

JUN 2009  
**Bee**

# Culture

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Bryan Abernathy, from Charlotte, North Carolina, captured these young bees in their ritual play flight – a rite of passage for foragers – with his Nikon DSLR. Orientation flights like this help new flyers learn where they are in relation to nearby landmarks. These aerobatics, usually occurring in early afternoon, can be quite spectacular.

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# Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

JUNE 2009 VOLUME 137 NUMBER 6

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# Eastern Apicultural Society

## EAS 2009

Holiday Valley, Ellicottville, NY  
August 3-7, 2009

### Toward Non-Chemical Beekeeping

Our Whole Conference is aimed at helping you reduce or eliminate using chemicals – any chemicals – in your hives. Russian Bees, Natural Beekeeping, Breeding Resistant Bees, Pest Detection and IPM, Current USDA Research, Basic and Advanced Breeding techniques, Swarm Control, Honey House Management and Lots MORE.

Plus, visit a commercial beekeeping operation for a good look at migratory pollination, commercial-scale nuc making, overwintering indoors, and honey extraction and marketing.

2 Level Intensive Short Course, Master Beekeeper Exam and Program, Pig Roast and BBQ, A Microscopy Workshop, Hundreds and Hundreds of beekeepers, a beautiful setting, and slate of speakers like no other EAS 2009. See all our information at [www.easternapiculture.org](http://www.easternapiculture.org), Registration online in May

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Tom Seeley

and  
Commercial Beekeeping  
Pig Roast & BBQ  
Indoor Wintering  
Marketing  
Honey House Management  
Banquet  
Microscopy Workshop  
more, more, more



Bob Brachmann



Tom Rinderer



Ontario Beekeepers Association  
Tech Transfer Team



## CCD Update

There has been a fresh outbreak of Colony Collapse Disorder reported by several commercial beekeepers throughout the U.S. When questioned, one of the leading commercial beekeepers said "In my entire beekeeping career I have never seen anything quite like this. The bottom brood box just collapsed, killing most of the bees. Yesterday everything was fine and now this morning the bottom brood chamber has collapsed down to about four inches high." The beekeeper didn't want his name released for fear that if his clientele got wind of this, they would no longer want his collapsing colonies on their property "Well I certainly don't want beehives falling over on my strawberries" said one large truck farmer in New Jersey

While some experts were pointing to rotten woodenware, beekeepers say, "No way! I assembled this box last year from good pine stock." Other researchers have been looking for a correlation between Colony Collapse and woodenware vendors. This has sparked a lawsuit from Dadant who claims "These people are deliberately maligning our reputation." Mann Lake could not be reached for comment, but there have been rumors that Mann Lake may be initiating a recall on some pre-painted deep supers.

Top officials at USDA insist that this is nothing new and there have been episodes like this in the past, pointing to a 1926 report where an epidemic of honey bee losses were reported. Jeff Pettis (USDA entomologist) said that "Yes this is very similar to the 1926 epidemic, however back then we called it "Fall Dwindle Disease" or 'FDD' "

Bert Namen, a 97 year old beekeeper from Minot, Maine doesn't buy the "we have seen this before" story Namen says "Ah ya we had Fall Dwindle Disease back in the 20s alright, but it wasn't anything like what we see now Back then colonies dwindled very slowly You would start with a box that was 21" x 16" on Monday and by Friday it would dwindle down to 19" x 14" Thing is it dwindled equally in all directions, including the frames. Ruined the bee-space inside the hive and the whole thing would get glued together with propolis so tight you couldn't open it with a

potato shovel."

Meanwhile backyard beekeepers are ignoring CCD and are clamoring to get their hands on a Varroa Destructor They claim mites are killing their hives and desperately need something to destroy the mites.

Dave Meldrum  
Andover, MA

## Booze & Bees

After reading April's issue, I can testify as a retired Police Officer that under the influence of alcohol, behavior of humans and bees can be very similar

I have seen many a human under the influence, regurgitate their nectar in their "hive", and have seen more than a few who thought they could fly Many also begin to do a dance, wiggling their tail hopping to signal other companions to follow.

Charles H. Knaack  
Circleville, OH

## Lost Art

Hey! I'm from eastern Kentucky where my grandmother had four hives, and I can remember sitting on the front porch of her house, as she went out with her smoker to take care of her hives. Beekeeping has become a lost art around these parts, and I'm interested in starting a hive. I came across your article on thedailygreen, and would love to have a copy of the magazine. Below is my address, and I really appreciate your article on beginning beekeeping, and the magazine!

Heather Burgett  
Bonnyman, KY

## Mission Accomplished!

Another victory for the beekeepers and for the honey bees. On April 21<sup>st</sup>, 2009, after nearly a year of effort, Prince William County (Virginia) supervisors voted 4-2 to overturn the old zoning language (no bee hives allowed on less than two acres of property) in favor of new zoning which permits up to four hives on any size lot, and for every 2,500 sq ft above 10,000 Sq ft, one extra hive may be kept. There are also some guidelines about flight

## Bee Culture Information



path barriers and water sources. This zoning matches identically to that of our neighboring Fairfax County (who has no negative reports related to beehives on their records) which we believe greatly assisted our cause.

There were some along the way who expressed reservations about our efforts, encouraged us to "let sleeping dogs lie" and even questioned if we would make things potentially worse for them by even raising the issue. Enough of our Prince William Regional Beekeepers Association (PWRBA) members believed passionately that what we were doing was right and that with all of the media attention around honey bees, the timing was right as well. We want to share with the readers of Bee Culture that engaging in this type of effort is not for the faint of heart. It took the work of many of our members, personal meetings with County supervisors, writing letters of support over and over again, asking friends and neighbors to write letters, and seeking letters of support from the State Department of Agriculture. In the end, and truly at the 11<sup>th</sup> hour, we were victorious! It is yet another example that change for the better doesn't just happen because people hope - it happens because people DO, and they BEE-lieve, and then they mobilize. Perhaps at some point in the future someone can share our story, along with stories of other communities who have worked hard to pass more bee friendly zoning and put together an article in *Bee Culture*.

Keith Fletcher  
Gainesville, VA

# BEE MAN

written & performed by Marc Hoffman

Marc Hoffman's "Bee Man" is a long overdue dramatization of the life of Lorenzo Langstroth, the man who designed the moveable frame hive. The Langstroth hive made possible a commercial beekeeping industry, but Langstroth never realized the commercial success of his hive design. In fact, he was beset with the complexities shaping 19th century politics, culture and the theological underpinnings that supported him through the tumultuous Civil War, the patent proceedings for his moveable frame hive and the internal struggles with headaches, depression, and faith.

Hoffman wrote a three-act play set in three different locations to represent three different stages of Langstroth's life and dramatizes these difficult struggles. With a sparse set consisting of a few pictures, a hive, a chair and side table, he opens the play with a direct invitation to the audience to enter his world. Hoffman lays an important foundation that Langstroth enjoyed with his family history against abolition, his love for his wife Ana, and his family's support to write the manuscript that would become *The Hive and the Honeybee*. The first act ends with the "Eureka" moment of discovery of "bee space" and optimism that his patent on such a hive design would bring financial comfort.

While the first act is fairly straightforward and optimistic, the second is darker and more pessimistic because Hoffman attempts to convey the internal demons that plagued Langstroth his entire life. Linked in an internal "stream of consciousness" dialogue, Hoffman pulls together the despair of the patent proceedings, the memories of a cruel teacher and the realization that his chance for financial success was slipping from his grasp.

It is an effective and necessary transition from the genial, kindly gentleman that we meet in the first act. While it is tempting to diagnose Langstroth's mental problems from a 21st century perspective, Hoffman simply portrays Langstroth as a man incapacitated. By all accounts, his extended family provided support for years, providing him with a house, money, and never suggesting that he waiver from his training as a preacher or a beekeeper. Hoffman wisely keeps the second act short,

in part, because anyone would have real difficulty sustaining the weight of such overwhelming forces. But I also think the second act has more power because of its brevity and gives the play and our portrait of Langstroth much-needed emotional intensity.

With the difficulties of the second act behind him, Hoffman shines as Langstroth in the third act. The genial smile beams with confidence. The invitations to the audience return. With the legal troubles behind him and beekeepers such as Charles Dadant defending his name (and publishing his book), Langstroth's faith is secure. The nation has put the question of abolition and slavery firmly and decisively to rest.

But there are little things in the play that may create confusion for an average audience. The complex legal proceedings regarding the Langstroth hive patent and ensuing lawsuits were so convoluted and arcane even during Langstroth's time that the issue is difficult to dramatize now for a general audience, even one filled with beekeepers.

Hoffman also drops names such as the European beekeeper Jans Dzierzon, who also invented new types of hives during the 19th century. In fact, there are still European beekeepers who insist Dzierzon was the inventor of the moveable frame hive, but Dzierzon did not have a moveable frame based on bee space. Dzierzon did, however, give the world an understanding of parthogenesis, the process by which the queen determines the caste of eggs she lays. While Hoffman's knowledge of his subject is thorough, the casual sprinkling of these names may tend to confuse audiences if not provided with more context.

There is so much to applaud in "Bee Man," but the central message is the most important to highlight: the steadfast faith that divine patterns lead beekeepers through the difficulties in front of them. This is not a play about bees, but about keeping one's sanity in difficult times. Hoffman liberally quotes from Langstroth's documents throughout the play. While some may question whether they can learn anything from a 19th century bee man, I think Hoffman's play has never been so timely.

submitted by Tammy Horn

## Hive Scale

Alan Hayes' Easy Hive Scale in the April issue is well-designed and fine-looking. If only I had his skill and patience. My version is made with the same economical spring type bathroom scale (\$9.99) and took only a few minutes to make. I obtained a plastic mirror replacement kit from my auto parts store (\$5.99), folded the mirror 45 degrees, and attached it to the scale with the included sticky tape. I put two scrap plywood pieces, painted, over the cement block hive stand, and one under the screened bottom board to protect the scale from debris. That's it.

Frank Linton  
Fairfax, VA



## Inner Cover Kudos

You are doing a great job on the Inner Cover. Keep it up! The almond pollination scenario was especially noteworthy. Since retirement I am challenged to keep up with bee news owing to many distractions traveling, serving on our HOA Board, musical performances, bee wrangling, etc. Retirement is a second career. It's retiring from retirement that is bothersome...but I'm planning for 15 good years.

Norm Gary  
Citrus Height, CA  
Formerly UC Davis



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submitted by Tammy Horn



# INNER COVER

**T**hat our honey bee nests have been fouled is without question. They have been desecrated by poisons from without, and by poisons from within. Those from the outside, those brought to us by crop protectors we have to suffer with until they are forced to stop their murderous deeds. For now, that is a story for another day, and it is a fight that still must be fought.

However we, too, have fouled our honey bee nests. That, too, is without question. The numbers are unforgiving regarding the chemical crimes we have committed against our bees for decades. We are guilty. The sentence is death by poisoning. As has been heard so often of late, it is time for change.

But still there are arguments to the contrary. It is too expensive, too time consuming, too labor intensive, too much work to make it profitable. Honey production is a game of numbers and the game's rules say that those who spend the least, win. By default then, those who spend any more than necessary, lose.

So we cut corners, take short cuts, find the easy way out and all the while science screams there's too much even legal poison in our hives, killing our bees, trashing our wax, poisoning our pollen. And with a twisted bit of logic, at the same time we fear that if so much as a drop of honey is found with a billionth portion of our daily poison this whole, entire industry – like peanuts and spinach and lettuce – will be flushed away. So we say nothing. Shhhhhh. It's the only way we can stay competitive. It's the only way we can kill the mites. It's the only way we can compete against cheap honey. It's the only way we can afford to stay in business. Besides, it's what everybody else does. The silence of the lambs.

For too long we have forgiven the sins of the thousand or two with many colonies because they are the life blood of our industry. They need the breaks, they need the edge, they need the easiest way to stay alive so beekeepers can pollinate, so beekeepers can make honey, so beekeeping can exist. We've overlooked their sins because they are our sins too. We are all guilty of sins of commission or sins of omission. We all know and we all look the other way.

It is time to change.

So this short primer is for those who have tried the wrong ways and found them wanting, and for those who want the right way to be the only way.

The most effective method to combat *Varroa* mites is to use honey bees that are resistant to *Varroa* mites. They exist. You can buy them. You can make them. You have to want them. They are the Russians. They are the survivors. They are hygienic. They are better than the rest. If these bees aren't in your colonies, on your list to buy, on the way to your colonies today then you are on the list of those who are on the way out. That we continue to pour poison into our boxes when we could be pulling pure and perfect honey out of them instead is amazing. It boggles the mind that this industry hasn't adopted these bees yet. What's wrong with this picture?

Yes, it costs to buy or produce these bees. But that's not a new thought, is it. What's it cost to treat? To keep treating, and still lose 30% or more every Winter? No matter how big the operation, the long term cost of treating is more than the cost of using resistant bees.

Integrated pest management uses resistant hosts, physical restriction, isolation, removal, some other kinds of tricks, and maybe eventually some kind of chemical warfare.

Easily, the first line of defense is using resistant bees. But as good as they are, those that we have, they aren't perfect – at least yet. So what else?

Another easy trick...get rid of the trash that's already there. This isn't new. Beeswax soaks up the bad stuff like a sponge and holds on tight. After awhile

they are full...and mostly black. Rotate them out, exchange with new, clean comb now. Black combs equal slow black death.

Whether you use resistant bees or not, in fact no matter what kind of bees you use you always have to know how many mites you have. You've heard this a million times. This hasn't changed. You have to know. The benchmark for action is 50 mites per day on a sticky board for a colony with about 40,000 bees in August. My recommendation is a dozen mites in early Spring, 50 mites at peak population, and half a dozen mites just before you shut them down, or the calendar says it's Winter. I don't have hard data for Spring and Fall – neither do the scientists, nor will they go out on a limb and say how many I will though. It's an educated guess distilled from talking to scientists who won't say officially, and lots of beekeepers who do the counting and are making it work. If you have more on the board do something. Fewer, keep watching.

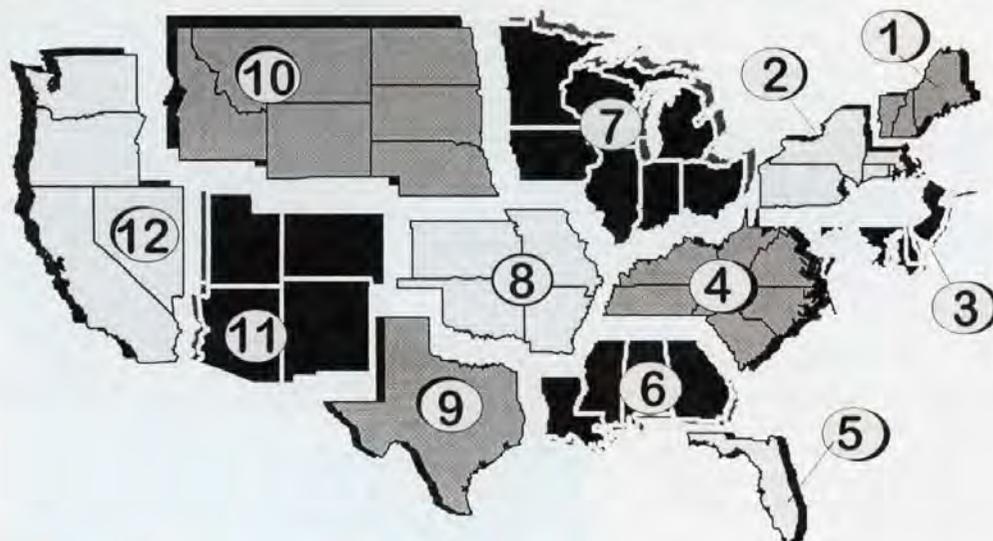
Or ether roll – for this the numbers are 300 bees in a jar for a sample and a half dozen dead mites in the jar in the Spring, a dozen dead mites sticking to the side of the jar in the Summer, and fewer than a half dozen dead mites in the Fall. These are somewhat conservative dead mite counts and they are still estimates (after more than 20 years, that's all we have). Bottom line, count mites. Do something when needed.

When you have 80 colonies in a yard how many colonies do you count? My recommendation – four 5%. On four different pallets N, S, E, W. Pick four colonies, mark them, and those are the colonies you check every time, all season long. It'll give you a picture of mite population.

*Continued on Page 62*

## Some Thoughts On IPM and *Varroa* Mites

# JUNE - REGIONAL HONEY PRICE REPORT



## Predicting The Future

We asked our reporters to peer into the future this month, and tell us what they thought that the demand for their honey would be this year and what they planned to do to contend with that demand. For those that do some pollination we wanted to know if they planned on raising their colony rental fees this year, and what would be the demand for their colonies this year from the growers they routinely dealt with. The answers are illuminating.

57% of our reporters are pretty

certain that demand for their honey is going to increase, or has already increased this season. Of those, 58% are going to increase prices (look at the prices this month compared to last month, and the same month last year to see what this might mean). 42% of these reporters won't change their prices this year, in spite of that demand increase. None, however are lowering their prices. That was good to hear.

Given an increased demand, 58% of these reporters are going to in-

crease their production this year to meet that demand, but 38% are going to keep it just about the same.

38% or our reporters see demand staying the same, or it has remained the same so far this season. Of those reporters only 26% are going to increase prices this year, while just over 70% are keeping things just the way they are. None, however, are going to lower prices. To satisfy this moderate demand, only 17% are going to increase production, while 77% are going to keep it about where it was last season.

Only 42% of our reporters also pollinate for money. Of these this

season, 32% are going to raise rental prices this season, 63% are going to keep things the same, but 5% are actually going to lower fees...mostly to meet the competition.

Our pollinating reporters see only 5% of their growers increasing the number of colonies they will be renting this season, while fully 82% will remain the same. Interestingly, 11% are going to reduce the number of colonies they rent.

REPORTING REGIONS													SUMMARY		History	
	1	2	3	4	5	6	7	8	9	10	11	12	Range	Avg.	Last Month	Last Year
<b>EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS</b>																
55 Gal. Drum, Light	1.52	1.62	1.52	1.58	1.47	1.65	1.47	1.50	1.40	1.48	1.37	1.48	1.37-1.65	1.50	1.53	1.34
55 Gal. Drum, Ambr	1.35	1.35	1.35	1.35	1.33	1.33	1.46	1.45	1.30	1.35	1.28	1.50	1.28-1.50	1.37	1.38	1.13
60# Light (retail)	120.00	138.00	130.00	121.40	120.00	122.50	116.40	112.00	150.00	130.53	140.00	150.00	112.00-150.00	129.24	125.70	121.26
60# Amber (retail)	120.00	126.67	130.00	119.24	120.00	123.33	109.00	110.00	100.00	124.01	130.50	149.00	100.00-149.00	121.81	119.78	114.84
<b>WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS</b>																
1/2# 24/case	52.08	65.32	43.20	43.82	62.76	54.00	42.04	62.76	62.76	42.00	42.60	93.50	42.00-93.50	55.57	58.17	56.23
1# 24/case	65.52	91.42	72.00	66.95	109.80	77.87	64.06	74.43	60.00	94.44	75.94	96.00	60.00-109.80	79.04	75.32	71.64
2# 12/case	69.72	73.12	64.80	59.00	69.00	65.70	63.72	81.00	52.00	69.24	55.60	79.20	52.00-81.00	66.84	67.23	63.68
12.oz. Plas. 24/cs	64.32	76.78	52.20	66.17	60.00	64.00	55.94	50.00	54.00	53.04	58.40	68.90	50.00-76.78	60.31	60.65	57.35
5# 6/case	76.41	83.99	75.00	67.56	79.33	90.00	70.72	78.00	66.00	64.41	72.00	90.00	64.41-90.00	76.12	76.72	71.24
Quarts 12/case	118.38	151.44	112.20	99.83	98.00	85.03	82.47	90.00	102.12	104.52	83.37	108.67	82.47-151.44	103.00	95.22	95.25
Pints 12/case	66.23	76.48	66.00	65.40	68.00	49.60	45.81	58.75	66.00	56.25	47.47	66.33	45.81-76.48	61.03	56.63	55.11
<b>RETAIL SHELF PRICES</b>																
1/2#	2.88	3.55	2.75	2.97	2.29	2.75	2.73	2.65	1.99	2.91	2.95	5.25	1.99-5.25	2.97	3.25	2.57
12 oz. Plastic	3.75	4.13	3.08	3.59	4.66	3.75	3.11	3.80	3.95	3.43	3.85	4.41	3.08-4.66	3.79	3.73	3.51
1# Glass/Plastic	4.38	4.91	4.73	4.61	5.35	4.67	3.84	4.40	4.19	4.48	4.86	6.19	3.84-6.19	4.72	4.63	4.42
2# Glass/Plastic	8.25	9.50	8.80	6.95	7.59	7.20	7.23	8.35	6.49	7.19	7.68	10.19	6.49-10.19	7.95	7.63	7.37
Pint	7.53	7.31	6.75	6.47	6.14	5.75	6.34	6.08	6.50	6.68	6.78	10.50	5.75-10.50	6.90	7.01	6.37
Quart	12.16	12.65	9.85	10.44	10.20	9.28	8.91	9.74	9.50	12.96	9.99	13.33	8.91-13.33	10.75	11.39	10.92
5# Glass/Plastic	17.00	15.89	18.30	15.50	30.00	17.00	18.98	19.10	18.00	14.05	16.55	22.00	14.05-30.00	18.53	16.44	16.54
1# Cream	5.25	5.82	3.89	5.69	5.56	4.00	4.63	5.79	3.29	5.82	5.60	6.10	3.29-6.10	5.12	5.45	5.14
1# Cut Comb	5.50	5.77	7.75	5.19	6.79	4.33	7.07	5.66	6.79	8.00	10.00	8.50	4.33-10.00	6.78	6.85	5.93
Ross Round	6.81	4.34	6.50	4.63	6.81	4.00	6.66	6.50	6.81	6.81	6.80	8.50	4.00-8.50	6.26	6.88	6.09
Wholesale Wax (Lt)	3.67	3.63	3.26	2.89	2.20	4.25	3.17	3.83	4.50	4.26	2.98	3.67	2.20-4.50	3.52	3.65	2.91
Wholesale Wax (Dk)	2.00	2.86	2.25	2.79	2.00	4.00	2.75	3.00	3.76	3.68	2.55	3.00	2.00-4.00	2.89	3.00	2.41
Pollination Fee/Col.	80.00	90.00	64.00	45.83	115.00	53.00	51.25	60.00	90.91	90.91	62.50	118.00	45.83-118.00	76.78	77.00	80.67

# STONELEIGH

The Biggest Meeting For  
Beekeepers In The U.K.

Peter Smith



*Our occasional UK correspondent Peter Smith went to the annual convention at Stoneleigh at the end of April. It's the largest beekeeper's meeting in the U.K. each year, with a huge vendor area, workshops and lectures. For many, it's the one time they get to visit a beekeeping business and purchase directly, avoiding freight costs. Read carefully...you'll quickly develop an appreciation for what we have. Here's his letter telling us about it...*

Went to the BBKA Annual Convention at Stoneleigh near Coventry yesterday. The show, three days this year, is held at the Royal Agricultural Society Show Ground each year. The show ground is quite big – over half a square mile – with buildings used for the Royal Show (early July) spread about. The British Beekeeper's Associations 'do' is held in the conference centre.

First thing you see are trucks hired by Thornes and other suppliers. These are parked outside the buildings and each has long queues of beekeepers with plastic bags and other containers full of beeswax in different shapes, colors and sizes. Thornes and others take this for 90p (\$1.34) a pound or exchange it for new foundation at published rates. Other lorries (sorry! Trucks) are there as well – these selling pallet loads of glass jars.

Fight your way through the melee to the queue at the entrance. Pay your £15 for members (\$22.36) or £20 for non-members (\$29.81) entrance fee and get your wrist band ('Non transferable and must be worn at all times') put on. Then fight your way into the hall. I can never work out why people choose the narrowest part of any access to stand and talk to their friends.

All the world and his brother are fighting to get the bargain stuff. Thornes had their own hall with stacks (this is 9:30 am) nearly to the ceiling of flat-packed (knocked down) supers, frames and other woodwork etc. Usually people take hand carts in and load 'em up but this year the carts were banned from in-

side the halls. ('Staff on hand to help you carry your purchases outside').

Massive queues at the stalls where traders are selling foundation – Maisemore Apiaries, National Beekeeping supplies, KBS, Thornes, and Wynne-Jones. The last one is a mystery. Sells 'shallow' wired foundation for £3.20 (\$4.77) for 10 but it's got Thornes labels on it and they charge £5.30 (\$7.90). Work that one out.

I Spend £85 (\$126.73) and take the trophies back to the car. Now! Where did I leave that? Finally find it, load the goodies, lock the car and walk back to the trade hall. Stop for a coffee to settle me nerves.

Find the IBRA (International Bee Research Association) stand with Mrs. Jones in charge and Miss Jones helping. Richard (Jones, IBRA Chairman) is Chairing a talk somewhere. Can't stop and talk 'cos there's people two deep along the Stall. All just looking 'cos they can't afford to buy due to the economic miracle affecting everything in this country.

Visit the Central Science Labs. stall to get booklets for those attending my beginner's course next week.

"Please, can I have 10 of each?"

"Sorry, these are all we have" (pointing to a small pile of about six copies of each.

Still only 10:30 am and all the booklets have nearly gone? There's the rest of today and all tomorrow. 'Of course, you can download them from the website'

Off to BBKA. Due to unprecedented demand, they have 'run out of Membership cards' so you have to produce a letter to prove you're a member. Would have thought that a small piece of card was easier and cheaper to produce and send out than a letter.

Spoke to owner of a hive manufacturing business ('Fragile Planet Ltd') making hives etc from waste wood, Plywood super only about £7 (\$10.43), which seems better than Thornes at £35 (\$52.18).

Ran into Norman Carreck (an occasional *Bee Culture* contributor). He was on the 'Bees for Development' stall handing out little flyers asking for support for a cycle event to raise funds. Had a long chat about the shortage of bees here this year. He breeds his own and reckons all imports should be banned. Asked about Brenda Ball. She has disappeared, disgusted – I am told – by the treatment she received at Rothampstead.

Asked at Thornes stall about bees. Can't supply any more – have run out. They were charging, I am told, something like £210/£220 (\$313-328\$) for a five frame nuc. Yes. Two hundred and twenty quid. National Beekeeping Supplies – based in Devon – same story. Smaller guys are selling five frame nucs for £140/150 (\$208-223) for delivery in late June, but want £100 (\$150) deposit

now.

Met two bee inspectors for this area – one current and one 'ex'. All worried about bees for the coming year as the demand for courses is quite exceptional. And when they've done the course...?

Crowds round the Sherriff stand, as well as BBNO etc etc.

People staggering along with piles of supers, frames, roofs, hive bits and foundation of all sizes. One disaster, someone – who thought that their hand cart was bigger than it was – was retrieving a heap of stuff from the gutter where it over balanced.

Ran into Little Richard (Richard Jones, IBRA. I've always called him Little Richard because he's over 6' tall, and he's always called me Peter The Great, because I'm even taller). He says IBRA is 'doing OK. The Museum in Flanders (Belgium) is having problems and he hasn't been there lately. The IBRA artifacts are all stored and the museum isn't open yet.

Met Claire Waring, editor of the British Bee Journal and chatted. Had a final look at all the things which Thornes and other bee suppliers would like to think that I needed and headed home.

Not sure what will happen next year. The Royal Show is being held for the last time this year (July 4th – 7th) and already some of the buildings have been demolished. It was an agricultural event with all the country pursuits (hunting, shooting and fishing) being represented as well as different breeds of cattle, goats sheep horses etc. With the decline in Agriculture over the last few years (it's cheaper to buy stuff from Kenya or New Zealand) the show has relied more on expensive clothing, furniture – even art. I have been every year for the last 15 and noticed the decline. Big patches of green grass where there should be farm equipment on display.

BBKA have their expensive HQ building there but it's in an area now some distance from the centre of things. The Show people decided to sell a vast chunk of land for development and the BBKA is now right on the edge of things. Last year, the nearby Banks and the finance companies had their employees standing in the nearby road trying to entice people in 'for a coffee'

Our association had over 40 applications for the beginners course this year. Couldn't cope, so I'm doing six or eight people at my house. That should be fun. Another thing of interest is that the Women's Institute is having their Annual General Meeting in June. Quite a powerful lobby and this year they are sending only one motion to the Government. This is to ask them to spend more on bee research. Result, half a dozen of the local branches want an up-date on the situation so I have been asked back to give the up-to-date position. This is why I read [www.thedailygreen.com](http://www.thedailygreen.com) so I know what's going on. **BC**

# Beeswax Candles For Added Income?

*Am I making all the money I should be making from my bees?*

Duane Waid

Am I making all the money I would like to make from my bees?

Am I making all the money I should be making from my bees?

These are questions that most of us are asking these days as the cost of operating a beekeeping business steadily escalates due to the expense of replacing dead-outs, medicating for new diseases and related problems, paying premium prices for queens, the high cost of fueling the truck and heating the honey house etc., etc., etc. Everything seems to be taking a bigger bite out of income.

Question number three. What can we do about it?

We were interested in some statistics found in a survey recently taken by a national fruit growing publication. It reported that 90% of those responding showed an increase in income over prior years. Two-fifths had sales increases greater than 16 percent and 11 percent reported increases of more than 31 percent.

Those reporting decreases in business income during 2008 blamed higher gas prices and crop shortages, things they had little control over.

But, what about those who were more successful and how does it relate to us? Many of them said that they had increased their offerings, activities and new products. This is what I want to talk about here. Can we earn more by offering more products?

## DEFINE YOUR INTERESTS

There are few things harder than forcing yourself to do something that you do not like to do. I mention this because there are many beekeepers who want to be just that . . . beekeepers, and they enjoy that, just tweaking their beekeeping skills, and that's good. They are the backbone of our industry. They will profit most by working to solve their problems and thereby increasing production.

But what about those of us who enjoy dabbling with other stuff, like collecting pollen, gathering propolis, making value-added products like creamed honey or candles or beeswax products and selling these value-

added items at Farmers Markets and other venues? Maybe we should determine if we want to expand our offerings to help increase our profit margin.

## WHAT ABOUT CANDLES?

When I began beekeeping more than 30 years ago, I did so because of a fervent interest in honey bees, one that I had acquired while printing books for Dr. Richard Taylor and Dr. Roger Morse. It would have been impossible to work with these two men for very long without falling in love with the honey bee. Their enthusiasm was infectious. I wanted to learn all I could about how to keep bees . . . not how to be a candle maker or anything else.

However, after acquiring my first few colonies I realized that beeswax was piling up so I hand-dipped a few candles to take to the Ithaca Farmers Market where I was already selling honey. They were an instant hit! It wasn't long before someone wanted red beeswax candles for Christmas. Other customers saw them and asked for different colors. I tried dyeing my own beeswax, and this was a disaster. Since beeswax varies so much in color, it was impossible to be consistent.

It was then that I began buying sheets of colored beeswax and Dr. Taylor gave me a jig which he had designed for cutting the sheets just the right size to make hand rolled candles. They continue to be popular

today, after all these years, and I still have and cherish that jig.

We have since added molded tapers, votives, pillars and novelty candles to our line along with the hand dipped tapers and rolled candles.

## ROLLED CANDLES

We got away from using the jig because the beeswax sheets we could obtain vary as much as half an inch in width, which created candles of varying diameters when using a jig with set dimensions. I now cut the sheets as follows:

1. Since the shade varies from one side of the sheet to the other, we always cut them in pairs . . . one sheet face up, one sheet face down.
2. First, cut them for length . . . 12", 10" or 8".
3. Next put a mark 1-7/8" from the far left corner and a mark 1-7/8" from the near right corner of the sheet (opposite corners).
4. With a straight edge and knife, cut between these two marks and you have two pieces of identical size.
5. Lay the straight edge of the cut piece along the edge of a table or board and make a crease about 3/16 inch wide.
6. Turn the sheet over, press the wick into this groove and roll it tightly for a couple of turns. Since some people prefer to buy candles in pairs to be hung, we cut our wick long enough to roll



*Poly molds are our choice for making novelty candles. Note that extra wick is wrapped around mold so that they are restraining as candle is removed.*



two candles together with 2" in between them. (22" for 10 inch candles.)

7. At this point we gently press a 5/8" pre-cut strip of wax along the diagonal side before continuing to loosely roll the candle the rest of the way. This strip can be the same color or it can be a different color to make a two-toned candle.

To save time when we roll, we cut candle wax and wick in advance as well as the 5/8" strips. We roll candles in pairs, one in each direction. We finish all of our candles with a standard 7/8" base finisher set on a hotplate, and, since rolled candles are so fragile, we sell them all in boxes. You might want to experiment here, but we prefer to use flat 15 ply wick for rolled candles. Be sure that your candle wax is at room temperature, or warmer, before starting to roll, otherwise it will crack. Work surface should be smooth and clean. The only tools you need are an 18" ruler and a sharp knife.

Hand rolled beeswax candles do not burn as long as solid beeswax candles, but are quite decorative, easy to create, burn clean and have been growing in popularity over the years. Family members may be enlisted to help with these, as has our daughter Roxanne and son Craig and his wife Patty.

#### PREPARING BEESWAX FOR MOLDING

Special attention should be given to the beeswax which will be used for making molded (or hand dipped) candles to be sure that it is free of contaminants such as honey, pollen



*Poly molds produce fine detail.*

and propolis, which is usually present, to some extent, in wax coming directly out of the cappings melter. The following method produces candles that burn cleanly and are nearly dripless.

We put about two inches of water in a large kettle placed over a propane turkey cooker, bring it to a boil and add cakes of beeswax from our cappings melter. Continue to boil for about 15-20 minutes and then turn off the heat. After it sits for a few minutes, the water vapor escapes, contaminants settle to the bottom and clean beeswax floats to the top. We skim off any floating debris then ladle off the wax, straining it thru a single paint strainer, into half gallon milk cartons, to be used later to make candles.

**Warning: Beeswax is highly flammable. It is safer to use a hot plate or stove without a flame as a heat source.**

#### MOLDED TAPERS

Our most popular candles are our 10" molded tapers which we make in three styles: standard, hexagon and colonial with the standard being our best seller. We make them available both loose in bulk and boxed. We also make a 6" molded taper which is a great seller.

We have both metal and polyurethane molds but prefer the later. Poly molds are expensive but have some definite advantages. Being flexible, the candles are easily taken from them and can be removed sooner (at about room temperature) than those from metal molds. Candles are seamless, have fine detail and are long lasting. They can be poured at 155-160° rather than 185-190° necessary

for metal molds.

During the pouring process, we use three commercial food warmers, double boiler type units much like crock pots but larger. In the first pot, we melt the wax which is then strained into the second unit, again utilizing a single paint strainer. In the third unit we set our pouring pitcher, into which we strain the wax from pot two, this time thru two paint strainers, resulting in exceptionally clean wax for pouring or dipping. Note: any double boiler will work here, depending on the quantity of candles you intend to make.

After much experimenting, we have settled on using the square, #5/0 wick for molded tapers, thereby increasing burning time while decreasing dripping.

We thread the Poly molds, using a wick threader which we purchased from a supplier, but a piece of frame wire with a loop twisted in one end works just as well. Put the end of the wick in the loop, insert the wire into the hole in the bottom of the mold and pull the wick thru. Secure the wick with a sewing pin inserted thru the wick. (These pins are available in hobby stores). Pull the wick tightly thru the mold and wrap enough excess wick around the mold to make several more candles. Then, as you remove one candle, you are re-wicking the mold for the next one. Center the wick and pour. As the wax begins to cool, it will be necessary to add a few drops of wax to make up for shrinkage. (the hotter the wax, the more noticeable will be the shrinkage).

To de-mold the candle, remove the pin, give the mold a gentle twist and pull on the excess wick. Out it

comes. Cut it off and replace the pin thru the wick for the next candle. Trim wick flush with the bottom of the candle and leave about 1/2" of wick at the top of candle for lighting. Bottom can be flattened on an old clothes iron or fluted with a base finisher to fit a standard 7/8" candle holder.

We use the same method with the metal molds, with the following exceptions. First, the beeswax must be heated to between 185 and 190°, so that as it cools, it will contract more, and pull away from the sides of the mold. If it still sticks, we put the mold in the freezer for an hour or so. If this fails, hold the mold under the hot water faucet while you pull on the wick with a pair of pliers. Coating the molds with mold release or silicone before pouring, may also be helpful.

With either poly or metal molds, something must be done to prevent the hot wax from seeping out around the wick as it is poured. We place cold, damp sponges under the base of the molds to congeal the wax as it escapes. It's also a good idea to set molds in a shallow pan, in case of major spills, and to set everything on newspapers or waxed paper to catch drippings.

#### **PILLARS AND NOVELTY CANDLES**

We have gone to the polyurethane molds exclusively for novelty and pillar candles. Dozens of shapes and sizes of molds are now available as well as kits for creating your own molds from a single prototype of your choosing. You are limited only by your imagination.

We started with one each of several styles, purchasing additional molds as needed for those which

proved to be popular. Certain candles are often purchased for wedding favors and party gifts and orders of several dozen are not unusual.

Novelty and pillar candle molds come ready to use and are handled pretty much the same as taper candles, but because of the variation in diameter, different wick sizes are necessary. We use: #5/0 for up to 2" in diameter; #1/0 for 2-3" candles and 60 ply for 3" and larger. We put two craft sticks across the opening of the mold to support the pin which holds the wick. The sticks are elevated somewhat by pieces of clay or short sticks placed under their ends. Fill the molds slightly less than full and the candle can be easily removed and have a nice smooth bottom. If necessary it can be smoothed even more on that handy flat iron or a base finisher.

Some molds are split along the sides and have to be pulled together by rubber bands. Mold should be at room temperature when poured. When cooled, candle can be easily removed from mold, wick trimmed and ready for sale.

#### **VOTIVES**

Votives are easy to make and easy to sell.

Cut a small metal-core wick about three inches long and insert it into a wick tab, or to make it even simpler, buy the tabs already wicked. Spread out your metal votive molds in a large, flat tray

In your left hand hold a small container of melted beeswax. With your right hand dip the tab into the wax and quickly set it in the center of the metal votive mold. It will instantly adhere to the bottom. (If left handed, this will be reversed).

When all molds are wicked, pour wax into each mold to within 1/8" from the top. Let stand until wax begins to congeal. Be sure wick is straight and centered in mold and then refill to the rim. Wicks must be centered for the votive to burn evenly.

When votives are completely cool, remove them from molds and trim wick to about 1/4". If they stick to molds, put them in the freezer for a while. Then try again. If wax is poured rather hot, 190 to 195°, they should pop out easily when cooled.

#### **HAND DIPPED CANDLES**

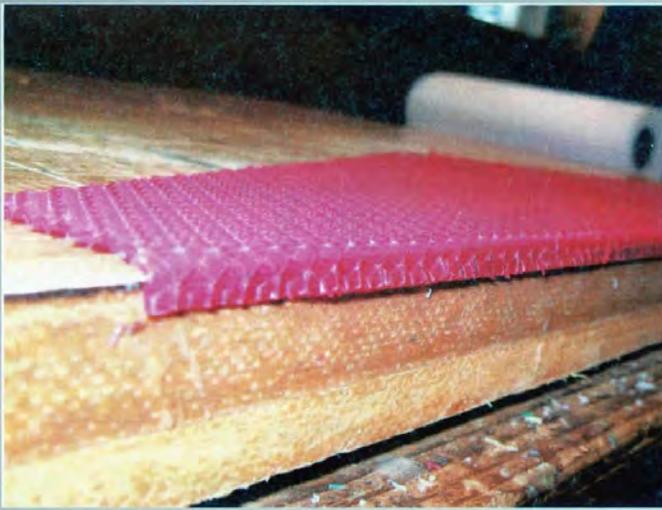
Hand dipped candles are my favorite even though they are more time consuming to make. That is why I run out of them so often.

A few candles can be made by dipping a single strip of wick into melted wax until the proper diameter is achieved. It should be pulled straight between each dip. By hanging the wick over a 2" wide board a pair of candles, of equal length, can be dipped at the same time. If you want to make any quantity though, a jig should be made so that several pair can be dipped at the same time.

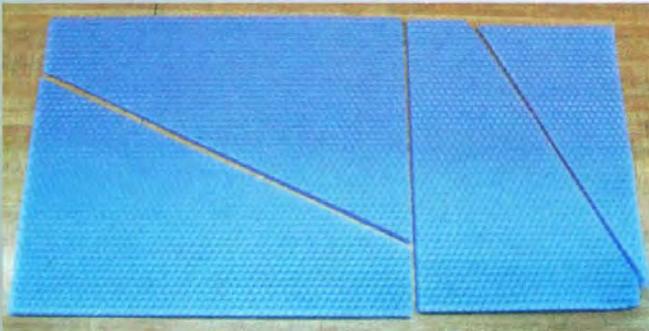
We use dipping frames sold commercially, each holding three pair of candles. These frames are adjustable for length, so desired length should first be set. Then, using one continuous length of wick, tie one end to one of the lower wick supports, run the wick up and over two of the upper supports, then down and under two lower supports, then back up and over two upper supports, continuing in this fashion until the frame is completely loaded. We utilize several of these frames, and we prepare the frames while the wax is melting.



*Metal molds are threaded by pulling wick down thru one tube then up thru the other, being secured by sewing pins and hair pins.*



*Long, straight edge of candle wax sheet is folded down over edge of table, forming a trough into which the wick is pressed. It is then tightly rolled for a couple turns and then loosely rolled to completion.*



*Our cutting pattern produces two 10" candles, one 8" candle plus a small piece which can be used for custom orders or giving demonstrations.*



*Richard Taylor's jig for cutting beeswax sheets for making rolled candles.*

Our dipping tank is heated in a water bath and is a few inches deeper than any candle we intend to make. Our longest candle is 12" and the dipping vat is 18" deep and about 8" in diameter allowing us to make numerous dips before having to add wax. While dipping, we have another pot of wax melting so wax can be added when needed.

We start dipping when wax temperature reaches 170°. It will cool

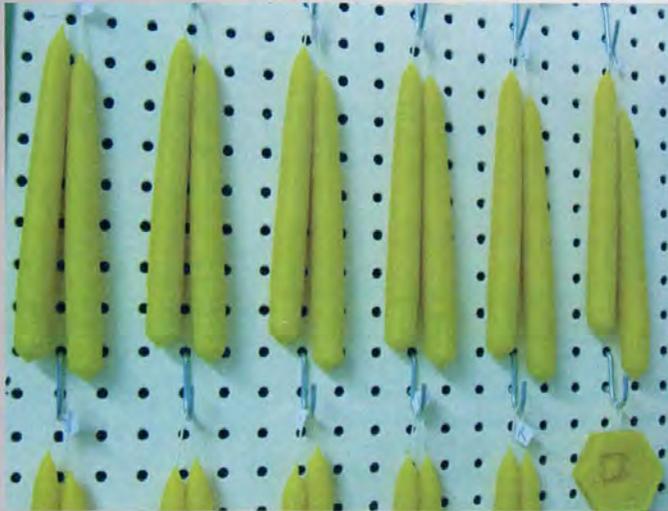
some as the dipping continues, but do not let it get below 160°, because, if wax gets much cooler than this, the candles will be rough. Remember though, the hotter the wax, the thinner the layer of wax adhering to the candle and the more dips will be necessary. The first dip only, should be submerged about 20 seconds to allow the wick to absorb wax. From this point on, dip quickly to prevent melting away more wax than is be-

ing picked up. We give each frame one dip and hang it on a hook while we dip the next frame, then repeat the process over again. Some people dip them in cold water between wax dips, but if several frames are being used, this isn't necessary. Dip to the same depth each time and never let the candles touch the bottom where contaminants settle.

When each candle is slightly thicker than a pencil, we cut them



Our molded candles are made by securing wick, at the mold opening, with a sewing pin, pulling it tight and wrapping extra wick around mold to make it self-threading. Molds are placed in PVC tubes set in wooden frames and placed in a shallow container.



Some of our hand-dipped candles on display at an Ithaca store.

A very cute customer makes a selection from a storefront display. (She just happens to be the author's granddaughter, Cortney.)



free from the lower racks so the candles hang free. We remove the lower rack and pull the wax off from the center rod. Continue the dipping process until you acquire the desired thickness, being careful not to let the candles swing together, making a lump wherever they touch.

When a diameter of about 7/8" is achieved, we cut each candle off at the end of the wick. We then flatten the bottom on our base finisher, or with a knife, then true it up by inserting it into our fluter. Giving each candle one more dip, leaves that little drop of wax on the bottom which is the identifying seal of a hand-dipped candle. These are hung in pairs on hooks at our market displays.

#### SUMMARY

Here I would like to add a few random tips. First and foremost I want to reiterate that beeswax is *highly flammable* and should be melted only over a flameless heater, in a double boiler. Never leave it unattended. I know from experience what

can happen . . . but that's another story. The wax container should be elevated in the water bath by a trivet to allow for circulation. Use a candy thermometer . . . don't guess at temperatures.

By covering the work area with freezer paper, coated side up, cleanup will be simplified.

Wear an apron and have gloves handy. Beeswax is slippery. Keep the floor clean.

We close with this warning. Don't start candle making unless you are sure that is what you want to do. It could get out of control. Ours did! **BC**

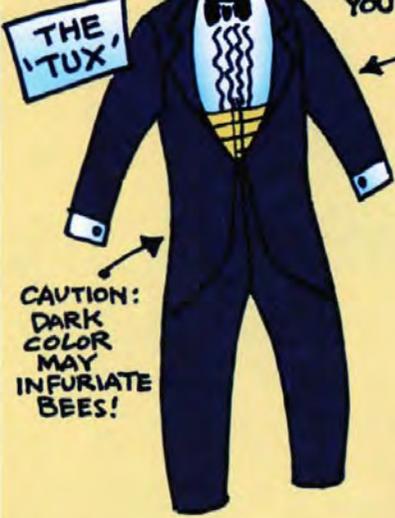
Duane Waid makes candles and sells them and his honey at the Farmer's Market in Ithaca, New York. Duane will be presenting a candle workshop at EAS 2009 at Holiday Valley Resort in Ellicottville, NY. Please visit [www.easternapiculture.org](http://www.easternapiculture.org) for details.



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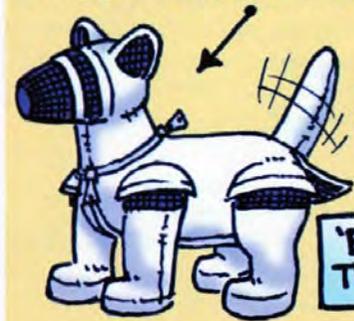
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# DOING DEMOS SELLS MORE HONEY

*I talk and talk. Granulation is O.K. This is how queens are made. Blueberry honey is from blueberry blossoms. I'm an ambassador of sweetness.*

Kitty Kiefer

We've all walked into food stores and stood in the honey aisle and watched people pick out the honey they are going to buy. Some of them have a list – some of them stand there and pick up each jar or squeeze bottle and read the label. Some stand there and end up with a couple of different honeys. Some just walk away. What are they looking for? What goes through each of their minds? How do they pick the one they pick?

I have been working with Merrimack Valley Apiaries, based in Billerica MA, as a sales maven for their wonderful honeys. Our first two customers were Russo's in Wattertown, MA and Whole Foods Fresh Pond in Cambridge MA. Every foodie in greater Boston shops at these two stores at least once every two weeks. Between these two stores you can get everything you need for the most incredible dinner party, family event or very special meal for you and your best friend. You can even eat incredible foods on the fly from these places – Everything is fresh and clean and you trust them always to have the best food from everywhere in the world.

How did I get us into those stores? #1 By telling the absolute truth about where the honeys came from, what floral sources, and how many colonies were devoted to producing each honey. #2 By having beautiful labels whose colors look like a stained glass window when you display them together – sort of like when you crack your hives in June and look at those first pollens collected – so many colors and so beautiful. And #3 – doing demos in the stores. This is the key.

I'm an attorney who now has ten colonies. I am not a trained market-

ing professional. I do like and understand the implications of language. I can answer a question in a way that reveals interesting things about our honeys. I can answer any question that comes my way and reveal yet another interesting thing about beekeeping, or honey production or American agriculture. I am not shy. So when I first called the stores to see about having our honey lineup on the shelves, I said that I would love to come into the store and talk to the grocery buyer at their convenience.

Because Merrimack Valley Apiaries is a farm (please go to [www.mvabeechers.com](http://www.mvabeechers.com)) we all wear denim. When I called on the stores I wore very clean denim (no propolis please), and I carried the honeys in a very nice basket, with little compartments for each of our nine different honeys. I had an antique Mason jar, with a wire bale and a glass top, in which I carried my popsicle sticks for tastings. The tops of my tasting jars are labeled so that I can be very meticulous and never blend my tastes, and I make this very clear to each person for whom I make my presentation. I have a clean denim table cloth that I can put down where ever we are talking. You know how honey drips – at the end I can fold up the mess and take it home to wash it and start over again. I've had these meetings and tastings where ever the store or circumstance require – on boxes in

the stock room, in the training room, in the demo kitchen, on somebody's desk – anywhere and everywhere.

It's a show. It's theater. You are inviting people to experience something they've not experienced before: a honey tasting. As part of talking with the buyer(s), I offer to do tastings or demos in the store or stores to introduce the customers to really good, never blended, never pasteurized,



- Tell The Truth
- Have Beautiful Labels
- Do Demos

American honey. Currently I'm the only beekeeper in New England and New York who is doing honey demos in stores. That should stop.

When I do a demo in a store, and I've done over 200 by now, I follow the same pattern every time. I have my own table – most stores require that you come with your own table, samples, food handling gloves, and other paraphernalia – ask your stores for their guidelines and regulations. I wheel my table, table cloth and samples to the customer service desk. ➤



Andy and Wes Card of Merrimack Valley Apiaries looking for some good blueberry honey.

I say that I've arrived for my demo and that the grocery department or some named contact is expecting me. That person then places me where I am to be for the next three to four hours. I set up my table, spread my table cloth, set out my hand made cherry cutting board and place my Merrimack Valley Apiaries framed picture with Wes and Glenn Card, the third generation of this beekeeping family, on the cloth so the table looks expectant and interesting. Then I go find my loaf of whole wheat baguette, pay for it, find my trash bag (I use a brown paper bag that stands up on its own). I return to my station, take out my antique 1870's bread knife. I take out all the honeys that my store carries, uncap them stashing the jar lids behind my framed picture and by the time I've started putting popsicle sticks into the jars I have my first customers.

Everyone wants to talk about bees, honey and beekeeping. CCD has done a world of good for the marketing of honey. Everybody is worried about the state of the world, the state of pollination, agricultural

practices and what is happening to the bees. I slice up my bread, thinly and then divide the pieces into quarters. I place Crystal's All Natural, one of our creamy raw honeys, on piece of bread after piece of bread. I put these in a little phalanx, marching across the cutting board. They disappear. They are decimated, but replaced. Lost foot soldiers in a marketing battle. Meanwhile I'm talking about honey, raw honey, filtered honey, never pasteurized honey and honey that is never blended – how we warm the filtered honeys to 125-130°F, never more – that this makes it taste better and more true to what the bees made. Yes it will granulate. How our raw honeys have different granulation patterns, how granulation is OK. No I don't have lavender honey – our bees don't

go to Europe, yet. Isn't Crystal's All Natural incredible!! Yes I put it on the bread because, being granulated, it doesn't ooze off the bread – it stays put. Granulation in honey is OK – in fact it's natural. That's right, Tupelo honey doesn't granulate, but we don't make Tupelo. Here, have some All Natural. Would you like to try some others? Yes, this honey is made on the blueberry barrens of Maine – up near T-25, Washington County. No the bees don't care about the fruit, only the blossom. It's blueberry blossom honey, not blueberry flavored. Blossoms give nectar and pollen – that's what the bees look for.

When I'm asked about the health benefits of honey, my reply is that if there are any health benefits from honey, the unfiltered raw honeys will have more of whatever those elements are. But I always say that I view honey as a food item. The grocery buyer has invited me to sell my/our honey in the store and it is a food item – it's not in the Whole Body section of the store.

When asked if the honey is local, I have several answers – I tend

to say, no this honey was not made here in Cambridge, MA or Watertown, MA – but we are beekeepers based in Billerica MA. You are supporting local agriculture when you buy from us. We have Blueberry honey made in Maine, we have Blueberry honey made in NJ, we have wild flower honeys made regionally in the northeast, and we have cranberry blossom honey made on Nantucket. I talk about where the honeys are made. The allergy question comes up – I answer in two prongs – #1 what do you think you are allergic to? If it is mold and cats, I'm not sure that honey is your answer, or #2, if it's rag weed or some other plant, my answer is – check with your health care professional. If a person is truly violently allergic to something, should they eat it? I view honey as a food item, a delicious sweetener and treat. If people just want to try pollen/honey for their own health curiosity, I ask what month they are sneezing in – blueberry honey is from May, cranberry honey is from late June and a bit of July, Crystal's All Natural is from July and a bit of August and Crystal's Wildflower and Chunky are from September.

As you can tell, I talk and talk and talk. I talk about why we use glass and not plastic containers, why granulation is OK, how we move bees, how you make a queen, why and when we requeen, why the person should go to a bee meeting, join a club, learn to be a beekeeper. I hear great stories about keeping bees in cities, suburbia, and about grandparents who kept bees – I've met the camera man who did the 60 minutes piece about CCD.

I'm an ambassador of sweetness. Two last pieces of advice – it is impossible to smile too much in this business, and never leave your tasting table unattended – health regulations don't allow it and every 10-year-old boy in the store will find it and you will be amazed at how much honey they can get everywhere!

I will be at the EAS meeting this Summer in western New York. Merrimack Valley Apiaries is hosting one of the days at the farm out here in Otto. I'll run a workshop on honey demos. It will be a lot of fun. I will answer every question, so bring some. Please be there. My motto: It's OK to own more than one jar of honey at a time. **BC**



Mixing ingredients in a double melter.

# SOAP

— Marina Marchese

Making real soap is a rewarding craft that is relatively easy to do at home.

I absolutely love hand made soap! Each bar is a one of a kind work of art that can be composed in endless combinations of scents, colors and textures. Besides being gentle on your skin it will make every bathing experience divine. Making *real* soap is a rewarding craft that is relatively easy to do at home and the bars you create will make luxurious gifts for your family and friends. Once you make your first batch of soap you will never use a commercially made bar again.

The history of soap making can be traced back to the ancient Babylonians. A clay tablet dated around 2200 BC explains a formula for a soap-like mixture using fats, water and ashes. Soap is thought to have gotten its name from Mount Sapo a fictional place in Rome where animals were sacrificed. When the rainwater washed away the animal fats with clay ashes down the Tiber River, the women who were washing clothes discovered their clothes actually became cleaner. This mixture created a cleaning solution that soon became known as soap. Since man gravitated toward sources of water it was natural that the lathering qualities of soap soon became an essential at bath time. Today, modern day soap making has become an art using extra virgin olive oils to make the high quality soaps we know as Castile from Spain, Marseille from France, Aleppo from Syria and Nabulsi produced on the West Bank. Today many soapers (as soap makers are affectionately called) are carrying on this traditional craft with these same basic ingredients.

As we have learned from ancient man, soap is a combination of fatty acids (vegetable or animal oils) that react with water and ash (potassium hydroxide-KOH), today we use lye (sodium hydroxide-NaOH) which makes a solid bar rather than liquid soap. Together they react and initiate a process known as *saponification* that changes into soap. This process of making soap is called the cold process (CP) method. I learned how to make CP soap almost seven years ago at an outdoor workshop held at an herbal farm. They made it clear that when making cold process soap it is imperative that you measure the ingredients and temperatures perfectly or you will end up with mush, wasting your time and money. There are a vast number of recipes for making hand made soap and you can create your own by choosing your favorite fats, oils and butters then determining the correct amount of lye to add. This amount of lye is a number called the *saponification number or value* (SAP) and it is different

for each fat. There are SAP charts available on-line or in soap making books to help you make a perfect recipe. This is an important detail because too much lye will burn your skin and not enough will make a mushy greasy bar. I suggest for your first time try a recipe that has been proven before venturing into designing your own. Once you are familiar with the process you will be prepared to experiment.

Below is my favorite soap recipe and in February the Back Yard Beekeepers Association hosted a soap-making workshop. We mixed up a batch of this recipe and *at trace* we added peppermint essential oil and finely ground up coffee beans making a truly decadent bar of soap. This is a great activity for beekeepers during the Winter season, why not have your club make soap?

*Please read warnings below before you begin:*

- PLEASE USE CAUTION WHEN WORKING WITH LYE
- KEEP CHILDRENS AND PETS AWAY.
- LYE WILL MAKE GLASS VERY SLIPPERY PLEASE USE CAUTION WHEN PICKING UP YOUR MIXING BOWLS
- INGESTION OF LYE CAN BE FATAL
- ONE SINGLE BEAD OF MOISTENED LYE WILL BURN AND EVEN BLIND YOU
- KEEP VINEGAR ON HAND IN CASE OF CONTACT IT WILL NEUTRALIZE ITS EFFECTS.

## Red Bee Honey Bee Soap Recipe

This recipe makes approximately 5 lbs+ of soap so make sure you have a large enough mold to hold all this good stuff. Read through all the directions first, have all

*Blending with a mixer.*





When filling your mold make sure you settle it to remove air bubbles.

your supplies ready to go before you begin. The tools and bowls you use for making soap should not be the same ones you use for cooking or eating, so pick up your supplies at a thrift shop or church fair.

#### Ingredients:

- 7 oz. Sodium hydroxide (Lye), (Red Devil or Red Crown brands, *Draino brand does not work*)
- 1 lb. 3 oz. Distilled H<sub>2</sub>O
- 1 lb. 5 oz. Extra virgin olive oil
- 16 oz. Coconut oil
- 14 oz. Palm oil
- 1 oz. Beeswax
- 6 teaspoons Essential or fragrance oils
- 1 oz. Honey, optional
- 2 oz. Texture, optional**
- 1 oz. Color, optional

#### Supplies:

- old newspaper
- gloves, safety goggles
- digital scale
- coffee grinder, optional
- 2 large heat resistant glass or stainless bowls
- 1 old pan to use as a double boiler or microwave
- 2 thermometers, candy style
- 2 stainless steel whisks
- misc. teaspoons
- rubber spatula
- hand held mixer
- 1 three gallon plastic bucket

## Personalizing Your Soap

There are many ways to personalize your soap; commercial colors are available specifically for soap making but I prefer using strained juices from fruit or vegetables and dry spices for a completely natural product. An ounce of juice from spinach will make your soap green, beets a bright red and annatto spice a yellow. If you like soap with a texture add oatmeal, cornmeal, lavender or poppy seeds. Be sure to dry these extras before adding them in, I found that fresh ones react with the mixture and turn into unattractive brown specs in your soap. Use an old coffee grinder to finely chop them you will be happy you did because large chunks in your soap can be abrasive. Essential and fragrance oils will add magical aromas to your soap and there are many to choose from – try lemon, rose or even sandalwood and, like the colors and textures, add them all at *trace*.

- vegetable butter, Crisco®
- soap molds, wooden loaves or milk cartons
- plastic wrap
- old towels or rags
- soap or dough cutter
- vinegar

#### Method:

1. Prepare your work area by covering the tables with newspaper. If using wooden molds, pre-coat with the vegetable oils.

2. Wearing gloves and goggles, place bowl on scale and measure distilled water then add honey, mix well. In a second bowl measure lye. In a well-ventilated area, slowly, *pour sodium hydroxide (LYE) into the water. (DO NOT POUR WATER INTO THE LYE!)*. Stirring carefully at arms length with a stainless steel whisk completely dissolve the lye. Be careful not to inhale the fumes or splash, the solution will become as hot as 160°F. Set this aside in a SAFE place where no one will mistake it for drinking water. Cover it if necessary.

3. Measure the coconut oil, palm oil and beeswax in a glass bowl and heat over a double boiler or microwave until melted. Add olive oil. Be careful not to scald yourself, this will also be very hot and beeswax is flammable. Mix well with a separate whisk until melted and clear.

4. Let BOTH mixtures cool down to 100-110°F. You may use an ice bath to cool down the lye. When BOTH mixtures are EXACTLY the SAME temperature, slowly *drizzle the lye mixture into the oil mixture (DO NOT POUR OIL INTO LYE MIXTURE-IT CAN SPLATTER AND BURN)* while blending with your electric mixer.

5. Continue mixing until trace. TRACE is when the mixture becomes pudding like in texture. Turn off the blender, raise the blades and watch as some of the mixture drizzles off. When the drips create a raised trail on the surface this is *trace*. It should happen in 15-30 minutes depending upon quality of ingredients and humidity. It may take up to one hour of mixing to see *trace*.

6. At early *trace* you may stir in color, scents and or exfoliates to personalize your soap. Mix well at least five minutes more.

7 Pour soap mixture into wooden molds or milk cartons using spatula to clean sides of bowl. The mixture is slimy and can burn your skin so be careful! Cover with plastic wrap to keep air from touching the mixture. Wrap molds with towels to keep warm, it should not cool too quickly. Leave undisturbed for 48 hours.

8. When your soap is cool and firm to the touch, carefully remove it from the mold with your soap cutter. Wear protective gloves. Slice soap into bars or desired shapes.

9. Let sliced soap cure in a ventilated room away from extreme temperatures for *three* weeks turning occasionally.

10. Enjoy your handmade soap. It will lather and clean better than any store bought soap. Let it drain on soap dish after each use, it will last longer. **BC**

*\*The author accepts no responsibility for any damage to property or person in any form and you follow this recipe entirely at your own risk.*

*Marina Marchese operates Red Bee Studios, producing soap, lotions, encaustic art and honey. Her book on beekeeping is nearing completion.*

# STORKM

Jason Nelson

Afternoon light is just perfect for watching bees. Well, honestly any light is just perfect for watching bees when you are a beekeeper but the fading afternoon sun falls on my hives just right. A few minutes earlier and you have to search to see the bees zip to and fro. A few minutes later and the ballet is over. Right as the sun dips down it looks like a storm of wings flashing above my hives. When you consider how the honey bee takes flight and the forces at work on those wings, it makes sense, as each bee rides on a thousand tiny storms.

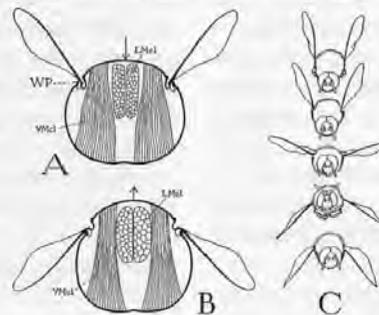
There are only a few methods by which insects take to the air (we'll ignore for now the spider my wife discovered on her car keys, which became both airborne and the world's fastest moving spider until its untimely death). Honey bees glide like a rock. Their wings are too small for the flap and glide technique, and the necessities of hive life leave them out of the flutter and float crowd (There's a reason we don't often say "Look! there goes a butterfly, carrying three times its weight!") Still, anyone who has ever seen a bee knows that they do fly, and they do it pretty well.

In order to understand how, you need a really fast camera. You also need some bees and it wouldn't hurt to have a lot of time and spare film. The resulting pictures would capture a phenomenon known as "Leading Edge Vortices." That's a fancy way for saying that at various points in a honey bee's wing stroke, tiny tornados form at the leading edge of the wings. The base of the honey bee's wing is attached to the thorax. The wing tips, being somewhat less attached, move much faster. This causes the vortices to roll out along the wings during each stroke. The vortices provide upward lift far greater than the honey bee's wings alone. In effect each honey bee carries a pair of tornado generators with it.

Did I say a pair? Put down the pitch forks, it is true that honey bees are in fact Orthopterids, meaning, "four wings." Honey bees have four wings, but the hind wings connect to

their respective fore-wings by a series of tiny hooks called *hamuli*. On the down stroke hamuli hold the wings together. On the upstroke the wings separate ever so slightly. Four wings that act as two. By varying the rotation of the wing tips the honey bee can control the lift from these vortices, called *unsteady flight forces*, to allow far more intricate motion than raw flapping would provide.

Add to this complex situation that each wing is beating 240 times *per second*. One thing that ought to be immediately clear is that one should never compete on a game show against a honey bee. If the buzzer were hooked to its wings, the bee would press the buzzer 40 times before you could twitch your



finger. It would press it twice before you could register that it was time to answer. Nobody buzzes like a bee. Since the bee failed to phrase its answer in the form of a question, we'll take this opportunity to answer the challenger's question. "How on earth did it do that?" The secret to this feat is *asynchronous flight muscles*. Asynchronous flight muscles mean that the honey bee does not have to continually send "Beat, Beat, Beat" commands to the wings. One nerve impulse will trigger the wing muscles to beat multiple times. The muscles are also *decoupled*. This is a way of saying that the wings do not attach directly to the primary flight muscles. They attach to the thorax, as do the flight muscles. To beat its wings, a honey bee flexes its thorax. You can feel this by placing your finger on the thorax of a bee and holding

it there while the bee buzzes. If you do this, make certain the bee is on a table, or a board, and not your palm or arm. Otherwise you may experience a *different* sensation the honey bee can generate, with a body part other than the thorax. One nifty side effect to decoupled wing muscles is the ability to move them without having the wings positioned for flight. In that case the honey bee's flight engine becomes a thorax sized space heater, useful for passing those cold Winter nights.

Flight is quite a trick by itself but the honey bee is an over achiever. Not content with gracefully zipping forward, wheeling through the tall flowers or crashing into my landing boards, the honey bee is also capable of hovering, slow descent and ascent, and carrying heavy loads. Humming birds hover by rotating wing position. Dragonflies hover by beating each of their wings individually. Then there's the honey bee. Their wings beat at 240 times per second in normal flight. When they hover (or when they are carrying a load), their wings beat 240 times per second. Instead of varying how *fast* their wings beat; they vary how *far* the wings travel in a stroke. Combined with the ability to manipulate the vortices this gives the honey bees the ability to fly, hover and haul. Next time you see a forager laden with pollen come in for a clumsy landing consider the factors involved in managing that many wings, that many vortices, that many times per second. That makes my head spin, so instead I conclude with an easier flight related math problem.

A honey bee in Seattle flaps four wings in two sets 240 times a second. If the sun sets at 6:15, and the temperature drops below 45° and the winds rise to 20 miles per hour, how long will it take a beekeeper to go inside when there are no longer bees on the wing?

Answer: Not long. At least until tomorrow evening, when the forecast calls for thousands of miniature storms to take their evening flight. I'm looking forward to it. **BC**

# 'Bout a 100 – Sideline Beekeeping

## TIME: HOW CAN I MANAGE IT BETTER?

Larry Connor

### Making More Efficient Use Of Our Time

#### Time: How can I manage it better?

*Is there a way I can work a 40-hour week (that is often over 50 hours) and still run 25 to 250 colonies? What do I have to prepare myself for to do it?*

Finding the best use of our time to carry out beekeeping activities is a huge challenge facing semi-professional beekeepers everywhere because of the pressures of the other job, family, and scheduled recreational events. During the busy time of the bee season (March-June in the temperate regions of the Northern Hemisphere), there are huge demands on our time. This article will help us focus our planning/scheduling and making more efficient use of our valuable time.

Visiting different beekeepers reflect huge differences in the management approaches they practice. Take one middle-America beekeeper who was in the process of adding supers to his colonies. His approach is direct, efficient, but not very bee friendly. Empty frames in supers, mostly drawn combs, were loaded onto the truck the night before the workday ended. The next morning the out apiary was visited and supers were added, two or three boxes per colony, depending on colony strength. No hive inspections were made during this time, for the beekeeper had a good idea of the strength of the colonies from previous visits, and was attempting to get the supers on the colonies as quickly as possible.

The truck was driven to the first group of bees in the apiary where colonies were positioned on either side, and the vehicle was left running. Colonies had their covers removed (all migratory lids), and the boxes placed over the brood nest. To speed the process, no smoker was lit and no effort was made to placate the bees. There was an approaching rainstorm and there were many unhappy colonies. But as fast as the boxes could be lifted off the truck they were placed onto the hives, the lids returned as soon as the boxes were placed.

As one group of colonies was finished, the beekeeper

*Ted Miksa is about to close the door of the bee truck in the queen yard of the Miksa Honey Farm in Groveland, Florida. The handwritten list has just about everything on it needed for catching queens and servicing mating hives. The first item listed is "bees" while the last is "Gas for Truck"*



jumped into the truck and advanced it enough to the next group so the supers were not carried more than a few feet from truck to hive. He wore a full bee suit and veil, gloves and a determined look. There were many bees in the air hitting the veils and the windscreen of the truck. The truck was emptied in less than an hour and the bees were ready for the white sweet clover that was starting to bloom in the area. No time was wasted lighting the smoker, carrying boxes of supers some distance from the truck, or worried about crushing a few bees as the lids were piled on the supers. While it is possible to add supers on a nicer early summer day with a smoker and minimum bee upset, this beekeeper did the job quickly and moved on to the next apiary. He had many colonies to super and the flow had already started. He figured he was losing money every day the supers were not in place.

Compare this beekeeper's system to that of another (actually a hybrid of several people), I have visited over the past few years.

The beekeeper keeps a hundred colonies in the southern part of the state for early buildup. The bees are 200 miles away but spread out over 50 miles. Just getting to the bees meant the truck and trailer had to be loaded and driven down the night before. So far this is a pretty common beekeeping experience in an effort to get Spring splits.

At the first beeyard, the truck is parked at one end of the yard, and every time the beekeeper needs something, he walks to the truck to get it. This includes extra frames, pollen, sugar syrup for the division board feeders, spare feeders, a better lid, and queen excluders. It might be easier to work on one group of bees at a time, near the truck, where all needed equipment is ready to use. Move the truck instead of spending time walking hundreds of feet to get something.

Or think about dropping off extra equipment at every few hive stands and having extra material piled up where it is close. Extra equipment taken off the bees can be just as easily stored in the piles, using bottom boards and lids to keep bees from robbing out removed combs and deadout colonies (there always seem to be new deadout colonies nowadays).

On the way out of the apiary pickup and load the material onto the truck. Make sure you tie down the load, even if you are driving a short distance.

Instead of risking the overheating of a queen in the truck, carry a few extra queens (in cages) in a canvas bag tied around the waist or in a carpenter's apron, making sure you can find what you want when you are wearing gloves and your fingers feel like rubber sausages. Or work a bit more carefully and retire the gloves. *Recent memo to self: when the entire crew is wearing heavy-duty bee gloves, it is time to put some on. When the crew is not wearing them, you probably will not need to wear them. Funny how that happens.*

This beekeeper spent a great deal of time driving the

50 miles from one yard to the other, moving the increase colonies to minimize drifting. Many hours of the beekeeper's time were spent in the truck and not working bees. Or sleeping. There are a lot of beekeepers on the road who have not had a full night's sleep for weeks.

### Some General Guidelines

1. Make a list and post it in the honey house and in the truck. This list should include everything needed for a visit to an out apiary away from the home base. But it works for work at home too. The list has two parts: things to take to the apiary and things to bring back from the yard when finished. If queens or cells need to go out to a mating yard, chances are that mated queens need to come back to the home base. While that sounds logical, failing to check the hive tops of mating nucs may result in a loss of queens inadvertently left behind. Or always put them into another canvas bag you carry with you.

From feed needs (sugar syrup, pollen patties), extra equipment, frames of brood and bees, frames of honey and/or pollen, take all the sorts of things that one might need in a beeyard during buildup and queen mating. Don't forget cages for spare queens, virgins, queen candy and marshmallows for introduction. You know what you need to take to the yard. Make the list. Once back from the yard, sit down and refine the list so it works better on the next trip.

If that checklist eliminates one return trip to get something you forgot, it will pay for the time you spent writing it out. Plus, the process of making the list will force yourself to organize your apiary visit. What can you realistically expect to do in one visit? What can you do that will eliminate a return visit?

2. Don't make work for yourself! What are some of the things that have slowed you in the apiary? Have you let robbing get started by leaving combs set open? Have you spilled syrup to trigger robbing? Have you forgotten your hive tool, smoker, smoker fuel, matches/lighter, or veil and had to work without? Do you have a problem keeping your smoker lit. For heavens sakes get someone to show you how they do it so it stays lit!

Have you invested in an extracting setup that is hard to clean? Do you leave it alone without cleaning as a result and the residual honey granulates and either blocks

future use or seeds the honey with crystals as you start to fill jars? Do you have drains in the honey house or do you have to mop up the wash water and squeeze it into buckets to dump down the drain in another room?

Are there ways you can simplify your work? Are there practices that prevent problems from developing? For example, if you have small hive beetles in your area, you are learning or already know that stored comb may turn into a huge mess in just a few days. So bring in just the amount of honey in supers from the hives that you can process. Don't let the honey sit in the combs over the weekend. This reminds me of cutting a hay crop - don't cut more than you can put up before the rain starts. Watch the weather, your spouse's schedule, and your scout/church/reunion plans you have made promises to participate and help at. That honey will most likely remain on the hives that produce it for a few more days without any problems, so you have time to take it off and extract it as you realistically can handle. This is not permission to be lazy, but strong advise to work smart.

3. Grow your operation, don't EXPLODE it! I only wish I had one dollar for every dreamer beekeeper who has explained to me in great detail how he/she wants to expand rapidly and make a lot of honey. If you have ten colonies, is it realistic to jump to 100 in one season? A lot of new beekeepers think so. There are a few lessons that have been learned by others that I should share:

a. There are points in expansion where everything changes. Somewhere between 50 and 150 colonies run for honey production you will want to upgrade the size of your honey extractor, honey truck (or finally get one), honey house (or build one), work schedule (especially if you are working full time somewhere else), and a lot more. Add to that some paper things: insurance coverage, workman's comp for your part time employee and maybe even a change in marital status! Are you working alone, or is your spouse/partner helping? At 150 colonies there will time when you will need help, reliable help that will show up at 7 am when you want to leave for the bee yard and put in a full day's work on your rare and precious day off.

b. Then around 400 to 600 colonies this all happens again. Your truck is too small, the extractor cannot handle the volume of honey. You need help, and your spouse



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**MAY GOD BLESS YOUR ENDEAVORS THIS YEAR**

has left you a note that you have an appointment with a divorce lawyer. You have started to add onto the honey house but run out of money, or time, or both, and the project is stalled until you get the check for the last honey you sold or the pollination contract. You have gone from handling hives one at a time to a pallet system and a forklift. You have to store and insure these things, and make sure you have adequate locations for all the bees, perhaps in southern and northern locations.

4. Worker smarter, not harder. There may be little surprise in the number of beekeeper's sons and daughters who run fewer colonies than their parents did. They saw, as children, how many late nights were spent building frames, extracting honey, filling bottles and making deliveries. Maybe they noticed that the crop was sold quickly, and the older generation had to buy other honey to fill orders. Here are some of the "new generation" business plans I have heard lately:

a. Reduce the number of beehives, and sell all the honey at maximum retail price. Stop selling good local honey at wholesale prices, but get the maximum for the crop. Move to varieties, by plant communities, and charge. One Alaskan beekeeper reports that he sells a 60 pound bucket of fireweed honey for \$900.00. The smart beekeeper knows that the demand for local honey is increasing, and buyers want a relationship with the honey producer. Certainly not all beekeepers have the personality or temperament to sell honey at local farmer's markets or community festivals, but some local participation will create a viable identify link for the honey user with the honey producer and develop some sense of product loyalty. That is something that you can take to the bank only if you have produced enough honey to sell at the local level and not run out. So, cut back on the number

of places where you sell your honey at a low price and raise your prices. If you have strong competition from a low-ball priced beekeeper, don't compete in that store anymore if the manager wants you to match the price. Move to another venue and sell at a higher price. Don't madly chase after EVERY place to sell your honey, but go for the high-end markets where your product will be appreciated and your higher price will be paid.

Reducing your colony count will give you a chance to increase production of added products, from creamed honey, flavored creamed honey, beeswax soaps, creams, polishes and more. Add a few candles and your favorite honey dipping sauce. Instead of selling one jar of honey to a customer sell honey, soap, lip balm and other products to the same people. What might have been a \$4 or \$5 sale will let you keep most of a \$20 bill, and the customer is happy. Get your special jalapeño pepper creamed honey out with the pretzel sticks and ask the guys if they are *man enough* to try a sample. They will be new customers taking several jars to share with their buddies.

5. Don't let the value added products ruin your life either! If you have to make honey soap every night after work, you might think that you have been too easy listening to these ideas. So again, build slowly. There is nothing wrong with running out of a product at the end of a farm market or community festival because you will have people buying earlier and earlier to make sure they get the product they want. **BC**

*In June and July Dr. Connor is teaching a class of new beekeepers at the family farm in Galesburg, MI. He is offering his last queen rearing class of 2009 over the middle weekend in July. If you want to know more, contact [LJConnor@aol.com](mailto:LJConnor@aol.com).*

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# The Importance Of Honey Bees: A Case Study

A Television Program By Feast Or Famine That Takes An In-Depth Look Into The Food Industry

Feast Or Famine is a national and international Television program that takes an in-depth look into the challenges in the food industry. Broadcast in 35 million households in the U.S. and 127 countries around the world, Feast Or Famine investigates the advancements in agricultural, environmental sciences and public health from the research and discoveries of our leading global experts. "Feast Or Famine" is a non-profit educational program focused on improving education and disseminating accurate scientific information to the world. Each program is shot on location and consists of expert interviews from the most respected scientific organizations, thought leaders, and award winning scientists the world has to offer.

Feast Or Famine was developed to counter sensationalized media reports on food and agricultural topics that often convey a one-sided approach. Feast Or Famine is educational programming for the food industry and viewers interested in knowing more about the origins of the food they eat.

Feast or Famine highlights the best practices of the food and agricultural industry. Our producers look for stories that demonstrate a positive impact on the food supply chain, showcasing how the world's food supply is protected and suggests improvements and solutions moving forward.

**The Feast Or Famine** Television program is broadcast around the world and available to a consortium of educational, scientific and government institutions thru TV broadcast and online video streaming. This consortium consists of:

1. 127 countries to 115 million viewers
2. 30 million subscribing homes in the U.S.
3. 852 Colleges and U.S. Universities
4. 70 leading corporations
5. 45 government agencies and laboratories
6. 23,000 K-12 and higher learning institutions
7. 2,360 Public Libraries
8. 594 Community Colleges
9. 74 Museums
10. Over 900,000 unique Ag related website visitors

**FROM THE EXECUTIVE PRODUCER, David Holden**

*Our mission for Feast Or Famine is to produce a **POSITIVE, solution-oriented** program focused on improving education and disseminating accurate scientific information to the food industry and consumers. I want to leverage*

*the two most powerful media, television and the internet, to highlight what the food and agricultural industries are doing right.*

*Feast Or Famine's latest effort "The Importance Of Honey Bees" has just been released.*

This program, with CC Pollen as a Platinum Sponsor, Mann Lake, Walter T Kelley and Brushy Mountain as strong supporters, features Kim Flottum, Editor of *Bee Culture Magazine*, Paul Younger from Patagonia Honey Company, Dr Brad Weeks MD, from Corrective Medicine in Washington, and Leigh Broadhurst, PhD, author of *Health and Healing with Honey Bees Products*.

The film was shot on location at the processing facility of CC Pollen in Phoenix, Arizona, and at a commercial beeyard near town. The beeyard scenes show the typical landscape of the area, and Kim Flottum and Paul Younger examining a hive and discussing the beekeeping aspects of honey bees.

Inside the plant both Dr Weeks and Leigh Broadhurst talk about the nutritional and medical benefits of using honey, pollen, royal jelly, and propolis and the many ways they can be used.

The focus is on the value of honey bees and their products, and how those products are produced and used. Discussed are threats to honey bees including pesticides, habitat loss, mites and diseases impacting bees, the current honey market and the ever decreasing numbers of beekeepers. Also, the benefits of pollination from the perspective of modern agriculture and certainly to wildlife in general are discovered.

Production of these products is outlined, and then the manufacturing processes that prepare these products for distribution are detailed.

Shown is how pollen is collected, stored and then cleaned using exact standards, along with information on its nutritional value. The sources of propolis are discussed, along with its biological activity in reducing infections and preventing additional problems, and how beekeeper-collected propolis is dissolved and warmed and all extraneous material removed and made ready for distribution. The biology of royal jelly is also discussed, and the value of this product to both honey bees and humans outlined. This product must be carefully handled so its nutritional levels are not diminished during the manufacturing process.

This film is a positive look at the beekeeping industry, and especially at the products that bees and beekeepers produce other than honey. Still, honey bees, and the beekeeping industry in general are under pressures that can derail their productive capacity. There are actions that can be taken to reduce habitat loss, pesticide kills, and other threats from modern life. These should be looked at closely.

*THE IMPORTANCE OF HONEY BEES: A CASE STUDY* will be shown on School Tube, YouTube, the Research Channel, the Farmer's Almanac channel, the U.S. Government's Voice Of America channel and other stations around the country. **BC**

by Kim Flottum



Kim Flottum, during production.

# All The BUZZZ in...



## Summer is Here!

I hope you have tons of time to play outside and enjoy everything nature has to offer.

Bee B. Queen Challenge

Bee B. Queen

Make a bee out of sticks, rocks, leaves, or sand and send us the photos.

**Legs:**  
Not Just For Walking



The honey bee has six segmented legs attached to the thorax. There are 3 pairs of legs: fore legs, middle legs and hind legs.

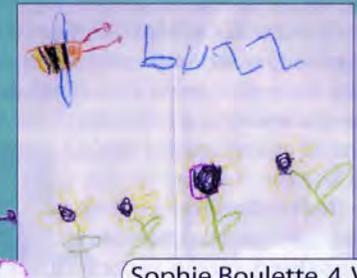
The legs of a honey bee are loaded with all kinds of tools and gizmos. Besides using their legs to walk, here are some other ways the bees use parts of their legs.



Emily Boulette, 7, VT



Raechel Simpson, 8, AL



Sophie Boulette, 4, VT

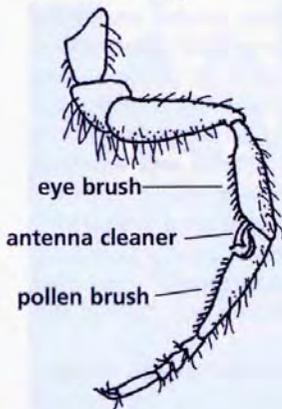


Bethany Isaac, 12, NS, Canada

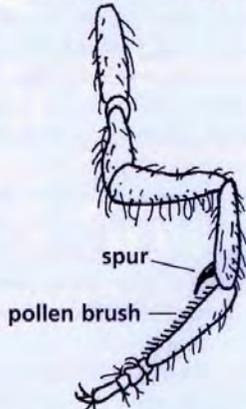
Emily and Sophie help their aunts Robin and Celeste with their bee hives.



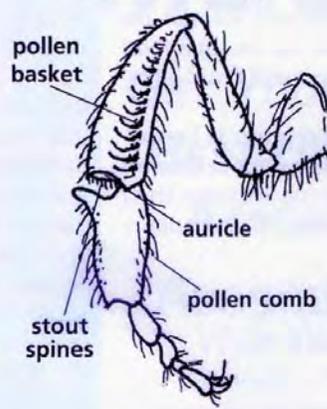
### fore leg



### middle leg



### hind leg



Courtesy of Indiana Department of Education

### Pollen Basket

On the hind leg there is a smooth area that is edged by a fringe of stiff hairs that help to hold pollen or propolis for the bees to take back to the hive. I guess you can say it's their bee backpack.

### Pollen Brush

The brush of stiff hairs on the fore leg is used to clean pollen from the front of the body. The brush on the middle leg helps clean the thorax and the fore legs. The brush on the hind leg collects pollen from the pollen brush on the middle leg.

### Antenna Cleaner

The antenna is placed in a notch that has a comb-like row of small spines. When the bee bends its leg, the antenna is held in place. It is pulled through that notch so pollen can be removed. Not only do the worker bees have an antenna cleaner but the queen and the drones have one too. There is nothing like a clean antenna.



### Spine or Spur

It may be used to dig plates of wax out of the wax glands.



# ... BEE kid's CORNER

Produced by Kim Lehman - [www.beeladyprograms.com](http://www.beeladyprograms.com)  
[www.beeculture.com](http://www.beeculture.com)

June 2009



Adrienne Issac, 6, NS, Canada



+



=



What do you get when you cross a bee with a seagull?  
 A beagle

Phillip, age 9, TX



## Sing a Song

Sing to the tune of a "Tasket and Tasket".

A tisket a tasket a little pollen basket,  
 To carry pollen to their hive.  
 A tasty little tidbit,  
 Lickety split, carry it,  
 A pollination benefit.

## GIVING POLLEN THE BRUSH OFF

You will need:

- a hair brush (the bee)
- a comb (the bee brush)
- cooked rice (the pollen)
- a bowl (the pollen basket)



Place the cold cooked rice on a plate. Fly the bee brush around the room to look for a good pollen source. Land on the rice with the bristles down. What happens next?

Now you need to scrape the pollen into the pollen basket. Do this by raking the comb through the brush bristles. Collect the "pollen" and transfer to the "pollen basket"



## True or False

1. The legs of a bee have segments.
2. A bee has 8 legs.
3. Every grain of pollen that sticks to the bee gets put into the pollen basket.
4. The pollen baskets are on the bee's hind legs.
5. Only the worker bees have antennae cleaners.
6. All the legs on a bee are exactly the same.

Pollination  
 Power  
 June 22-28 is  
 National  
 Pollinator Week.

Hair Today,  
 Pollen  
 Tomorrow

Question: How do the hairs on the bee body help with pollination?

Answer: The pollen from the flowers stick to the hairs on the bee's body. When she goes to the next flower some of the pollen will drop off and work its way down into the flower to produce seeds and fruit. Voila. Pollination.

## Become a Bee Buddy



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

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City, State, Zip Code \_\_\_\_\_

Age: \_\_\_\_\_ Birthday: \_\_\_\_\_

E-mail (optional) \_\_\_\_\_

Send all questions, photos and artwork to:  
[beebuddies@hotmail.com](mailto:beebuddies@hotmail.com) or mail to the above address.

# ASIAN HONEY BEES

— A n Harman

## Biosecurity Queensland combs the suburban streets of Cairns

Community vigilance and science are two vital weapons in the challenge faced by Biosecurity Queensland in its campaign to eradicate an invasion by Asian honey bees in far north Australia.

The accumulated knowledge of the pest bee is proving invaluable as Biosecurity Queensland combs the suburban streets of Cairns and the farm and bushland to the city's south.

Rain and flooding is hampering surveillance in the area 1,050 miles north of Brisbane, the state capital, but the hunt continues after some foraging bees were found in January

"Sometimes it feels like we are looking for a needle in the haystack," Biosecurity Queensland surveillance manager Wim de Jong says. "But the more we learn about the bee and the more the public is aware of the threat it poses to the bee industry, the quicker we are able to detect and destroy nests. It is important to anticipate their movements and stay on top of them."

Biosecurity Queensland initially thought the bees were eradicated with the destruction of the seventh nest on Admiralty Island in November 2007

Follow-up surveillance detected

no pest bees for the first eight months. Then the Asian honey bees (*Apis cerana*) reappeared in areas south of Cairns.

Since July last year, Biosecurity Queensland teams have destroyed 10 nests and swarms on two fronts. In total 20 sites have been destroyed.

DNA tests show the bees killed this year are related to the initial incursion detected in May 2007

Biosecurity Queensland Principal Veterinary Officer Karen Skelton tells *Bee Culture* a restricted area was declared in the area of the incursion was based on the possibility of these bees carrying *Varroa* mites or other exotic mites.

"It has since been found that this is not the case," Skelton says. "None of the Asian honey bees nests detected to date have been infested with *Varroa* mites, *Tropilaelaps* mites or *Tracheal* mites (*Acarapis woodii*)."

She says genetic testing indicates all the Asian honey bee nests are related and there has been only the one incursion.

"However, the restricted area remains in place to allow control over movements of managed hives and bee products and equipment into, within and out of the restricted area," Skelton says.

All Asian honey bee nest de-

tections to date have been within the restricted area and there is no indication there are any outside of this area.

Movements of managed beehives are allowed into and within the restricted area under permit, but no movements are allowed out.

A 100-mile restriction around the sites has been imposed by the U.S. Department of Agriculture for live bees being imported into the United States.

The USDA rules state live bees being sent to the U.S. must be sourced from apiaries that are not within 100 miles or 160 kilometers from a site where Asian honey bees have been detected in the previous two years.

"This is not an issue for Australian live honey bee exporters as the vast majority have apiaries more than 1,000 kilometers (625 miles) south of the Cairns Asian honey bee restricted area," Skelton says.

The Cairns incursion, detected in a boat mast in the Portsmith area of Cairns, was one of the first major challenges for Biosecurity Queensland when it was newly formed as part of the Department of Primary Industries at the start of 2007

The first five nests were located on Portsmith business sites. Through the surveillance technique known as bee-lining, the last two nests destroyed last year were found in dead trees amid dense mangroves on Admiralty Island across Trinity Inlet from Portsmith.

De Jong had doubts that all the bees were destroyed last year

"Bees don't like rain and will hide during the wet season," he says. "Surviving queens would have the opportunity to breed up and swarm. The Cairns area is surrounded by ideal bee habitat, so it is not unreasonable to expect bees to have swarmed to areas where there is a lot of cover"

After a response to an incursion has been completed, it is standard



The Asian honey bee (right) is noticeably smaller than the European honey bee (left) and has stark brown coloring on its abdomen. (photo by Paul Zborowski)



Asian honey response team members Ian Rodger and Wim de Jong with remnants of the nest destroyed at Green Hill in July 2008. (Biosecurity Queensland photo)

biosecurity procedure to continue a surveillance program for at least 12 months.

De Jong led the surveillance program involving ongoing searches and trapping over a six-mile radius from known nests and promoting public awareness.

The detection of IP8 – Biosecurity Queensland lingo for the eighth Infested Property – was the result of a call from a cane farmer. He felt the bees he saw on his property were different to ordinary honey bees.

Asian honey bees are slightly smaller than the European honey bee and its abdomen has a more distinctive brown and yellow stripes.

His vigilance led directly to the reporting of a swarm of Asian honey bees three days later.

Sweep netting located more Asian honey bees near Alooomba and beelining led to discovery of two nests in trees in forested areas near Walsh's Pyramid.

Meanwhile back in town, six nests were located in the inner-city suburbs of Bungalow and Parramatta Park not far from the original incursion site at Portsmouth.

The quick action of the biosecurity surveillance response team allowed these nests to be quickly eradicated.

Operations manager for the response Ian Rodger says the team is dedicated to a search-and-destroy campaign.

"The general public is very much

a partner of Biosecurity Queensland in this campaign as they are our eyes and ears," Rodger says. "Residents are at their homes seven days a week and know what's going in their yards.

"It is vital that people understand the need to be vigilant in their backyards and homes if we are to completely eradicate this pest. We don't mind if we get hundreds of calls. We will follow up every one of them."

The Asian honey bee under the spotlight in Cairns is the Java strain and tests so far have shown it does not carry the *Varroa* destructor mite.

"The mite is actually the real villain of the piece," Rodger says. "In Asia, the Asian honey bee and the *Varroa* mite co-exist and the mite is less of a problem. When the mite builds up numbers to a critical point in an Asian honey bee nest, the bees abandon that nest and set up elsewhere leaving most of the mites behind. But they always carry a few with them and the whole cycle starts again.

"The bees' ability to readily swarm is a naturally-developed coping mechanism for the bee over centuries of co-habiting with the mite."

Queensland Primary Industries Minister Tim Mulherin says if the mite gets into Australia it will become a major threat to the European honey bee (*Apis mellifera*).

"The Asian honey bee has the potential to ruin Queensland's honey industry because our native bees have no coping mechanism or tolerance to the mite," he says.

"There are more than 3,000 beekeepers in Queensland and more than 120,000 hives producing around



Department of Primary Industries senior operations Mick Berridge officer checks out the remnants of the Asian honey bee nest found and destroyed in a dead tree on Admiralty Island. (Biosecurity Queensland photo)

75 kg (165lbs) of honey per hive annually. The estimated gross value of Queensland's honey and beeswax industry was A\$10 million (US\$6.8 million) in the last financial year."

Some 65% of Australia's agricultural crops rely on honey bees for pollination.

"Queensland's agricultural industry is worth about one billion dollars annually and Asian honey bees need to be eradicated," Mulherin says.

Rodger says if the mite enters commercial or hobby hives it will destroy them as it is doing right now in New Zealand and the United States.

"This will impact severely on our ability to produce honey and to provide pollination services to the agricultural and horticultural



## SMALL HIVE BEETLE

The Western Australia Department of Agriculture and Food says the bee industry's initial eradication plans for small hive beetle failed, and it's been deemed by industry, not the department, that eradicating small hive beetle in the Kimberley is impossible.

The outbreak in the far north of the state was first detected in October 2007 when three small hive beetles were found in two hives.

At the time Department of Agriculture Director of Animal Biosecurity Ashley Mercy said the beehives where the beetles were found were destroyed and other hives put into quarantine pending surveillance and test results.

The department also carried out surveillance work on more than 1,300 beehives.

Mercy was optimistic then, saying there was no evidence small hive beetle has become established in Western Australia. All the beetles found were male and no eggs or larvae had been found.

But Kununurra beekeeper Bob McFadden tells the Australian Broadcasting Corp., that since then the beetles have continued to grow in numbers and will spread into areas of the Northern Territory if nothing is done.

He says the agriculture department has been sitting on its hands.

"At this stage the only investigative trapping being done is by my self and one other beekeeper up here, but apart from that, the department is not to be found," he says. "We're going to end up with an area of country controlled by the small hive beetle."

Department director of plant biosecurity Sashi Sharma says the decision not to enforce an eradication plan in the Kimberley, 1930 miles north of Perth, was due to the wishes of the broader bee industry which voted not to act.

He says the bee industry's initial eradication plans failed and it's been deemed by industry that eradicating small hive beetle in the Kimberley is impossible.

"An eradication plan was considered in 2007 but the beetle was not eradicated," Sharma says. "It was given another try in September and November of 2008, but we still have the beetle and so the bee consultative committee's view is full eradication is not achievable."

Sharma says a small hive beetle management plan is being put in place for the Kimberley and legislation will be introduced to stop the transportation of live bees outside of the Kimberley.

industries," he says. "It will impact directly on the natural pollination of our native flora as the feral honey bees will die out."

De Jong recently attended the 9th Asian Apicultural Association (AAA) Conference and Exhibition in the city of Hangzhou, China.

He says the event was an eye-opener for him.

"I certainly gained some insights into the behavior of various species of Asian honey bees," de Jong says. "In Asia, the Java strain of *A. cerana* is considered the vermin of the bee world. The bees' honey is considered second-rate.

"The Chinese told me what we already knew from our own experience – this Java strain is a prolific swarmer and you need to act urgently. We have to be mobile and quick in destroying the nests and swarms to prevent further swarming."

De Jong says while the popular bee in Asia is the strain known as *A. cerana cerana*, they actually prefer the European honey bee (*A. mellifera*) to the Java strain of *A. cerana*.

"The bee industry in Asia is keen to control the *Varroa* mite in their countries because of its damaging impact on the European honey bee as well as their native species," he says.

"They use chemical impregnated sticky traps in their commercial European honey beehives to control the mites."

Surveillance methods used by De Jong and his teams include sweep netting and flower inspections for foraging bees, scenting (using melted bees wax and honey to attract bees), sticky traps, syrup feeding stations to attract foraging bees and the use of rainbow bee-eater birds.

These techniques help Biosecurity Queensland officers establish a bee-line and follow the bee's flight path which eventually leads to the nest.

The innovative technique of using rainbow bee-eater birds not only helps to locate bee nests. It is a way of determining if Asian honey bees remain present in the area.

Primary Industries Department



The rainbow bee-eater lunches on a bee. (photo by Scott Templeton)

senior operations manager Scott Templeton is a keen birdwatcher and Biosecurity Queensland has taken advantage of his expertise.

On his last visit to Cairns, Templeton tracked down bees and enlisted the aid of local birdwatchers in tracing the bee-eaters.

"The rainbow bee-eaters have their favorite roosting trees where they return at about 5pm to 6pm every day," he says. "By watching the birds' flight paths we can determine the location of their food source, the foraging bees. Once we locate the bees we can establish a beeline.

"During the night, the birds regurgitate the indigestible parts of the bees in the form of pellets. We lay down groundsheets under known roosts to collect the pellets and bring them back to the laboratory."

Entomologists then pick through the pellets to see if they find the distinctive wing pattern of the Asian honey bee. A new method is being developed to use DNA testing to determine if the Asian honey bee is present.

But De Jong says the most important part of surveillance is public reporting.

"The public support to the campaign to date has been fantastic," he says. "In fact, of the 17 nests and swarms destroyed, 10 were a direct result of public call ins."

"We don't want Asian honey bees in our country and we certainly don't want any parasitic mite gaining a foothold in our industry" **BC**

Alan Harman is a frequent contributor to our Gleanings section.

# BEEHIVE MISTAKES

James E. Tew



*Both bees and beekeepers can make them.*

## Helping weak colonies - too much writing?

Maybe I write about this subject too much. After all, we seem to agree that honey bees are not as vibrant as they were a few decades ago; but in life, we seem to forget the bad and remember the good. Am I, and others like me, just remembering the good bee things of the 70s and early 80s? Maybe to some degree that is true, but one of the few things, of which I am sure, is that today's bee colonies are not as resilient as they were around 30 years ago. Is the end of bees and their keepers at hand? I don't think so. Will our food supply be threatened? It hasn't been so far. Can we do something to help hurting bees? One would think that we could, but in most cases, it's hard to help bees. If bees have something like a "life's philosophy" it seems that it would be that they choose to live or die on their own terms. In general, they simply want to be left alone – and yet here we are – wanting to be helpful.

## Setting the bee stage

This subject is on my mind as it is every year at about this time. For you, right now, it's early Summer and the season is well underway but as I write for you, it's still late April for me. I am dealing with the previous Winter kills and trying to help the ones that survived. As I now do nearly every year I bought some packages of bees to help replace my Winter loss. When I ask beekeeping groups for rough approximations of their Winter-kill rates, it's all over the page. Some lose nearly everything while others lose nearly nothing. Then there's the middle group that just loses a lot. Is this an "average" winter result? It appears so. Small survivors are increasingly common.

## Just an "average" season

In beekeeping, my concept of "average" has been forced to change. During seasons past, I would lose 10-15% of my colonies during the Winter – maybe less. Surviving colonies would build up quickly. Within a few weeks, swarms would be plentiful. Recovering colonies built up quickly and could be split. There were even bee colonies for sale in farm publications. So, if I lost a few colonies during this old-fashioned "average" Winter, no big deal. The losses were easily made up.

Now, I routinely lose 35-40% or more during the Winter. The survivors are frequently pitifully small. Swarm numbers have dropped dramatically and package bees are expensive and queens are "iffy." I rarely see established colonies for sale. As a younger beekeeper with more

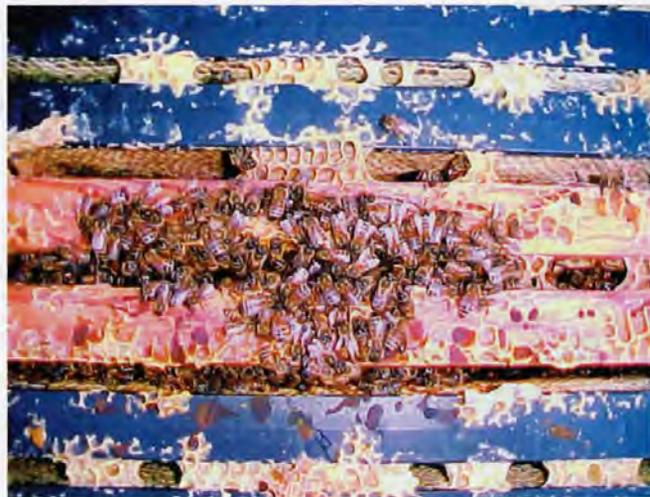
human help, I kept 200+ colonies at Ohio State. If I am lucky, I will have about 40 this season. I keep thinking that this annual situation is just a passing phase. This could not be an "average" season. You just watch – one day soon all will be right again and things will again be properly "average." Would someone please slap me on both cheeks? The old "average" is gone and the new "average" is here for the foreseeable future. CCD, poor queens, poor beekeeping – whatever the reason – the fact is that Winter kill rates are higher, mites are a perpetual problem; survivors are frequently weak and replacement bees are expensive. Deal with it, Jim. Stop whining.

## Really – what can be done to help modern-day small, wintering colony?

Choose your examination day very, very carefully. The Winter day must be one of those rare days when the weather breaks, the air is still, and the sun is bright. Work in late morning so the bees have a chance to recover before the cool/cold of the afternoon returns. Unless it is really to be a warm day or if you and your bees live in a warm climate, don't break the little cluster.

What is the primary information you need from such a small colony? Is there a queen and does the colony have access to food? Knowing either will not solve the little colony's problem. If it is too cold, a ton of honey and the best queen in the world will not prevent the small colony from freezing to death.

Other than combining such a small unit with another



*A small, sickly late Winter colony.*

colony – which may not be the easiest Winter task you can imagine – there is truly very little you can do. Even if they have a queen, so what? Apparently she wasn't a very good one or the sickly colony wouldn't be sickly. You can't really add brood/adult bees from another colony without a major disruption to both colonies.

So, what to do? Insulation? Feeding? Combining? Any of these tasks will cause massive disruption and disturb both wintering clusters. It's hard to be helpful. I sense that, unless you are in a very warm climate, it's too late to help the little colony. Maybe something different could have been done in the Fall, but now in late Winter, the bees seem to just want to be left alone.

### But reality can be bitter

Last Fall, a tall colony and a nuc remained in my home yard. Due to my recent health issues that I have written about elsewhere, both of these units – indeed all of my colonies – only got a promise and my best wishes. I expected the nuc to die. It did. I hoped the tall colony would live. Ultimately, it didn't.

As I described above, I chose my day carefully. I opened the tall colony and found a few bees alive. They still had honey stores. I thought maybe – maybe – I could transfer the small cluster to an observation hive and nurture them in my heated shop. Help them get through to Spring as it were. Most of the cluster was already dead. I don't have a clue why. Misplaced honey stores, I guess. I gently pulled the frame, with a few of the bees dropping off, to search for a queen. Since there were only a few hundred bees, it was a quick easy search. There was no queen. What could be said? This colony was already dead, it just hadn't finished dying. As I put the frame back inside, yet a few more bees dropped off. My impulse was to pick them up and return them to their dysfunctional cluster. Why? So they could die tomorrow instead of right now? I felt disappointment, guilt, annoyance, even disgust. Knowing a colony is going to die is one thing, but the colony actually dying is a bitter experience. Seemingly a waste and there was so little I could do about it. The colony is still back there – dead.

### Helping package bees – too much writing?

This season, I bought 15 packages. Within 36 hours, honey bees from the Southeastern U.S. were free flying in Ohio. They must have been in shock. The weather was cold and rainy and was only going to get worse. In a very real way, helping packages get a toehold is the same as



So – is this queen dead or alive?

helping established bee colonies survive.

Can you believe it? I had everything ready (Thanks to John G.). The empty equipment was ready. As I told you in previous articles, I have been hoarding honey in deep frames rather than supering and extracting, so I had plenty of honey. I had pollen substitute. I even had sugar and corn syrup if the need arose. The one thing I didn't have was good weather. Should I leave them in the packages or install them on a less-than-good day? I released them on a less-than-good day.

I did the deed through my lunch hour. This time of day was as warm as it was going to get and the rain was light and intermittent. I didn't want to risk the bees staying in the shipping cage so I shook them out. I positioned the caged queen between two frames of honey but I did not remove the cork. Remember, the bees were recently from the south and were not properly introduced to the queen in the package. I worked as fast as I could. To forestall bees from taking flight, I tried to close the colony as quickly as possible. Since every bee that took to wing was probably doomed, I wondered if my decision to release them was any better than having them sit in my darkened lab for a few extra days. As the day passed, it became colder and windier. The rain came down heavier. Lying in my warm, dry bed that night, I worried. Did outer covers blow off? Did queen cages drop to the bottom board? Did I lose too many bees that took flight? Do they still have honey? Maybe I should have waited.

### Queen release day

I waited nearly five days before returning to release the queens. On one hand that gives the bees a good, long time to get to know the queen, but on the other hand, it gives the bees a good, long chance to build a large piece of burr comb around the queen cage. The first five releases were textbook. The sixth queen was dead in the cage. I don't know why – she was just dead. Her attendants seemed fine. Of course, on queen release day, it was raining. To be so smart, bees can really be stupid. Each time I gingerly opened a colony, a few bees flew out. I fear that most of them were lost on this cool, rainy day.

### Queen #8 will never be forgotten

Queen #8 came out of the queen cage as though her rear end was on fire. It was raining. I wasn't using smoke. Bees were flighty on this bad day and I had a nervous queen running around like a mentally-deranged bee. Her run behavior turned into a run-hop. I kept trying to gently bat her back to the frame top bars. She became crazier. Then she did it – she managed to get airborne. Haltering and clumsy at first, but she slowly gained altitude. *Stupid, stupid bee* was my only thought. I tried to catch her en-flight. That didn't happen. In the rain, jumping around – grabbing at the air – I must have looked like a clown. I remember thinking that this was a lot like, "Where's Waldo?" the popular children's book series where the challenge is find Waldo amongst hundreds of other figures. Trying as hard as I could to keep her in sight, she was suddenly gone from sight. I chased drones. I chased worker bees. Nothing. Wherever she was, the rain prevented the usual little cluster from forming around her. She was just gone. Where should I step? Should I move my truck? She could be anywhere.

I followed protocol and left that particular hive open

while I uneventfully released the remaining queens. I returned to the open colony with a fired a smoker and gently smoked the frames all the while looking for the errant queen. Surely she found the colony No sign of her – none whatsoever It was a frustrating moment. Somewhere around that colony was a \$20 bug profoundly in the wrong place. I still clung to hope that she was somewhere in the wet, disorganized colony I left the yard.

**Queen #8 apologizes**

I returned to my lab to answer some of your mail and to deal with routine bee issues for nearly three hours. As I left for home, I remembered the queen caper Should I leave the colony alone or go look one more time to see if I could find her on the frames. If she was there, opening the colony would not be a good idea. If she is not there, there is nothing else I could do that day An inner voice said, "Just leave them alone, Jim." I couldn't do that anymore than you could do it. My plan was just to go look at the outside of the colony as the rain gently came down and continue on my way home. I stopped at the yard, but a safe distance from the crazy colony

In clear view, she was about a foot behind the colony on a blade of grass. She was in terrible shape. She was immobile. Absolutely ALL of her flightiness was gone. In

her own way, she was very sorry As I closed my hand around her, I could feel her coldness. I sat in the truck blowing through my fist on her Nothing. Three – four minutes passed. Nothing. Then maybe a tiny, tiny tarsal movement. After 10 minutes of warming she was extremely stiff – clearly alive – but barely able to move. I re-caged her and put her back in the colony within a group of bees. The next day, she appeared fine. For the second time, I released her A week later, all seemed fine. I can't believe she won't be superseded. I will never forget Queen #8.

**Some things go wrong. Some things go right.**

Do what seems logical to make wrong things right. Enjoy the right things when they do go right. Always remember that bees are wild animals and really don't want our intervention. Please understand this – what I have tried to write here is not a negative article. It's just an article. Bees don't always follow the plan. Be helpful when you can, but be prepared to just leave them alone when your help would not be helpful. **BC**

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# a closer Look



## PROBOSCIS EXTENSION RESPONSE

Carence Collison

**PER is a feeding reflex found in honey bees, flies, butterflies and other insects.**

Proboscis extension response (PER) is a feeding reflex found in honey bees, flies, butterflies and other insects that is triggered by chemical or mechanical stimulation of the antennae, foretarsi (front feet) or mouthparts. In honey bees, the PER is elicited when the antennae or tarsi come into contact with nectar during foraging or trophallactic (mouth-to-mouth) feeding in the hive. The reflex is so sensitive it can be used as a bioassay to understand learning and behavior in honey bees, or as an indicator of neurological problems such as memory impairment caused by chemical exposure (Takeda, 1961, Couvillon and Bitterman, 1980, Pham-Delègue et al., 2002) The most commonly used PER paradigm (test design), classical conditioning through odor-learning, trains a bee to extend her proboscis to novel, non-food odors; the success or failure of this training reflects (to some extent) the condition of the bee's brain, her motivation to feed, or her behavioral development. In current research efforts to understand colony collapse disorder (CCD), the most common use of the PER bioassay is to monitor the sublethal effects of pesticides on the honey bee's ability to make olfactory associations (Decourtye et al., 2005). The assay provides insight into the neurological condition of poisoned bees and the bees' ability to function under chemical duress.

Proboscis extension assays are based upon the honey bee's natural ability to find nectar sources from odor cues released by the plant source. In nature, nectar is the reward for a successful odor-food

association, but during PER experimentation, a sucrose solution is used in place of nectar. The concentration of sucrose varies greatly from 0.03%-60% depending on the nature of the experiment and the age and sucrose response threshold of the bees being tested. Odor-learning assays are generally performed on bees of foraging age, since this is when their ability to make odor-food associations is greatest (Ben-Shahar et al., 2000). In a typical odor-learning assay, bees are either reared to a known age or collected at the hive entrance as foragers, immobilized on ice, and secured in such a way that the head and proboscis are free to move, but the bee can not crawl or fly away. Each bee is tested initially for a PER to sucrose solution, and bees that do not respond to sucrose are not used in the experiment. During the first phase of odor-learning, each bee is given a puff of odor to the antennae, followed immediately by a sucrose presentation to the antennae and a subsequent feeding. A record is kept of each bee's response to both the odor and the sucrose. In time, a bee that has a well-developed odor memory will extend her proboscis to the odor alone, requiring no subsequent sucrose feeding.

The PER assay has also been performed without an odor to clarify the relationship between bee age and sucrose response threshold. Previously, it was believed that a bee's proboscis response frequency was more or less related to her physical maturity, being at its lowest when the bee reached the nectar foraging age. Research has since shown that

several factors besides age determine sucrose responsiveness, including state of satiation (to satisfy fully), genetic predisposition (Scheiner et al. 2004), and the presence of brood pheromone (Kralj et al. 2007). Pan-kiw and Page (2000) used a PER assay to demonstrate that a bee's innate sensitivity to sucrose, along with genetic and behavioral factors, determines her particular foraging task (water-, pollen-, nectar-foraging) later in life. An ascending range of sucrose solutions was tested on over 700 bees within their first week of adult life; following testing, bees were marked and released back into the hive. Marked bees were recaptured as foragers and their crop contents and pollen baskets were examined to determine which foraging task they were performing. Comparing the foraging duties to the sucrose response thresholds measured earlier in life, a correlation was evident. Water-foragers had the lowest sucrose thresholds as young bees, and nectar foragers had the highest.

Although foraging bees are generally less-sensitive to sucrose than hive-bound bees, their ability to retain odor memories is much more developed than bees performing in-hive duties (Laloi et al. 2001). For example, Ben-Shahar et al. (2000) observed that in a reversal learning (behavior extinction) test, nurse bees dissociate an odor with a reward significantly faster than foragers. Foragers and nurses were first conditioned to make an odor-reward association through classical conditioning of the PER, and then asked to "unlearn" this association. Nurses performed

significantly better in this test than foragers of various ages; the rate of extinction was thus attributed to behavioral state rather than age of the bee.

The PER assay has proven useful in monitoring the interaction of bees within the hive without disturbing the colony. Grüter et al. (2006) employed the PER assay to prove that bees use trophallaxis (mouth to mouth feeding) to transfer olfactory information about food sources to their nestmates. Bees trained to forage at an artificial feeder filled with linalool-scented sucrose were marked and allowed to return to their hive to share their crop contents with their nestmates. Recruits from the hive were observed at the feeder for three hours, captured and prepared for PER assays, along with individuals of different ages collected from the same hive. Over a period of days, proboscis extension was observed to applications of both linalool and a novel odor (an odor to which bees had no previous exposure). A group of "control" bees (no experience with scented sucrose) was given the same applications. The results proved that bees of all ages acquired some of the scented sucrose from foragers and developed a PER to the linalool odor, but not to the novel odor. The control bees showed no response to either application, proving that the PER was an acquired response to scented sucrose in treated bees.

Currently, the PER assay is helping scientist to evaluate the effects of pesticides on learning in foraging bees that come into contact with these pesticides while gathering and consuming tainted pollen and nectar. The types of pesticides most frequently evaluated in PER bioassays are those considered non-harmful to honey bees, such as certain insect growth regulators, fungicides and miticides (Abramson et al., 2004; Decourtye et al., 2005; El Hassani et al., 2005). Such pesticides are often only evaluated for a lethal dose for honey bees and information on sublethal toxicity is rarely available.

Abramson et al. (2004) demonstrated some of the potential side-effects of honey bees ingesting the insect growth regulators (IGR's) tebufenozide and diflubenzuron in a worst-case scenario of field exposure. Using the PER assay, they trained bees that had been fed one of these insecticides to extend their proboscis

to a non-food odor, and then to discriminate between the trained odor and another non-food odor. They observed that both of these insecticides inhibited the ability to learn in at least one classical conditioning paradigm compared to untreated bees. Decourtye et al. (2005) screened nine different pesticides for sublethal effects on the PER of worker bees in an attempt to determine the oral No Observable Effects Concentration (NOEC) for the following compounds: deltamethrin, ÷-cyhalothrin, cypermethrin, ÷-fluvalinate, prochloraz, triazamate, endosulfan, dimethoate and fipronil. Bees were fed a range of concentrations of each insecticide before undergoing an odor-learning assay to assess the effects of each pesticide on classical conditioning of the PER. Only four of these compounds did not retard learning or cause mortality, although the dosages tested were well below the determined lethal dosage.

It is unfortunate that the PER assay is not a required test in determining the "environmental hazards" information presented on pesticide labels. It is currently the only assay which allows for the standardized testing of sublethal oral doses of insecticides on honey bees, and although the results of this assay can only be applied to foraging bees, which come into direct contact with pesticides, the health of the entire colony ultimately depends on the health of its foragers.

The proboscis extension response is an extremely valuable research tool in analyzing the physiological mechanisms underlying associative learning, memory abilities and behavior in honey bees. Division of labor within the colony seems to be related to individual bees responding to various odors and environmental stimuli that alter their developmental patterns and behavioral responses. Differences in response thresholds of individual bees are believed to be related to behavioral decisions and learning. Once the intensity of a task related stimulus exceeds the response threshold of an individual, the bee starts performing the associated task (Scheiner et al. 2004). **BC**

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# Colony Collapse Disorder

## CCD – The Sign Of Things To Come?

Ross Conrad

**W**hen I'm asked why I am so passionate about keeping bees without using chemicals, I have to reply that while I have long been wary of the impacts that chemicals can have on bees, I think chemical contaminants may be playing a larger role in the increase in honey bee die offs seen in recent years than has been acknowledged up until now. As a result it is my opinion that while we may see a decline in CCD reports (primarily from efforts to increase the overall health of our honey bee populations), we are not likely to see CCD totally go away anytime soon.

I used to believe, like many today, in the current thinking regarding CCD: that it has multiple causes from disease and mite pressures, to chemicals, environmental and dietary stress. However there has been one small detail about this theory that has been bothering me. That detail that has been nagging me in the back of my mind for some time, is the one characteristic of CCD that tends to be overlooked when discussing the cause of colony collapse and typically appears way at the bottom of the list of CCD symptoms: The notable delay in robbing by other bees and slower than normal invasion of the collapsed hive by common pests such as wax moths, small hive beetles (SHB), wasps, and hornets.<sup>1</sup> As far as I can tell, this symptom differentiates the current mass die off from previous large scale bee losses of the past.

While I admit it is theoretically possible that honey bee diseases may have an impact on hive scavengers, I am not aware of any honey bee diseases that also effect other insect species though research is ongoing in this area. While it is likely that we may eventually discover that honey bee diseases may effect other types of native bees in some instances, the ability of such diseases to jump from bees to moths or beetles seems very unlikely to me. Even a clearly recognizable disease such as American Foulbrood with its notorious foul smell is not enough to deter

other bees, wax moths, or beetles. Now I know there are those that will disagree with me, but I find it doubtful that we would be seeing this symptomatic delay in scavenging in such a variety of species if a honey bee disease were the driving force behind CCD.

By the same token, there have been no studies or reports to date of honey bee parasites, such as *Varroa* and Tracheal mites, deterring moths and beetles from feasting on the remains of a dead or weakened colony. In addition, environmental or dietary stress that is not obvious to the beekeeper, has not been shown to be a deterrent to moths and beetles. While the interaction between diseases, mites, dietary and environmental stress is believed to be implicated in CCD, it is hard to see how any of these factors combined would cause a delay in scavenging when none do so alone. This is not to say that they don't have a role to play and are not the cause of many colony losses, but by themselves and taken together these causes of death are not able to explain the lack of moth and beetle activity that has been observed.

**T**here is however, one potential candidate for the cause of CCD that is currently being evaluated and could potentially explain the symptom of delayed scavenging: toxic chemical contamination. Unlike the other suspects, chemicals have already proven themselves capable of repelling bees as anyone who has used a fume board to harvest honey can testify. As a result, it is much more likely that chemicals are also the factor that repels wax moths and SHB.

### Our sea of toxic chemicals

Research at Penn Sate University in 2007 identified 46 different pesticides and their breakdown products in samples of bee pollen, with as many as 17 pesticides in a single sample.<sup>2</sup> Such toxic compounds found in the hive can potentially come from many sources including indus-

trial pollution, toxins emitted from the use of consumer goods (including automobiles), agricultural chemicals, genetically engineered organisms, and chemicals that beekeepers use in and around the hive. To help regulate such chemicals the U.S. Congress created the Environmental Protection Agency (EPA). Unfortunately, the EPA's efforts to protect the public and the environment from harmful chemical contamination have been a dismal failure overall. Now I don't want to sound like I am criticizing the EPA. As I will explain, it really isn't the agency's fault that its founding charter to protect human and environmental health from potentially harmful chemicals has not even come close to being met. Let me outline a few of the many reasons why I believe this is the case.

**W**hen the EPA was created in 1970 and sanctioned with the task of regulating chemicals, all the chemicals that were already used in commerce up to that time were grandfathered in. Additionally, since the EPA is given very limited personnel and financial resources, the agency ends up relying on the chemical manufacturers for the majority of the scientific data that is used to evaluate the safety of the regulated toxins.

When chemicals are evaluated for toxicity, they are studied in isolation. Little thought is given to the chemical's break down products which can prove to be more toxic and longer lasting than the original chemical itself, such as in the case of Imidacloprid Olefin, which is produced as the neonicotinoid, Imidacloprid. Once in use and released into the environment, chemicals, and their breakdown products, will combine with other chemicals already in the environment to form new compounds. The synergistic effects of some of these combinations have proven themselves to be a thousand times more toxic than either compound on its own.

Recent research into endocrine-

disrupting chemicals (the kind often used as pesticides), reveals that the timing of exposure combines with the amount of exposure to produce a chemical's effect.<sup>3</sup> Thus, a certain dose might be very toxic to an organism in its developmental stage, while not having any detrimental effects on the organism once it has matured, or vice-versa. To make matters worse, in some cases low doses of a chemical can be more damaging than higher doses. These new understandings of chemical toxicity have proven wrong Paracelsus's 450-year-old maxim, "The dose makes the poison." Today we know that often the timing makes the poison<sup>4</sup> and that sometimes less is actually worse.<sup>5</sup>

Add to this the many studies that now show that a cocktail of "insignificant" doses of several chemicals each acting on their own can combine to have significant results. In other words, exposure to very low concentrations of several chemicals at the same time can cause biological effects that none of the chemicals would have on their own.<sup>6</sup> Thus when an living organism is exposed to a mixture of chemicals, every component contributes to the overall effect, no matter how minute their concentration.

### Is meaningful chemical regulation actually possible?

All of this makes the task of toxicity testing so complicated that realistically no chemical is going to ever be thoroughly tested for safety either for humans or bees, before being manufactured and marketed. To do so we first would need to know which biological tissues or functions the chemical affects, in what ways, at what potencies, and whether vulnerable populations will be exposed to other chemicals that affect the same tissues or biological functions. Then we would have to test groups

of chemicals in combinations at low and high doses, and several doses in between. We would then have to determine whether the creature being studied (mouse, human, honey bee, or whatever) is impacted by this combination of chemicals at one particular stage of life or another. In humans we know for example that during gestation in the womb, exposure to certain chemicals during one particular week can produce effects not seen when exposure occurs during a different week.

However, none of this testing takes into account the potential synergistic effects of the multiple compounds that already exist in the environment. For example, suppose we wanted to test the synergistic actions of just 1,000 toxic chemicals in unique combinations of five chemicals each. A little mathematics indicates that we would have to test over eight trillion groups of chemicals. Even if we could test the wildly optimistic number of a million combinations each year, it would take us over 8,000 years to finish the task. When we consider that we are presently putting hundreds of new chemicals into commercial channels each year, and we (and our bees) have the potential to come into contact with tens of thousands of man-made chemicals daily, we begin to understand the enormity of such a task.

Even if we stopped producing and releasing new chemicals into the environment today, there are tens of thousands of toxic chemicals currently in use, and a clear understanding of the complexities and expense involved in proper and thorough toxicity testing is unlikely to happen. At this point you might be asking yourself, how on earth did this situation come about? How could we have managed to allow the impacts of our various economic activities to add up to a world so damaged

that the Earth's natural capacity for self-renewal is being exceeded and permanent degradation has become evident? And more importantly, where might we begin in our efforts to fix this mess? I will attempt to begin to answer these questions on these pages next month in part two. **BC**

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Honey Bee diseases such as *Nosema* will likely need to be proven to repel scavenging insects before they can be considered the primary cause of CCD.

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# Good Design, Good Reading



Ann Harman

## Here's your chance to be creative - within limits!

Well, now you are – the newsletter editor. Cheer up! Here is a chance to be creative (within limits) and produce an interesting beekeeper association newsletter that will give the reader (beekeeper) what is needed to be a good beekeeper. The many things that constitute a good newsletter can be broadly grouped into content and appearance. Let's look at content first.

In some ways content is governed by the association's budget. Just be certain that your dues are covering your costs. Your association may be able to afford only two pieces of paper, but that gives you four sides of the paper for your content. Just remember that your newsletter may be the only way you are contacting some of your members – those who are unable to attend some or all of your association meetings.

Content will also be influenced by the frequency of your newsletter. With a monthly one you can have articles that continue from one month to the next. Newsletters that appear less than about four times a year really cause the members to lose contact and subsequently enthusiasm for the association.

One important factor to keep in mind always is that those readers cover the whole range from just beginning to 30-year veterans. Yes, it is hard to keep everyone happy but you do need to find a way to have interesting information for all. Keeping content seasonal is also important.

You can obtain much information from the Internet. However some of it is rubbish and you really do not want to pass that on. Be selective. If it sounds weird it probably is. Some editors want lots of input from members of the association. There are several ways to achieve this. If you just simply ask your membership in general, you probably will receive nothing. However if you ask Beekeeper Joe if he would write a short article on how he feeds his bees you probably will get something. You asked for something short on a particular topic. State as-

sociation newsletters sometimes have reports from regions in that state.

Photographs or not? One problem with photos is the reproduction of them. A full page of photos from the summer picnic that reproduce as blobs of black, and gray would probably be better being a full page of recipes from the potluck picnic. Our digital cameras are doing a pretty good job of good photos. But take a critical look at the reproduced appearance.

A masthead is essential. Not only will your members benefit but also your newsletter may travel beyond your association. The names and contact information for the officers, the editor, the webmaster and the website (if you have one) are essential. Other contacts listed could be the apiary inspectors, legislative contact, librarian, directors, past president, membership chair, program chair, meeting coordinator. A masthead can be on first or second page but I have seen it at the end of the newsletter. Keep it in the same place every issue.

Put some imagination, thought and design into the nameplate. This is usually found at the top of the first page, or on the cover of a multi-page journal. You can have it down the left-hand side (more about that later). One newsletter I saw had the rather dramatic nameplate at the bottom of the first page. I guess the association members are used to it but I did not find it readily because I looked at the top of the page first.

Does your association have a logo? If so, use it in the nameplate. If not, why not make a logo and use it. Does your newsletter have its own name? Many newsletters, large and small, just say "newsletter" and give the name of the association. In second place for popularity is "The Bee Line."

Pieces of paper seem to become detached from their partners and get mixed up with other bits of papers. How about a footer with page number and edition information. Is it page

four from July 2009? Or Summer 2009? Or February 2003? (That one has been floating around for quite a while hasn't it?) Even if the newsletter is living in your computer the footer will let you know which one you are looking at.

Is a newsletter a place for humor? It can be but it can also be out of place. Use caution. If a funny story involves the author of the story and the author wishes it to be in the newsletter you are probably safe in including it. If you see a funny cartoon in a magazine or newspaper remember that it is copyrighted and you need permission to use it.

Beekeeping has its own language. So do other pursuits. You do need to use the correct terms and the ones in most common usage. I think the most abused term is "super" that beekeepers seem to use for any four-sided box of the hive. Running neck-and-neck with "super" are the terms "hive" and "colony." Keep a couple of beekeeping equipment catalogs handy to use as a dictionary for terms. If someone submits an article to you with the terms all jumbled up it is your job as editor to sort it out and put the correct terms in. Remember, some of your readers are beginners who are just learning the jargon of beekeeping. Start them out right.

By the way, you must spell people's names correctly. Some people don't care if it is misspelled, but many do want their names correct. If in doubt, even a tiny doubt, check the spelling with the person.

Will you have any advertising? Some newsletters will advertise member's sale items, beekeeping services, or items wanted. Other newsletters will have ads from large or local equipment suppliers. And some newsletters will have no advertisements at all. You are the editor so it is up to you and your readers. Advertisements, their quantity and size, will have to fit in your overall format. Do not sacrifice good beekeeping information for an overwhelming number of ads.

Now that we have an idea of some of the content, we will see how to put it together so that it is inviting to read. Your computer is your friend – and your enemy. You can certainly use MSWord® to create a newsletter. Word will be adequate for rather simple, straightforward newsletters but it can be quite cumbersome and awkward to use for a creative newsletter. Microsoft Publisher® seems to be a common program and can be made to work well as long as it is only used for your newsletter. The programs of Quark and InDesign are expensive but are versatile and powerful.

You need to choose a font or two. Most recommendations suggest a maximum of two fonts. Keep in mind that serif fonts are the easiest to read for text. San-serif fonts work well for headlines. Two common and pleasant fonts are the serif Schoolbook series and the san-serif Arial series. If your newsletter will be sent by Internet these fonts should not cause a problem. But totally crazy, wacky, off-the-wall, little-known fonts can create problems—arriving at the reader in some form of scribble. Font size for the text is best at either 10 or 12 point. Headlines can be larger. I find that text larger than 12 point makes me feel someone is shouting at me.

You can easily set up a template

for your newsletter so you do not have to recreate one each time. Your goal is to make a newsletter that is inviting to read. If it appears to be overwhelming at first glance it will probably be tossed aside “to read later” and ends up unread in the recycle or delete bin.

Good margins, left, right, top and bottom, should be 3/4 to one inch. Narrow margins make the pages seem too full and may not transmit by e-mail very well. The page must be divided into columns. Type that runs across the whole page from left margin to right margin discourages the reader. It's just too much. Dividing the page into two columns works very well. The gutter – the space between the columns—can be fairly narrow, such as 3/8-inch, and can have a line down it. Dividing the page into three columns usually creates lines of three or four words, making the text “choppy” to read and creating too many hyphenated words.

Justified text or ragged right? The ragged right is the most popular today and it is the easiest to work with. Justified text works best with two columns; with three columns on a page spacing and hyphenated words are the trouble-makers.

You can divide the first page unevenly. This divide seems to be popular at the moment. You will have a one-third, two-thirds divide. The

far left column is the one-third. The right column is the two-thirds. The rest of the newsletter can then be in the two-column format.

Length of paragraph is important. They need to be short. Don't hesitate to make two paragraphs out of one long one. A double space between paragraphs contributes to the overall “easy to read” appearance.

Yes, you can put frames around a few items. But too many fancily-framed items scattered all through the newsletter will end up looking like the boxes of gifts under the Christmas tree. Too many little drawings and little clip arts also scattered around look like the decorated Christmas tree itself. Too much of anything is distracting; a few decorations sprinkled throughout are pleasant, giving a break from endless text. Advertisements can be placed strategically to give relief from that endless text. If a newsletter is pleasant to look at, it will be read. That is your goal.

Now that you have put your issue of the newsletter together you need to read it over from start to finish, every word. Do you have a proofreader to help you? It would be nice. Now just read below and take comfort that typos lurk and wait for us all. By the way, there is a deliberate typo in this article. Can you find it?

#### HOW WELL WE KNOW

The typographical error is a slippery thing and sly. You can hunt till you are dizzy but it somehow will get by. Till the forms are off the presses, it is strange how still it keeps. It shrinks down in a corner and it never stirs or peeps. That typographical error too small for human eyes. Till the ink is on the paper when it grows to mountain size. The editor just stares with horror then he grabs his hair and moans. The copy reader drops his head upon his hands and groans. The remainder of the issue may be clean as clean can be. But that typographical error is the only thing you see! **BC**



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# NATURAL REMEDIES

*These plants flourish in the southwestern U.S.*

Abbas Edun

## AGARITA

*Mahonia trifoliolata* is a suffrutescent<sup>1</sup> plant of the family Berberidaceae. To botanists it is also known as *Berberis algerita*, *Berberis trifoliata* and *Odostemon trifoliolatus*. Its common names are Chaparral Berry, Texas Currant and Trifoliate Barberry.

This plant is native to the semi-arid regions of the southwestern United States. It grows mainly in Central Texas, from the Edward's Plateau westward, with more limited representation in southern New Mexico and Arizona. It also flourishes in the Mexican states of Chihuahua, Coahuila, Nuevo Leon, and San Luis Potosi.

A slow-growing hardy evergreen, it is found in open woods, thickets and pastures, on rocky flats, slopes and cliffs, usually growing independently from other species or in close proximity to trees such as live oak and mesquite. Unlike most members of the genus, this species must have a well-drained soil. It prefers a neutral-to-alkaline one and an arid climate, and can grow in caliche, shallow clay and gravelly soil. It has a low maintenance requirement, very high heat tolerance and can endure drought.

The plant grows about six feet (1.8 m.) or more horizontally; it is a rounded shrub with many strong erect branches radiating out in all directions from a lignotuber.<sup>2</sup> In favorable conditions Agarita can reach a height of eight feet (2.4 m.).

The root has a dark orangish-brown, furrowed bark, often white with lichens; inside, the wood is quite yellow. The stem is somewhat knotty with a yellow inner bark. Its leaves are bluish-green to gray-green and resemble those of Holly (*Ilex*). They are alternate, two to four inches long, and each consists of three coriaceous, palmate leaflets which have three to seven lobes armed with sharp, stiff intimidating spines. Thus, the plant is perfectly adapted for protection from browsing by herbivores such as cattle and deer.

In West Texas papillae are present on both surfaces of the leaves, possibly helping to preserve moisture. However, in Central Texas they are absent, perhaps because the young plants in this area are highly subject to mold fungi.

Inflorescences emerge from bud scales at the tips of the shoot, including newly formed lateral bud scales on long shoots. Numerous small clusters of yellow flowers, up to 1/2 inch wide with six petals and a like number of sepals, appear early in springtime, their fragrance often filling the air. The stamens are opposite the petals, the filament is enlarged, the anther adnate, bilocular, opening by a whitish valve which rolls up from the base to the summit.

The hermaphrodite flowers are attractive to, and pollinated by honey bees. The plant is considered to be a good source of nectar.

Agarita is effective against a wide range of pathogens, i.e., bacteria, such as cholera, *Escherichia coli* (commonly known as *E. coli*), *Staphylococcus* and *Streptococcus*. The rhizome contains certain alkaloids used for medicinal purposes, including berberine<sup>3</sup>, which has marked antibacterial and fungicidal effects and is used as a bitter tonic. Because it is not appreciably absorbed by our bodies, berberine is used orally in the treatment of various enteric infections, especially bacterial dysentery. Agarita is also used to treat consti-

pation, eye infection, fever, chronic indigestion, sinusitis, mouth ulcers and strep throats.

## AILANTHUS

*Ailanthus altissima* commonly known as Chinese Sumac, Chouchun, Copal Tree, Paradise Tree, Tree of the Gods, Tree of Heaven and Varnish Tree, is a rapidly growing member of the family *Simaroubaceae*. Unlike other members of the genus *Ailanthus*, *A. altissima* is found in temperate climates rather than in the tropics. It is native to both Taiwan and northeast and central China. It is a medium-sized upright and spreading deciduous tree which grows rapidly and is capable of reaching heights of 50 feet (15 metres) in less than a decade; however, it tends to become senescent at about 50 years.

The tree has become widely naturalized across the North American continent; it is found in a variety of disturbed sites, from urban areas to abandoned strip mines. Its ability to sprout from the roots and the prolific germination of its seeds has led to its successful reproduction on impoverished soils and in harsh environments.

*A. altissima* has demonstrated an invasive tendency in Australia, New Zealand, many of the American states and several countries in southern and eastern Europe. In those places it often escapes from cultivation and naturalizes in areas with minimal



*Ailanthus*

management. In some countries outside of Europe and the United States, the tree has become so prolific that it has spread to many areas beyond its native range. In some of those areas, it has become a seriously invasive species because of its ability to grow rapidly and to suppress competition with its allelopathic chemicals.<sup>4</sup> The tree re-sprouts vigorously when cut, making its eradication difficult and time-consuming.

In a suitable urban environment, the tree is adaptable to a wide range of soils due in part to the plasticity of its roots. They are shallow spreading, and often develop near the surface of the soil, allowing for adventitious sprouting. Those that are near the trunk grow into large rounded structures, which, it is assumed, are for the storage of water, and may contribute to the drought hardness of the tree. Its extensive root system can drive out other plants and may cause major structural damage to roads and sidewalks.

It produces very long, pinnately compound leaves with up to 25 leaflets, each of which has one or more glandular teeth near the base. The wood of the tree is soft, weak, coarse-grained and creamy white to light brown in color. All of its parts have a strong, offensive odor, which has been likened to peanuts or cashews.

This large handsome tree is often cultivated in the south of England. The flowers are arranged in large terminal panicles of inconspicuous yellowish-green flowers which are visited by honey bees for nectar late in the spring. A dioecious species, the trees are either male, producing only staminate flowers and no fruit, or female (pistillate). The male trees produce three to four times more flowers than the female ones. The male flowers emit a disagreeable odor

that attracts numerous insects; it is reminiscent of *Sambucus* (elderberry) flowers. Honey was once obtained by a London beekeeper who kept hives not far from Kensington Gardens. It was believed, from palynology, that the nectar was mainly from the Tree of Heaven as it was planted on the street in that neighborhood. In North America and other parts of Europe the Tree of Heaven has become sufficiently abundant to become a source of surplus honey; when fresh, it takes on the offensive taint of the flowers, but later matures to assume a high-quality muscatel flavour. It is of a pale greenish brown color and crystallizes after about three months with a fine grain.

Seeds are produced on the female trees in a yellowish to bright red samara, a type of fruit in which a flattened wing of fibrous, papery tissue develops from the ovary wall.

The samaras are 1.5 inches long, yellowish to bright red winged achenes. They may remain on the tree for long periods of time and are carried away from the parent by the wind.

The bark of the Tree of Heaven is valued in Oriental medicine. It contains, inter alia, aianthin, calcium oxalate crystals, ceryl alcohol, quassinin, tannin and isoquercetin, a glycoside that has not been fully researched. In China, the bark is a popular remedy for dysentery and other bowel complaints, and in Korea, the root bark is used in the treatment of coughs, gastric and intestinal upsets. A tincture of the root bark has been used in the treatment of asthma, epilepsy and cardiac palpitations. The root, bark of the trunk and leaves may be used to treat itching, eruptions of the skin and parasitic ulcers. The fruit is used in the treatment of bloody stools and ophthalmic diseases.

## ANTELOPE HORNS

*Asclepias asperula* is a creeping, clump-forming, deciduous, perennial herb. This low-growing dicotyledon is a member of the family Lamiaceae, and is also known as Candlelit, Pleurisy Root, Spider or Trailing Milkweed, Silkweed and, in Spanish, Immortal.

It grows in varying degrees of shade, is very hardy and can withstand extreme drought and high temperatures. It flourishes in arroyos, desert swales, dry plains and pastures, slopes and clearings in oak woodlands, pine forests and rocky hillsides at elevations between 3000

9000 feet. It can be found in a heavy mineral, serpentine soils where few other plants can grow, but does best in dry or moist sandy substrates which are acidic or neutral and well drained.

In the U.S. it is found at a height of up to 6000 feet in Utah and it does well in other southwestern states, such as Arizona, California, Colorado, Idaho, Kansas, Nebraska, Nevada, New Mexico, Oklahoma and Texas.

The plant grows about one to two feet (30-60 cm.) tall, with somewhat decumbent stems radiating outward along the ground from a deep central taproot which is often of enormous size. The gray-brown epidermis is very thick and deeply grooved in adult plants; in the younger ones it is thin and characterized by reddish longitudinal stripes. The narrow irregularly grouped leaves have lanceolate blades four to eight inches (10-20 cm.) long.

*A. asperula* blooms from April to August; its greenish-yellow hermaphrodite flowers have floral whorls of sepals (the calyx) and petals (the corolla). A third whorl, the corona, which looks like a five-lobed crown, is formed by the fusing together of the five stamen filaments. Each lobe of the corona consists of a tubular hood with a horn projecting from its centre. Each of the hoods contacts its corresponding anther. Between each hood and anther combination, there is a tiny dark elliptically shaped glandular structure.

The flowers are an excellent source of carbohydrates for bees and other nectar-seeking insects. Typical of all asclepiads, the plants have a unique and fascinating pollination mechanism in which they rely upon



*Antelope Horns*

specific diurnal and nocturnal pollinators such as bumble bees, butterflies, flower flies, noctuid moths, spider wasps and tachinid flies. They are quite unlikely to set seed unassisted outside the natural range of those insects. Honey bees do gather nectar from the flowers, but they are generally not effective pollinators despite the frequency of their visits. Hundreds of pollen grains are produced in complex waxy masses called pollinia or pollen sacs. The pollinia are connected in pairs by a gland and translator arms.

When a forager lands on a flower, a pollinium can easily adhere to its leg. Once removed from the flower,

the pollinia actually re-orient as the translator arms dehydrate and bend. Upon landing on another flower, the properly oriented pollinia are deposited into a receptive stigmatic groove where they break down and the pollen germinates, growing pollen tubes through the stigma to the ovules in the ovary.

After the flowering period ends, follicles develop and become unilocular fruits formed from a carpel and dehiscing by the ventral suture in order to release their mature seeds. The plant gets its common name from the follicles which elongate and curve as they mature, resembling the horns of an antelope. The seeds

are ovate, about 3/8 inch long and arranged spirally around a central axis. They are a light brown color and tipped with a coma of silky hairs about 1 1/4 inches long. The decided effectiveness of such a coma in wind dispersal explains the wide distribution of the plant in the southwestern states of the U.S.

Cardiac glycosides (CG) are a biologically active heterogeneous group of diterpene compounds that have been recognized for their inherent toxicity as well as their clinical benefit. They affect man's neurologic, gastrointestinal and cardiovascular systems, the last being the most significant. They are secondary metabolites found in a diverse group of plants; a small amount of them is contained in the tissues, including the latex, of Antelope Horns. CG are used in the treatment of congestive heart failure and cardiac dysrhythmia since they can increase the force of contraction of the heart muscles and lower the rate of the heartbeat.

*Asclepias asperula* is used to lessen the severity of sinus congestion and as a laxative. The plant has been used by the Hispanic population of New Mexico and Colorado for hundreds of years to stimulate labor and to assist in the body's full separation and expulsion of the postnatal placenta.

Because the concentration of CG varies with the conditions under which the herb is grown, and their inhibitory action is proportional to the dose, caution must be exercised when using the plant as an herbal remedy to make sure that the dosage is therapeutic and not poisonous. **BC**

*Abbas Edun has been keeping bees in Ontario, Canada since 1979.*

#### References

- <sup>1</sup>*Suffruticose, somewhat shrubby.*
- <sup>2</sup>A starchy excrescence at the base of the stem at soil level or just below. The lignotuber affords good protection against range fires, including controlled burns.
- <sup>3</sup>A quaternary ammonium salt from the group of isoquinoline alkaloids, berberine is found in such other plants as Goldenseal (*Hydrastis canadensis*), and Goldthread (*Coptis chinensis*), usually in the roots, rhizomes, stems, and bark, and is effective against cancer by increasing macrophage activity, i.e., it stimulates the immune system to defend the host from the rampage of malignant cells.
- <sup>4</sup>Allelopathy is the inhibition of growth in one species of plants by chemicals produced by another species.



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# GLEANNINGS

JUNE, 2009 • ALL THE NEWS THAT FITS

## ABF MAKES A CHANGE IN MANAGEMENT

The day-to-day operations of American Beekeeping Federation (ABF) are now being handled by an Atlanta-based association management firm, Meeting Expectations, Inc. Longtime ABF Executive Director Troy Fore will give up that title and assume the role of director of government relations.

Founded in 1992, Meeting Expectations (ME!) provides full-service association management for regional, national and international associations. For ABF, ME! will be handling association management, convention management, newsletter publication, Web site maintenance, membership and member marketing, and financial activities.

The new ABF Executive Director is Robin Dahlen, CAE, who has been with ME! six years. Kari Free-land is in charge of member services and will take incoming calls; she has been with the firm two years.

Fore became ABF executive director (then called secretary-treasurer) in September 1988. He had previously served a number of years on the ABF Board of Directors and Executive Committee. In his new role, he will continue to work closely with the ABF representation team in Washington to see that the interests of the bee and honey industry are considered with regard to new legislation (and funding) and new agency regulations. In addition to government relations, he will continue to serve as the main contact for the media calls to ABF. He will also be tasked with working toward fulfillment of ABF resolutions and policies – principally in connection with government agencies and other industry organizations.

ABF President Zac Browning said, "On behalf of the ABF, I extend deep gratitude to Troy Fore for his over 20 years of service and commitment to the ABF. As executive director, Troy has been a true asset to the ABF and to our industry. Be-

cause of the new challenges facing our industry, the Board of Directors and I believe that Troy needs to focus his efforts on legislative matters for the ABF. His keen understanding of legislative affairs is critical to our organization during these challenging times for the industry. We have full confidence in Meeting Expectations, Inc., handling the day-to-day management of ABF. Members of our organization will receive the best of both worlds; Troy's superb communications and legislative skills, as well as top-notch organizational management and meeting planning services from our management firm. This transition will mark a new era for the ABF, allowing our organization to stand out as the clear and recognized leader in the U.S. beekeeping industry."

"The ABF Board of Directors is seeking to broaden and enhance the management of the organization," said Dahlen. "Meeting Expectations can help do just that – providing the tools needed to move them forward on the path toward this vision and allowing the ABF leadership to focus their efforts on shaping that path. We have an ambitious list of objectives, and we look forward not only to fulfilling those but also to creating new goals for membership growth and expansion."

Fore will remain executive director of the Foundation for the Preservation of Honey Bees, Inc., and independently, he publishes *The Speedy Bee* quarterly and *TheSpeedyBee.com* Web site.

Contact the ABF at 3525 Piedmont Rd., Bldg. 5, Ste. 300, Atlanta, GA 30305, ph. 404-760-2875, info@abfnet.org. The ABFnet.org Web site is being redesigned, as is the bi-monthly ABF Newsletter.

Fore and the Foundation may be reached at P.O. Box 1445, Jesup, GA 31598, ph. 912-427-4018, troyfore@abfnet.org.

## ONTARIO'S PROVINCIAL APIARIST RETIRES



Doug McRory has decided to retire, April 30 2009, from the Ontario Ministry of Agriculture, Food, and Rural Affairs (OMAFRA).

Doug is a graduate of the University of Guelph, with a B.Agr (1968), specializing in apiculture and entomology. He was the Provincial Apiarist of Manitoba from 1967-1971.

From 1971-1983 the McRory's operated a 4200 colony commercial operation in Manitoba.

In 1985 P.W. "Phil" Burke retired from the Provincial Apiarist's position. With this position open, Doug was enticed to return to Ontario and the world of government extension work. He places great importance on the extension aspect of the work.

In 2002 Doug was the recipient of the Canadian Honey Council Fred Rathje award to honour the candidate who "has made a significant, positive contribution of innovative, creative and effective effort to our industry."

Doug has been involved with or the "lead" in working on many projects that have assisted the bee industry. Some of which expand past Ontario's borders.

To name a few of a long list:

- Enabling the commercial production of Russian honey bee stock in Ontario

- Facilitating the registration of Apistan and Checkmite+ in Ontario
- Working with key beekeepers to develop Best Management Practices for the bee industry
- Lobbying for and maintaining Canada's best bee inspection programme
- Actively meeting with all of the 25 local bee associations in Ontario
- Advisor to the Tech Transfer Programme

A 2003 quote by the lead of the Tech Transfer Programme says it all:

"When talking with a bee inspector this summer, I was impressed, but not surprised, to hear how highly regarded Doug is as a boss. He is supportive, enthusiastic and a friend to those who work as inspectors for him. Having traveled with Doug this past summer, members of the Tech Transfer Programme observed his interactions with the beekeepers. Doug knows the families of the beekeepers and is always welcome in their homes. He is directly involved in their beekeeping operations and offers advice to improve their business and to improve the bee industry as a whole. Doug works in the bee industry, but he also is concerned about the beekeepers themselves." (CHC Hivelights February 2003)

Don't be surprised if you bump into Doug on a lake, fishing for the "big one"!



## HONEY FOR SALE

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**INNER ... Continued From Page 10**

in a colony over time. If you have 2000 colonies you'll end up checking 100. Mark them and check just those every time once every three to four weeks. Two people, maybe a day to do that for ether roll, one person two days to put, collect and spot count for sticky boards. I'll bet less after some practice. But that's what it'll cost. How many times? At least once per month for the first three months of the season. If the numbers stay low (see above), then cut back. If the numbers stay up...don't quit.

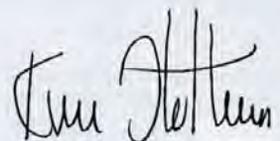
Drone removal...it works. Varroa move in, you move them out. Get that comb in early, do it two, maybe four times, and your varroa population will be low...very, very low. But keep checking. It's not too late to start now Every dead mite is one less to worry about.

Screened bottom boards...it's a one way trip when those mites let go, and even though not many let go... every one that falls is one more that won't reproduce...And besides, these boards increase ventilation and airflow so much that they're worth the work. If only all the manufacturers would make them sturdy enough to last more than a couple of years before they bow out and fall apart. Some do...look for them. A screened bottom would work on pallets if you tried. And cut some weight besides.

But when worse comes to worse and the population gets out of control because you didn't do what you should have done when you should have done it...as a last resort, soft treatments and organic acids work. They're not spectacular but they are predictable. And you can count on them. When you have to, but you shouldn't have to.

And none of these put trash in your hives, mess up your wax, defile your queens, emasculate your drones, or threaten to flush us away when the poison police come looking.

It's time for change. It is time.



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Dear Sis,

If it has been raining as much and as long with you as it has with us, pity you! I wonder if the pent-up energy of your three boys would equal that of my one boy and a man! Billy is always a problem during a rainy spell, but this time I've had Rob on my hands as well, and it has been a great relief to have the sun come out and stay out. Ten days of steady drip with only short recesses made Rob like a caged lion; he was so wild to be out in the apiaries, and to have the bees flying again, that he could scarcely contain himself. He was extremely busy every day, however, for he knew that these rains keep the bees in the hives and swarming would be bad just as soon as they could fly. Such an interruption as this in the work is hard to bear. It is one of the uncertainties of a beekeeper's life that has to be counted upon.

No man who is not a good gambler should ever be a beekeeper. You know they all always figure on a "bumper crop," but there are so many factors upon which the crop depends that it really is a gambler's chance. A beekeeper can control his bees to a certain extent — have them free from diseases and in good condition for gathering — but he cannot control the clover crop, nor the flow of nectar in the clover, nor the weather.

Rob is really philosophical, for he says that if the weather holds from now on we will have a bumper crop this year anyhow. The rains made a fine growth of clover and I never saw so much of it.

I wish your boys had been here to see the swarms we had one day right after the rainy spell. It was the worst swarming time we have had for years, and the fun has just begun! This swarming happened here in the home apiary. One colony started and the others seemed to catch the swarm spirit and followed suit. Such a time as we had hiving them, with five swarms in the air at a time! We caught all but one with an unclipped queen that lodged high in the big oak that the swing is on. Rob couldn't get to it, and in despair resorted to throwing stones, hoping to dislodge it so that it might settle again in a more convenient spot. Instead it flew off to the woods and we had our hands so full that we couldn't follow it.

Six swarms settled one after the other on the little pear tree in the middle of the yard, which makes Rob more firm than ever in his conviction that it is odor which attracts bees in swarming. He thinks the odor left on the tree by one swarm attracts another, and that the swarm odor in the yard excites bees from other colonies to swarm.

Rob always feels discouraged if swarming sets in, although he knows that it cannot always be controlled. He seems to think he is to blame and has failed in his beekeeping practice. I told him, in an effort to cheer him, that bees are still wild animals, and if they have not been domesticated in all these centuries, he needn't think he can do it. He replied impatiently that he does not expect to tame them, but he does think it is about time scientists found out the cause of swarming so that there would be a sound basis for methods of control. At that, Bill spoke up and said, "Why do you wait for somebody else, Daddy? You could find out for yourself," Rob looked thoughtful, and a little shamefaced, as he replied, "Billie, believe you are right. We can't expect the men in the laboratory to find out these things. It is the men who know bees thoroughly that will have to learn scientific experimenting and do it themselves."

So do not be surprised if we set up a laboratory next! We shall not look for you until we hear that Howard is better. Poor little chap! I do hope it is not whopping cough. Our fresh county air will do him lots of good, I feel sure.

With love to all of you, Your loving sister  
Mary

## Letters From A Beekeeper's Wife June, 1917 Swarming Season

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