the 1840s embedded in a load of guano shipped from islands off Peru to Antwerp where it was acclaimed as a fertilizer that was going to revolutionize food production. It was the first 'green revolution.'

To potato farmers Paris Green was a godsend, as Charles Mann describes so vividly in *1493: Discovering the New World Columbus Created.* To chemists it was something that could be tinkered with. If arsenic killed potato beetles, why not worms, weevils and moths in cotton, apples and elm trees? The invention of foggers, sprayers and nozzles meant that instead of dusting arsenic on crops, it could be sprayed in combination with lead and calcium.

By the 1880s French researchers had discovered that copper sulfate was a remedy for the potato blight that had devastated Ireland 40 years previously, even though it was known that copper sulfate was toxic. What the farmers and the scientists did not realize was that the chemicals, despite their toxicity, would lose their effectiveness as the insects adapted.

The first recorded resistance was in 1912 but not much notice was taken as the pesticide industry developed new compounds. After the First World War the companies that had been devising gasses to kill people turned their technology back to insects, and during the Second World War Swiss farmers tested a 'miracle compound' known as DDT, an organo-chloride that was celebrated for seven years before insects adapted and the extent of its accumulation in organisms and the environments was realized. But the agro-industrial complex had been well and truly launched with its three determining characteristics: improved crops, high intensity fertilizers and chemical pesticides.

The 1970s was the age of organo-phosphates which accumulated less in the soil than DDT but modified insect behavior. Effects on the waggle dance of honey bees, for example, caused researchers to consider seriously the sub-lethal effects of pesticides.

The pyrethroids of the 1980s did not kill honey bees but their foraging behavior was modified; the bees, unsteady on their legs, tumbling over and liable to get lost after leaving home, appeared to be 'intoxicated.' One of the findings of the current Managed Pollinator CAP program is that the residues of pyrethroids pose a three-fold greater hazard to a colony than neonicotinoids.

The larvicidal insecticides of the 1990s and the neonicotinoids of the 2000s were welcomed because of their low toxicity to humans and cost savings to the farmer. Neonicotinoids, applied as a seed dressing, are systemic and thus omnipresent in a plant, and act by blocking neural transmissions in insects.

At Apimondia in 2009 Bernard Vaissiere asserted that if DDT had a toxicity of 1, the toxicity of imidacloprid is 7290, clothianidin 6750 and fipronil 6560. All are neonicotinoids, so called because they are modeled after the natural insecticide, nicotine. Moreover, the synergy between a pesticide and either a fungicide or a herbicide might increase that toxicity a thousand times.

In *The Botany of Desire* Michael Pollan describes a toxic treadmill in which agricultural land is doused with so many fumigants, pesticides, herbicides and fungicides as to create a 'clean field' – ie. devoid of life except for the desired plants. The pesticides kill not only the target species but their enemies as well, and as all of the species develop resistance ('super bugs') yet another more potent chemical weapon is required.

The world's 50 millionth chemical was formally registered on September 15th, 2009.

Has this cycle been successful? After 25 years of chemical treatments in the USA, *Varroa destructor* is still the main cause of honey bee losses and would seem to be on the increase. In January of this year doctors in India reported the first cases of totally drug resistant tuberculosis, described as 'long feared and virtually untreatable.'

CCD initiated urgent scientific studies into the causes of the decline, and in the January 2012 issue of *Bee Culture,* Keith Delaplane, in summarizing the CAP project, states that ". . . national sampling of bee-collected pollen has revealed 130 different residues of pesticides or pesticide metabolites. The average number of residues per bee pollen load is 6.21."

Finally on January 3, 2012, the Public Library of Science published the results of some research from Purdue entitled *Multiple Routes of Pesticide Exposure for Honey Bees Living Near Agricultural Fields* which describes the finding of extremely high levels of neonicotinoids in planter exhaust material produced during the sowing of treated corn seed as well as in the soil, in dandelions, on dead bees and in pollen stored in the hive.

In 2010, 99.8% of corn seeds planted on 88 million acres of land (the largest single use of arable land in North America) were coated with neonicotinoid insecticides; in fact, the amount of clothianidin on a single kernel contains enough active ingredients to kill more than 80,000 honey bees. In other words, if bees foraged on corn fields, the pesticides on one kernel of corn could kill a large, Summer colony.

I was under the impression that bees do not forage on corn, at least not directly and not unless they are desperate. (Corn, as a member of the grass family, is essentially wind pollinated. As typical of wind pollinated grasses, they produce a lot of pollen because they are relying on chance that the pollen will be carried to a receptive female corn flower. Because of the quantity, the quality, i.e. protein content, is quite low.) But the writers of the PloS ONE report argue that corn pollen is frequently collected by honey bees when it is available and that it makes up more than 50% of the pollen collected by bees in samples collected from agricultural areas. Perhaps there is a difference between the prime pollinating agent of corn (wind) and bees collecting it when it is available – in much of the midwest corn is in flower when the main nectar flow has ended which makes it particularly attractive to bees.

But it is more than direct foraging on corn itself. The researchers found high concentrations of pesticides, herbicides and fungicides (especially clothianidin, thiamethoxam, trifloxystrobin, azoxystrobin, propiconazole, atrazine and metolachlor) in samples collected from dandelion flowers, from honey bees (both dead and healthy) and in the waste products produced during the planting of treated corn seed, in particular the talc that is added to the seed box to reduce friction and stickiness and ensure the smooth flow of seed. In the process of planting the talc is blown out by an exhaust fan; some falls on the soil but much goes into the air.

The researchers note that neonicotinoids found in dandelions and in soil samples could be explained by translocation from soil to flower, from surface contamination from dust, or a combination of the two. There was a positive correlation between proximity to agricultural areas and the presence of neonicotinoids. The results further showed clothianidin present in the surface soil long after treated seed has been planted. "All soil samples we collected contained clothianidin, even in cases where no treated seed had been planted for two growing seasons," the report says.

This is not the place to list all of the hazards of neonicotinoids but it is worth noting that they are water soluble and mobile in ground water, that they kill the entire structure of soil-born organisms, eventually leaving an inert medium, and that imidacloprid has a half life of 19 years, meaning that it could take a century or more to rid it from the 200 million acres world wide where it has been used.

Summer is bad enough but the real impact of this report is that the potential for greatest exposure, and the period when mortality was noted, is in the Spring during planting time when there is exposure to extremely high concentrations of neonicotinoids in waste talc and from dust disturbed by the planting process. Not only is it found on dandelions, a major pollen source for bees in the Spring, but it is also in the pollen reserves in the hive that are fed to newly emerged bees shortly after they chew their way out of their capped cells and on which the strength of the future colony depends.

It is interesting, perhaps even ominous, that, at the time of writing, the report Purdue research has had little coverage in the popular press, unlike, say, the attention given to the recent discovery of a parasitic phorid fly in California.

Last year I noticed some strange behavior in my colonies. Besides poor health and low honey production, there were abnormal brood patterns, poor quality queens and clusters of bees leaving the hives in the Fall. Initially I blamed the cocktail of chemicals being used by nearby orchards to control the outbreak of stink bugs, and that may still be an issue, but apparently these are also the specific symptoms identified by European beekeepers as typical of bees that have had several years exposure to neonicotinoids.

The Europeans have been more concerned about this than have we, and more vociferous; perhaps they are more intimately connected with their environment because space is restricted and thus all the more precious. French beekeepers for example, have taken to the streets in protest against major agro-chemical industries like Bayer. In addition each European country appears to have one major beekeeping organiza-

tion which takes up the cudgels on behalf of all of its beekeepers, and government ministers seem to have the power to make significant decisions, by skirting the powerful lobbying which is part of the American political process.

The Europeans also tend to take a longer term view than we do, as witnessed by their aversion to GMO's. Neonicotinoids are touted as being safe for humans, and they may well be in the short term. The fear is that, just as some chemicals are advocated as safe for bees based on lethal consequences, the sub-lethal effects are ignored. We can no longer avoid breathing, eating and drinking these toxins – they are omnipresent – and this in a country that is seeing rapid increases in afflictions such as cancer, diabetes, obesity and ADHD.

France, roughly the same size as California, last year registered 2.3 million hives, a number which is increasing, compared to 2.5 million in the entire U.S., a number which is declining.

There are presently no international laws or agreements, but in 2000 the European Union issued Directive 91.414 that oversees pesticides and marketing. Even though manufacturers sat on the decision-making bodies and there was an agreed lack of bureaucratic oversight, the number of active legal substances was reduced from 800 to 400 in the first nine years with another 22 substances banned in 2010.

Two years ago 91.414 was revised, tightened and reissued as a Regulation.

What we are seeing is not Colony Collapse Disorder; indeed it may be bigger than CCD if not as dramatic. Speaking at Apimondia two years ago the Italian researcher Franceso Panella stated that the agro-chemical industry is now in control. Eight thousand years ago agriculture was the key in the move from barbarism to civilization, and that which made us civilized is under threat.

What was seen as an adroit solution a hundred years ago is now poisoning our environment. In the midst of the current financial crisis there is an agricultural crisis which, in the long term, may be more debilitating, more pivotal, more critical.

It's tempting but simplistic to


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Multiple Routes of Pesticide Exposure for Honey Bees Living Near Agricultural Fields

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Abstract

Introduction

Results

continue to advise beekeepers to move their hives to new locations which are less agricultural and thus less affected, but it is increasingly difficult to find such areas. Surely it's time to be outraged and to work towards a ban on the over-whelming use of these potent and toxic chemicals.

Is this depressing? Possibly so. Some would even say hopeless. "One of the penalties of an ecological education," Aldo Leopold noted, "is that one lives alone in a world of wounds." And yet I live in hope, the kind of hope that believes an understanding of the past can explain the present and inspire a healing of the wounds. The kind of hope that is grounded in and nourished by real information available to everyone everywhere. The kind of hope that motivated the late Vaclav Havel who, during the Soviet occupation of Czechoslovakia, and together with a few dissidents, circulated petitions, drafted manifestos, wrote protest plays and smuggled news from the outside world, often with very little to show for it. What sustained him was not a belief that his cause would prevail but a belief that his cause was right. "Hope is not prognostication," he said. "It is an orientation of the spirit, an orientation of the heart; it transcends the world that is immediately experienced and is anchored somewhere beyond its horizons."

It's time for our faith in our children and in nature, as well as in our capacity for healing and loving work, to eclipse behaviors based on habit and haste. Life on earth will outlast us. Without insects mankind might last 50, even 500 years; but without man insects would do just fine. The question is not whether life will go on. Rather the question is whether we will continue our reckless use of this earth or we will work to preserve the intricacy and beauty of our universal home.

Honey bees, unlike humans, hold no grudges. Their health is in our hands and ours in theirs. What more joyful work could there be than to support their untiring work with healing, especially the healing that happens when, in the words of Scott Russell Sanders, our wisdom transcends our knowledge. BC

Jeremy is a beekeeper in York County, PA.

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Alan **Harman**

West Michigan

FARMLINK

www.wmfarmlink.com

Create, Connect, Cook.

A Better Way For Growers and Consumers To Meet and Greet, Buy and Sell

Veteran Michigan beekeeper Alan Haarsma has moved forward to the past with a one-stop delivery scheme that distributes his honey to the top chefs of the city of Grand Rapids in the west of the state.

Haarsma and fruit grower Scott Wells have taken their long-time partnership another step by joining a new sales system called FarmLink.

Entrepreneur Jerry Adams thinks FarmLink might be the biggest advance since the creation of farmer's markets.

He got the idea when his wife began spending two days a week going from farm to farm to find fresh produce.

Walking through a farmer's market in Grand Rapids late in the day he saw stalls still laden with freshly harvested fruit and vegetables.

When the market closed, the farmers would have to load their unsold produce and take it back to the farm.

There is also another drawback.

"He works from dawn to dark the day before the market, picking his crop, getting it ready," Adams says. "On the day of the market he gets up at 4 a.m., trucks his products to the site and sets up his booth so it is all ready by 7 a.m.

"Then at 7:30 a.m. it starts raining and sales that day are virtually nothing, but he still has to stay there until the market closes."

In Michigan, too, Winters are hard and farm markets close for the duration.

"I love farmer's markets, but they are very limited in a lot of ways," Adams says. "I came up with the concept of trying to simplify the supply chain for farmers."

Adams figured out a way to take the gamble out of the marketing.

What he came up with is two on-line farmer's markets.

One links families with growers and the other does the same for chefs.

In both formats the farmers know what they have sold before they harvest their crops

The family-oriented West Michigan Coop has about 300 buyers and 40 farmers. The online market allows people to shop for farm fresh products from their homes and then pick up their orders at a once-a-month drop off.

It's been operating for five years and the turnover has reached $25,000 to $30,000 a month. The coop gets 5% from the buyer and 5% from the seller.

Adams operated the coop for five years but has now moved on his latest concept, FarmLink, involving the chefs in restaurants, hospitals and schools around Grand Rapids.

With both operations a web site is used for customers to place their orders. Farmers then see what they can match.

"I let the farmers know what they have sold before they pick it," Adams says.

Instead of spending the day trucking their produce from location to location, the farmers bring it to a central site where customers pay for it and pick it up the same day.

With FarmLink, chefs interested in quality fresh local produce don't need to spend days traipsing from farm to farm.

They simply go to a website and place their orders.

Farmers check the website and fill the orders.

Each Wednesday, the farmers go to Adam's offices in Grand Rapids and deliver the produce. The chefs arrive at the same time and collect their orders, paying for the produce then and there.

FarmLink also collects a 5% commission from both buyers and sellers and Adams has a check in the mail to the farmers within days.

He also restricts his suppliers so that, apart from fruit and vegetable producers, they do not compete with each other.

Beekeeper Haarsma, who runs his beehives in the Grand Rapids area, became indirectly involved first with the coop and then FarmLink through Wells.

Haarsma pollinates Wells' trees each Spring and Wells sells Haarsma's honey at his farm outlet.

With the launch of FarmLink, Wells signed up for both his fruit and Haarsma's honey.

The attraction for both men, who previously sold mainly though farmer's markets and farm shops, was selling directly to the chefs.

"By selling direct we have communication with the customer and can supply fresher product," Wells says.

The reaction from the chefs was immediate.

Haarsma says he has seen an increase in demand from the chefs for the one-gallon containers of honey he offers at FarmLink.

"Scott has sold more honey for me this year than ever before," Haarsma says.

And while their sales through FarmLink are still small, they say the venture is new and hopefully it will grow

For Haarsma it is a trip back the old days when he started beekeeping in 1987.

"In the past we did sell and deliver directly to schools, restaurants etc.," he says "That went away but is coming back in FarmLink. It would probably be cost- and time-prohibitive to deliver to each customer location.

"FarmLink is a return to close to what we used to be."

Wells says time will tell if FarmLink grows and catches on.

"We have been selling Al's honey for a number of years now and sales keep growing," he says. "We sell it at our own farm market and at three local farmer's markets.

"People love the local honey and that we use Al's bees to pollinate our fruit trees each Spring."

FarmLink has been operating weekly but this Summer Adams is looking at expanding it to twice weekly perhaps adding a Friday to the existing Wednesday operation.

"There is a need for volume going into the weekend and to keep it fresh, especially with the veggie and fruit producers," Adams says.

Adams has a reason for insisting on growers and buyers meeting each week as orders are filled.

"I want people to know the guy growing their food," he says. "I want the buyers to know the people supplying their product. We get a few beers and have a happy hour with chefs and farmers on a Wednesday afternoon.

"With FarmLink that relationship changes the product. The chefs are influencing the farmers now. The chefs are saying, 'You are bringing this in, great. But if you did it this way or grew this, I would buy it'."

It takes the gamble out of the crop for small farmers.

Chefs have a direct relationship with farmers.

"Farmers don't have to make 20 deliveries to 20 locations each week," Adams says. "They make one and the buyers come in and get it and the farmers talk to them and then go back to work doing what they do best, growing stuff."

Adams says some producers like to go to farmer's markets, but for some it's the biggest pain in their rear end.

"They are not social beings," he says. "They like being out by themselves in a field. That's why they are a farmer.

"Society has almost forced them into this spot. They are not big enough to sell to the chains. They are not even big enough to aggregate with their like fellows.

"This way they are having the direct relationship with the people they need to have it with."

Six months into its operation, FarmLink had about 15 producers signed on, selling everything from fruit and vegetables to honey, goat cheese, lamb and ducks.

There are 12 regular buyers, all restaurants except for St. Mary's Hospital.

With these numbers, FarmLink is turning over $2,000 to $2,500 a week.

"If I can get 20 or 30 people shopping, that's going to be fine."

Adams says FarmLink is a learning experience for some chefs.

"They work with food but some don't even know what grows when.

FarmLink is attracting quality restaurants with chefs that want to do food the right way. If a crop gets wiped out, they will change their menu.

The system is a radical change in making chefs come into pick up their supplies.

"I am shifting the power." Adams says. "The chef is coming in here and meeting the farmer, He gets to care about that farmer. He's your guy; not just some nameless, faceless entity.

"It's a big shift. I want to even it up a bit more for the farmer."

Adams says the restaurants are crediting the system on their menus and including the FarmLink logo.

"It's taking off because it makes sense," he says. "Farmers are a different species and chefs certainly are. I understand them both.

"Organic is not essential for quality food. I want people with good intentions. If I know the guy growing it and I trust him, that's enough for me.

Adams quickly found the FarmLink model can be universal.

When he traveled to a Slow Food International conference in Italy he spoke of his operation and when he returned to his seat found 20 people waiting to talk to him about it.

As a result he is setting up a website for two women in Gambia to offer a Food Link program there.

This gave him another idea – make the model available worldwide.

He set up a website that offers two options.

Computer- and Internet-savvy entrepreneurs can download the shareware program and use it to create their own FarmLink programs.

For those who are not, Adams will set up the local program anywhere in the world.

"If you are interested in food but need help and want somebody to host it, we'll put up a site for you, call it FoodStand Gambia or Hampton Roads FoodStand, whatever.

"We'll host it; we'll keep you in business; we will work with you and get you up and running."

Adams says there are no upfront costs, but his charge to operate the site, including its marketing and accounting is 5% of sales – 2.5% from buyers and 2.5% from farmers."

The people using the system set their own commission percentage.

"We have the softwear developed to make these connections," he says. "I am not going to give it to somebody two blocks away, but it doesn't hurt us to give it to somebody else somewhere else.

"It easily and quickly allows people to connect with their local growers. It gives farmers wherever they are another revenue stream that they don't have right now."

Adams is in the process of setting five for this year including in Hampton Road, Virginia, and in Saugatuck, St. Joseph, and Traverse City in Michigan.

"I would like to set up a whole network of these throughout the state of Michigan," he says. BC

Alan Harman is a freelance writer who lives in Michigan.

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Electronic P

Can Facebook Be Useful To Tod

Honey bees know all about the concept of social networking. They, along with ants and termites, started the idea millions of years ago, and are able to spread complex information through their colony quickly and easily with an intricate set of pheromones. Humanity has recently seen the rise of a social network, the Internet, which can be used for sending complex information across the globe. Though a number of social platforms on the Internet have risen and fallen, Facebook has gained popular acceptance and now seems to be nearly ubiquitous in our culture. As of August 2011 50% of adults in the United States said they used a social networking site. That's 50% of ALL Americans, not just those who say they are online. Only six years ago this number was 5%.

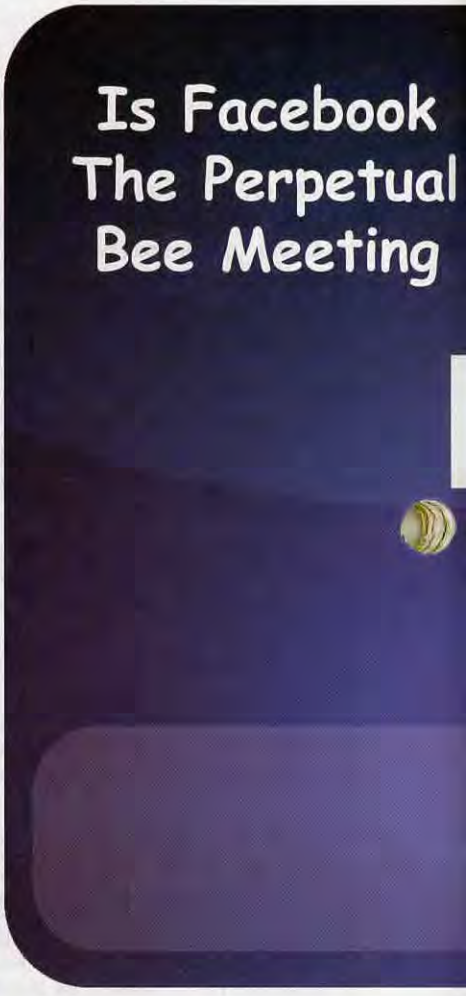
I write this from an outsiders perspective. Though I was in university when Facebook came to life, I think I was living in a beekeeper's trailer at the time and never bothered to sign up. To me the concept fell into the Too Much Information category, and appeared to be another time sink when the hours and minutes were precious enough. Plenty of other criticism of Facebook can be found in a massive Wikipedia page, from privacy issues to data mining to it being a major cause cited for divorce in the UK. 'What is wrong with good old-fashioned email?' I have always said. But instead of being a flash in the pan, Facebook has penetrated our society and it looks like it is here to stay.

I steadily ignored Facebook until a recent combination of events occurred. I was working in a yard of bees with my friend Francisco Rey, a Chilean queen-breeder, and he mentioned something like "Being on Facebook is like having a bee meeting all of the time." I happened to be reading about marketing retail honey in *The Hive and the Honeybee* the day before, and I had chuckled after seeing these lines: "The electronic age, however, has ushered in some significant changes which will aid beekeepers significantly in the future. Of special importance is the desktop computer. This flexible electronic device has several uses that can immediately be put into action by any agriculturalist." OK, so I was reading the 1992 edition of *HatHb*, but that future is now.

I pushed Francisco for more information on his use of Facebook; he had a personal account and his company had a professional one. He was able to keep in touch with friends and customers from all over the world, and was able to look at pictures of bees of one friend in Jordan, another in Canada. But when I questioned him further on Facebook's usefulness for beekeepers, he skirted around the issue and talked more about using the website to stay on tabs with his kids.

To look for more concrete reasons, I decided to sign up. I created a character, *Apis mellifera mellifera,* just your everyday European honey bee, and planned on floating from profile to profile like blossoms bursting with nectar to see what was happening in the beekeeping world of Facebook.

After finding a picture and setting my status to female, single and works for 'Queen Bee,' I began looking through profiles. I wasn't the only *Apis mellifera* with a Facebook profile, so I sent a few friend requests to the other online bees. I decided to "like" a few things, like *Bee Culture* Magazine and The National Honey Board. I 'poked' another friend of mine, which I guess is not as drastic as a sting. I perused the Beginner Beekeeper Page and saw an amazing picture of honey hunting. I saw that Eva Crane had a Facebook page, as did Lorenzo Langstroth. If Reverand L. had this page back in 1851, do you think that he would have posted his discovery on his wall? (Pondering, as I had so often done before...) Ethnobeeology had a very interesting profile full of international bee information that dragged me away to a few sites. I learned that I could have received minute by minute updates of the ABF conference in Las Vegas via the Honey Queen. I saw that The National Honey Board is friends with the National Peanut Board, and suspect when they get together they make some great sandwiches. I clicked and scrolled through a slew of videos, links, pictures and the next thing I knew three hours had disappeared, my neck and eyes hurt and my browser was set on the profile of my high school girlfriend. I cursed the wandering mouse, shut down the computer and went outside to enjoy the rest of the day.



In my next session I vowed for more discipline and I began by looking at the marketing strategies of retail honey producers. Facebook has expanded beyond the personal. According to a Merchant Circle survey of January 2011, 70% of local business use Facebook for marketing, up from 50% in the same period the year before and 37% said that creating a profile on a social network is a

heromones

Beekeeper?

William **Blomstedt**

highly effecting marketing/advertising method. This is the modern day 'honey stand' at the county fair, except open 24/7 and with much more potential for exposure.

The profiles of retail honey producers, as well as the National Honey Board, seem to have a central and focused use for Facebook; the promotion of honey consumption. When a customer navigates to the producer's profile (bear with me here, experienced FB users) he or she can 'like' the page, meaning that every time there is an update, the customer will be notified. Here is example of a post from the National Honey Board: "Looking for dinner ideas for tonight? Check out Bobbie Flay's Rib Eye Steak With Chipotle Honey recipe! This sounds incredible!" with a picture and a recipe link embedded. Or, another idea might be to alert customers about deals, sales, contests or new products, interspersed with positive links or videos to promote a meaningful dialogue about honey and bees.

The opinions on Facebook's use varied. Leeanne Goetz of Honey Ridge Farms in Brush Prairie, Washington wrote "(Facebook) has its benefits for exposure but I have no way of knowing how it influences sales. I would not say it is more useful than an email list or website however. It is another tool for public relations and keeping our name in front of others." On the other side Carla Marina of Red Bee Honey, a beekeeper, author, designer and honey sommelier, claimed that Facebook has greatly helped her business and book. She has six different Facebook pages and wrote "It's a good tool if you use it correctly and is part of the overall marketing required to be competitive in today's economic environment." Indeed, the competition for consumer attention is a fierce business, and it seems that Facebook can be used well, or may even be a necessity depending on your market.

Another useful way I found beekeepers using Facebook was through their local associations. When creating a Facebook group page any of the invited members can submit posts for the rest to see. These posts can be recipes for pollen patties, links to petitions, questions about bees and beekeeping or reminders of events in the area. For a good use of a Facebook I invite you to look at the Morris & Somerset Counties (NJ) Beekeeping Association page. This Spring was early, and the beekeepers in New Jersey were confronted with a number of beekeeping oddities. One member posted a picture of his wrapped hive overflowing with bees in mid-March, asking if anyone else had a similar problem. Other members chimed in and linked a video to an Indiana beekeeper who was adding supers to an overflowing hive in early March. One of the group's more experienced beekeepers posted that the bees were three weeks ahead of schedule and gave practical advice on how to best care for them. These sort of interactions seemed helpful for the questions and problems that occur between meetings, and for spreading information through the association rapidly and easily.

While wandering through these association websites, I remembered someone once telling me that high school reunions are losing their importance because of Facebook: people no longer need to gather together to learn about each other. Do we really want to go have awkward conversations with people when we already know everything about them from the safety and comfort of our computer chair? Will physical beekeeper meetings fade away to be replaced by this constant online version? Do we really want to be having a bee meeting all of the time, as Francisco put it? Is there something important about face-to-face human interaction that we shouldn't ignore?

As I pondered these questions my mouse button began wandering again and I found myself hours later playing Farmville, Facebook's online farming game (Yes, online farming: another reason to fear for our future). My online beehives were dying. Because I hadn't tended them in a few days, three bees had flown away. Three. It looked like I was going to have to spend more time tending my online bees, the real ones can take care of themselves.

Facebook is about sharing information, but most of it seemed to be on the light-n-fluffy videos, recipes, humorous pictures side, which is a fine form of entertainment in small doses. The hard science world did not seem to be well represented, and for a more appropriate place to look one may have to point the browser to a forum like BEE-L. But Facebook is entrenched enough in the American culture that it cannot be completely ignored if you are in the marketing game. For those of you still holding out, remember: it's free, fairly simple and has the potential for huge exposure. As for me, this trip into the world of social networking has not changed my opinion. I believe I'll take advantage of Facebook's new deletion policy and spend the rest of the day outside. BC

3 Ladies

Home of the Misses Elizabeth Dickerson and Nell Pearce at their bee farm near Woodinville, WA.

Miss Elizabeth Dickerson among her beehives where her Caucasian bees are at home.

William J. **Hall**

All who have studied the history of the honey bee know that beekeeping has been practiced for thousands of years. In those years past it was probably practiced by as many members of the fairer sex as the male apiculturists (maybe more). The female beekeeper seems to possess a real love for the bees that they work and study diligently to refine the art and improve the whole process. The story that follows is a tale about three ladies that started a business including bees as the main part under rough conditions.

In the good old days of 1920-21 two courageous young Seattle urbanites, young women had not only a desire but also a plan to escape the mundane and venture forth on their own. They had no thought of failure or defeat. The female of the species have great determination; for the bull closes his eyes when he charges, and the dam keeps hers open. Such was the zeal of these young ladies.

The names of these first two ladies are Miss Elizabeth Dickerson and Miss Nell Pearce. Miss Dickerson was an instructor in physical education and Miss Pearce a trained nurse. Both were very skilled at their professions, but they had had enough of city life, and had aspirations to achieve something of value beyond the closed time cadence of a society that drained everything from its members and gave little back.

Miss Elizabeth and Miss Nell ventured into the wilderness bordering what became Duvall highway which meandered along and through the Valley of The Samamsish (around Samamish lake). They invested in a 10-acre tract of wilderness dotted with somber Douglas firs, vine maples, and western red cedar. It was beautiful land, but it was as rough as the wilderness of North America when the first pilgrims landed on the shore. This was just what the stalwart young pioneer women were looking for.

In those days the would-be beekeepers found no improvements to help them with progress. There was no pavement, electricity, water, telephone, postal delivery, and none of the convenience of modern living of which they had been accustomed to (even for those early city times). Whereby, it took unyielding steadfastness on their part to learn and eventually master the rural environment and come up to the level of survivors in the rough.

The year 1931, 10 years after they ventured forth in their quest, these persistent ladies were still striving to reach their goal of successful beekeepers in the wilderness. About this same time in 1931, Miss Nell's sister, Pearl decided to join the two trail-blazers. She too was a trained nurse. Now that they were three, much more could be done to share the load of not only tending to the bees, but all the other chores that went into trying to become independent and successful business women.

Twenty years after the first two ladies strode forth, they were still pushing out their horizons. The addition of Miss Nell's sister had been of great benefit from 1931 to 1941. Those first years were stressful, but they were also very satisfying. The gift of knowing one can claim victory in spite of all odds is invaluable.

At the end of the first 20 years, the three lady beekeepers were expanding their horizons far beyond the pinnacles of the Olympics and the Cascades. With a business that at that time extended not only from the paved highway that by then passed right by the front door unto the last beehive on the gentle knoll in the rear flanked by the evergreens, and even unto the ends of the western hemisphere, these pioneers were just as busy as their own bees. By 1940, many improvements over the rough beginning of 1921 were welcomed thankfully and hopefully with gratitude of nature's gifts.

At the end of 20 years, four of the original 10 acres had been fenced, and one acre was under cultivation. Among the stumps were over 100 hives of Caucasian bees which had been hauled down just recently from the neighborhood of Sultan in the forested foothills of the Cascades near Stevens Pass. The bees had been moved down to spend the Winter at home within the bounds of civilization where black bears won't usually come plundering for golden honey.

These beekeepers were interested in doing a quality business only. Therefore, they produced only quality sweets such as honey and all kinds of high-grade specialties in jams made from gooseberries, black currants, wild blackberries, ground cherries, and marmalades. Their honey put up in jars and pails, was a delectable sweet distilled through the mysterious alchemy of their Caucasian bees.

The choice of the Caucasian bees was probably prompted by the gentle nature of the Caucasian, or maybe the availability of the race. At any rate, the Caucasians got the job done just like these three remarkable ladies.

This story is an example of what people can do – male and female – if they set their mind to it. The employment of the old rule of economics – Land, Capital, and Entrepreneur – does work, but there is an extension of the Entrepreneur that is the most important part of the system. The over and beyond element, where extra effort is stressed. A plan, a desire strong enough to keep the plan going even when it seems that things are going in the wrong direction, study that fuels the knowledge needed to succeed, and patience, always rewards those that have faith. BC

All The Buzzz in...

Happy Summer,

You are a bright, beautiful flower in life's garden.

Send me a photo of your garden.

Your Friend,
Bee B.Queen

Mackinzie Daniels, 6, TX

Demarcus, FL

Flowers Need Bees

A bee lands on a flower. The anthers brush against the bee and the pollen sticks to her hair. The pollen is then transferred to the stigma of another flower or the same flower. The pollen works its way down the ovule to develop into fruit and seeds. POLLINATION!

The Inside Scoop on Flowers

Let's take a closer look at flowers.
Most flowers have four parts – sepals, petals, stamens, carpels.

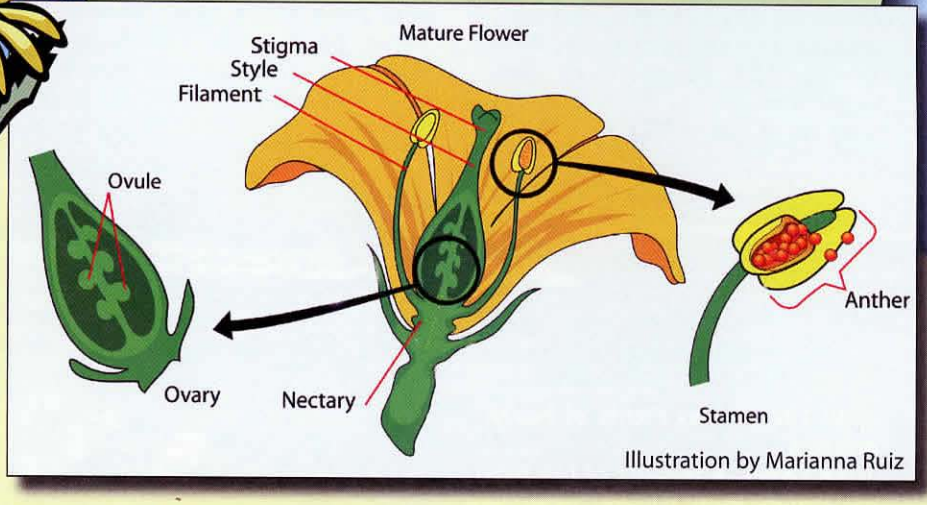


Illustration by Marianna Ruiz

Carpels

This is the female part of the flower where the egg can be found. Carpels grow into fruits which contain the seeds. The parts of the carpel include the stigma, style and ovary. This is the part of the plant that holds nectar.

Stigma – Pollen grains stick to the stigma.
Style – This is the slender stalk that the stigma is attached to. Pollen moves from the stigma down the style through pollen tubes.
Ovary –This is the part that becomes the fruit. The ovary protects the ovule which is the egg.

Sometimes the carpels are referred to as pistils. The pistil is the flower's whole female reproductive system. The pistil can be made up of one or more carpels. For instance an apple blossom has five carpels. So the pistil is segmented into five carpels. Each carpel segment has a portion of the ovary, style and stigma and is pollinated separately. Peas and beans have only a single carpel which forms a single pistil.

Stamens

These are the male parts of the plant where the pollen is produced. The parts of the stamen are the anthers and filaments.

Anther - The part develops and contains the pollen.
Filament – This is the stalk of the anther.

1. Buttercup 2. Carnation (car nation) 3. Rose

... Bee kid's corner

Produced by Kim Lehman -www.kim.lehman.com
www.beeculture.com
June 2012

Nature Detective

You will need:
A flower, a magnifying glass, paper and pencil.

Go outside and observe as many flowers as possible.
Write down what you see for each flower.
Describe the petals (number, color, shape)
Does the flower have a scent?

Carefully dissect the flower.
How many sepals, stamens and pistils can you see?
Can you find the stigma, style and ovary?

Web Challenge

See if you can build a flower with all the parts. Go to http://tinyurl.com/8yfsm3d.

Blooming Riddles

Can you guess what flowers these could be?

1. A dairy product and a dish?
2. A country with many cars?
3. What he did when he sat on a tack?

What does the letter "A" have in common with a flower?

They both have bees coming after them.

Everyone has these flowers on their face.

Tulips

Flower Transfers

Materials:
Fresh flowers and leaves
White fabric or paper
Wax paper or newspaper
Tape
Hammer

Directions:
Tape a piece of waxed paper or newspaper to a hard surface like a sidewalk. Lay the flowers and leaves on the paper. Cover with the fabric or white paper and tape down the edges to hold it in place. Gently pound on the fabric or paper until the colors begin to bleed through.

Bee Buddy

Meet Riley Brunson, age 11, from Washington State. She is learning how to be a beekeeper by working with her parents. They run the Earth Family Bee Farm. Riley wishes that people would stop spraying pesticides, herbicides and fungicides because they are harming the insects of the earth including the bees. She likes working around bees and also loves the honey that they harvest from them.

Beecome a Bee Buddy

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

Name: _____

Address: _____

City, State, Zip Code _____

Age: _____ **Birthday:** _____

E-mail (optional)

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

Bay Area Beekeepers

Kensington's Rogue

Judith **Adamson**

"I've been called a Rogue because beekeeping is illegal in this little square mile."
David Eichorn

I moved to Kensington, California in 1973 and a year later bought a hive out of *The Berkeley Barb* for $25. My mother had been a beekeeper, and I made bee equipment and helped her extract the honey when I was a kid. It must run in the family because my brother has 15 hives in Big Sur. I have only two hives now. I've had up to 25, but they were in out-yards, and recently I decided I only want to have bees in my own yard. From just those two hives I can get about 150 pounds of honey a year. I give it away to family and sell to neighbors and friends.

I've been called a "rogue" because beekeeping is illegal in this little square mile that's Kensington, but I do it anyway. Contra Costa County has an ordinance that makes beekeeping illegal, but cities can override this ordinance as most have done. Since Kensington is unincorporated, it's unable to change the ordinance, so it's subject to the laws of the county. I'm not worried about being found out. My neighbors know I have bees, and actually they're delighted because the bees pollinate their gardens and fruit trees.

David Eichorn removing a huge hive from the Port Costa church belfry.

My honey, and the Bay Area's honey in general, is largely eucalyptus since there's so much of it and it has a long, rich blooming season – December through June. Its nectar is high in sugar, and the honey bees love it. I have lots of raspberries in my yard and citrus trees nearby, which they also love, so that gets mixed in. Environmentalists in the Bay Area are on a rip to get rid of the eucalyptus because it's an exotic tree and they think it's taking over the old oaks and redwoods. Ironically, eucalyptus doesn't need pollination, but bees adore its nectar so pollinate anyway.

I've had a bee equipment business and I've taught beekeeping for many years at Contra Costa College. I also teach private students in the spring. I have an observation hive which I take to classrooms and tell kids all about bees. They just love it, and I love to teach them. I'm also the go-to person in the East Bay to take unwanted swarms which, as a public service beekeeper, I find homes for.

People ask me why I'm a beekeeper. Beekeeping is endlessly fascinating, and I love it because it's a lifetime learning process. Bees and elephants are the two animals that just fascinate me. Bees and their lifestyle are mysterious, and anything mysterious is more interesting because there's always more to discover.

We all know there's an order in the hive – the queen's the queen, the workers do all the work. But there's just so much more. New bees that emerge immediately go to work in the hive doing cleanup. They clean the hive spotlessly, often needing to remove bees that have died in the hive. They're also responsible for making wax, building the comb and transferring nectar and pollen from the field bees.

Field bees fly back from their foraging with bellies full of nectar and pollen pockets full of pollen. The inside workers are right there at the entrance, some to take the nectar – mouth to mouth, while the foragers store their own pollen. And the field bees go right back out to get more. It's all perfectly timed and methodical. The house bees deposit the nectar and pack the pollen into cells to a certain depth, knowing to place it adjacent to the laying area of the queen so the bees who are feeding the larvae can easily get it. They mix it with secretions from a gland in their head and then exude the milky white substance – the exact right amount – into the cell for

the larva to ingest; eventually it morphs into a pupa and then adult. When you hold a frame to the light you see all the different shades of pollen – brown, yellow, orange, red, grey-blue—all mixed up in the cells. It's a beautiful multicolor array.

The house bees have eight wax glands and are the only ones capable of making wax because the field bees' wax glands atrophy. House bees ingest the honey and make wax. When the nectar has evaporated to 80% sugar, all those cells that have the honey are capped with a very thin coat of beeswax which holds the honey in.

Honey is virtually indestructible and has been found in Egyptian pyramids that are thousands of years old. In fact, it may be the oldest food. Another mysterious thing . . . how do the bees know how to put just the right amount of acid into the honey to preserve it? It's been known for centuries that honey is antibacterial and can be applied to lesions and cuts.

Another group of house bees cap the larval cells with something that's not quite wax. It's a mixture – a brown color – of new and recycled wax, propolis and other material. This is so the young bee can push through it when it's ready to emerge. It's fantastic to see it happen. Nobody helps it; the young bee struggles valiantly with its front legs and head to come out.

For a long time I was resentful of drones; they give males a bad name, but they're actually the colony's insurance policy to continue the queen's genetic line. If a hive produces a new queen because the old one died or was injured or just got old, she has to get mated. If she's not mated, she only makes drones and a hive cannot survive with only drones. She has to be mated to make females because it's the sperm that makes the females who are the workers. The queen has the magical ability to withhold sperm if she does want to lay drones, and the rest of the time she gives a little bit of that sperm to each egg to make a worker bee. At the height of the season, which is around May, the queen will lay 1,500-2,000 eggs a day. She just puts her rear end into a cell that's been cleaned and groomed and deposits an egg. Along comes a worker to feed royal jelly to the egg. It's precision timing.

The comb itself is mind-boggling. It's quite amazing that the bees can make these perfect hexagonal structures. The hexagonal cell is the absolute best shape. Inside the hexagon is the circle that holds the egg. If you think of the alternatives . . . a triangle can take a circle and is very strong, but there would be a lot of wasted space, and it would use a lot more wax. An octagon can take a circle, but octagons won't interlock and fit tightly together. A square could take a circle but would be too weak. The hexagon is absolutely perfect. It's the strongest, uses the least amount of wax and saves the greatest amount of space. It's the miracle shape. When I pick up a frame after I've taken the honey out it's the weight of a feather – so light and yet so strong, and virtually indestructible. God, or whatever you want to say designed this, made the construction work perfectly.

When I go into the hive and pull out a frame of brood, I look at a laying pattern, and what I like to see is a complete plate with no cells that the queen has excluded. She's so well programmed that she lays an egg in every cell and doesn't hop around. Who knows whether she lays them by row or in a certain area at one time because you can't watch the queen. She seldom lays an egg when you pull the frame out because she doesn't like the light. Usually you're not lucky enough to see the queen at all.

Swarming is an amazing process. First of all, the Mother Queen slims down because the workers put her on a diet. She lays eggs in queen cups that her workers turn into queen cells. They're large, rough, vertically hanging cells made out of the same material they use to cap the brood. To make the queen, they feed the larva more and better food. They feed them the right amount to create a queen. The first virgin queen to emerge stings the sides of the other cells to kill them or, if by chance two emerge at the same time, they fight for dominance.

Just when the new queen is ready to emerge the old Mother Queen takes off with about half of the hive to find another place to live. This is the swarm. It's amazing to think of the timing of all this and how half of the hive is "chosen" to leave.

I took a swarm the other day. When I take a swarm, the presumption is that the queen is in the swarm, so I act as if she's in there. I went to look the next day and there on the lid was the queen. I didn't know why she was there – she belonged inside the hive – but there she was, and she was quite small and black. I was very nervous. As a beekeeper I'm very cautious when working around the queen. You don't want to damage her in any way because a swarm, which doesn't have a hive yet, has no way of generating another queen, so they're particularly vulnerable at that point. I saw this beautiful little black queen walk down into the hive, and I wasn't anxious anymore.

I could go on forever. This is why I'm a beekeeper. BC

Excerpted from *Backyard Beekeepers of the Bay Area* by Judith Adamson; ***www.BackyardBeekeepersBayArea.com***. David Eichorn, ***larkhorn@att.net***

TASTING BROOKLYN'S HONEY

Michael **Hegedus**

Last Fall was the Brooklyn Beekeepers Club's '4th Annual Honey Tasting' and awards party. Though every year seems special, this event had a new factor giving it a sweeter reason to celebrate what we beekeepers no longer take for granted (honey, and a place to keep bees), it was the first full season since the legalization of beekeeping in NYC!

And it brought out dozens of clandestine honey producers!

In fact, a large part of what the BBC has tried to do for the last four years (during bee prohibition) was to get as many local beekeepers together as it could find. The idea was for us to get to know each other, and to share our knowledge and experiences.

I first started the 'Tasting' in '06 by inviting a few local beekeepers over to my place so we could try each others urban honey. The next year a dozen beekeepers came by for a relaxed social event with an amazing assortment of local honey, as well as an eclectic selection of honey from around the world (as beekeepers would invariably collect honey on their travels), some good conversation, and perhaps a few libations (including the Club's signature 'Honey Sangria')!

What now makes the 'Honey Tasting' so special is that it draws urban beekeepers, with only one or two hives, into bringing samples of their very limited supply of mostly 'Single Hive' honey.

Many urban beekeepers produce single hive honey incidentally, as they may have only one honey super to extract! They may also have the time, and inclination, to separate, extract and bottle the light frames of honey from the dark ones.

This type of artisan honey is also sought after by consumers with allergies who prefer it's localized (local pollen rich) properties to ease their symptoms. But of course it also offers a unique flavor representing the local nectar of their area.

An eight ounce jar of 'Organically Produced' (no use of chemicals or antibiotics in the hive), unpasteurized, 'Single Hive' local honey in New York City sells for $20! Of course no one is sure if chemicals are used on the flowers the bees visit, but many consumers now understand that most flowers in the city are not sprayed with pesticides/herbicides the way farmers use them in the rural areas to spray their crops.

Beekeepers, in my experience as a third generation beekeeper, seem to be very territorial, and urban beekeepers are

no different. When they arrive, they want you to feel that they are representing a specific area, or neighborhood, and often have the honey named after it: 'Heights Honey' from Brooklyn Heights, 'Eleven 216 Honey' from zip code 11216, 'Honey Bee Local 718' from area code 718, etc. It's almost tribal, how proud each beekeeper is of their neighborhood's honey. They pull an 8oz. jar from a secret deep pocket of their jacket, or carefully unwrap what was stashed in their currier bag, and a grand smile crosses their face. If we're really lucky, they will reach for a second jar of a different color from a braggingly second extraction. For that moment, their 'single hive' honey is who they are! And, like a proud parent, it is their legacy!

The great success of such an event has all to do with the sheer number of beekeepers living in such a small area. This year we had 28 beekeepers bringing their local honey. Nearly double the number from last year, and triple from the year before. But there could be perhaps three times as many in NYC. Though New York City, since it's legalization, has encouraged beekeepers to register their hives with the city, the city has yet to release the number of beekeepers that have done so.

The BBC also embraces the national community, that is, it encourages the local beekeepers to research, and support, the many companies across the U.S. that are here to provide us with the information and resources available to succeed.

By contacting as many supply companies, and breeders, as it can find across the country, and asking them to supply catalogues/flyers, and door prizes for the event, it provides industry updates for the experienced beekeepers, while the new beekeepers (the various classes here are now filled with hundreds every year) get an idea of the variety and scope of their options when it comes to equipment, bees, and literature available to guide them in their first steps.

Since the 'Tasting' opened its doors to the public in 2008, the suppliers across the country have been more than generous with their donations! They've been sending everything from bee books, and candles, to certificates for packages, queens, and complete hives! Often the beekeeper running the 'smallish' supply company is so thrilled with the idea of supporting urban beekeeping, and a 'beekeepers club', that it sends extra items for the BBC to raffle off. To raise funds for the club to encourage it's success.

But for the BBC, the 'Honey Tasting' is, and has always been, an event to celebrate 'The Beekeeper'! ALL donations are GIVEN away, and for the 4th year in a row, EVERY beekeeper has won a prize (averaging $30). A $5 entrance fee at the door, and a jar of honey, is all it takes to cover the costs of the room and supplies (washable plates, knives etc. are used year after year. As little as possible ends up in the landfill.)

With Summer just around the corner, it's time to start anticipating next Summer's honey flow, and for the BBC to start planning the its '5th Annual Honey Tasting'. We can open the new catalogues and resources picked up at the last tasting, email our new beekeeping neighbors, and hope for some Spring honey. With legalization now firmly behind us, and the new classes starting, we anticipate this year's tasting to be the most successful yet! Of course there is no guarantee we will get any honey, but at least we have a place to keep bees! (legally) BC

College Beekeeper Is Both A Blueprint And A Support System

Michael **Smith**

Of all the hot-topic problems facing honey bees today, the dwindling number of beekeepers, and their advancing age, has received little attention. Quite frankly, beekeepers are getting older, and we need a new generation of younger beekeepers to take up the reins. Regardless of any other problem, fewer beekeepers mean fewer bees to go around.

Most beekeepers are older males. That's good news for me, because one day I'll be old, and I'm relatively sure my gender will remain the same. But for right now, I'm a young beekeeper, and I'm a student. And being a student tends to complicate beekeeping: I have no fixed housing, I have no income, and I'm always busy. Learning beekeeping is tricky enough – imagine the difficulty for a first-time *student* beekeeper!

College Beekeeper helps overcome this challenge, by helping students initiate beekeeping programs at their place of education. The idea behind the initiative is simple: get bees on college campuses so students can learn beekeeping by actually *doing* beekeeping. Mentored by local beekeepers, who provide essential help for setting up the programs, the student group gradually becomes independent as they gain confidence managing their own colonies. Within a year or two, College Beekeeping groups function just like any other student club, with older students instructing new arrivals. Since college can last four years or longer, even the busiest student will get to participate in the full gamut of beekeeping.

To be honest, my initial motivation behind College Beekeeper was somewhat selfish. I wanted to learn beekeeping while studying at the United World College of the Atlantic (UWC-Wales), and suspected that the administration would be more willing to allow a *group* of students to set up hives rather than an individual student. With an awesome local beekeeping mentor, Chris Adam, who I met through a serendipitous series of events, we were able to begin beekeeping. Three months later, I graduated, leaving the group in the hands of the students and Chris. Seven years later, that student group is still thriving. Since then, student beekeeping programs have sprouted up at Princeton University, Boston College, and Wageningen University (Netherlands), with others (hopefully) on the way at Brown University, St. Johns College, UWC-Maastricht (Netherlands), and Cornell University.

Using college campuses for beekeeping provides serious advantages. There's immediate access to a large number of young people, from a wide range of studies. It's easy to find 10 interested students without much effort, and normal to have groups of over 40. In the U.S., many colleges give financial support to student clubs, so a wisely worded proposal can cover start-up costs. Most importantly, local beekeepers are willing to donate their time, expertise, and resources, when they know it's going to an educational student group.

College Beekeeper is both a blueprint and a support system for students. The website explains how to start a student beekeeping program, how to maintain it, and which schools already have programs running. It is also a way for me to compile all the useful information from multiple programs in one place. Like swapping good recipes, each existing program makes it easier for a new group to start up.

So if you're a young beekeeper wondering what to do with your bees once you've gone off to college, perhaps you'll consider starting up a College Beekeeper program, and share your expertise with your colleagues. If you're off to college, and don't know a single thing about beekeeping, but would like to, starting a College Beekeeper program requires only time and gumption. Lastly, if you're nowhere near college age, but are keen on mentoring an enthusiastic group of students, then get in touch with your local college, high school, or university, and I'd bet there are some students who would love to learn from you. BC

To contact College Beekeeper, email collegebeekeeper@gmail.com, or visit our (very basic) website: ***https://sites.google.com/site/collegebeekeeper/***

ABF MEETS IN VEGAS 2012

SCIENCE

Malcolm **Sanford**

Traditionally conventions of the American Beekeeping Federation end the first day with presentations to Special Interest Groups (SIGs). These include: Commercial Package Bee and Queen Breeders, Honey Producer/Packers, Small Scale Producer/Packers and others. This reporter attended the Commercial Package Bee & Queen Breeders session. Tom Glenn, one of the premier bee breeders in the country, provided an entertaining discussion of his philosophy: 1) keep things simple; 2) focus on quality; 3) keep good records; 4) cultivate loyal customers; and practicing the golden rule. The latter is encompassed in the question, "Would I want this queen in my own colony?" From a customer's perspective Glenn Apiaries is perhaps the most comprehensive description of queen rearing and selection to be found on the World Wide Web **http://www.glenn-apiaries.com/**. The major message from Mr. Glenn was the conundrum of a grand bargain trade off in queen breeding, selection to narrow the genetic base, while laboring to keep it as diverse as possible.

Mark Spitzig and Melanie Kirby of Zia Queens finished off the session with their description of using survivor stock for their operation **http://www.ziaqueenbees.com/**. They are perhaps unique in rearing stock in two extremely different areas of the country, Michigan and the New Mexican Highlands. This includes areas of isolation such as islands in Michigan and remote mountain valleys in New Mexico. They breed for longevity; the goal is to get bees living for two-years without treatment. *Varroa* usually kills a colony in 18 months; those bees are eliminated from the breeding pool. Diversity is important as well and they have it in spades with their two geographic locations. The also collaborate with other breeders to ensure a broader gene pool to select from, again reflecting Mr. Glenn's preoccupation with increasing diversity at any cost.

The general session the next day featured a discussion of Sue Cobey's efforts to increase genetic diversity by importing queens from Europe in cooperation with Steve Sheppard of Washington State University. One goal is to re-establish Apis mellifera caucasica in the U.S. In this effort, teams have visited Italy, Slovenia, Georgia and other European areas, bringing frozen semen into the U.S.

Each year certain themes become apparent in the scientific presentations at the American Beekeeping Federation convention. Both the broad areas of pesticide effects on bees and honey bee nutrition seemed most important in Las Vegas. Thus, topics like nutritional stress on migratory colonies, as well as honey bee diseases, and the more subtle effects of pesticides on honey bee populations were emphasized. In the latter situation, it is becoming clear that a paradigm shift in occurring in how scientists and beekeepers view pesticide effects on honey bees. Specifically, the traditional way of looking at pesticide kills via acute toxication (poisoning) of adult bees is no longer sufficient. Studies must now be more nuanced, looking at a wider range of variables, including longevity and behavioral and neurohormonal effects. In addition, studies in the past have almost exclusively focused on adult honey bees. The newer chemicals must now also be viewed with reference to their effect on other honey bee life stages (eggs, larvae, pupae).

Studies of an enzyme class, Cytochrome (CPY) P450, at Pennsylvania State University is revealing that honey bees could be challenged by a number of pesticides in a novel way. CPY P450 is responsible for detoxifying a range of chemicals, but this protection has a limit and can be "used" up when an organism is challenged by a large number of toxic materials. This could be happening to honey bees, especially if they are also affected by beekeeper-applied materials in an effort to control *Varroa* mites.

Insecticides have usually been a focus of most studies, but now their interactions with fungicides and herbicides are being looked at detail.

Mark Carroll, a chemical ecologist at the USDA-ARS Tucson, Arizona described his experiments feeding bees as they were pollinating a number of crops, including almonds, apples, cantaloupes and cucumbers. Nutrition it seems is a "boom and bust" kind of situation; the results are not instantaneous in colonies. It also affects things like mite attraction and how colonies recover from the effects of pesticide poisoning.

Gloria DeGrandi-Hoffman, who heads up research in Tucson, said that nutrition is the top research topic at that lab. One area is microbes and their role in making pollen digestible for honey bees. Another is the contamination of pollen by fungicides and perhaps broad spectrum antibiotics. These conditions might influence queen replacement and colony immunity to disease.

There is continuing research in how nutrition effects colony development. Use of "triple cohort colonies" (TCC) is revealing how the physiology of the colony is being changed by the food it consumes. Research at Texas A&M using honey bee brood pheromone to manipulate foraging resulted in the following abstract: **http://www.plosone.org/article/info:doi%2F10.1371%2Fjournal.pone.0016785.**

"Division of labor is a striking feature observed in honey bees and many other social insects. Division of labor has been claimed to benefit fitness. In honey bees, the adult work force may be viewed as divided between non-foraging hive bees that rear brood and maintain the nest, and foragers that collect food outside the nest. This study demonstrates how division of labor associated with brood rearing affects honey bee colony growth rate, a token of fitness."

Jeff Pettis reported on research concerning queen quality at the Beltsville Bee Laboratory in Beltsville, MD

http://www.ba.ars.usda.gov/psi/brl/index.html. One area of concern is the new nosema (*Nosema ceranae*) and how it might affect egg-laying rates and the queen's chemical signal to workers via queen mandibular pheromone (QMP). Study of the effect of pesticides on drones is revealing that there might be effects on mating behavior and sperm viability. Specific research using coumaphos, the active ingredient in the *Varroa* mite treatment Check-Mite+, has shown extensive die off of sperm in queens that have become "drone layers."

The USDA-APHIS is continuing it's National Honey Bee Survey, according to Dr. Pettis. It began in three states in 2009, increasing to 34 by 2011. The plan for 2012 has now been issued **http://www.aphis.usda.gov/plant_health/plant_pest_info/honey_bees/survey.shtml**. The 2012 National Survey has two major goals, 1) identify potentially invasive pests such as the exotic mite Tropilaelaps (a mite found on Asian honey bees), and problematic Apis species such as *A. cerana* as well as viruses; and, 2) conduct an epidemiological survey that would meet the goal of developing a long-term overall baseline picture of colony health.

"To accomplish these objectives, cooperators will distribute sampling kits, identify stationary and migratory beekeepers who will participate in sampling of their honey bee colonies, collect and preserve samples, quantify parasite loads from bees collected in alcohol and forward live samples for molecular analysis. All data collected will be maintained at APHIS, ARS and UMD. This data will be entered into the APHIS NAPIS database as well as the BIP database described above."

The BIP, or Bee Informed Partnership, referred to in the previous paragraph was also on the agenda **http://beeinformed.org/**. Based on a human epidemiological model, the BIP survey will be highly publicized and available to all beekeepers online from March 30 to April 20, 2012. This ambitious project will be analyzed over time and results delivered to the beekeeping community. It has five-year funding window and expectations are that it will become self-supporting in the future.

Another exciting research initiative described by Dr. Marla Spivak, University of Minnesota is that of the Bee Extension Health group **http://www.extension.org/bee_health**. A specific part of this effort is the Managed Pollinator - Coordinated Agriculture Project or CAP **http://www.extension.org/pages/24315/managed-pollinator-cap:-coordinated-agricultural-project.**

It is made up of various teams, focusing on *Nosema ceranae*, viruses <Israeli acute paralysis virus as an indicator of colony collapse disorder (CCD)>, toxicology and pesticide interactions and genetics and breeding.

Dr. Spivak emphasized the stationary apiculture project as something of extreme importance to beekeepers: "One of our biggest investments is a coordinated national study using seven sentinel apiaries (in CA, WA, TX, MN, FL, PA, ME) in an attempt to understand factors affecting colony survival in the field – parasite and disease levels, environmental toxins, weather, land use patterns, and their interactions. In general, this data set is showing the preeminence of *Varroa* mite, corroborating our lab studies above. High levels of *Varroa* are associated with high levels of virus and low populations of adult bees and brood."

Research at the Baton Rouge Bee Laboratory **http://www.ars.usda.gov/Main/site_main.htm?modecode=64-13-30-00** was described by Dr. Jeff Harris, who has worked a long time on the *Varroa* sensitive hygiene (VSH) genetic trait. This has been introduced into the U.S. honey bee gene pool in a number of ways, and there is active discussion about this at **http://vsh-breeders.org/**. One finding is that there is a cost to the colony; too much hygiene can in fact be detrimental.

The current status of the Russian bee project is that it has been totally taken over by breeders that form the Russian Queen Breeders Association **http://www.russianbreeder.org/**. However, the Baton Rouge lab continues to assist the association in making decisions that will contribute to the success of the line.

Dr. Peter Teal of the Center for Medical, Agricultural & Veterinary Entomology (CMAVE) in Gainesville, Florida, is a chemist by training, but recently has used significant resources in this laboratory to look at both small hive beetle and *Varroa* biology.

With reference to small hive beetle, he published a summary in the December 2011 E-Buzz published by the American Beekeeping Federation on its web site **http://www.abfnet.org/displaycommon.cfm?an=1&subarticlenbr=173#science_buzz**: "So, this solves our question and we now know why we are catching beetles in areas where there are no managed hives in the United States. It's simply because the beetles are well able to survive and reproduce on fruit available in nature . . . I can honestly say that we have found odors from fruit to be far more attractive than the best attractant we have identified from bee hives and that we have a synthetic fruit perfume that is irresistible to beetles."

A further reaching conclusion of Dr. Teal is that this beetle (*Aethina tumida*) of the family Nitidulidae may in fact have moved from fruit to honey bees during its more recent evolution. Finally, he is finding that beetles are repelled by crushed beetle larvae, opening another research possibility for the laboratory.

The well-recognized fact that *Varroa* prefers drone brood has led to some experiments involving various chemicals extracted by solvents. At CMAVE researchers have found that frozen brood is no longer attractive to mites, suggesting some active material may be a repellent or attractant to mites. Study of the protein vitellogenin levels in *Varroa* influences whether they lay eggs. Perhaps some inhibitor can be found to "turn off reproduction in female mites." Another area for research at CMAVE is the use of RNA interference (RNAi) **http://en.wikipedia.org/wiki/Rnai**. This technology was first described in *Bee Culture* in 2008 with reference to virus treatment **http://apisenterprises.com/papers_htm/BC2008/viruse_treatments_RNAi.htm**.

On the last day of the convention in Las Vegas, a series of workshops were held on numerous topics, including: labor laws, apitherapy, residential beekeeping, forming local bee associations, and beekeeping for prisoners. A packed audience attended a presentation by Randy Oliver, on *Varroa* integrated pest management (IPM). Mr. Oliver is unique in that he is both a beekeeper and a researcher **http://scientificbeekeeping.com**. His pithy statements on treating honey bees for various maladies were alone worth the registration fee to the Federation convention. He is dedicated to "keeping *Varroa* miserable!" and by all accounts is succeeding in a number of ways.

The 2013 meeting of the Federation will be at chocolate headquarters in Hershey, Pennsylvania. This will be

a big change in terms of locale. There are not many large-scale beekeepers in the region, which have traditionally made up the bulk of the Federation membership. However, perhaps a plethora of small-scale operators will be in attendance making up for this deficit. A slide show of January's Las Vegas convention is available and information on the event will be continually updated at **http://www.abfnet.org/**. Make your plans to attend now. BC

Malcolm Sanford is the retired Extension Specialist, Apiculture in FL, current Secretary of FL State Beekeepers Association, Editor of the Apis Newsletter and administers Bee Culture's Global Beekeeping Calendar, available at ***www.beeculture.com/buzz****.*

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USING QUEEN CELLS

The Future Of Good Colony Management Starts With Rethinking How We Use Queen Cells

Larry **Connor**

The break in the writing thread concerning teaching beekeeper instructors continues this month to cover another topic. Last month I discussed the use of virgin queens. It seems important to step back, biologically at least, and discuss the various aspects of using queen cells in a small or moderate beekeeping operation. With the April release of my newest beekeeping book, *Beesentials: A Field Guide*, I have taken a major position that every new beekeeper should start with or maintain not one but at least two hives during the first year, and then make a nuc (=nucleus) from those bees with the goal of entering Winter with two full and one half hives. My book and journal articles discuss the goal of having a higher success rate for new and formerly single colony beekeepers.

Key to the production of a nucleus is providing one or two frames of emerging worker brood with a queen, or a queen in development. During swarming season, worker bees stimulate the existing queen to deposit fertilized eggs into preconstructed queen cups. These bees are not worker bees at any time in their life, but always queens from the time the old queen places the egg in the cell. These bees receive royal jelly all their lives, and one assumes only the best of care. Compare this to the queens produced under the supersedure instinct. This is when the colony's decides to replace the old queen with a new queen, usually because she is producing a smaller brood area, less pheromone and may (or may not) be running low on sperm stored in her body. In this case the worker bees select a few worker cells and rebuild them, extending the architecture of the cell into the bee space between two combs, or inside breaks in combs. This worker bee is like a stand-in actress in a musical, when the star is unable to go on and the worker bee has a chance at being queen. Only here the differences are nutritional, with the worker larvae receiving royal jelly all her life and thus being chemically (by special diet) converted into a queen.

Generally swarm cells are at the edges of the frames, where the brood extends because of great growth. Supercedure cells are also near the edge of the brood area, but it is a reduced area. They appear usually on the face of the frame, where the proper-aged larvae are found. The position of these two different cell types is more determined by the status of the colony rather than the queen cell production process at work.

Cells from open brood

Some beekeepers make queens for new colonies by removing a frame or two of brood with eggs and larvae (along with sealed brood) so the new colony is able to raise their own queen. I consider this to be the least satisfactory method of queen production, and for two reasons. First, this takes the longest time (from newly emerged larvae to laying queen) for a colony to produce a queen. Second, the new colony may be too weak or nutritionally prepared to produce a top quality queen. Some commercial beekeepers split strong hives, and let the queenless portion produce replacement queens. This is easily done just before swarming, when the colony is in at least two boxes, with brood in both boxes. They do not find the queen, or remove any cells. Instead they spit the hive, and let the bees sort out the queen status with what is left in the new hive. These colonies are often put onto pallets and moved to a new location. When stronger groups of bees are used, this method may be successful but at a big risk of loosing valuable bee assets. Should a split fail to produce a queen, it is stacked back onto another colony. For many commercial beekeepers this method is the only way to keep genetic diversity in their hives, as each colony passes on genes to the daughter hives. No other system does this.

Using cells for new hives

I just conducted a Master Class for the Denver Bee Club, and we made a new hive by using the swarm cells found in a strong, over wintered, natural comb hive. Natural comb, made without foundation, tends to be more random in shape and has lots of places for cell construction. The natural combs were structurally less stable, and require pretty careful handling during the splitting process. We were successful in finding several frames of brood and bees with relatively uniform comb filled

Three swarm cells on a medium frame, extending below the frame. Note the queen cups (empty) and drone brood, also at the bottom of the frame. Swarm cells are associated with full frames of brood such as this one.

These two supercedure cells were selected from larvae at the edge of the broodnest. Now the brood area has been reduced. Associate supercedure cells with smaller brood coverage and smaller hives. These cells were re-built from worker brood. Beekeepers may make splits from these colonies, keeping the cells, but only when supplemented with extra bees and brood.

with brood, some of it emerging. The stimulus for our decision to make the new hive was the presence of about a dozen swarm cells. There was some discussion if the colony had already swarmed because the colony was so filled with emerging brood. The queen cells were sealed, so it seems possible they might have. We remove three frames of brood, honey and pollen to make up a new hive and made sure that the two brood frames both had more than one sealed queen cell protected during the move to the new bee box. Queen cells on the face and bottom of a frame are easily destroyed by a change in location. Two empty combs were put into the five-frame box to force the bees to confine their burr comb construction into the frames.

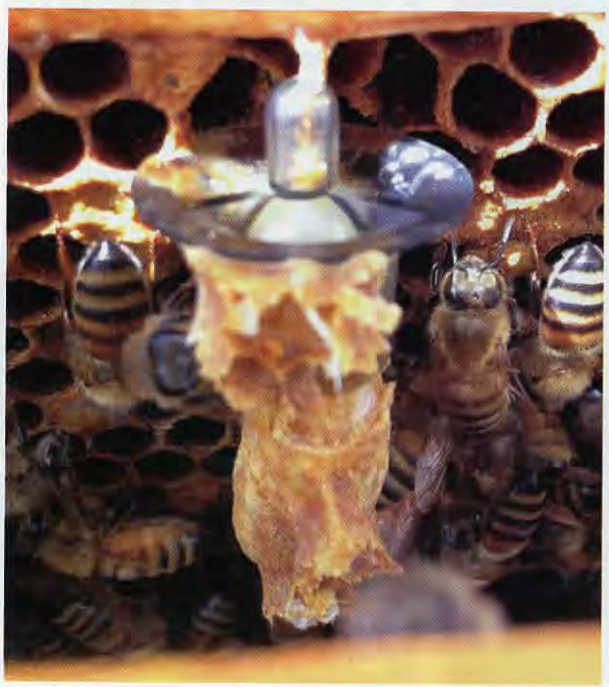
Since we did not find the queen (but there were cells with worker eggs), we did not cut any cells, but left them in both the parent and the daughter hive. That way both colonies have the raw materials (eggs and young larvae) if the colony had already swarmed and there was no queen! The parent hive was weakened by the loss of three frames of brood and food, and the colony given more room for development. This may help break the swarming instinct, but there are no guarantees.

This is an efficient and useful way to use queen cells. Rather than letting the colony swarm, by removing frames of brood we have reduced the population, and hopefully the swarming instinct. These queen cells are probably the best produced cells one finds. The parent colony and the daughter colony both need to be monitored every ten days or so until there is proof of a laying queen in both units. In about a month the five-frame nucleus should be strong enough to move to a larger hive size.

For those who seek using natural systems, the use of swarm cell and supercedure cells is quite natural, since the bees have done all the selecting. Even G.M. Doolittle, the 'father' of modern queen rearing, recognized that bee-raised queens are often better than those produced under the transferal system he developed.

Using queen cells from a queen rearing method

I started producing queens by grafting in mid April this year, earlier than 2011. While I am watching the nurse bee population grow in the queen rearing hives, I am pleased that the cells that are being started (after mechanically moving the larvae from a worker cell to a plastic cell cup) generally look good. These cells may be used at two points in their development.



A 48-hr cell that was completed by a two frame nuc, but torn apart when I opened the hive and separated the frames. The cell was attached to the adjoining frame.

Genetic transfer with 48-hr old cells –Two days after grafting (when the larvae are in their fourth day), we are able to remove six-day old queens (three days as an egg and three days after emergence), that are approaching the half-way point on their development path of 15-16 days. The main advantage of this system is for a rapid and inexpensive way to transfer larvae from a special breeder queen, and a marvelous tool for small-scale queen producers to increase the genetic diversity of the bees in their hives. Imagine a local bee club meeting where every queen producer shares 48-hr cells with

other beekeepers, either for trade, barter or sale. I have instrumentally inseminated queens from Glenn Apiaries, but there are some survivor lines in Michigan that I could trade with area beekeepers for just the cost of fuel to drive to a central location, or meeting, to meet and swap cells. A two or three frame queenless nucleus will rapidly complete the construction of these cells. When made in advance the bees are biologically aware they are queenless and will respond to a started cell by feeding and building the cell. While we only gain two or three days over self-raised queens, we benefit by having queens from the colony we select. Therein lies the benefit of these cells.

The cells are well fed in the 48-hour period from the time of larval transfer, and the larva floats on the top of the jelly. When young larvae are selected it will still be too small to free itself from the surface tension of the jelly, but will be held here tight. This allows the transport of 48-hr cells without need for heating. I push the plug of the base of the cells into a plastic Styrofoam container and then cover the container with another plastic container or thin film to prevent desiccation during transport. It is not a fancy system, but I have successfully carried these 48-hr cells in the car and in an airplane–in my carryon bag, everything sealed in a zip-lock baggy. There are no bees in the container. Be advised that governments regulate the movement of bees from state to state, and ***Never*** move bees from one country to another without permits or face some serious fines and legal charges.

Nearly mature or ripe queen cells– Many beekeepers produce queen cells for themselves and for others that are within a day of emergence. This is a standard method of introducing queens into splits or nucs used by many beekeepers, and the benefit is that you know the queen source of these queens. The emergence of a queen will be within a day, making this a more sure thing.

Both 48-hr and ripe queen cells should use a marking system to identify the queen. The easiest way to do this is to use one color plastic cell base to identify a queen or queen line. If you leave the cell base in the hive you can determine the queen line without too much record keeping. Just make sure you remove the old cells.

Rather than letting the colony swarm, by removing frames of brood we have reduced the population, and hopefully the swarming instinct.

Cells from cell finisher, 48 hours after grafting. Ready to be installed into a nucleus hive for construction completion.

It is pretty important that cells be properly placed when they are put into the hive. I like to push the base of the cell into the top of a frame of brood. With 48-hour old cells it is quite important that they point straight down, not into the brood or into the adjoining frame. With a fully formed cell this is less of an issue. I find I need to leave a bit more space between frames to prevent damage.

Mature cells are easily placed between frames, outside of the brood nest, right on the top bars of adjoining combs. This prevents damage to the cell itself, allows proper emergence of the queen, and eliminates the need to pull frames apart if the colony was made up earlier or is being re-queened after a prior queen was removed. BC

Bee-sentials: A Field Guide *by Dr. Connor is available for immediate shipping. Order from your favorite bee supply dealer or directly from Wicwas Press, 1620 Miller Road, Kalamazoo, MI 49001. The price is $29.95 postpaid in the United States. If you live outside the US, please email* ***LJConnor@aol.com*** *for a quote payable via PayPal. Or check out the* ***www.wicwas.com*** *website for PayPal purchase. This full color book is ideal for use in bee classes and training programs, so contact Dr. Connor for quantity discounts to bee clubs. See the full-page ad in this issue for further information.*

Bee population in cell finisher, mid April 2012.

Dealing With Package Bee Anxiety

Mostly, what can go wrong, will.

James E. **Tew**

Arrangement of package components for a slow-release technique.

I know, I know . . .

I know, I know . . . the 2012 season for package bee installation has passed. By now, we all have a pretty good idea if the 3# start is going to make it to the Fall season. But as I write for you, I am still in the throes of the strange Winter/Spring season of 2011/2012. At this moment, I don't know how things will end for the season. It is as though the past Winter and Spring were combined. A cool, protracted Spring followed a very mild Spring-like Winter. The mild winter part was good for my established colonies, but the cool protracted Spring phase has greatly increased the level of my *"package anxiety."* Now, as fruit bloom ends, a week-long *"Northeasterner"* is predicted to bring two to four inches of late season snow and cold weather for a full week. I presently have ten package colonies on nine frames of foundation and one empty comb.

To you new beekeepers – I feel your pain

About seven months ago, I retired from The Ohio State University. For all the years I worked there, I routinely purchased packages and installed them in typical fashion for various OSU programs. Since I had access to every piece of beekeeping equipment known to beekeepingdom, I had it nice. Feeders, extra equipment, and queen-releasing cages – it was all there. That was all left when I left.

I have written about my present status in past articles, so enough has been said. I did not retire from beekeeping. I am starting anew in beekeeping. I am purchasing and assembling new equipment. I bought ten packages using my personal money. So this is where I am – my package bees are on foundation and one empty comb and a week of serious cold is on the way. I have labeled my feelings *"package anxiety."* Let me start at the beginning.

Google it

Go ahead, Google *"Package Bee Installation"* and you will get over one million hits. One of the many segments said that one could learn to install a package by watching a two minute video. Across the Internet, beekeepers are bouncing and shaking 3# packages into awaiting equipment. How difficult could it be? If you spend two-three minutes per page, there are enough videos and instructions to keep one reading for a short four years. In general, releasing the bees is a simple process and the techniques for this procedure can be found everywhere.

The Traditional Five-Step Process

In general, installing package bees is about a five step process. (1) Remove the outer lid and feeder can, (2) Remove the queen cage and check her out, (3) remove the cork from the candy plug end and insert – candy end-up – between frames in the colony, (4) Bounce and shake bees on the queen cage. (5) Place the empty cage in front of the hive and close things up. Yes, I know there are all kinds of variations on this general procedure but this is the typical way.

Then return in a few days to be sure the queen is out and – ideally – laying eggs. Have some kind of feeder on the colony and keep it full and then just watch the colony develop. When all goes well, it is an easy process that probably could be learned from a two minute video, but long-term memories are made when things go in directions that are not typical or traditional. Please know that I am not complaining about these variations, but writing about the stress that comes from having to deal with aberrant package-bee situations.

The Weather

In package bee issues, the weather is nearly always involved. Too hot, too cold, too rainy, too anything. Beekeepers are difficult to please when it comes to weather issues. This past Spring, I heard a radio interview during which a beekeeper complained that the mild winter would result is high colony mortality due to starvation. I was struck by the oddity that the guy was complaining about mild weather. Would a harsh Winter have been better for our bees? As a group, we appear *unpleasable* when it comes to weather issues.

⇨

Rain

During the Spring of 2010, rain was the culprit. It was raining when the packages came into Ohio resulting in a battlefield appearance at the pick-up site. I put the bee packages in a quiet, darkened, cool, room and waited for the rain to stop. It didn't. Several days passed. The steady hum of the living packages and the ever rising number of dead/dying bees on the cage bottom caused me high levels of package anxiety. Yet releasing bees into the rainy weather would result in all flying bees being lost. When do things tilt? When does it become dire enough to release bees in rain rather than hold them in the cages another day? It is not an easy call to make.

I used a slow-release method, in which the bees are not shaken, but rather the cage – full of bees – was put inside a hive box shell. The technique worked reasonably well and of course – just like most of you, I videoed the process. It is posted it at: **http://goo.gl/qIE6P**.

Wind

The 2012 Spring, the issue was wind. I'm not talking about gentle spring breezes that blow bees off course, but a high-wind advisory with gusts strong enough to blow bees to the next county. I used the same technique for releasing bee packages into high wind situations that I used to release during excessive rainy situations. Again, it worked as well as could be expected.

Why not wait until the weather improves? Because the high wind weather front was bringing a cold wave of air behind it. To have waited until the high passed would have meant that I would have to install the bees during weather that was in the 40s F.

Procedure overview

An empty shell surrounded the package with queen cage just in front of the open package. The single empty comb was directly below the package opening. The feeder can was positioned near the developing cluster. In a perfect world, the confined bees should exit the package and cluster around the queen and on the drawn comb.

Burr comb the bees built on the queen cage. Note both cork plugs are still in place.

Good points/bad points

There were only a few bees that got caught in the gusty wind and they seemed able to deal with it. Otherwise, over time, the bees came out and accumulated on the caged queen and onto the drawn comb that I had provided. While that is a ***big*** good point, I must admit that it was about the only good point to this procedure.

In several packages, the bees came out and clustered beneath the package lid where they immediately began to build small comb pieces. In other instances, they clustered in various other places other than the comb on which I wanted them on. As the bees took flight from various package colonies, apparently, they drifted around to other colonies. Consequently, some clusters are clearly larger than others. I will equalize these new colonies during the early summer.

This procedure required extra hive equipment and the displacement of a single frame. I hung it in the upper shell just to give it a temporary home until I can put it in the hive. The extra equipment required may not sound like much of a problem until I remind you that I had to buy and assemble all this equipment. Cost, labor and time was involved – my cost, labor and time. There is a noticeable difference in hauling ten deeps and hauling 20 deeps when you are the hauler.

Package Queens

Several years ago, I stopped puncturing the candy plug when positioning the queen cage. Why? My reasons are not crystal clear but are primarily one of replacement queen availability and costs. Many years ago, extra queens were available for replacing dead or lost queens. On some occasions, they were even free. Those days are gone. Additionally, queens are currently difficult to get in short order. If a package goes queenless, that package will probably have to be combined with another colony. So over time, I began to feel more comfortable having more of a part in the actual queen release process. After five or six days, I either remove the cork end that allows the queen an immediate escape or I peel the screen back and release the queen on the combs. If anything does not look right – anything at all – she goes back in the cage for a few days.

Problems or challenges? Occasionally a queen is silly and flies away. That event is always good for a *Bee Culture* article. Occasionally, if I only open the non-candy cork end of the cage and lay it on the top bars, worker bees crowd into the cage preventing the queen from immediately emerging. I really don't know how long it takes for her to leave the cage, but at least I know she was kept in the cage a couple of days longer than if I had punctured the candy plug.

In the past few years, package queens have gotten a bad rap. Maybe they deserve it. In fact, in quiet circles of beekeepers, I have heard it said that present-day package queens are merely placeholders to get the colony established. Soon thereafter, a queen of better quality should be installed. Hmmmm. Let me think about that one. I will admit that some package queens are better than others – even a lot better – but I am not sure I want to spend even more money on that package until it has survived the first Winter.

Feeding the Package Colony

At this very moment, my biggest concern is feeding these small, immature colonies. I know, I know, use top feeders or whatever, but I don't have them and I won't be able to get them in time to use them this season. These are very small colonies with essentially no food existing in marginal weather. At least there are pollen and nectar sources available to the few foragers that try to make a trip, but these colonies should be fed. How?

Several years ago, I wrote about using fondant as a fast food supply for needy colonies. It requires no real equipment modification and no mixing, but it does require availability and money for purchasing. I also learned that it does not keep well after opening. Oh, the bees like the harden stuff well enough, but it is like feeding them hardened cement pieces. While I have not taken this technique out of contention, it is not presently high on my list.

I have a few top feeders but I have no division-board feeders. This small colony ***might*** be able to learn to use a top feeder and to make the trip up into the feeder, but this technique really needs to work and the bees need to learn to use it quickly. Dry sugar on the inner cover is interesting and fast, but inefficient – plus the bees would need to get to water to deal with the dry sugar.

Okay, this is where I am. I have preliminarily tested a procedure that has been in the beekeeping literature for many years, but one that I had not tried until I suddenly had no equipment – zip-lock plastic bags. I just could not believe that it would not leak everywhere, but it didn't. Normally, gallon bags are used, but since the colonies are so small, I have been using quart bags. They are sticky to fill but that stickiness lets the bees know something good is within. The bags are filled with syrup, laid on the top bars and then slit with a razor in a two-inch "X" formation. Oddly, unless pressed, they do not leak.

The other oddity I plan to try is to put these bags on at night so the bees won't fly. I will use minimal smoke. So I will need empty equipment, granulated sugar, sandwich bags, and a scraper razor, all of which I have. I am doing all of this due to a reversal of weather fortunes including accumulations of snow and no chance at foraging. There's a very real chance that this supplemental food is all they will have to live on until the goofy weather passes.

This one-frame colony is what I have to work with.

For warm climate beekeepers

For those of you living in warm climates and chasing swarms, a friendly pox on you – and yes, those of us dealing with this weather turndown do envy you. So there it is. Feel smug. BC

Dr. James E. Tew, State Specialist, Beekeeping, The Alabama Cooperative Extension System, Auburn University, 330.345.8336; ***Tewbee2@gmail.com;*** ***http://www.onetew.com;***

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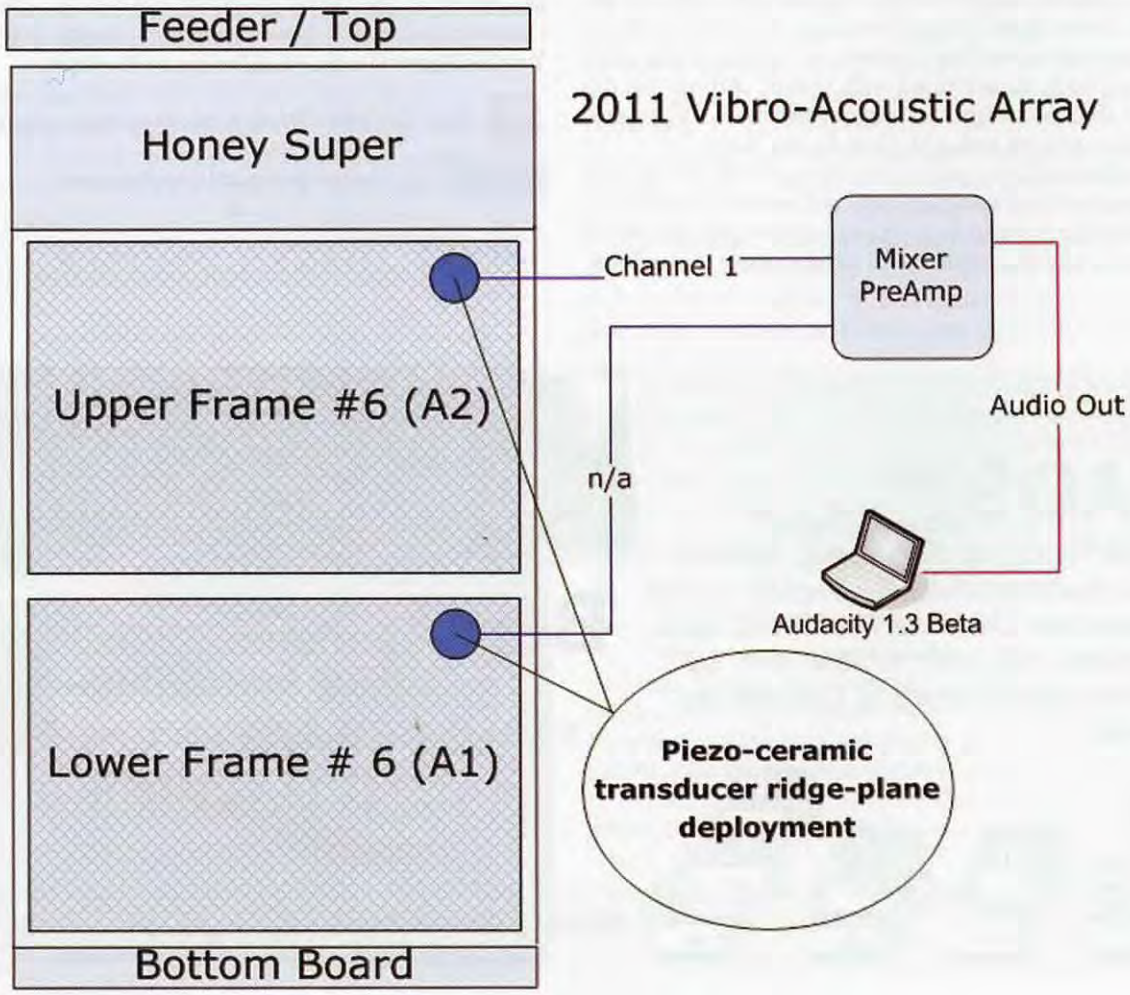
Honey Bee Music?

Are the bees playing music?

Stephen **Engel**

2011 was a very busy year on many accounts. I manage a small, experimental remotely-monitored apiary that I call StephensApiary.com. It is a beehive continuous lifecycle/behavior monitor combined with the vibro-acoustic array. I call it a platform or suite of *mechatronic* applications for a beehive. Basically a bunch of mechanical stuff mixed with electronics all connected to the internet. During early Spring of 2011, I moved the entire operation from Sacramento to a new facility near San Jose, California. The hives enjoyed a similar lifestyle as the previous year, with a plethora of forage options for their any desire within less than a quarter mile radius all year long. I had a similar array of piezo-ceramic transducers deployed in my two hives during 2011 as in 2010. Additionally, I continued to identify these initiator and responder signals within the combs of both hives throughout the year. During the 2011 hive year I identified some seasonal variance in the number of pulses of the initiator signal. In the Spring and during the Summer the signal had eight pulses and during the Winter the signal had nine pulses. Now that I know that the signal varies, I may find even more variance in the future.

In 2011 just after 3 p.m. on December 5th, well after all of the Summer bees were gone, I was able to record this file: ***Alpha_UpperF6_12_5_2011_1520pm.wav*** This file may be downloaded from my Google site from this link: **http://goo.gl/cKRI3** If you open this link in your browser, you will be directed to a Google site with a File menu link in the upper left corner which will give you the option to save or open this file in your media player. I think this file represents the initiator and responder signals much better since only winter bees exist in the hive. This recording was done with Audacity 1.3 Beta with my notebook computer. Only Channel 1 is recorded due to the cluster existing mostly in the upper box and no signal was coming from the lower frame; not one of my best recordings so I apologize ahead of time for the high-gain in the file.



K&K Pure Classic (four-head piezo-ceramic transducer with end-pin jack). I cut off the connector and installed each in a single frame.

Transducer within ridge plane of comb.

I still do not know exactly what is generating the initiator or responder signals conclusively, but I have a few guesses and thought maybe I could share my wild ideas a little and see what kind of responses or better ideas I can get.

One thing I have learned this year is the initiator signal is out of the acoustic range of a honey bee (200-350 Hz). The initiator signal was measured to have a fundamental frequency of 4 kHz with detectable harmonics at 8 kHz and 12 kHz.

The responder signal "sounds-like" a flutter of the wings or legs against the combs coincidentally after each initiator signal.

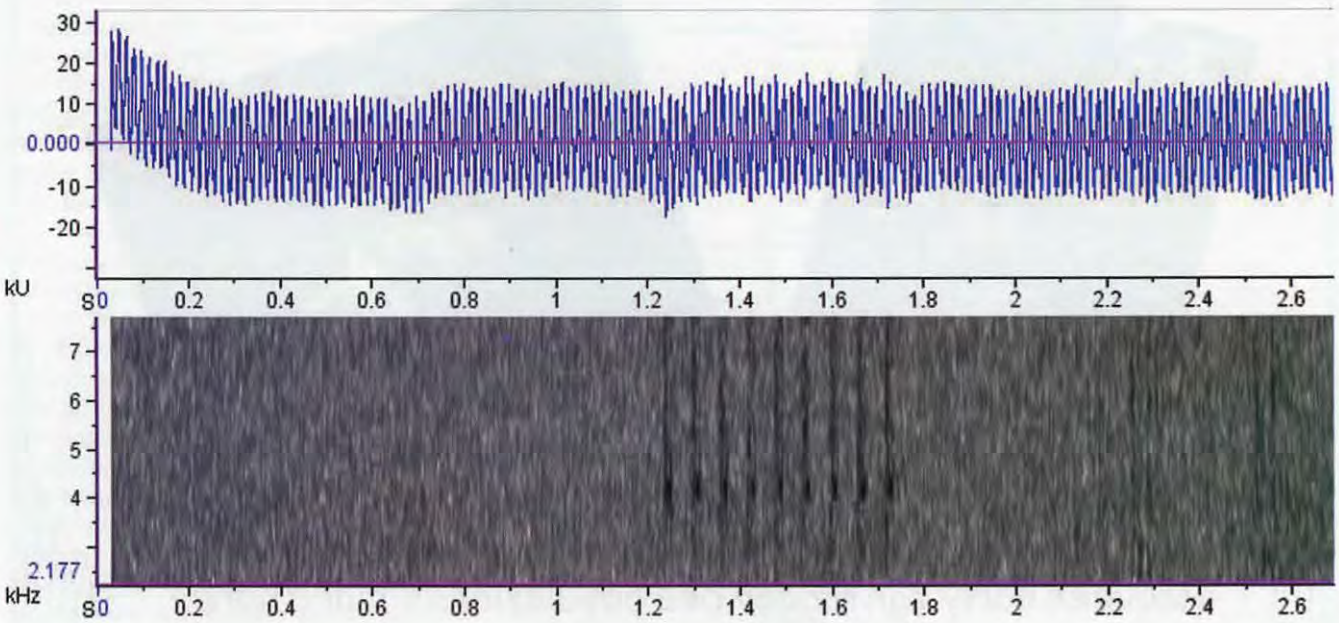
The initiator signal could come from some other critter in the hive, but I suspect that it is a bee. I have detected a similar signal in every hive I have tried my array in, both in Sacramento and in San Jose and with completely different sound equipment and frames. I have also detected the signal in a new package before the queen had been released.

If it is a bee, how could a bee generate a signal that it could not acoustically detect I thought? It seemed to me that a logical possibility might be that a bee generates the signal by rubbing the comb somehow. I am not sure how a bee rubs the comb, but I think it is performed near the ridgeline of the combs or within a cell at or near the ridge plane. Some behavior produces the rubbing that leads to signal generation. That signal gets to the transducer within the ridge plane. An analogy to this system might be similar to the incidental harmonics generated in a violin while it is played.

To consistently produce this signaling with seasonal variance during the year suggests to me that it is an intentional and integral signaling behavior of their lifecycle. Since the bees consistently "flutter", it seems to me to be a response to the initiator signal. Is it related to the initiator signal or just a coincidental response? A bee might be "playing" the honeycombs like a musical instrument. Honey bees could be musicians, wow!

...or some other life form or phenomena is playing for the bees, any ideas? BC

Send your thoughts to Stephen Engel, ***Stephen@StephensApiary.com***.



Waveform & Spectogram for initiator.

TOO MANY DRONES?

Drones have a use, but they're not perfect!

Jim **Thompson**

Many times I have looked at a hive and thought that this hive has too many drones. Then I remember the items that are available to confine, trap or eliminate drones, so it isn't an unusual observation that a hive may have a lot of drones. What are the reasons for there being a lot of drones? What is a normal amount of drones to have in a hive? Is having a lot of drones a good or bad practice?

As a beekeeper interested in honey production, a lot of drones in a hive seems a detriment because drones take up space, eat a lot of honey, and do not perform any duties within the hive. Drones exist to mate with a queen from a different colony, and to provide some positive morale for his nest mates. In the Fall of the year the workers realize that most of the drones are no longer required and force them out of the hive, but there still may be a token number of drones that overwinter.

Drones develop from an unfertilized egg. A queen may lay an egg that will develop into a drone by selecting a larger cell that doesn't compress her abdomen when she enters the cell butt-first. Then when comb is damaged by mice, other pests or the beekeeper, there will be an empty space, and the bees will fill the area with drone cells.

When a hive becomes hopelessly queenless, one or many worker bees will assume some of the duties of a queen. Because she isn't able to mate all of the eggs that the worker lays become drones, and she is called a laying worker. Moreover, a queen that runs out of semen lays eggs that develop into drones and is called a drone layer.

A queen will mate with 12 to 15 drones over a period of two or three days and stores enough semen to last her life time. Some beekeepers advocate changing a queen yearly to assure that she won't run out of semen, but I have found that the queen's best production is in her second year. I have also witnessed an observation hive having the same queen for *seven* years. Yes, she swarmed twice and was recaptured. I know it was the same queen because I marked her. Knowing that she probably could not last seven years on the stored semen from her maiden flight suggests to me that perhaps queens take additional mating flights during her lifetime but I've never seen that, and nobody has proven it. Queens mate with drones from other hives to aovid progeny with inbreeding problems.

When people believe that there are too many drones in a hive, they use entrance guards, queen and drone traps, they remove drone cells, or eliminate frames that have drone cells. Anytime you put a restrictive device on a hive you have to remember that not only does the device keep insects in the hive but also prevents other insects entering the hive. You also have to make sure that the hive does not contain other holes, cracks, or rotted areas that could be used for an alternative exit or entrance.

In 1876, J.S. Harbison patented a grated entrance. The entrance was on the front of the hive but located up from the bottom board. Another entrance guard was developed in 1907 that used zinc excluder material. The entrance guards of the 1950s used the Chrysler steel excluder material.

When a beekeeper uses a pollen trap on a hive the trap prevents the queen and drones from using that entrance. Most pollen traps provide a cone device where the drones may exit a hive and relieve the congestion. A queen could also use this exit, so occasional monitoring is necessary to assure that the hive is queen right.

Jan. 11, 1876 J.S. HARBISON
GRATED ENTRANCES TO BEEHIVES **172,019**

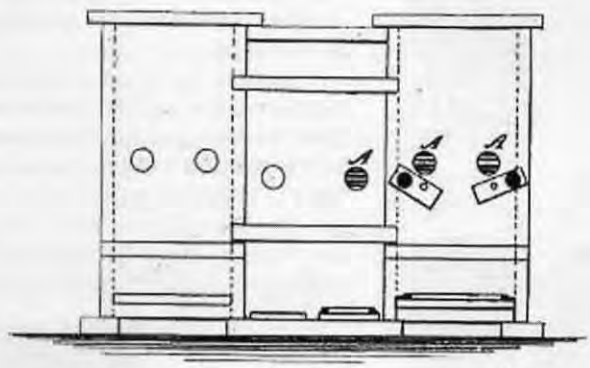


Fig. 1

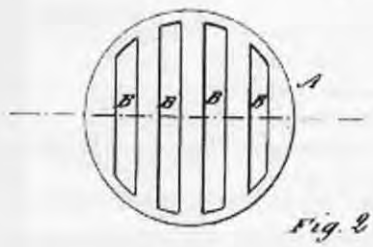
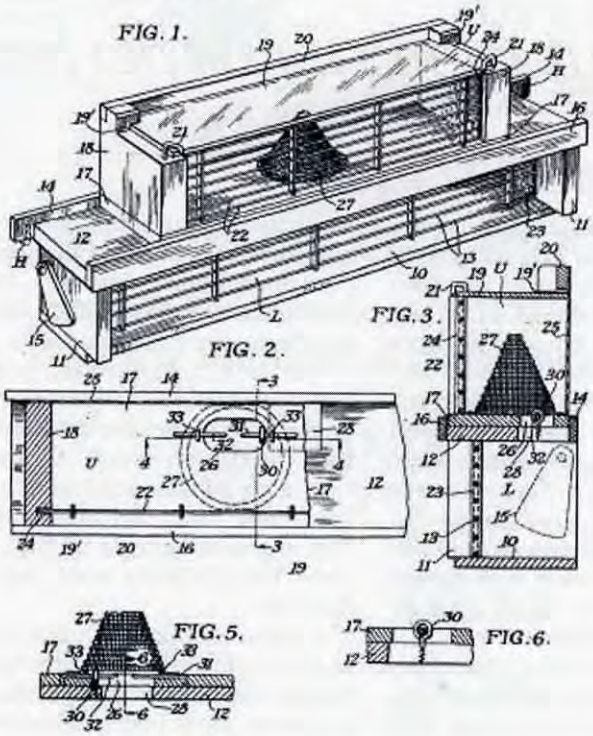


Fig. 2

July 7, 1953

C.H. PEASE
QUEEN AND DRONE TRAP
Filed Feb. 20, 1901

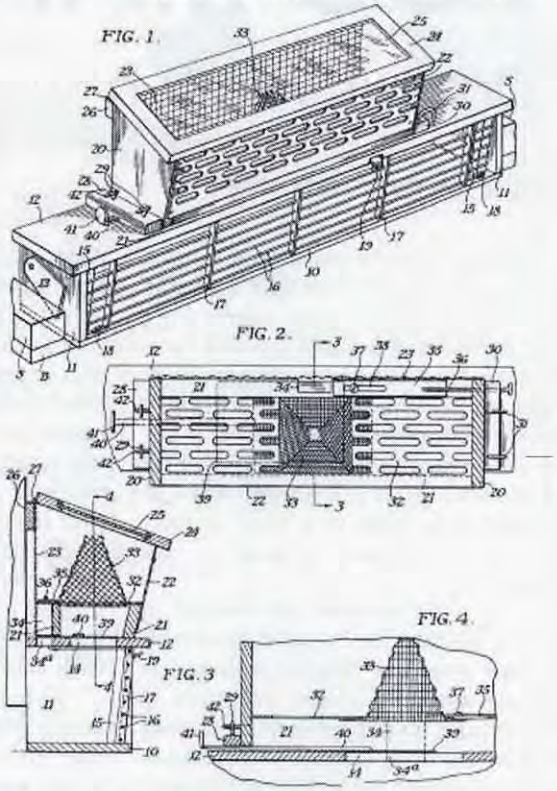
2,644,175



Dec. 11, 1951

C.H. PEASE
QUEEN AND DRONE TRAP
Filed Oct. 29, 1949

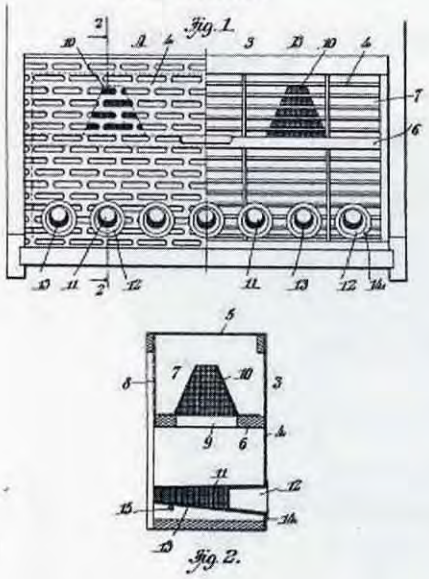
2,578,634



July 24, 1923

M.V. LOVETT
ENTRANCE FOR HIVES
Filed March 18, 1922

1,462,711



The queen and drone trap was developed in the 1920s. It has an entrance guard beneath an area that holds queens and drones that enter through upright cones. Once the bees are in the upper area the larger bees cannot reenter the hive nor fly. There is a metal slide on the later models to allow the beekeeper to open and let the bees return to the hive. However the main intent of this trap is to catch drones. The early models of this trap were available for eight and 10 frame hives and had wire cones and zinc excluder material. Traps made in the early 1950s, had a combination of zinc excluder material and Chrysler steel. The later models of this type of trap have the zinc movable slide, Chrysler steel excluder material and plastic cones.

An easy method in reducing the number of drones in a hive is to shift those frames that contain drone cells to the position next to the hive wall. Once the developing worker bees that are on these frames have emerged, the frames could be removed. The beekeeper using this method tries to keep frames with worker cells in the center area where the queen is laying eggs.

Varroa mites present another problem. Because it takes 28 or so days for a drone to develop, female mites prefer to lay their eggs in drone cells. This allows more mites to develop than in worker cells and is used as a form of mite control. When the bees have sealed the drone cells, the frames are removed and frozen. You are not worried about killing the developing drones as they have a small contribution to the hive. If drone cells were not provided, the mites would occupy regular worker cells.

Often the honey bee pupas that get used as food by the developing mites emerge as deformed adults with

Mite Zapper

K-wings or are lopsided.

Frames with dead mites and drones can be put back in a hive for the bees to clean and the cycle is begun again. This practice does not assure you that the drone population is going to be near zero. It also relies on the queen laying eggs in drone cells rather than in worker cells. Bees will always find room for drone cells and if it is not in the frames, it will be between the frames.

Another new approach to eliminate mites is to use the Mite-zapper frames which are electronic plastic frames. When the bees have filled the cells with drone brood, the beekeeper may hook up a 12 volt battery and kill the mites on the drone brood while the frames are in the hive. When the electricity is disconnected, the bees may clean up the frame and you are ready to repeat the process. I am concerned about the frame space that is reserved for drone brood and heating of the queen or worker bees accidently. Whether you use the freezing or heating techniques, you might consider a strain of honey bees that have hygienic behavior.

Some beekeepers use drone brood to raise drones to be used in a queen rearing operation. This means that you should have three distinct yards, a drone development yard, a queen mating yard, and a queen development yard.

If you look at the mathematics or efficiently of wax use, you suddenly realize that bees store more honey in a drone cell than in a worker cell. There is less beeswax used per frame so it is beneficial to use drone comb in honey supers. This practice might cause you to use queen excluders or full supers of honey to keep the queen out of the honey supers.

The number of drones or the use of drone foundation depends upon your activity. If you are striving for honey production few drones are needed within a hive. Some methods of mite control require quite a few drones. If you are raising queens, even more drones are needed than in a mite control operation. BC

Jim Thompson is a retired Bee Inspector and he is currently a Honey Judge living in Smithville, OH.

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Vendors, Part I

Take care of those folks and your meeting will be well received.

Ann **Harman**

Every bee association, large or small, has meetings, large or small. Beekeepers love things – large things like extractors and fancy uncappers, smaller things like smokers and hive tools, and small things like 2-oz bear containers and beetle traps. Each year catalogs from equipment suppliers appear with new items highlighted. Beekeepers really like to see and feel bee equipment, try on the latest style in veils, and ponder the many types of syrup feeders. Beekeeper meetings do provide an opportunity for vendors, large and small, to introduce their wares to eager consumers.

Vendors and their wares are important for newbees who are just getting introduced to the exciting and fascinating world of beekeeping. Newbees may be hesitant to purchase an item they see in a catalog. But at a meeting they can see the item and have an opportunity to talk to the vendor who is happy to answer questions.

The life of any vendor is not an easy one. Unfortunately vendors are frequently overlooked in meeting planning. The host association is spending time finding a venue and searching for speakers. Vendors come at the bottom of the list of things to do. Let's see how the club and its meeting planners can make vendors be an effective part of a bee meeting and happy to return.

Every association, no matter the size, that invites vendors to their meetings should have a Vendor Coordinator. This person is a club member not selected at the last-minute. A Vendor Coordinator should not have other meeting responsibilities. A Vendor Coordinator has a number of important tasks, before, during and after a meeting. The position can be considered a "permanent" one, similar to that of an association's secretary or treasurer. Those associations who have such a Vendor Coordinator will attest to the efficient planning and the resulting happiness of vendors.

Let us review the responsibilities of a Vendor Coordinator (can we say the VC?). First of all the VC should be a member of the site selection committee. Only a knowledgeable VC knows what is normally needed – how many vendors, space needed for those, electricity if needed, good lighting, and – most important – **access**. Access means two things – can the vendors easily get their wares into the venue and do the beekeepers have easy access to the vendor area. Good access for both is really important.

Security is always in vendors' minds. If vendors can set up the evening before the meeting begins, will the room or area be locked? If a two-day or more meeting, what is the security overnight? Does any cleaning crew have access to the vendor area during the night? Security is one of the questions the VC needs to ask of the venue management and then report the findings to the vendors.

The VC must be aware of the Fire Code of the chosen venue. What doors need to have free access? Are there any doors that can be blocked by a vendor's display? The venue management should be able to supply this information ahead of time so that the VC can plan the layout of the tables and spaces.

Vendors really do need to know the size of tables that will be provided. No standard seems to exist for tables. Lengths can be five, six or eight feet. Widths can range from the narrow two-foot to the usual three-foot size. If the vendor is aware of the size then there will be no need for the VC to scurry around in search of more tables to accommodate the display. If the vendor knows the size then the correct number of tables can be requested.

Some venues have tables that must be prehistoric. The wooden top is battered, splintered and has lumps of hardened goo stuck on. The VC can inform vendors that a table covering would be useful.

Once the venue has been chosen the VC can then begin correspondence with the vendors. The VC should have a file with information on vendors who have attended in the past and also on possible vendors, large and small, who might come.

The next step is for the VC to send a short letter of invitation to each vendor. The letter should have the VC's contact information, especially telephone and email. A vendor registration form should be included. The information requested is important. Here's a sample list. Keep in mind that some information is applicable only for multiple-day meetings and unnecessary for a one-day meeting. You may think of other items to be listed.

All vendor contact information including telephone, mailing address and email.

If vendors will have pre-printed name tags, names of all vendor attendants.

How many tables, chairs are needed?

If area is divided into separate booths, the size of booth, width and depth.

How much extra space for large

items is needed?

Do you need electricity?

Any other special requests?

If a fee for tables/space, clearly indicate, and how, and who, and when to pay.

If meals available at venue for attendees, how many on which days? Cost.

If special events, what, when and cost.

For large meetings, does vendor wish to sponsor a break? Cost of break.

For large meetings, does vendor wish to advertise in meeting program? Cost.

Include a deadline for submitting registration.

Some information given in advance will be very helpful for vendors.

Difficult access (such as stairs); need to use elevators; venue restrictions.

Vendor area has limited space.

Size of tables (length and width).

Give information on nearby motels, hotels and if meeting special rates available.

Give information on access and parking.

Give the day(s) and times when the vendor can set up and also take down the exhibit. *The vendor area should not be open to meeting attendees at those times.*

Vendors need time uninterrupted by customers to set up and take down their exhibits.

The VC should send a confirmation to the vendor. Any questions the vendor may have could be answered at that time.

Yes, there will be surprises. On the day of the meeting a vendor appears "out of the woodwork." It is someone who heard about the meeting and decided to bring "things." These things can range from some small items that would fit on one table to a large quantity of woodenware that needs a big display space. This is the time a VC needs diplomacy. How to welcome the vendor, make the vendor feel welcome and then scurry around to see where to put this vendor. (Smile, don't scream.) Yes, this has happened. But at least the VC now has contact information for the next meetings.

The VC is responsible for putting vendor opening and closing times in the meeting program, posting signs, or making an announcement to the meeting attendees.

On the day the meeting opens the VC must be in attendance before the time stated for vendor set up. The doors and access to the vendor area must be unlocked promptly. If the VC can have an opportunity to monitor table placement and space before that set up time, much time will be saved. The tables can then be labeled with the vendor's names so that when vendors arrive the set up will go smoothly and the vendors will be ready for customers when the vendor area is opened.

The VC will know what sort of directional signs are needed so that the vendors can find the loading docks or doors, and the meeting attendees can find the vendor area. Signs giving the opening time and closing time should be posted at the entrance(s) to the vendor area. As the vendors arrive and find their places the VC should ask them if any problems are apparent and, if so, try to correct if possible.

Having the breaks in the vendor area does bring many attendees in. Sometimes it is not feasible. Some Vendor Coordinators bring break drinks and snacks to the vendors before the actual break times. If a lunch, such as a box lunch, is available at the venue the vendors should be informed when it is available and allowed to get their meal *before* the morning program finishes. Vendors are chaotically busy during breaks and meal times. They appreciate having a bit of quiet time to eat before the crush. By the way, trashcans should be scattered around the vendor area. Otherwise vendors find half-filled coffee cups, empty soda cans and other trash left on their display.

Volunteer help is always in short supply. Sometimes vendors really need a helper with doors that won't stay open, tight corridors, awkward access, using elevators. Since the VC is familiar with the venue one or more volunteers should be asked, before the meeting day, if they could help during set up and closing times. Vendors will be very appreciative.

Vendors come in two basic sizes: one group I'll call the Big Guys – ones like Brushy Mountain, Dadant, Rossman, Mann Lake, Maxant, Kelley and others, and the Small Ones, who are usually local to the meeting – ones like the soap makers and T-shirt sellers. Some of the needs are common to all, no matter the size. Some needs are particular to one or other of the groups. In Part Two of this article some other general needs as well as the special needs of these two groups will be discussed. BC

Ann Harman is a vendor at meetings everywhere with C&H books.

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moval and road repair. They will be able to move their storage buildings with them, plus all the equipment so when it's done...and it is by the time you read this, the Beltsville Bee Lab will be in their new home – hopefully for another 80 plus years of service to the beekeeping industry.

•

A letter From Maine

Roughly 70,000 honey bee colonies are in Maine every May pollinating the wild, or low bush blueberry crop. They are just finishing as you read this. That's only about 3% of the colonies in the U.S., a long shot from the 65% that pollinate California's almonds, but probably bigger than any other monoculture, single location crop in the country. But those 70,000 colonies are pollinating only half of the 60,000 acres of wild blueberries that grow in Maine because of the way wild blueberries are managed...can you believe - half the acres are taken out of production each year to be pruned to let them rest and re-grow for the following year. Half!

Colonies that head toward Maine...most years in mid-late May for an end-of-May bloom, but earlier this year because of the warm and early spring ...haven't been sitting in holding yards for months just waiting for the crop to bloom, or been slowly building in the south as fast as they can so they are up to strength for that crop. No, blueberry bees have usually been pollinating all along the east coast...vine crops and fruit crops in Florida, apples further north and now into blueberries and as soon as that's over down to Massachusetts to do cranberries and then on to make honey somewhere else...probably back south or to the Midwest.

But this year was different. Florida crops were about normal for bloom time, but crops further north were early, so those Florida bees were supposed to be in two places at once, the on time Florida crops and the early crops further north...that's a stretch for even good beekeepers, so it's been hectic to say the least. Some of these bees come from further west and south, and for the most part they've been building on early flows rather than trucking

Continued on Page 80

Making Patties

Joe Romance explains the process.

It's been stated again and again that one of the issues with migratory beekeeping and almonds is that many beekeepers have to move bees away from home when home is where winter is to sit in a barren and food-empty holding yard somewhere near the almond orchard they will eventually pollinate.

To get a winter colony from the Midwest, or anywhere for that matter, up to fighting trim, or pollinating strength as it were, takes food. Lots of protein to raise lots of young. This gets the colony off its winter mode and into a growth mode. It gets the queen laying, produces lots of nurse bees to take care of lots more brood so the colony is at peak strength right about February first, when they move into the orchards.

In recent years the bee supply companies have realized there is a market for a quality protein substitute that beekeepers need. They have added micro ingredients, enzymes, additional food supplements and the like to make the food the bees are eating better and better.

However, some beekeepers will tell you that a healthy colony fed very simple ingredients will do just fine...if they actually eat the food. That's a key. Eating the food. The best stuff in the world won't do squat for a colony unless they eat it. A healthy colony eats, and that's the motto of Joe Romance, who produces thousands of pounds of protein substitute every season for beekeepers with healthy, hungry bees.

His ingredients are simple...Brewer's yeast, sugar, sugar syrup. That's it. He can, and does add other ingredients for some beekeepers...some of those things that get not-so-healthy bees to eat, like lemon grass and other products. But this is a very fundamental mix...protein and sugar. If they eat it, they grow and the colony thrives.

He hasn't been doing this very long...basically he runs several thousand colonies and grows acres and acres of almonds for those colonies...but it kind of grew out of a need he had for his bees...and then expanded even more.

The equipment has grown, too, and automation has made it faster and easier to produce these patties. Proper ratios are easy and not a secret, but getting the stuff well mixed, and not over mixed so it over heats is always an issue. Then extruding it out of the mixer so if is sandwiched between paper layers on a conveyer belt is next. Cut, and piled and the next batch prepared.

GLEANINGS

JUNE, 2012 • ALL THE NEWS THAT FITS

NATIONAL HONEY BOARD NEWS

New National Honey Board members Sworn In at March Board Meeting, New Officers Elected – Several new Board Members and alternates recently appointed by U.S. Secretary of Agriculture Thomas Vilsack attended the National Honey Board's meeting on March 20-21 in Atlanta, GA. Pictured here (left to right) are Hans Boedeker, Importer Handler member; Kimberly Coy, Marketing Specialist, USDA/AMS; Nancy Gamber-Olcott, First Handler member; Charles Kocot, Importer alternate; Mark Jensen, Producer member; Eric Wenger, First Handler alternate. Following a brief orientation of the duties and responsibilities for Board members, the new appointees were welcomed and sworn in by Kimberly Coy.

During the meeting the Board reviewed and accepted the 2011 audited financial statements and report, reviewed marketing and research plans for 2012, and approved amendments to the 2012 budget. The Board elected new officers, including Brent Barkman, Chairperson; Mark Mammen, Vice-Chairperson; and Nancy Gamber-Olcott, Secretary/Treasurer. The next meeting of the National Honey Board is scheduled for October 16-17 in Denver, CO.

National Honey Board Funds New Honey Bee Research Projects Focusing on Honey Bee Health – The National Honey Board will fund in 2012 five new research projects focusing on honey bee health. The Board's Research Committee, with input from a panel of experts, selected the projects from 17 proposals it received by the December 15, 2011, deadline. The total dollar commitment for the five projects is $146,406. A sixth project is still under consideration pending additional information. "Any budgeted funds for bee research that are not committed to projects this year will be carried forward and added to next year's allocation for bee research," said CEO Bruce Boynton.

New projects approved so far for funding in 2012 include:

1."Benefits of Propolis to Honey Bee Health," Marla Spivak, Univ. of MN.

2."How does Nosema infection affect larval development and queen production?," Daren Eiri and James Nieh, University of CA San Diego; Guntima Suwannapong, Burapha University, Thailand.

3."The impacts of pesticide exposure during larval development on adult worker honey bee (*Apis mellifera*) foraging performance and general fitness," Jamie Ellis, University of FL.

4."Quantifying the risk of neonicotinoid seed treatments to honey bee health," Greg Hunt and Christian Krupke, Purdue University.

5."Understanding colony level prevalence and intensity of *Nosema ceranae* and investigating effects of colony nutrition on persistence of Nosema ceranae in honey bee colonies," Ramesh Sagili, OR State University.

WHITE HOUSE BEEKEEPER RETIRES, BUT STILL OVERSEES WH HIVE

The keeper of the first-ever White House beehive officially retired from the government in May, but his 70,000 bees won't be buzzing June Carter Cash's "Will you miss me when I'm gone?"

That's because Charlie Brandts, who was a White House carpenter when the first family's chef Sam Kass tapped him to establish a hive near Michelle Obama's veggie garden in March 2009, plans to devote his retirement to beekeeping and will continue to oversee the multi-colored hive on the South Lawn.

While honey bees don't need daily attention, the White House reveals that they have established a backup team to help Brandts or take care of any emergency: pastry chefs Susie Morrison and Bill Yosses. "The hive doesn't really need day-to-day care, so Charlie will still be doing the primary work on it with Susie and Bill helping," says a White House aide.

Kim Flottum, editor of the industry publication *Bee Culture*, said the new beekeeping arrangement should work just fine. "They work close together," he tells Secrets. Brandts agrees. "We're like in a partnership," he says. Brandts, 55, worked at the White House for 28 years, starting during the Reagan years, and is a 35-year federal employee.

Spring and Summer are the most intensive time to tend bees during which the hives expand after Winter and begin making babies and honey.

Over the three years, Brandts says the White House hive has been an all-star honey producer, giving up 340 pounds, easily twice what a typical hobby hive makes. The reason, he explains, is the country-like setting around the White House which is populated with trees, annuals and ponds. "It's like a Shangri La for bees."

When the Obamas arrived at the White House and began talk about establishing a garden, Brandts was approached by Kass and the idea took off fast. Brandts, who tends bees in neighboring MD, brought an established hive to the South Lawn where it has thrived ever since.

The honey has been used as gifts, to make beer and in daily meals for the first family as well as fancier formal dinners.

Surprisingly, there hasn't ever been a major problem with having so many bees in such a public place. Just consider events like the Easter Egg Roll, when thousands of people swarm the South Lawn. On days like that, the hive is closed up and the bees kept cool with screens on the top and entrance, and occasional squirts of water, a typical beekeeping practice.

Paul Bedard, WA Examiner Secrets

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Continued From Page 71

back from California.

The crop potential seems good this year and over the past several years the rest of wild blueberry management has given those plants every advantage to produce a good crop. Wild blueberries are just that you know...wild. They grow almost everywhere in the south eastern part of the state along the south coastal areas, carefully hidden in the forests and sort of everywhere in the barrens. Remove the trees and the weeds and the shade, get rid of the boulders, level the land, control the diseases, add the right fertilizer and especially add irrigation, then plug in mechanical (instead of hand) harvesting, and you can get an average of a ton of blueberries per acre, and as much as 12 – 14,000 pounds per acre when things go well. Is this sounding a bit like almonds?

Of course Maine's weather needs to go well. A late freeze...like one in May that kills the blooms even while the bees are there, or a midsummer drought that turns the berries into raisins and all the preparation and planning goes out the window. Freezes, and even drought can be significantly reduced if there's enough water...irrigation for the drought, and sprinklers for the freezes. But it comes down to water and equipment. Sound familiar?

Oh, and bees. You need lots of bees to pollinate wild blueberries for a maximum crop. Not unlike pollinating alfalfa for seed are these berries. Like almonds, growers want every blossom to produce a berry. Every one. So they put out lots of bees...the growers that skimp, or don't have the perfect acidic soil, enough water or fertilizer or soil that doesn't drain quite right, use only a couple of colonies per acre. Those that have everything under control may use six or more colonies per acre. But the total is about 70,000 colonies sitting in Maine in May. It was about 62,000 in 2009, 65,000 in 2010 and not quite 70,000 last year. That brings yield up to 83,100,000 pounds of blueberries last year, selling for $0.859/pound, totaling $71,355,000....a healthy contribution to Maine's agricultural income.

Unlike almonds, the blueberry bloom moves east, beginning earliest in southwest Maine coastal areas and moving east with the spring...and colonies can follow so some bees get used in more than one area. Too, bear are a problem and sets need to be fenced to protect them...and growers gladly, kind of, provide that protection...if bees are on trailers and the trailers are fenced so much the better, and it seems the prices paid to beekeepers reflect that service.

A downside of saturating a crop with bees to insure maximum fruit set is that the crop just doesn't produce enough food for all those bees. And since pine forests are the only other plant life in the neighborhood colonies can, and do go downhill during bloom. When coming off this crop beekeepers have to work to rebuild their populations to take advantage of future honey flows or pollination contracts. There is a price to pay for this job. This is the result of pollinating a monoculture with a monocultural pollinator. It is industrial agriculture in the extreme.

The different clones show up as different colors as the plants mature in the Summer and Fall.

You need bees in wild blueberries because these plants are not self-fertile, and flowers from one clone (same species but different cultivar...think Delicious and Macintosh apples) need to have pollen transferred from one clone to another to set fruit, and, since blueberry plants aren't actually planted these clones tend to be sort of randomly spread out throughout a field. Moreover, each clone is different in yield, bloom date, attractiveness to honey bees and susceptibility to pests and diseases (just like those apples). Because of these differences some fields are occasionally neglected because the bulk of the plants are not productive, though they do produce a source of needed pollen.

Colony rental prices are all over the map...but the average is somewhere between $75 - $120, but different growers have extremely different views on what a colony is worth. And some colonies are moved so that is part of the final equation. Even so, the value of wild blueberry pollination ranges from $5.3 million to $8.4 million...between 6% and 10% of net on these berries...a bit lower than almonds.

Like almonds, there are many blueberry growers...small holders who have only a few acres and huge land owners with thousands of acres, but there are only six companies in Maine that process, freeze and can wild blueberries, as well as one fresh-pack cooperative. An estimated 99 percent of all the berries harvested in Maine are frozen for use as a food ingredient. And although there is a blueberry commission, they don't have a marketing order so there is still some independence between these companies.

The pollination story in Canada is a bit different however, because getting bees is troublesome. Some provinces still quarantine bees from other provinces, and they all restrict bees from the U.S. from entering the country. The possibility of producing more berries is an absolute...but for the problem of getting enough bees. American bees.

Still, Canada produces more wild blueberries than the U. S., with most of their production in the eastern, and primarily maritime provinces. Last year they produced 132.3 million pounds, with 15 million pounds of those from unmanaged forest sources. Quebec produced 70 million pounds last year, Nova Scotia made 28.5 million pounds, New Brunswick 27.5 million, P.E.I. made 10.4 million pounds, while Newfoundland made a million pounds of the blue fruit.

Maine's Wild blueberries...another success story for American Beekeepers, and *not one* of China's nine million colonies helps one bit.