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Bee

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Bee Culture

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SEPTEMBER 2009 VOLUME 137 NUMBER 9

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Don't Overlook These Standards

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Super Cart

Bruce the layed off tool and die maker (new bee) again. I mailed you the pictures of my raised, bear proof, hive stand in northern Michigan. It did well. With more time on my hands, and an eye for "curb shopping" I picked up a used golf bag cart. As you can see, it is now a fold-up super cart.

Bruce Sabuda
Pinckney, MI



Aloha Kauai

Honey bees were introduced to Hawaii in the 1800s from Oregon to Oahu (main Hawaiian Island) and they multiplied under the care of beekeepers until Hawaii had thousands of hives on all eight islands. I've read that Molakai produced millions of pounds of honey and at one time (early 1900s) was the biggest producer of honey on the planet. Foulbrood wiped out a lot of hives in the 1930s and various attempts to rejuvenate and care for the bees has brought us to the present situation.

Mites have been found on two islands. We are mite free on ours, as far as I can tell. I have never

seen a mite in any of my hives which were all acquired by hiving swarms and removing bees from homes.

The bees are the heart of the business and we try to take the best care of them as possible. I keep my bees far from corn companies and their pesticide spraying. I lost 25 hives when the corn company sprays tasseling corn with Sevin less than 100 yards from the hives. The Sevin mist drifted into my beeyard, knocked me out unconscious, and the next morning all the hives (25) were dead. None survived.

We make a little honey for friends, family and whoever wants it. Life in the fast lane left us sick, with no peace of mind. We keep a few, less than 50 hives and harvest from one hive, five gallons at a time. Shake and brush the bees off of the combs, uncap by hand using a cold serrated knife and hand crank our four-frame extractor and strain the honey through a paint strainer and bottle in quart canning jars. It feels good and friends enjoy the Pure Raw Local Honey. Take good care of the bees, plant fruit and nut trees and nectar producing clovers. And stop using poisonous chemicals.

We have never used chemicals. All our hives are doing fine. The only hives we've lost were sprayed with Sevin. We need to change the world and make it better by making better choices in what we do and doing what's best for the bees by planting more nectar and pollen bearing fruit, nut and flowering plants and stop poisoning the life in all of us.

"Va mau ke ea oka aina i ka pono." (Hawaiian)

The life of the land is perpetuated in righteousness.

Hope you have a happy year with your bees. See you at the swimming hole.

Kawika Moke
Kehaha, HI

More About Ticks

I did not attend medical school, and did graduate from Ozark University; however I do pay attention to the news.

Here are some facts that the Ozark tick expert did not place

Bee Culture Information



in his article that in July's *Bee Culture* magazine.

There are at least six human tick-borne diseases that have been reported in Missouri: Rocky Mountain spotted fever, ehrlichiosis, tularemia, lyme or a lyme-like diseases, Q-fever and the southern tick-associated rash illness.

The number of tick-borne illnesses in Missouri rose to 668 in 2008 – up nearly 100 cases from 2007. State health department officials have documented a 300 percent increase in tick-borne disease in Missouri since 2003. As of July 2007, the MHDSS reported 56 cases of ehrlichiosis, more than double the total number of cases reported in 2006.

Around June 12, the first death related to a tick borne disease was reported when a St. Louis man died from ehrlichiosis. The man contracted the disease from an attached tick.

The MO Department of Conservation is a reputable and reliable source for everything outdoors. The MDC website recommends removing a tick from back to front, as close to the skin as possible and to use tweezers.

The reasoning behind this removal method, is to keep from squeezing the tick and forcing the tick's body fluids from entering your body. Now I have squashed enough bugs to think that this makes sense.

The application of DEET was useful information, however, DEET when applied over pants would provide an added layer of protection when compared to short pants and bare legs.

The Ozark expert's homespun wisdom reminds me of a delightful



story I had heard many years ago while working in Gainesville, VA.

The story goes like this. During a particularly cold spell a man did not show up for work and he did not show for three days. When he finally did come to work his coworkers inquired if everything was alright at home. The man told his coworkers that the radiator in his car had frozen up, and cracked the block. When he was asked how long it had been since he checked the antifreeze in his radiator he said that he never put antifreeze in his radiator. When asked why he would do such a thing he stated that he used Spring water in his radiator. The coworkers were puzzled by that answer and asked what Spring water had to do with anything. The man answered, my daddy always said that Spring water don't freeze and I believe him.

Now I am not criticizing knowledge gained from experience, but there are times when homespun wisdom can prove a danger and I think the Ozark experts article presents one of those instances.

Lou Dreon
Gower, MO

make breathing so extremely difficult that you will end up in the hospital. Result, I now keep an Epi-pen in the house for emergency use.

Given the fact that the reaction is an allergenic reaction, I discussed with a pharmacist my reasoning that taking an antihistamine before actually needing it could minimize the reaction to the venom. The chemistry sounded logical. Therefore, about an hour before working with my bees, I take a minimum of two Benadryl tablets, each containing 25mg of Diphenhydramine hydrochloride. I will follow up with two more tablets if I notice any more than localized swelling following being stung. I will take the final two tablets (maximum dose per day is six) before going to bed. The next day, I use the Benadryl tablets as necessary. So far I have not had to repeat such concentrated dosages. I can testify that this procedure has been effective in limiting the extent of reaction in my body.

One serious consideration when using this procedure is drowsiness/sleepiness. I am very careful not to drive or operate other potentially dangerous equipment/machinery following this procedure.

Perhaps others have implemented this practice, or perhaps medically qualified people can comment professionally.

Charlie Meier
Colorado Springs, CO

Critter Control

In response to reading "Screen Bottom Boards" in the Mailbox section of *Bee Culture*, August 2009, by John Hoffman.

He says "If only all beekeepers would use 1/2" mesh screen as an open bottom board critter guard..." Then he says, "Unfortunately, there are quite a few influential members of the beekeeping industry still advising beekeepers to use 1/8" screen."

On a nice 60° plus day in late March 2009, I did my first thorough Spring inspection in both of my hives, which sit about 100 yards apart from each other, on short hive stand tables made of 2 x 4s. Seeing that the screens on the bottom boards were gummed up with propolis and other matter, I thought it would be beneficial to replace them with a wider mesh screen.

You see, I was more concerned with stuff falling out, not climbing in. Having read about completely open-bottom hives, I figured 1/2" mesh would be okay. I read, and clean, and regrease my sticky boards regularly year-round.

The weekend of April 4th was the first 70°+ day of Spring. Many fruit trees were in bloom, and my two large pink flowering plums were all a-buzz with bees, so I opened the entrances about halfway to give my bees room to move and more fresh air. Around noon we left to go fishing at Crescent Lake, spent the night, and returned the next day, late afternoon. That's when I saw the terrorists swarming both of my hives. I suited up to close down the entrances and get a closer look at these large dark honey bees. While sitting by my hive, which housed a good strong colony, I noticed a small clump of bees and a red dot on the ground under the hive stand. That was my marked queen and some of her attendants! I got a jar and scooped them up and put them back in the hive at dusk when the thieves had gone home. At that time I pulled out the sticky board and found it piled high with dead bees. Then I knew what had happened.

Upon inspection the next day, I found the queen with only a handful of bees. Not a lot of honey was gone because they fought to the death protecting it. My other hive was weak and waiting for a package and new queen, so I wasn't too surprised to find it empty of bees and honey.

I had no idea that robbing could happen in early Spring with an abundance of flowering fruit trees.

Even a healthy strong colony cannot defend the whole bottom of the hive against a vicious onslaught of hungry intruders.

In all this talk of open-bottom hives, and 1/2" mesh screen, I've not heard any talk of potential robbing.

So John, I hope that I am one of those influential beekeepers advising people to stick with their 1/8" mesh screen bottom. Am I really the only that this has happened to? Sometimes I think that there is an over-exaggerated fear of mites that robs us of common sense. But it does sell lots of miticides, too.

Julie Pierzina
Dexter, OR

Allergic

I just read the article, "Allergies to Bee Venom," by Larry Connor, and I must share my experiences.

I have been a backyard beekeeper for years, and I have never enjoyed being stung despite my wearing my complete "bee armor." Even with my total armor, lots of smoke, and a beautiful sun shiny day, I have found some hives extremely bent on protecting their stores. And despite all preparation, I have been stung over one hundred times in a single afternoon by the inhabitants of a strong hive. Strong hives do produce honey more efficiently, but they are not the most easily handled.

I am one of those who has become sensitive to bee venom. And yes, I can attest to the fact that your throat can swell up enough to



INNER COVER

How many cities and towns, mega-urban metropolises, major urban population centers and anywhere else you can think of that until just recently used to ban bees, beekeepers and beekeeping within their confines have had a change of heart, an attack of common sense or a seismic shift in rational behavior and now, today, will let you have bees in the backyard, in the garden, on the roof, fire escape, empty lot across the street, community garden, behind

the garage or almost anywhere you want to keep bees? How many?

And how many have taken advantage of this turn of events and now have bees where bees have never been? Let's try and find out, should we? Let's see where the bees are now.

Here's the deal.

I write an occasional article – some call it a blog – for a web site hosted by Hearst Communications. They publish a boatload of web sites, plus magazines like *Cosmopolitan*, *Country Living*, *Good Housekeeping*, *Town and Country*, *Popular Mechanics*, *Esquire* and others. They are fairly big players in the publishing business, and their sites get pretty heavy traffic because of all the exposure they get in their magazines.

thedailygreen.com isn't a magazine though. It's a stand alone web page that has as its focus "green", and all that implies in today's environmentally sensitive world. They were ahead of the curve when they started, and are doing a good job at what they do, at least in my opinion. They asked me to make some contributions on Colony Collapse Disorder aimed at both the non-beekeeping and beekeeping readership they have, back when it first became news, and for about two years I sent along something nearly every week. The blog is called "The Beekeeper" and it's on the front page sometimes, and buried somewhere sometimes but usually on the "News" page. There's no accounting for location, but there's a search box on the top right (usually) that works. Type in The Beekeeper and a list of articles comes up. I've done some that aren't on CCD, which are the most fun, and generally get the best response.

Anyway, the Editor, Dan Shapley and I were talking recently. There was a new CCD paper out in early August that I reviewed for the column, for the BUZZ and for here. It was the first news on CCD in quite awhile, so it was news, even though there wasn't anything newsy in it. Which is, in its way, news. But I digress.

I wondered if he was interested in something on the monumental growth of city bees and beekeepers and one thing led to another, and below is what we came up with. We'd really like to see where you have city bees, how it's working out, and anything else that will help other city folks do a better job. Here's the release we sent out to his group, the CATCH THE BUZZ list, and some others. And now you...take a look.

Bee Culture Magazine and thedailygreen.com want to celebrate the incredible explosion of City Beekeepers. We want all urban dwellers with beehives and beesuits, with hive tools and smokers, with supers and covers and frames galore to stand and be counted, to be recognized and noticed. We want everyone with five frame, eight frame, ten frame or top bar hives to raise their hands to the sky and shout here I am! We want every and all of America's backyard, roof top, window box, fire escape, empty lot and anywhere else in the city honey-makers to join the hive and let the world know you're alive. Let's get everyone with every hive, in every large or small, crowded or sparse asphalt landscape in towns and cities, suburbs and gardens of America's everywhere and anywhere to share what they do, show what they grow and take pride in their work, their passion

and their hobby. It's no matter if you just started or are already seasoned in city bees. And if it's not Kosher to keep bees where you are, we won't tell, we won't share because we don't care...we only want the world to know there are thousands who are working to make the bees at home. Thousands who want only the bees, only the peace, only the gentle gift of helping things grow.

If this is you, if this is your time, send us a photo, a gift to share with those who share with you, especially those who do what you do. Send a high quality photo, 50 or so well chosen words about your specific, or general location and operation...depending on you, your neighbors and the law of the land where you live. We need contact information so we can get back to you (an email is just fine) if there's a question so we get it right the first time. Please send all this to Dan Shapley the web and news guru at thedailygreen.com at dshapley@hearst.com. He's a whiz at making all this work. When you send your photos and descriptions, you give thedailygreen.com and Bee Culture the right to publish the material and share it with their partners. For details, visit www.thedailygreen.com/bee-photos.

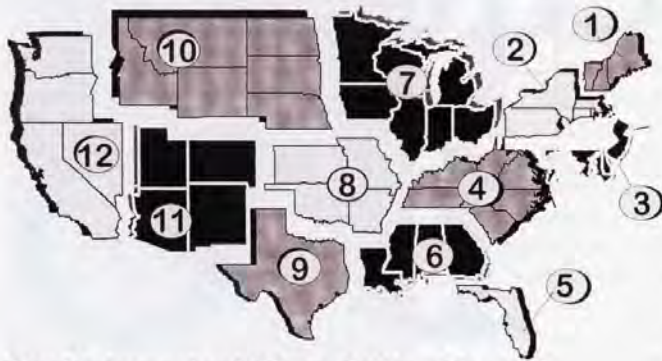
Friends, it's time for the bees. Help us show what you do and how you do it. It's only for those who have, and those who want bees. Be part of the Revolution. UrbanBees Now!

So there you have it. We'll put your photos and short story on their web page and ours, and in the magazine for a few issues so new beekeepers and experienced beekeepers and wannabee beekeepers can look and learn. If we find a story, we'll be in touch and help expand it so even more will have access to what you do.

Continued on Page 62

Show Us UrbanBees; CCD Update

SEPTEMBER - REGIONAL HONEY PRICE REPORT



What's Important When Selling Honey?

We polled our reporters again this month because we wanted to know what marketing techniques were important to them when selling honey. We have done this for four years now and have some comparison data that is beginning to show some changing trends for some things, and stability for others. Take a look at the data. We asked if each item was Important, Moderately Important, or Not Important. The per cent of each is listed for all four years.

Interesting conflicts arise when analyzing the data. For instance, 12 ounce containers appear to be more important to more beekeepers this year, but plastic containers are less favorable. Not sure how that happens. Quarts and pints are still important, but more so in the south and southeast than in the north and west. Overall, the label remains an important part of marketing, and we received the most comments on that aspect of selling honey...as we

should. It's the gizmo that catches the customer's eye on the shelf, but more importantly, it's the message on the bottle that gets old customers coming back, and new customers a way to find you...which is why having your name and contact info on the label remains important. They can't buy if they can't find you.

The price has moved up in importance this year after a couple of years in decline. I imagine the economy in general has some influence, but better cost accounting should be moving the price up as other costs in the beekeeping business are factored in. Labor, I'm sure, isn't one of those.

Putting the variety of the honey inside on the outside of the jar hasn't moved as much as all of us here thought it would. It has been demonstrated again and again that giving your honey a name...Springtime Bouquet, Summer Sun, Autumn Gold...or something similar, gives customers a handle they can remember when they come back next year. And, separating harvests, colors and flavors on your part makes it easier to sell, and lets you charge more for the difference. Try identifying your artisan and varietal honeys next season and see if there isn't a difference.

Use this information when opening new markets, or changing your product in existing markets. Just because what you have now works...it seems... doesn't mean you need to stand still...you are an easy target when you aren't moving forward.

	% Important				% Moderately Important				% Not Important			
	2006	2007	2008	2009	2006	2007	2008	2009	2006	2007	2008	2009
My Label Design	78	87	63	65	14	13	13	32	8	0	25	3
Glass Container	39	49	45	36	31	40	33	41	30	27	23	23
Plastic Container	20	24	23	14	40	49	44	50	40	27	33	26
12 oz. Size	42	34	25	47	37	39	18	21	21	29	57	36
1 lb. Size	64	62	62	59	19	21	28	23	16	17	14	17
2 lb. Size	45	44	38	38	25	20	32	25	33	36	30	37
5 lb. Size	31	44	42	34	28	16	19	28	41	24	39	43
Quart Jar	56	54	50	53	9	12	20	18	36	34	30	29
Pint Jar	43	42	42	49	16	20	26	18	41	23	32	34
Price	68	56	47	62	27	34	47	32	5	10	7	6
Local Honey	97	99	79	84	3	0	15	14	0	1	6	2
My Name On Label	71	80	72	80	18	16	14	13	11	4	15	7
Variety On Label	-	-	23	22	-	-	27	41	-	-	29	37
Time of Year	42	37	18	28	29	36	29	42	29	27	37	30
Store I Sell In	64	55	29	37	10	22	26	30	25	23	21	33

REPORTING REGIONS												SUMMARY		History		
	1	2	3	4	5	6	7	8	9	10	11	12	Range	Avg.	Last Month	Last Year
EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS																
55 Gal. Drum, Light	1.55	1.65	1.55	1.54	1.55	1.58	1.45	1.50	1.40	1.55	1.42	1.54	1.40-1.65	1.52	1.54	1.42
55 Gal. Drum, Ambr	1.48	1.39	1.45	1.34	1.43	1.31	1.55	1.51	1.30	1.33	1.35	1.40	1.30-1.55	1.40	1.41	1.25
60# Light (retail)	141.75	124.50	130.00	122.17	120.00	124.67	133.40	122.40	135.00	141.75	138.33	145.33	120.00-145.33	131.61	134.63	122.53
60# Amber (retail)	131.23	115.00	130.00	118.42	120.00	117.50	123.00	117.50	100.00	131.23	135.00	149.00	100.00-149.00	123.99	127.41	120.07
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS																
1/2# 24/case	63.81	51.95	43.20	46.75	63.81	32.50	46.50	63.81	63.81	45.36	39.90	84.50	32.50-84.50	53.83	55.96	56.20
1# 24/case	93.17	70.37	72.00	66.56	110.00	75.87	73.20	73.92	60.00	97.44	80.20	97.80	60.00-110.00	80.88	79.95	74.03
2# 12/case	74.36	64.08	64.80	58.25	69.00	59.70	62.16	81.00	52.00	75.00	56.13	80.80	52.00-81.00	66.44	69.10	66.14
12 oz. Plas. 24/cs	74.20	63.97	52.20	68.11	60.00	65.50	60.72	62.24	54.00	57.60	73.20	69.90	52.20-74.20	63.47	67.84	60.35
5# 6/case	77.39	75.98	75.00	67.14	77.39	77.50	74.40	80.40	66.00	80.40	73.80	81.00	66.00-81.00	75.53	79.42	74.93
Quarts 12/case	93.33	98.50	66.00	100.39	78.00	79.65	93.00	92.25	102.12	83.97	93.76	97.00	66.00-102.12	89.83	100.74	95.89
Pints 12/case	71.28	56.95	61.95	67.37	58.00	56.50	54.80	57.06	66.00	69.30	48.70	64.00	48.70-71.28	60.99	65.38	59.01
RETAIL SHELF PRICES																
1/2#	3.50	3.15	2.63	3.17	3.78	2.88	3.17	1.79	2.07	2.72	2.95	5.50	1.79-5.50	3.11	3.09	3.00
12 oz. Plastic	4.51	3.74	3.24	3.73	5.50	3.74	3.47	3.58	3.90	3.37	4.10	4.58	3.24-5.50	3.96	3.72	3.55
1# Glass/Plastic	5.00	4.39	4.45	4.86	5.67	4.63	4.05	4.42	4.23	4.65	5.38	6.25	4.05-6.25	4.83	4.56	4.51
2# Glass/Plastic	9.25	7.50	8.30	7.08	8.50	7.23	6.82	8.52	6.83	7.82	7.96	10.37	6.82-10.37	8.02	7.58	7.38
Pint	7.66	7.38	6.50	6.81	5.75	6.10	6.70	5.83	6.50	7.57	7.47	9.37	5.75-9.37	6.97	7.24	6.67
Quart	12.28	9.48	11.00	10.50	12.00	9.25	10.02	10.48	9.50	13.35	11.22	14.75	9.25-14.75	11.15	11.55	10.60
5# Glass/Plastic	19.76	15.11	16.23	16.13	25.00	17.25	15.98	19.00	19.00	15.40	18.60	23.00	15.11-25.00	18.37	17.61	17.07
1# Cream	5.25	5.48	5.98	5.38	5.98	4.75	5.59	5.79	3.39	5.19	6.89	6.87	3.39-6.89	5.54	5.61	6.12
1# Cut Comb	8.00	4.78	6.50	5.88	6.47	4.50	7.42	6.00	6.47	8.00	8.25	8.50	4.50-8.50	6.73	6.68	6.32
Ross Round	6.93	4.65	6.50	4.83	6.93	5.50	6.70	6.50	6.93	6.93	7.13	7.50	4.65-7.50	6.42	6.54	6.15
Wholesale Wax (Lt)	5.00	4.00	2.63	2.91	2.15	4.05	4.56	3.50	3.35	3.00	2.67	3.75	2.15-5.00	3.46	3.57	3.25
Wholesale Wax (Dk)	4.00	3.48	2.50	2.57	2.00	3.42	3.07	2.50	2.50	2.11	2.98	3.11	2.00-4.00	2.85	3.09	2.76
Pollination Fee/Col.	89.76	102.50	67.50	46.83	127.50	55.00	57.60	65.00	89.76	89.76	65.00	115.00	46.83-127.50	80.93	71.98	77.52

a closer Look



UNDERTAKER BEES

Clarence Collison



Undertaking behavior is carried out by only a small percentage of colony members, and usually for only a day or two.

Division of labor is fundamental to the organization of honey bee colonies and is thought to be one of the principal factors in their ecological success. Division of labor is characterized as different activities being performed simultaneously by groups of specialized individuals, which is assumed to be more efficient than if tasks are performed sequentially by unspecialized individuals (Robinson 1992). Colonies respond to changing internal and external conditions by adjusting the ratios of individual workers engaged in the various tasks. This is accomplished in large part through behavioral flexibility of individual workers themselves. Worker honey bees exhibit age polyethism: they pass through distinct behavioral phases during their lives. During each behavioral phase, a worker belongs to a particular age caste – a group of similarly aged individuals that performs more or less the same kinds of jobs for a sustained period of time. Individual variability among workers within an age caste results in an even finer division of labor or task specialization. Some tasks in honey bee colonies are performed by small numbers of bees (a few hundred, at most) and investigators have regarded these as highly specialized tasks (Breed et al. 2002). Highly specialized individuals such as guards or undertakers are thought to contribute to colony fitness by working more efficiently than less specialized workers (Huang et al. 1994).

Undertaker bees specialize in the removal of the dead (necrophoresis) from the interior of the colony. Necrophoresis is a form of hygienic behavior, which is an essential adaptation to social life in enclosed nests. This behavior is distinguished from house-cleaning duties in the undertaker's selection and systematic disposal of dead bees while ignoring debris and other hive contaminants (Visscher 1983). Although most bees die in the field while foraging (Gary 1992), those which die within the nest are promptly removed by undertakers to prevent the transmission of pathogens throughout the colony; brood that dies in the comb for any reason is also cleaned out and discarded.

Visscher (1983) observed the initiation of undertaking behavior by introducing freeze-killed bees into the bottom space of an observation hive and noting the response of workers to the corpses. Several behaviors were

observed of 77 bees encountering a corpse: 10.4% encountered the corpse in their path but seemed to ignore it completely, turning aside or simply walking over it; 36.4% encountered the corpse, antennated it for less than one second and then either turned away or walked over the corpse; 6.5% encountered the corpse, antennated it briefly, drew away again about 1 cm, and then returned to the corpse briefly; 31.2% licked the corpse with their proboscis or antennated it closely for more than one second, 9.1% grasped the corpse in their mandibles and moved it for one to five cm, or pulled on it for 1-30 seconds; 6.4% moved the corpse more than five cm, or tugged on it for more than 30 seconds. The behavior of the bee that actually removed a corpse from the hive seemed more purposeful and rapid than that of bees whose inspections did not result in corpse removal.

The time required for dead bees to be identified and removed is extremely variable, and is affected by such factors as outside weather, crowdedness of the colony and the location of the corpse within the hive. When observing the removal of five dead bees in an observation hive, Visscher (1983) noted that bees were carried haphazardly in a circuitous route, often involving several bees, before exiting the hive. This observation suggests that the specialized bees that finally remove corpses may not always be the bees that carry

“Several studies of undertaking behavior indicate that there is a strong genetic component in the tendency of bees of various genotypes to engage in housecleaning behavior.”

these corpses from deep within the nest. Bees were carried out very slowly or not at all when it rained or the temperature was low. Removal was slower in less crowded colonies, in which the bottom board of the hive was less busy, or when the corpse was far from the entrance, where there were few bees moving about. The consummation of necrophoric behavior may require some time out of the nest, to remove the corpse an appropriate distance from the hive. In Visscher's study (1983), marked honey bee corpses were recovered between 10 and 100 meters from the hive.

The cues eliciting undertaking behavior are at least in part chemical, and according to Visscher (1983), a combination of tactile and chemical cues is likely. Visscher reported that bees will promptly remove dead bees, while leaving stationary debris in the hive for long periods, suggesting that immobility is not the sole cue for removal. He designed an experiment to determine whether bees would respond to immobile objects as readily as to dead bees by constructing wooden models of the same shape and weight as a dead bee and testing them against freeze-killed bees. The dead bees were removed significantly faster than the wooden models, implying a non-tactile cue was triggering necrophoresis. Visscher also compared the removal time of paraffin-coated corpses, dead bees that had been chemically extracted to remove surface hydrocarbons, freeze-killed bees, and bees marked with liquid paper. Freeze-killed bees were removed significantly faster than the others, and of those paraffin coated bees that were removed, some of the paraffin had been gnawed off. He remarked that differences between freshly killed bees and corpses dead for some time, which result in different rates of necrophoresis, seem likely to be exclusively chemical, since the texture of the bees is not altered, and there is no obvious difference in rigidity between the corpses after different treatments.

Gould and Gould (1988) hypothesized that oleic acid released by decaying corpses instigates undertaking behavior. When they applied oleic acid topically to live bees in the hive, including the queen, these bees were seized and removed to the hive entrance by undertakers; once the

“Highly specialized individuals - such as undertakers - contribute to colony fitness because they are more efficient than less specialized workers.”

oleic acid evaporated, the ejected bees were readmitted. Breed et al. (2004) stated that oleic acid is perceived with four other fatty acids (linoleic, linolenic, palmitic and palmitoleic) as a nestmate recognition template by guard bees for the identification of intruders and kin. However, to guard bees, oleic acid is not a cue for rejection and removal, but an important signal for acceptance of other bees; though it must be presented with the other four template compounds to elicit this behavior.

Morse (1972) suggested that undertaking and house-cleaning are complementary tasks. He noted that several successive workers drag a corpse a short distance and then abandon it, until the corpse is finally taken out of the hive entrance. Observations of these house cleaning activities have shown that as many as five bees (the average is three) will participate in the removal of a single piece of debris, even though the distance from the place where the object is introduced to the entrance of the hive is seldom more than 12 inches. Usually only one bee at a time grasps the object. Occasionally a worker may actually carry it away from the entrance, since not all the workers are aware of where the entrance is. Most of the bees in a hive are quick to take action against a foreign object; any bee that encounters the object will carry it at least some distance away from where the bee is working. Even if a bee is already occupied, it will switch at almost any time to an emergency task. Foreign objects are not normally removed from the hive; they are carried some distance from it, so that if they represent a source of danger or infection, they are rendered unlikely to cause trouble. If a bee does die within the hive, the body is treated as a foreign object. Workers carry it to the front entrance, and the worker that flies away with it carries it a considerable distance from the hive before dropping it (Morse 1972).

Several studies of undertaking behavior (e.g. Robinson and Page 1988; Visscher 1983) indicate that there is a strong genetic component in the tendency of bees of various genotypes to engage in housecleaning behavior. Robinson and Page (1995) found that an increased stimulus resulted in increased undertaking but that the genetic background of undertakers recruited into the task came from the same genetic subgroup in the colony population as the original undertakers. Division of labor in honey bees has also been analyzed from an endocrinological perspective (Huang et al. 1994). Middle-aged bees, two to three weeks old, perform a variety of tasks such as building comb, receiving nectar from incoming foragers, guarding the nest entrance or removing corpses from the nest. Only a small percentage of a colony's workers act as guards (Moore et al. 1987) or undertakers (Visscher 1983; Trumbo et al. 1997); most bees apparently never perform these tasks. In a survey of nine different groups of task specialists, the only endocrine correlates of division of labor among similarly aged workers that were detected were for guards and undertakers; both had high, forager-like, blood titers of juvenile hormone, higher than those of other middle-aged bees (Huang et al. 1994).

Trumbo et al. (1997) studied the division of labor between undertaker specialists and other middle-aged workers in honey bee colonies. Individually labeled undertakers, guards, food storers and wax workers exhibited a broad range of task-related behavior, but bees tagged as undertakers were more likely to subsequently remove a corpse from the hive and handle a corpse compared to other middle-aged bees. The activity level of undertakers was similar to other task groups, suggesting that undertaking specialists were neither hyper-active “elites” nor quiescent “reserves” that become active only when a dead bee stimulus is present. Undertakers were also more likely to remove debris and to remain in the lower region of the hive or near the entrance, even when not engaged in corpse removal. Guards and undertakers were less likely to perform behavior normally associated with young bees compared to food storers and wax workers. Undertakers and guards also initiated foraging at earlier ages than the other task groups. These results suggest that under-

takers and guards may be slightly developmentally advanced compared to food storers and wax workers. There also was evidence for lifetime differences in behavioral preferences which could not be explained by differences in adult development. Bees tagged as undertakers were more likely to subsequently remove a dead bee during their entire pre-foraging career compared to other task groups or members of their general age cohort.

Not all bees will serve as undertakers during their lifetime. This duty is carried out by only small percentage of the colony members, and usually for only a day or two (Trumbo et al. 1997). The number of bees assigned to necrophoresis is dependent on the demand for the task. According to Breed et al. (2002), increasing the demand for undertaking resulted in more bees performing the task, and depleting the number of undertakers by removal of bees carrying corpses resulted in new bees assuming undertaking duties at approximately the same rate. Undertakers were observed to remove only dead bees and do not respond to live foreign intruders when they are placed in the core of the colony. The lack of overlap in the task of removing dead bees (by undertakers) and live bees (by guards) could be due either to a low probability of undertakers encountering the live bees or to a low probability of removal by an undertaker (Breed et al. 1992).

Undertaking behavior is one of several different mechanisms that honey bees use to maintain a healthy hive environment and protect their food stores of honey and pollen. This behavior prevents the nest cavity from filling up with corpses where they could transmit pathogens or attract scavengers. Dead bees are usually removed from the hive in much less than an hour, whereas bits of wood or paper usually require much more than an hour, so necrophoric behavior is especially rapid and well-defined (Visscher 1983). Any debris that enters the hive environment is either removed from the colony or, if too large, is encased in propolis. **BC**

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A College Farm Pursues

ORGANIC BEEKEEPING

Sean Clark and Oliver Pogue

Stock selection, forage availability, mite treatments and supplemental food all can be challenges to an organic program.

Stock selection is fundamental to any type of livestock operation, including honey bees. Beekeepers select for or against traits, including honey production, resistance to parasites and diseases, and aggressive behavior, when they manage and propagate hives. In 2007 we began an on-farm research project at Berea College to select honey bee stock that would be well suited for organic production. The horticultural enterprise of the farm where the apiary is located was already certified organic, but previous attempts at managing commercially-available Italian stock without the use of synthetic inputs, especially miticides for *Varroa destructor*, had ended in unacceptably high hive mortality. Therefore we decided to develop an organic management plan and impose it on five different stocks, four of which came with claims or evidence of *Varroa* resistance or tolerance. The fifth was the commercial stock we had been using previously which served as a control for comparisons. The first objective was to find out if there really were differences among the stocks and if the claims of *Varroa* resistance had validity. The other goal was to systematically select for breeding stock most suitable for the organic management system we planned to use.

It's important to understand what meant by "organic management" in general and specifically when applied to bees. The term refers to a production system that is certified by an accredited inspector to be in compliance with the standards described in the Organic Foods Production Act (OFPA) enacted under the 1990 Farm Bill. This generally means that the use of synthetic substances is not permitted, though it does not ensure that products are free of prohibited substances such as synthetic pesticides. Although USDA-certified organic honey and other bee products are widely available in the United States today, the standards are vague and questions remain about what this really means.

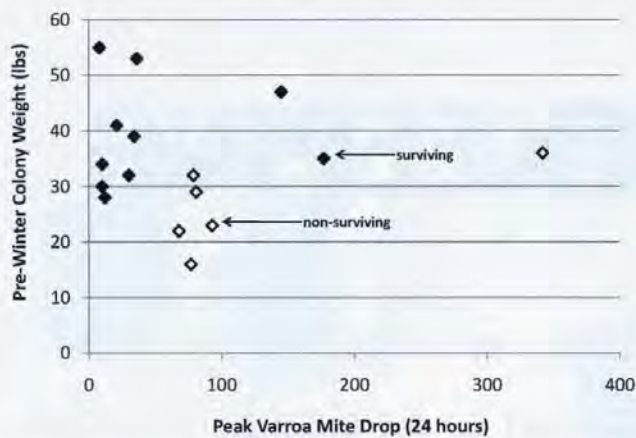
According to the National Organic Program (NOP, 2009) honey bees are considered livestock and therefore should be fed only organic feed and given no prohibited substances. Certifiers, producers, and suppliers of organic honey are using the draft apiculture standards developed by the National Organic Standards Board's (NOSB) Apiculture Task Force (Riddle et al. 2001), as-

suming these will be incorporated officially into the NOP eventually. The Task Force was charged with developing these standards to "establish allowed and prohibited production practices for organic apiculture operations based on the requirements of the Organic Foods Production Act" (Riddle et al. 2001). According to the NOSB Apiculture Task Force Report, hives should be: 1) under organic management no less than 270 days prior to the removal of the product; 2) managed according to an organic apiculture plan that includes adequate record-keeping; 3) located on certified organic land; and 4) provided with sufficient organic or "wild" forage (Riddle et al. 2001). Honey bees are permitted on non-organically managed land as long as adequate forage from organic and/or wild (defined in OFPA § 205.207) areas is available. Any supplemental feed, if given, must be certified organic and no sugar syrup can be provided within 30 days of a honey harvest. Hives cannot be located in areas where the certifier deems there is a significant risk of contamination within four miles. And of course pests in the hive must be managed without the use of prohibited synthetic or non-synthetic materials.

The honey bees evaluated in our project included four Italian stocks and one cross of New World Carniolan and Russian (NWC/Russian) stocks, as indicated by the suppliers (Table 1). The NWC/Russian stock was purchased from a semi-commercial source in northeastern Georgia and produced from open mating according to the breeder. One of the Italian stocks was derived from a survivor hive at Berea College established in 2001 that had had no synthetic chemical pesticides applied to it (referred to hereafter as "Berea survivor stock" or BSS). The remaining three Italian stocks were purchased from commercial sources. The Italian-A stock was from southern Georgia and had no claims of *Varroa* resistance or any other particular traits. This was the stock we had used in previous years with little success. The Italian-B and Italian-C stocks were from Texas and both were advertised as having been developed under non-chemical management for *Varroa* resistance. The Italian-C stock also came with the claim of having the SMR (suppressed mite reproduction) trait. All of the hives were established in April or May, 2007, with three to six colonies of each of the five stocks (Table 1).

All of the colonies were managed for *Varroa* mites with screen bottom boards and regular population monitoring using bottom board sticky traps (Great Lakes IPM, Vesta-

Sean Clark is a faculty member and chair and Oliver Pogue was an undergraduate research assistant in the Department of Agriculture and Natural Resources, Berea College, Berea, KY. For more information about the Berea College Farm go to <http://www.berea.edu/anr>



burg, Michigan). Traps were installed every three to five weeks during the non-Winter months and left in place for a three-day sampling period. A threshold of 50 mites per day (24 hours) was used based on work reported by Caron (1999), Strange and Sheppard (2001), and Delaplane et al. (2005). If hives exceeded the threshold, about a half liter (1 pint) of powdered sugar was applied evenly to all bees in the brood area by taking out each frame individually and dusting all bees present using a canning jar with a screened top. A single application was made each time a hive's sticky trap exceeded the threshold. Although some research indicates that the effectiveness of this method is questionable, our limited experience before beginning the project indicated that it worked nearly as well as commercial thymol-based products.


Due to the high cost of certified organic sugar and protein sources, we provided colonies with a minimal amount of supplemental feed. Colonies were provided with the equivalent of two to four pounds of sugar per hive in granular or syrup form in the late Fall and early Spring. Colony weight was periodically monitored and compared among stocks by first subtracting the weight of the woodenware so that the total hive weight included only adult bees, brood, comb, and food. Honey supers were harvested in July of each year only from the heaviest hives to minimize colony stress and the need for supplemental feeding.

Colonies began exceeding the *Varroa* mite threshold on sticky traps in early August, 2007. Mite counts differed somewhat among the stocks, but there was also considerable variation within stocks. The average mite count

in the Italian-A hives reached a peak of 160 per day by mid-September, two to four times higher than any other stock. At the end of the first complete year (May, 2008) only nine of the original 20 colonies were still surviving. All five of the NWC/Russian colonies survived while all six of the Italian-A colonies had died. The other three stocks had intermediate levels of survival (Table 1). The average peak *Varroa* mite count in colonies that survived the Winter was 48 while in those that did not it was 123. Likewise, pre-Winter weights of surviving colonies measured in November, before supplemental feeding, averaged 39 lbs while in those that did not survive it was only 26 lbs (Figure 1). Both *Varroa* counts and colony weight were statistically significant factors in explaining Winter survival in the first year.

During the second year (2008) the general pattern of *Varroa* mite counts was similar but some hives began to exceed the threshold of 50 mites per day by late July. Peak *Varroa* mite counts averaged 62 in surviving hives and 194 in non-surviving colonies. The average pre-Winter (and pre-feeding) weight of surviving colonies was 51 lbs while in non-surviving colonies it was 30 lbs. After two years of the study only four of the original 20 colonies were still surviving – one BSS and three NWC/Russian.

The project findings confirmed that differences among stocks and sources can have important consequences for the success this beekeeping operation. Though there was variability within stocks, clear differences between the stocks emerged. Combined we lost 50% of the NWC/Russian and BSS colonies over the two years but 100% of the commercial Italian colonies. The Italian stock we had originally attempted to use in previous years was clearly not suited for this management system. Even in the two Italian stocks from Texas with claims of *Varroa* resistance, colony mortality was unacceptably high. Clearly the most promising stocks were the NWC/Russian produced by a beekeeper using organic methods and the local survivor colony. We found that both peak *Varroa* mite counts and pre-Winter colony weights were predictors of survival and could be used as a basis for selecting stock for propagation or possibly for more immediate management intervention to improve colony survival odds if necessary. In addition, the threshold of 50 mites per day seems to be a reasonably effective gauge for action. None of the hives with peak mite counts below 50 in a given year died in the subsequent Winter, while two-thirds of the hives that exceeded the threshold did not survive the Winter.



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Table 1. Honey bee stocks evaluated and colony survival over two years under organic management, Berea, KY.

Stock	Description of stock	Initial number of hives	Number (percentage) surviving after one year ¹	Number (percentage) surviving after two years
Berea survivor stock	(BSS) Survivor stock derived from a single hive, probably of Italian stock established in 2001 that had not been treated with any miticides.	3	1 (33%) ab	1 (33%)
Italian-A	Commercial Italian stock from Georgia with no particular claims about traits.	6	0 (0%) b	0 (0%)
Italian-B	Commercial Italian stock from Texas with claims of varroa mite resistance and that no chemical miticides were used in the breeding operation.	3	2 (67%) ab	0 (0%)
Italian-C	Commercial Italian stock from Texas with claims of the SMR trait and that no chemical miticides were used in the breeding operation.	3	1 (33%) ab	0 (0%)
New World Carniolan/Russian (NWC/Russian)	Semi-commercial stock from Georgia with claims that the bees are derived from open mating of New World Carniolan and Russian stocks and have been managed without chemical miticides.	5	5 (100%) a	3 (60%)

¹Values within this column with different letters indicate significant differences in survival according to Fisher's exact test with Bonferroni's adjustment for multiple comparisons.

The apiary now consists of 13 hives, 11 of which are either original surviving colonies or new colonies derived from those two stocks (with open mating). Our immediate plan is to continue using the 50-mite threshold for treatment with powdered sugar, though the efficacy of the method is still unclear. We will also continue to propagate new colonies from those with the lowest peak mite levels and highest pre-Winter weights in order to maintain 10-20 hives. We've submitted an organic apiculture management plan to the Kentucky Department of Agriculture's Organic Program and are awaiting a verdict. With or without USDA organic certification, we'll continue to select stock that can survive with minimal intervention and no synthetic pesticides and explore alternative methods of suppressing mite populations. **BC**

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Death Of A Drone

Jason Nelson

The life of a drone is one of idyllic pleasure followed by either rejection, starvation or orgasmic death. They do not work in the hive, gather honey or defend it. In fact they skip from hive to hive showing no allegiance to one over the other. The cruel reality of their existence is that to mate, a drone must tear its genitalia from its abdomen and die. Those who do not live to die in mating will be cast from the hive in the Fall to starve. As bad as that sounds, there are worse roles for a drone. It could be a pet for my daughters.

This particular drone shared the same special features all drones have: a round barrel shaped body, eyes that touch on the top of his head and a round abdomen missing any hint of a stinger. He was selected for one property in particular – he wasn't very fast. Some people freeze drone larvae to kill varroa mites. Some people cull drones to reduce the burden on the hive. Some people harvest drones for artificial insemination. Some people collect them as pets for their daughters.

I fall into the last category. My girls understand that a drone can't sting. That it can't bite. That it can safely be stroked, picked up, stared at, handled, even squashed (accidentally, of course). The squeals of delight when I gave my oldest the cage echoed through the neighborhood. There were three arguments before I could remove my suit. Two pushing matches before they could get inside. I should've grabbed another drone.

Bee books will tell you that a drone cannot feed itself. Those bee books were written about unmotivated drones because Dronely, as the drone was soon named, had no trouble sucking the tiny drop of honey I provided on the screen. I tucked the cage away under the laptop where it would remain warm and said good night. The next day I wasn't around to monitor the daughter/drone interaction and things didn't go so well.

Now, let's be clear – when I removed said Dronely from the hive I did not expect him to survive. Still, I didn't bear any particular malice toward him. The problems began when my oldest ate her lunch. She was hungry and therefore, she reasoned, so was Dronely. Dronely would not eat buckwheat honey. He preferred mesquite honey, she said. What a co-incidence – Dronely's taste in honey was identical to my daughters. Well, mesquite it was. Now, a drop of honey seems to be fine. The vast pool of honey provided proved too much for Dronely and he wisely retreated to the other end of the queen cage.

My daughters did not grasp that his crop was smaller than his head, or that the honey in the cage was larger than the drone. They tilted the cage so that the honey would flow toward Dronely because obviously if he hadn't eaten it all he must not know it was there. Dronely was quite aware of the ambrosian avalanche rolling toward him and made a break for the opposite end, crawling through the honey on the way.

Now the cage was sticky so out came Dronely (into a cup, since he could not fly) and the cage was washed

and then dried by hand. Next my girls noticed the drone was still sticky, in a clean cage. So they got wet q-tips, and swabbed the drone. Then re-washed the cage.

Unfortunately, the drone was still somewhat sticky, so they concluded that what it really needed was a bath. It got one. Then the cage was cleaned again and Dronely was put back in the cage, cold, wet, mangled, and stuffed. My daughters noticed that he was wet and cold and therefore decided that the appropriate way to fix that was a hair dryer. Nowhere in a natural hive do you find gale force winds at a 140°, so spare a drop of pity for Dronely. The screen on the queen cage had come loose. The girls couldn't bear the thought of him getting out so out came the scotch tape and the cage was quickly "secured." Fed, swabbed, washed, blown and taped, the drone was put back under the laptop stand where warm air could blow on him. That's where he was when I came home.

Did I mention the cage was slightly wet? Tape doesn't stick well to wet cages. Tape came off. Screen came up. Dronely made a break for it as fast as his six legs could carry him. When the girls came back to "care" for him, He was not there. A hunt ensued and I was quickly assured that Dronely was found. They gathered in the kitchen, petting the back of the bee and talking to it, coaxing it back into the cage.

Meanwhile, over at the laptop, I noticed something moving. Something large and black. Something that looked quite a bit like Dronely, though somewhat more sticky, wet, and mashed than when last I'd seen him.

"Girls, which bee are you playing with?" I asked. The worker bee, who could have stung them at any point was soon released. I took the cage and went back to get Dronely. Unfortunately the forces to which he was subjected are never found in nature. Some will tell you that bees have no ability to reason, no way to see what lies in their future. I disagree. As I approached the laptop stand Dronely scurried to the edge and plummeted to his doom.

My daughters were heartbroken. They insisted on burying him in the queen cage but on the way out I dropped the cage and the dog ate him. It was a tragic end to a tragic day.

"You killed him," said my oldest to her sister "by not feeding him."

"No, Mom said not to dry him with the towel, but you did," said the younger back.

I think he jumped.

"Dad?" said my daughter

"I learned something from Dronely."

"What was that?"

"You should never blow dry a bee."

I guess that will do for now. **BC**



Jason Nelson and his children care for drones, and workers and queens, from his home in Kirkland, WA. Find out more at www.voiceofthehive.com.

HONEY & INFANT

BOTULISM

Ross Conrad

Why is honey the only food that is singled out for a warning label stating that it should not be fed to infants less than a year old?

“Do not feed honey to infants under one year of age” or some similar warning is common on honey labels. This is because honey may contain spores of the bacterium *Clostridium botulinum*. Botulism spores are similar to seeds in that once in a favorable environment they will germinate and grow into their vegetative phase. Infant botulism is caused when enough *C. botulinum* spores enter their vegetative stage and start growing rapidly in an infant's immature digestive tract producing a toxin that impacts the child's neurological functions. Newborn babies lack the intestinal micro flora that prevent healthy children and adults from getting sick after ingesting *C. botulinum*. About half of reported cases of infant botulism have occurred in babies less than two months old. While it is believed that by six months of age most infants will have developed their intestinal flora to the point where they become resistant to *C. botulinum*, an additional six months has been added to the warning by the national Center for Disease Control (CDC) as a safety factor

Symptoms of infant botulism include muscle weakness or loss of control such as droopy eye lids, weak cry, feeble sucking, drooling, lethargy, irritability, constipation, and progressive ‘floppiness,’ all of which may follow an initial fever. An infant exhibiting these symptoms should receive prompt medical attention. Recovery is almost certain as long as the condition is diagnosed and treated early and the baby has not gotten brain damage. Infant botulism should not be confused with food borne botulism resulting from the consumption of preformed botulism toxin that can sicken older children and adults.

Infant botulism can occur in babies that are not fed honey. This is because *Clostridium botulinum* spores are

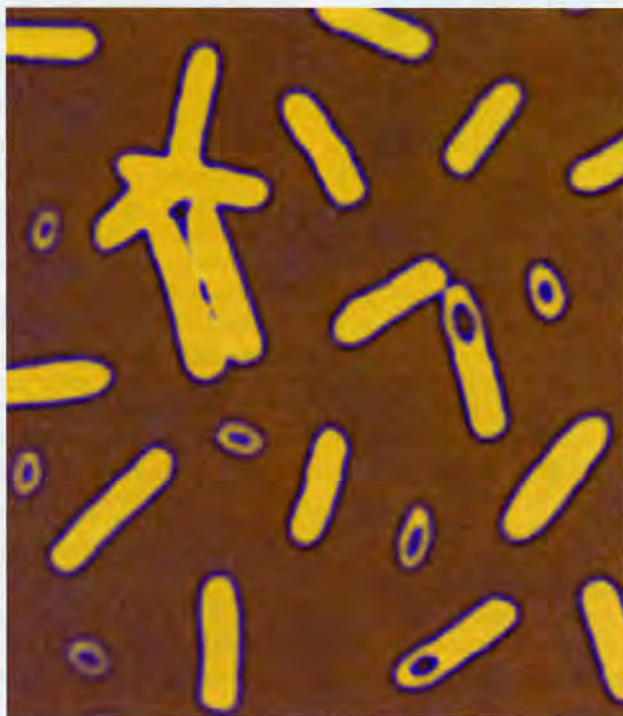
ubiquitous in our environment and found in soil, water, and on dust floating in the air. It is not known how many spores must be ingested before infant botulism will occur, or why only some babies seem to become sick. However, it does seem that chances of contracting the illness depends a lot on the immediate environment of the infant and the

overall health and susceptibility of the baby. Infants may contract botulism from the surfaces in the environment, breathing dust in the air or from water or food, as most foods will contain *C. botulinum* spores unless they have been processed in a way that has cleaned off or destroyed the spores and bacteria. The states of Pennsylvania, Utah, Arizona and California tend to have higher instances of infant botulism than other states. It is believed that these states may have soils that have higher than average levels of *C. botulinum* spores.

C. botulinum in its vegetative stage can not survive in honey due to honey's antibacterial and antimicrobial properties that are well documented. In fact, when honey is ripe with a moisture content below about 18 percent,

nothing harmful to humans can grow in it. Raw honey that is ripe is the only natural unprocessed food that, for all intensive purposes will never spoil when stored properly in an air tight moisture proof container

There are several ways that honey inhibits the growth of bacteria and mold. The high sugar content and pH of honey inhibits the growth of molds and other pathogens in much the same way that sugar is used to preserve jams and jellies. Raw honey that has been unheated and unfiltered also contains the enzyme glucose oxidase which converts into hydrogen peroxide and water as it breaks down. In addition, honey is hygroscopic. This means that it draws moisture to itself. As a result, when honey comes



in contact with bacteria, it will suck the moisture out of the bacteria killing off the microscopic critters. In fact, if you have botulism growing in a petri dish and add raw honey, the honey will kill the botulism. Given that honey itself will kill off botulism in its vegetative stage and that *C. botulinum* spores are prevalent throughout our environment and thus present in many foods besides honey, why do we focus specifically on feeding honey to infants under the age of one?

To date I have not been able to find any documentation of a single case of infant botulism that can be proven to be caused by honey. This may be because it would be considered immoral to conduct a study where babies were purposely fed honey contaminated with botulism spores in an effort to clearly prove cause and effect. However, this begs the question: why is honey the only food that is singled out for a warning label stating that it should not be fed to infants less than a year old?

When researchers investigate instances of infant botulism, they find that in most cases the child has not consumed honey, however there have been some cases where the babies had been fed honey at some point prior to getting sick. When this information is combined with the fact that about five percent of the thousands of honey samples tested have been found to contain *C. botulinum* spores, this identifies honey as a risk factor and establishes a correlation between honey and infant botulism. This is the reason why the CDC, the American Academy of Pediatrics (AAP), Health Canada, along with other public health associations and the National Honey Board all agree that there is enough of a scientific link between honey and infant botulism to warrant the precautionary measure of a warning statement. However, any scientist worth his or her salt will tell you: one of the most basic principles of science is that correlation does not prove causation. This basic truth seems to be what the CDC, AAP, Health Canada, and National Honey Board want us all to forget.

Now don't get me wrong, I am not claiming that just because it has yet to be definitively proven that honey is a cause of infant botulism that it is impossible for babies under one year of age to contract botulism from contaminated honey. After all, high concentrations of spores have been found in honey at times. What gets me is that the same can likely be said for many other foods. As a result I will admit that while label warnings may be prudently cautious and appropriate in the case of honey, I am at a loss to understand why honey is the only food item singled out with regard to carrying a warning statement.

Where are these spores coming from in the rare cases where honey has been found to be severely contaminated with *C. botulinum* spores? Some scientists believe that high concentrations of botulism spores may enter honey during rare and extreme conditions within the hive, or when dead bees get into the honey. However, since botulism spores can not grow in nectar that is being processed into honey inside the hive, nor can it grow in ripe honey that is in the comb or in the jar, it seems most likely that contamination occurs sometime during the honey harvesting, extracting, and bottling processes.

Efforts to produce honey free from botulism spores start by thoroughly cleaning your honey processing area, and all equipment prior to use for extracting and bottling. Everyone involved in the processing of honey should wash their hands before work. These are common sense actions that should be done by everyone on a regular basis anyway.

If you want to go the extra mile, open windows should be closed to prevent dust buildup. To be extra cautious, outdoor shoes should be left at the door and only clean indoor shoes should be worn while processing the honey so as not to track dirt into the processing area. As unlikely and inconvenient as these last suggestions sound, they may be the easiest way to ensure your honey is free from significant numbers of botulism spores, especially if you keep your bees in one of the states identified as a higher than normal risk. While it is possible to irradiate honey in order to kill off any spores it may contain, such measures are inconvenient and expensive, and well beyond the reach of an average beekeeper.

If you are among those of us who are unable, or simply unwilling to take such measures to ensure your honey's purity, then err on the safe side and only sell your honey to customers that are older than one year of age. **BC**

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2010 ALMOND POLLINATION

Water, Honey & Nuts

Joe Traynor

2006 was a watershed year for almond growers. The price of almonds hit a record \$3/lb, yields were good and almond consumption was increasing at double-digit rates (over 10% annually).

Things slowed down in 2007-2008 as almond prices dropped to \$2/lb – still profitable and well above the \$1.25/lb that most almond growers figure as their break-even point. Current almond prices are around \$1.45/lb and holding, but the \$1.45 figure is for the premium Nonpareil variety (about 40% of California's acreage). Prices for hardshell varieties (about 20% of state acreage) have dropped to \$0.90/lb, well below the cost of production.

At \$3/lb, almond growers pulled out all stops to increase yields. Many upped their bee supply by ½ colony/acre, looking at the extra bees as good insurance against poor weather during bloom.

Bee colony use went from two colonies/acre to as high as three/acre for some growers. Not all growers increased their bee numbers, but enough did to create a strong demand for bees from 2006-2008.

An increase in almond acreage from 600,000 acres in 2006 to 700,000 acres in 2009 also contributed to the robust demand for bees.

The increased demand for bees, coupled with the well-publicized problems in the bee industry caused growers to bid up the price of bees during 2006 to 2009. Average bee rental prices for almonds jumped from \$80/colony in 2005 to \$150/colony in 2008 with prices for super-strong colonies approaching \$200. The U.S. bee industry responded to the increased demand for bees by increasing colony numbers. Instead of focusing on honey production, beekeepers devoted their efforts towards increasing colony numbers for almonds. Honey production was sacrificed during the Spring and Summer months in order to divide honey-producing hives to fill the demand for almond bees

the following February. Many honey-producing beekeepers discovered that they liked the switch – almond pollination was a sure, fixed source of income while honey production was hostage to the weather and the whims of market prices for honey. Honey production for individual beekeepers dropped as their colony numbers increased.

The 2009 almond pollination season will be remembered as “the year everything changed.” 2009 was the first time in recent years when the supply of almond bees exceeded the demand. All this in the wake of widespread publicity on CCD, which peaked during the Winter of 2007-2008. Lower incidences of CCD in 2008-2009 were likely due to a combination of a virus running its course and beekeepers being able to afford better care of their bees (via almond income). Along with increased colony numbers and less CCD came a third unanticipated factor: reduced demand by almond growers. Growers decided to remove some older orchards that were not profitable at the lower prices. Water shortages throughout the state caused some growers to go into a maintenance mode: sacrificing yields for the current year by reducing irrigation in order to keep the trees alive until the water (and almond)

situation improved. Nursery orders for 2009 almond plantings were cancelled. Almond growers, squeezed by low commodity prices and higher input costs took a hard look at their operating costs with many deciding that reducing bee rental costs was the best way to reduce total production costs and that maybe they could cut their bee requirements by half a colony/acre.

Many Midwestern beekeepers bring their bees to California in October-November every year without an almond pollination commitment because they have always been able to rent them in the past, sometimes at a premium price. This year, the anticipated demand for almond bees didn't happen and beekeepers were forced to negotiate price with growers that held the upper hand.



Blue Diamond photo

Significant numbers of these beekeepers wound up losing money on almond pollination, some were lucky enough to break even and some were totally shut out of almond pollination and lacked sufficient funds to return their bees home.

Determining Rental Prices

What is a fair rental price for almonds? A fair price is determined by first getting a firm grip on operating costs and then adjusting pollination fees accordingly. Dr. Michael Burgett (Oregon State University) has published the *Pacific Northwest Honey Bee Pollination Economics Survey* every year for the past 23 years. This survey performs a tremendous service for all beekeepers as it gives them a handle on pollination prices and operating costs. The current Survey (see Summer 2009 *Speedy Bee*) gives an average annual hive maintenance cost of \$178/colony with a range of \$132 to \$225/colony. Burgett politely suggests that “beekeepers should try to be more precise in calculating their operating costs. If you can’t answer the question of your operating cost on a per colony basis, you need to adjust your operational accounting.”

Burgett makes a trenchant point: *How can you set pollination fees without knowing what your operating costs are?* I know of no beekeeper that can give me a precise figure on his operating costs. My guess is that most beekeepers set pollination fees (for almonds, or for any crop) that are below their operating costs for that particular crop. In contrast, I know of no almond grower that does **not** have a firm handle on their operating costs – I have seen their accounting sheets that neatly categorize every operating input. These sheets include a column for ROI (return on investment). There are probably some out there, but I don’t know of any beekeeper that has ROI down on paper or in his head; some have never heard of the term.

Beekeepers can, perhaps, be excused from their lack of knowledge on operating costs as these costs can vary widely from one year to the next – unlike almond growers, there is no typical year for beekeepers. With the recent *nosema ceranae* scare, beekeepers that had never invested in fumagillin are winding up with a significant fumagillin bill (and, as others have pointed out, it is not clear that this money is well spent). With almond growers demanding stronger colonies, beekeepers’ supplemental feeding bills have skyrocketed in recent years. Honey production costs can vary widely from year to year as can queen replacement costs. In determining operating costs, a three-year average will produce a more reliable figure than costs in any given year. A beekeeper that makes 150 lbs of honey/hive and gets a 90% take on his queens one year, but only 20 lbs and a 20% take the following year would be best off averaging the two years when setting pollination fees.

The 2010 Almond Season

Pollination prices for 2010 almonds are currently

\$10/colony below 2009 prices (2009 prices ranged from \$145 to \$195/colony). They could go up if beekeepers that got shut out of almonds in 2009 decide to stay home in 2010 – they could go down further if they don’t. Based on the 2009 season, the best advice for beekeepers is: *don’t bring bees to California unless you have a firm, written almond contract.*

Almond growers are becoming increasingly aware that bee colonies can vary greatly in strength – most are willing to pay a premium price for colonies of 8-frame strength or better. Some pay a bonus of \$10/frame on colonies exceeding 8 frames. If you want to get top dollar for almond bees you will have to invest in a supplemental feeding program. If you don’t have a good September-October bee location (e.g., rabbit brush or blue curl) you will have to provide supplemental feed in Sept-Oct in order to get strong almond colonies. And yes, before investing money in fall feeding, make sure you have a firm almond contract in hand.



The Future of Almond Pollination

Long range, almond prices will bounce back up, and almond pollination fees are likely to follow. In spite of record crops and current global economic woes, almond consumption has increased by 7%. Consumption will go back to double-digit figures when the current economic crisis is over (in late 2010?). Almond acreage has leveled off at 700,000 acres and will hold at that figure for the foreseeable future (it may decrease if

the water-short west side pulls out significant almond acreage). Once almond prices return to profitable levels, almond acreage should increase, but this won’t happen for a few years.

With current strong honey prices, many beekeepers that have brought bees to almonds will return their focus to honey production, especially if almond pollination fees continue to decline. It may be a few years for the supply-demand equation for almonds to settle out but when it does, almond pollination should continue to be a major source of income for U.S. beekeepers.

Water Woes

California farmers are calling our current drought a “Regulatory Drought.” Millions of gallons of water are flushed into San Francisco bay each year in order to preserve the habitat of the delta smelt, an endangered species. This is water that could be going (via a permanent aqueduct) to San Joaquin Valley farmers, including many almond growers. The science behind the water dumping has been challenged (it has not been demonstrated that sending more water to farmers would be detrimental to the delta smelt). It is federal regulators that are calling the shots – the state has no say. If you bring bees to almonds from other states, contact your congressman to get behind providing more water to California farmers. **BC**

Joe Traynor is a pollination broker in Bakersfield, CA.

GOOD

THE MEDIA

Eugene Makovec

An international media survey released by the BBC identified the U.S. as one of three industrialized countries whose citizens trust the news media even less than they trusted their government.

Much of that distrust is due to reporting scandals that pop up periodically. The Boston Globe, New York Times, Washington Post and CBS News have all been forced to discipline reporters for plagiarizing or even fabricating stories. Columnists have been fired, and one reporter even returned her Pulitzer Prize. (Her story was a great one – it just wasn't true.)

But I also believe that as more people come into contact with journalists, they come away with their own personal reasons for skepticism. This has certainly been the case with me. I have been featured in local media on a half-dozen or more occasions (most bee-related), and almost all have left a bad taste in my mouth.

My journalism degree may make me more sensitive than some to poor reporting. But just as you don't need a football background to be critical of a dropped pass or a missed tackle, I don't think it's unreasonable for an ordinary reader or viewer to expect reporters to get their facts right.

People are always calling to my attention the latest bee-related stories they've seen in the print or broadcast media. And I don't think I've seen more than a couple where the reporter got everything right.

Granted, some issues are debatable, like the number of bees in a hive or the particulars of the waggle dance. But many of the "facts" I've seen have been way off the mark. One local weekly here in St. Louis, in a feature on a historic neighborhood, mentioned the existence of a "bee tree." It had been there for years and, to their credit, residents not only tolerated the bees but were happy to have them. After all, said the reporter, the existence of such a hive is a known deterrent to so-called African killer bees. This was stated matter-of-factly, and not in any way attributed to anyone in particular.

Several years ago the St. Louis Post-Dispatch's science reporter (!), in an error-riddled story on Africanized honey bees, made the statement that "all the workers are males." I emailed the guy with a polite list of corrections, and did not even receive a response.) A *Time Magazine* article stated that tracheal mites "can kill an entire hive in a matter of hours" Hmmm.

But my all-time favorite has to be this gem from a St. Paul, MN, weekly. In an article called "The Secret Life of Apiarists", the reporter cites as her main source "my friend Lorraine," who had recently attended a beginning beekeeping class. People's fear of bees is largely unfounded, the reporter writes: "Lorraine said bees only sting at night, when they're crawling around and it is possible to step or lean on them." On the downside, she writes, beekeepers are forced to kill large numbers of their stock, as "bees multiply really fast ... hives are divided

ADVICE

MITE THINGS

Dick Marron

Sometimes truth is stranger than fiction. Training a pigeon, not one of our smartest creatures, to do anything, may seem like science fiction. Listen up. Back when World War II was getting tooled up, a rising psychologist by the name of B.F. Skinner got a grant from the government. His mission was to train pigeons to fly guided missiles. You heard right. That he got the grant is not strange if you follow the governments' doings. That he actually trained a few Kamikaze pigeons is the weird part. Remember, this was in the days when vacuum tubes were the heart of radio; radio was not reliable. It got better and the project was scrapped.

Dr Skinner was a comer and did a lot of work with pigeons. He is the person that is responsible for the system now in use to train animals and humans to do a variety of things. It is the backbone of one of the psychologies. Reinforcement theory is one name I remember. If you want to look it up try, "Operant conditioning." When you praise your children for good grades you are using it. When you divert attention from adult conversation to attend to an interrupting 3-yr old you are reinforcing that behavior too.

One of the things old B. F. did was to cage a pigeon in an enclosure that had a drawer that would open up with a pellet of food on it. There was no other furniture. It was a little like they way we keep prisoners in our jails; an empty room with a slot in it for food. I digress.

The hungry pigeon learned to keep a close eye on that drawer. If you wanted to train a pigeon to peck at a button when a bell rang you would first key the food drawer to the button. Then eventually, the pigeon would peck at it and get the reward. Then you would start only opening the drawer when: 1. you rang the bell and 2. The bird pecked the button at the same time. If you wanted the pigeon to hop twice on one leg when the bell rang and then circle the cage before finally pecking the button and getting fed... it would be easy to do. Of course the successful conditioning of the bird would have to be "rewarding" to the experimenter, otherwise what would motivate him/her?

As you might guess, the drawer was programmable to a certain extent. What do you think would happen if you forgot to reboot the computer and left the helpless drawer to open once each ten minutes? Do this and you get a "superstitious pigeon." The bird will be doing *something* when the drawer opens. By the law of averages the bird will eventually be doing that same *something* again when the drawer open another time. And a gain. Don't forget, the psychologist is at home in bed the clock is doing the work. When the lab opens in the morning there will be a hapless bird demonstrating how (he thinks) he opens the drawer. He may be preening his feathers or dragging a wing on the ground. His *something* will be a random act like pecking his foot, etc. With what a pigeon has to think with, it's not fair to say he *thinks* he opens the drawer

MEDIA

regularly and ... if this procedure continued indefinitely, the beekeeper would eventually end up with thousands of hives, too many to maintain." It's okay though, this mass murder of bees; Lorraine "assured [the reporter] it was painless. They roll in the snow and go to sleep."

All this stuff can make for great entertainment, but it makes one wonder: If they are so far wrong about the things that I know, how can I trust them on the things that I don't? What about economics, or politics, or the environment? I think the key is, you have to take everything with a healthy dose of skepticism.

Based on my own experiences with reporters, whenever I watch or read anything in the news, I try to keep the following points in mind:

- Words between quotation marks *are not necessarily* a quote. They may be a summary of what you said, written the way the interviewer wishes you had said it. A story looks more credible if it contains quotes, and if a good quote is not available, it can be manufactured.
- Originality and imagination are secondary to cute catchwords. Hackneyed phrases like "a honey of a hobby" and "the buzz about beekeeping" were clever when they were first used during the reign of Ramses II. Now they are just annoying.
- Journalists are not good with details. I know this is harsh, but here's a prime example: After an extensive interview with a local beekeeper Bob, and a tour of his honey house, a reporter came away with, "Starting in mid-July, the honey-flow activity begins." (How's that Anchorage yard doing, Bob?) In addition to being about two months off, this statement is in the form of a quote attributed to Bob. (See first bullet point above.)

Like the old adage says: Don't believe everything you read. Journalists have their biases like everyone else; if a reporter is scared of death of bees, the likely result will be a story with a sensationalist spin. And remember, reporters are usually working under tight deadlines; as much as they'd love to get the story right, their main concern is getting it finished.

The irony is that as media outlets try harder to connect with the community via human interest stories, sloppy and sensationalist reporting ends up alienating the very people whose lives they are spotlighting. Imagine calling your friends and family to tell them you're going to be on TV or in the paper, only to find yourself misrepresented, misquoted or, worse yet, the butt of some anchorman's joke. All of these things have happened to me. (Not that I'm bitter or anything.)

The more I think about it, the more I think maybe

MITES

His behavior has become conditioned!

If you've read all this way without a bee fix, you are doing well. Here's the connection. Whenever I hear of a new cure for a bee disease or pest, I think of that pigeon. Mite loads and honey yields as well as disease come and go. If, just before that change, the beekeeper did *something*, it's easy for him to believe he caused the change. If the outcome is a year away, as in wintering success, the false confidence is harder to displace. Spraying or puffing various things for mites is just as problematical. I'm told you can get a mite-drop with water. Somewhere there is a beekeeper that sings a song to his bees before he opens the hive and talks throughout his inspection with the assumption that he is calming the bees or that they recognize him. (What? You've never done this?)

Researchers, of course, know all this and plan for it. But if you don't think humans can act like pigeons, consider what happens when you misplace your keys. You look in the three most likely places and then you do a more general scan. Then you look in the same three places *again*. Then you do another scan. Then, in defiance of all common sense unless someone holds you back... you will look in the same three places *yet again*. *Maybe they came back?* No, it's just that in the several other times they were misplaced you were *rewarded* for looking there by actually finding them!

I hope this was of interest. It was rewarding for me to write it. **BC**

Dick Marron is a retired psychologist, living in a beeyard in Connecticut.

the Pulitzer board was too hard on that Washington Post reporter. I know it sounds bad when a writer pulls both her story and her sources out of thin air, but at least no real people were hurt in the process.

I'm not suggesting that we all shy away from reporters from now on. Our industry can certainly benefit from media attention, and it can be pretty cool to be the subject of a human interest story. I'm just saying that, should the opportunity arise, speak slooowly and deliberately. Only a small fraction of what you say will end up in the story anyway, so try not to confuse the nice reporter with too much technical information. You might even ply her with a bottle of honey and offer to review the final edit for accuracy.

That's not likely to happen, but it's worth a try. **BC**

Eugene Makovec is a freelance author and sideline beekeeper from the St. Louis, MO area.

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OKAY, EVERYONE SET? HAVE A WARM, SAFE, DRY WINTER!

WHAT? YOU NEED TO PEE?!? CAN'T YOU HOLD IT 'TIL SPRING?!?





Wintering Beehives

Part 2. Wintering Biology

James E. Tew

Firewood and honey

I am presently having problems finding firewood for the upcoming Winter. The Emerald Ash Borer (EAB) <http://www.agri.ohio.gov/eab/> has very nearly been found in my front yard. Firewood can be moved into my county but not out of it. Much of the ash that would have been lumber (and firewood) has been chipped and put in landfills. I may actually have to go back to cutting and splitting firewood instead of buying it. I really need the firewood to help keep my family and me warm this Winter.

Bees need to stay warm in cold weather, too. Where does a wintering hive of bees get its firewood – of a sort? How does a bee cluster “bump” its thermostat up on those cold nights just before dawn? As the beehive keeper, what are my responsibilities to the beehive as the temperature drops? These are hard questions with vague answers. Honey bees were keeping themselves warm long before I was ever a carbon-based being. They know a lot about their heating requirements while we are only just beginning to understand their needs.

Fueling the cluster's Winter furnace

The bees gather their firewood just as I do – they collect it, season it, and conveniently store it nearby. Rather than wood or natural gas, the bees' firewood is capped honey. Bees gather their unseasoned fuel (nectar), season it (convert it to honey) and then store it (place it in capped honey combs). Honey is the specialized fuel burned by the colony's furnace. Each little cell of honey can figuratively be compared to a miniature barrel of fuel oil or a few sticks of firewood. And where is the hive's heating furnace? It's within each individual bee. Each bee consumes honey, metabolizes it (burns it) at the cellular level and produces heat and muscular energy. Each individual bee's heat is contributed to the cluster and communal heat is produced – in some cases, a lot of communal heat.

What if humans clustered?

The manner in which a hive population warms itself is delightfully simple so long as you don't mind being extremely close to your neighbors – really physically close – so close that another is touching you on all sides all the time. Let's suppose that for some unfathomable reason, about 20 lightly dressed people were put into a room and the temperature was slowly lowered. At first, little notice of the coldness would be given. After a short while, our test group would begin to move around, inquiring about the availability of hot coffee and complaining about the encroaching cold. At an even colder temperature, our twenty cold people would begin to exhibit agitated movement (we,

too, as human-things, generate heat at the cellular level). Clumps of shivering people slapping themselves and loudly complaining would begin to form. Approaching hard cold, all inhibitions would be lost and our 20 people would pack together trying to produce communal heat. Those inside this human cluster would be warmest while those on the fringes would be the coldest, ergo my human comparison to the wintering bee cluster.

The colony's thermostat

Individual bees are cold blooded, but a healthy cluster of bees within a hive, with honey positioned correctly, has a great deal of control over its group temperature. As the outdoor temperature approaches about 55-57°F, depending on wind and sun conditions, bees within a hive begin to loosely centralize themselves near the bee nursery area (the brood nest) or near stored honey combs if the nursery has already been closed down for the season. As the day really cools to the 40s or so, bees will have clearly centralized themselves and will have begun to cozy-up. Colder still and the bees, just like our chilled, hypothetical human test population, will compact tightly. Some bees are in the interstices between combs while others are laying head first in empty cells. This tight configuration forms a solid, living cluster having roughly the volume of a soccer ball. The population at this point consists of adult worker bees, possibly some immature bees and the queen. No drones. They were all “eliminated” during the Autumn and will be reproduced during the following Spring season. If baby bees are present, the nursery area will be kept at around 90-95°F while bees making up the outer layer will be nearer 40°F. If no developing bees are present, the center of the cluster will be around 70°F. Now suppose it gets really



Wintering cluster viewed from the top.



In the tightly packed cluster, each bee has specific needs.

cold – down around 0° Those bees making up the outer boundary get cold rear-ends, get agitated, and in their own bee way, begin to vociferously complain. This agitates bees that are closer to the center and that are warmer All bees begin to flex (micro vibrations) their flight muscles, which increases the burn rate of their honey firewood, and the temperature of the cluster is increased. No honey = no heat = frozen bees. Every few weeks, a warm period is needed to give the cluster an opportunity to reposition itself onto more honey; carrying out the ashes is a human analogy for this. A bee cluster can withstand a bitter amount of cold for many weeks and survive very well. Indeed, the bee cluster may even survive better during a cold Winter They live so closely that contagious Winter diseases can spread rapidly; however, some authorities feel that coldness suppresses bacterial spread.

The cluster's composition

Other investigators speculate that the cluster is simply a condensed environment that is controlled by temperature. On warm days, the environment is opened up and bees fly freely On cold days, in an effort to control the temperature of the cluster, the large environmental expanse compresses itself into a volleyball-sized volume. Nurse bees and the queen are at the epicenter while house bees and foragers make up the insulating shell. It is as though the bees' environment collapses on itself. It goes from being acres and acres in size to hardly 10 inches in diameter Just as in warm weather when nurse bees make decisions concerning the nest's temperature needs, nurse bees make the Winter temperature decisions, too.

Said a different way, the bees cannot heat the ecosystem to 60°F, but they can form a cluster and heat themselves to 60°F

A comfortable bee

Another concept that is getting traction is that year-round temperature in the cluster is controlled by each bee doing whatever it takes to make itself comfortable. It becomes clumsy to try to write what a bee could be thinking, but individual bees are apparently struggling to keep themselves at a comfortable temperature in both Winter and Summer When combined, that individual effort results in what humans see as cluster temperature control. So a cluster is made up 30 or 40 thousand individuals that are individually working to meet their individual needs. It is apparently not 30 or 40 thousand individuals working to meet the greater needs of the cluster The bee is instinctually concerned about itself – not the cluster Let me get back to you in 10 or 20 years to see if this concept takes hold.

Heat the cluster – not the hive

In my human comparison that I presented earlier, it's important to point out that the room of cold people made no effort to heat the room, only themselves. In like fashion, the bees make no effort to heat all the space within the hive, only themselves. Beekeepers are frequently admonished not to open a hive during cold weather It is said that they "Will let all the heat out" Not so. The temperature within the hive, excepting the cluster, is the same temperature as the ambient temperature.

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I know where we get that impression. My three daughters and now my grand kids have made most of life's decisions standing in an open door while letting out my expensive heat. Now, for whatever reason – and I can't think of a good one – if the beekeeper should break the cluster, that's another story. Dislocated bees will quickly become chilled and freeze. Much below 40°F and individual bees are in real trouble. Bees still within the disrupted hive will be unable to reform the cluster and conditions inside the cold hive quickly become desperate.

I have stood at one of my shop windows on snowy, wintry days, after nature has stripped everything to an outline, and marveled that my snow-covered hives, on that frigid day, actually had a hot spot within them that was at least 70°F. In essence, the bees are keeping their living room warmer than I am keeping mine. The snow covering is an insulating asset. In a reverse way, a hive covered in snow generally fares better than one sitting exposed and unprotected during Winter months.

Restroom breaks. Bees need them, too.

With all these warm ruminations about cold snow, it shouldn't be surprising that the lower entrance to the hive will readily close shut with drifted snow. As this occurs, the beekeeper can be of assistance to the wintering cluster. Providing the hive with a second, higher entrance allows the bees to get out on those occasional warm Winter days. The snow will have closed off the normal lower entrance. The upper entrance also serves to allow moisture-laden air to escape in much the same way that our human homes have ventilated eaves and gables.

On cold Winter days, when all my family hops into the car, the windows quickly frost over. Ventilation is required to remove the window frost. When that small bit of warmed air rises from the warm cluster inside the hive, it quickly cools to the same temperature as that of the surrounding air. Cool air can't hold as much water as warm air, so water condenses. In a very real way it rains in the hive. An upper entrance allows for ventilation to let the warm air along with its heavier moisture load to exit the hive. It's one thing to be cold, but it's something worse to be cold and wet.

Throughout the Winter when possible, bees from the

The mice will, if opportunity provides, raise an early brood in this nest, before Spring returns and they can leave – or you remove the mouse guard.



wintering cluster are constantly checking the countryside for the first early Spring food sources, which are normally pollen snacks from maples and willows. Secondly, they need to go to the toilet. For practical hygienic reasons, bees don't defecate within the hive, but rather relieve themselves in-flight producing yellow rain.

When the Winter weather briefly breaks, bees will take cleansing flights and will reposition themselves nearer their food stores as the afternoon temperature drops. An upper entrance and an occasional warm Winter day are good things for the overwintering hive.

Long-time enemies – bees and mice

An on-the-ball beekeeper will have restricted the hive's lower entrance from its normal large opening to a slit not much larger than a single bee during early Autumn. Surprisingly, this is not to keep out the coldness, but to keep out mice. Mice, too, get cold during Winter months. What a great mouse place – that dark, somewhat warm wintering beehive. There are dead bees to munch on and protection from the elements.

In general, I don't care for mice. Bees seem to dislike mice, too. Moving about through the wintering hive, the interloping mouse family causes constant disruptions. The agitated bees produce more heat, which uses more honey, which increases fecal content, which causes the bee colony to Winter more poorly. The beekeeper should be certain that the entrance reducing cleat be put in the lower entrance **before** the mouse family moves in. Otherwise the mouse group is effectively trapped within the hive making a bad situation worse.

Wintering beekeepers

What really happens in the wintering beehive is still mysterious. We know a good deal, but as beekeepers who are trying to help bees during cold weather, Winter becomes a quiet, trying time. Most of the help beekeepers can administer should be done during this time of the year. Next month, the final segment of this series will review what beekeepers can do and what they should do to help bees survive the Winter. A lot of guessing will be required. **BC**

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To make room for the nest mice will chew holes in adjacent frames. They will eat dead bees, even live bees, brood, comb, pollen and wax.

Bear Story

Dan Stiles



Preventing wild animal damage is tricky. Sometimes easy, sometimes not.

I am a retired wildlife biologist – employed by the United States Fish and Wildlife Service for 37 years. I loved my work with the wild creatures, but I learned wildlife can cause people a lot of trouble – sometimes serious trouble. I’m going to write about bears first – then bears and bees.

American Black Bears – I’ve seen them on quite a few occasions. While deer hunting a few years ago, one ran right up to me and rested under my bow hunting tree stand. She was exhausted and panting like a hound after a long run. I was high above her. I spoke in a kindly way not wanting to startle nor annoy her. She looked up, our eyes met, and she ambled off. I wished her well. I should have brought along my camera – she was huge! Bear encounters are always unforgettable experiences for me and, I guess, for most people.

Everybody wants to know how big Black Bears can become. I looked up the information. The biggest black bear male ever recorded was from North Carolina and weighed 880 pounds. The biggest female on record weighed 520 pounds. Adult males are one third larger and heavier than females. Most Black Bears weigh far less – their weight depends on their age, health, time of year and abundance of food. Bears may live 20 to 30 years if they are lucky. Most living outside parks and other protected places usually don’t live that long, and they don’t die of old age. But, estimates suggest there are still some 800,000 black bears on the North American Continent.

The other question we all have is, how dangerous are they? The record of attacks on humans shows 56 documented killings of humans by Black Bears in North America in the past 100 years. Some will argue that lightning strikes kill many more people than bears do. But, after reviewing some of the details of these 56 killings, I for one, will always treat black bears with uncommon respect. For sure, no one should feed or attempt to befriend a Black Bear – no matter what! And the old wives tale suggesting that you should play dead when confronted by a bear turns out to be terrible advice. You’ll just be easier to eat that way!

Rupert was the name I gave the huge Black Bear I saw last Fall near a ridge top on our property in remote West Virginia. He was sound asleep, and I took a dozen nice photos of him. Black Bears are easy to see in the daylight – their black, glistening fur stands out among the

leaves and trees almost as much as a deer hunter’s blaze orange vest. Seeing bears at night, however, is just about impossible. A bear’s vision is not good, but their nose is said to be more sensitive than a bloodhound.

A few weeks before I saw him, a bear had pulled down the American flag attached to our primitive cabin out there, and knocked over all five of my hives! But, at the time, the damage seemed minimal. He didn’t break more than a half dozen frames, and I rather liked the idea of having such a huge bear around. Besides, there is a long bear hunting season in West Virginia. Seven bears were killed in our County (Morgan) the previous season. He might well be the trophy of a lifetime for a bear hunter, thereby ending my worries.

When I arrive at our cabin and notice that the American flag is on the ground, I know Rupert had paid us another nocturnal visit. The flag is permanently attached with a metal bracket to the side of our cabin. Three times this Spring he returned to knock down the flag and leave his muddy footprints on it. I have no idea why he does this. When it happens, I dread looking at our beehives behind the cabin, because I know that inevitably one or more of them have been damaged or destroyed.

Bears are pretty intelligent. The first hive he completely destroyed contained the most honey I knew that and somehow he did too. Probably it had to do with his bloodhound nose. This hungry bear consumed many pounds of honey and wax, and chewed quite a number of the wooden frames into small pieces. He spread the pieces of the hive all over the ground and stepped upon the bees and frames, and even mashed the screened bottom, so





there was little left to salvage except the heavy wooden hive bodies. The queen bee was among the mass of dead bees on the ground, so eventually the few surviving bees were also lost. My understanding had been that a bear's most cherished nourishment in a hive would be the larvae, but this bear left a number of really nice "apple pie" looking frames of brood on the ground untouched.

I guess just about everybody realizes that bears have an excellent memory, so once hives are discovered, the offending bear is almost guaranteed to return on a regular basis. (How are you going to keep them down on the farm?) When I arrived about two weeks later, I could see from a distance that the American flag had been torn down again, and sure enough, hive number two was spread over the ground. All the bees in the colony were dead.

This fellow's "droppings" would have made an elephant proud. Wildlife biologists like to carefully examine them (don't tell anyone) for clues on their food habits, but I could only tell he had eaten some berries, and that there were very few hairs (usually from white-tailed deer carrion) visible, so this huge bear had been finding plenty to eat.

A few days later, during the Spring turkey gobbler hunting season, I stepped out on the porch of our cabin at 4:30 in the morning, and in the moonlight I could see a huge bear hovering over hive number five. I had a flashlight and a camera and approached to within 20 yards. I figured that was close enough. It was Rupert, no doubt about it. I can recognize him. I took several flash photos, but the pictures only showed a pair of huge white, glowing eyes. I spoke to the bear, but he ignored me. He had a frame of honey between his paws and was lying comfortably near the hive. Bears are extremely bold at night and persuading him to leave, no matter what promises and threats, was clearly an impossible task. Some will say I should have "dusted" his hind end with birdshot, but I did not want to do that. Bears are appealing, just like big dogs, and in my opinion, symbolic of wild places. But, then again, three of five of my really nice hives had been completely destroyed, and these losses do represent a significant investment of time and money. Rupert had become quite a persistent problem and an interesting challenge.

So, I purchased all the material needed to build a solar powered electric fence to surround my remaining two hives. (We have no electricity out here). I had no idea how well my electric fence might work, especially since this bear surely must think of our hives as a marvelous dream come true. And, this bear was huge, bold, and no doubt resourceful, and the strands of electric wire do seem pitifully thin and weak. I rather doubted a solar powered electric fence would discourage this bear for long. Perhaps

he would walk right on through it as he surely would when hampered by thick, thorny vegetation and tangled vines. Perhaps he would think the electric shock was similar to a bee sting. After all, surely his nose, mouth and tongue must have been stung multiple times when chewing the honey-filled frames covered with bees. Perhaps a combination of barbed wire in addition to the comparatively thin electric wire would be a sensible way to go.

So, I built a 50 by 30 foot rectangular fence using four by four inch pressure treated eight foot posts buried two feet into the hard, rocky ground. On the inside of the posts I attached insulators for four strands of electrified smooth wire, eight inches apart, and five strands of strong, but unelectrified barbed wire about ten inches apart on the outside. Wearing rubber-soled shoes, the shock of the six volts from the smooth wires was not impressive, but without the shoes, the shock became very serious business indeed! Certainly it would get the attention of a bear with his four bare feet on moist ground! And, a friend suggested a piece of bacon wrapped in aluminum foil tied to the nose-high electric wire would be a good way to introduce this marauding bear to another new problem he faced. This might work I thought. And, I installed an infrared flash "game" camera on one fencepost, triggered by motion up to 45 feet away, to watch over my fence enclosed apiary day and night while I was away. The camera is powered by six "D" batteries, good for six months, holds 1,037 good quality photos, records the time, and temperature when the picture is taken - pretty neat!

I'm going to stress one point. Preventing wild animal damage is tricky. Sometimes it is easy and sometimes it is just about impossible. For example, if an animal like a deer is starving to death and has no other source of food, he will step over the bodies of his dead brothers who were shot - to get to that food source. Some wild animal repellents work remarkably well when an alternate food supply is readily available. And, when I was a kid, a single strand of electric wire was all that was necessary to keep granddad's Jersey cows within their Summer pasture in Vermont. Not so with a hungry bear and hives full of honey. We all know that.

A week later when I arrived at the cabin the American flag was still flying, but both remaining hives had been knocked over. My camera had taken 150 pictures - 148 of them showed deer, raccoons, rabbits, squirrels, woodchucks and birds flying by, but number 149 and 150 were photos of Rupert within the fence, somehow, checking out the two hives at 3:39 am. Unfortunately at that point the camera failed, but at least I had two fairly good pictures of him. He had knocked over both hives a few hours before I arrived, but did little serious damage to the equipment, although you can bet he made my good tempered bees plenty angry!

Next week, I'm going back with more barbed wire and six additional fence posts. I know this contest will continue until one of us dies. Let's hope it's not me. But seriously I've learned that sooner or later an apiary located within the home range of a Black Bear will eventually be rampaged. I've enjoyed raising bees out there for nine years without a bit of bear trouble, but I'll have a continuing contest from now on. Of that I'm certain. **BC**

Dan Stiles is a retired wildlife biologist, arguing with bears somewhere in West Virginia.



The Bees

Les Abeilles

J Jonnes

Parisian chefs, bakers and chocolatiers have all long been famous for their delectable creations. And so, as a novice beekeeper and veteran Francophile, I was delighted to learn that Parisian bees, too, are famous for making delicious honey: *Miel de Paris*. Thus a lovely June

afternoon found two of us embarked on a Paris food pilgrimage, walking up the hilly rue de la Butte-aux-Cailles in the 13th arrondissement in search of "Les Abeilles"

[The Bees We had heard that the owner of this shop sold *Miel de Paris* from his own bees. We emerged into a picturesque cobble-stoned square and spotted a hanging store sign with two golden bees hovering on a crimson background. At the entry-way stood two large vats with spigots for dispensing honey by the weight: one vat's honey was light gold - acacia, the other a rich brown - horse chestnut. Equally eye-catching, a large shallow tray filled with lovely comb honey for sale.

The shop was tiny charmingly stenciled with bees. The shelves on one wall were stocked with bee suits, smokers, veiled hats, and some items unfamiliar to us, such as bottles of honey vinegar. The opposing wall of shelves was largely devoted to all manner of bee products, including our Holy Grail - Paris honey. Proprietor Jean-Jacques Schakmundès, a bearded beekeeper of 40 years experience, confirmed that this was indeed his own *Miel de Paris*. He generally harvests from 600 to 900 kilos from fifteen Dadant-style hives he maintains in the nearby Parc Kellerman and another 15 in the Bois de Vincennes. His Parisian bees are, he

says, simply the indigenous "black bees."

He tells us his shop, open since February 1993, is the only place in Paris where you can buy beekeeping supplies. He estimates there are between three and five hundred hives kept by Parisian beekeepers. Almost certainly the most celebrated beehives in Paris are those atop the neo-baroque Gilded confection known as the Paris Grand Opera House. Just put "bees paris opera" into Google and you can see for yourself on Youtube! Rumor has it you can buy the opera bees' honey in its gift shop.

Schakmundès proffered little plastic spoons to let us taste his creamy pale-yellow *Miel de Paris* and when we exclaimed at its delicious, complex flavor, he gave a Gallic shrug and said, "We have a very large range of flowers here in Paris and no pesticides." Then an impish look came into his eyes, "And we have no bears or badgers to worry about." Paris honey is harvested in July, and in good years, again in September.

We spent a congenial half hour chatting and tasting a dozen different honeys sold in small and large size jars. Schakmundès once worked as a translator, so his English is excellent. Various customers wandered in to buy anything from honey lollipops (children) to regulars seeking their favorite kind of honey. Since the very word connoisseur comes from the French, it's not surprising that French recipes assume a familiarity with the differences between say, honey made from thyme flowers and those made from buckwheat, and instruct accordingly.

Among the honeys we tasted at

"Les Abeilles" that were new to us: sunflower, eucalyptus, wild lavender from Provence, rosemary, and glossy buckthorn. We were also surprised to see pine tree and cork oak tree honey, which we learned the bees made not from flowers but from the honeydew of aphids who live on those trees. In the end, my favorites were the very floral almost lemon-colored *Miel de Paris* and the dark and intense cork oak tree honey.

Monsieur Schakmundès then introduced us to what the French call Spice Bread, but he said it is really honey bread, a dense dark rectangular traditional loaf that is half honey half flour and some baking powder. He sliced a thin wedge off for us to taste, saying, "It's best toasted and spread with foie gras." But we thought it was quite delicious just plain. While we did not taste his honey mustard, it is quite renowned. Other enticing treats heavy on the honey were jam-filled spice muffins known as "Nonnettes," or Little Nuns after their original creators, as well as slabs of nougat candy.

Anyone checking out the website for "Les Abeilles" (www.lesabeilles.biz) will be startled to see portraits in French and Japanese. Apparently the store has become a favorite destination for Japanese honey lovers. It's obvious that this little store's customers are a well-traveled bunch, for Schakmundès's top-most shelf is an amazing collection of souvenir honeys they have brought him from all over the world.

Of course, we could not leave without buying numerous jars of honey, nougat candy and Nonnettes. Our only regret is only that we could not haul home yet more of his delicious products. **BC**



Changing The Way We Train New Beekeepers

Teach them the right way

It was over a year ago when the editor of this publication and I discussed the newest surge in interest in bees and beekeeping. We attributed it to a number of factors: the aging Baby Boomers looking for something to do when they retired; a reaction to all the 'we need bees' publicity that arose from the fantastic Colony Collapse Syndrome media attention (which continues as networks rerun their feature stories); and the growing interest in producing food locally, a phenomenon that has many names and comes from many social and political viewpoints.

The Editor made a comment to the effect that "And we will see many of these people get out of bees in a year or two, like we have before, because now it is more difficult." I asked 'isn't our job to change that situation,' but he remained silent or repeated what he had just said.

Starting with the time I was in graduate school at Michigan State University, I have been involved in the education of new beekeepers for over 40 years. Basically the questions are all the same, but the answers to questions take a lot more time than they did in the late 1960s. That was a time before tracheal mites, *Varroa* mites, small hive beetles, CCD, neonicotinoids, and African bees. In the 60s the biggest problems were American foulbrood, wax moths, pesticide kills and low honey prices.

While the latter have NOT gone away, we now have a growing need for more a much more complete information set that must be given to new beekeepers as they start their course in setting up a beehive.

Unfortunately, many beekeepers still start out the same way that many did 40 years ago: they order bee equipment from a supply dealer, order a package of bees from that same supply dealer, get a 10-minute demo of how to install the package, and get a pat on the butt with a parting 'you can do it kid, it's not that difficult.'

If there was ever a formula for failure, that certainly comes pretty darn close.

As a kid I read *Starting Right with Bees* and most of a much thinner version of *The Hive and the Honey Bee*. We got a package of bees or two and put them into hives and watched them grow. Two neighbors and an uncle were on call if we got into trouble – and I have no idea how much they did without our knowing to keep the hives alive. Mostly we got the bees into the box with foundation and came back in August to take out some honey. There were some brood inspections, because photos exist showing a neighbor helping one of my brothers. I probably took the photo.

Yes, package bees can still work. But there is so much more to know and understand. And, as most of you know, there is a growing disgruntlement with packages as a way of starting a new colony, a fact I make in *Increase Essentials*. But the other option is to purchase a nucleus hive, and these are far from being a perfect way for a new beekeeper to start out with a first colony.

So far this year I have been in eight or nine states teaching some aspect of bees and beekeeping. In those areas where package bees are commonly used, the complain level is high. Packages arrive with three inches of dead bees at the bottom and are replaced. Or the queen is dead. Or the queen dies at introduction. Or the queen lays one egg and the bees build a supercedure cell from that larva. On it goes. Five to six weeks after installation the colony swarms, even though it has not finished building one box of new foundation.

Apparently in 2009 we are have an excellent year for replenishing the bee trees and nesting cavities in the local environment regardless of the source of the colony: over-wintered, package hive or nucleus.

The Bee Club's Role

Proactive bee clubs, and there are a number of them, offer intensive bee schools for training. Some are 'old school' and hold classes during the Winter for five to 10 weeks and ending when the newbees get their packages or nucleus hives. The quality of the instruction is all over the place, and there is an emphasis on mites, diseases and other 'bad stuff' in beekeeping that discourages many from ever getting started. This is not a good approach. You don't buy a product after spending a great deal of time learning about what will go wrong. And for new beekeepers the bad news factoids are meaningless until the beekeeper gets bees and



sees some of this for the first time.

Really cool clubs sponsor Mentor programs. The Mentors meet with individual and small groups to review what the colony should be doing at this time of year. Many of the sessions with mentors are not over a colony of bees, but held in a classroom. Field days are key to the success of a good Mentor program.

I see a real difference in the success of new beekeepers who work with Mentors. As a rule they have colonies working at the end of the season, and a higher success rate with over-wintering. Of course there is a great deal of variation in the knowledge of those who serve as Mentors, but most clubs put in their most experienced and en-

thusiastic members to help newbees. These people are less likely to drop out of beekeeping if their colony dies, regardless of the reason.

The Farm

In April I started teaching a 'Season Long Beekeeping Essentials' course at the family farm in Michigan. In setting up the program I made the following decisions:

a. The groups are small. There are a total of 15 students (one is a scholarship student), and they meet either on Thursday or Sunday afternoons. I approached this like a college course, with different sections. There were two groups of interested parties in regards to time of day: those who wanted to meet on the weekend, and another group who could NOT meet on the weekend (usually for work-related reasons). I can work with seven or eight beekeepers at a time because we open each person's hive one at a time. As many as ten students around a beehive is the limit, as side conversations develop and they miss the action inside the hive.

b. Each student MUST have his or her own beehive. One lady wanted to use one of my hives and I refused. Why? Because there is an enormous difference between managing someone else's hive and managing your own. Call this the rental car syndrome - a person is more careful with a hive of bees if they have assembled and painted the equipment (another requirement), installed a nucleus hive, and been mixing feed for several months. If they were work-

ing one of my hives, they might not be as invested in the process, just like you are not likely to be as fussy about that rental car as you would you with the four year old beast you are still making payments on.

c. All the student's hives are in one apiary. We set up the hives in my Dad's old orchard, complete with lots of autumn olive, honeysuckle, raspberries and poison ivy. Lots of poison ivy. So everyone wears real shoes and long pants to work bees or risks the danger of doing a lot of scratching.

In my opinion, this is where the magic happens. When you have a hive of bees in your backyard you have ZERO chance to compare it to another hive unless you started with two hives (some students have done two). But when you work your hive and then watch another beekeeper work his/hers you are forced to make comparisons between the buildup rate, the pattern of larvae the queen is laying, the presence or absence of disease and mites and lots more.

Most of us are competitive, and when we keep bees we want to know how our bees are doing. Unless we have a basis for comparison, we are working in a vacuum, and cannot know if our bees are doing exceptionally well or if they need help. By looking at other colonies, we get to see a range of performances. While the queens were, in general, very good, I think the students have now seen a wide range of issues that have arisen. One colony had extremely bad chalk brood. Another, the first to produce

surplus honey, was one of the first to swarm when the weather turned colder

d. Arrangements were made to get sister queens in five-frame nucs. All the bees were supplied by a beekeeper who has hives in Indiana and Michigan and who has stock from the Purdue queen-breeding program operated by Dr. Greg Hunt and beekeeper Krispn Givens. The reason for this is clear: I really wanted to use a locally-adapted stock with some proven *Varroa* mite resistance. I knew these queens were open mated daughters, so the chance of a high degree of resistance was low. I expected to see some variation in the performance of the colonies because of the open mating. My students and I were all amazed at the extent of this difference.

The five frame nucs arrived 20 May later than most instructors will tolerate for package bee installation. We have had a very cool and wet year, and buildup of these colonies was slow. As of late July I am still waiting for the weather to warm up. Earlier we had about five days of really warm weather while the basswood was in bloom, and some of the month old colonies produced a deep of honey, drawn from foundation, in those five days.

When the bees arrived we started feeding sugar syrup immediately, most often in plastic gallon bags or in top feeders. Feeding stopped with the short nectar flow.

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MAY GOD BLESS YOUR ENDEAVORS THIS YEAR

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e. Frequency of classes. I scheduled seven or eight sessions from April to October. The first session was in the basement of the house to put equipment together. Each student worked to put one box and the frames together under supervision, and then took the remaining materials home to finish the project.

f. The last class meeting will be on moving bees. All the colonies will leave the farm and go to the beekeeper's home or, in some cases, a community garden sponsored by a local church to produce food locally.

In general sessions have all gone very well, and friendships and concern for the other person has developed, as well as some socializing after we work the bees. Snacks and beverages appear. It brings up images of "it takes a village" as a method of teaching beekeeping. I am the sole experienced beekeeper, and in the future I will try to bring in others to share their experiences with bees. There are relatively few people in an area like mine where potential instructors have both an academic and a real world beekeeping experience, so I will be selective on who adds further confusion to my student's minds.

My style is pretty low key when we work bees. I want each beekeeper to work his or her own hive. My job is to coach them through the comb removal and inspection. If I see them struggling with something I will try to model an easier way by taking

the hive tool or comb and suggesting "maybe this will be easier for you." It is frustrating for me to see people struggle with thick, clumsy gloves, but many of the students shed them during the first or second class session. For the glove wearers I have to develop compensating moves to help them work the colony without getting a bit frustrated with all the 'damn propolis'

Full Access to Colonies

A brother lives at one end of the farm and has met all the class members. This provides a safe and secure means for all of them to check their colony at most any time without someone calling the sheriff. I like having people come and go to check their bees, and when I am there (or in a few cases I have met them to work on something), it really extends the teaching opportunity one on one or in a small group.

All of the students have each other's email addresses and some have shared what is happening with their colony when they made an individual visit. One woman was working her bees when another student's colony swarmed, and we had an impromptu class on hiving the swarm.

This is real world beekeeping. Swarms, chalk brood, queen replacement and other natural events happen. We have had lengthy discussions about the weather and how it impacts the hives. The key is to let as many of these students share in the experience as possible, and then to

discuss the events in one of the two small groups.

There has not been time in our three-hour sessions to do a formal classroom presentation. We fire up the smokers and go out to the bees for most of that interval, and end the time sitting at a picnic table to discuss what we have seen. That is my only organized time for instruction, since I can ask formal questions, usually along the line of 'what does that mean' or 'what is happening here?' We use Dewey Caron's big textbook (*Honey Bee Biology and Beekeeping*) and like any class some have read it cover to cover and others have not cracked the cover, and admit it. This not a graded course - I tell students that the bees determine the final grade.

So far we have not lost any hives, but we have seen supercedure and swarm cells and swarming. We have tried lots of ideas to help students and sometimes they help and usually they don't. Being unable to predict the weather we teeter on adding another super with more feeding.

Next month I will continue this discussion and make recommendations on how to start a site-based, season-long beekeeping essentials class in your area. **BC**

Larry Connor owns and operates Wicwas Press - www.wicwas.com and also runs an incredible mentor program for new beekeepers at his family farm in Michigan.

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The Cheapskate Beekeeper

Edwin Simon

Beekeeping can be expensive as we all know I'm a natural scrounge and reluctant to spend my hard earned money when an alternative would do. I also enjoy the challenge of developing and making my own equipment whenever possible.

Consequently, I have developed a list of alternate ideas for the supplies you need for making your own equipment. Listed are some of the sources I've developed and the supplies and equipment that I have acquired. This list does not and I repeat **NOT** preclude an occasional dumpster dive when needed.

It should also be noted that occasional gifts of a honey bear or creamed honey go a long way in gaining access to a business's scrap pile. In the same manner, knowing the maintenance workers at a hospital or any other institution can result on the inside track of equipment that is being discarded.

Wood – 2"x4", 1"x4", 1"x6", Plywood lumber

1. Outdoor sign companies – Sign companies get their supplies in bulk and parts of signs are pre-constructed. These supplies are generally large and fragile. They require packing crates and boxes to protect the contents. Usually these companies are happy to have you remove the wood from their scrap pile so they don't have to pay someone to dispose of it. This is an excellent source of 1"x6" and 1"x4" and 2"x4" lumber
2. Lumber stores – Seconds and returns from customers are usually available at a huge discount. Look for a pile of miscellaneous supplies with a sign offering discount prices.
3. Construction sites – safety first... Be careful. Most construction sites have piles of old or small pieces of plywood or pieces of aluminum that are too small for the current job and will be thrown away Ask for permission to look things over and carry a full honey bear in your back pocket. Sometimes they will even help you load what you want since they have to trash it anyway

Plastic and Glass– All sorts of plastic and glass imaginable

1. Outdoor sign companies – see the "WOOD" section under outdoor sign companies
2. Home renovation sites – Thermo pane windows are great for making that solar wax melter All you have to do is adjust the melter dimensions to the window size. They also make tops for cold frames so you can start you garden early

Aluminum – Top Cover

1. Printing companies – Printing presses use aluminum sheets to produce the images required. This plate is sheet aluminum of variable sizes and thicknesses depending on the press's requirements. I haven't tried this source yet, but a friend uses the plates all the time.

Stainless Steel – Uncapping sinks, large pots, outer cover metal, wax melters

1. Recycling Yards – Almost anything made of metal is available for a price, usually at a pound rate regardless of the shape the metal is in. A friend picked up a three section stainless steel sink in excellent condition for 75 cents a pound. After replacing the drainage plumbing, he had an excellent uncapping unit.
2. Restaurant supply stores – Large used cookie sheets make excellent protection for your wife's counter tops when bottling honey They also ease cleanup because they can be taken outside and hosed off. When working with wax, the cookie sheets can be cleaned off with a heat gun and a paper towel.
3. Restaurant auctions – A used hot fudge unit makes a fantastic wax melter

Advertising – Swarm removal, used equipment, give aways (free equipment)

1. Electric Co-op swap sheets – All free advertisement places have restrictions. But, you can use them to your advantage and they are free. I placed a fifteen word ad for "Honey Bee Swarm Removal" in a May issue and received a call within a week of the publication.
2. Work place swap sheets – There is a lot of unused bee keeping equipment available sitting in sheds and barns. One ad brought in some free equipment and books.
3. Better Business Bureau web sites – The BBBs exists to help the business man. Take advantage of them.

Paint – Five Gallon containers of indeterminate color or spray cans for marking equipment and making signs.

1. Store closeouts – The color doesn't matter to the bees. Unless you are supplying bees to the "White House" then your hives can be any color
2. Paint and Building Supply Stores – It's amazing the number of times paint is mixed to the wrong color at building supply stores.

3. Recycling centers – Small cans of paint are turned in at recycling centers. These are then consolidated into five or six gallon buckets of paint. The color is usually indicated by a splotch of paint on the lid. Five gallons of outdoor latex paint (Retail \$80 to \$110) is free.
2. Sawdust – Clean up your wood shop and save the dried out sawdust and wood chips.
3. Manure – My Favorite – Besides being free it is the ultimate in recycling. After collecting the **old** paddies, I dry it out on the patio for a couple of days. I chop and mix it during the drying. It is then stored in five gallon buckets.

Utensils and Melting Pots – Crock pots, coffee urns, ladles, spatulas, dippers, hair driers, sheets, cookie sheets, muffin tins, hand towels

1. Salvation Army and Goodwill stores – almost anything is available
2. Hospitals – Get to know the facilities support personnel. They throw away everything. A wax melter that was used to treat arthritis needed a leak plugged to make a super wax pre-melter
3. Universities/Educational Facilities – Some have yearly garage sales of unused equipment. A one hundred cup coffee pot that doesn't look good still works great to maintain wax in a water bath at 155°

Smoker Fuel – Always needed.

1. Landscaping wood chips – Available in bags at any landscaping store or building supply.

Bee Swarms – Free for the taking

Offering to remove swarms is an easy way to acquire bees. I leave my name and revised form of the letter (Attachment "A") at many of the following places. All of the places listed below have at one time or another needed or had requests for bee removal.

1. Insect Exterminators – Send a letter offering free removal (see the box)
2. Home Builders Associations – Send a letter offering free removal
3. County Agriculture Extension Service
4. State Department of Natural Resources (DNR)
5. Police Departments
6. City and County Animal Control Departments
7. City and County Parks Departments
8. City and County Administrators (Clerks) (very important in small towns)

JUNK DAY

Gwen Rosenberg

One day a year, every residence in my Ohio town is invited to hurl unwanted, unloved and unappreciated trash out to the curb for removal by an armada of garbage trucks hired by the city. This annual off-loading of personal effects, furniture, debris and oddities has come to be known affectionately as "Junk Day," and is considered a civic holiday by most residents. Adults and children alike look forward to Junk Day and anxiously scan the house for items, usually belonging to someone else, to haul to the curb in what has become a citywide cleansing ritual.

For most people, the cause for celebration is not only the act of unloading the hideous, over-stuffed, green leather chair picked up last Junk Day, but the acquisition of a whole slate of new junk. Better junk. Fascinating, fresh and exciting junk, but most of all, FREE junk. In the days leading up to Junk Day the streets hum with the clattering of over-filled pickup trucks teetering with twisted metal shards and broken appliances destined to be sold for scrap. Cars drive slowly past piles of furniture just in case something

really good, like a bookshelf, or an old dining room chair, or a slate chalkboard is hiding beneath the mildewed carpet on the tree lawn. The neighborhood kids crawl over heaps of trash looking for parts of unloved toys and pieces of something that can be made into a new strange plaything, usually some kind of bizarre weapon. Everyone appreciates Junk Day for the free bounty it provides. By the time the garbage trucks do eventually trundle down the road, you can be certain that anything of value, whether it's recyclable scrap, or some abused household item still clinging to usefulness, is gone.

It is a phenomenon of urban living, that left long enough, *everything* will be re-purposed, reused or resold by someone. City sidewalks are a testament to this, with the resale shops that sprawl their contents, blocking passage with rickety chairs, broken bird cages and empty wooden picture frames. It is a perfectly acceptable part of life here to claim some abandoned item and keep it for yourself. "Trash picking" is an unpleasant term for a really resourceful and enjoyable urban hobby. It's not completely ac-

curate either, since it's not always trash that's being picked.

The little Greek grandmother who picks the leaves of the wild grape vines along the highway median is not picking trash -- she's making dinner. (Apparently, the wild ones are superior for this stuffed grape leaves.) The path along the river is crowded with blackberry bushes and don't think for a moment that the birds are the only ones to notice. Day old bagels at the bakery, hubcaps that have sprung from their wheels, and aluminum cans left to litter the city park are all free for the "picking."

I prefer to think that I live in a "finders keepers" world. People here seem quite satisfied that the dollar they lost and was found (by someone else), will even out when the person who found the dollar leaves today's paper creased and abandoned, fortuitously, on the very bench the person who lost the dollar planned to sit on, after buying a paper. Not just in my small city, but every city has an unspoken economy of misplaced, lost or abandoned items that become a "prize" to someone new.

In Brooklyn, New York, "mumblers" are still a presence known to all who look to the sky, over the apartment buildings, to the battling flocks of pigeons hurtling toward one another. Capturing another mumbler's pigeon is a victory and has one of several outcomes depending on

- 9. County Department of Natural Resources
- 10. Siding Contractors
- 11 Roofing Contractors

Note: A three-wheel child mobile that is used as the base was picked up at the local incinerator for free. **BC**

Edwin Simon saves money and keeps bees in Oronoco, Minnesota.



To emphasize the point of this article, look at the picture of our "HONEY WAGON" that my grandkids use to sell their honey and candles at the local fest. The entire cost of the stand was \$5.32 for clear contact paper to make the stencil for the sign and \$4.38 for the front blue bee drape used to hide the base.

the relationship of the battling mumbler. Return the bird, sell the bird back to the rightful owner, or, in the case of a very bitter rivalry, kill the bird. Finders keepers taken a little to the extreme, I'd say. Now, there's no way I'm killing a swarm of bees, even if they swarmed from the yard of that woman who let her dog poop on my yard and didn't clean it up, but I would consider selling her bees back to her at almond-pollination-dor-die-honey-bee-dearth prices.

Bees, pigeons, crinkled newspapers, stray kittens and dead tennis balls have value to someone in a crowded cityscape full of people finding a new use for a found object. It is this urban habit of "finding" that provokes me to climb to the top of my garage and position an empty deep super with several frames of well worn foundation in the hopes that a free-roaming swarm of bees (ideally, roaming from someone else's backyard apiary) will choose this spot to bring in the fall honey crop. A swarm in June is a silver spoon. A silver spoon glimmering alone with no one claiming ownership, that is. I suppose I could 'fess up should a beekeeping neighbor bemoan the loss, but who's to say that six pounds of buzzing honey-making potential was their swarm anyway Capturing a swarm is no different than finding



a dollar, or 50 dollars depending on the season, and claiming ownership, lest it be wasted. How would such a conversation even sound? "I lost a swarm of bees yesterday and it looked exactly like the bees in your garage-top, swarm-lure, bait hive!"

"Really, the 20 dollar bill I lost yesterday, looks just like the one in your wallet!"

"I tell you what, you keep the bees, and I'll keep the 20."

"Deal."

At a community garden this Spring I overheard a conversation about a couple of empty hives "discovered" in some other neighbor's yard. A stout hippie, who had not aged well,

with the rightful owner of the bee hive was cordial. The owner cautiously acknowledging the "wastefulness" of leaving the hives empty all Summer, but citing certain economic realities. They would probably agree to some sort of compromise involving a swap of empty hive bodies for a case of beer or honey futures. Finders keepers

may be the rule, but a smart urbanite is mindful of the sticky situation of being a "finder" but not necessarily a "keeper" I thought for a second about warning my earthy friend of the potential pitfalls of using old equipment with regard to transmission of disease, but I was wearing clothes I bought at a used clothing store so it seemed sort of silly for me to issuing warnings.

Junk day has come and gone again this Summer, but the desire to find something for free never goes away. Everyday scout bees buzz around my bait hive and contemplate moving in - I suppose they are thrilled to have found an "abandoned" hive. Maybe they consider the stale pollen a lucky discovery, and several uncapped cells of honey a victory Should a swarm deign to move in to my hive, I, more than likely, would give it away to a beginner beekeeper to start a backyard apiary. I would give it away not because it is useless to me, and not just for the satisfaction of erecting a new bait hive to capture the new beekeeper's swarms (which admittedly would be really fun). I would give it away for the enjoyment of sharing with others the hobby I have found and plan to keep. The good things in life are most certainly free, especially on Junk Day. **BC**

Gwen Rosenberg keeps her bees, and discards her junk in Kent, Ohio.

Dear Sir;

I represent a group of very dedicated beekeepers who are deeply concerned about the continued destruction of the common Honey Bee (*Apis Mellifera*). As you have probably read, the cause of the destruction is unknown at this time and will probably not be solved immediately.

Subsequently, we would like to offer you a FREE service for the removal and saving of any honey bees you are called to remove. This is a no charge service which applies only to Honey Bees.

We would work directly under your supervision as one of your staff to remove the bees to the best of our capability.

Of course this has a few restrictions:

- 1) We will not put ourselves or anyone else in danger. If it is apparent that the removal will be difficult we will recommend the destruction of the bees. Electrical shock hazard, precarious positions or impossible working conditions are some of the examples that require the destruction of the bee colony.
- 2) We will work under your business insurance.
- 3) We will keep all bees removed and place them in an area where they will do no harm and possibly a lot of good.

We wish to be of a service to you and the community and to preserve the bees that need removing.

Sincerely,
(Sign your name here)

Cacti & Succulents For The Bee Garden

These plants deserve a place in your bee garden.

Conn e Krochmal

Cacti and succulents deserve a place in the bee garden. Though they're reliable nectar and pollen sources, this group receives less attention than most other bee plants.

Once they're established, these require little routine care. Quite drought-resistant, most cacti and succulents like full sun. On the whole, these prefer a light, well drained soil. If your garden lacks good drainage, plant them in raised beds or berms. Less fussy than most succulents, the stonecrops will tolerate a slightly heavier soil.

While most cacti and succulents are evergreen, certain species are herbaceous. These plants are generally grown from seeds, cuttings, and offsets. Some species can be divided. Certain cultivars don't come true from seed.

Cacti and succulents for bee gardens include the following species, many of which are native to America.

Adam's needle (*Yucca spp.*)

These are known by various other names, including Spanish dagger and Spanish bayonet. About a dozen species occur in the Southeast and West.

These are generally evergreen perennials or shrubs, but they can be trees. Their height varies greatly from three to 30 feet, depending on the species. They're mostly stemless.

The succulent, stiff, sword shaped foliage has sharp pointed ends. With threads on the margins, the leaves arise from the base of the plant in a rosette.

With six petals, the large, bell-like, drooping, waxy flowers are typically cream or white. Sweetly scented, these open in large, branched clusters on a tall flower spike during July and August.

Depending on the species, hardiness can range from zone two or three to zone seven or eight.

Hardy to zone four, soapweed (*Yucca glauca*) is about three feet tall. The blue leaves have touches of white along the edges. The whitish-green blooms, opening from late May through July, are two inches across. This species occurs from Iowa to North Dakota throughout the West.

Spoonleaf yucca (*Yucca filamentosa*) is hardy to zone five. Native to the East, it is about three feet in height. The pendant, white blooms are up to three inches in diameter. These open on three-foot-tall flower stalks from June through September. Cultivars with variegated foliage are available.

Mound-lily yucca (*Yucca gloriosa*) is native to the Southeast. With multiple branching stems, this is hardy to zone seven. It can reach eight to 13 feet in height. In the southern part of its range this species will have a short trunk. But, elsewhere it will be trunkless. The large,



Euphorbia palustris

whitish-green blooms, often with reddish tinges, reach four inches in diameter

Aloe yucca (*Yucca aloifolia*) is hardy to zone seven. With one or more trunks, this is native to the South and Southeast. Typically, it is around ten feet in height. The leaves have very sharp pointed edges.

All of the yuccas are well liked by bees. Yielding large quantities of nectar, the flowers can provide a good surplus of honey

Aloe (*Aloe spp.*)

Most aloes are hardy to zone nine. Forming rosettes or fans, the thick, fleshy leaves have spines or teeth along the edges. The leaf color varies from grayish-green to blue-green with white warts or other contrasting highlights. The leaves of some species are a foot long. While many species of aloes are around six inches in height, taller ones reach one to six feet in height.

Aloe blossoms open in racemes on tall flower stalks, 1½ feet or more in height. The bell-like blooms, up to two inches long, are generally red, yellow, or yellowish-red.

Aloes provide lots of nectar and pollen. The honey is nearly colorless or water white. Granulating very quickly, it develops fine granules. This very sweet, mild flavored honey has a creamy body

Century plant (*Agave spp.*)

There are over 200 species of century plants, which are members of the Amaryllis family. These have stiff, fleshy leaves with toothed edges. At the terminal end is a



Yucca



Prickly Pear

sharp spine. The foliage forms a rosette. The plant height varies from one to 15 feet.

The short-tubed, greenish-white, pendant blossoms are bell-like. These open in panicles on tall flower stalks, up to 25 feet in height. Fragrant at night, the blossoms emerge from June through August. Though most species die after they bloom, they will first produce suckers that can be planted.

Most are hardy to zone nine or so. Those species with blue-gray foliage are the hardiest.

Century plant flowers are very rich in nectar and pollen. They yield around 90 pounds of honey per colony. This dark colored, strong flavored honey has a sharp, sour-like fragrance. Generally fed to the bees, it takes a long time to ripen.

Hottentot fig (*Carpobrotus spp.*)

Also called trailing sea-fig, these succulents are native to South Africa. There are several species in cultivation with some naturalizing in California and Oregon. The plants tolerate salt spray, and are hardy to zone nine.

About three inches tall, these have creeping stems that are several feet in length. The thick, fleshy leaves are triangular and several inches wide.

The scented, mauve or purplish-rose blossoms, two inches in diameter, open in June and July. These plants bring nectar and pollen.

The blossoms can provide a surplus of very light or almost white honey with a wonderful flavor.

Moss rose (*Portulaca grandiflora*)

Native to Brazil, this is also known as portulaca. This succulent is typically grown as an annual.

Generally eight inches or so in height, it can reach a foot or more across, depending on the variety. The fleshy leaves can reach an inch in length. Packed closely together, they can conceal the fleshy stems.

Many varieties of moss rose are available. Most have a spreading growth habit though a few are more upright.

Throughout the Summer and Fall, the solitary blooms

unfold when the sun comes out and close during the evening. Some varieties have flowers that remain open later in the day.

An inch in diameter, the flowers come in a range of colors, including pink, white, red, yellow, and purple. Choose varieties with single type blooms as double flowers aren't suitable for bees. Easy to grow from seed, these plants self sow.

Well-liked by the bees, these flowers yield much nectar as well as pollen. The pale amber to straw colored, high quality honey is very sweet flavored.

Prickly pears (*Opuntia spp.*)

All of the cacti are superior nectar and pollen plants, particularly the prickly pears. Occurring in all regions, there are about 200 species. Instead of leaves, these have flat pads that are often rounded. The juicy fruits are a type of berry. Most prickly pears have sharp spines and/or bristles.

The plants bloom for about four to six weeks during the Spring and Summer. The solitary blossoms emerge from the areoles, which are brown spots on the pads. Flowers assume various shapes, such as wheels and funnels. Up to 2½ inches across, the blossoms open during the day. Colors include purple, red, yellow, orange, and yellow with red tinges.

Of all the prickly pears, *Opuntia humifusa* is the most widespread. Its range extends from Montana to Massachusetts south to Florida and westward to Texas. Hardy to zone six, this low, spreading species reaches a foot in height and several feet wide. The flat, greenish-gray joints have tufts of brownish, hair-like bristles. The vivid yellow blossoms feature showy petals and sepals.

Bees eagerly work prickly pear blossoms for nectar and pollen. These provide a surplus of honey, 85 pounds or so per colony, about every third or fourth year.

The light amber honey tastes strong when fresh. Becoming milder with age, it is heavy bodied with a stringy texture and large crystals within the liquid honey.

Red yucca (*Hesperaloe spp.*)

Also called red hesperaloe, several species are found in America, mostly in the Southwest. With short fleshy stems, these resemble their relatives, the yuccas. The stiff, linear, grooved, fleshy leaves are several feet in length. These form a rosette. Along the edges of the foliage are threads.

The bell-shaped, tube-like blooms, either red or yellow, can have contrasting centers. These open on a branched flower stalk, up to ten feet tall. Appearing in Spring and Summer, the blooms are 1½ inches long.

The most common species is *Hesperaloe parviflora*, hardy to zone six. Forming a clump six feet across, it can reach four feet in height.

Red yucca blossoms provide nectar and pollen. They can yield a surplus of honey.

Spurge (*Euphorbia spp.*)

A number of perennial spurges are native to the U.S. Mostly semi-evergreen, some are fully evergreen. They have distinctive, colorful, petal-like bracts – modified leaves surrounding the flowers. The small, inconspicuous blooms lack petals and sepals. Most spurges have green, yellow, or greenish-yellow blossoms. Bloom time



Euphorbia

extends from spring through the Summer depending on the species. The leaves are fleshy

The spurges have milky sap, which can irritate the skin. Most species are hardy to zone three or four

Cuttings are necessary to propagate certain cultivars. However, most spurges are grown from seed.

Griffith's spurge (*Euphorbia griffithii*) is hardy to zone four. With a mounding growth habit, this can reach three feet in height. The deep green foliage, which turns red in the fall, has pink along the midribs. During the Summer, the reddish-orange blossoms open in long clusters.

Cushion spurge (*Euphorbia epithymoides*) is hardy to zone four. This forms a 1½ to two-foot-tall clump several feet wide. The greenish-yellow blooms appear from spring through mid-summer. The leaves become brightly colored in the fall. Generally, this species prefers some shade.

Myrtle spurge (*Euphorbia myrsinites*) Hardy to zone four, this robust evergreen is six inches in height with a spread of a foot. Its trailing stems feature blue-green foliage. Both the leaves and stems are fleshy. The vivid yellowish-green blossoms open from March through June.

All of the spurges provide nectar and pollen.

Stonecrop (*Sedum spp.*)

There are many species of hardy stonecrops, some of which are native or naturalized in the U.S. Though most are herbaceous, a few are evergreen. The growth habits can vary greatly. Some are very low growing with spreading stems, while others are more upright.

Stonecrops have large, fleshy flattened or cylindrical leaves that can vary greatly in size. Some resemble scales.



Euphorbia polychroma Spurge



Sedum spectabile Autumn Joy

In some cultivars, the leaves and/or stems are variegated. The stems are fleshy as well.

The tiny, star-shaped blooms form large, rounded clusters. Each cluster contains hundreds of blossoms. Flower colors include rose, pink, yellow, and white.

The flowering time depends on the species, mostly from May through July. There are several late flowering ones, such as Autumn Joy.

Hardiness depends upon the species. There are at least 20 or so hardy species in cultivation along with lots of cultivars. The most commonly cultivated species are the following.

Hardy to zone three, gold moss stonecrop (*Sedum acre*) is three inches tall. It forms a mat that is several feet in diameter. The evergreen leaves are flattened and blunt tipped. Its bright yellow or yellow-green blooms open in June and July.

An evergreen, two-row stonecrop (*Sedum spurium*) is a mat-like perennial that is only about six inches tall. However, its creeping stems can spread to three feet. The oblong to oval leaves are bright green with red edges. Mostly pinkish-purple, the blooms open from June through August. Sometimes, they can be other colors, including white, purple, pink, or red. It is hardy to zone four.

Autumn Joy is two feet in height. The fleshy, toothed foliage can be three inches long. In the late Summer, this produces large, flat flower clusters, up to six inches across. The flower heads start out beige. Gradually by fall they change to pink, then red, and finally brown. By far the most popular stonecrop, this is hardy to zone three.

Showy sedum (*Sedum spectabile*) is hardy to zone three. Forming a clump, this 1½-foot-tall species is wide spreading. The oval, gray-green leaves are three inches long. The showy pink blossoms appear in late Summer.

Stonecrops can be grown from seeds and cuttings, and divisions.

These are considered excellent bee plants. This yields a high quality honey that is superior to clover. **BC**

Connie Krochmal is an award winning garden writer and a beekeeper in Black Mountain, South Carolina.

In Search Of A Speaker

Where can you find these most important people?

Ann Harman

Look! The calendar says September Summertime beekeeper picnics are over. Some beekeepers may be in the midst of requeening. Other beekeepers have almost finished preparations for winter (Winter, so soon? Yes.). And the local association meetings are going to be in full swing. Some state meetings will also be held from September through next Spring and even into the Summer. And every one of them – local or state – needs a program featuring at least one speaker.

It would be nice if we could just pluck a bee from one of our hives and have her tell us about life within her four walls. Since we can't do that it is up to you to find speakers for all your meetings. It can be frustrating and challenging. It can be successful.

My first suggestion would be – listen to your membership. By that I mean not only the “regulars” at your meetings but also to those members who do not or cannot come for one reason or another. You could start out by simply asking them. What topics do they want? What speakers can they suggest? However, make no promises. You have given them a chance to be heard and that is important.

You might prepare a brief survey sheet – a half page is completely adequate. The survey sheet could be passed out right at the end of a meeting to be left in a box by the door. The attendees can fill out a few simple questions: Was the topic interesting to you? Was the speaker easy to understand? Then put a line for Comments and another line for Suggestions.

But you really should also survey those who do not regularly attend. Don't be afraid that a member might say that the programs are boring or useless. In what way are they boring or useless? There must be some sort of explanation. Any input from the members is valuable.

What if your members want

speakers from far, far away and your little local association has a small treasury. It does no harm to explain to the members what their dues are used for and how much is in the treasury. Prepare a brief cost accounting of the funds necessary for such a speaker. Include transportation, lodging, meals and honorarium. Present the figures—funds available and funds needed – to the members and they will certainly see what can and cannot be done.

Your members have heard talks given by almost everyone in the club. No local association is an island surrounded by a sea of sweet clover. Your association is bordered by other local associations. In some cases distances may seem great; in other areas local associations are actually quite close to each other. You need to find the contact information for your bordering local associations. Go to www.beekeeping.com, click on Who's Who. Now you can contact them to see where they search for speakers. They are probably in the same dilemma you are – finding speakers.

Great! Here are opportunities that haven't been discovered yet. Yes, your association has heard all about preparing hives for Winter – from one or more of *your* members. Would a speaker from a neighboring club give some different suggestions, different approaches? Think about all the topics you cover during meeting season: requeening, swarm prevention, feeding, supplements, laying workers, diseases, and many more. There is not one way to do something in beekeeping. A different view or reinforcement of a same view is valuable information. Trade speakers.

Will everyone in your association agree with that speaker from the neighboring association? No. But then will everyone agree within your own association? No. So do not let a few negative comments dissuade you from inviting speakers from other local associations. Oh oh, what if almost everyone in your association disagrees violently with views presented. If during the presentation, keep control of the situation; let the speaker finish. Then allow a few with a calm approach make a few comments. Now you have a topic for another meeting, perhaps a panel discussion of the controversial topic.

Planning a season's programs is always a good idea. However, those of you who are faithful members of the Procrastinator's Society may well get around to doing that later. How about taking a bit of time during a meeting and letting the members help plan? You will need to keep the discussion on track but if you can at least get the monthly topics chosen, you are ahead.

Beekeepers always want presentations that fit the season. For example, Spring seems to revolve around swarming; late Summer and Autumn is for Winter preparations. You need to think about topics that do not have to fit the seasons. You need to think about topics that are different from just plain beekeeping. You need to think of topics that will introduce different aspects of beekeeping to your members. You need to think about the Newbees – the ones that took your beginning beekeeping classes and are still floundering around, but enthusiastic. Here is where contact with neighboring associations is so valuable for locating speakers economically.

Let's look at some of the topics that “have no season.” How about photography? The bees and hives are interesting year around. Hives buried in snow; bees flying on a cold January day; a frame of starving bees (embar-

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raising for beekeeper educational for Newbees); bees visiting blossoms in the south in February endless possibilities. Beekeepers do not have to be "professionals" to take some great photos. Have photography as a meeting topic then follow up with a photo show (no, I did not say contest, I said "show") in six or eight months. The photo show could be combined with a picnic or a social meeting. Where to find a speaker? From your association or one of your neighboring associations. Lots of people are photographing everything since the proliferation of inexpensive digital cameras. Emphasize the "not professional" aspect. Photography really does open up a whole new world in beekeeping.

Apitherapy has no seasons. It is an interesting topic and probably one that the club members have heard about but are a bit vague on what it all means. There is a national association, American Apitherapy Society (AAS), with members from every state. Many of them are willing to attend a bee meeting and give a presentation. There may even be someone in your local association but has never been asked to speak about it. To find a person in your area you can contact the AAS with this e-mail address: aasoffice@apitherapy.org.

I mentioned the Newbees – the ones who took your beekeeping classes in the Spring. I do hope you have invited them to join your local association and, most particularly, made them feel welcome. Remember you are running around saying words like "refractometer" and "pheromones" and the Newbees are trying desperately to remember what they mean. Have a meeting especially for the Newbees. A good time would be late Autumn or during the Winter. The new beekeepers have had their bees long enough to have lots of questions. Tell the Newbees to write down all their questions to bring to a panel of experienced beekeepers.

A variation of a program for the Newbees would be to have them as a panel, describing their experiences as new beekeepers and letting them make suggestions for the bee course to be given next Spring.

Is your local association in an urban or suburban environment? Perhaps a topic could be how to fit beekeeping into a busy work and family schedule. A cookery/social

meeting can live up Winter months. Have everyone bring honey goodies to eat and to trade. Don't forget humor. Real but silly swarm catching stories can live up a meeting. Start out a business meeting with one story. Plan a joint meeting with one of your neighboring bee clubs. Clean out your beekeeping things and books (duplicates, gadgets) and hold a mini-auction. Have all the members bring a small sample of their honey crop. Someone is sure to have a refractometer and polariscope. Now all your club members can have their honey checked for moisture and crystal content. Finish up with taste sampling. One of your members may have been asked to give a presentation to children. There is a topic for a meeting – giving bee information to kids.

Some beekeepers have libraries of videos and are now adding DVDs to their collection. Not only are these a good emergency backup if a speaker cannot come at the last minute but they can form all or part of a program. Not all videos and DVDs are good. If you are the program chairman you can review the ones you might wish to show, or have a fellow beekeeper help you do a review.

Showing those videos and DVDs brings us to the problem of equipment. Does your meeting place have the equipment to show a video or DVD? If not, is someone going to bring what is needed? Today many speakers have a presentation on Power Point in a computer. The lap-

top is usually not a problem. But the digital projector can be a big problem. They are expensive! And replacement bulbs are expensive! Few actually own a projector.

It is a good idea to discover the availability of a digital projector before you actually need one. However, some speakers, or even a member, may have access to one. Always ask. Otherwise you could contact your local Cooperative Extension Service office, the local library, an organization, a school, a university. Audio/visual equipment rental shops may be in your area. What is the cost of rental? Check with your club treasurer to see if renting a projector is possible. A bit of persistence and imagination is sometimes needed.

One of the buzzwords of today is "Think outside the box!" To think of topics and the speakers for them really makes it necessary to think outside the brood box. In addition, work collectively just like your bees do.

Hey! Just because it's September and you need months of speakers, don't give up now. You are going to learn many things about honey bees in the months ahead all from your imaginative programs. **BC**

Ann Harman is a speaker, and lives in Flint Hill, Virginia.

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GLEANNINGS

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FLORIDA ANNOUNCES NATION'S FIRST REGULATION BANNING ADDITIVES IN HONEY

Florida Agriculture and Consumer Services Commissioner Charles H. Bronson today announced that his department has instituted the first regulation in the nation and perhaps the world prohibiting any additives, chemicals or adulterants in honey that is produced, processed or sold in Florida. The regulation, which takes effect July 14, provides the first-ever "Standard of Identity" for honey.

"We want to assure consumers that the product that they are buying is pure," Bronson said. "Too often in the past, honey has been cut with water or sugar, and sometimes even contaminated with insecticides or antibiotics. In the future, when you're paying for honey in this state, pure honey is what you will get."

State Rep. Alan Hays, of Umatilla, has been a major advocate of the new regulation, which is supported by Florida's honey industry, and joined Bronson at a press conference here today to unveil the new rule.

"I am pleased that the Florida Department of Agriculture and Consumer Services is leading the way for all America in establishing this standard by which all honey may now be measured," Hays said. "Commissioner Bronson and the leaders of the honey industry—beekeepers and honey processors—are to be applauded for their leadership in protecting not only the health of Floridians but also in protecting this industry which is so vital to the production of food products for all mankind."

Under terms of the new regulation, honey containing anything other than the "natural food product resulting from the harvest of nectar by honeybees" is considered an adulterated or mislabeled product. Such products are subject to a "stop sale" order in which a manufacturer, processor or merchant would be served with an order prohibiting the product's sale. Repeat offenders

would face fines of up to \$500 per violation.

Florida is the fourth-leading honey producing state in the country with cash receipts to beekeepers of more than \$15 million in 2008 and an industry that has an economic impact estimated at \$40 million a year. It employs more than 500 Floridians.

As a result of a flood of adulterated honey from overseas into Florida in 2006, a petition was submitted to the U.S. Food and Drug Administration (FDA) later that year by five major honey producers and processors, asking the federal agency to establish a U.S. standard of identity for honey. Two years later, the FDA responded that due to other pressing matters, it would be unable to review the petition.

At that point, the industry asked Bronson's department if it would consider developing a standard of identity for the product, and today's announcement is the culmination of that effort.

Bronson noted that despite efforts in various quarters, international governing bodies have to date been unable to establish an international definition of or standard of identity for honey, making it likely that Florida's regulation governing honey may be the first of its kind anywhere.

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MICHIGAN SWARMS

Southeastern Michigan Beekeepers Association members have collected 123 honey bee swarms this year.

The association reports the swarms were collected by 21 of its members and more than 80% of the swarm calls were received through its Internet website.

Winn Harless led with a total of 20 swarm retrievals, two of which lacked a queen and one with two queens. Harless also reported that a swarm issuing from SEMBA member Mack Clausel's hive was 8-10 pounds in weight and was the largest

swarm he had ever seen.

Association members Don Schram, who removes bees from walls as well as retrieving swarms, says the first thing beekeepers should ask when receiving a request for help is, "Where is the job?"

Schram spent 20 minutes on the phone talking to a caller and agreed to remove her bee problem. Then he asked her how to get to her home.

She replied, "Do you know the Torch Lake area?"

That was 230 miles away.

—Alan Harman

NEW EFB DISEASE

Some 100 hives have been destroyed after an outbreak of European foulbrood (RFB) began spreading through Scotland.

The Scottish government confirmed the outbreak in colonies of honey bees in the Perthshire area.

EFB is caused by the bacterium *Melissococcus plutonius* and multiplies in the mid-gut of an infected larva and causes the larva to starve to death by competing for its food.

EFB is a notifiable disease under The Bee Diseases and Pests Control (Scotland) Order 2007 and is subject to official control by examination of colonies for signs of disease and compulsory treatment or destruction of diseased colonies. Weak colonies and those with a high proportion of diseased brood are destroyed but lightly diseased may be treated.

Scottish government bee officers have begun inspections of about 5,000 colonies near the infected area to determine which of the three control options should be used in colonies infected with EFB: treatment with the antibiotic oxytetracycline; treatment with the shook swarm husbandry method; or destruction of colonies too heavily infected to respond to treatment.

It's not known how EFB arrived in Scotland, but there have been occasional cases since the 1960s.

The latest outbreak was diagnosed in July and the Scottish Beekeepers' Association says EFB is suspected to have been present in the apiaries

of a commercial beekeeper in Perthshire for at least two years.

Around 5% of his colonies are infected and the beekeeper is pursuing a policy of burning all affected colonies.

"Continuing investigations suggest that this disease may be well-established in the apiaries of other beekeepers in the area and, at present, neither the geographical boundaries nor the ultimate origins of the outbreak can be determined," association bee diseases convener Gavin Ramsay says in a statement.

The association says it is possible the disease is as yet unrecognized elsewhere and more widespread.

The EFB outbreak differs from the widely understood description of the disease in the following ways: primarily sealed brood are affected, although serious cases can have a few unsealed brood cells with visible symptoms; the lateral flow strip test marketed by Vita has not provided clear-cut results and needs care in interpretation; and it seems to occur in colonies suffering a relatively high mite load.

Ramsay tells *The Scotsman* newspaper the outbreak was potentially devastating, calling it the "biggest bee health issue to affect beekeeping in Scotland in recent years.

"It's not going to be possible for the current team of inspectors to get on top of it before the season ends. It's certainly going to be here next year." —Alan Harman

TRACING HONEY TO ITS ORIGIN

With overseas producers fraudulently finding ways to make customers believe their product is New Zealand honey, a company has developed a system to produce a unique geochemical fingerprint of the area where the honey was produced.

Dunedin-based Oritain Global Ltd. says it acted after getting evidence of "New Zealand honey being relabeled by a U.S. company and sold as New Zealand manuka honey for nearly six times what the New Zealand branded product gets on the same supermarket shelf."

Oritain, specializing in the independent scientific verification of origin services, says the way to protect New Zealand beekeepers from others capitalizing on New Zealand's reputation lies with the bees.

"Their honey provides deep insights into their flight patterns and provides a unique geochemical fingerprint of the area where it was produced," Oritain says in a statement. "Genuine New Zealand honey is chemically different to honey produced anywhere else."

Oritain determines the geochemical profile, or fingerprint, of the soil and can use this to traced the local origin of honey.

This is increasingly important for honeys from more generic flowers such as clover or thyme where New Zealand doesn't have the monopoly on the pollen. The fingerprint of

honey not only proves its origin; it can determine the proportions of a mixture from two distinct sources, as long as reference data are available.

To protect New Zealand honey, Oritain says, it is developing the Honey Map of New Zealand.

"This map will provide critical reference data so that any honey sample anywhere in the world can be compared to "what it should look like if it truly came from New Zealand" Oritain Manager of New Zealand Operations Mike Darling says.

"Oritain has undertaken a program to test thousands of samples from across New Zealand and to purchase and sample New Zealand-branded honey in the U.S. and other markets.

"This is a critical 'insurance' for New Zealand beekeepers as it can protect them from the catastrophic effects of fraudulent representation that have been experienced by Australian honey producers," he says.

In Australia, honey from China contaminated with an antibiotic, was represented as being Australian and distributed in the U.S.

"Since that discovery, the Australian honey industry has never recovered," Darling says.

Oritain Holdings is a global company, based in New Zealand with operating companies in Australia, the U.S. and New Zealand.

— Alan Harman

English Group Proclaims NEONICOTINOID PESTICIDES SHOULD BE BANNED

British organic group The Soil Association says neonicotinoids are killing honey bees as it launches a petition to ban the chemical killers.

The petition calls on Secretary of State for Environment, Food & Rural Affairs Hilary Benn to immediately ban neonicotinoid pesticides. The association says the pesticides have been shown to kill honey bees and are thought to be a contributory factor in the recent dramatic increase in honey bee deaths.

Neonicotinoids have already been withdrawn in France, Germany, Italy and Slovenia and The Soil Association believes there is already enough evidence to justify an urgent ban in the UK.

Recent mapping of the bee genome has revealed bees' capacity to detoxify chemicals is much lower than other insects. Instead bees have two strategies to protect themselves. On the first day of foraging in a new area, scout bees are sent out first to

taste the nectar and pollens – if any are adversely affected they will be expelled from the hive immediately, and the colony will avoid the area.

In addition, once foraging begins, nurse bees in the hive clean foragers each time they return. These strategies protect the colony from mass exposure to lethal doses of chemicals, but they do leave honey bees particularly susceptible to sub-lethal exposures to any contaminants they encounter.

The association says another important factor is the complex behavior of honey bee colonies.

Neonicotinoids work as an insecticide by blocking specific neural pathways in insects' central nervous systems. The chemicals impair bees' communication, homing and foraging ability, flight activity, ability to discriminate by smell, learning, and immune systems – all of which make them vulnerable.

— Alan Harman

MANUKA TEST PASSES

A new worldwide standard is being introduced to test New Zealand's manuka honey for its unique antibacterial activity.

The new test will provide more accurate and reliable ratings of manuka honey's antibacterial activity, and will be launched with its own trademark.

Waikato University's Honey Research Unit, which created the first worldwide standard, says the new test is better and more reliable test and comes with its own trademark.

It says this will allow consumers to easily identify products that have been reliably tested by an independent authority, and rated for the antibacterial activity that is unique to manuka honey but not present in all honey sold as manuka honey.

"The move means honey producers can get more accurate testing on the antibacterial rating of their honey, potentially earning them thousands of dollars more per drum," the unit says in a statement. "And because the test will be widely available, it will create a bigger and more competitive market for certified honey."

The new test, developed over the past couple of years, eliminates those variables, and guarantees the batch tested has an activity that is above the stated rating.

"It's far more accurate, far more scientific and is quicker for the producer," Molan says. "It's going to be quite clear what you are buying. At the moment consumers could be buying a ranking of 15, but in fact it's less than 13."

The revised test will be commercially available to all honey producers who are selling the genuine active manuka honey. They will be able to credibly advertise the effectiveness of their honey and that, in turn, means a wider market for consumers.

— Alan Harman

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INNER ... Cont. From Pg. 10

Colony Collapse Disorder research continues. Researchers in August released the newest finding in a lengthy paper that looked at the relationship of toxins, diseases and other factors. Below is their summary

We initiated a descriptive epizootiological study in order to better characterize CCD and compare risk factor exposure between populations afflicted by and not afflicted by CCD.

Methods and Principal Findings: Of 61 quantified variables (including adult bee physiology, pathogen loads, and pesticide levels), no single measure emerged as a most-likely cause of CCD. Bees in CCD colonies had higher pathogen loads and were co-infected with a greater number of pathogens than control populations, suggesting either an increased exposure to pathogens or a reduced resistance of bees toward pathogens. Levels of the synthetic acaricide coumaphos (used by beekeepers to control the parasitic mite *Varroa destructor*) were higher in control colonies than CCD-affected colonies.

Conclusions/Significance: This is the first comprehensive survey of CCD-affected bee populations that suggests CCD involves an interaction between pathogens and other stress factors. We present evidence that this condition is contagious or the result of exposure to a common risk factor. Potentially important areas for future hypothesis-driven research, including the possible legacy effect of mite parasitism and the role of honey bee resistance to pesticides, are highlighted.

Read the entire paper at <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0006481>

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Dear Sis,

I am tired tonight, for the whole family has been bottling honey all day – even Billy has been helping by sticking on labels and putting the jars on the shelves. You know we told you when you were here – it already seems ages ago – that we were going to sell some of our honey in pint and quart jars for a little more per pound to fat, honest Mr Day, instead of selling it all at wholesale. That is what we have been bottling. I went into town yesterday; and when I saw seven or eight people looking into Mr Day's window I went over to look too. It was our observation hive full of live bees that had drawn the crowd. (Yes, eight makes a crowd in our village at eleven o'clock in the morning!) They were all so absorbed in watching the moving mass of insects that not one looked up as I joined them. Beside the hive were pyramids of our jars of honey, shining like bottled sunlight. I was so proud that I could scarcely refrain from tapping my neighbor on the shoulder and saying, "They are our bees, and I bottled that honey!"

Florence protests, whenever she helps with the honey, that it is a shame to take it away from the bees when they have worked hard all summer to gather it. Her father insists that the bees owe him their surplus for the rent of his hives and the care he gives the inmates. He always ends the argument with a twinkle in his eye as he says: "Besides, doesn't everything in the world exist for man's particular use?"

He knows that will start me off; for all of the illogical and conceited man-made theories, that one seems to me the worst, which insists that nature is made for man. We have only to look about us to see how each species is struggling for its own existence, each one ruthless in its disregard of every other species, and if need be, preying upon another species. I suppose the advocates of the theory that the world has been evolved for man reason that, since man likes honey and robs the bees of it, the bees exist solely to make it for him. They get it from the nectar of flowers; therefore the flowers exist to produce nectar for bees to take, to make honey for man! If the soil were not warmed by the sun, the flowers would not grow; therefore the sun exists to warm the soil; which nourishes the flowers, which produce the nectar, for bees to take, to make the honey for man! Doesn't it make a good House that Jack Built? To follow such reasoning to its logical conclusion, if our tiny sun exists for man's sole benefit, I suppose all the other suns in the universe, that we call stars, the light from which takes years to travel to us, exist to make our sky beautiful at night! Man is a modest creature!

I did not mean to give you such a dissertation, but even in would-be scientific papers I have seen the nature-exists-for-man theory and it always heats me. To think of puny little man taking such a theory seriously in the face of the great facts of nature! Bah!

When I began this letter I meant to tell you about Rob's plan for educating the public – meaning our town – to like dark honey. Do you remember exclaiming over the delicious flavor of that tulip poplar and locust honey when you were here, and wondering why you never saw any on the market at home? That set Rob thinking. He has always contended that clover honey is little better than some of the darker honeys, and that to put up the white color as a standard is arbitrary and artificial. Next Monday when the county fair opens, in addition to the honey and bee

exhibit that Rob is going to have, he wants the girls and me to go in white dresses, with white aprons and caps, to hand out samples of as many different kinds of honey as we can get, on crackers. We are to have a color scale of honeys on the table to use in the demonstration. The girls think it will be a lark for we will see everyone we know and many that we don't.

So think of us on Monday in spotless white, telling men, women and children how good dark honey is and passing out a little dab on a cracker! I wonder what kind of demonstrators we shall make. I wish you could be here to help.

Yours deep in the bee business,
Mary

Letters From A Beekeeper's Wife September, 1917

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