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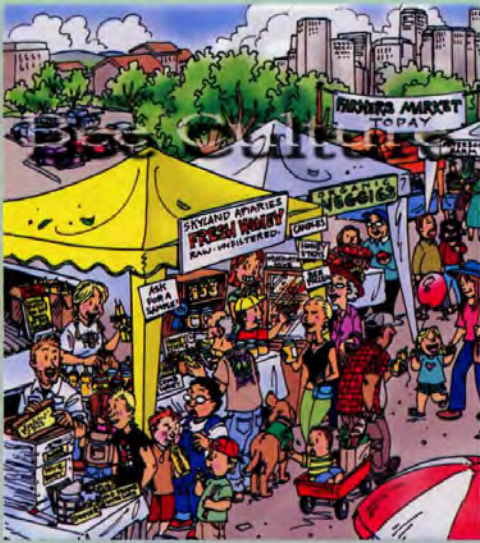


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*drawing by Leyla Dowling*

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# Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING  
JULY 2007 VOLUME 135 NUMBER 7

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## Feathery Feet

I have some bees that look like they have feather feet! I don't know what is attached to their feet or what the consequences are to the health of my hive but I was hoping someone there could help identify and give information.

Jeannie McClymond  
Kingsville, MO



**Editor's Note:** Those very much appear to be milkweed pollinia, the pollen sacks from milkweed flowers. Search for an early blooming flower in the milkweed family that bees are foraging on. (It turns out that apparently there is a very early swamp milkweed the bees were visiting.)

## CCD, Api-Diabetes

May I bring to the attention of your readers some thoughts on Colony Collapse Disorder? I am the co-author of the Hibernation Diet and am interested in honey and its many benefits.

A recent paper by Lynne Chepulis demonstrates that there is a very different outcome in weight control in rats, fed with sucrose and honey (honey wins hands down).

My thinking on this is that honey contains a powerful package of antidiabetic principles that allow for improved disposal of glucose

in all cells. During periods of stress glucose disposal is inhibited by cortisol, glucose concentration builds in the cell and this inhibits transport of fats into mitochondria for oxidation (burning) by CPT.

The increased glucose concentration prevents glucose from being transported into the cells via insulin signaling (insulin resistance). Thus we have a model for diabetes type two and obesity and this may apply to all glucose using creatures, including insects, and this is directly related to stress.

In insects some of the stress hormones differ from humans but the overall stress response is similar. Bees are unusual because during flight they are exclusive users of glucose, from trehalose. The contracting wing muscles process large loads of sugars (glucose and trehalose) through the bee haemolymph into muscles. The trehalose both protects against high osmotic pressure and against glucose toxicity.

A study by Dr H Gu demonstrates that honey compared to sucrose improved flight dynamics in parasitic wasps. Honey is a one to one glucose/fructose ratio (as is sucrose) and therefore some other factor is responsible for this improved metabolism, which will improve glucose oxidation and therefore flight performance.

Again we have a model for improved glucose metabolism with honey, as opposed to sucrose, in spite of similar sugar ratios. Most of the scientific papers on sugar loads in haemolymph in insects, focus on osmoregulation. This is a serious problem for insects, aphids for instance make polysaccharides, when phloem sugar is high, and

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Suggestions

Comments

this reduces osmotic pressure. Bees make trehalose, effectively halving the osmotic pressure of these molecules.

However it may be that interest in this problem for bees has resulted in less focus on sugar toxicity and potential for stress induced inhibition of glucose disposal. If in periods of stress the bees are being fed sucrose, they have none of the protection offered by honey, to improve glucose disposal. Working bees have some protection from this because exercise as in flight will improve glucose disposal due to insulin independent exercise induced uptake by contracting muscles.

This is a well known phenomenon of exercise metabolism and insects must also express this. Also exercise improves insulin sensitivity and therefore working bees would have some protection during periods of stress.

However non-working bees and larvae will not have this protection and will be more vulnerable. It is well established that insect stress hormones (neurohormones - biogenic amines, ecdysteroids, adipokinetics) have powerful influence on developmental hormone

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titres (junior hormone) and disrupt normal life cycles. An excellent model for this is aphids, which are not able to tolerate either low or high concentration of phloem sugars, larvae do not develop and the numbers collapse. Phloem sap will contain a bolus of glucose disposing principles as does nectar and honey, but even this is not sufficient protection against sugar toxicity when sugar concentrations are high.

Bees, as exclusive carbohydrate users in flight, with no portion of fats in the fuel mix, must be highly vulnerable to poor glucose disposal in times of stress (weather etc) and during such times may not fly, and will have no protection from exercise induced insulin sensitivity.

Therefore we have a powerful model for a form of api-diabetes. How much more must this be the case, when the powerful protection of the many anti-diabetic principles in honey is removed and sucrose and/or high fructose corn syrup is provided?

I include below a short conversation between a bee and a beekeeper.

"I know this is not the best, but I sold all the honey (the price was good), so I have purchased refined sugars and they will provide you with as much foraging energy

as you need"

And the reply?

*"Listen Mr. Beekeeper, sure I will have the energy I need. But you offer me no protection against sugar toxicity. You are creating trouble ahead. You must already know that sugar, without all the extra protective ingredients provided in plants, in nectar and in honey, is toxic. Why do so many humans have diabetes? Has it not occurred to you that bees are even more vulnerable to diabetes? You at least can use fats as energy in your fuel energy supply mix. We have no such resource. This is great. We are fabulous athletes, even you know that, and that is because we use only glucose, which gives us a weight to power output humans can only dream of. Sure we can fly fast, and travel far, but if we hit a period of any kind of stress, like adverse weather conditions, and as you know stress hormones disrupt energy pathways big time, we are done for. We have no fall back, you have removed from the hive the only protection we have, our anti-sugar principles in honey - FloralFlavones, vitamins, amino acids, minerals and potent trace elements, such as chromium and vanadium (there are around a dozen of these). You killed the golden goose. We die from sugar poisoning, just like many of your own species. In our hive we call this api-diabetes, and I can inform you that it is a big topic of conversation and dance in our hive, so please do for us what you may not do for yourself and give us the food and fuel we make for ourselves. We do a big job for you guys, we pollinate your crops and we provide you with a food and energy supply you could not have invented, but please give*

*us what we need. When you feed us refined sugars, devoid of regulatory principles, you provide sugar without hope.*

*It is the basic right of every bee to be provided with honey. Look it up, it is in the Universal Declaration Of Bee Rights - and is kept in the Jamestown Library, where the first pilgrim honey bees came from Europe"*

As the spokesbee said:

Every drop, every spoon of honey, is provided with a sweet suite of antisugar principles, principles that regulate glucose metabolism, and act to prevent build up of glucose in the circulation (hyperglycaemia), by promoting removal and disposal of glucose into tissues, mostly muscle.

Along with a blessed package of antisugar principles, fructose (The Fructose Paradox), the FloralFlavones, vitamins, and amino acids there is provided a team of elements or minerals that all act to promote this antisugar activity.

What are the universals in Colony Collapse Disorder?

This appears in different regions of different countries over many decades, and therefore the most likely candidate (as in humans) is food/fuel.

We humans have lost our ability to regulate metabolism of fats, because we have first lost our ability to optimally metabolise glucose. As a result of chronic overproduction of stress hormones we have a modern epidemic of infertility, and bees will be no less vulnerable.

A combination of stress and poor diet is killing humans and very probably bees.



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May I respectfully suggest that bee biologists direct their attention to feeding bees with refined sugars, which do not possess any protection against api-diabetes?

Mike McInnes  
Co-Author, *Hibernation Diet*

## May Inner Cover

I have subscribed to *Bee Culture* for a number of years and have gotten information that was a help in taking care of my bee colonies. Your latest "Inner Cover" was a little amusing, especially your comments on Global Warming.

In your writings you often write everything has to be proved and records kept. This is the factual way of doing things which I agree. Global warming is not factual or has not been proved. Mr. Al Gore preaches all of this but does not apply the same standard to himself.

Have you ever written anything on the great accomplishments to the environment that President Clinton and Vice President Gore did? I don't recall any negative articles on any Democrat.

When you start writing about politics, may I suggest that you are factual and give equal time to both parties.

Donald Young  
Converse, IN

## The New ABC

Thanks for sending a copy of your new *ABC & XYZ of Bee Culture*. It arrived yesterday. I read it a bit last night and was very impressed with the parts that I was familiar with and with the parts (in this case candle making) where I was clueless. I was surprised how the introduction of color affected me. It attracted me to the book and it helped to establish this edition as a modern standard for encyclopedic information for beekeepers.

John Harbo  
Baton Rouge, LA

## Kids and Honey Bees

Hi! I am a Kindergarten teacher

at Lakeland School in Meredith, NH. My students just finished a cross-curricular unit on honey bees and I wanted to share a picture of some of the projects they made. Your magazines were helpful for us to view pictures of bees and to learn about their honey-making.

Thank you for a very informative and educational publication.

Christina Reynolds  
Meredith, NH



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# INNER COVER

It's mid-June now. Newspaper articles, I count 45 today on Google, continue to recite the CCD story – thousands of colonies lost, pollination threatened, farmers in danger of crop loss, no end in sight, beekeepers distressed, and still no answers. No answers at all.

What's going on with this no answers?

Well, for one thing researchers are playing both the wait-and-see-what-happens-next-with-the-bees game, and mostly the wait-for-funding game so they can continue. Behind the scenes some sophisticated science is ongoing I understand – high-powered survey planning and analysis, monitoring bees on CCD comb, genetic comparisons, pesticide residue sampling and testing, and more.

And that's the way it is mid-June. I'm sure somebody is doing something else, somewhere. Probably.

But for all the attention bees, beekeeping, beekeepers, CCD and all the rest have had in the last six months; for all the villains that have been blamed – the new and old pesticides, the viruses, fungi, mites, and everything evil in paradise; even the weird, the crazy and the awful; even with all of these there's one thing that is so very wrong that it has to be mentioned here and now. So listen up.

Most story tellers, reporters, and bloggers usually do some diligent research when reporting on the reports that they are supposed to report on. They find good statistics, fun facts and scary numbers to quote – like that in 1979 the U.S. had 4,155,000 colonies, and in 2006 we had only 2,392,000 – a 42% decrease (what the heck, just round that up to about 50%). Seldom is any reason given for this dramatic drop, and the story goes on without hesitation as if CCD is and has been the only cause of this staggering loss. The decline and fall of beekeeping as we know it must be blamed on...something (now that it has "suddenly" come to light), and CCD just has to be the reason.

You and I know that's a load of manure. Pure and simple.

Moreover, every producer of every agricultural crop in the U.S. knows the same thing.

For the last quarter century, more or less, every ag commodity – corn, soybeans, wheat, honey, rice and the rest have been beat down in price, threatened with extinction by unidentifiable and unidentified cheap imports, consumed by the complete vertical market control of huge agricultural businesses and in most cases kept alive only by continuous intravenous feedings of federal subsidies.

With bees it's been the same, plus the land grabbing loss of available forage, lethal pests that come again and again and again, and microscopic federal support for agriculture in general and beekeeping in particular. With the funding available for honey bee research in the last 20 years our USDA has allowed bee researchers to just barely hang on. It's hardly the researchers fault because there's just not enough of them to really get ahead. Even with CCD only a third of the existing research effort is federal...the rest University and private. And where's the federal money that was supposed to be rushed to the scene as dictated at the congressional hearing? Bills have been introduced . . . we'll see.

Right now everybody and their brother is focused on losing honey bees, losing pollination and Einstein's predictions (that he didn't really make). So, I'm going to poke a hole in most of these storytellers' balloons. My question is - where was their concern when honey prices were in the toilet, federal funding for bee research was in continuous, full speed reverse and honey packers couldn't import the cheapest, antibiotic-adulterated Chinese and Argentinean honey fast enough?

Where, I ask, were those caring folks when these crimes against humanity were ongoing? Where?

Wait, there's more. As long as we're picking on the feds...the public, bees, beekeepers, pollinators of all kinds and pretty much everybody and everything that breaths and moves on this planet are still getting clobbered by applications of poisonous agricultural chemicals that endlessly flaunt the

label regulations that barely suggest when and where and who to spray. There is so little enforcement, so much wink-wink, nod-nod between the EPA, State Ag Department enforcement agencies and pesticide companies it's embarrassing. Bees are still dying in droves in places because of this lawlessness. Still. And when did you ever hear about that on the 6:00 news?

The next time a reporter asks you what's wrong with the bees, tell them exactly what's wrong. It's been their apathy, their indifference, and their callous disregard for the rules and regulations that support and protect both those insects and those who care for those insects they now seem to worry about that lies at the heart of this. But wait. We know that's not quite right, don't we.

You and I know it's not really about the bees, or even about the beekeepers. It's tomorrow they're worried about. Tomorrow's breakfast, tomorrow's dinner and tomorrow's supper that's really on their minds.

Where were they when we needed them? Out to lunch, that's where.

OK, enough ranting. Moving on.

Every month we send out renewal notices to those subscribers that have just about run out of issues. If they don't renew then we'll send another letter a little bit after the expiration date as sort of a reminder that their subscription has expired and we think it would be a good thing to renew. If they still haven't renewed after a few months we'll try again. But by then both of us usually know the relationship is over, for whatever reason.

By industry standards we have a very high renewal rate so we are pleased that almost all of you either really like the magazine and want to keep receiving it, or are so tempted by the stunning graphics and spell binding copy of the renewal letters we send that you just can't resist one more year. Whatever the reason we appreciate your business.

Almost every time we send out these letters one or two come back

*Continued on Page 70*

## Ranting



# July - REGIONAL HONEY PRICE REPORT



## COMPARING JUNE 2006 TO JUNE 2007

We looked at prices in each category - bulk, pails, wholesale and resale, and compared prices for June last year to June this year for each region. We also looked at these across all regions.

### Region 1

Bulk up 7%, pails up 12%. Wholesale up only 3%, and retail down 6%. Wax up 10%.

### Region 2

Bulk up 29%, pails up 12%. Wholesale up 14% and retail up 7%. Wax up 13%.

### Region 3

Bulk up fully 36%, but pails up only 7%. Wholesale up 10%, and so is retail. Wax down 23%.

### Region 4

Bulk down 5%, and pails up 7%. Wholesale up 4%, retail dead steady. Wax up only 3%.

### Region 5

Bulk down 7%, pails up 20%. Wholesale up 8%, but retail up 17%. Wax up 42%.

### Region 6

Bulk up 4%, pails up 16%. Wholesale up 15%, and retail down 29%. Wax up 25%.

### Region 7

Bulk prices steady, pails up 8%. Wholesale up 14%, retail up 21%. Wax up 6%.

### Region 8

Bulk down 12%, pails up 7%. Wholesale up 24%, retail up 5%. Wax steady.

### Region 9

Bulk down 15%, pails up 24%. Wholesale up 29%, retail up 5%. Wax up 9%.

### Region 10

Bulk down 14%, pails up 11%. Wholesale down just 2%, and retail up 8%. Wax down 14%.

### Region 11

Bulk down 5%, pails down 15%. Wholesale down 1%, retail steady. Wax up 23%.

### Region 12

Bulk down 7%, pails down 5%. Wholesale up 10% and retail up 16%. Wax unchanged.

### Across all regions

#### 2007 compared to 2006

Bulk up 3.5%, pails down a half a percent. Wholesale up 9.1%, retail up 6.5%. Wax up 17.8%.

### Across all regions

#### 2007 compared to 2005

Bulk up 5.6%, pails up 5.7%. Wholesale up 13.2%, retail up 6.5%. Wax up 6.4%.

## REPORTING REGIONS

## SUMMARY

## History

	REPORTING REGIONS												SUMMARY		History	
	1	2	3	4	5	6	7	8	9	10	11	12	Range	Avg.	Last Month	Last Year
<b>EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS</b>																
55 Gal. Drum, Light	1.07	1.23	1.07	1.15	0.95	1.10	1.15	1.00	1.07	0.95	1.00	1.19	0.95-1.23	1.08	1.03	1.00
55 Gal. Drum, Ambr	0.96	1.15	0.96	1.08	0.72	1.02	1.07	0.96	0.82	0.96	0.90	1.03	0.72-1.15	0.97	0.95	0.98
60# Light (retail)	105.00	120.33	120.00	101.83	110.00	135.00	101.25	101.45	126.50	126.50	133.33	126.67	101.25-135.00	117.32	112.31	112.26
60# Amber (retail)	105.00	111.67	120.00	101.60	110.00	114.17	99.00	110.00	100.00	130.00	126.67	137.75	99.00-137.75	113.82	109.52	110.79
<b>WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS</b>																
1/2# 24/case	46.08	55.98	40.80	41.30	61.78	43.25	41.85	61.78	61.78	35.76	30.00	61.23	30.00-61.78	48.47	46.64	37.26
1# 24/case	63.36	68.28	70.20	60.80	60.00	69.70	69.35	72.00	87.94	77.76	69.93	90.52	60.00-90.52	71.65	67.13	62.84
2# 12/case	61.26	63.32	67.80	56.13	54.00	56.93	64.75	62.00	45.00	57.84	54.00	76.80	45.00-76.80	59.99	57.78	57.85
12.oz. Plas. 24/cs	58.56	61.68	45.60	59.43	48.00	63.50	61.57	54.08	66.94	47.28	63.00	62.00	45.60-66.94	57.64	55.30	55.50
5# 6/case	68.75	70.49	70.50	59.57	69.64	75.00	70.64	90.00	69.64	61.86	65.50	84.00	59.57-90.00	71.30	64.92	61.76
Quarts 12/case	88.11	100.35	88.11	78.54	78.00	77.25	88.92	80.10	96.00	109.50	84.20	105.00	77.25-109.50	89.51	91.65	89.16
Pints 12/case	56.27	49.95	56.27	59.75	56.00	48.17	58.88	46.32	60.00	60.00	54.20	58.33	46.32-60.00	55.35	55.25	51.87
<b>RETAIL SHELF PRICES</b>																
1/2#	2.75	2.68	2.60	2.88	4.00	2.90	2.63	3.85	2.50	2.79	2.69	4.25	2.50-4.25	3.04	2.72	2.40
12 oz. Plastic	3.25	3.56	2.49	3.40	3.14	3.33	3.19	3.29	3.00	3.14	3.55	4.08	2.49-4.08	3.28	3.22	3.29
1# Glass/Plastic	3.67	4.09	4.20	4.00	3.39	4.00	4.08	4.01	3.75	3.89	4.02	5.66	3.39-5.66	4.06	4.06	3.96
2# Glass/Plastic	7.50	6.64	7.80	6.10	6.24	6.45	6.96	7.00	6.33	6.38	5.40	8.15	5.40-8.15	6.74	6.70	6.62
Pint	7.25	7.38	7.25	5.63	5.54	5.11	8.04	5.01	5.50	7.01	5.14	7.25	5.01-8.04	6.34	6.29	5.92
Quart	14.00	8.98	11.55	9.02	8.33	8.90	10.06	8.92	9.33	13.46	8.43	13.46	8.33-14.00	10.37	9.74	9.70
5# Glass/Plastic	12.00	14.26	15.29	13.40	15.45	12.50	15.81	17.50	15.45	14.45	13.45	18.25	12.00-18.25	14.82	15.03	14.62
1# Cream	4.75	5.75	5.41	4.81	5.93	4.80	6.17	5.39	5.93	5.02	5.41	5.75	4.75-6.17	5.43	5.50	4.71
1# Cut Comb	5.00	4.60	5.19	4.93	7.19	4.83	7.50	5.17	7.19	6.00	6.48	7.50	4.60-7.50	5.96	5.92	5.42
Ross Round	6.44	3.97	5.60	4.50	6.44	5.15	5.38	5.00	6.44	6.00	5.98	7.00	3.97-7.00	5.66	5.44	4.96
Wholesale Wax (Lt)	2.33	2.45	2.00	2.57	1.90	2.93	2.86	2.00	1.95	2.52	2.59	1.94	1.90-2.93	2.34	2.27	1.85
Wholesale Wax (Dk)	1.67	2.07	1.00	2.32	1.80	2.50	2.00	1.50	1.85	1.90	1.93	1.50	1.00-2.50	1.84	1.73	1.70
Pollination Fee/Col.	62.50	79.00	60.00	44.00	42.00	36.50	61.60	60.00	78.96	78.96	75.00	95.00	36.50-95.00	64.46	69.44	56.32

# Colony Collapse Disorder: Have We Seen This Before?

Robyn M. Underwood<sup>1</sup> and Dennis vanEngelsdorp<sup>1,2</sup>

“Colony Collapse Disorder” (CCD) is a new tag name presently being given to a condition that is characterized by an unexplained rapid loss of a colony’s adult population. Collapsed colonies have no or very few bees remaining, either in the dead hive or in the apiary. There are usually plenty of food stores in these colonies and if bees remain, the population consists of a queen and a small number of young workers. The stores appear to remain untouched by robbing bees or honey bee comb pests such as wax moths and small hive beetles for several weeks after the collapse.

Affected operations can be devastated by the condition. Some beekeepers have reported losses of 90% of their operation. A recent survey conducted by the Apiary Inspectors of America estimated that between 651,000 and 875,000 of the nation’s estimated 2.4 million colonies were lost over the winter of 2006 – 2007. While a majority of these losses were attributable to known bee threats, over 25% of beekeepers were considered to have CCD [1]. In the mid-Atlantic region, continuing surveys from several sources have demonstrated recurring periods of heavy Winter losses. Specifically, beekeepers reported experiencing heavy losses in the Spring of 2001, 2004 [2], and 2007 [3].

Large-scale losses are not new to the beekeeping industry (Table 1). Many of the symptoms similar to those expressed by CCD-affected colonies have been described before. Like today, in the past, the cause

for the colony collapse has not been ascertained with certainty, although speculations as to the cause(s) are plentiful. In this paper we briefly review the past history of colony collapses that are reminiscent of the present situation.

The first published record of this disorder appeared in 1869. An anonymous author reported loss of bees which left behind hives with plenty of honey. It was speculated that the death was due to a lack of pollen, poisonous honey, or a hot summer [4]. Subsequently, Aikin [5] described losses in Colorado in 1891 and 1896 where large clusters disappeared or dwindled to tiny clusters with queens in May, hence the name “May disease.” Investigations at the time identified various fungi with these collapses. Burnside [6] was able to isolate, culture, and reproduce symptoms very similar to CCD with a strain of *Aspergillus* fungi.

Stonebrood, caused by the fungus *Aspergillus flavus*, affects both immature and adult bees. Infected larvae turn into solid, hard mummies that are not easily removed by the bees [7, 8]. Stonebrood-infected adults fly or crawl a considerable distance from colonies before dying [6]. Superficially, the adults appear normal [6]. It is believed that stonebrood is spread through the sharing of infected combs [9], as the fungus has been isolated on combs [10]. In addition, Giauffret [11] believed that disruption of the intestinal flora of bees due to antibiotic use may allow the fungus to spread. It is yet to be determined if the losses that are being seen today will, like with stonebrood, appear suddenly and then disappear [12].

In three epidemics between 1905 and 1919, 90% of the honey bee colonies on the Island of Wight in the United Kingdom died [13, 14]. Bees afflicted with this disorder could not fly, but crawled from the entrance

[15, 16]. Researchers disagreed as to the cause of this affliction. Some concluded that the losses were due to acarine disease or the honey bee tracheal mite, *Acarapis woodi* [13]. Others believed that starvation was the cause of the losses [14, 17]; while still others thought *Nosema* disease caused the high losses [18]. Some affected beekeepers over the years have blamed their losses on the so-called “Isle of Wight disease” whenever they could not find another cause [14]. Bullamore [17] noted that genetics likely played a role and emphasized the need to dispose of colonies after a maximum of three years.

In the Stawell district of Australia in 1910, 59% of colonies were lost and many more were severely weakened [19]. Beuhne [19] noted that colonies that did not have their honey extracted and that were allowed to gather honey late in the season did especially poorly. He concluded that honey made from *Eucalyptus leucoxydon* was too high in moisture, presumably fermented, and so was not suitable for consumption by the bees [19]. The author also mentioned that reliable accounts of severe losses from as far back as 1872 have been noted “at intervals of some years” [19].

Instances of large-scale losses were also reported in 1915 in Portland, Oregon [15] and from Florida to California in that same year [20], but these losses were not well documented. In 1917, widespread losses were reported in New Jersey, New York, Ohio, and Canada [21]. This time, an overabundance of pollen was blamed and bees were found dead in front of the hives. Root and Root [15] noted that this “disappearing disease” disappears within a short time without treatment.

In the 1960s, many reports of losses were published. In Texas and Louisiana, bees disappeared in the Fall and Winter [20]. In the

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Rio Grande River region of Texas in particular, the losses occurred after a period of unseasonable cold followed by two weeks of rain [22]. In Louisiana, bees were tested and found to be free of nosema disease, septicemia, honey bee tracheal mites, external parasites, and paralysis virus [23]. Roberge [24] noted that the bees had suddenly stopped clustering and believed the problem was genetic. Bees were also lost in California [25]. The remaining bees in the dwindled colonies appeared healthy and had plenty of food stores.

In Australia, losses were high in 1975 [26]. Termed "disappearing syndrome," losses seemed to be due to dampness, poor nutrition, and stress [23]. Olley [26] noted that the syndrome could be transmitted between closely adjacent colonies through robbing and suggested that a virus was the cause. At about the same time, losses were reported in Mexico [27]. The losses in Mexico, called "disappearing disease", were blamed on the environment, as research ruled out genetic factors [28]. In addition, paralysis virus and cold weather did not play a role [27]. Many factors, such as diseases, poor nutrition, and genetics, could have worked together to cause this syndrome [28]. An extensive survey conducted in 1975 indicated that the disorder could be found in 27 states [29]. Witherell [30] ruled out poisonous pollen, poisonous nectar, pesticide poisoning, and diseases caused by microorganisms, including viruses, as possible causes.

In the late 1970s, losses occurred in Winter and Spring in Florida [31]. Pathogens, food or lack of it, weather, genetics, and management were all suspected causes. Studies of the effects of protein sources on bee longevity and brood rearing showed that inadequate pollen substitutes could cause bee loss [32]. Losses also occurred in Seattle, Washington, where bees failed to cluster and were observed flying on a very cold day [33]. Losses in Texas at the time were not due to nosema disease or septicemia [22].

In the mid-1990's, losses again became evident in the northeastern United States [34]. Research showed that bee mortality could be reduced when Apistan, Terramycin extender patties, and Fumidil-B were used, but that menthol and grease patties did

not prevent loss. This suggests that good nutrition and pest control may keep bees healthy and enable them to resist this malady and that honey bee tracheal mites did not likely contribute to the losses.

During the Winters of 1998-1999 and 1999-2000, heavy losses were reported in France. Research showed that known honey bee diseases were present, alone or in combination with each other, in 76% of the effected apiaries [35]. There were no combinations of diseases that were more likely than the others, so the main suspects became colony mismanagement, nutrient deficiencies, and chemicals in the environment. Then, as now, the cause of the losses was generally unknown.

Pesticides are often suspected as the cause for honey bee mortality because many that are used on bee-pollinated crops are toxic to honey bees. Tests commonly focus on finding doses of pesticides that are lethal to honey bees. However, the sublethal effects can also lead to problems at the colony level. At sublethal doses, the effects are more subtle. Honey production suffers [36] and foragers seemingly disappear [37]. For example, when colonies are placed near crops of sunflower treated with imidacloprid, foraging is disrupted and colonies dwindle and die as foragers fail to return to the hive [38]. This may be explained by the fact that some pesticides can cause a disturbance in the dance language or in the orientation abilities of worker bees [39, 40, 41]. In addition, the lifespan of workers can be reduced by sublethal pesticide exposure [42, 43].

Recently, a new species of nosema has been described [44] that has been suspected to cause losses sim-

ilar to those being experienced at the present time. The presence of the parasite causes non-specific symptoms, such as low honey yields, higher than normal Fall/Winter colony mortality, and gradual depopulation of colonies [45]. The protozoan was first found in the Asian hive bee, *Apis cerana*, but is now reported from European bees, *Apis mellifera* [44, 45, 46]. In Spain, this protozoan was found in samples of bees where unexpected losses and poor honey yields were reported [46]. However, a recent survey of *N. ceranae* prevalence in the U.S. has found the parasite to be widespread and to be in samples collected as far back as 2000 [47]. Very recent work has concluded that *N. ceranae* is not likely the cause of CCD [48].

The losses that have been occurring for over 100 years could be completely separate events or part of a cycle of disappearance. So far, we can only speculate. The cause of the recent honey bee colony losses, termed Colony Collapse Disorder, is still unknown [see MAAREC.org for the latest information]. Scientists are working hard to determine what is killing our bees. It is hoped that, armed with many new tools, such as a complete mapping of the honey bee genome and modern molecular techniques, the cause of this latest outbreak will be determined. **BC**

**Table 1. Past years of large-scale colony losses**

Year	Location	Citation
1868	Kentucky, Tennessee	[4]
1872	Australia	[19]
1906	Isle of Wight	[17]
1910	Australia	[19]
1915	Portland, Oregon	[15]
1915	Florida to California	[20]
1917	United States	[15]
1917	New Jersey, Canada	[21]
1960s	Louisiana, Texas	[49]
1960s	Louisiana, Texas	[50]
1960s	Louisiana	[24]
1963-64	Louisiana	[23]
1964	California	[25]
1970s	Mexico	[27]
1970s	Seattle, Washington	[33]
1974	Texas	[22]
1975	Australia	[26]
1977	Mexico	[28]
1978	Florida	[31]
1995-1996	Pennsylvania	[34]
1999-2000	France	[35]
2002	Alabama	[20]
2002-2003	Sweden, Germany, etc.	[51]

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Last month I discussed the rationale for pesticides being implicated in colony collapse disorder (CCD), specifically a new class of chemicals that is being implemented widely by applicators called neonicotinoids. The lead compound for this class is imidacloprid. It and its derivatives are extremely effective on insects, attacking specific nerve targets (nAChR), but relatively benign on mammals (humans, dogs and cats).

Because they are so specific for insects, however, means that honey bees could be readily affected by neonicotinoids. The first indication of this was in France, when beekeepers noticed an extreme decline in their colonies in sunflower fields. The Syndicat National d'Apiculture, Syndicat des Producteurs de Miel de France, and Union Nationale d'Apiculture Française issued a joint statement in Paris, 18th December 2000, which contained the following preamble:

"A press communication dated 16th December 1998, produced by the Minister of Agriculture and Fisheries, announced that: The commission (Commission de toxiques) charged to evaluate the impact of Pesticides have studied the dossier 'GAUCHO' (Imidacloprid - BAYER). Following these studies, it has published the following advisory comment.

"Taking into account recent studies evaluating the impact that Imidacloprid could have on the activity of bees when used as a seed treatment for sunflowers', the Commission des Toxiques during its meeting held on the 16th December, 1998 considered that:

"The examined data does not allow for a conclusion of indisputable effect of imidacloprid or its metabolites on bees and the production of honey.

"Inversely, it is not possible to totally exclude the effect of imidacloprid and its metabolites, taking into account the toxic effects of minute doses, doses that are in keeping with those concentrations potentially present in the plants during the period of harvest.

"That complementary study should be undertaken to clarify the following points:

1. The metabolism of the product in parts of the plant accessible to bees.

2. The limit of the toxicity of the

Malcolm T. Sanford

## Insecticides And CCD, Part II



"... and what about the neonicotinoids?"

product and its metabolites for bees and the quantities present.

3. The persistence of imidacloprid in the soil and the presence in crops that have not been treated."<sup>1</sup>

A demonstration in Paris by beekeepers associated with the above statement led to the pulling of the label for Gaucho®, the first and only time this has occurred to my knowledge.

This and other reports and investigations have led to numerous reflections on imidacloprid and its relatives. Graham White in the United Kingdom provides a rather complete synopsis of his analysis with many good references via the British Beekeepers Association Web Site:<sup>2</sup>

"My concerns are threefold:

"As a beekeeper I am concerned that we are beginning to see evidence of unusual collapse of bee colonies in the UK.

"As a conservationist I am concerned that the large scale use of this highly toxic, systemic and persistent insecticide in the UK is effectively sterilising fields of all soil-invertebrate life including: earthworms, beetles, ladybirds, butterflies, moths etc. This has profound ecological implications, especially for insectivorous birds and mammals.

"Imidacloprid is highly persistent in the environment and is absorbed into all parts of the crop-plant: pollen, nectar and seeds. If collected by bees it is progressively concentrated in honey as the nectar is evaporated. It seems likely that it will be present in sunflower and rape-seed oil, - even if in small quantities. As a neuro-toxin this may have implications for the food chain and human health."

He concludes: "Currently there is growing concern in the UK about the unexpected collapse of bee colonies in Summer (a time when they normally thrive) and a sporadic incidence of

failure of queen bees to mate or prosper. As yet the evidence is anecdotal and a national survey/ study is urgently needed but if the pattern follows that observed in Sweden, France and Canada, it seems a reasonable hypothesis that imidacloprid may be a causal factor. Imidacloprid is a systemic insecticide which attacks the nervous system of all invertebrates; the target pests are flea beetles and wireworms etc but beneficial species such as bees, earthworms and beetles are also killed. The pesticide is dusted onto seeds before they are planted and is used on a worldwide scale on crops including: sunflowers, oilseed rape, potatoes, wheat etc."

Unfortunately, the evidence is mixed on imidacloprid's presence in plants honey bees might use for forage. In one Canadian study:<sup>3</sup>

"Kentville, N.S., March 8, 2002. A collaborative research project recently found that imidacloprid (Admire®) was not found in pollen and nectar of wild flowers and clover flowers in years following an in-furrow application of the product.

"The research project was undertaken as a result of a question raised by beekeepers whether imidacloprid or its plant metabolites was the cause of the dwindling bee populations reported by beekeepers in Prince Edward Island and other areas. Admire® is a popular insecticide for control of Colorado potato beetle and other insect pests in potatoes.

"Results of the Imidacloprid Residue Study were presented to the Canadian Honey Council and the Canadian Association of Professional Apiculturists in Banff on January 30, 2002." The principal investigators were Jim Kemp and Dick Rogers.

They concluded: "Our answers to the question are based on determining the residue levels in parts per billion after imidacloprid was applied

in-furrow. Measurements were taken in the current year and the first and second year after application. Imidacloprid and its two main metabolites (hydroxy and olefin forms) were not found in clover flowers and wildflowers, bee collected pollen and nectar, and uncapped honey. Residues can be measured when they are at or above the detectable limit of two parts per billion.

"The study took place during the Summer of 2001 in PEI and New Brunswick. It included sampling and analysis of over 3,800 soil cores, over 8,000 clover leaves, over 2,000 clover flowers, over 480 grams of wildflowers and over 6,000 honey bees.

"The Imidacloprid Residue Study was funded in part by the governments of Prince Edward Island and New Brunswick, with major funding by Bayer Inc. Additional partners and collaborators in the study included the Agriculture and Agri-Food Canada Research Branch, Cavendish Farms Research division, Jasper Wyman & Son and the potato growers and beekeepers of the Maritimes."

A study by a team of French scientists "describes a new approach to assess more specifically the risk posed by systemic insecticides to honey bees with the example of imidacloprid (Gaucho®). This approach is based on the new and existing chemical substances Directive in which levels of exposure (PEC, Predicted Exposure Concentration) and toxicity (PNEC, Predicted No Effect Concentration) are compared. PECs are determined for different categories of honey bees in relation to the amounts of contaminated pollen and nectar they might consume. PNECs are calculated from data on acute, chronic, and sublethal toxicities of imidacloprid to honey bees, to which selected assessment factors are applied. Results highlight a risk for all categories of honey bees, in particular for hive bees. These data are discussed in the light of field observations made on honey bee mortalities and disappearances. New perspectives are given to better determine the risk posed by systemic insecticides to honey bees".

In their discussion, the authors conclude: "The PEC/PNEC derived from the calculation of honey bees' exposure to which appropriate assessment factors were applied show that the risk posed by imidacloprid is alarming for all categories of honey

bees. These ratios are all over 1, and greater in adult hive bees than in any other categories of bees. Whatever the validated toxicity data are, the determined PNECs are in a limited range of values (between 1.2 and 50 pg/bee). These estimates are in agreement with observations made in regions of extensive sunflower and maize cultures, which report a decrease in honey production since the launching of imidacloprid on sunflower plants in 1994."

"At sublethal doses, pesticides are known to have profound impacts on the colony, in particular on the honey bees' longevity, the brood production, the development of hypopharyngeal glands, and the egg laying. Imidacloprid is known to affect the honey bees' cognitive behaviors such as the proboscis extension reflex PER. Learning and memorization in honey bees' tasks are very important. For example, a forager that is disoriented might get lost and eventually die. In the case of massive foragers' intoxications, the colony is likely to be greatly affected. In an experiment under tunnels, Vandame et al. exposed honey bees to deltamethrin at a sublethal dose that is 20-fold lower

than the registered dose at which foragers are expected to be exposed to in the environment. They found that 54% of the treated bees were disoriented and took flight toward the sun. The authors concluded that such sublethal effects may be the cause of the symptom called the 'disappearance bee disease' by beekeepers who observed colonies' weakening without finding dead bees close to the hives. This hypothesis was formerly raised by other scientists."<sup>4</sup>

Note that deltamethrin mentioned here is a pyrethroid<sup>5</sup> in the same class as fluvalinate, considered one of the most benign pesticides used for *Varroa* control. If one mixes this knowledge with the fact that organophosphates (coumaphos in CheckMite+®) may also be used inside beehives at very low levels, then the blame for disorientation and forager loss may not lie strictly with the neonicotinoids. The bottom line is that we simply don't know how much sublethal pesticide levels individual honey bees can take before their population becomes at risk of "disappearing" and/or "collapsing."

Several beekeepers I have talked to are convinced that neonicotinoids are implicated in CCD. And David Hackenberg, one of the first beekeepers affected by the disorder, has written his pollination customers providing them a list of materials, asking them not to apply any of these substances, and to instead consider alternatives.<sup>6</sup> Beekeepers might also consider this when planning their control measures for parasitic mites. There seems little question that adding any pesticide to the honey bee's environment puts it and the colony it inhabits at greater peril. **BC**

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# Food For Thought

Honey bees reared on poor quality pollen are stressed.

—Eric Mussen

Like other animals, honey bees require adequate shelter and food in order to survive. Food for honey bees is made up of water, nectar, and pollens. Water is as essential to honey bees as it is to us, for the same reasons. Nectar provides a good deal of water and sugar. The sugar can be used immediately by the bees for energy or brood rearing, or stored as honey for later consumption when sugar is needed and nectar is no longer available.

Pollens make up the nutritionally most important food in the hive. They provide the proteins, lipids, vitamins, minerals and micronutrients that support adult bee physiological equilibrium and brood development. Similar to humans, honey bees require the same ten essential amino acids in their food to be healthy. Honey bees cannot synthesize cholesterol, an essential compound for their lives, so they obtain that as 24-methylene cholesterol from the pollens they eat.

From a honey bee nutritional standpoint, not all pollens are the same. Various researchers have determined that pollens can be grouped into categories, based mostly on crude protein content (but also on amino acid composition). Pollens from most deciduous fruit trees are nutritious for honey bees. Lupine pollen is listed as good in Australia, as are almond, clovers, pear, and some of the gum (*Eucalyptus*) trees. Buttercups (some are toxic to bees), *Crocus*, willows, wild radish, prune, apple, mustard, rape (canola), and poppies are supposed to be good.

Pollens that are less nutritious and with which a mix becomes more important are: elm, cottonwood, ash, pussy willow, dandelion, sweet corn, and alfalfa (actually alfalfa pollen is nutritious, but honey bees don't like to eat it).

Air-borne pollens tend to be least nutritious such as alder, hazel nut, ash, birch, poplar, and field corn. Sunflower, eastern buckwheat, fireweed, blueberry, and weeping willow are not adequate nutrient sources.

Coniferous tree pollens are especially poor: pine, spruce, fir, and cedars.

Honey bees rear two physiologically distinct types of worker bees. Summer bees, reared from late December through July, progress through the classical textbook series of jobs, beginning with various duties in the hive during the first three weeks. Then, they become foragers for the final three weeks of their lives.

Winter bees, reared from August into October, do not immediately begin hive work, including brood rearing. It might be that brood rearing or beginning to forage may start a six week clock similar to Summer bees. During Winter, Winter bees should do little other than participate in the Winter cluster until it is time to begin rearing brood toward spring. Healthy Winter bees have a life expectancy of about six months. Winter bees comprise the colony population that survives the Winter, when fresh food is not available. Winter bees are still supposed to be in the hive in February and March to be our "almond bees" in California, long after the previous season's summer bees have died off.

As adult bees reach the final days of life, they fly from the hive and die in the field, weather permitting. The few bees that die in or around the hive (five to 25 of the daily thousand or so in the Summer) are picked up and carried away by under-taker bees to some distance from the hives. Normally, very few bee bodies are found around a hive containing a healthy honey bee colony.

Honey bee longevity also is impacted by a "group effect." Given 100 adult bees of the same age and health, each held in an individual cage with food and water, we would expect the bees to die in a manner

that leads to a "bell-shaped curve." A few bees would die quite early, most of the bees would die around the same median time, and a few would persist quite a bit longer. A similar group 100 bees, caged together with the same food and water, would die a bit differently. Again, a few bees would die quite early. The rest of the bees would share food and nutritional body reserves. The intra-group sharing tends to result in a longer average lifespan for the group, and eventually most of the bees will die during a more concentrated period of time at the end.

Honey bee colonies dying of Colony Collapse Disorder (CCD) seem to be following expected behaviors of natural death: 1. flying away and not coming back and 2. maintaining the group as long as possible and then giving out all at once. This may explain the losses in the field, but it does not explain the cause of early death.

When things are going properly, healthy honey bees escape most infections, parasites, and poisonings by resisting them in the first place. The immune system of a honey bee, and its ability to denature toxins, has been found

not to be as robust as those of many other insects. Honey bee resistance is at its peak when the colony has been well fed (meaning substantial amounts of quality pollens).

Honey bees reared when a good mix of pollens are not available are stressed. In some cases, the stress is visibly apparent. Examining colonies in alfalfa seed pollination in California shows that newly emerged bees are much smaller than normal, looking more like flies than honey bees. Usually, however, malnourished bees do not look different from normal bees.

Previous studies on honey bee nutrition and those being conducted currently by USDA/ARS researchers demonstrate that undernourished



colonies produce worker bees that are lighter in weight and have significantly reduced life expectancies. It appears as though supportive feeding of the colonies, with pollen substitutes or supplements (substitute with added pollen), helps the bees to a certain extent. Up to this time, we do not have an available pollen substitute or supplement that can replace a mix of pollens, nutritionally, and sustain robust brood rearing. In most cases, honey bees will not consume the supportive feeds, unless some fresh, natural pollen is being collected and brought into the hive.

That was a concern of some beekeepers whose bees were collapsing this Winter – “They won’t touch the feed.”

This past Winter in California we basically had no rain in January. Normally, Winter weeds grow and bloom in January. We also had serious, unanticipated frosts that set back or killed Winter annual plants. Our normal early pollens were not there to stimulate consumption of beekeeper supplied feed.

One other observation that beekeepers made was “How can my colonies be nutritionally deprived when I see combs of multi-colored pollens (bee bread) inside even as the colonies collapse?” That is a question that directs further attention to pollen production and local weather conditions. There are references in the literature that report that too much chilling interferes with meiosis in forming pollen and the grains are “sterile.” Other reports suggest that too dry and too hot conditions lead to the production of “non-viable” pollen. But, those reports relate to germination and fertilization studies. What has happened to the living protoplasm that normally occurs inside the pollen grains? That protoplasm contains the protein and carbohydrate used by the pollen grain to grow a pollen tube into the female part of the flower and fertilize the potential seed. Is the protoplasm still there, or are the pollen grains empty? Bee bread would look the same whether the pollen grains were intact or empty. Perhaps the weather changed the vitamin content or amino acid ratio of otherwise nutritious pollen.

When I arrived in California in 1976, many western beekeepers already were providing supplemental feed to their colonies. Sugar syrups

were being used to stimulate egg laying, and protein patties were being fed to help build brood. Dr. Christine Peng conducted research that determined brewers yeast was well digested by bees and helped support brood rearing. Her studies showed that late summer/fall feeding returned the best results for the dollars invested. While not much more brood was reared than in the unfed colonies, examined workers contained more stored protein and glycogen (fat bees), survived the Winter better, and produced more brood through the Spring into May. Colonies fed only in the early Spring did not benefit nearly as much from the feeding. Colonies fed in the Fall and Spring benefited the most in colony size, but the gain was not as cost effective as feeding only in the Fall. Fortunately, during the field study, natural pollens were abundant enough to stimulate use of the substitute feed.

What about Australian packages? Since the seasons are reversed from ours in the southern hemisphere, their Summer bees are reared from late June through January, and their Winter bees in February and March. Their Winter bees would be expected to live through August or September. Thus, Australian packages purchased in October through January would be populated with Summer bees hav-

ing a six week life expectancy. So, it would be unrealistic to expect the Australian bees to “make it through the Winter” in our hives, unless they had access to substantial food and reared considerable brood during August and September or during our Winter months.

All this information suggests that despite our efforts, honey bee colonies can be impacted severely by the vagaries of local weather conditions, especially as they affect quantities and quality of pollens. Honey bees are one of the few agriculture related animals for which a complete, sustaining, artificial diet has not been developed. It appears that research in that area has to be accelerated as changing land use and the vagaries of weather continually reduce the forage available to honey bee colonies. **BC**

For more information, “Pollen: Biology, Biochemistry, Management” by R.G. Stanley and H.F. Linskens. Springer-Verlag, NY 1974. Also, there is the down-loadable “Fat Bees, Skinny Bees” at a url that I have suggested in previous newsletters: [www.rirdc.gov.au/reports/HBE/05-054.pdf](http://www.rirdc.gov.au/reports/HBE/05-054.pdf). There is a review table of values of Australian pollens to honey bees at: [www.rirdc.gov.au/reports/HBE/01-047sum.html](http://www.rirdc.gov.au/reports/HBE/01-047sum.html).

Eric Mussen is Extension Apiculture Specialist, University of California, Davis.

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# New Bees

James Fischer

Feeling down because the price of packages has gone up?

Well, worry no more. Low-cost packages are now available from a new source. Nabisco has reportedly hired a large number of small children to collect bees so that they can offer "Honey Maid Bees" at the amazingly low price of \$3.60 per one-pound package.

While some beekeepers think that Nabisco and their bee collection effort is behind the bee disappearance associated with "Colony Collapse Disorder," there have been no sightings of gangs of urchins near any of the apiaries hit by CCD.

State Apiarists we interviewed expressed more concern over the prima facie violation of child labor laws than any connection to CCD.

*Bee Culture* wanted to know how these packages compare to packages from the usual suppliers, so we bought a few packages, and hived them in early April.

First, all the packages we bought were queenless. We were very careful to inspect every bee individually, and we can conclude that Nabisco needs

to make significant improvements in this area. These bees also look very unusual.

We sent high-resolution photos of these bees to several entomologists, and none of them offered any identification of the breed of bee. We were somewhat reassured by the package labeling, which confirmed that these bees are the "Honey" variety, rather than solitary bees or bumble bees.

When installed, very little of the usual activity one might expect from a newly-hived package was observed. Over an eight-week period, the packages consumed no feed, drew no comb, and refused to fly out of the hive.

We wondered if the bees might have a disease, but each and every bee had a smile on its face, leading us to conclude that they were happy and healthy.

With none of the usual Spring activity evident, we sampled a few dozen bees, persevering them in liquid nitrogen for a full battery of tests back at *Bee Culture's* labs, located in the seedier part of Medina Ohio.



[Ed Note: By "seedier," he means that the surrounding fields had recently been seeded.]

We were amazed to find no Varroa, no nosema, and no viruses. We not only found no tracheal mites, we couldn't even find trachea in these bees.

One downside was that the bees did not show good hygienic behavior at all.

All bees were covered with massive amounts of crystallized sugar, but none made any attempt to clean themselves or their hive-mates. As for temperament, they are extremely gentle. We'd rate them as docile, almost comatose.

No one handling these bees has been stung to date. Upon closer examination, we found that they lacked stingers.

Our conclusion is that the gangs of children are nothing but a promotional stunt.

These are a new and hitherto



unknown hybrid cross. We are trying to track down a breeder named "Graham", as the package label indicates that these bees are "Graham's".

While Nabisco's offering was far less than acceptable in several key metrics mission critical to the package bee business, we are encouraged that a major corporation has entered the market, and delighted at their distribution scheme.

No dealing with post office delays, these bees are supplied through grocery retailers. **BC**

*Jim Fischer lives in Manhattan and keeps his bees on Long Island and his crackers in the cupboard.*



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# Healthy Colony Growth and Sub-Lethal Chemical Exposure

Larry Connor

Nearly 30 years ago certain beekeepers experienced Disappearing Disease in different parts of the United States, a condition where the bees in colonies were no longer found inside the hive or out – often after good buildup or at the end of a good season – leaving behind the queen, newly emerged workers, normal brood and food supplies. Disappearing Disease was also called Fall Dwindling and Colony Collapse, in addition to other names. Considerable investigation was made into the nature of the disease, and after several years of study, the scientific “blame” for the disease was attributed to poor colony nutrition. These results were published in 1982 in the *American Bee Journal* by Professor Walter Rothenbuhler and his research team at The Ohio State University.

Disappearing Disease took place years before tracheal or *Varroa* mites were introduced into the country. Cell phones were not yet in use, and a class of new insecticides called neonicotinoids did not exist. A few blamed African honey-bee genes as the cause of the problems, one reason perhaps why bee geneticist Rothenbuhler was selected to investigate the cause.

It has been about six months since most of us first heard about the Colony Collapse Disorder (CCD), and so far the collaborative research effort has eliminated a number of potential causes of the “disorder,” including a shared queen/genetic source, *Nosema cerana*, high fructose corn syrup and several other potential explanations. Some causes were eliminated as a result of the survey of affected beekeepers combined with preliminary laboratory results. It is still too early to make an educated guess as to the cause, but history – our industry experience with Disappearing Disease – gives us two high-level candidates: pesticide exposure and/or nutritional deficiencies. If either of these factors is involved, it will undoubtedly be related to complications related to changes in beekeeping practices and/or agricultural methods applied on a widespread basis.

## Pesticides – lethal and sub-lethal

Let’s discuss pesticide use in and around the beehive. Beekeepers position bees in active agricultural areas when they provide bees for pollination. In these areas, the presence of a few hundred bees – dead and dying – in front of the hive has little impression on a commercial beekeeper who measures a pesticide kill in mounds of dead bees that can be scooped up with a shovel. But wait a minute! If you have worked around strong, healthy bee colonies for a long time you know that they very rarely leave dead bees in front of a hive in pesticide-free conditions. In agricultural areas, the treatment with so-called non-lethal materials, including herbicides, fungicides and other compounds, may result in so-called “minor” bee mortality, but not

enough to cause concern for commercial beekeepers. Many commercial beekeepers undoubtedly think that a strong colony will raise enough bees to overcome such a small loss.

Of course, this is often true, but it puts some type of pesticide into the bees and probably the bee colony as well. It seems very likely that this material has both lethal and sub-lethal effects on the colony, as well as the few bees scattered about the front of the hive. Perhaps the bees that died are only the ones that were foraging in a field of target or non-target flowers, and directly blasted as a fungicide (or some other pesticide) that was being applied in an orchard or field. While the colony continues on, those bees are dead via chemical exposure. Some may return to the hive and are carried out of it, but not in a normal manner.

In a large agricultural area, just how many of these sub-lethal chemicals are in a hive – materials that only affect a small percentage of the bees and do not kill thousands of bees and result in huge piles of dead bees that are noticed by the beekeepers? And even more importantly, how do these materials interact with each other and with the various mite-killing chemicals the beekeeper has been using to treat for *Varroa* mites? And how small an amount of these materials can interact with other chemicals to cause bee behavior changes, not to mention bee death? Are we dealing with just parts per billion, or nearly non-detectable parts per trillion that interact with miticides and other agricultural chemicals and negatively affect some behavior of the bees? If a scientist reports that a material has been looked for in a sample of bees, comb, honey, pollen or beeswax, and is not found, are we limited by the power of the chemical investigation tech-



*Hundreds of dead bees covered the area immediately in front of the colonies in the apiary. In other apiary locations, where no spraying was underway, this bee mortality was not observed.*

nology conducted on dead bee and hive samples where primary chemicals have often degraded naturally into less toxic compounds, or into compounds the scientist is not looking for? I am highly suspicious of any research effort that looks at samples from combs from dead hives, from bee bread, honey or beeswax, without a correlation with actively dying bees – it is a huge waste of time and research money to examine old samples.

In the early 1980s PennCap-M and Sevin killed many bees foraging in apple orchards after bloom, and on corn, especially sweet corn while the plants were in dehiscence. When samples of the dead bee piles found at the hive entrances were tested, they often had very low levels of insecticide because the bees has been exposed to the environment for too long, or the bees had metabolized the materials and this speeded their degradation. But when dying bees were collected and stored on ice and quickly delivered to the laboratory it become clear that the exposure to these materials was real, and the extent of the losses considerable. But what became even more amazing was the discovery that many samples of these dying bees contained not just one insecticide, but as many as five different pesticides including some that were not targeted for insect control, such as fungicides.

That was my big light-bulb moment. It was the interaction of two or more chemicals that was contributing to large-scale losses! It became clear that in these cases one plus one often equaled 1000, far from the expected result. Rare are the studies to show what and how these interactions work. And for the past 10 or 15 years, there have been few research programs that focused on this aspect of bee mortality. A quarter century ago there were several noted bee pesticide research labs that were helping the industry. These programs no longer exist. After all, there was more pressing work to be done with tracheal and *Varroa* mite control.

Drug interactions are common in humans. Your doctor will ask you what else you are taking before writing a prescription. Nowadays they even want to know what vitamins and over-the-counter medication you take, not just the prescription drugs. We know more about human drug interactions, and know that there are certain

ones that may be deadly. But where is our research on drug interactions, synergisms, in honey bee colony treatments of miticides, foulbrood controls, and chemicals being applied outside of the colonies? For the most part, they do not exist. Few people are routinely looking for interactions.

That worries me. It worries me a great deal. Are we creating a chemical environment in the bee colony that combines mite controls with pesticides picked up in the fields and orchards that will combine, synergistically, to kill more bees? I certainly do not know the answer to this question, but until we have researchers actively working in the laboratory to screen these materials in various combinations of delivery and exposure techniques will we have definitive results that will tell us if this a concern or not.

Whenever I visit beekeepers – especially commercial businesses – I am usually a good guest and I do not take photos of chemical treatments that the beekeeper does not want me to record. It happens on many bee yard visits. Sometimes the beekeeper tries to do a slight of hand and remove the incriminating strip or pad or wooden stick before I can get the camera out and focused. Other times they tell me, point blank, don't make a photo of that. I can only speculate they want to hide the way they deliver a chemical to the colony because it does not necessarily comply with chemicals registered for mite control. I am pretty sure these items are not in the hive for decoration.

At meetings of commercially motivated beekeepers there are always at least two meetings going on, often at the same time. There is the one in the meeting room, where researchers are discussing their latest results. But for many beekeepers the really important meeting is the one conducted in the hallway or in a restaurant or bar where one experimental beekeeper tells about his or her latest mite-control concoction/delivery system/timing that they have been using. They often report on these techniques without being able to report how well the system worked. Sometimes, when the formal meeting is over, the researchers join in these conversations and keep the beekeepers from killing themselves by giving out

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When the author toured almonds fields in California during the end of the blooming period, he observed a "light" sprinkling of dead bees at the entrance of many colonies. Ground-based sprays of fungicides were underway at the same time.

information that also will help them to keep from killing all of their hives. Some do anyway, but don't talk about it too much. We know this happens. These methods are posted on various Internet sites, sometimes before the meeting is over, and reprinted in local and state newsletters. Sometimes there is a comment that the particular treatment is not approved, or is dangerous to the beekeeper. Some of the recommendations even say it will kill some of the bees while doing their work.

After listening awhile it is pretty easy to count up the treatment methods and chemicals used and realize that individual colonies are getting hit with three, four, five and often more compounds in a single season. Can anyone tell me what the synergistic effect might be from using five compounds in a beehive during a beekeeping season? Do any of these people ever collect data to see what impact their methods are having on mite loads? What happens with a sub-lethal herbicide or fungicide or so called safe insecticide is added to those hives? I really don't know. And I am pretty sure a lot of folks never want to know the real answer as long as there are bees alive in the hive.

So far the beekeepers affected by CCD report that they suspect *Varroa* and tracheal mites, viruses (that may or may not be associated with *Varroa* mites), small hive beetles, and other pathogens as key suspects as causative agents in the Disorder. But some suspect the increasing spread of certain insecticides, the neonicotinoids, especially imidacloprid (registered in 1992) and clothianidin, acetamiprid and thiamethoxam. The neonicotinoids are often applied to plants where they are systemic, moving through the plant tissue, making the entire plant toxic to pests (this would include pollen and nectar). The materials are also applied directly to crops for pest control.

The neonicotinoids are now the most widely applied insecticides used in the U.S., and are used on: "seed treatments for corn, cotton, canola and sunflowers; foliar

sprays for fruit, nut and coffee crops; granular and liquid drench applications in turf, ornamentals, fruit crops and in forests; and in California the number one use of imidacloprid is for the control of structural pests." (From MAAREC.org, **Protecting Honey Bees from Chemical Pesticides**, Maryann Frazier, Senior Extension Associate, Penn State).

The report continues with the statement "Additional research has found that imidacloprid impairs the memory and brain metabolism of bees, particularly the area of the brain that is used for making new memories. . . The chemical was present, by systemic uptake in corn and sunflowers in levels high enough to pose a threat to honey bees." In a survey of corn pollen in France, imidacloprid was found in 49% of 81 samples.

Finally, when certain neonicotinoids were used with certain fungicides, they synergized to increase the toxicity of the neonicotinoid to honey bees over 1,000 fold in lab studies.

To me, this is where energy must be spent by research teams, especially labs set up for chemical analysis, emphasis on the plural, in order to involve as many minds and laboratories as possible to further discover these relationships and possible involvement with CCD.

There is another big area to discuss based on past history, and that is regarding bee nutrition. There is not enough space to discuss this in the rest of this article, so we will have to pick up on this in a future article. In the meanwhile, if you can, go on line and download a copy of *Fat Bee, Skinny Bee* from the Australian Department of Agriculture. [www.rirdc.gov.au/reports/HBE/05-054sum.html](http://www.rirdc.gov.au/reports/HBE/05-054sum.html). It is a real world discussion of how bee nutrition is monitored in Australia and how this affects beekeeping success.

### Should scientists stop looking for Zebras in beehives?

The story has been around for a long time, but this is from an Internet piece I lifted from a Saab mechanic's website:

An example given "for MD's in diagnosing illnesses is if you're walking down the street and hear hoof beats behind you, think horses not zebras. There's a noted tendency for ambitious young doctors to suspect rare illnesses rather than the common ones and a bias to making the symptoms fit a complex theory. It gratifies the ego, opens the door to career moves, and makes work interesting. Reality is usually banal and most of us find that boring."

Lately I've heard bee researchers talk (in all the media attention bees have received) about looking for possible zebras – like cell phone interference with bee communications – when they should be looking for the old horses first. Pesticides and nutrition are two of the old horses we know, and should be researched thoroughly. **BC**

*The boxes are unpacked, and the dust has started to settle on a new home for Dr. Connor and Wicwas Press in Kalamazoo, Michigan. The old email still works: [eebooks@aol.com](mailto:eebooks@aol.com). So does a new phone number 269.344.8027.*

**For The Latest On CCD, see [www.BeeCulture.com](http://www.BeeCulture.com)**

# BUILDING THE PERFECT HIVE

Peter Sieling



When you make beehives in your wood shop, you must take a number of details into consideration. Two important items are seldom addressed by articles and plans: discrepancies in hive dimensions and wood/humidity issues. I recently received a query from a woodworker with several questions on these topics. Before you wax your table saw and set the fence to 9-5/8", let's do some homework.

**Sean Crowley:** I've been a home builder and woodworker for 33 years with an engineering and physics background. I am getting into beekeeping and would like to build my own equipment. I have read about problems associated with bees build-

ing excessive burr and brace comb and propolizing everything. I would like to avoid these problems by building equipment with the proper dimensions. In researching the construction of beehives I've come to the conclusion that **there is no standard**. The hive measurements from eight internet sites and four books were all different, and most plans contained bee space violations.

Next I visited the local beekeeping supplier to look at their hives. They also have bee space violations. I continued to research how a hive is designed, taking into account bee space and other factors. This led to further questions. It appears that hive equipment has evolved part

by part without regard for how one change affects the whole.

As a builder I continuously have to deal with problems of wood expansion and contraction related to relative humidity, such as squeaky floors, building settlement (actually the wood drying out) and doors that closed fine when installed but after a humid season have to be trimmed. When I started researching bee hives, which have very tight tolerances with bee space, and bees that generate their own humidity, I was surprised to find very little information addressing moisture problems with wood.

I have some questions I hope you can answer.

**Peter Sieling:** I wrote a book several years ago titled *Bee Hive Construction*. In that book, I tried to figure out the closest thing to standard hive dimensions – not necessarily the ideal dimensions for a hive. I had accumulated second hand equipment from various manufacturers with many minor differences. Whether accidentally or on purpose, those size differences reduce interchangeability, encouraging beekeepers to buy from the same company.

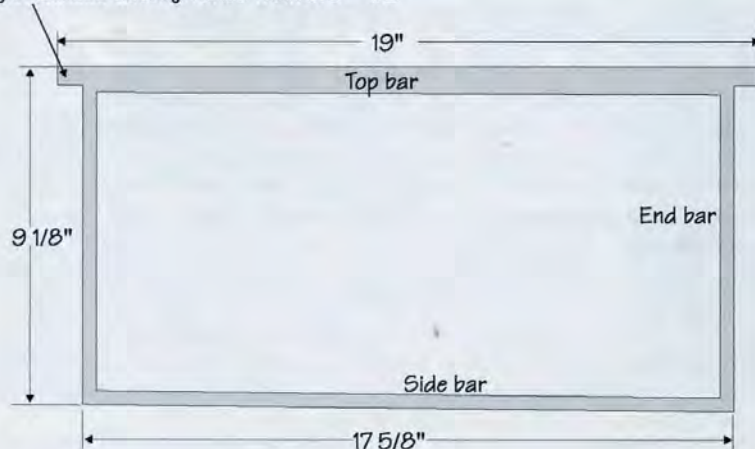
I have worked as a lumber processor and kiln operator for over 20 years. I deal with lumber drying issues daily and have first hand experience with lumber movement and humidity problems in my own hives.

## Hive Dimension Discrepancies

**Question:** The current "standard" for box height appears to be

## Standard Langstroth Frame

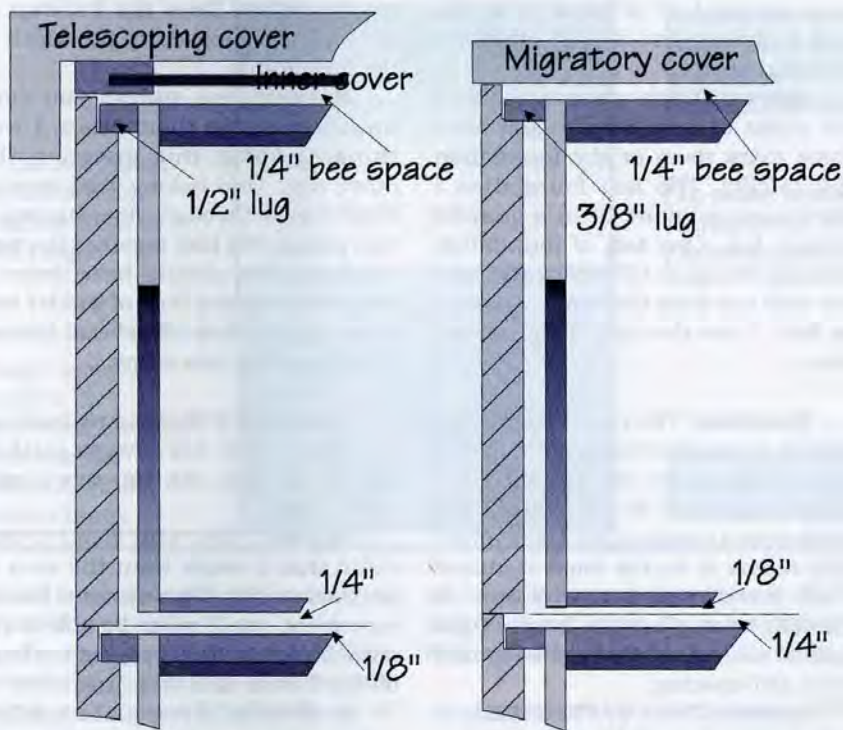
Lug thickness usually varies from 3/8"–1/2"



Sides and bottom bar thickness vary from 5/16 to 3/8", but outside dimension stays the same

## Cross Section

Frame rest rabbet  $3/8 \times 5/8$ "



9-5/8" and the standard frame appears to be 9-1/8". Doesn't that leave a difference of 1/2" which violates the bee space?

**Answer:** The standard Langstroth frame is 9-1/8" x 17-5/8" (figure 1). It's been the same for over 100 years and is a good place to start working up the dimensions of a proper hive. All of the frames that I see for sale now are 9-1/8". The universally available 9-5/8" deep leaves a 1/2" space between hive boxes, larger than a bee space and big enough for bees to fill with burr comb. The actual depth of a deep box should be between 9-3/8" and 9-1/2".

**Question:** Would you consider 5/16" bee space between the frames and ends of the hive to be an optimum dimension?

**Answer:** It would be a good standard, because if the frames are slightly off square, there would be a little leeway. If you use the standard frame dimension with a 3/8" wide frame rest, the top bars will fit into the frames rests with no extra room. I tried that several years ago and

they became so tight they had to be pounded into position. Most hives have 3/8" between the frame ends and the interior wall. It works because bees build a roughly spherical nest in our square box. They won't spend a lot of time filling in the corners and edges unless they run out of space, so even if the space between the frames and the hive body slightly exceed 3/8", it doesn't become a problem for the beekeeper.

**Question:** If you take the 19-7/8" box and put two 3/8" x 5/8" rabbets in the top, with a 19" long top bar you are left with 1/16" on each end of the top bar of the frame. This is the space between the end of the top bar frame and the vertical portion of the rabbet. This certainly will keep the frames

secure the long way. Is 1/16" enough clearance or will it be too tight and require scraping the propolis every time that I take out a frame in order to get it back in? Or do you have to scrape propolis regardless?

**Answer:** Some early beekeepers liked to have a 1/4" bee space between the ends of the top bars and the rabbet end, usually made by cutting the top bars shorter. This allowed bees to pass through and probably reduced hiding places for wax moth larvae, but it was too easy for frames to slide back and forth and even fall off the rabbet, especially when transporting hives. Their solution was to add little wire spacers underneath – a lot of extra work. It's easier to make 19" top bars.

A 1/16" gap allows a person to lift out frames and fit them back in easily. The bees will always make propolis and glue things together, but it's pliable and the small quantity they add to the frame ends doesn't cause a problem.

**Question:** A 5/8" deep rabbet for the frame rest seems to be the standard. I measured my Pierco frames and the ear measures 7/16" thick. I went down to the beekeeping supply and measured their frames and they were also 7/16" thick. All of these leave a bee space on the top smaller than the 1/4" recommended by the *ABC and XYZ of Bee Culture*.

Should a deeper rabbet be cut to accommodate a 1/4" space above the frames to give clearance between the box and a migratory lid? I would think that having the proper bee space would prevent the lid from being glued down.

**Answer:** I would keep the rabbet at 5/8" because that does appear to be a consistent standard among manufacturers. Adjust the frame height with the thickness of the lugs. I cut my frame lugs 1/2" thick which leaves 1/8" above and 1/4" below (see figure 2). This works with the lip of an inner cover and minimizes problems caused by mixing equipment (some

## BEE SPACE

The space left by the bees between combs ranges from 1/4" to 3/8". L.L. Langstroth, inventor of the first practical movable frame hive, is credited with noticing that if this space is maintained between the hive parts, the bees wouldn't fill the smaller gaps with propolis or fill larger spaces with honeycomb.

make their frames flush on top, some flush on the bottom and most are in between. With migratory covers there is only a 1/8" gap. While that seems like a problem, bees don't fill in the space unless they are crowded. I use excelsior covers (See *Bee Culture*, Nov. 2006) on some of my colonies. Like the migratory cover, there isn't a lip to create a bee space between the frames and the cover. So far there hasn't been a problem with propolis buildup.

**Question:** Beesource.com's frame plan shows a tapered ear which goes from 1/2" to 7/16". Is that a good idea? This seems to create a space for the bees to fill with propolis. Wouldn't it be better to have a flat ear which would make a thinner propolis "glue line"? It seems it would make it easier to pry the frames out.

**Answer:** Some commercial frames are tapered and some companies miter the corners (figure 3). It's just extra work to taper your own. Whether you make your lugs square or tapered and mitered, bees will eventually add propolis.

**Question:** I have noticed some manufacturers use a metal frame rest that actually bumps up the frames by 1/8", creating a large void under the frame ears which the bees can fill up with propolis. Using these frame rests seems counter productive. Is it better to have less space for the bees to propolize to create a thinner propolis "glue line" and making it easier to get the frames out?

**Answer:** Metal shoulders aren't necessary except to protect the wood when cleaning the frame rest with a hive tool. I would not bother to put them in hives. If they are already in the equipment I would not clean out

the groove except to scrape it flat.

**Question:** On one plan for frames it shows the bottom rail with a 5/16" deep kerf in a 3/8" thick rail. This only leaves 1/16" of wood thickness and creates a space of 8 9/16" for the foundation. Should the kerf be 1/4" deep leaving 1/8" of wood thickness and matching the 8 1/2" standard foundation size?

**Answer:** There are several different styles of bottom rails. You need some extra room or the foundation will buckle. The last foundation I purchased wouldn't fit in a grooved bottom bar. One box of foundation actually hung 1/16" below the bar, the next box from the same company fit fine. I use the split style bottom bars.

**Question:** The next dimension I looked at was the width of the box. I tried to figure out how a "standard" of 16 1/4" could be calculated. The math doesn't add up, yet this dimension seems to be the most standard of all. No one seems to vary from it. Shouldn't you place the frames tight against each other? They're supposed to be self-spacing.

**Answer:** Ten 1 3/8" frames side by side fill a space 13 3/4", but the interior width of the super is 14 3/4". That leaves a one inch space: just enough room for a forgotten piece of equipment called a "follower", "spacing board" or "hive-dummy". This is the same length and width as a frame and 3/4" thick, leaving a 1/4" bee space. You pry that out first, then slide the adjacent frame into that space to loosen it. It prevented a lot of bee crushing but was just one more piece of equipment to maintain. As used today, the Hoffman style self-spacing frame isn't self

spacing. Beekeepers spread them out evenly, sometimes using only nine or even eight frames in ten frame honey supers (Don't try this with frames of foundation). The bees draw the foundation out farther, leaving a bee space between combs.

**Question:** Does the buildup of propolis and wax add to the width of the frames?

**Answer:** Yes, unless you continuously scrape them clean. I was thinking about this question the other day. One colony had spread their brood through five supers. I was putting the hive together the way I thought they should have done it. Even with an extra inch of width I had to scrape propolis off several frames to squeeze ten into a box.

**Question:** If there is no buildup and the frames are always pushed tightly together, can you use a narrower box?

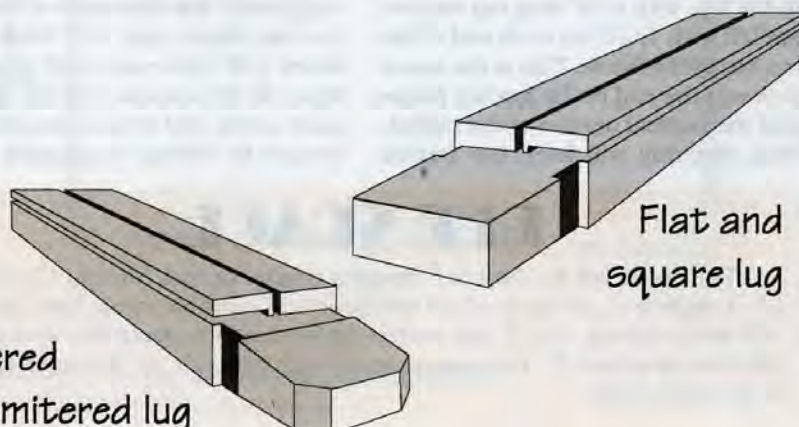
**Answer:** You still need a box width that is wider than the sum of the frame width. Without some lateral movement, you'll never be able to remove frames without prying top bars off the frames and crushing bees.

In addition, if you make a different sized box from everyone else, you will not have interchangeable boxes. Used equipment isn't worth much because but non-standard boxes aren't worth anything.

#### Wood and Moisture Issues

Both wood and honey are hygroscopic. They absorb or give off moisture until they are at equilibrium with the humidity of their environment. Woodworkers call this the equilibrium moisture content or EMC. Wood expands and contracts as it absorbs and loses moisture. Honey's properties change as well, its density increasing and its volume decreasing as it loses water.

A honey bee colony operates much like a lumber kiln. Both remove moisture at a controlled rate to create a usable product. Both require heat. The bees produce heat using their own metabolism, keeping the hive temperature higher than the ambient temperature. A lumber kiln uses a boiler or solar energy. Both provide air flow, moving warm dry air across a large surface area. Both kilns and colonies can use convection and forced air (fans or wings). Both





## How dry is air dry?

Moisture content (MC) is defined as a ratio of the weight of water to the weight of wood. For example, at 50% MC, the weight of water equals one half the weight of the wood. At 100% MC the weight of the water equals the weight of the wood. When the wood's moisture content is at equilibrium with the average relative humidity it has reached its Equilibrium Moisture Content (EMC).

	relative humidity	EMC %
	90+	30
	90	21
	86	18
	80	17
	77	15
In the Northeast air dried wood reaches EMC in this range	72	14
	68	13
	64	12
	59	11
	55	10
Target moisture content for kiln dried lumber matches the humidity in a heated home	51	9
	48	9
	44	8
	40	8
	36	7
	33	7
	29	6
	25	6

Most green wood starts with a MC of 40-120%, depending on the species. Most drying defects start in this range.

In most areas of the country, the EMC of beehive equipment will fall within the same range as air dried lumber - 11-15%.

Fully air dried lumber can be coaxied into the kiln dry range by moving it into a heated building.

give off large quantities of water that vent to the outside.

Because bees produce and evaporate a large quantity of water, it's important to consider the effects of water on the lumber used to make a hive.

**Question:** I looked up the expansion and contraction coefficient for pine and found with a moist climate the frames could increase in size from 1.375" to 1.4" or more. Have you noticed any expansion in the wood due to the moisture generated by the bees?

**Answer:** Yes. Most companies dry lumber intended for interior use to a moisture content (MC) of 5-8%. Lumber intended for construction is left with a higher moisture content. I checked the moisture content of some of my frames during a honey flow and they showed a range of 9-14% MC. If I made them from pine at 5% MC and they gained 9%, they would expand to approximately 1.4 inches. Ten frames in a hive total 14 inches: you've gained a whole quarter inch in total width.

Unless your lumber just came out of the kiln, its moisture content will likely be higher than 5%. When making hive parts, it's best to use thoroughly air dried rather than kiln dried lumber. If you do use kiln dried,

let it equilibrate by stacking it with plenty of air space for a few weeks before making hives.

**Question:** According to the *ABC and XYZ of Bee Culture*, "It is the rule to make the depth of the hive 3/8" deeper than the frame - 1/8" under the frame and 1/4" on top. For dry climates a greater allowance should be made on account of shrinkage". That means a 9 1/8" frame would dictate a 9 1/2" box.

I am not generally concerned with shrinkage, as I am using kiln dried wood with a moisture content of 7%. I suspect the shrinkage the book was talking about happens when you build a hive out of green or wet lumber. I am concerned about the expansion of the wood with the moisture generated by the bees from evaporation of excess moisture in the honey, and respiration of the bees, especially in the winter when the hive does not ventilate much and moisture can condense on the cold surfaces. A piece of 9.5" pine taken from 7% to a fiber saturation point of 28% will expand to 10.0 inches.

The relative humidity in Southern California averages between 45 and 60%. At just a little higher, approximately 66% relative humidity, the wood will absorb enough water to reach an EMC of 12%. This will

change a 9 1/2" board at 7% EMC into or 9 5/8" board.

**Answer:** I don't believe you could ever seal a hive to the point where the lumber will rise to 28% without suffocating the bees. That requires a prolonged period of 100% relative humidity. Because air inside the hive is warmer than the ambient or outside air, and warmer air holds more water than cooler air, the air inside a hive is always below 100% relative humidity. Bees can remove water from their hive efficiently.

Starting with either air dried lumber or lumber kiln dried to 12% will reduce or eliminate problems associated with moisture-caused expansion or contraction.

### Summary

Making your own hives can save you money and provide hours of enjoyment if you have some wood-working skills and the inclination. It can also be disastrous. Start with accurate, sharp tools. Make sure your lumber is properly seasoned - neither too dry nor too wet.

Deep supers should be trimmed to 9-1/2" or even a little less.

Bee space concerns are less critical in how frames are spaced because the bees will draw out the comb to fill the available space.

Bees vary genetically from colony

## How to tell if your lumber is too dry or too wet

When I kiln dry lumber, I sort samples of the wettest and driest lumber in the pack, weigh them, determine the exact moisture content, then weigh them every one to three days to keep track of the moisture loss. You may not have a moisture meter, but you can tell if your wood is too wet or dry with a kitchen scale that can measure to the nearest ounce.

First, pick a board or boards and trim at least 20" from each end (board ends lose moisture more quickly than the center). Your sample should take up most of the scale's capacity (for example, if your scale weighs up to 25 lbs, your sample or samples together should weigh 15-25 lbs.) Paint the ends with a thick coat of latex paint or glue to slow moisture loss from the ends. Weigh the board and mark it with the exact weight. The sample should be stored with the rest of the lumber, stacked for air drying in an unheated building such as a garage or shed, or outside under a cover, allowing air circulation. Weigh the board every two or three days. If it neither gains nor loses weight, the sample is at equilibrium. Because relative humidity varies widely, you can expect a small variation in weight.

There is a lot of water in lumber. One 22 lb. poplar board sample at 33% MC can lose 4.5 lb. when kiln dried to 6.5%.

to colony. That includes average bee size (which will affect the bee space) and the tendency to propolize. Bees make their brood nest and storage areas roughly spherical. We put them into a rectangular box for our convenience, not theirs. Bees aren't machinists or engineers. They work within an approximate range of

measurements rather than to hundredths or thousandths of an inch. That allows careless beekeepers to mix equipment from different manufacturers with only minor inconveniences.

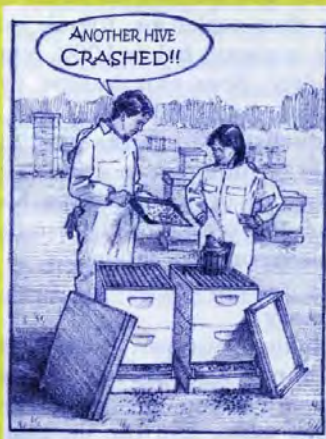
Except for problems associated with different brands and styles of covers which affect the bee space

above the frames, the modern hive design is about as close to perfect as I can imagine. **BC**

*Peter Sieling owns Garreson Lumber Company and has raised bees for over 30 years. His books about making hive equipment and drying lumber are available at [www.petersieling.com](http://www.petersieling.com).*

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# Confessions Of A Fair Chair

Sharon Garceau

Let me start by saying that the Beekeeper's Association I belong to takes our County Fair very seriously. The fair runs the third week of August and the fair chair for 2006 was committed by October 2005. In fact, our seriously reluctant President only agreed to take his job on the condition that he had a specific individual as fair chair. Me. I still consider him a friend, all evidence to the contrary.

By November people were clamoring for a fair meeting. When, where, what should we do? I dragged my feet, stalled, made excuses, and managed to go through the whole year without one meeting. I actually resorted to hiding at one point. When we had our "last day of the fair, what do we do now" meeting (called by the president, not me) they were STILL mourning the lack of meetings. Apparently I underestimated the emotional attachment these folks have to fair meetings. I always thought they were just there for the snacks.

You understand that not much of anything ever gets accomplished at any of these meetings. A lot of action items are identified: homework and busy work for people to do. But all the real work starts when we finally get into the bee barn, get all the Fairboard's stuff kicked out of the way and can really roll up our sleeves and get busy. That is usually a week or two before fair starts. This year, we

had major construction to do.

I should explain the workings of the Bee Barn; where it all happens. We have a 90' x 24' barn, with overhead garage door entrances at each end. The middle eight feet is open walkway, so we have two 8' wide strips running the length each side to play with. On one side there's 24' given to sales of honey, beeswax, soap and lotions, candles and creams, and anything made with honey we can think of. The next 24' is the Association Booth, where we illustrate our theme for the year. This year's theme was *Farm Fresh*. We built an old fashioned general storefront, named Honey Junction, with a front porch filled with all manner of treasures. You may be wondering what a general store has to do with *Farm Fresh*. Well, it started out to be a farmhouse with a front porch. We digressed. But we had a really good time doing it. To go along with the *Farm Fresh* theme, we asked association members to donate excess produce from their garden, so we could have a farm stand. It was my idea, and of course I didn't really advertise it. (If only I'd had a meeting.) Consequently, it wasn't a huge success. We did have fresh produce available all week but only made about \$36. And three of those were mine.

Anyway, next to the front porch, we have seven competitive educa-

tional booths. These are fair entries and the purpose is to have people decorate each booth with an educational beekeeping-related display. This year we had two entries. Two out of seven; which left five leftover booths to do something with. There have been years when we had eight entries for seven booths. I would be hard-pressed to say which problem creates the bigger panic. The year, fortunately, one of our more ingenious and creative members managed to fill them quite nicely, thank you. She's one of those people who can take a hanky, a tire iron and an apple and make it look like a work of art. Voila.

Step over to the other side of the barn, where nothing can be permanent. There is a 90' long wall to be filled. We share our barn with the knick-knack people and during fair week, that wall is the back of their risers. The rest of the year, those risers are pushed all the way over so the Fair Board can store benches and campers and wagons and whatever. But during fair week, it's ours. This year we had a member who volunteered to paint that wall with a mural of a very large, very detailed and very beautiful farm scene. She and her mother worked hours on it; far more hours than they expected. By the third day, she was mad at all of us and by the fourth day she wasn't really speaking anymore. But, by the end of the fair, she was planning what she would add to it next year. She's a trooper. So we have this incredible farm scene to serve as backdrop to our Children's area, (affectionately known as The Brood Box). This is where the faces are painted and the candles are made and the toys are distributed (and the money is made.) Our association made well over \$1000 by painting faces. At a

Looking down the length of our building, mural on left.



Selling honey and more.



Our 'Theme' display.



buck apiece, that's one thousand sticky, sweaty, over-sugared, over-faired squirmy little kids. All salute the face painters. We're going to buy them comfy chairs next year.

Next to the Children's Booth we have a demonstration area. Here we do extracting demonstrations, apitherapy demonstrations, cooking demonstrations, how-to demonstrations and we are always looking for new ideas to explore. This is one of those areas where no matter how much we do, it always seems like we could have done more. We have never realized the full potential of this area and I'm not certain we ever will. We could have an IMAX movie and someone doing queen grafting and I would still wonder if maybe we shouldn't have made some cookies to go with it.

The next section is where we have the fair entries displayed, with a separate special section for the winners. We currently have 43 different entries in the Apiary section of the fairbook. Lots of entries, lots of entrants and a judge that earns every penny he makes. Historically, the judging is the most controversial area of the entire fair week. I pity our judges, although they are the only ones who actually get paid for being there.

At the end of the barn, we have two very large, beautifully displayed observation hives and the bees are always the biggest attraction of the barn; except when they get into a robbing mode or decide to swarm. Then their charm wears off really quick. One of the top priorities for the week is to make certain the bees stay happy and calm. The fair board is more than happy to ignore us except when someone complains. Then they have to take action; and they hate to have to take action. It is incumbent upon us to make certain no-one com-

plaints about the bees; if the bees are happy, the fairgoers are happy, the beekeepers are happy and the fair board is happy. Don't you just love it when we can all play nice?

So now that we have toured the barn, let's take a look at what we did this year. The fair chair did everything she could to avoid her responsibilities. Starting around the end of July, we went into panic mode and had a couple work parties where the volunteers were worked until they were in pain; the mural painting ladies were in tears, the beekeepers were chomping at the bit and the fair chair had to go out of town for work. These stout-hearted beekeepers forged ahead on their own. The weekend before the fair opened, people I had never seen before showed up to help and contribute. They took a bare-bones foundation and built it into a home for the week of fair. We had a 'fridge and a coffee pot. We had cooking and apitherapy and extracting demonstrations. There were donated groceries to be given away, and hundreds of donated toys to be given away. We signed up 90+ people who want to be notified about our spring beginner's classes. Our volunteers ranged from age six to 76. There were people who came and stayed; day after day until they finally just fell asleep where they sat (and I have the pictures to prove it.) One guy, who took a week's vacation to help at the fair, seemed to have an odd fetish about his ladder. This worked out great for me. Anytime we needed someone to get up and rustle around in the rafters he was there, ladder in hand.

Speaking of volunteers; since I have already acknowledged my shortcomings, I need to point out how those volunteers stepped up to fill the void. We have such a large and complex structure that we use

to fill our Bee Barn, we can't really keep it functioning without at least five people there all the time. More is better, but less is lethal. That is five people from 10 a.m. until 10 p.m. for seven full days. That is a lot of hours for a lot of people. And they did it. In all honesty, there were not as many volunteers as I would have liked but there were more than I've seen in the past and they did a superb job. This year, with all its weaknesses and mistakes; hurt feelings and out-of-joint noses, silliness, giddiness, sleepiness and just plain happiness, was about the best week I have ever spent at the fair. And that is directly attributable to the commitment and friendship, kindness and dedication of a small but special group of beekeeping volunteers.

There was one volunteer who stepped up and took on a huge task, and may never volunteer again. I would like to draw your attention to the Honey Junction sign one of our members made for us. He spent hours making this sign and the tin-roof awnings that frame it. He was meticulous. He did a lovely job. Unfortunately, he forgot the "N" in Junction. I look at that sign as the perfect metaphor for the fair where we celebrate our "Junction". It is the fumbles and oops that make the fair special. No matter how hard we try, no matter how close to the goal we get; occasionally we all lose an "N" once in awhile. What counts is what we accomplished; what we attempted and achieved. Not what we missed. And this year our efforts forged a great Junction between beekeepers and fairgoers. After all, what's a missing "N" amongst friends? **BC**

*Sharon Garceau is both a retired Fair Chair, and Bee Culture Publication's Assistant, living in Lorain County, Ohio.*

Show winners.



Painting faces.



Honey Junction.



# Recovering Some Of My Winter Bee Losses

James E. Tew



## Packages & Splits

### The bleeding has stopped

Whoa...what a Winter beekeeping experience I have just come through. I know that you are reading this in July, but for me, Spring is here and the time is right to clean dead-out equipment and recover from one of the worst Winter seasons I have had in many years. I fully believed that all my 80 hives would perish during the Winter that would not stop. Finally, I ended the dreadful season with roughly 27 of 80 hives surviving. Right now, during July, I am already making plans for the Winter of 2007. I will not get caught short again. You may be wondering just now how bad of a beekeeper am I. It's okay. I'm wondering that, too.

### It's a long, boring history

In Ohio, I have not made a respectable honey crop in three years. Most of my honey reserves – both in drums and in hives – have been pretty much used up. My colony numbers, usually maintained at about 80 or so, had dwindled to something like 35. Since I really need 45 to 50 colonies for my program, I usually maintain about 80 to be sure I have access to 50 productive hives. I was below my critically number, so Spring, 2006, I bought splits, packages, queens, and made splits from those I could. I took a gamble. Problem is, Spring 2006, never really arrived and I was left with 80 excessively light colonies. Winter, 2006, was meaningful, even vengeful. I lost my bee shirt. If I were to try to feed all those colonies, the work load would be significant as would the cost. I took my losses, as did many people across the U.S. I estimate that 50% of all the colonies in Ohio died from depleted Winter stores. What a stinking, onerous mess to clean

up and from which to recover. That's where I am right now – recovering.

### My current status

Most of my 27 colonies that survived were pitiful. They were haggard and defeated. Signs of dysentery were everywhere. I am suspecting the cause to be Winter stores made from honey dew. Finally, after fruit bloom, my colonies were up to the point where they should have been coming out of Winter. I sense that I and my bees are about four weeks behind schedule. I am, desperately, desperately, depending on this Spring season being a productive one.

I bought 10 packages and I made four splits (so far). Presently, I am at 41 colonies having no plans to attempt to get to the mystical 80 number this season. My discussion here is specifically concerning one of my surviving colonies; out of all my bee mess, there is a single jewel of a colony.

### My wife said, "Your hive is swarming."

I only keep a very few hives at my home. In fact, right now only one. This single hive wintered better than any of my other colonies in other yards. Last week, while mowing grass, I noticed a lot of flight activity, but not excessive activity. I kept mowing. Just a couple of hours later, my wife shouted that, "Your bees are swarming!" They sure were. It was 3:00 PM. My neighbor was mowing his grass without his shirt and I had 35,000 bees in the air (clearly an article subject for another time). I really wanted that swarm. I have already explained my colony number situation. I watched and waited. I worried for my neighbor.



A colony on its back in preparation for breaking propolis seals.



A new queen being greeted by acceptant workers.

The swarm drifted here and the swarm drifted there, so I began to suspect the queen was not with them. I seriously hoped that they would return home. They did and I didn't hesitate forming a plan. I had already bought six queens in anticipation of a need for extra queens. Clearly, I was in need of some of them.

I got extra equipment (remember I have plenty of dead stuff) together and prepared a plan. *An aside...I know that I complain a lot in my writings and I tediously take time to tell you all the things that did not work. Well, shock of all shocks, this hive-splitting scheme worked really well - so far.*

### The scheme

The weather was still classic spring weather. It was cold some nights, warm some days, maybe bright sun and maybe rainy. In the middle of this, I planned my hive-splitting strategy.

I have recently become a serious believer in reducing stress on my colonies whenever possible. The colony to be split was a good, old-fashioned boomer hive. How would I ever find the queen on these cool, rainy days without keeping the colony open for a long time? I decided not to even look for her. I would split the colony into thirds and give each a caged queen - knowing all the while one of the thirds had an established queen. I would wait three days (longer would have been better, but I had the fever), look for eggs and then search that split for the queen. My results follow.

### The split procedure

There is no standard procedure for making colony splits. Nearly everything is a variable. The colony was in two deeps and was packed. It was really a nice colony. I had 20 frames with which to work. Obviously each third would get six active frames of bees, brood, and stores, with two frames left over.

I suited up, fired up a smoker and broke the hive open. It was packed with honey and bees. Broken drone brood was everywhere. (I saw not a single *Varroa* mite.) I had the empty equipment nearby. I looked at each frame and divvied them up between the three units. The bees were beautiful...they were beautiful. Throughout the entire event, I was stung only a single time; yet I was surrounded by bees everywhere. The bees were calm on the comb; not runny, but rather were docile and manageable. I need to say it again - these bees were beautiful. (I



From one colony, three smaller ones.

would love to give you the queen producer's name, but I suppose that would be inappropriate.)

The splitting went quickly. The colony was soundly glued together with propolis, so I laid it on its back to break it open. As I expected, I never saw the queen, though as I said above, I wasn't truly looking for her. I made the splits, closed everything up and left them alone for three days. When making the splits, I destroyed swarm cells as I saw them, but made no effort to find absolutely every cell. I made no serious effort to scrape frames. I left the drone brood alone. I simply made the splits and got out. This is a part of my new bee stress reduction program.

The third day is today and just a few hours ago, I again opened the hives.

Right on schedule - so much so, I am still grinning, I found two queenless units (no eggs) and one queen-right unit (containing eggs). I quietly released the queens in the queenless units with absolutely no fanfare. The new queens were calm and readily (apparently) received. In the queen-right unit, I quickly found the queen and put her, along with a single frame of brood, in a separate nuc. I plan to use this small split in an observation hive I have in my lab. Now, what to do with the caged queen in the queen-right colony? Should she stay caged a few more days? *Another aside...as is so much of beekeeping, intuition (a feeling) is invaluable. Nothing beats beekeeper experience and history.* This colony **felt** as though it would accept the caged queen - even though it already had an established queen. Did the presence of swarm cells have a mitigating effect on an extra queen being in

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the colony? I don't know. Maybe more importantly, the queen-right colony was not in the original location so all the field bees had drifted out of the split colony back to the original split left on the parent stand. Not wanting to be worrisome to the bees by opening their colony again in a few days, I decided to release the queen onto a brood frame. If it didn't work, I would recage her and try again two or three days from now. She quietly crawled onto the comb without incident. In fact, she was nearly completely ignored.

### The next phase of my splitting scheme

I plan to leave these three colonies alone for the next week or so. As the new queens become established and begin to produce their own brood nest, I will check the overall populations and again move bees and equipment around to compensate for the parent-stand split presently being the largest of the three splits. I will balance brood populations and be prepared to feed both carbohydrate and protein. So far, this simple system of splitting, with minimal intrusion, has worked stunningly well. I fully realize that other colonies would have tried to kill me as I did the manipulations, but this beautiful colony didn't. For the first time in a long time, I can say that this was old-fashioned, enjoyable beekeeping.

### Other splits

As did so many other beekeepers across the country, I made other splits that I did not discuss in this article and I will make others this summer as the season progresses and opportunity presents itself. Since the particular

colony I described for you was so impressive and since the splitting procedure worked so well (thus far), I wanted to take the time to describe it to you.

U.S. beekeepers, and many other beekeepers across the world, have experienced serious colony losses this past year. Splitting colonies in order to maintain colony numbers, indeed, even to grow in colony numbers is the logical thing for beekeepers to do in order to recover from Colony Collapse Disorder (CCD) and from general Winter-killed colonies. It is a healing process; one that is needed and one that feels good.

### A lament

I considered not telling you, but so many of you took time to communicate with me about the "Survivor Hive" I suppose I need to let you know that the Survivor hive did not survive. As did so many other colonies last Winter, the Survivor starved to death. I was sick about it.

For those of you not having read about this unique colony in previous articles, in review, I stumbled onto some abandoned eight-frame equipment that had been left in an unused yard for something like 17 years. The equipment was full of bees, having essentially no bottom board and no top. The occupying bees had improvised a propolis top for the unit. It had never been requeened, never been treated for mites, or never supered. It literally, for some unknown long number of years, had been doing its own thing. I canvassed the *Bee Culture* readers and you unanimously said to leave it alone. Other than putting on an old outer cover, I did not bother it at all. I should also say that during a high wind Spring storm, a nearby tree blew down taking the hive with it. The unit laid face-down for several weeks. I sat it back up. Some of you said even that was too much intrusion.

For one of the few times in my many years of beekeeping, other than my very first hive, this hive struck a fundamental bee nerve of mine and became my favorite colony. I never have colony favorites, but this colony intrigued me. This mystery colony was an example of how bees conducted their business without my assistance. Its success was to be a model of how well a colony survives when it is not being forced to compete with other colonies just a few feet away. Its success was to be an example of my justification for minimalist beekeeping recommendations. This unique colony was to be the foundation of my argument not to work your colony constantly but rather to let the bees (mostly) do their own thing...but it died.

Now what? The 32 frames in the now dead survivor hive have never been exposed to antibiotics or to mite-control chemicals. That's unusual in this age of beekeeping. What should I do with it? Should I use these frames within another colony that is not medicated? I don't know. Wait to see if another swarm occupies the equipment? What do you think? Maybe this episode is finished, but I learned something. I'm just not sure what. **BC**

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# The Dog Days Of Summer

Jennifer Berry

The dog days of Summer are here. Hot temperatures not only drive us to our porches, but the bees to theirs as well.

This time of year usually calls for mint juleps and blackberry pie, cane pole fishing and lemonade, naps in the hammock and BBQ, but for the beekeeper, chores are still mounting. Here in the piedmont region of Georgia our honey flow ceased at the end of May. Now, we can only hope for a trickle of goldenrod and aster this Fall, unless we moved our bees north for the sourwood flow (June-July), or south for Gallberry (May-June), cotton and a variety of other agricultural crops. Usually we can count on these plants for providing decent flows, but with the horrible drought we are experiencing, only time will tell.

Hot Summer days along with dry weather are not only tough on the vegetation, they can also be especially hard on our colonies. One thing you can do to help reduce stress is provide your colonies with water, especially if the colony is not near a natural water source. Bees collect water to dilute honey. They also use water to cool the interior of the hive. One way they do this is by depositing water directly inside of the cells toward the top of the frames or cells with developing larvae. If humidity levels fall too low, developing larvae will dry out and die. They also cool the inside by fanning in different areas of the hive. This activity keeps the air

circulated and temperatures lowered. While fanning, they'll extend their proboscis with a droplet of water. The surrounding air is then cooled due to the evaporation of the water. On a Summer afternoon, check out the entrances of your colonies and you will see several bees positioned there fanning their wings as hard as they can.

If there are no natural water sources located within a mile of your apiary keep birdbaths, pans or buckets full of water at all times. Make sure to add some sort of floating device so the bees won't drown. Another idea is to use a Boardman entrance feeder filled with water. This way the bees don't have to travel far for the water. It will also help keep your bees at home as opposed to visiting your neighbor's pool, dog bowl, pond, etc. We receive several calls each Summer complaining about bees swarming around water sources and scaring the

children. After a little investigation we usually locate a beekeeper in the area and explain the crisis. Once water is provided, the problem's solved and everyone – bees and children alike – are happy.

Water may not be the only thing your colonies require this Summer. You will need to evaluate honey supplies and *Varroa* population levels plus prevent robbing. Let's start with food stores. I realize I may push this issue a bit; however starvation is something we can control. During the sweltering Summer months we sometimes forget about our colonies as other projects draw us away, but don't let this be the case. If Spring/Summer honey flows were light to medium and you don't expect another substantial flow this year or you were a wee bit greedy during honey extraction, your colonies may be in danger of starving well before the Winter winds ever blow. But no matter what



Bearding colonies during hot Summer days.



A Boardman feeder used for water.





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your situation is, periodically checking food supplies should always be on your list. If colonies are short on supplies, feed a 1:1 sugar solution. An average colony in our region needs at least 35-40 lbs to survive the Winter but you must also consider those long Summer dearths. In certain parts of the country you may only experience one nectar flow, like here in Athens, yet colonies are still growing and therefore consuming stores. Feeding bees can be a chore and an expense you may not have considered. Here at the lab we use gallon zip-lock baggies filled about  $\frac{1}{2}$  way. We then lay the baggie on top of the upper super, slice a four-inch slit on the top, add a super, and ring the dinner bell. The air leaks out of the slit leaving the sugar syrup for the taking. The bees will crawl to the slit and collect the syrup. Over the years I have had numerous problems with division board feeders, hive top feeders and buckets, so we've opted for this method.

Another problem beekeepers overlook this time of year is robbing. Strong colonies will rob honey supplies from weaker colonies even if they have plenty of food. If you have ever experienced robbing before, you know it is not a pretty sight. Colonies are wiped out within a day or two. They just can't hold back the tens of thousands of bees forcing their way inside. But the major problem is, once robbing starts in an apiary it is almost impossible to stop. Therefore, precautionary measures should be

taken earlier rather than later. Colonies should be equalized throughout an apiary. Weaker colonies are vulnerable to robbing and hence should be removed or equalized. Entrances should be reduced and all gaps, cracks, and holes taped to discourage foreign bees from entering a colony. Too many colonies at a particular site may also increase the robbing urge. 25-30 colonies are usually the maximum for a single apiary. Another important tip, if you find yourself feeding, be extremely careful not to drip sugar syrup anywhere outside a hive. Bees will quickly find it, and then mob the colony near the spill. Also, Boardman entrance feeders are not a good idea during a nectar dearth. They attract unwanted neighbors to the entrance due to the smell of sugar syrup. Feed internally with buckets, jars, division board feeders or baggies. After extraction, don't put wet supers out to be robbed in or near the apiary. Place them as far away as possible. Once the robbing frenzy is started it is impossible to stop. The bees become fixated on finding food and will strike any colony in their path. In years past we experienced robbing to such a degree we had to work each colony under large netted cages. Without the cage the colony would have been overwhelmed in minutes. Even strong colonies are at risk if you leave them open too long. The best advice to discourage robbing is: don't pack in the colonies, keep entrances reduced, don't leave honey/sugar syrup around, use inner

hive feeders, and don't leave hives open too long.

Only one more Summer chore left for now; evaluating *Varroa* mite levels. Female mites over Winter inside the cluster and survive by feeding on adult bees. However, once brood rearing commences in late Winter, early Spring, the female mite kicks into gear. It is her time to reproduce. She makes her move by entering a cell just prior to being capped and starts laying eggs; she is called the foundress mite. The first egg laid is a male which will mate with those from subsequent eggs laid, which are female. These offspring mites develop and emerge from the cell along side the worker bee. These newly emerged female mites seek out other cells in order to lay eggs of their own. Warmer temperatures, and nectar flows not only trigger swarming but drone production as well. There is nothing more appealing to a female mite than drone brood. Think of all the extra time her progeny has to complete development before the drone emerges: three extra days. That translates into a lot of extrababy mites. If the drone or worker bee emerges before the newly hatched mites reach adulthood, the mite will die. Here are some numbers you may find interesting. In worker brood, the foundress mite's first female egg (first egg is a male) has a 92% chance of reaching adulthood before the worker bee emerges. Her second female egg only has only a 38% chance of survival and her third only 13% chance. However, in drone brood, her first female egg has a 98% chance of survival, second egg a 94%, third egg an 84%, fourth egg a 76% and fifth egg a 63% chance of survival. Oh, what a difference three days can make. Hence, the foundress mite can more than likely replicate herself *by five* inside drone brood and *only once* in worker brood. Therefore, by late Spring mite populations are quickly escalating. By mid Summer, mite populations can be well into the damaging levels or above the economic threshold. That is why it is essential for beekeepers to appraise their colonies mite populations several times a year. We sometimes evaluate mite numbers once a month. Especially those colonies close to the economic threshold level.

There are several methods for sampling mites: ether roll, powdered sugar roll, alcohol samples or sticky

sheets. We choose sticky sheets because it's the easiest. Insert sticky sheets (you can make these or purchase them) for 72 hours, count the number of mites and then divide that number by three.

Leaving the sheets in for 72 hours as opposed to 24 is a preferable method because it allows for weather fluctuations which may occur and alter mite drop. Do not put any miticides on while you are sampling. This number needs to represent a natural mite drop. If you find populations above the economic threshold (60-180 mites for 24 hours in August and 1-12 mites in February) you will need to treat. This particular economic threshold was determined for the southeastern US. The economic threshold in your area may be lower or higher due to regional climate/geographical variations. James Strange and Steve Shepard determined a western economic threshold of 12 mites in February and 23 mites in August. You can also go to the National Bee Unit's internet site and enter your mite numbers in their *Varroa* calculator <http://beebase.csl.gov.uk/public/BeeDiseases/varroa-Calculator.cfm>. Due to time of year and the number of mites the program will determine if you need to treat. Be aware, their threshold levels are much more conservative than ours.

Then the question remains; what to use in order to reduce mite popula-



Evaluating mite populations several times a season, using sticky boards, is critical for colony survival.

tions? There are more options today than there used to be (which may be a good thing). The newest being essential oils which are proving well for reducing mite loads. Remember, all creatures big and small can tolerate a certain amount of infection or infestation, including honey bees. It's when that amount reaches a critical level

that we need to intervene. One more thing, never put any kind of miticide in your colony during a nectar flow. Don't want to contaminate the honey now do we.

See ya! **BC**

*Jennifer Berry is a Research Associate at the University of Georgia at Athens.*



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# A Look At A Local Farm Market

Jim Kellie

Every detail was given, with the promise that every drop of honey would sell.

While at a beekeeping meeting in Eastern Kansas last year I learned all about Farmer's Markets. It was a wonderful presentation all about how, when, where, and what not to do at a Farmer's Market. Every detail, right down to where and how to park was given by many presenters, along with the promise that every last drop of honey would be sold because people just flock to every farmer's market. I decided that I should try this myself. So off back home to western Kansas I went with visions of selling lots and lots of honey and being cool like all them easterners.

Well, I reasoned I should check first if our town (notice I didn't call it a city) had a Farmer's Market. So I went down town to our Chamber of Commerce and visited with Ms Jansen. She likes that Ms Thing because it sounds so metropolitan and very Donald Trump. She was chosen because last year she had lived in Kansas City (about as far east as you can get and still be in Kansas) working at a new and fancy upbeat corporation, so it was thought she would have the talent to bring our town into the new century. Ms Jansen said that we indeed had a Farmer's Market and that it was on Thursday at 7:00 a.m., right in front of the drugstore on Main Street.

I was excited! Our town is pretty big for Western Kansas. We have two stop lights here on Main Street. I should say we have two stop lights for the whole town. In the big city, if you time your driving you can go right on with the lights turning green as you go. Our city fathers being the business entrepreneurs that they are, decided to not time the lights. That way those traveling through had to stop and look at our four stores in town. Hopefully waiting at the light

they might possibly decide to do some impulse buying. What good fortune for me.

I remembered from the meeting that a banner was important. Not a sign, but a banner. It had to say the right things and have a great sophisticated look, as the easterners say in the marketing bizz, "it just POPS." The presenter said they are easy to get - just go to your local Kinko's and they can make whatever you want. So I went downtown looking to get my sign, er, ah, I mean Banner. No, we naturally don't have a Kinko's in our town, but I thought maybe Sara Bingham's dry goods store might have something. Now we like to call our town the "Town Of Tomorrow." Whatever you want they don't have, but they can get it for you tomorrow. Miss Sara didn't have what I described from seeing the PowerPoint at the meeting. So she made up her best rendition of my Banner. It was the best cardboard sign, I mean banner, I had ever seen.

Armed with my Banner, my next step was table presentation. At the meeting they said I needed lots of variety. Many different sizes of jars and a variety of containers with an urban farmer-style label that says I am folksy, but certainly rich and with great style. I also needed a canopy in case of rain or if it was too hot. This also gave all those yuppies a place to come in and browse. Out here yuppie canopies could only come from catalogs. Now we have heard about the

Internet but we just can't figure out how to wire it to the wall dial phone. Anyway, it would take too long to get one of those wedding canopies so I had to settle for Elmer Burkes hay tarp. After a good shake and a long airing (Elmer's sheep had found it to be a good resting place), it was ready to go. Man, this whole thing was really coming together now.

I also remembered that you wanted your vehicle by, or in back of your stand and certainly, you should have a nice looking vehicle. I felt bad because I was going to have to tell ole Red, my favorite vehicle, she couldn't go. Ole Red and I have been together since she was born. She is a 1982 Ford pickup. Actually, she used to be red but now she's mostly rust with a faded semblance of color. She has rust holes in all the fenders now and I don't wash her because the mud is what holds her together. If you lock the driver's door you won't get it

open unless you come through the other door. To get the heater running you have to open the hood and do it from there. Neither one of us has ever minded what we look like, and both of us have a rare disposition for yuppies. She will do some of the dangedest things around a beamer. She has backfired, shot out smoke, leaned sideways and dumped dirt in their pathway. We get along very well, Ole Red and me. She has been ever faithful, starting every time (except when my teenagers try to start her. Good Girl!), and to this day we still run around together. But for progress I had to leave her home and take the new diesel one ton. That surely should impress those customers.

Ms Jansen told me that Gertie



Proz did a good business at the Market so I went and talked to her. Gertie sold those rare veggies that everyone else had trouble producing. She had found *the niche*. Gertie told me to be there promptly at 7:00 a.m., because that is when she sold most of her product.

Thursday finally came and I took the big diesel down to Main Street. I chose a spot right in front of the drugstore. Mr. Noble's wife Effie used part of the drugstore for fancy do-dads for the house. It was kind of an interior decorator Shoppe. She even calls that area "Touch of Class." Catchy, ain't it? I reckoned that I would catch all them yuppies coming in. Gertie was there early as well and she set up her stand right next to mine. I had all kinds of containers set and stacked every which way. Some with little ribbons and others with those fancy folksy labels. But, when I tried to put my tarp up Gertie suggested maybe that wasn't a good idea. Seems she was down wind, so I put it back in the truck.

Miss Effie came out to see the new person at the market (there were only two, Miss Gertie and me). Miss Effie said, "Jim I didn't know it was you out here. I didn't see ole Red."

"Yes ma'am I brought the big truck down. Thought it would look better," I said.

"But everybody knows you are in ole Red. Now I bought honey from you last week off the back porch. You know where I put the money?" Miss Effie said while hurrying back into the drugstore. "Oh yes ma'am," I said.

Just then Mike Hunt stepped out of the feed store across the street.

"Jim is that you over there," he said.

## I had all kinds of containers set and stacked every which way.

"Yes sir it's me."

Mike hollered back over the sound of the grain elevator. "Didn't know that was you without ole Red. I don't need any honey this week, but the Mrs. says to pick some up next week. I'll get it off the back porch. You know where I put the money."

"Yes sir I sure do," I hollered back.

Right after that Miss Gertie whispered, "Here come the yuppies." Sure enough it was the Langs coming. (The rich ones don't you know; not his brother John. He . . . , sorry, getting off the subject.)

I should mention that we only have one couple that are yuppies in our fair town. They don't drive beamers cause they are kind of hard to find in these parts, but they have a dandy Lincoln Continental. Ole Red don't mind that one too much. Miss Lang spoke right up with that proper eastern voice she learned. "Jim did you walk down here. I don't see ole Red. I just bought some honey off the back porch yesterday. You know where I put the money?"

"Yes ma'am I know where it is and thank you," I replied. Mrs. Lang walked over to Gertie's and got her specialties and off they went in that fine Lincoln.

Darrell Riener was going by in his 9420 John Deere and powered down when he got up even with us. (He had to stop for the stoplight anyway.) Darrell opened up the cab door and yelled, holding up a jar of honey, "Jim I didn't know you were down here. I got some honey off the back porch.

You know where I put the Money? You going to be here next week?"

"No sir, I think I am pretty much done trying it here," I said. Darrell smiled with a wave, powered up and off he went. (Light turned green.) I looked over and Gertie was packing up. Folks were all at work now and the yuppies were gone. Not a jar of honey left my table and my banner didn't even impress anyone.

Some good ole country sense hit me at that time. I had been selling honey all along and I didn't even have to move a muscle. While packing up, I thought about doing a speech at the next meeting to those easterners about back porch sellin'. But then I realized the extreme expense it would be for them. Armed guards at the door, a camera to catch the burglar at night, the credit card machine and Internet access because them eastern yuppies don't carry cash, and then there are those flashy lights. Those easterners love flashy lights and signs; they are everywhere back there. Yep way too much cost, guess they best stick to those Farmer's Markets.

Mike stepped back out from the feed store and asked if I wanted a game of checkers. "What are you going to do with all that honey?" he asked.

Well that's easy I said, "I'm putting it on the back porch." **BC**

*Jim Kellie is President of the Kansas Honey Producers, and sells honey off his back porch in Larned, Kansas. He'll know where you put the money.*

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# The Honey Bee Hardsell

## *On Selling Beehives To New Neighbors*

Gwen Rosenberg

I recently moved away from the bucolic and oh-so-quiet-rural setting of Medina County, Ohio. Think horse pastures, open spaces and nice wide berths between houses, compared to the hectic, no-livestock-allowed, sardine can, big city of Kent, Ohio. Sure, Kent sounds like a quaint little college town in the Midwest. And I suppose for the most part it is, with its little gazebo, train tracks and old train-station-turned-restaurant, the "Pufferbelly." (Honestly, who in their right mind eats in a restaurant on the mighty Cuyahoga River called the Pufferbelly? But I digress.) We haven't yet unpacked all our junk from the crinkled boxes in the garage and already I sense a difference in the air and a strangeness to the people here that I didn't encounter in Medina. For one thing, everyone I've met here has a Ph.D. which is pretty annoying. But I'm careful not to offend my new neighbors because there's still one family member, or rather 50,000 family members, who have yet to complete their move and I'm a little afraid that our uber-educated new neighbors might find *us* suddenly annoying. Before I unpack another trinket I must convince these people not to swarm the zoning board when my honey bees take up residence on Rockwell Street. Luckily, I have a doctorate in what I call "sales-ology", and am willing to share my personal style of persuasion, manipulation and outright deceit with you. A little investment in some sales training now could protect you from a brush

with the dark side of the zoning commission in the future.

Oh yes, Mr. and Mrs. Honey bee are scheduled to arrive any day now and things around here could get pretty interesting to say the least. My first tactical strike was to ally myself with my closest neighbors by any means necessary. The closest neighbor to my West was a real cake walk since he is a horticulturalist turned geologist who, as it seems, has always wanted to keep honey bees. He's delighted with our arrangement in which he gets to keep any swarms that land on his side of the fence. Considering my wintered-over hive of carniolans, he should feel quite satisfied, if not overwhelmed, with the number of swarms he's about to claim. His wife is equally amenable and we've become quite good friends (more of making friends later). A strong ally in a neighborhood cannot be overemphasized. The neighbor on the East side of the house is an archeologist, of course, because no one around here is content to be a nurse, mailman or used car salesman. The approach I took with him was pseudo-intellectual sneak attack of sorts, emphasis on the puesday, something I learned in my used car salesman days. It starts with a simple conversation in which I get him to agree to a lot of general statements, then impress him with my intelligence or total lack thereof, and close the deal. Our first meeting went a little something like this: "Wow, archeology that's a really interesting field isn't it?"



"Why, yes it is."

"I've always been fascinated by ancient civilizations and bones and shards of pottery and all that stuff. In fact, I always admired that guy who came up with that Piltdown man hoax. Ya, think if I wired an old dog skull with a ground hog jawbone I could convince anyone it was the missing link?"

"Uh...."

"You know, I consider myself a bit of an amateur archeologist of sorts. The honey bee for example is a fascinating little insect that goes back quite a ways. Some smart guy even found a cave with drawings of a bee tree in it- How about that? I'm sure you know all about bees in your line of work-Don't you?"

"Yes, well, no... I should probably go now."

"Wait, I brought you a jar of honey. You like honey don't you that's an ancient food isn't it?"

"Well, yes, I suppose it is, but as I told you I study mostly prehistoric new world populations dating back to about 10,000 B.C. so that really predates...."

"Well, the reason I ask is because I'm a beekeeper and...."

"Beekeeper? Where are your hives?"

"Well that's that thing, see, I'd really like to put them in the yard so I'm going to try to bribe you with all the honey you can eat in exchange for your silence in the matter. How's that sound? Pretty good deal for you, I'd say."

"Oh, that's all you want. Go ahead. Hey, how about in addition to the honey you never try to engage me in a discussion of archeology again, and you keep all the hives you want O.K., Helen?"

"It's Gwen, and you've got yourself a deal."

That's pretty much how our first conversation went. Total success. Boy, if I could bottle that kind of persuasion and total lack of personal dignity I'd be a very rich woman. Since our initial somewhat awkward meeting we've really hit it off. It turns out he travels out of town pretty often, and he needs someone to retrieve his mail and newspaper collection from the driveway. Talk about your tit for tat- no wonder he was so eager for the bees to take up residence.

This move has turned out to be a great opportunity for me to flex some of my sales muscle that has gone unused since I've been staying home with the kids. My next opportunity was small game. The neighbor at the corner who's house does not have any view into my backyard, so I consider him to be a low level threat, stopped by one afternoon. He attends graduate classes, no doubt on his way to doctorate-ville. His wife, who already has a Ph.D., is on leave while she writes a book about something I know nothing about. Initially, I had not considered this particular family threatening enough to

go into the whole beekeeper sales pitch, but since he rang my doorbell I figured I'd work a little magic on him too. It turns out he stopped by the house to borrow some cornstarch. Did I tell you this was a really odd town. Well, I for one am never without cornstarch, and after it was discovered that we both read the same magazine article about fried tofu, I resorted to the old "we have so much in common" strategy. Generally speaking, the husband of a university professor who makes fried tofu is a creature with some predictable habits. They don't call me the "profler" for nothing - and this is undergrad 101 stereotyping. I knew right away to go for the ol' one-two punch of the New York Times and NPR.

"Here's the cornstarch and a jar of honey, in case you wanted to try the baklava recipe in the New York

## *A little investment in some sales training now could protect you from a brush with the dark side of the zoning commission in the future.*

Times Food section on Wednesday."

"Local Honey? Very cool, are you a beekeeper?"

Yes, sir, an organic beekeeper in fact."(Remember these are tried and true tactics to the successful salesperson not a treatise on ethics) "Did you catch that little blurb on NPR the other day when they interviewed that Ohio beekeeper about his new book? Yea, that guy is a great friend of mine." (Ok, so I may have asked him a question once at a bee meeting.)

"You should really look into selling your honey at the food co-op downtown. Hey where do you keep your hives?"

"That's a great idea, I'll have to look into that co-op. Here's your cornstarch and honey. Take another jar why don't you and let me know if you ever need a sitter. Please tell your wife I'd love to check out a draft of the historical text/case study/novel she's writing. I consider myself quite the literary type, you know."

Another satisfied customer. I can see a real improvement in my ability to shove honey into peoples hands while utterly distracting them from the suspicious buzzing coming from the pickup truck that has just pulled into my drive.

There are two houses on the street that I have ruled out of even attempting to engage. Neither one has a view over the newly constructed privacy fence, and I plan to employ a more sinister plan to keep them from talking. A little re-con mission on my part has revealed that in the house directly across the street resides two young women with voracious appetites for beer and some volume control issues when it comes to rap music. I don't plan on ratting them out to the coppers, if they mind their own business, see, and we'll all get along just grand, see. The other

house is a college rental and anyone who has ever dealt with a college town landlord knows the apathy runs deep, and the cops will come every time you call.

With the West side of the street covered, I can now turn my focus on my biggest threat. This family is going to be a toughest sale yet. My backyard abuts against a lovely single family two-story colonial complete with a mega-playground in the backyard. It is no exaggeration that this playground cost more than the value of both my cars and the contents of my home combined. People who invest this much money in jungle gyms do not enjoy the thought of their little darlings having any direct contact with any of the hymenoptera clan. These are the people who call yellow jackets "bees." Not to worry dear reader, I won't be beaten. I have already enacted a full scale multi-generational assault that will test my skills as a salesman, a sleuth and a pied piper of sorts. Step one, I sent my son as a scout to play with their children in the hopes that he will be able to lure them into my yard. Once I snare them, I plan to ply the tikes with honey. Then when the sweetness of the honey clouds their instincts, I'll delicately begin the process of brainwashing the little urchins into accepting the thought of masses of flying, stinging insects. While initial attempts have thus far failed, I have regrouped and am now pursuing a different tactic or shall I say "insur-



ance policy." I've entered my children into a playgroup with a nearby, but out of flight path, family whose two incomes are derived from successful legal practices. Needless to say, my newfound friends are practically drunk with free honey.

This playgroup business is practically made for the coercive sales practices I'm endorsing. All these moms get together, shoot the breeze, make nice nice and whammo! They're your friends, and friends don't call the zoning board on people who stock their pantries with honey. Every neighborhood has it's villain. In this case it's not the generous beekeeper, but the family hassling the beekeeper. I have even undertaken a shotgun approach to this community bribery by volunteering at my son's school. The school is a short walk from my house so I know that some of the would be child-spies attend this very institution. Child-spies are very dangerous to beekeeping so it's important to take the offensive. Young kids are normally allied with their parental unit, but I've employed a little preemptive assault of my own to ensure their



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*Remember, these are tried and true tactics to the successful salesperson, not a treatise on ethics.*

allegiance to me. Kids love bees, and they'll love them even more when I'm done with my beekeeping demo and all-you-can-eat honey buffet served up in the classroom. I'm already scheduled for the kindergarten class next week, and I plan on infiltrating the remaining grades in the coming months. From neighborhood pariah to "the nice lady who came to my class" here I come.

I have no plan of stopping there. I plan on embedding myself in this town like foul brood - they'll never get rid of me or my bees. I've already

stopped by the town hall to collect a little information on the zoning meetings and more specifically the elections (insert maniacal laughter here). It all comes down to what I said about applying a sales mentality to getting the neighborhood to accept you and your bees by default. A little linguistic flexibility and a lot of free honey and you can keep your bees anywhere - even a town like Kent. **BC**

*Gwen Rosenberg is quietly keeping bees, and kids, in Kent, Ohio. She is the Secretary of Medina County Beekeepers.*

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# A Miniature Mobile OBSERVATION HIVE

Henry Harris

The best beekeeping and honey promoter is a knowledgeable beekeeper who loves to talk about bees and beekeeping and is able to put what he or she knows into terms easily understood by his or her audience.

But beekeeper speakers do their best work with help so I would like to introduce you to the most wonderful aid a beekeeper can have a miniature, mobile Observation Hive (OBH)

## The OBH

The miniature mobile Observation Hive (OBH) contains two half-length medium (6¼") frames – a honey frame over a brood frame. It has a handle and a swiveling base.

When properly set up it provides just about everything a beekeeper needs to illustrate the life of the honey bee and the marvels that go on inside the hive in a way that children and adults find irresistible.

My OBH has a base that is roughly 16 inches long and nine inches wide. The overall height is 18 inches. It weighs less than 15 pounds ready to show. It is carried by a handle on top as easily as a briefcase or laptop computer, yet when properly made up it contains an entire hive full of information, enjoyment and amazement.

I started taking bees everywhere soon after I started beekeeping: schools, churches, bazaars, folk festivals and the county fair. A large OBH was just too much work to make up

and carry around for a one day show or an hour or two in a classroom.

The miniature mobile OBH evolved from a full sized OBH over many years. It has also grown into an entire OBH system with support nucs and specific requirements for its make up and appearance.

The OBH sits on a 9" by 10" base to make it stable and virtually impossible to tip over accidentally. The actual OBH support platform is about 16" by 6¼". This platform is attached to the base with a six-inch Lazy Susan ball bearing turntable.

I added the swivel feature early on because the queen continually goes to the darker back side of the comb making it necessary to either station the OBH on the end of a table so people could move around it or pick it up and turn it around frequently, not a safe thing to be doing repeatedly. With the swivel not only can my audience keep up with the queen without moving but I can more easily display different points of interest on both sides of each comb.

The comb containing observation area is 3-1/8" wide, 10-3/8" long and 15" high. The top is held to the end pieces with a cabinet clip at each end. At first I would screw the top to the ends but the clip is easier and safe as long as the OBH is not left unattended. There are two one inch ventilation holes in the top and one near the bottom of each of the upright ends. All are covered with 1/8" hardware cloth.

After flipping the clips open the top can be taken off. The glass sides slide up and down in grooves in each end piece. Pull the glass up and out of one side and the frames can be inserted into routed recesses in the upright end pieces from the open side. The routed recesses are 3/8" deep. The rest for the top frame is 1-1/16" wide and 3/4" high. The slot for the end bar lug to slide down is 1/2" wide. The rest area for the bottom frame lugs is 1-1/16" wide and 1" high. It is best that the width of these rest areas be tight to keep frames from wobbling. Once the frames are in place the glass is slid back down its grooves, the top is put on and clipped fast and the OBH is ready to be taken to show.

## Glass

Early on I used thin Plexiglas in my large OBH and found it bending in on the bees when in a very cool mall, because thin Plexiglas bends toward heat. Since then I have used two layers of regular window glass separated by a ¼" space and have had no problem or breakage. However, in my most recent miniature mobile OBH I have used single pieces of ¼" Plexiglas. It will get scratched with use and cleaning and need to be replaced sooner but will be easier to use and safer.

## Frames

The half-length frames are made by cutting a top bar in half and shaping the cut end on the table saw to match the manufactured end. Two extra end bars must be added,



Parts and pieces.



Partially assembled.



Slipping plexiglas in.



**For the safety of the OBH and the public any OBH not fastened down should never be left unattended. It is a tool to illustrate and illuminate the beekeeper's talk and provides little information to non-beekeepers by itself so stay with it.**

the bottom bar must be shortened and cut in half then the frame assembled.

A sheet of foundation can be cut into three equal pieces and one installed in the frame. The shortened foundation leaves a little more than an inch of open space at each end which the bees readily build out.

In the past I have wired the frames or used comb honey support pins but have come to prefer plastic foundation and find the bees accept it very well.

The half-length frames not only reduce the size and weight of the OBH but minimize the area my audience must look at. The area is reduced but everything is still there.

### Appearance

Whether a beekeeper is doing a purely informational presentation at the county fair, an educational talk at a school, church, neighborhood meeting, nature center or conservation club or using the OBH to attract customers at a festival, bazaar or farmer's market we are representing beekeeping and honey.

An OBH, as indeed everything we put before the public, needs to reflect a clean, pure, healthy image. The

OBH needs to be new or in like new condition, clean and attractive.

My OBH is painted a semi-gloss light, off-white to project a light, clean appearance rather than to attract attention to itself. The semi-gloss finish makes it easy to keep clean. If it gets chipped or dinged I repair and repaint it. If the damage cannot be made as good as new I make a new OBH. Presenting a good image is a serious thing.

This serious attitude demands new combs be used in the OBH every year. That may seem like a waste but it is important. I want clean white pine frames with just a little bit of red propolis on the shoulders to talk about but no unsightly smears and not the used, travel stained brown of old frames.

I want comb in the brood frame to have had two but no more than three cycles of brood raised in it before it is shown so the brood area is a light, translucent, golden brown. Never use a black comb unless it is unavoidable: the public equates black with dirt and germs. With the light golden comb the brood cappings will be a soft beige to contrast with the snowy white cappings on the honey frame. The pleasant brown of the slightly used comb can be used to explain about the brood cycle.

### Backup

At this point you should be able to see that there is more involved in preparing and stocking the OBH than just opening a colony, finding the queen and putting her and some bees on any old combs.

My OBH is backed up by two nucs. Each of these nucs hold 12 half-length, medium frames front to back or six full length medium frames side to side. Two half-length frames can be joined together with a coupler to make a full length frame.

### Nucs

Many years ago I switched from using two deep brood boxes to three medium (6-5/8") boxes for brood. With my whole operation in medium boxes, frames and even entire boxes can be switched back and forth simplifying matters of replacing broken frames, malformed combs or expanding or contracting brood nests and supering as needed. As a bonus my OBH frames can be coupled and put anywhere in any of my colonies to be drawn out and filled with honey or brood.

In recent years I have mainly used my OBH at the local 4-H County Fair the last week of July.

To prepare for the fair, in early May I remove honey, pollen and brood in full length medium frames from over wintered colonies and place them in the two nuc boxes where the bees will raise their own queens. Heading only a small nuc the queen will never be big and her quality is not important. I consider these nucs to have one purpose, that is to be shown to people. They must have all the components of a full hive but honey production or the longevity of the queen is unimportant.

I even open the nuc and make up the OBH for an all day county library sponsored Science Alive activity for kids the first Saturday in February. The nucs never have brood in February and I have to settle for a black brood comb, but an OBH with live bees in the middle of Winter is a big hit anyway. I still have my attractive honey frame saved from the Summer before. If the nuc and queen survive



Top.



Swivel.



Assembled.

the ordeal of opening in February and being out all day that is fine, and they have every year so far. If they do not survive they have served their purpose and I will start a new nuc in the Spring.

### The Coupler

My first miniature OBH was inspired by a Maxant Styrofoam mating nuc I received for Christmas one year. The half-length frames in this mating nuc were 5-11/16" deep. Steel sleeves were provided to slip the supporting lugs of two frames into to make one full length frame to hang in a super.

The sleeve/coupler held the frames together fine but the bees promptly filled the 1½" space between the frames with comb into which they put honey or brood.

I eliminated this problem by adding a block of wood the length of the space between the frames and the width of the narrowest part of the frame and fastened it to the bottom of the metal coupling sleeve. The block extends down to the bottom of the frame with a "claw" on its bottom to hold the two end bars against the spacing block.

In early May coupled half-length frames from last year are placed in the brood nest of large colonies to have some filled with brood while others are placed above the brood nest to be filled with honey and pollen.

### Combs For Show

In early June the new queens should be laying in the nuc boxes.

I shake all bees off the full length frames back into the empty nuc boxes and return the frames to the large colonies. The coupled half-length frames are removed from the large colonies, separated and placed in the nuc boxes, brood to the front and honey to the back.

Once the nucs have settled in on the half-length frames half of the brood frames and half of the honey frames are removed and put in a second nuc box which will be placed over a queen excluder on the nuc and new frames with foundation are put in their place in the bottom nuc box. The bees will draw the foundation and the queen will have time to raise about two cycles of brood in the new comb before the fair at the end of July. The honey frames will be drawn and filled.

I want my OBH to illustrate as much as possible of what goes on in a hive. I try to watch the honey frames develop and get one with one side completely drawn and beautifully capped while the other side is only partially drawn to my audiences can see the progression from foundation, through cell building, cell filling and capping. When I find an ideal or nearly ideal honey frame I keep it in the OBH so the bees do not "ruin" it by finishing it.

I try to get a brood frame with all stages of brood on it. Even if it is all capped on one side and the open brood is on the other that is fine since the swivel makes each side equally accessible to the viewer.

### OBH Population

When making up the OBH I only want enough bees to cover the capped brood; a patch about 3" in diameter. You may think this is not enough bees to give a real representation of the inside of a hive but even this low worker count is impressive to non-beekeepers and it has several advantages.

If the OBH is filled wall to wall with bees it is a moving, mesmerizing mass that no non-beekeeper can understand or begin to make sense of. With a small population in the OBH individual bees can be watched and followed. Their coloration, wings, antenna, hair, pollen baskets and abdominal segments can be seen and identified by everyone. With fewer bees people can see down into cells to identify larvae and sometimes even eggs. Finally with fewer workers in the OBH the queen must stay in plain sight with the workers on the face of the comb rather than hide around the edges or between the two frames.

### The Queen

The queen should always be marked with a light, bright color. My favorite color is yellow but I have also used light red, light green, light blue or white. Dark colors are too hard to spot with all the other dark colors among bees. I want the queen to stand out so people can find her quickly and easily on their own. Being marked not only makes it possible for people who have never seen a queen before to find her but makes it easier for them to make comparisons with workers.

### Using The OBH

People do not like to be "jumped" by attendants with coupons, samples or information. I can stand a little away and ask someone looking at the OBH, "Did you find the queen? She has a red paint spot on her back." Even if they were on the point of turning away they will look again and proudly point her out. If they cannot find her I turn the OBH around and let them try again.

While they are having another look at the queen I can begin telling them about her laying eggs, the development of brood, the division of labor by age and then foraging for nectar, pollen and propolis. The honey comb illustrates the ripening of nectar into honey and then I offer a taste of honey



Carrying.



Nuc.

and, if I were at a festival I would very likely lead them into a sale.

"Is that the queen? She's not very big, I thought the queen was supposed to be bigger."

Another educational opportunity! Explaining why this queen, laying only a few hundred eggs a day is not as big as one laying 1,500 eggs a day can lead to issues of the feeding and care of the queen.

Questions are very often asked and something in the OBH will illustrate my answer.

If I am going to a school it is a simple thing to show the OBH at the front of the class, point out the things I would like the kids to look for, then set it on a desk in the back of the room with a teacher or teacher's aide who will let four or five kids look at it at a time while I talk to the rest from the front of the room.

At a sales event in the open the OBH is small enough that I can protect it from direct sunlight while still using it to draw customers. Sun shining through the glass will quickly cook the bees and melt the comb.

#### Care Of The OBH

Even in the air conditioned Agriculture Hall at the county fair the small number of bees I stock the OBH with can become overheated. I keep a container of plain water available and when I see bees deserting the comb to run around on the glass I know it is time to put a few drops of water in the OBH for them to cool the interior with. Even this offers the opportunity to explain how bees regulate the temperature and humidity in the hive. Notice I said a few drops of water. It does not take much and you do not want to fog the interior or soak the bottom.

A mobile OBH should never be left made up for more than one day. Very soon after closing the OBH the workers recognize that they are closed in with no outside source of food. They quickly eat all eggs then they take a small amount of honey from open cells in the honey frame and place it in empty cells in the brood nest so the queen will not lay eggs in them. By the end of the day the workers often have pulled one or two larvae from their cells and carry them around the OBH looking for some way to dispose of them and sometimes one or more bees are lying dead on the bottom of the OBH.



Double frame.

Big deal? Yes it is! Even children want to know about the dead bees and what the white thing is the bees are carrying around. While I can use these things to talk about life in the hive and how it is different from being locked into the OBH these are anomalies and distract audiences from the good and positive things I would like them to remember.

So every evening I put the bees and their queen back in their nuc and the next morning I make up the OBH from the second nuc. I could use one nuc and still put them back each night and make it up each morning. But the fair lasts 10 days and it is just possible that with the constant disruption I would run out of decent brood frames to show. Also, the nuc could decide there is something wrong with this queen that disappears everyday and try to replace her before the fair is over. Alternating between two nucs is best.

#### Cleanup

When all is done and the bees are back in their nuc for the night it is time to clean and check the OBH. Wash the glass and remove traces of propolis and wax then check the OBH exterior for dirty fingerprints left by



Display.


yourself or kids at the display and propolis during installing or removing the combs. I also check the honey frame to be sure the bees have not emptied too much honey for food or to fill brood cells. I try to have a spare ready if needed.

A cardboard sleeve is slipped down over the OBH to both protect and hide it while being transported and in storage and in the classroom until I am ready to reveal the bees.

At the end of the season you can either try to overwinter the nucs or combine them with large colonies. Perhaps another time I will tell you about how I overwinter these nucs in Styrofoam boxes. **BC**

*Henry Harris is a strong advocate of educating the whole world about honey bees, and uses his OBH every chance he gets.*

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# SUBURBAN BEEKEEPING



Passing through the toll booth on the New Jersey side of the George Washington Bridge, the collector saw the beehives stacked in the bed of my 1977 F-250, rolled her eyes, took my money, and quickly closed her door.

I was moving four colonies from our 45 acre Ohio tree farm to our new home on the Eastern end of Long Island, N.Y. Apart from wondering what the drive through NYC with the bees would be like, I was not sure how the bees would like being cooped up on their new suburban ½ acre lot. That move was on December 26, 2002, and I am happy to report that the little sweethearts are doing fine, possibly as a result of minimalist management, screened bottoms, and help from feathered friends. And perhaps a healthy load of dumb luck.

## THE GOOD OLD DAYS

30 years ago, I was my father's teenaged assistant beekeeper, taking care of the two colonies we had on our small NY state farm. "Taking care" is a misnomer. They took care of themselves. No medicine, no chemicals, no mites. Harvesting honey and catching the occasional swarm were the only real duties.

After a stint in the Navy and starting a family, I returned to beekeeping in 1997 in Ohio. I was stunned by how much more complicated the craft had become because of *Varroa* and the required treatments, and after a few years on the Apistan merry-go-round, I decided to kick the habit.

## COLD TURKEY

My decision to "go clean" was prompted by the dis-

covery of a large feral colony in an old house. The colony had nearly filled three wall bays with honey and brood, and only had a small entrance (about 1/2" x 3') on the North side of the house. I figured that if the feral colony could survive without chem/med assistance and with a tiny entrance on the wrong side, then my girls with big openings on the South side could, too.

I decided to stack the deck by getting screened bottoms, and also put Imrie shims (which create upper entrances without poking holes in supers) above the brood chambers, which I leave in place all year. I do not put the plastic board into the screened bottom over Winter. The bees seem to like the fresh air.

## THE NEW YARD

As you can see from the picture taken from the house, the bees share the hen pen, and are located behind the pool. The hives are literally 50' from our back door. They have a southeast exposure under a locust tree, and the pen fence 4' from the hive entrances gets the girls up quickly.

I am blessed with a lovely wife and 11- and 14-year-old daughters who help with the bee chores. I am also very fortunate in that we have pretty reasonable zoning on our little island, and generally nice neighbors. Of course, I try to keep the place neat, and our bees seem to be pretty well behaved.

## THE BIG PICTURE

Like most Americans, we have to watch the budget pretty carefully, so our hobbies have to pay for them-

## Chickens, honey bees and a swimming pool, all on a half acre suburban lot.

selves. The bee equipment is five to 30 years old, much of the woodenware is homemade, and the chicken house and fence are primarily made from salvaged lumber. I think I have just under \$1000 into bee equipment, including basic extractor, and about the same amount into the chicken coop and equipment. A typical Spring or Summer morning (when not at work) means early fishing from the kayak, with the bass or flounder fillets into the freezer or pan. The carcass goes to the chickens, who peck it for a few hours, after which time it is buried in Cara's vegetable garden. The bees pollinate the plants in the garden, and the chickens make dessert of whatever drops through the screened bottoms. I get a perverse kick out of eating eggs made from digested mites and bee garbage. And for the past eight years, we've had a reliable 150# +/- yield of honey for table, baking, mead, and gifts. It is a happy circle, with no unnatural chemicals in the bees, chickens, or eggs.

The pool and backyard get pretty heavy use from family and friends, including little ones. Nice neighbors and good zoning aside, aggressive bees would not be welcome. I've gradually moved to gentle Buckfast and Carniolan stock, and make sure to harvest on days no one is around. Knock wood, so far it all seems to be working out. Some swarming seems to be unavoidable, especially during an extremely wet Spring, such as last year's. Fortunately, all swarms have (at least initially) alighted on one of the trees on our lot, where I could capture them if they were low enough to catch.

### LESSONS LEARNED?

Just when I think I've broken a bit of the bee's code, they straighten me out. Having the bees so close makes it easy to notice behavior I would have never seen before (and cannot find described in any book), and I think in 30 years I've gone from an intermediate beekeeper to a novice. In addition, my situation, on an approximately 12 square mile island with somewhat limited influence from mainland, feral, and other managed bees, is admittedly different from that of most other beekeepers. Given that, I haven't bought chems/meds in over five years, nor replacement packages in two years, so I'm hopeful I'm over the hump.

Ventilation - The single most important change that we've made has been the permanent installation of the screened bottom and the Imrie shim above the brood chamber. The enhanced ventilation has allowed me to permanently reduce the lower entrance to the 3/8"x3" size. I believe the upshot of these changes has been reduced defensiveness of the bees due to the smaller entrances; less internal congestion due to the second entrance; less disruption by seasonally changing size and locations of entrances; and debris (ejected mites?) from the colony can fall through to the ground, where it is eaten by the chickens. I still have *Varroa*, but the bees seem to be able to deal with the infestation levels that are present. The downside of the Imrie shim is burr comb between the top brood super and the first honey super, but I only go into that area once, in the Spring, so it is not much of a real problem. The shim also acts as the traffic transition zone between the ten-frame brood boxes and the nine-frame honey supers. The bees do not seem to miss the full-sized opening in the Summer, to my surprise. The bees returning to the bottom entrance generally appear

to carry more pollen than the bees returning to the top entrance, which I suppose makes sense given the location of the brood.

Birds and Bees - After our first year here in Suburbia, it became obvious that building another fence right in front of the bees to get them higher above the pool was imperative. I was also tired of keeping the grass mowed under the hive. So, salvaging some lumber and a neighbor's downed locust tree, we made a little hen coop and pen, which also acts to get the bees over the pool and garden and keep kids away from the front of the hives. The Buff Orpington breed of chickens we raise has a reputation for pleasant personality and hardiness, so we bought some mail order chicks about two years ago. After the initial culling, all 10 layers are alive and well, and the three bee colonies we had at that time are still going strong, along with the three swarms they kicked last Spring. The hens do a great job of keeping the area under the hives clear, and seem to eat anything that drops from the hive, including dead bees. Interestingly, although the chickens are lethal to any insect unlucky enough to walk or fly within 18" of them, they leave live bees alone. Likewise, the bees don't seem to pay any mind to the birds.

Minimalist Management - The longer I spend with the bees the less I can predict their behavior accurately. I am pretty sure, though, that every time I open them it seems to take a day or so for them to get back to normal. Therefore, I make one big inspection in Spring, feed them with a top feeder a bit, then top super as necessary. In mid-July, I do the harvest in one day, let them clean up that night, then leave them with two deeps and a medium for Fall and Winter. Other than checking their weight, I do not mess with the colony after July. The Fall flow is theirs, and the *Varroa* battle is theirs, too. They seem to like benign neglect as much as we do, with two full-time jobs and family demands.

Swarming - Between the bees' somewhat unpredictable nature, my job schedule, and the neighborhood, I was a bit nervous about swarming. I've never been one to go to huge lengths to prevent swarming, partly because I find it fascinating and partly because I respect the bees' inherently wild nature. But visions of multiple, aggressive swarms invading neighbors' houses and cars did not come to pass. One very rainy Spring I was fortunate to be off work during the big swarm week in late May, and caught most of them. They settle easily in one of the trees near the hive, at a height that seems to be related to wind speed at the time (the higher the wind, the closer to the ground the swarm settles). I called one of my favorite neighbors to help with swarm catching this year. I enjoy his help and company, and I think it is good for more people to see what still seems like a nearly miraculous natural event. (I also invite school kids and scouts to visit the apiary, but younger kids seem to be more interested in the dumb birds than the brilliant bees).

Stings – In three Summers, we've had three stings in the pool and one in the garden, before the fence was installed. Prior to using the pool, we always skim the few dead bees that might be in the pool. I think, overall, that we have close to the number of stinging incidents that we might have if we had a lot of yellow jackets or other stinging insects nearby, i.e., reasonable and acceptable. The bees have plenty of water sources nearby, and are not aggressive in the slightest, with the exception of harvest day. I carefully pick harvest day when I know the pool and neighborhood are quiet. If the bees ever did create a problem, though, obviously I would find a new home for them, good zoning notwithstanding.

#### CONCLUSION

Pride goeth before the fall, as Ed Colby eloquently reminded me last year. Hopefully, though, our bees will keep giving us 150-200# of honey each year, the chickens

will keep giving a couple dozen eggs each week, my mead habit will not become a problem, and the neighborhood will enjoy pollination services without nuisance. Come what may, though, I'm committed to zero chemical use in my beekeeping. First, I am not sure it is in the best long-term interest of beekeeping; and second, because anything that is in the beehive will wind up, to some degree, in the eggs. I prefer my omelets with mushrooms, not Apistan residue.

With each passing day I gain increasing admiration for the bees' industry and how harmoniously these wonderful insects live. And I really enjoy having these amazing insects so close. With planning, care, and luck, it seems to be possible to successfully keep bees in suburbia, without modern chemistry. **BC**

*Cara and Mike Loriz take care of chickens and bees on their Long Island Suburban Farm.*



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**FARMING MAGAZINE**

"The Magazine that offers hope to the small Farmer"



The Bee Man from Bodie is historical fiction about beekeeping during the later half of the 19<sup>th</sup> century. The story is designed to describe beekeeping in another era and to illustrate how many beekeeping techniques used then remain equally effective today. The places of business mentioned actually existed and the beekeeping text used by the Bee Man can still be obtained today.

The town of Bodie is an island of sorts. Isolated by a hostile environment, and geographically remote at 8375 feet elevation, it was held together by the romance and excitement of gold mining from 1859-1900. Here, a plant community of mainly Mesquite and sage brush survived in an extreme environment. The 10,000 plus people that lived there, and the very town itself, survived when other mining boom towns quickly bloomed and then just as quickly faded. Armed with desire, a "how to book" and everyday items the Bee Man from Bodie survived too. The following is his story.

Surviving a mining accident in June 1885, William Irwin, the Bee Man from Bodie as he became known, resolved to find a safer means of making of living. At the Boone and Wright general store he found a dusty copy of *Mysteries of Bee-Keeping Explained* by Moses Quinby written in 1860. Thumbing through the book, his mind wandered to a time and place from his childhood. His father was a successful beekeeper, as was his father before him. He kept the family and his friends supplied with a generous supply of honey and sold the remaining honey at a road side stand. The Bee Man's reverie came to a startled end by the store owner who had walked up behind him. "If you think you can use that book, it's yours. It's just been collecting dust for years. It belonged to Charlie Donnelly before he left town years ago. He worked the Lucky Ridge Mine until the ore ran out. Donnelly had bees behind his house. They still might be there.

William decided to visit Donnelly's long abandoned house located on Green Street. Sure enough the hive boxes were still there; however, they had not held up to time and the harsh Bodie climate. The frames no longer had any comb, but they were structurally sound; the only residents of the former beehives were an extended family of mice. Looking around the outside of the house he discovered where the bees had gone to. A knot hole in the wall was a busy portal. At the other end of the house he found a second colony. The bees had survived on their own for at least the last four years. Like William Irwin they too were survivors.

That afternoon William returned to his rented room and started reading *Mysteries of Beekeeping Explained*. Enthralled with the book, William realized that keeping

bees could provide him with the means of making a living in Bodie. He decided that one of his first steps would be to transfer the bees to a box with movable frames. He recalled watching his father removing frames from his hives. According to his new book, there were tools and equipment he was going to need to accomplish this. Since it was already Spring, he would need equipment now in order to take advantage of the upcoming honey flow. Given the infrequent stage coach visits to this remote corner of Northern California, shipping would take far too long. It would be late Summer before he would receive the needed tools. This called for resourcefulness.

Taking stock of what was available in town, he came up with creative ways to make the tools and equipment he needed. For general protection, he purchased coveralls and gloves from Boone and Wright, the general merchandise store in town. To protect his face, he used a small section of a gossamer window curtain from an abandoned home that he tied to a wide brimmed hat. He attached a draw string to the bottom of the curtain. For his hive tool, he found an old flathead screw driver while scavenging through the dump at the edge of town.

The smoker was more of a challenge. According to M. Quinby, "tobacco smoke...is the grand secret of success...with it ...I have done it [handled bees] time after time without receiving a single sting, and no protection whatever, for either hands or face".\* (page 33) A tobacco pipe would have worked, but the Bee Man's lungs were bad enough from years in the mines. He decided a better choice was a roll of newspaper. Frayed at one end, it could be set on fire then blown out. It would continue to smoke long enough to work the bees. As long as he remembered to always exhale and never inhale, it worked fine.

The brood boxes were less of a challenge than he had thought. From his experience the Bee Man knew dumps just outside of any large mining town were a rich source of various materials. Dynamite boxes were discarded daily and were plentiful. With only a small modification they worked well to support the frames. The boxes were quite strong and uniform in size, so they stacked well. Adding a handle made from scrap wood was an easy task. Hive covers and bottom boards were fashioned from the wood used in the doors of now collapsed miners' shacks.

Now prepared with the necessary tools and confidence gained from reading his book, the Bee Man was ready to transfer the bees from the wall. To transfer the bees from their old home to the movable frames required









containing the wet comb between the top of the stack of brood boxes, and below the cover. This arrangement provided easy access for the bees without encouraging robbing. Since the honey came from the same two healthy hives spreading disease was not an issue. This mashing and straining method of honey extraction would prove to be successful for the Bee Man for many years.

The ever helpful Harvey Boone agreed to sell the Bee Man's honey in his general store. Harvey provided containers for the honey in exchange for a commission on honey sales. Anxious to check on sales, the Bee Man

visited the store a week later where he witnessed an argument between two customers. Two women were debating who had first seen the only remaining jar of honey! Harvey settled the argument with a toss of a coin. These citizens of Bodie were eager to purchase the fresh, local honey. It was a rare and sweet treasure not often enjoyed by this isolated population. Harvey Boone, all smiles, referred to the brisk honey sales, "There's more than one gold rush in Bodie." At that point the Bee Man decided to name his honey "Bodie Gold."

The next six months proved to be a time of prosperity and growth for the bees. The Beeman continued to add to his beekeeping knowledge through reading and experience. In the Fall of 1885, William Irwin saw an exciting advertisement in the Bodie news. A man in nearby Bridgeport was going back east and wanted to find a home for two well established hives. This was an opportunity the Bee Man could not refuse. He saw visions of his growing business. After a 40 mile round trip in an old wagon, the Beeman now had doubled the size of his apiary. There seemed to be no limit on extracting gold in this mining town. The Beeman had staked his claim in Bodie. **BC**

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# The Honey Garden

Connie Krochmal

*Combining honey bee pollinated garden crops with honey recipes. The best of two worlds.*

**EGGPLANT** In recent years, home and garden makers have been the rage. In the case of vegetables, a similar trend has emerged in plant breeding. An example is the familiar eggplant, which is now giving way to a colorful mix of hybrids in various shapes and sizes. Eggplants are classified as a fleshy berry.

## Growing Conditions

These vegetables typically need a long growing season. For the North, select early maturing varieties.

Eggplants are warm season vegetables. These prefer full sun and lots of it in order to really be productive. Thriving in a well drained, rich soil with plenty of organic matter, they like a pH of 5.5 to 6.5. Light soils are best since they warm up quicker during the Spring.

## Planting

As with most vegetables in the nightshade family, it

is best to either buy transplants or start the seeds early indoors eight to 10 weeks before planting outdoors. If possible, use a heat mat under the seed tray as these seeds will sprout faster with warm temperatures.

Eggplant seeds should be planted one-fourth inch deep. They will germinate within one to two weeks.

Before transplanting eggplants to the outdoors, be sure the temperature is at least 80°F during the day and around 60°F at night. If the weather is too cold, the plants will become stunted and less productive.

In the garden, eggplants generally need about two to three feet of space between plants in rows that are around three to four feet apart. However, dwarf types can be set somewhat closer – 1½ to two feet apart in rows that are 2½ to three feet apart.

Hot caps or other forms of protection can be used if an unexpected cold snap occurs after these are transplanted.

## Caring for Eggplants

For best results, eggplants need a steady supply of a complete fertilizer. Any check in growth will affect the harvest. So, apply the first application at planting time to get them off to a good start. Then, reapply every six weeks or so throughout the

Summer as a top dressing.

Control weeds so the eggplants don't suffer from competition. If desired, you can stake and prune the plants to help keep the fruits straight. This is more of an issue if you're growing the slender Oriental types.

Though the plants can tolerate some dry conditions once they're established, the yield will be better if they're



## RECIPES

Ann Harman

The purple eggplants are a beautiful vegetable with their glossy deep purple skin. You can make a nice centerpiece for your dinner table with some purple ones, fat and skinny, and some of the white round ones. Add some green leaves such as ivy or even some romaine lettuce. After dinner and after admiring the combination you then can cook the eggplants.

Eggplant is one vegetable that is not eaten raw. It blends well with tomatoes, garlic, onion and green and red peppers. A ripe eggplant has glossy skin. Once the skin begins to get dull, don't buy it since eggplant will become bitter when overripe. The texture of eggplant is interesting. Its

flesh is porous with air cells. This texture has led cooks to salt eggplant after slicing and letting it stand for about 30 minutes, then rinsing off the salt, patting the slices dry, then cooking it. With this treatment it absorbs less cooking oil. But if the cooking oil is well-heated before adding the eggplant it will absorb less oil. However, some cooks do not bother with the salt treatment.

If you decide to salt you must rinse off the slices of eggplant and pat dry before cooking or your completed dish will be too salty!

Eggplant will discolor when sliced so a sprinkling with lemon juice will prevent that. To peel or not? If the eggplant is young or small and the skin is thin, you do not need to peel. For best results with mature and large eggplant, it is best to peel it. Eggplant does not store well after harvesting. But if you must, then

wrap in plastic and store for one or two days in the refrigerator. If soft brown spots appear, the flesh will be bitter. From a nutrition standpoint eggplant is rather disappointing. Some potassium and foliate are present but levels of other vitamins and minerals are quite low; it is low in calories, however.

Perhaps the most classic recipe for eggplant is Ratatouille. It is a wonderful Summer vegetable dish that can be served hot, at room temperature or cold. Cut some pita bread into triangles and toast. Use to scoop up the Ratatouille. Although this dish can be made any month of the year, if you have some of the vegetables fresh from your garden you will really enjoy this combination. You can find many versions of this recipe, all claiming to be the classic one. So, here is just one of the many recipes.

watered on a regular basis during dry spells. This should be done any time an inch of rain doesn't fall each week or so.

For best results, use row covers until the plants begin to bloom. This will prevent flea beetles from having their way with the foliage. The cover also helps to keep the plants cozy warm during the night. As a result, they grow better and are more productive.

Colorado potato beetles, which can be controlled with Bt, also attack the foliage. Other troublesome insects include aphids, and spider mites.

Phomopsis rot, a type of fungus, can become a problem. This causes spots on the leaves and sunken tan or brown areas on the stems and fruits. Infected plants should be discarded. Fusarium and verticillium wilts can affect eggplants.

To minimize disease outbreaks, select resistant varieties and rotate the crops in the vegetable garden every couple years. Avoid growing eggplants, tomatoes, and peppers in the same spot year after year.

Fall clean-up in the garden helps to prevent pests and diseases from overwintering in the plot. Remove all vegetable debris at the end of the season.

### Pollination and Honey Status

According to USDA, eggplants are one of those vegetables that require pollination with honeybees being the preferred pollinators. Limited information is available on honey and pollen yield.

#### Varieties

Fruit color, shape, and size vary according to the variety of eggplant being grown. They may be solid colored or striped. The kaleidoscopic colors include purple, black, white, and red. Basically, there are four basic types – Oriental, oval, slim, and the classic, bell shaped eggplant. If you don't like thorny plants, grow spineless varieties.

### RATATOUILLE (Not The Movie)

- 1 medium or 4 small eggplants
- 4 tablespoons olive oil
- 2 large onions, thinly sliced
- 3 cloves garlic, finely chopped or pressed
- 1 green bell pepper, seeded and cut into strips
- 1 red bell pepper, seeded and cut into strips
- 2 thin zucchini, sliced
- 3 medium fully-ripe tomatoes, cut into wedges and seeded
- 1/4 teaspoon salt
- 1/4 cup chopped fresh basil leaves
- 1 bay leaf
- 2 tablespoons finely chopped fresh parsley

Cut the eggplant into 1/4-inch slices then into cubes. Heat the oil in a large skillet; cook the eggplant cubes in the oil for 6 to 7 minutes until lightly browned all over. Add the

onions, garlic and peppers and cook for 3 minutes more. Add the zucchini and remaining ingredients. Cover the skillet and cook over low heat for 15 minutes. Remove the lid and continue cooking until most of the liquid has evaporated, about 10 minutes more. Stir occasionally just to make sure the vegetables are not sticking to the bottom and burning. Serves six.

*The Great Food Almanac*  
Irene Chalmers

How about eggplant and honey? It is difficult to find eggplant recipes that contain honey since eggplant is used in many Mediterranean dishes with lots of tomatoes and seasonings. You can, of course, add a small amount of honey to your recipe since a dash of honey enhances the flavor of any dish.



### EGGPLANT, FRENCH TOAST STYLE

- 1 large eggplant
- salt
- 2 eggs
- 2 tablespoons milk
- 1 tablespoon honey
- cornflake or cracker crumbs
- butter or margarine
- honey, warm

Slice eggplant into 1/4-inch rounds, paring if desired. Sprinkle generously with salt and set aside on paper towels or in a colander for 30 minutes. Rinse slices thoroughly to remove salt and brown juice that has formed. Pat dry. Beat eggs slightly and combine with milk and honey. Dip eggplant slices into egg mixture, then into crumbs, coating both sides. Melt butter in large skillet

#### Black Beauty

Though there may be many new varieties, this still remains popular partly because it is widely adapted to most areas. This dependable variety begins yielding in about 74 to 78 days. The plants are very productive. The classic, egg shaped, dark purple fruits can be harvested at any stage.

#### Calliope

This spineless variety is excellent for container gardens. The plants give a good yield even in colder climates. Ready to harvest in about 64 to 75 days, the oval fruits are bitter free. They make great baby vegetables. These are purple with cream stripes.

#### Casper

Often grown as a novelty for its ghostly white color, this mild tasting variety is recommended for short growing seasons. Ready in about 70 to 75 days, this is a high yielding variety. The plants are compact. Harvest at the baby stage, or wait until they're five to six inches long.

#### Dusky

A proven performer, this disease resistant variety is very high yielding. The bushy plants are suitable for short growing seasons. Harvest begins in about 80 days. The oval, dark purple fruits reach nine inches or more in length.

#### Fairy Tale

Among the most popular varieties, Fairy Tale is slightly earlier than some – 50 to 65 days from transplant. An All-American Selections winner in 2005, this dwarf variety is good for container gardens. It is ideal for baby eggplant. For that purpose, harvest when they're only four inches long. The tear-drop shaped fruits, lavender with white stripes, are bitter free. They have few seeds.

### Millionaire

Very early yielding, this Oriental variety is ready to harvest about 55 days from transplant. The strong plants provide a heavy crop of long, slender, black fruits. The flesh is very tender.

### Rosa Bianca

An Italian heirloom variety, Rosa Bianca is ready to harvest somewhere between 70 and 90 days. Warm night temperatures are needed for the best yields. The rose-pink fruits with white streaking reach about five inches in length. They're tear-drop shaped to round. These are bitter free.

### Harvesting

Typically, eggplants will be ready to pick during mid-Summer. However, this does depend on several factors, such as when they were transplanted into the garden and the variety being grown.

There are early, mid, and late maturing varieties. The range extends from about 70 to 90 days from the time of transplant.

Most eggplant varieties can be harvested in the baby stage and all other immature stages. Normally, these are picked when they've reached about one-third to two-thirds their mature size. For most large fruited eggplants, this will be when they're six to eight inches in length. If left too long on the plant, these vegetables become tough and inedible. The skin should be smooth and glossy. A dull color indicates they're past their peak.

When harvesting, use a shears or scissors to snip the fruits from the plant, leaving part of the stem on the fruit. These can be stored in the refrigerator for about 10 days.

### Culinary Uses

Eggplants are very versatile. They can be steamed, fried, baked, stuffed, scalloped, and grilled. Some varieties are totally bitter free, while others may have a slightly bitter flavor. **BC**

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



let over medium heat. Add eggplant slices and cook until brown on both sides and fork-tender. Add more butter to skillet as needed. Serve eggplant slices with additional butter and warm honey. Makes seven servings.

*National Honey Board*

Here is another recipe that will be superb with your home-grown garden vegetables this Summer. If you planned to grill these vegetables and it rains, conventional oven directions can be used. I hope the sun is shining the day you fix this eggplant dish.

### HONEY-GRILLED VEGETABLES

- 12 small red potatoes, halved
- 1/4 cup honey
- 3 tablespoons dry white wine
- 1 clove garlic, minced or pressed
- 1 teaspoon dried thyme leaves, crushed
- 1/2 teaspoon salt
- 1/2 teaspoon pepper
- 2 zucchini, halved lengthwise and halved again
- 1 medium eggplant, cut into 1/2-inch thick slices
- 1 green bell pepper, cut into eighths
- 1 red bell pepper, cut in eighths
- 1 large onion, cut in 1/2-inch thick slices

Cover potatoes with water in large saucepan. Bring to a boil and simmer five minutes; drain. Combine

honey, wine, garlic, thyme, salt and pepper in small bowl; mix well. Place potatoes and remaining vegetables on oiled barbecue grill over hot coals. Grill 20 to 25 minutes, turning and brushing with honey mixture every 7 to 8 minutes.

**Conventional Oven Directions:** Toss vegetables with honey mixture. Bake, uncovered, at 400°F for 25 minutes or until tender, stirring every eight to 10 minutes to prevent burning. Serves four.

*National Honey Board*

This next recipe makes a delicious appetizer when served with lightly toasted bread.

### CAPONATA

- 1 medium eggplant
- salt
- 3/4 cup olive oil
- 2 tablespoons olive oil
- 2 cups onions, chopped
- 1 cup celery, finely chopped
- 1 cup tomatoes, cored, peeled, seeded and chopped
- 1/2 cup pitted, halved green olives
- 1/4 cup capers, rinsed and drained
- 1 tablespoon pine nuts
- 1/3 cup red wine vinegar
- 1 tablespoon honey
- freshly ground pepper, to taste

Peel and cube the eggplant.

Place the cubes in a colander and salt thoroughly. Let drain for 30 to 60 minutes. Rinse thoroughly and pat dry. Heat half the oil in a large skillet over high heat. Sauté half the eggplant until golden brown, five to eight minutes. Remove to a strainer and drain. Add the remaining oil, sauté the rest of the eggplant, and drain. Wipe the pan clean, add the additional two tablespoons oil and sauté the onions and celery just until tender. Add the tomatoes, cover the pan and cook four to five minutes. Uncover the pan and cook additional five minutes. Add the sautéed eggplant, olives, capers and pine nuts. Combine the vinegar and honey; mix well. Pour into the eggplant mixture and simmer, covered five to 10 minutes. Season to taste and cool. Makes seven - eight cups.

*Victory Garden Cookbook*  
Alfred Knopf publishers

Recipe books for Italian food will always have recipes for eggplant. Unfortunately most do not call for honey. But if you see small quantities of sugar listed in the ingredients, just substitute honey, 1 to 1, and the result will be delicious. **BC**

*Ann Harman cooks up eggplant recipes at her home in Flint Hill, VA.*





# ? DO YOU KNOW ?

## Check Out The Basics

Clarence **Collison**  
Mississippi State University

Commercial, migratory beekeepers who have suffered serious losses associated with the colony collapse disorder (CCD) are struggling to recover, while many hobby beekeepers are working to get their colonies in peak condition, in hopes of having a productive year. The general public is alarmed at some of the reports they are hearing in regards to CCD and the potential impact that it is projected to have on our food supply. While this

phenomenon has caused serious economic losses in several beekeeping operations, there is still a lot of interest in getting started in beekeeping. Numerous beekeeping short courses have been held this spring and attendance has been good.

Please take a few minutes and answer the following questions to determine how familiar you are with basic beekeeping knowledge.

### Level 1 Beekeeping

- Hivastan® is a new pesticide labeled for the control of \_\_\_\_\_.  
A. Tracheal Mites  
B. Small Hive Beetles  
C. *Varroa* Mites  
D. Bee Lice  
E. Wax Moth
- Hivastan® belongs to the \_\_\_\_\_ class of insecticides.  
A. Organophosphate  
B. Pyrethroid  
C. Carbamate  
D. Chloronicotinyl  
E. Pyrazol
- Hivastan® contains the active ingredient \_\_\_\_\_.  
A. Fluvalinate      B. Permethrin  
C. Coumaphos      D. Fenpyroximate  
E. Resmethrin
- \_\_\_\_ Queen honey bees are able to transfer virus to their offspring. (True or False)
- \_\_\_\_ Honey bees require sterols in their diet for normal growth development and reproduction. (True or False)
- The source of cholesterol in the honey bee diet comes from \_\_\_\_\_. (1 point)
- \_\_\_\_ Honey bee workers forage for food according to their own needs. (True or False)
- \_\_\_\_ Brood food glands in worker honey bees degenerate as bees begin foraging. (True or False)
- \_\_\_\_ The mandibular glands of the worker secrete the clear component of brood food; rich in enzymes, lipids, vitamins and proteins. (True or False)
- The royal jelly fed queen larvae during early development is high in \_\_\_\_\_ compared to worker jelly.  
A. Protein      B. Amino Acids  
C. Vitamins      D. Sugar      E. Lipids
- Name two advantages of using sticky boards over the ether-roll technique in monitoring *Varroa* mite populations. (2 points)
- What is the function of the female *Varroa* mite's peritreme? (1 point)

### Advanced Beekeeping

- \_\_\_\_ Royal jelly lacks vitamins A, C, and E but contains a large range of the vitamin B complex. (True or False)
- Thiamine, riboflavin, pyridoxin, pantothenic acid, niacin, folic acid and biotin
- The chemicals listed above are known as \_\_\_\_\_. (1 point)
- What is the source of these chemicals in the honey bee colony? \_\_\_\_\_ (1 point)
- \_\_\_\_ Makisterone A is a moulting hormone found in honey bee pupae and in the ovaries of queens. (True or False)
- \_\_\_\_ All species of honey bees and many species of stingless bees collect propolis. (True or False)
- \_\_\_\_ *Varroa* mites in addition to vectoring several viruses, can also vector chalkbrood and nosema disease. (True or False)

Listed below are several families of plants that contain important floral sources for honey bees and honey production. Please match the floral sources with the appropriate plant family. (1 point each).

- A. Asteraceae    B. Rosaceae    C. Asclepiadaceae  
D. Ericaceae    E. Anacardiaceae    F. Aceraceae  
G. Aquifoliaceae

- \_\_\_\_ Holly, Gallberry
- \_\_\_\_ Milkweed
- \_\_\_\_ Brambles, Tree Fruits
- \_\_\_\_ Smooth Sumac, Staghorn Sumac
- \_\_\_\_ Maple
- \_\_\_\_ Dandelion, Canada Thistle, Chicory
- \_\_\_\_ Blueberry, Sourwood

ANSWERS ON NEXT PAGE

## ?Do You Know? Answers

1. C) *Varroa* Mites
2. E) Pyrazol
3. D) Fenpyroximate
4. **True** Queen honey bees have been shown that they can transmit viruses to their offspring. Feces and tissue (including hemolymph, gut, ovaries, spermatheca, head and eviscerated body) of individual queen bees were tested for viral presence. All tissue forms but one, as well as feces, were found to carry viral infections. Once the viruses in the queen bees were identified, their offspring (including eggs, larvae, and adult workers) were tested and found to carry the same viruses.
5. **True** Honey bees require sterols in their diet for normal growth development and reproduction. One class of sterols (cholesterol) is known to be essential for honey bees. Since honey bees are not able to manufacture these components, they must obtain them in their diet for normal development.
6. Pollen
7. **False** Honey bee workers forage for food not according to their own needs, but in response to the needs of the colony.
8. **True** Both the hypopharyngeal and mandibular glands degenerate after honey bees finish their nursing activities and begin foraging activities.
9. **False** The hypopharyngeal glands, not mandibular glands, secrete the clear component of brood food. This secretion is rich in enzymes, lipids, vitamins and proteins.
10. D) Sugar
11. Several studies have shown that monitoring *Varroa* mite populations in honey bee colonies is more accurate using a sticky board in comparison to the ether roll technique. The sticky board samples the entire colony, whereas ether rolls sample only a small portion of the colony. Sticky board sampling can be done with a minimum disturbance of the bees without killing them. Sampling can also be done

during cold weather and during broodless periods without disturbing the brood nest.

12. When a female *Varroa* mite enters a cell containing an older honey bee larva just prior to being capped, she submerges herself in the larval food below the larva. While the mite is in the larval food, she uses her peritreme, a highly specialized breathing tube for obtaining air. It resembles a snorkel which swimmers use to breath under water.
13. **True** Royal jelly contains a large range of the vitamin B complex, but lacks vitamins A, C, and E.
14. B-complex vitamins
15. Pollen
16. **True** Makisterone A is a 28 carbon moulting hormone that has been identified as the major free pupae ecdysteroid in the honey bee. It has also been isolated from the ovaries of queen bees.
17. **True** All species of honey bees as well as many species of stingless bees collect propolis. Honey bees use propolis to varnish the hive interior, strengthen wax combs, and objects that can not be removed from the nest are frequently sealed. Stingless bees use propolis mixed with beeswax

to construct their tubular nest entrances, as well attaching various structures within the nest.

18. **True** Female *Varroa* mites have been shown to be effective vectors of chalkbrood and nosema spores on their cuticle. Thus, they are capable of spreading these diseases in honey bee colonies.
19. G) Aquifoliaceae
20. C) Asclepiadaceae
21. B) Rosaceae
22. E) Anacardiaceae
23. F) Aceraceae
24. A) Asteraceae
25. D) Ericaceae

There were a possible 13 points in each test level this month. Check the table below to determine how well you did. If you scored less than six points, do not be discouraged. Keep reading and studying- you will do better in the future.

Number Of Points Correct
13-11 Excellent
10-8 Good
7-6 Fair

Clarence Collison is a Professor of Entomology and Head of the Department of Entomology and Plant Pathology at Mississippi State University, Mississippi State, MS.



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# GLEANNINGS

JULY, 2007 • ALL THE NEWS THAT FITS

## APIMONDIA IN AUSTRALIA 2007

Let me introduce you to Apimondia. The word certainly indicates bees and the world. Every two years beekeepers come from countless countries to take part in a world congress of beekeeping. As you walk through the hallways looking for your next session you will hear conversations in many languages but bees and beekeeping are the topics. In the large hall for vendors you will pass by booths from Nepal, Italy, Germany, Kenya and the USA, to name just a few countries represented. You can attend sessions on every imaginable subject about bees and beekeeping.

Every two years the host country will be different. In 2005 the congress was held in Ireland. This year Apimondia will take place in Melbourne, Australia September 9 through 14. That's springtime in Australia! Beekeeping is big business in that part of the world. Field trips are offered so that you can see not only the interesting countryside

but also visit beekeepers and see what beekeeping is like in the land "down under."

Australia is, of course, the native home of the many species of eucalyptus trees. The varied times of bloom of the trees can give some areas an almost continuous nectar flow. You are probably aware that the US is now importing package bees from Australia in order to fulfill pollination contracts. Now is your chance to see where the bees come from.

Apimondia has a web site: [apimondia2007@meetingplanners.co.au](mailto:apimondia2007@meetingplanners.co.au) where you will find information about the congress, registration and hotel information and news about the congress in general. Go ahead—open the web site up—discover another world of beekeeping.

Remember, if you get tired of hearing about bees you can always go and watch the kangaroos.

*Ann Harman*

## NHB PROVIDES ADDITIONAL \$100,000 FOR RESEARCH ON CCD

The National Honey Board (NHB) has approved \$100,000 in additional funding for research on the phenomena recently termed Colony Collapse Disorder (CCD), bringing NHB's total funding to date for CCD research to \$158,000.

The funding has been awarded to a CCD Working Group composed of

university faculty researchers, state regulatory officials, cooperative extension educators and industry representatives. In January, NHB approved an emergency funding request for \$13,000 for the group. In addition, NHB approved \$45,000 for a CCD research project as part of its 2007 production research funding.

## CALL FOR SCHOLARSHIP APPLICATIONS

The Foundation for the Preservation of Honey Bees, Inc. is a charitable research and education foundation affiliated with the American Beekeeping Federation (ABF). The Foundation Trustees have chosen to use a portion of the grant to offer five \$2,000 scholarships to graduate students in apiculture with the stipulation that a portion of the funds be used to attend the 2008 joint meeting of the American Beekeeping Federation, the American Honey Producers, the Apiary Inspectors of America and the American Associa-

tion of Professional Apiculturists in Sacramento, January 8-12, 2008 to present their research. The scholarships are available to all graduate students, and students at universities outside the U.S. are invited to apply.

Applications for the scholarships will be accepted until August 15, 2007. Applicants should submit a cover letter from their advisor, a curriculum vitae and a research summary (not to exceed three pages) to the Board for consideration. The re-

*Continued on Page 67*

## Cobey Moves West

### DAVIS UPGRADES BEE LAB

Intent on meeting the needs of California's multibillion dollar agriculture industry, the University of California, Davis, is revitalizing its honey-bee research program, the oldest such program in the nation.

Once a powerhouse in bee biology research, the UC Davis program declined during the 1990s as faculty retirements and budget shortages collided. With California's honey-bee industry now facing challenges ranging from mites to small hive beetles to colony collapse disorder, rebuilding the 65-year-old program has become critical.

California agriculture produces almonds, alfalfa, sunflowers, tree fruit and many other crops that rely on bees for pollination each spring.

"The honey-bee industry plays a key role in the success of California agriculture, and it is imperative that UC Davis provide the research necessary to help solve some of the pressing problems related to bee health, breeding and pollination," said Neal Van Alfen, dean of the College of Agricultural and Environmental Sciences. "During the coming years we will be adding new staff and faculty to our bee biology program and renovating the Harry Laidlaw Jr. Honey Bee Research Facility here on campus."

One of the first steps toward rebuilding the research program is the

hiring of accomplished bee breeder and geneticist Susan Cobey, who has been at The Ohio State University. Cobey arrived in June as full-time manager of the Laidlaw bee biology facility and plans to begin offering specialized classes to bee breeders.

"It is a huge honor to help revive UC Davis' bee biology laboratory," said Cobey, who worked in the Laidlaw lab during the late 1970s and early 1980s. She was mentored by its namesake, the late Professor Harry Laidlaw, who inspired her career choice. She has gone on to become a leading expert in instrumental insemination of bees and practical bee breeding.

She will collaborate with Cooperative Extension apiculturist Eric Mussen, who has anchored the bee biology program's research and industry education efforts during the lean years. His bee industry leadership and research in the areas of colony management, pollination, mite control and insecticide damage, were recently recognized by the American Association of Professional Apiculturists, which awarded Mussen its Apicultural Excellence Award. Mussen was also the first noncommercial bee producer to receive the prestigious Beekeeper of the Year Award at the 2006 California State Beekeepers Association Conference.



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## OBITUARIES

**John Free**, 79, died December 2006. John first became fascinated by bees as an undergraduate at Jesus College, Cambridge, encouraged to study bumblebee behavior by the eminent ethologist Professor W.H. Thorpe F.R.S.

In 1951, he joined the Bee Department at Rothamsted Experimental Station as a postgraduate student and obtained a grant from the Agricultural Research Council to continue his studies in bumblebee behavior under the direction of Dr. Colin Butler F.R.S. He was awarded a PhD for his studies in 1954. John published his first book *Bumblebees* co-authored with Colin Butler in 1959.

John joined the Bee Department at Rothamsted and soon became an international authority on pollination, social organization of honey bees and pheromones.

At Rothamsted, he established pollination research as a major scientific discipline of global importance. During the 1960s he investigated pollination of many UK top fruit, soft fruit, legume and Brassica crops. In the 1970s he focused on the role of honey bees in enhancing hybrid seed production and crop protection and pollination of oilseed rape crops. At this time he also initiated studies into the pollination needs of tropical and sub-tropical crops about which virtually nothing was known; these studies enabled him to combine his love of bees with his love of travel overseas. Akec, aubergine, avocado, cashew, coconut, coffee, cotton, cucumber, mango, okra, peppers, pawpaw, pigeon pea and pumpkins lured him to many exotic countries. In 1995, he was invested a Companion of St. Michael and St. George for his contributions to research and development in tropical beekeeping.

He also investigated the influence of colony, queen and brood on the

foraging activity of colonies. His more strategic studies developed ways of increasing the density of bees on crops, distributing them more evenly and making them more effective by changing the position, arrangement or time of introduction of colonies, or encouraging the collection of pollen rather than nectar for better pollination. This enabled recommendations to be made to beekeepers on bee management as well as to growers on crop and orchard planting and husbandry. Technology transfer was second nature to him, long before the term was coined. He became Chairman of the Central Association of Beekeepers, Vice-Chairman of the International Bee Research Association, and regularly gave talks to beekeeping associations. In 1970, he reviewed current knowledge on crop pollination in his monograph 'Insect Pollination of Crops' (revised in 1993), a treatise which remains a landmark publication on this subject to this day.

John was 'the Horse Whisperer of the bee world'. For example, in his elegant studies of the various functions of the chemically-complex Nasonov pheromone of the honey bee, he was able to cluster free-flying bees onto specific components – an impressive demonstration of the pheromonal language of the honey bee. These and other studies are summarized in his books *The Social Organisation of Honeybees* (1977) and *Pheromones of Social Bees* (1987).

In 1986, following his retirement from Rothamsted, John became Professor of Zoology at Cardiff University, where he continued to advise and inspire postgraduates from around the world in bee research for several years. He is survived by his wife Nancy, his daughter Nicola and his sons, Anthony and Mark.

Ingrid H. Williams  
Rothamsted Research

**Thomas Bigelow Ross** passed away in Boulder, CO, May 26, 2007.

Tom was born January 22, 1913, son of William B. Ross and Evelyn Wilhelm Ross. He spent most of his life in Massillon, OH, then moved to Boulder, CO with his wife Carol in 2006. He was an active citizen in both communities. Tom served in Europe with the 75th Infantry Division during World War II. He married Carol Dorothy Bell in 1944 – they recently celebrated their 63rd wedding anniversary. He held a degree in architecture from Ohio State, and was a partner in Mallalieu, Ross, Roberts and Doll for many years. In the mid-70s he became a beekeeper, then founded Ross Rounds, an international bee equipment company. Ross Rounds equipment went on to become the most widely used comb honey production method in the world.

He is survived by his wife, Carol, his brother Henry Ross (Genie); children Susan Ross, Bill Ross (Joy), and Jude Ross (Jim); grandchildren Alex Dorgan-Ross (Gressa), and Daniel Ross (Jessica); by many nieces and nephews, stepchildren, grandchild-



dren, and great-grandchildren; and by Halley, his beloved dog.

After cremation on May 30th, Tom's ashes will be distributed by friends to places he loved. Prayers for him and his family are appreciated. Memorial contributions in his name may be made to organizations which benefit all beings and help conserve the planet. Please have a party in his memory too.

**Floyd E. Helm**, 90, died November 9, 2006. He was born May 29, 1916. He was a World War II veteran, serving in the U.S. Army.

He was employed at the Naval Weapons Support Center, Crane, IN in Public Works Department, Transportation Division and retired after 27 years of service in 1970.

Floyd was a beekeeper since 1943 and owner of Helm Apiaries. He started beekeeping as a hobby which turned into a business. Following retirement from Civil Service, Floyd worked with several Apiaries during the Winter months in Georgia, working with the Bell, Rossman and Wilbanks Apiaries where he assisted in all areas of beekeeping including the packaged bee business and queen rearing.

He was a State Bee Inspector for Indiana and Illinois and past president of the Illiana Beekeeper Association.

Funeral services were held at the Odon Unived Methodist Church, Odon, IN with Rev. John Trasher officiating. Burial was at Walnut Hill Cemetery at Odon with military graveside rites by the American legion and the Veterans of Foreign Wars.



Floyd Helm

### Scholarships ... From Pg. 65

search summary can cover research completed within the past two years or proposed research that will have begun prior to the meeting. Recipients will be selected in September, 2007.

Applications can be submitted electronically or in print to Troy H. Fore, Executive Director, Foundation for the Preservation of Honey Bees, P.O. Box 1337, Jesup, GA 31598, troyfore@honeybeepreservatio.org.

If you have any questions or need more information about the scholarship program, contact Marion Ellis, Scholarship Program Coordinator, Foundation for the Preservation of Honey Bees, mellis3@unl.edu.

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THE SCOTTISH BEEKEEPER. Magazine of The Scottish Beekeepers' Assoc. Rates from Enid Brown, Milton House, Main Street, Scotlandwell, Kinross-Shire KY13 9JA, Scotland, U.K. Sample on request. \$1.

THE AMERICAN BEEKEEPING FEDERATION has many benefits to offer its members. Send for a membership packet of information today! Contact the American Beekeeping Federation, P.O. Box 1038, Jesup, GA 31598, ph. (912) 427-4233, fax (912) 427-8447 or email info@abfnet.org.

THE BEEKEEPERS QUARTERLY is published by Northern Bee Books, Scout Bottom Farm, Mytholmroyd, Hebden Bridge, West Yorks HX7 5JS. Write or email jeremy@recordermail.demon.co.uk for a sample copy.

MELLIFERA is published twice a year by the Development Foundation of Turkey. An annual subscription is \$US 20. Write to TÜRKİYE KALKINMA VAKFI, Çetin Emeç Bulvan, 7. Cadde No: 39, Öveçler, 60460 Ankara, TURKEY.

BEEKEEPING published by Devon Beekeepers' Association. Memberships rates outside Europe are £21. Send to Brian Gant, Leat Orchard, Grange Rd., Buckfast, Devon TQ11 0EH.

## INNER ... Cont. From Page 10

with a hand written note on it telling us that as much as they love the magazine, and as much as they love the bees, the beekeepers in their lives, the beekeeping association they have been a part of for years and years, as much as they actually need the smell of beeswax foundation in their lives and their dedication to their lifelong honey customers . . . it's time to hang up the hive tool and call it quits. The boxes are too heavy, the work too hard, their time too short.

I know lots and lots of people who have kept bees for a season, maybe two who quite soon saw that this was not the life and times they were expecting and make a quick and clean exit. It's better that way. Better for the bees they didn't buy and let die, and much better for the family that missed working long and hot hours not having fun. That's a wise decision on their part.

But after 30 or 40 or 60 years of having bees in your life...longer than with your family, your home...longer than almost everything in your life, making the decision to let go must border on a religious experience. Even when the boxes are too heavy and the work too hard. Even when just getting to the backyard becomes a task the body no longer wants to tackle.

I both love and hate reading these letters. I'm always glad that someone took the time to write us, and let us know it wasn't our fault they could no longer take the magazine. Almost always they share a memory.... started reading *Gleanings* when I was in grade school and used to sneak it to class...stole my dad's copy or I'd never get to see it...have been sharing it for years and years with my son. That people share those memories is probably the highest praise we get here. They are truly gold.

But I hate getting them for a very selfish reason...because every one reminds me that I'm on that same path...getting to the point where I'll have to make some of those same decisions.

I reach a milestone next month, another reminder that I'm no longer the robust youth I'd like to think I still am. 60 hits you right between the eyes when it comes, even when you know it's coming...but it's only 60 after all. Almost all of the folks who write us those letters saw 60 decades ago. So I hope it's decades to go for me, too. And for you also.

July is a slow time for most of us. When you are done honoring the Fourth, be sure to sharpen your hive tool, and get some more smoker fuel....it'll all start up again soon, and you need to be ready.


*Tom Jett*

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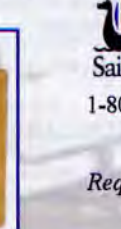
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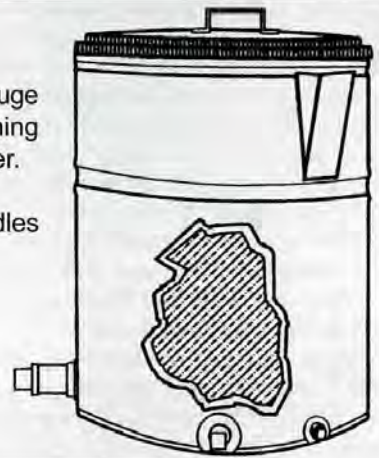
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keep getting swarm calls this merry month of May. I've even started charging to pick up free bees.

The nicest lady phoned last week. She identified herself as the manager of a condominium complex in Glenwood Springs, about 14 miles from my place. She said that honey bees were "swarming" into residents' condos and that at least one child had gotten stung. She further reported that boys were throwing rocks at a "ball of bees" hanging on a spruce tree.

She said her concern was for the bees. She wanted to do the right thing, and that was why she called me.

This scenario had "Beekeeper to the rescue!" written all over it. Plus I'm such a soft touch.

Upon further questioning, however, she confessed that she hadn't actually seen the bees herself, so I had no idea if they were in easy reach, or even if they were still there. I smelled a wild goose chase.

I said, "You take a look and call me back. If the little darlings are still there, maybe I can come out."

When she said, "How much?" I said, "Oh, I won't charge you anything."

I have no idea why I said that. I don't make a living chasing swarms, and I do like to reward folks for calling a beekeeper, rather than an exterminator. But this wasn't some senior citizen living on Social Security. This was a professional property manager with a budget for unexpected expenses, and she'd obviously expected to pay.

She called back to say the bees now formed a "giant mass" on the ground under the tree.

"Perfect," I thought.

When I got there, I found this pathetic little swarm under a tree. There couldn't have been more than a couple of thousand bees. They were right next to one of the main condo walkways.

The bees were soaking wet, and my initial thought was that someone had hit them with the Black Flag. I picked up a handful. They were alive, but groggy.

By this time, I had an audience. A voluptuous barefoot woman came out of one of the buildings with a babe in arms. She brought to mind Lil Abner's girlfriend Daisy Mae. She might have been 19.

She said, "The neighbor kids have been dumping water on those poor babies. When the bees first got here, they were flying all around, and some got into our condo. My one-year-old got stung. I didn't know what to do. First I called the Division of Wildlife, but they said they don't do bees, so I called the condo manager. All I know is, bees are endangered, and you're not supposed to kill them."

Ah, she'd have charmed you, too.

I propped a super on top of the swarm. I didn't know how long it would take those cold wet bees to move into their new home. But I figured I'd return the following evening, and they'd be settled in.

I told Daisy Mae I'd be back, and to yell at any little monsters who messed with my bees. "I will," she promised, "but it won't do any good."

About then two 10-year-olds rode by on their bikes. I said, "You guys like to talk in Spanish, or English?" Because I can scare kids in both languages. They said, "English."

I said, "Look, I don't want anybody fooling around with my bees, OK? I might have to call the cops. Plus, somebody could get stung, and I wouldn't want it to be you guys."

They acted impressed. "OK," they said.

"Tell your friends, too," I said, "because I don't want to have to call the police."

I was driving home congratulating myself on having intimidated two small and possibly innocent boys, when it hit me: This wasn't a feral swarm any longer. I owned these bees now, and they were situated in the middle of a busy housing complex. If some juvenile delinquent were to get stung, he might deserve it, but I'd catch the blame. Events don't just happen. Bad outcomes generally have to be someone else's fault.

I went back the following afternoon before school got out. I knew I lost some foragers by fetching the bees before dark, but in this imperfect world, you do what you can. I was only ten miles from Carbondale, so I ran up to Granny's and united my new colony with a queen-less one that I keep there to pollinate her apple blossoms and her raspberries.

I wondered if driving a total of 80 miles for one puny swarm was worth it. Of course I could have charged a fair price, and gotten compensated that way, but inexplicably I didn't.

By the time I got home, I was hungry and a little cranky. I was in no mood to talk, but when the phone rang, naturally I picked it up.

The caller said, "I've got this giant swarm of bees on my construction site. It's incredible! First they were whirling around, and then they all landed on the side of the house. The owners are gonna freak. Could you come out?"

"Where are you calling from?" I asked.

"Carbondale," he said.

"Geez, Louise! I just got back from Carbondale," I said. "But I guess I could drive up there again. Would it be worth a hundred bucks to you?"

"No problem," he said.

You can always tell when money is no object to some people. I wondered why I didn't say, "Two hundred."

The way he said it, I knew I should have said "Two hundred."

Ed Colby

## Charging