

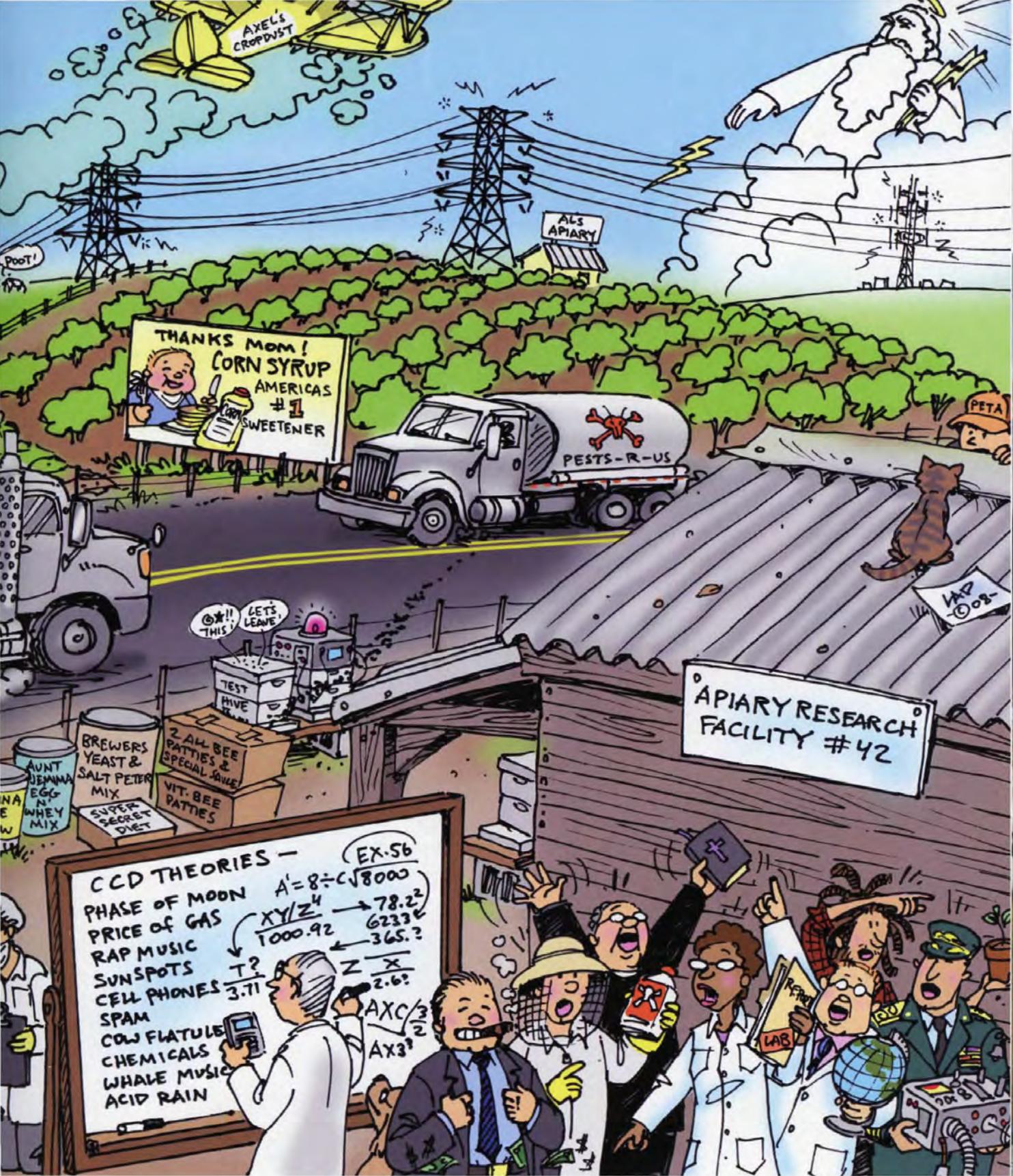
Bee Culture



What's Causing CCD????

\$4.99





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Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING
OCTOBER 2008 VOLUME 136 NUMBER 10

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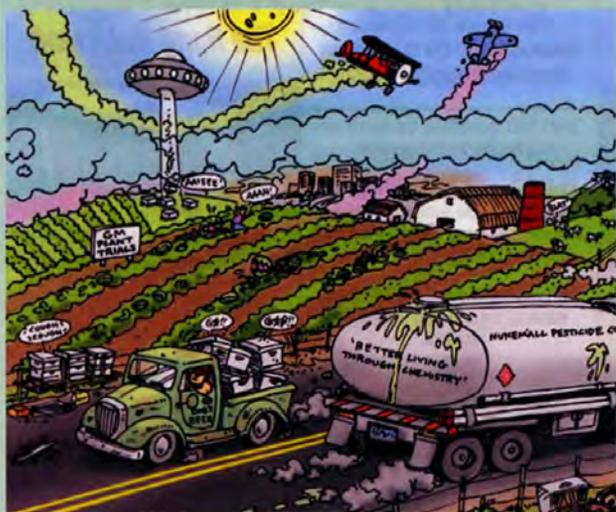
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Mapping the feral bee population just got easier

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New movie based on the best selling novel by Sue Monk Kidd.



Autumn signals for too many beekeepers the return of Classic Colony Collapse Disorder symptoms – and subsequent colony losses. What causes CCD? We've reviewed some of the research, theories, guesses and hunches here. (by Lela Dowling)

800.289.7668 • www.BeeCulture.com

Publisher – John Root

Editor – Kim Flottum, Ext. 3214, Kim@BeeCulture.com

Production Coordinator – Kathy Summers, Ext. 3215, Kathy@BeeCulture.com

Circulation & Advertising – Dawn Feagan, Ext. 3220, Dawn@BeeCulture.com

Contributors

Clarence Collison • James E. Tew • Ann Harman

Malcolm T. Sanford • Steve Sheppard

Larry Connor • Connie Krochmal

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Bee Culture The Magazine of American Beekeeping
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Up, Or Down

I did not thoroughly explain why I install a queen cage with candy side *down* in my article "Package Time" appearing in the April issue. It has been my experience over the years that the consistency of queen candy can differ from one queen producer to the next. Some make their candy as hard as a rock while others are much softer. During hot weather the candy can melt and actually run down inside of the cage trapping the queen. Without the attendants (because I always remove them) to clean this up your queen can be completely covered with candy and possibly killed. If you leave the attendants in the cage (which I don't recommend) then you will want to install the cage candy side up. This eliminates the possibility of little dead, worker bee bodies being entombed in the candy and blocking the food. Also, I never just pull the cork and let the workers eat through the queen candy. I want to personally see my queen emerge from her cage and walk across the comb. First I want to examine if she is in fact ok, physically and next to see if the colony accepts her. Sorry for any confusion.

Jennifer Berry
Watkinsville, GA

Cure For Mites & CCD

I have had the misfortune of one of California's fires. Known as the "Trabing Fire," Watsonville, CA, June 20th, a fire blew through my apiary. Twenty four double deeps, with two deeps on top, full of honey.



The picture shows the ant proof racks they were burned on. The pipe racks are sch.40 galvanized pipe. Not a single colony made it out in time. The fire took just minutes to melt aluminum, and destroy a lifetime of beekeeping.

If you keep bees in "fire country" make sure and have sprinklers in your apiary. Does any one have

bees for sale?? Check your insurance policy as well. I guess there's always next year

I'm a reader since 1975.
Thanks for all you do!

Jeff Kost
Watsonville, CA

Bee Cake

For my boyfriend's father's 54th birthday, his daughter and I made him a beehive cake. He currently owns three hives and is an avid reader of *Bee Culture*. It was a vanilla cake with strawberry filling. The decorations were made out of fondant.

Jessica Endres
Guilderland, NY



Sugar w/Corn Starch

I just bought 50 pounds of sugar at Sam's and when I got home I see on the bag that it contains corn starch to retard clumping. Is this safe to feed bees?

Russ Whaley

Editor's Note: I'm going to guess that the amount is so small that it won't be a problem but of course the safest bet is to 1) take it back and try something else, or 2) try a gallon's worth to see if there is a problem. But, again, I suspect there is so little involved that it won't make any difference note though, I said suspect. I'm glad you told me this though

I've never heard of regular sugar having starch in it it's always something, isn't it?

Bee Culture Information



623 West Liberty St.
Medina, OH 44256

Suggestions

Comments

Bees In The Wall

In Spring I called, asking you for advice on collecting bees that were housed between exterior siding and the wall of a utility shed. You were kind enough to explain the process of bee extraction, so I wanted to let you know how it went.

With my husband's help we popped the old wooden siding off and were pleasantly surprised by golden comb approximately three feet long by two feet wide covered with thousands of gentle bees. Steve cut the comb in sections to fit empty frames which we rubber-banded to secure them temporarily. Somehow we luckily transferred the queen in the process and enough bees to fill two medium supers. As you had said, this was a sticky job taking several hours and we accidentally killed bees.

This was an opportunity we couldn't pass up knowing that it





might not happen again. In the end, we got free bees and the farmer was able to re-side his shed without exterminating them. This old colony living in the shed was successfully transferred and pollinates his fields.

Many thanks again.

Maria Hudgins
Parma Heights, OH

Runway Bees

In response to a message on my answering machine on July 15. I talked to Mike Head of the Fire Department of MBS airport, Freeland, MI. Mike said we had a swarm of honey bees on a runway in the airport, can you come and get them? I replied, we'll be there within the hour. This being my eighth swarm for this year, equipment was getting short. I had a 6-5/8 super with old drawn comb and a hive body with wax foundation, also a bottom board, inner cover and cover which was loaded in the Ranger. I also

took an old empty hive body for a stand.

Mike met me at the gate as planned. We talked for a few minutes while clearance was obtained from the control tower. Mike escorted me to about midway on the N-S runway. There they were about three pounds of light colored bees, spread over about a 10 feet wide by 20 feet long. The control tower said you got about 15 minutes before the next plane lands. By moving equipment closer and closer to the edge of the runway I was able to finally move the bees to a point 25 feet off the runway.

We met at the gate again the next morning at day break. Mike escorted me back to the bees where some had gathered back on the crack. I placed a frame on the ground and within a few minutes they walked onto it and I placed them in the hive and we left. I came back about dark to pick them up.

I'm impressed that the airport people were so kind and concerned about the bees. I have been with bees since 1933 and to this day some of my happier days have been with bees. I was away from them for a few years during WWII while I flew 24 combat missions. I am 85 years old and still trying to learn.

John Brown

Screened BBs

I was quite pleased to see Ross Conrad's article "USING SCREENED BOTTOM BOARDS" in the August issue of *Bee Culture*. In general, we both agree "... that a screened bottom board should become standard equipment on all managed honey bee colonies in the United States"

In particular, however, there are two major points where we disagree.

1. Open Bottom Board Construction:

Ross Conrad uses 1/8 inch hardware cloth where I specify the minimum mesh size to be 1/2 inch. The effectiveness of the Open Bottom Board quickly deteriorates if all the hive debris cannot fall to the ground without obstruction. It is impossible for a dead bee to fall through an eighth inch hole, and any live mite that falls will wait on that debris to reattach itself to the housekeeping bee rather than fall through the hole to oblivion.

Modifying the standard bottom board by cutting out the center and then covering the opening with screen is a common practice. Unfortunately, the ledge provides a place for debris, mites and moisture to accumulate.

2. Increasing the Screened Bottom Board's Effectiveness:

I have no need to use the powdered sugar method to increase the live mite drop. The natural mite drop, when using the form of Open Bottom Board system I recommend, is sufficient to reach a very acceptable low level *Varroa* mite population. The system maintains that low level, is none intrusive, requires no effort on my part and reduces housekeeping chores for the bees.

In conclusion, Ross Conrad's comment "Additionally, and perhaps most importantly, the screened bottom board seems to improve the air circulation within the hive, helping to keep the hive cooler in the Summer and assisting the bees in controlling the humidity levels and removing moisture from the hive which is essential for Winter survival in cold climates." is indeed quite accurate and almost as important as control of the mite population.

The moisture reduction benefit





provided me with an opportunity to use the "Dead Air Space" concept in my colonies this past Winter and Summer for the first time. Its application proved to be a complete success exceeding all my expectations.

John Hoffman
Mount Holly Springs, PA

Bee Relocation Program

As you may know, in addition to making honey, bees are a critical part of our ecosystem. Bees transfer pollen from blossom to blossom, thus fertilizing plants and enabling them to bear fruit.

Colony collapse disorder is a disease that has been mysteriously killing off bees, causing a drastic decline in honeybees during the last few years has made preservation of wild bee populations a critical part of preserving our local ecosystems and agriculture. For example, up to a million colonies of bees are used to pollinate California's 600,000-acre almond crop, according to the National Honey Board.

Cox Communications has thousands of "pedestals" or equipment enclosures throughout Orange County, California to house their technical equipment. Bees seem to find the conditions in these enclosures ideal for building hives, which unfortunately is a problem when Cox technicians need to access the equipment inside the enclosures.

Until a few months ago, Cox did what virtually every company does when they find these hives in their equipment – they used conventional chemicals to exterminate them.

But a thoughtful employee raised the issue to Cox leadership,



and researched a more environmentally-friendly method of dealing with the issue. The employee, Jack Robinson, found a local beekeeper who uses a safe and humane, vacuum-based tool to relocate bee hives to a bee farm where they can live in safety and continue their productivity

In May 2008, Cox contracted with the beekeeper to relocate all the bee hives found in its technical equipment, and so far Cox has relocated 19 hives in its south and central Orange County service area, with many more expected in the future.

This arrangement presents numerous benefits to our local environment, including the fact that no more toxic chemicals will be released into local neighborhoods to exterminate the hives, and the bee hives are preserved to be safe and productive. Also, the cost to relocate a hive is half the cost to exterminate it.

Jack Robinson
Orange County



Young Beekeeper Will

There are always reports of reduced numbers of younger beekeepers. My exposure started as a teen with a family apiary. I rekindled my interest as a "Senior" and exposed my grandchildren.

The photo is of my four-year-old grandson Will who loves honey and insisted on seeing how bees make honey. Note the intensity of eye contact. He looked inside all of my hives.

William Lesko
Clifton, NJ



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INNER COVER

The attention honey bees have been getting hasn't abated much this Summer and Fall, and if you were part of a county or state fair or other public event I'm sure you realize just how much people already know, and that they want to know even more. How are the bees? is still the most popular question this year more so than even - How many times have you been stung? That's encouraging.

But this year probably the second most asked question at least from people representing groups, associations, clubs and the like was We know there's a problem and we'd like to help. Where can we send our donations? That's an even better question, and if you don't know already, here are some good answers and suggestions.

Certainly supporting businesses that support beekeeping is one way to lend a hand. One of the more prominent businesses to belly up to the beehive and lend a hand is Häagen-Dazs Ice cream <http://www.helpthehoneybees.com/> They have gone all out to help honey bees. Their support is directly related to the fact that a large percentage of the flavorings for their ice creams come directly from products produced by honey bee pollination. They have a dynamite web page, bee items to sell, and special flavored ice cream, and have donated cash and their special ice cream product to a wide variety of organizations that support honey bees and pollinators in general.

Dundee Brewing <http://www.dundeebeer.com/> has a Save The Honey Bee campaign going on also. Their web page has information on pollinated products, CCD and what you can do to help. Of course their Honey Brown beer benefits directly from the honey those affected bees produce, so they have good reason to help out.

Burt's Bees www.burtsbees.com, a company that makes personal beauty products has joined in too, offering to donate 5% of the sales of one of their beeswax products to CCD research. They also make a fantastic Public Service Announcement promoting their donation, and bringing attention to Colony Collapse Disorder in general. The original Burt, a beekeeper living in Maine, is the central figure in the PSA and it is both entertaining and informative. They are contributing their funds to a sister group, The North American Pollinator Protection Campaign and its Honeybee Health Improvement Project.

I know I have heard of other businesses that have climbed on this wagon and are generously donating time, money or promotional activities to help the cause of the honey bee right now, but these three are the first that come to mind. If I have missed one let me know and we'll get the word out. We don't want to slight anybody, and the more legitimate organizations we find, the more we'll publish.

These companies have been very careful about making sure that you know about their generosity What you probably don't know about are the swarms of small beekeeping organizations, like yours, that have made, or want to make modest cash donations to the coffers of larger, more organized groups so the money can be added together and donated in chunks instead of small pieces. There are too many of these county-sized groups to mention here, and I certainly don't know them all, but they are making a difference, and their contributions are appreciated.

But larger groups give larger chunks of money from their coffers, aided by donations from smaller groups and individuals like those you met at the fair

Probably the biggest is a hybrid industry group called Project Apis m. <http://www.projectapis.org/> The steering committee consists of commercial beekeepers, pollination brokers, almond and other crop growers and in-

terested folks who have a stake in the bee business and businesses honey bees affect. Project Apism is relatively new at this, stirred to life about the time CCD first showed up. They've raised and donated tens of thousands of dollars already to various projects. They have funded research that you are already using, they have more underway now and more planned for the future. You can see everything they do on their web page. All that, and they make donating easy. If you have money to contribute, this is one of the places to go.

Another organization that funds honey bee research is The American Beekeeping Federation, <http://www.abfnet.org/>, through their non-profit arm called the Foundation For The Preservation Of Honey Bees <http://www.honeybeepreservation.org/>. Through this they fund not only honey bee research but also other beekeeping events. Working with Penn State University and Project Apism they recently helped fund a program to partially cover the costs of having your colonies checked for pesticides. This has made this task affordable for regular beekeepers, the folks who need to know. To take advantage of this program, contact Maryann Frazier at mxt15@Psu.edu They've also made money available for other research projects and programs. Certainly consider this group if you want your money to help honey bees.

Another organization that actively supports beekeeping research is the Eastern Apicultural Society (EAS) www.easternapiculture.org. They accept donations toward their research fund and you can down-

Continued on Page 41

A Time To Give; *Nosema ceranae*

OCTOBER - HONEY PRICES & MANAGEMENT SURVEY

What's Bugging Your Bees? Across All Regions



| Problem | Year | | | | | |
|-------------------|--------|------|------|------|------|--------|
| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
| Winter Weather | - | - | - | 7 | 6 | 5(Tie) |
| Spring Weather | - | - | - | 2 | 3 | 2 |
| Summer Weather | - | - | - | 6 | 4 | 4 |
| Varroa | 1 | 1 | 2 | 1 | 1 | 1 |
| Queens | 2 | 3 | 3 | 3 | 2 | 3 |
| Small Hive Beetle | 8 | 7 | 10 | 4 | 7 | 6 |
| Tracheal Mites | 3 | 2 | 4 | 5 | 5 | 5(Tie) |
| Low Prices | 4(Tie) | 5 | 5 | 8 | 8 | 8 |
| Chalkbrood | 4(Tie) | 4 | 6 | 9 | 9 | 7 |
| Skunks | 5 | 8 | 8 | 10 | 10 | 9 |
| Bear | 7 | 9 | 9 | 11 | 11 | 10 |

I = Worst Problem; 11 = Least Problem

Each year in October we poll our reporters to measure the difficulty of each of several problems that are common in beekeeping. Obviously some problems are greater in some areas than in others. This has to do with the weather, the climate or other factors. Each problem is given a value, with a 1 being the greatest problem, and on down the line to 12 being essentially no problem at all. The chart above lists the degree of difficulty each of these is causing across all regions for the last 5 years. The chart below looks at the same problems for each region over 3 years. Compare and contrast the whole nation

with your region, and each region separately, and the changes in the same problem in your region over the years. You will note interesting differences, and similarities. If you teach a Beginning Beekeeping class this information will be valuable in determining how to allocate the time you have to teach about each of these. T = Tie

| Rank | Region 1 | | | Region 2 | | | Region 3 | | | Region 4 | | | Region 5 | | | Region 6 | | | Region 7 | | | Region 8 | | | Region 9 | | | Region 10 | | | Region 11 | | | Region 12 | | | |
|-------------------|----------|------|------|----------|------|------|----------|------|------|----------|------|------|----------|------|------|----------|------|------|----------|------|------|----------|------|------|----------|------|------|-----------|------|------|-----------|------|------|-----------|------|------|---|
| | 2006 | 2007 | 2008 | 2006 | 2007 | 2008 | 2006 | 2007 | 2008 | 2006 | 2007 | 2008 | 2006 | 2007 | 2008 | 2006 | 2007 | 2008 | 2006 | 2007 | 2008 | 2006 | 2007 | 2008 | 2006 | 2007 | 2008 | 2006 | 2007 | 2008 | 2006 | 2007 | 2008 | 2006 | 2007 | 2008 | |
| Tracheal Mite | 6 | 4T | 6 | 6 | 6 | 6 | 3 | 5T | 6 | 3 | 1 | 6 | 1 | 3 | 6T | 6 | 6 | 4 | 5 | 1 | 2 | 6 | 8 | 6 | 10 | 6 | 9 | 4 | 6 | 4 | 4 | 4T | 8 | 3 | 2 | 6T | |
| Queens | 3 | 1 | 4 | 2 | 1 | 2T | 4 | 4T | 7 | 5 | 4 | 5 | 4 | 6T | 4T | 4 | 3 | 5 | 3 | 3T | 5 | 1 | 3 | 2 | 4 | 2 | 3 | 2 | 1 | 3 | 3 | 2 | 2 | 2 | 2 | 3T | 5 |
| Varroa | 1 | 2 | 1 | 1 | 2 | 2T | 1 | 2 | 3 | 1 | 3 | 1 | 2 | 2 | 2 | 3 | 5 | 2 | 2 | 4 | 4 | 2 | 5 | 3 | 3 | 5 | 5 | 1 | 2 | 1 | 3 | 1 | 1 | 1 | 1 | 3 | |
| Small Hive Beetle | 9 | 9 | 8T | 10 | 7 | 10 | 2 | 4T | 8 | 6 | 5 | 4 | 1 | 1 | 1 | 2 | 1 | 1 | 9 | 7 | 6 | 5 | 7 | 1 | 6 | 1 | 2 | 9 | 3T | 10 | 5 | 8 | 9 | 10 | 10 | 10 | |
| Spring Weather | 2 | 6 | 2 | 2 | 3 | 7 | 3 | 3 | 2 | 2 | 2 | 2 | 6 | 7 | 5 | 1 | 2 | 6 | 1 | 2T | 1 | 3 | 2 | 4 | 1 | 3T | 1 | 3 | 3T | 2 | 1 | 3T | 3 | 4 | 6 | 4 | |
| Winter Weather | 4 | 8 | 3 | 3 | 4T | 5 | 6 | 5T | 4 | 7 | 6 | 7 | 8 | 6T | 8 | 8 | 7T | 7 | 7 | 2T | 7 | 8 | 4 | 5 | 5 | 4 | 6 | 6 | 5T | 6 | 2 | 3T | 4 | 7 | 5 | 8 | |
| Summer Weather | 5 | 4T | 5 | 4 | 8 | 1 | 5 | 6 | 1 | 4 | 8 | 3 | 5 | 4T | 3 | 5 | 7T | 3 | 4 | 5T | 3 | 2 | 6 | 8 | 2 | 7 | 10 | 7 | 8 | 8 | 6 | 7T | 7 | 8 | 7 | 1 | |
| Low Prices | 7 | 5 | 8T | 5 | 5 | 8 | 3 | 7 | 10 | 8 | 7 | 8 | 3 | 4T | 4T | 7 | 9 | 8 | 6 | 6 | 8 | 4 | 10 | 9 | 8 | 8 | 4 | 6 | 5T | 7 | 5 | 6 | 11 | 6 | 8 | 6T | |
| Chalkbrood | 5 | 7 | 7T | 8 | 9 | 4 | 7 | 9 | 5 | 9 | 9 | 9 | 4 | 9 | 7 | 9 | 10 | 9 | 8 | 9 | 11 | 7 | 11 | 11 | 7 | 10 | 8 | 5 | 11 | 5 | 6 | 7T | 6 | 5 | 9 | 7 | |
| Bears | 10 | 10 | 7T | 9 | 10 | 9 | 9 | 8 | 11 | 11 | 10 | 11 | 7 | 8 | 6T | 11 | 8 | 11 | 11 | 8 | 10 | 9 | 9 | 10 | 11 | 9 | 11 | 8 | 5 | 10 | 11 | 4 | 9 | 9 | | | |
| Skunks | 8 | 3 | 9 | 7 | 4T | 3 | 8 | 1 | 9 | 10 | 4 | 10 | 7 | 5 | 9 | 10 | 4 | 10 | 10 | 3 | 9 | 8 | 1 | 7 | 9 | 3T | 7 | 7 | 4 | 9 | 7 | 4T | 5 | 9 | 3T | 2 | |

HONEY & WAX PRICES IN REPORTING REGIONS

| | 1 2 3 4 5 6 7 8 9 10 11 12 | | | | | | | | | | | | SUMMARY | | History | |
|--|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------------|--------|------------|-----------|
| | EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS | | | | | | | | | | | | Range | Avg. | Last Month | Last Year |
| 55 Gal. Drum, Light | 1.41 | 1.45 | 1.41 | 1.45 | 1.23 | 1.50 | 1.50 | 1.41 | 1.41 | 1.50 | 1.36 | 1.48 | 1.23-1.50 | 1.43 | 1.42 | 1.15 |
| 55 Gal. Drum, Ambr | 1.27 | 1.35 | 1.27 | 1.25 | 1.07 | 1.40 | 1.50 | 1.27 | 1.21 | 1.27 | 1.34 | 1.38 | 1.07-1.50 | 1.30 | 1.25 | 1.02 |
| 60# Light (retail) | 120.00 | 130.33 | 130.00 | 115.00 | 120.00 | 113.33 | 117.80 | 105.00 | 129.57 | 117.00 | 149.25 | 137.50 | 105.00-149.25 | 123.73 | 122.53 | 114.38 |
| 60# Amber (retail) | 120.00 | 121.33 | 130.00 | 112.40 | 120.00 | 113.75 | 116.40 | 105.00 | 95.00 | 109.25 | 138.33 | 132.33 | 60.00-138.33 | 114.90 | 120.07 | 112.74 |
| WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS | | | | | | | | | | | | | | | | |
| 1/2# 24/case | 52.08 | 60.98 | 53.20 | 55.85 | 52.00 | 54.00 | 46.75 | 65.38 | 65.38 | 42.00 | 49.50 | 97.50 | 42.00-97.50 | 57.88 | 56.20 | 59.11 |
| 1# 24/case | 65.52 | 77.28 | 71.40 | 66.33 | 72.00 | 76.27 | 68.36 | 88.80 | 93.88 | 94.44 | 78.93 | 97.50 | 65.52-97.50 | 79.23 | 74.03 | 70.16 |
| 2# 12/case | 69.75 | 74.72 | 64.20 | 55.67 | 66.00 | 61.80 | 60.44 | 78.00 | 50.00 | 69.24 | 63.33 | 80.50 | 50.00-80.50 | 66.14 | 66.14 | 65.08 |
| 12 oz. Plas. 24/cs | 64.32 | 70.98 | 52.20 | 62.60 | 57.60 | 69.00 | 55.52 | 78.00 | 65.83 | 53.04 | 73.20 | 67.33 | 52.20-78.00 | 64.13 | 60.35 | 58.12 |
| 5# 6/case | 85.41 | 82.49 | 75.00 | 63.75 | 78.28 | 90.00 | 66.40 | 96.00 | 78.28 | 64.41 | 76.00 | 90.00 | 63.75-96.00 | 78.84 | 74.93 | 67.00 |
| Quarts 12/case | 93.50 | 100.35 | 112.20 | 88.40 | 78.00 | 81.80 | 80.00 | 96.00 | 93.50 | 120.12 | 85.68 | 120.00 | 78.00-120.12 | 95.80 | 95.89 | 97.83 |
| Pints 12/case | 57.36 | 51.95 | 66.00 | 60.03 | 58.00 | 50.40 | 45.60 | 58.50 | 57.36 | 52.65 | 53.50 | 68.50 | 45.60-68.50 | 56.65 | 59.01 | 56.00 |
| RETAIL SHELF PRICES | | | | | | | | | | | | | | | | |
| 1/2# | 2.88 | 3.17 | 2.36 | 3.03 | 2.47 | 3.00 | 2.83 | 3.00 | 2.79 | 2.78 | 3.16 | 4.28 | 2.36-4.28 | 2.98 | 3.00 | 2.72 |
| 12 oz. Plastic | 3.25 | 3.76 | 2.87 | 3.66 | 3.49 | 3.81 | 3.20 | 4.00 | 3.29 | 3.24 | 3.90 | 3.50 | 2.87-4.00 | 3.50 | 3.55 | 3.39 |
| 1# Glass/Plastic | 3.88 | 4.32 | 4.47 | 5.11 | 4.14 | 4.59 | 4.02 | 5.00 | 4.79 | 4.25 | 4.25 | 4.73 | 3.88-5.11 | 4.46 | 4.51 | 4.25 |
| 2# Glass/Plastic | 7.50 | 7.70 | 7.43 | 7.38 | 6.65 | 7.05 | 6.90 | 8.00 | 7.00 | 6.61 | 8.16 | 9.75 | 6.61-9.75 | 7.51 | 7.38 | 7.22 |
| Pint | 9.25 | 7.38 | 6.50 | 6.34 | 5.46 | 5.90 | 6.56 | 6.00 | 9.00 | 7.02 | 7.53 | 8.78 | 5.46-9.25 | 7.14 | 6.67 | 6.09 |
| Quart | 15.00 | 9.48 | 11.00 | 10.10 | 8.45 | 9.31 | 10.19 | 10.50 | 11.07 | 13.88 | 10.71 | 14.50 | 8.45-15.00 | 11.18 | 10.60 | 10.60 |
| 5# Glass/Plastic | 17.00 | 15.53 | 19.30 | 14.79 | 17.20 | 16.50 | 14.91 | 18.00 | 17.20 | 13.18 | 17.00 | 6.50 | 6.50-19.30 | 15.59 | 17.07 | 15.68 |
| 1# Cream | 5.66 | 5.43 | 5.79 | 4.92 | 5.66 | 4.00 | 5.56 | 4.75 | 5.66 | 4.73 | 5.64 | 5.68 | 4.00-5.79 | 5.29 | 6.12 | 5.22 |
| 1# Cut Comb | 5.38 | 5.71 | 6.50 | 6.95 | 8.40 | 5.00 | 6.13 | 5.00 | 8.40 | 8.00 | 8.00 | 7.25 | 5.00-8.40 | 6.73 | 6.32 | 6.50 |
| Ross Round | 6.81 | 4.20 | 6.50 | 4.50 | 6.81 | 4.25 | 5.87 | 5.00 | 6.81 | 8.00 | 7.00 | 7.23 | 4.20-8.00 | 6.08 | 6.15 | 5.23 |
| Wholesale Wax (Lt) | 3.67 | 3.67 | 2.53 | 2.27 | 2.15 | 4.75 | 2.28 | 3.13 | 3.75 | 6.00 | 2.35 | 3.42 | 2.15-6.00 | 3.33 | 3.25 | 2.69 |
| Wholesale Wax (Dk) | 2.00 | 3.25 | 2.48 | 2.31 | 1.90 | 3.00 | 2.00 | 2.00 | 3.63 | 2.15 | 1.98 | 1.75 | 1.75-3.63 | 2.37 | 2.76 | 1.65 |
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RESEARCH REVIEWED

The Latest In Honey Bee Research

Steve Sheppard

"The shaking experiment resulted in colonies that were largely free of disease symptoms."

Over a period of time, many rewards come to those who practice the art of Beekeeping. Therefore, it is no surprise that over the past few centuries myriad books and essays have been produced on the subject. Maintaining a historical perspective towards both the rewards and the challenges faced by beekeepers of then and now provides another point of view from which to examine our beekeeping practices. Historically, the contagious bacterial disease American foulbrood (AFB) was a very significant problem in beekeeping operations. In the U.S., recent standard practice for many beekeepers has been the application of antibiotic treatments. The advantage of using antibiotics has been the speed of application, low labor costs and apparent effectiveness at removing symptoms. Another technique, shaking the bees from AFB-infected hives into empty hives provided with new foundation, has been known for at least 150 years. The "shaking technique" is effective, but as it involves more labor, extra equipment and reduces the honey production of the hive within the year of application, it has been seldom practiced by large-scale beekeepers in recent years. However, in the realm of "all things old become new again," researchers in Canada recently reevaluated the shaking technique. Their findings may give beekeepers seeking to eliminate or reduce applications of antibiotics pause to rethink their AFB control methods (Pernal et al., 2008).

Pernal and colleagues, working in Beaverlodge, Alberta set about to "evaluate the feasibility of the shaking technique as an option for non-antibiotic control of AFB under...commercial honey bee management practices." In June of 2005, they combined bees from 15 colonies that were infected with AFB into a large popu-

lation cage. They then set up four experimental groups, each consisting of six hives with brood chambers containing: 1) nine frames of AFB-infected combs (each with approx. 150 AFB-infected cells, 2) nine frames of foundation, 3) nine frames of drawn comb (previously used only for honey production) or 4) five frames of drawn comb and four frames of foundation. Equal portions of live bees were added to the hive setups, consisting of enough bees to cover both sides of two full-sized combs. The AFB experimental group was located near the old apiary location, while the three other groups were located eight km distant (to prevent mixture with the AFB control colony bees) Colonies were fed sugar syrup. For the next four months and in May of the following year, colonies were inspected for signs of AFB and bee samples and honey were taken for spore analysis. Colonies were overwintered indoors. Colony mortality was monitored and some losses were attributable to bear damage. All AFB control colonies perished during the wintering period, while all shaken colonies (except for one lost to a bear) survived the wintering period.

An additional experiment was set up in 2006 to evaluate the effect of shaking itself on honey yield and consisted of three experimental groups of

12 colonies each. The groups included 1) colonies established from package bees in April 2006, 2) colonies overwintered in single brood boxes and then shaken onto frames containing foundation and 3) colonies overwintered in single brood boxes and then left on their original combs. All colonies were AFB free and contained same age queens obtained from a single queen producer. Subsequent brood and honey production of the colonies was assessed and economic

parameters of the colony operating costs were estimated to compare profitability

Results of the shaking experiment indicated that shaking bees onto foundation, drawn comb or a mixture of the two resulted in colonies that were largely free of disease symptoms. The maximum number of in-

fecting cells seen in any of the shaken colonies during an assessment was eight. No infected cells were detected in the group shaken onto foundation. The lack of disease symptoms in the shaken group was mirrored by low levels of AFB spores found in the bee and honey samples from the same colonies, relative to AFB control colonies. AFB symptoms continued to escalate in the AFB control colonies and none of them survived Winter

In the honey yield experiment, the researchers found that colonies that overwintered and were either



destined to be controls or shaken contained approximately two times the sealed brood and three times the number of adult bees than colonies that had been recently started from packages. After the season, the total weight of honey harvested from the overwintered colonies was 1.4 times greater than that obtained from the shaken colonies. By examining seasonal data, the researchers found that this difference was attributable to the early harvest period in their location. By the second harvest period, there was no difference in production. Overall, the researchers estimated that overwintered colonies were 104% more profitable than using packages and 64% more profitable than using the shaken bees. The shaken treatment was 24% more profitable than using package bees. In their discussion, the authors concluded that "the choice of shaking bees onto either drawn comb, a mixture of drawn comb and foundation, or foundation alone did not significantly influence the reoccurrence of disease symptoms, the decline in *P. larvae* spore levels or the amount of honey produced." While the authors cautioned that their results were for a single year in a specific location in Canada and thus would need to be interpreted carefully (and may not be applicable) for other areas, they concluded that "shaking offers a profitable solution to the emerging complexities of managing AFB in the Spring." They recommended that in their location AFB cases found up until Mid-May could be dealt with by shaking directly onto foundation. Whether these findings and recommendations would hold if the experiments were repeated in the more southern climes in the U.S. remains to be seen. However, as interest grows to reduce or eliminate antibiotic use in food production and beekeeping, Pernal and colleagues have presented an interesting approach that will quite likely stimulate further exploration. **BC**

Dr. Steve Sheppard, Thurber Chair, Dept. of Ent., WA State Univ., Pullman, WA 99164-6382, shepp@mail.wsu.edu; www.apis.wsu.edu.

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There has been remarkably little written about the emergence of a "new" honey board. This is intriguing for a number of reasons, but especially because of the apparent success of its predecessor, The National Honey Board, which has been authorized via a number of referenda over two decades. One way to look at the situation is that the new Packer-Importer Board (PIB) is a next logical step in the honey industry's search for the perfect honey promotional vehicle. According to the May/June 2008 newsletter of the American Beekeeping Federation, the organization "reluctantly" supported the change, concerned that the U.S. honey industry would be left without the valuable services currently provided by the National Honey Board, including unfair competition, marketing and sale of counterfeit honey, adulterated honey, misbranded products and other damaging events. Most recently, the National Honey Board has also sponsored a number of research initiatives involving Colony Collapse Disorder or CCD, which promise to be beneficial to its assessment-paying producers.

The pioneering generic promotional program, the Honey Research Promotion and Consumer Information Act (Order), came into existence in July 21, 1986, after being voted for by a majority of then honey producers and importers.¹ From that legislation, the current National Honey Board was formed.² The run-up to the voting and concerns of the industry about the National Honey Board over an extended period were well documented as part of the *Apis Newsletter*, an informational organ, published for over 20 years at the University of Florida.³

The packers and importers of honey and honey products approved the new program via a referendum conducted April 2-16, 2008 by the USDA's Agricultural Marketing Service and collection of assessments for the current National Honey Board are to be suspended. The PIB will be funded by an assessment of a one-cent per pound levied on first handlers and importers of honey and honey products, authorized by the Commodity Promotion, Research and Information Act of 1996.

One of the complaints often expressed about the activities of the

Malcolm T. Sanford

The Packer-Importer Board (PIB)



"The next step in honey promotion."

current National Honey Board was its mandate by the USDA to be an organ for generic honey promotion. Some beekeepers continue to believe that the price of honey from this kind of promotion would not benefit U.S. producers much, but only promote an increase in importation. Generic promotion was discussed at some length by Dr. Ronald Ward, at that time an employee of the University of Florida in the Department of Food and Resource Economics. The following is a summary of his remarks to the American Beekeeping Federation, which met in Tampa, Florida in 1985.⁴

"Two kinds of advertising are possible: brand and generic. Generic advertising is urging consumers to buy any kind of honey and is primarily intended to precipitate and remind. Brand advertising is urging consumers to buy a certain brand name and is used to persuade and reinforce. Precipitation and reminder are more likely to increase total industry sales, while persuasion and reinforcement are usually associated with maintaining or increasing market share.

"Advertising through federal programs is either done with funds generated by marketing orders or research and promotion acts. The latter kind is proposed for honey. It is national in scope and is primarily directed toward promotion. Currently research and promotion acts exist for eggs, potatoes, wheat for food, cotton, lamb, wool, mohair and dairy. The beef and floral industries have voted against these so-called 'check off' programs. Generic advertising is a secondary activity of marketing orders. Since 1970, 21 orders support some kind of generic promotion. The 21 fruit and vegetable orders in 1982 spent \$8.4 million on generic promotion and about \$1 million on research.

"In 1982, about \$44 million was

spent on domestic generic promotion, nearly \$9 million on research through Federal programs, and \$19 million was spent by USDA on overseas market development. Commodity groups at the state level also spent over \$91 million for promotions and \$10 on research. In 1982, U.S. food and fiber commodity groups spent about \$84 million on generic messages in consumer-oriented media. Of the total, 81% went to network and local television and radio, 17% was spent on magazines and newspapers, and the rest on billboards and other media. However, generic expenditures still represent less than 2.5% of all advertising on foods and beverages in consumer-targeted media in 1982.

"Effectiveness of generic advertising is variable. A number of economic studies have measured the success of citrus, milk, potatoes, cotton, eggs, and others. A recent study of generic promotion of fluid milk shows that in 1979, the rate of return to milk advertising was 314%; in 1981, the rate declined to 231%; and by 1983, the rate equaled 166%. Consumption increased by 4.47% over what would have existed without promotions. In contrast, studies of the total and generic advertising of potatoes show a positive response to potato advertising, but failed to show the separate effect of generic efforts.

"Although it is not possible to directly evaluate new programs with exactly the same types of analysis, commodity and market characteristics can be identified, which contribute to the success of new generic programs. These include:

1. Product must be reasonably homogenous.
2. Product must not totally lose its identity in market channels.
3. Product must have clear standards that can be perceived by the consumer and these qualities must be reasonably

“One of the complaints often expressed about the activities of the current National Honey Board was its mandate by the USDA to be an organ for generic honey promotion.”

4. Distribution system and product availability must be acceptable.
5. There must not be an excessively large number of substitutes.
6. Consumption potential must exist, the market cannot be saturated.
7. There are a variety of potential uses for the commodity among consumers.
8. Producers must have common objectives.
9. There must not be an excess of competing advertising among brand names.
10. Industry structure must not be monopolized by a few firms.

“Some limiting factors might include:

1. Geographic distribution of production and relative size of producers.
2. Unlimited barriers to entry of honey into the marketplace (e.g. increased imports or a large number of small producers not subject to assessment) can reduce long-range effectiveness.
3. Possible existing supply response to rising prices; potential for stimulating imports.

“Unique characteristics of the honey industry which might lead to successful generic promotional programs include:

1. Declining per capita honey consumption points to the need for programs to reverse the trend,

the main reason for considering the Research and Promotion Act. Although the negative trend in consumption could possibly reduce effectiveness of new advertising programs, the market is not saturated and there exists room for expansion.

2. As a product group, honey can be considered homogeneous. This should contribute to generic promotion success, but existence of and control over grades and standards is essential.
3. Lighter and milder honeys are marketed for table use, whereas darker ones are sold for industrial use. This may provide a good division for differentiating advertising messages and identifying target audiences.
4. Degree of substitution directly affects expanding honey demand. The more substitutes available, the more difficult it becomes to increase consumption. The growth in substitute sweeteners is a formidable problem in new honey use. It appears the darker honeys are more susceptible to competition from substitutes, ➤

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and less payoff from advertising directed toward the commercial sector would be expected.

5. Table honey does not lose its identity while moving through market channels, a distinct advantage in generic advertising.
6. In comparison to other products like milk and orange juice, special storage costs on honey are nil, an important attribute when considering candidates for promotion.
7. Much of the successes with milk and orange juice is due to perceived health attributes of the commodities. Honey might also be promoted on this basis with the proper studies to back up claims.
8. Because today's consumers are looking for convenience foods, advertising programs have been particularly successful in this class of products. Honey could also be promoted on this basis.
9. Honey is an 'experience good,' one the consumer can try without incurring much cost. Many commodities are promoted on this basis. However, standards

must be high and quality consistent, if repeated consumption is to be achieved.

"If generic advertising succeeds in shifting demand for honey, then other problems may arise over time:

1. Although citrus advertising has been effective, a share of the expanded demand has been supplied by increased imports. The same is probable for honey. Unlike citrus, however, imported honey is subject to the 'check off' assessment.
2. Early honey imports were primarily of a darker industrial grade, but since the 1970s this has shifted to lighter grades. Long-range benefits of promotion are always affected by added supply. Gains to domestic producers will depend on relative prices for domestic versus imported supplies. If relative prices widen, imports are going to gain a larger share of increased demand.
3. The Act assesses only those producers or importers handling 6000 pounds or more of honey per year. This could give rise to

growth of smaller producers who would not be taxed because demand shifts lead to a disproportionate gain to those not paying tax.

4. Effects of eventual disposition of U.S. government honey stocks is also a vital consideration, as is potential abuse of the refund provision of the Act.

"Dr Ward summarized his presentation by stating that honey appears to be a good candidate for generic promotion and that some reasonable success can be expected with the appropriate administrative structure. Although a great many persons in the industry are excited about the prospects of the Act, many questions brought up by Dr Ward and others remain. Unfortunately, there is no way to begin to finding answers until the Act is implemented."

In March 2008, Dr Ward was commissioned by the National Honey Board to study the results of the program. In his 57-page report available by contacting the Board, *Measuring the Impact From Generic Promotions on the Demand for Honey*, the con-

clusion is clear: "they (the National Honey Board's demand enhancement programs) have benefitted those subjected to the honey check off assessment with the rate of return beginning around seven dollars for each dollar invested in the Honey Board." And that rate is on the conservative side, he writes, since it does not include the less reliable impacts on the use of honey for manufacturing.

It's clear that the current National Honey Board has set the bar pretty high with respect to its innovative promotional programs over the last two decades. Many producers are left wondering what the new Packer-Importer Board (PIB) can do as an encore. And the same folks are also trusting that the honey producer, in the end responsible for existence of the product at all, and whose vision and assessments contributed to the pioneering activities of the present National Honey Board, will not be left out in the cold when it comes to PIB activities. **BC**

Dr. Sanford is a former Extension Specialist in apiculture at the University of Florida.

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BLACK QUEEN CELL VIRUS

Clarence Collison

The name of the virus describes the darkened areas on the walls of queen cells containing infected pupae.

Most viruses infecting European honey bees, *Apis mellifera* L., are known to reside at low levels in colonies and often go undetected due to the absence of physical symptoms. Several studies have shown that apparently healthy bees can harbor multiple viruses simultaneously. For example, Chen et al. (2004, 2005) found up to four viruses in individual worker bees, and 93 percent of the queens examined had two to five simultaneous viral infections. Currently, over 20 honey bee viruses have been identified and physically characterized (Ball 2005), but the connection of many of these with bee mortality is not well understood. Both *Varroa* mites and nosema disease are often associated with viral infections, suggesting the virus may be an additional mortality factor. Black Queen Cell Virus (BQCV) is one of three honey bee viruses that are intimately associated with the microsporidian parasite *Nosema apis*, and this virus is implicated in the mortality resulting from nosema disease (Kevan et al. 2006).

Black Queen Cell Virus is a picorna-like virus (superfamily of positive single-stranded RNA viruses) belonging to the genus *Cripavirus* (family Dicistroviridae). It was first isolated from prepupae and pupae of queen and worker honey bees found dead in their cells (Bailey and Woods 1977). These dead pupae contained at least 10^{12} isometric virus particles, 30 nm in diameter, per individual. The name of the virus describes the darkened areas on the walls of queen cells containing infected pupae. BQCV particles contain a positive single strand RNA genome and four capsid proteins with molecular masses of 34, 32, 29 and 6 kDa. The South African isolate of BQCV was found to have an 8550 nucleotide genome, excluding the poly (A) tail (Leat et al. 2000; Benjeddou et al. 2001, 2002).

BQCV is a widespread disease, identified in bees from Britain, Europe, North America, South America and Australia (Bailey et al. 1981, Berényi et al. 2006; Antúnez et al. 2006). It is a common viral infection in the United States (Chen et al. 2004), and the most common cause of death in queen larvae in Australia (Anderson 1993). An examination of 29 U.S. honey bee queens found 86 percent of them to be positive for BQCV (Chen et al. 2005). Tentcheva et al. (2004) completed an extensive survey of six bee viruses, including BQCV, in France. The frequency of BQCV reached 58 percent in adult bee populations during the Summer, but infections in the pupae were very scarce during this time; only two percent were positive for the virus. Adults in 24 apiaries were positive for the virus throughout the year, indicating BQCV

causes chronic infections in bees. Although it is not often observed, BQCV infection in worker and drone brood is possible (Siede and Büchler 2003). A symptomatic infection was first observed in Hessen, Germany, where diseased drone brood was discovered in two beeyards. The drone larvae were seriously damaged, and some of them were dead.

In the early stages of BQCV infection, pupae have a pale yellow appearance and a tough sac-like skin, much like prepupae that have died of sacbrood. The virus becomes symptomatic in queen pupae during the capped-cell stage and is most prolific in the Spring and early Summer. BQCV infected pupae rapidly darken following death, and eventually the walls of the queen cell become dark brown to black in color; these symptoms are most noticeable when many queens are being reared together.

Unlike sacbrood virus, BQCV does not multiply when it is consumed by worker larvae, but it multiplies readily when it is injected into pupae; however, the virus does not multiply when injected into adult bees. A coinfection of *Nosema apis* appears to enhance the ability of BQCV virus to multiply within a host bee (Scott-Dupree and McCarthy 1995). *Nosema apis* infects the bee's mid-gut epithelium, increasing the susceptibility of the alimentary tract to infection by BQCV (Bailey et al. 1983). This is understood to be the main transmission route of the virus. At the same time, the virus seems

"A coinfection of *Nosema apis* appears to enhance the ability of BQCV virus to multiply within a host bee."

to compound the pathogenicity of the microsporidian, accounting for the variation of virulence observed with nosema disease (Bailey 1981). For instance, in Toledo (Spain), an outbreak of BQCV in an apiary of 80 hives resulted in massive deaths of adult bees. The symptoms of mortality resembled those of a nosema infection and included diarrhea, enlarged abdomens, edema of the midgut (abnormal accumulation of watery fluid) and distended rectums filled with a transparent liquid (Higes et al. 2007).

Under laboratory conditions, per os ("by way of mouth") infection of adult bees with BQCV is totally dependent on the presence of *N. apis* (Bailey et al. 1983). The close association of BQCV and *N. apis* in naturally infected colonies is further reflected in their coinciding replication and transmission cycles (Ball and Bailey 1997). Bees infected with both BQCV and nosema disease have shorter life spans than those infected with only Nosema disease. A combination of *N. apis* and BQCV was distinctly more harmful than *N. apis* alone, which may account for the significantly

"Bees infected with both BQCV and nosema disease have shorter life spans than those infected with only Nosema disease."

more colonies found dead in late Winter that were infected with BQCV than were expected by chance (Bailey et al. 1983).

An examination of 10 queen honey bees indicated that BQCV was found in 100 percent of the queens' feces and guts, and in 70 percent of the queens' ovaries (Chen et al. 2006); it was not found in the queens' hemolymph, spermathecae, heads or eviscerated bodies. The modes of transmission and replication for *N. apis* and BQCV appear to be somewhat similar. The detection of BQCV in the feces of queens suggests a role for feeding (ingestion) in virus transmission. Nosema is transmitted through fecal matter, which is deposited on the combs while bees are confined over Winter and ingested by housecleaning bees in the Spring. The virus titer in the guts was significantly higher than in the ovaries, suggesting the gut may be a major reservoir for replication.

The viral status of a queen's offspring, including eggs larvae and adults, was also investigated for implications of vertical transmission (Chen et al. 2006). Queens infected with three to five different viral infections including BQCV produced BQCV infection in 100 percent of the egg samples, in 27 percent of the larvae and in three percent of adult bees. Queens positive for only two viruses – BQCV and deformed wing virus – yielded BQCV infection rates of 100 percent in eggs, 22 percent of the larvae and five percent of the adults. The presence of virus in the ovaries and in surface sterilized eggs is excellent evidence of transovarian transmission.

Even though *Varroa* mites are known to vector and activate several latent viral infections within honey bees, BQCV does not appear to be associated

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with *Varroa*. Mite samples examined for the virus from 36 French apiaries with an 86 percent incidence BQCV were negative, implying that dissemination of the virus by mites is improbable (Tentcheva et al. 2004).

Little is known about the processes that are responsible for activating asymptomatic viral infections in bees. When honey bees from seemingly healthy Australian colonies were injected with various salt solutions, inapparent infections of BQCV were activated (Anderson and Gibbs 1988). The activated virus replicated to detectable levels after pupae were incubated at 35°C for three days. They were also able to show that the replication of activated BQCV was suppressed when injected with BQCV antisera. In addition, a greater proportion of activated BQCV infections occurred in pupae in which the replication of both Kashmir bee virus and sacbrood virus was suppressed. Further research is needed to determine what factors are responsible in triggering black queen cell viral disease outbreaks.

If BQCV is present in colonies to be used for queen-rearing, it can quickly spread to developing queens, resulting in poor queen hatch. Unfortunately, it is difficult to identify the viral status of queens without killing them and is common in adult bees. Since the virus has an intimate association with nosema disease, indirect treatment for the virus may be accomplished through control of nosema disease. **BC**

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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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Distance, Direction, Navigation

Bees Definitely Don't Have A Lack Of Communication

Norman Carreck

The general public all know a few things about bees, and one of these may be that bees use dances to communicate the location of food to their nest mates. Anyone who has demonstrated an observation hive to the public on a sunny day will have seen the look of delight on children's faces when you show them a worker bee dancing and showing the location of the food to its friends. Due to a number of popular books^{18,19}, many members of the public may also be aware that for many years there has been controversy about the so-called "dance language" of bees, and they may believe that scientists are somehow divided on the issue. Certainly there have been a number of very public debates between two highly polarized camps; on the one hand the "odor only" group, and on the other the "dance language" group, adopting extreme positions and trading colorful insults, but achieving very little. In fact, this "either / or" approach is very unhelpful and very simplistic.

Bee navigation is actually a very complex subject, but before thinking about how bees might navigate, let us briefly consider how humans navigate. Let us assume that you are asked to go to a friend's house where you have not been before. You are given an address, and also told that the house is the one on the south side of the park, the left hand house of a pair, with the blue front door, next to the corner shop, behind the brewery and opposite the engineering works. Assuming that you don't have a SatNav, you might start your journey by looking at a map.

Maps come in various types, cartographic maps (or cartograms), which accurately represent to scale the relation of places in terms of distance and direction, and topological maps, of which the London Underground (subway) map is the most famous example, where merely the sequence of places is shown, the exact relative locations of the places being distorted for clarity. The subway map is very handy for navigating underground, but useless above ground. How many of us have taken the subway for one stop and then found that the two stations are actually only a few hundred yards apart on the surface? The two types of map have similarities; for example a freeway

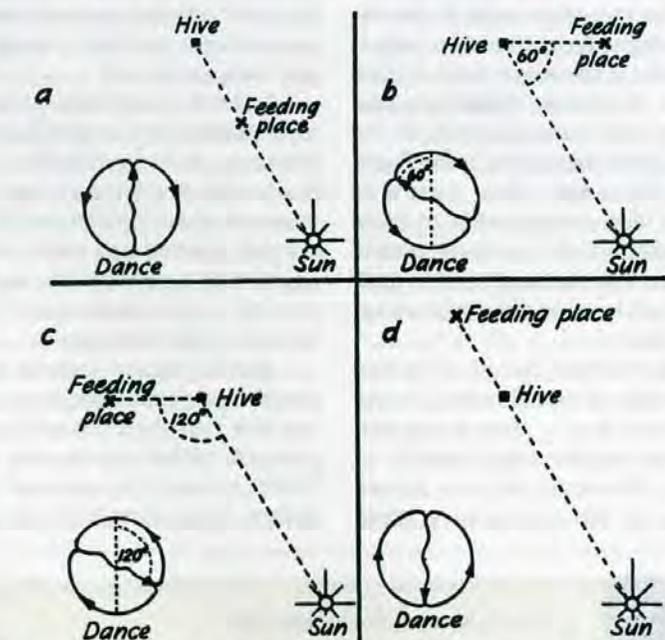
map shows the distance and direction between places, but we tend to use it as a topological map, just looking at the sequence of numbered junctions.

So you set off, and using your highway atlas, and then perhaps a street map, you get close to your location. But how do you finally find the house? You could look at the sun to decide which side of the park to look, you could smell the brewery, you could hear the engineering works, you could look out for the corner shop, you could look for the pair of houses, you could look for the left hand one, you could look for the blue front door, or failing this, you could look for the street name and the number of the house. So when you finally find your friend's house, how many different means of navigation have you used? You

may have used: distance measurement; directional cues; visual cues, especially landmarks or color; odor cues; and auditory cues. And we do all this, all of the time, without thinking. Could you still find the house if one or more of these cues was unavailable, for example if it was dark, or if you had no sense of smell? Probably. This is because we can compensate and substitute one means for another.

The truth is that we use a huge range of different ways to navigate, and so do bees. With the exception of hearing, which is very poor in bees, they can use all of the techniques that we can, plus a few additional ones. For this reason it is very difficult for experimental purposes

to exclude all others and to study just one mechanism at a time. In many cases the senses of honey bees are much more highly developed or different from ours. They cannot, for example, see a focused visual image in three dimensions as we can, but they are much better at detecting movement, and can see different parts of the visual spectrum from us. Many flowers have ultra violet patterns, invisible to us, which are used by bees as nectar guides, but on the other hand, flowers which appear red to us are black to bees. Their powers of olfaction are much greater than ours, hence the recent development of "sniffer bees" to detect explosives, drugs or other substances. Bees can also detect the polarization of light, which we cannot, and are sensitive to the earth's magnetic



Giving the sun's bearing in a dance on a vertical comb surface. The little diagrams on the left of each drawing show the dance as it appears on the vertical comb.
(Taken from *The Dancing Bees* by von Frisch)

field, which we are not.

Before we can go into details of how bees actually navigate, we need to consider how they measure distance and direction. For a long time it was believed⁹ that bees estimate the distance that they have covered by gauging the energy they expend to reach the destination. It is now known that this is not the case. Instead it is believed that bees use so-called "optic flow" to measure distance^{6,7,16,17}. It seems that bees gauge distance in terms of the extent to which the image of the environment moves past their eyes. Consider the insect compound eye, which consists of numerous individual facets, each with its own lens and retinal cell. As an object passes in front of the eye, it will be seen first by one cell, then by another and so on. If we think of an insect flying over a textured surface, each cell will therefore experience a series of objects passing by it, and this forms the "optic flow," representing the motion of the image of the environment. It is thought that bees can integrate these changing images over time to obtain an estimate of the distance travelled¹⁶, and this has been demonstrated in a series of experiments, of which more later

There is now good evidence¹ that bees are able to regulate their ground speed by holding constant the speed of the optic flow in order to compensate for headwinds, and can adjust their flight height to maintain a standardized rate of optical flow. This is why bees fly low to the ground on windy days. Harmonic radar has also demonstrated¹⁵ that bumble bees can compensate for strong cross winds by constantly adjusting their flight heading until the direction of the optic flow occurs at the angle relative to the sun that corresponds to their intended track. Further evidence for this is the fact that bees flying over water, a featureless surface, tend to drift off course, presumably because they cannot make use of optic flow in these circumstances.

So much for distance, what about direction? It has long been known that bees make use of the sun. In order to fly to a known food source from a hive, a bee can note the angle between the sun and the object and fly in that direction. Unfortunately of course, the sun moves throughout the day, so using a sun compass requires

the bee to use some system with a time correction factor to take account of the fact that the sun will move whilst they are out foraging. It has been demonstrated that bees are very efficient at doing this⁹, but exactly how they do it is much more mysterious⁵. Another problem is that the sun is often obscured by clouds. To some extent, bees can see the sun through clouds because ultra violet light penetrates through clouds, but when the cloud cover is more dense, providing that some blue sky is visible, bees can use polarized light. Sunlight is normally polarized, meaning that the direction of vibration of light waves changes in a regular way as the sun moves through the sky. We cannot see these polarization patterns, but bees can.

So bees can measure both distance and direction. They can also perform a technique called "path integration"^{3,4} or "dead reckoning." In essence, the bee keeps track of its movement from a starting point, and so makes it possible for it to return to that point. For example, even though a bee may use a roundabout route during a foraging trip from a hive to the last flower on the trip, it can still perform a straight "vector flight" the correct distance and direction straight back to the hive. This has been demonstrated using radar¹⁴, where bees collected at a feeder and displaced some distance away in a featureless landscape were shown to fly the precise vector flight that they would have performed had they not been displaced.

In their co-evolution with insects and other pollinators, plants have evolved a number of means of drawing attention to their flowers. As is well known, wind-pollinated plants tend to have inconspicuous flowers. In contrast, insect-pollinated flowers may be large, brightly colored (sometimes with patterns visible in ultra-violet light), with a strong odor, and may provide rewards in the form of nectar or far more pollen than may be required to achieve fertilization.

Having found a rewarding source of food, there is clearly an advantage to a social creature like a honey bee if it can then communicate the presence and location of the food source to its nestmates. The Rev. Charles Butler in the 17th century² knew that bees danced, and in fact, more than 2000 years ago Aristotle wrote: "a for-



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ager remains faithful to flowers of the same species until it returns to the hive. After the foragers return to the hive they shake themselves and each one is closely followed by several other bees."¹¹

The first person to realize the significance of these dances was the Austrian bee scientist Karl von Frisch. Having worked on the idea for more than 20 years, in 1946 he published his theory⁸ that through the waggle, round and other dances, foragers communicated the distance and direction of food sources, or nest sites, essentially the vector flight information mentioned earlier. In 1967 he published his mighty tome "The dance language and orientation of bees"⁹, which summarized 40 years of field experiments, and he was awarded a Nobel Prize in 1973. For such a controversial idea, the idea of dance communication was accepted by most bee scientists remarkably quickly

A number of scientists soon began to feel, however, that the "dance language hypothesis" did not explain everything that was observed in practice. In particular, Adrian Wenner, who had worked with von Frisch's colleague Martin Lindauer, became increasingly convinced that much of what he observed in practice could be explained by bees using odor, rather than by recruitment using dance communication. Among many criticisms, he pointed out that whilst bees attending dances may later turn up at a feeder indicated by the dance, they took much longer to get there than they should have done had they flown in a straight line. In extensive experiments replicating some of von Frisch's techniques, he was able to conclusively demonstrate that in many circumstances, bees were using taste and odor to arrive at experimental feeders. In his first book¹⁸ he accepted that this alone did not disprove the existence of dance communication. Increasingly embittered at the difficulty of publishing "anti" dance communication papers in refereed scientific journals, for a while he abandoned bee research altogether, becoming a marine biologist. By the time of his second book¹⁹, however, Wenner felt that his experiments demonstrating the use of odor by bees had indeed disproved the "dance language hypothesis."

Perhaps he was too late, for much further evidence

"Having found a rewarding source of food, there is clearly an advantage to a social creature like a honey bee if it can then communicate the presence and location of the food source to its nestmates."

had meanwhile been accruing, demonstrating that honey bees can indeed make use of dance information. In an elegant series of experiments, James Gould¹⁰ demonstrated that bees could be "tricked" into going to the "wrong" location. Under normal circumstances, bees dance within the hive in the dark, orientating their dances according to gravity. If however, the comb is placed in dim light, bees orientate to the light, detecting it with the three simple eyes (ocelli) on their head. Gould placed a light source near to a comb, and then painted over the ocelli of the dancers. The dancers behaved as if in the dark, the attendants behaved as though in the light, and consequently were directed to the wrong feeder. When the light source was moved, the recruits went to another, equally wrong location.

Further evidence in support of dance communication was provided by Axel Michelson and a team at Würzburg, Germany, who after many attempts, produced a "robot" dancing bee, which could direct bees to a food source¹². This was exceptionally complex, since in order to successfully direct bees, the robot had to supply food samples, to move in the correct fashion, but had also to flap its "wings" at the correct frequency to provide the auditory vibration component of the dance, which ironically, had been discovered by Wenner himself independently of von Frisch's group.

A satisfactory explanation for Wenner's observations that a recruited bee took much longer to reach a feeder than it should do if it traveled in a straight line had to

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“Further evidence in support of dance communication was provided by Axel Michelson and a team at Würzburg, Germany, who after many attempts, produced a ‘robot’ dancing bee, which could direct bees to a food source.”

wait until much more recently. Joe Riley and colleagues from Rothamsted Experimental Station, UK, working with Randolph Menzel and colleagues from the Freie University of Berlin made use of harmonic radar to repeat one of von Frisch’s experiments, but crucially with the ability for the first time to directly observe the flight paths of the bees¹³. Bees flying from an observation hive inside a tent were trained to an unscented feeder. When bees which had visited the feeder were observed dancing on the comb, recruits attending the dances were then tracked using radar. They were observed to leave the hive and then to perform a straight vector flight directly to the vicinity of the feeder. In order to demonstrate that these bees had not visited the feeder already, some recruits were captured at the hive entrance, transported some distance away in a dark box, and released, upon which they performed the straight vector flight that would have taken them to the feeder, had they not been displaced.

This seems conclusive proof that bees do indeed use the vector flight information encoded in the dance, but the really interesting point was that although the vector flight took them straight to the vicinity of the feeder, since the feeder was a simple glass jar, without scent, there were no visual clues to attract them, and no odor, so despite extensive searching of the locality, few of the recruits found the feeder on their first flight. In the real world, of course, a food source would be colored or have an attractive odor [To be continued]. **BC**

Norman Carreck is a member of the Technical Committee of the British Beekeepers Association, a Member of the Central Association of Bee-Keepers, Secretary of the Examinations Board of the National Diploma in Beekeeping, and Senior Editor of the Journal of Apicultural Research, published by IBRA.

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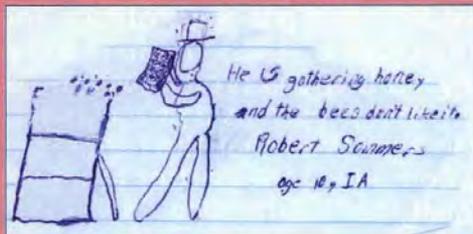
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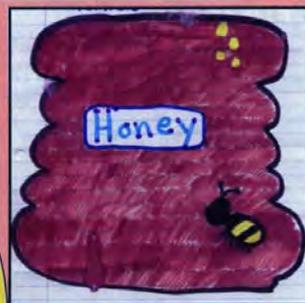


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Social Insects

Honey bees are social insects. What makes an insect a social insect?



They like to go to parties?



They talk on the phone a lot?

Social insects live and work together in large groups called colonies. Here is some information about social insects:



There is one queen who lays the eggs. Drones are male members of the group that fertilize the queen. The other insects in the group divide up the work. In a beehive, the worker bees do different jobs depending on their age.



Good try.



I like bees because they are fuzzy.
I like bees because they are buzzy.
I like bees because they sting.
I like bees to catch them.

Raechel Simpson, age 7, AL

There is an overlapping of at least two generations, which means the older insects help related, younger ones.



They work together to take care of the babies.

All ants and termites are social insects.

There are well over 1 million different known species of insects in the world, and some experts estimate that there might be as many as 10 million!

There are a number of other bees and wasps besides honey bees that are social insects. The rest are solitary and live alone.



Rosalyn Sommers, age 7, IA

... Bee kid's corner



Produced by Kim Lehman - www.beeladyprograms.com
www.beeculture.com

October 2008

Social Scramble

Here is a list of social insects. There is only one problem. The letters were getting a little too social and have lost their correct places. Can you help them out by unscrambling the letters for them? The answers are somewhere on this page.

1. TANS - _____
2. EONYH EBES - _____
3. LFAE TUCRTE STNA - _____
4. PARPE SPWAS - _____
5. TESITEMR - _____
6. YWOLLE JKEACTS - _____
7. FERI ATNS - _____
8. BUMEEESBLB - _____



Social Bee Buddies

Invite your friends over for a party centered on honey bees. It can be for your birthday or just for fun.

Decorations

Decorate yellow balloons with black markers and tissue paper wings. Hang them around the room. Make a centerpiece by putting chenille bees on sticks and placing them in a vase with flowers.

Refreshments

Make bee cookies. Using icing in a tube, decorate cookies to look like bees. Use licorice for antennae and wings.



Game

Hide paper bees all over the house or yard. Give your friends a paper bag for their hive. See who can find the most bees.

Seth Josiah Bales, from Oklahoma, is our youngest bee buddy at 7 months.

Biomass

"Some Scientist think 10% of the animal biomass of the world is ants, furthermore they believe another 10% is composed of termites. This means that 'social insects' could make up an incredible 20% of the total animal biomass of this planet."

Insect Home Page, www.earthlife.net

There are a number of definitions for biomass. What we are talking about on this page is the amount of living material in the world. This includes plants and animals. Only the dry weight is measured. In other words only about 30% of a creature is counted. The rest is water. There is about 75 billion tons of biomass on the earth. Humans are about 0.13%, domesticated animals are about 1.0%, and crops are about 2.7%. This information is from the American Heritage® Science Dictionary.



Become a Bee Buddy



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

Name: _____

Address: _____

City, State, Zip Code _____

Age: _____ Birthday: _____

E-mail (optional) _____

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

'Bout a 100 – Sideline Beekeeping

CELL FINISHERS, DRONES & EVALUATING QUEENS

Larry Connor

Natural, healthy hives produce some of the best-fed queens during swarming and supercedure.

Cell finishers (or builders) attempt to duplicate the high population and crowding conditions found during swarming, and create an area of reduced queen pheromone similar to supercedure.

The Cell Finisher

Select a strong colony; or several, depending on your queen production needs. Early in the season select overwintered colonies with young queens and stimulate brood production by feeding protein and syrup. In Northern states, start feeding pollen patties in late February or early March. When weather permits sugar syrup feeding. Or use a candy board starting in February. In Southern states, feeding may start in January or early February. Once you start feeding, stay with it; do not leave the bees in a growth mode without food available to support that growth.

When maples are in bloom, these colonies may be ready to swarm because of your feeding. Watch carefully and eliminate queen cells (save some for royal jelly). You may want to remove bees and brood for an increase colony. You must keep the population at full throttle without permitting swarming.

There is a late-season option if you decided to raise queens and did not have a plan of prior feeding. You can compensate for the reduced colony strength by adding frames of ready-to-emerge worker brood to the cell finisher to boost bee populations. I find this better than adding bulk bees (packages) to the colonies, since this sometimes starts fighting.

You may begin grafting queens when you have over

100 drones in the purple-eyed stage or older for every queen you intend to produce. Because drones take longer to develop and are slower to reach sexual maturity, this delay in queen cell production will produce right-aged queens and drones. It is critical to check this anytime you start to graft. If you are producing queens in the late Summer and Fall, make sure there are still drones in production or you may have virgins flying to drone congregation areas (DCA's) with a reduced and ineffective population of waiting and eager virgin drones.

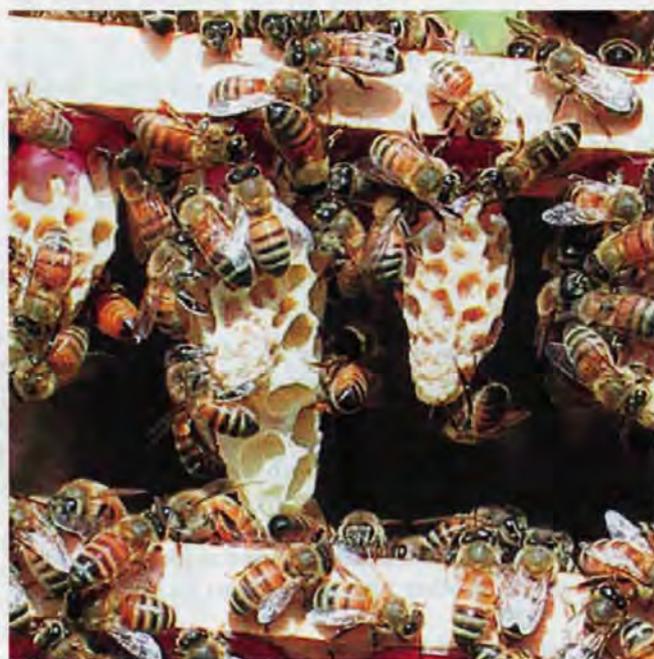
Below we discuss drone production. For now, just remember that the drones in your cell finisher will probably not mate with the queens if they are both in the same apiary. But cell finishers will produce drone brood, so be ready to deal with it. Rotate comb into the colony for drone production only if the queen is of a type producing target drones for your operation.

When you are ready to start cell production, follow these steps every 10 days. This will insure plenty of bees in the hive and keep the colony booming. It will also keep a large number of queen cells in production.

1. Find the queen – You need to position the queen below the queen excluder in a two-box unit (deep or medium). Check all frames for the queen, and when you find her, set her aside and look for a second queen.



Placement of drone comb in the number three position in the brood nest of a good strong colony from which you want to make drones.



Close-up of cells in cell builder. Some webbing is taking place.



Inspect the emerged cell to confirm that the intended queen emerged from the cell. If the time line is correct, the queen you installed is yours.



Integral to any bee breeding program must be some selection against Varroa mites. Hygienic cell cleaning is known to reduce mite loads. Researchers are looking at grooming.

Mother-daughter queen combos are not unusual during the spring when queen replacement is linked with strong colony strength.

2. Put sealed brood and empty frames in the box below the excluder. Make sure the queen is carefully moved to the lower box, preferably while on a frame of brood, and the frame gently pushed together with another to prevent damage to her large body.

3. Carefully position the queen excluder on top of the lower hive body. In a hive body above the excluder center all open brood (eggs and larvae) plus one or more frames of pollen. Center the brood frames, and place the food frames at their side. Fill the rest of the box with frames except for the space needed for the grafting frames between brood frames.

4. Leave space for one or two grafting bars in the top box or have frames marked so they may efficiently located and removed when the queen cells, "the graft" is added to the cell finisher.

5. Feed the colony with thin sugar syrup, starting several days before you position the cells into the colony. This is true even when the colony is strong and there is a flow going on. Feed anyway. Don't sell the honey, cause now it's funny. Add fumigilin as a medication against Nosema of both species.

6. Every 10 days rotate the brood frames. Above the excluder the formerly open brood above will be sealed so put it down into the lower hive body. Either find the queen or carefully brush the bees off frames of open brood into the lower hive body. It is absolutely essential that you keep the queen downstairs. Because of all the heavy feeding you may have more frames of brood than you can correctly position. In that case, remove some brood frames to strengthen another hive or make an increase colony.

Drone production

Most beekeepers consider drones as part of their

colony's everyday life, and there are plenty of them. The biology is simple: drones are produced and maintained only as the colony's needs dictate. There are rarely too many drones. Then the workers execute them at the end of the season.

For even the smallest queen producer, the maintenance of strong colonies of desired stock will ensure good drone supplies for ordinary mating. When you want to make queens, you will need a lot of drones to mate with one queen. I think that 100 drones, at sealed brood stage will give you enough drones for one queen. Drones die virgins 95% of the time.

Installing drone comb foundation and comb into desirable colonies will keep the number of drones at an optimal level. Pierco makes a green plastic comb that is easy to spot in the hive. It can be added to the hive as needed four to six weeks before grafting will start. Dadant makes a wax drone comb foundation. Paint the top of the frames green so they will be easier to locate.

Adding drone comb will unintentionally stimulate *Varroa* mite reproduction. *Varroa destructor* breeds better in 24-day drones than 21-day workers by a factor of three to five to 1.2. A few generations of that and the hive is dead. So have a control plan. Or it will be more than the drones that must face the executors pale.

Queen and Nucleus Evaluation

The big difference between a queen propagator and a bee breeder is the effective use of selection techniques used by the breeder often overlooked by the propagator. Many queen producers propagate only, like cooks with cookie cutters, making many copies from the same old formula used by granddad years before. Many graft from the best colonies in their operation in a southern state, Hawaii, or California. These are not the same environments as the rest of the beekeepers use. Fortunately, some of the more progressive propagators are making

efforts to become bee breeders. For starters, they are buying stock selected for hygienic behavior.

Queen breeders are usually university and USDA employees charged with stock improvement. I was fortunate to know three of the best: Drs. Bud Cale, Jr. (Dadant & Sons, Inc), Walter Rothenbuhler (Ohio State), and Harry Laidlaw, Jr. (Univ. Calif. Davis). Bud Cale was unique since he worked for a bee supply company and earned his doctorate with corn geneticists in Iowa to develop true hybrid bees using the hybrid corn model of inbreeding and crossing these lines utilizing instrumental insemination. His Starline and Midnite hybrids no longer exist, but the Starline was the beginning gene pool for the Minnesota Hygienic strains.

We are in a new era of bee breeding and queen production. The new breeder can be any beekeeper with the training and skills that allow them to select more than just their "best colonies," but use standardized testing for making controlled measurements. Success will come to those who develop a reliable, predictable, mite-resistant and productive line. If you have one or a few survivor colonies, that does not make you a bee breeder, since the selection was non-directed. But if you set up apiaries with high mite loads and test for hygienic behavior from the survivors, you can start calling yourself a bee breeder.

Evaluating new queens

To evaluate the queens produced by our method of starters, finishers and mating nuclei, we must keep in mind that it takes time for the queen to turn over the population of bees in the nucleus. Also, that small colony

"Long before Shakespeare, before the Ra God of Egypt, the male honey bee has had really rotten press. Well, it is time to change that attitude."

is only a predictive tool for the full colony. As the nucleus is allowed to grow, or the queen is used in a full-sized unit, the dynamic within the colony between the workers and the queen will change. Defensiveness may become more pronounced in a larger colony than a small one. Small colonies seem to be better at *Varroa* mite control when compared to larger colonies. This may be something to do with the ratio of nurse bees to field bees.

Brother Adam, in his effort to find tracheal mite resistance, used overwintered nucleus colonies as his basis of comparison before putting queens into production colonies. This is a two-step evaluation requiring years of careful observations. The queen was kept in a small nucleus from mid-summer to spring and evaluated there. Many queens were removed at this point if they failed to meet the monk's expectations or testing levels. The second year the colonies were in full-sized colonies and evaluated for mite resistance, productivity, and general characteristics.

Brother Adam's approach was borne, in part, out of limited economics. How does a small bee breeder with finite resources test a large number of queens? Brother

INNER ... Cont. From Page 12

load a pdf of their form to make a donation at <http://www.easter-napiculture.org/about/EASDues.pdf> (you don't have to pay dues to donate, by the way). EAS is a regional group that awards \$5,000, or maybe \$10,000 each year to researchers looking at applied research. For the past two years however, they have been making additional donations to researchers studying CCD. Your money goes where you tell it to with EAS, so a CCD donation gets where it should be.

So there you have it...if you are interested in helping honey bees or know someone who is there are a variety of organizations set up to help. They are all tax deductible non-profit groups if tax considerations are part of the equations, and they are all intimately associated with the beekeeping industry and the research programs that are ongoing. You can contact any of them and ask more if you want, or make the appropriate purchases from the businesses that have seen the light and are helping out.

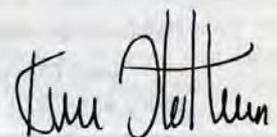
No matter where you go...the bees thank you for your help.

October ... it's getting late, maybe too late for taking care of that *Nosema ceranae* disaster that's going around. If your bees seem to have it you can guess and treat, or get samples sent in to labs that can tell you counts. The Beltsville Lab will do this for you, give counts that is, but they don't separate out the different *Nosemas*. Jeff Pettis says that he tells beekeepers that they should assume they have it. But counts can be iffy if you don't take the right samples. Take old bees, from the outside of the brood nest and the entrance. Young bees don't seem to show much. If your counts are high...in the many millions...the colony will probably crash no matter what you do. Feeding fumigillin is the only treatment, but feeding it more often seems to be helpful though it can be hard to get into a colony during a late honey flow. But crashing colonies throw drifting bees, which spread it rapidly in the apiary. Feeding protein now will help

also, as will feeding sugar (and adding fumigillin in the sugar is probably a given). Colonies that have had several supercedures, poor brood patterns and seemingly slow growth are most likely suffering from high spore counts. Clean up the *Nosema* and you'll find your queens live longer, your bees live longer and those spotty brood patterns clear right up.

If you have a very few colonies, sample one or two. If you have more than 50, get a microscope and learn how to do the samples yourself. Treating is expensive, replacing bees in infested colonies is way expensive and not very bright, and that microscope is expensive but useful. Healthy bees is the goal. This is the way. You want bees, this is part of beekeeping. Figure it out.

Meanwhile, heading into winter, it's time to sharpen your hive tool, and check out your smoker fuel. The experts say it's going to be a long, cold, snowy season. Get ready.



"Success will come to those who develop a reliable, predictable, mite-resistant and productive line."

Adam found that the overwintered nucleus was an ideal answer

Evaluation in the nucleus – Once the queen has replaced the bee population, you can look at several characteristics. Check egg-laying rate, buildup rate in the spring, temper (defensiveness) of the bees, temperament (how quiet are the bees on the combs), housekeeping (removal of debris), propolis use, uniformity of the brood pattern (sex alleles), hygienic traits (removal of frozen brood), and much more.

Evaluation in the hive – All of the observations listed above may be revisited, as well as full-colony issues: wintering (or summering in the tropics and desert), production (pollen and nectar), defensiveness, and hygienics. Larger numbers of bees may provide more individuals of each sub population that support traits that are not clearly expressed in the nucleus. Each subfamily comes from each drone the queen mated with.

How do you record data? Make it easy for yourself. Instead of weighing each colony and counting every bee, count the number of frames of honey produced and the number of frames of bees. Make estimates of the percent-

age of missed cells due to inbreeding and pollen stores. Use a one to five scale to record subjective observations: defensiveness, temperament, housekeeping, propolis use as examples.

Selection of high or low lines for certain traits – Let's take a trait like pollen collection. You can select for both high and low pollen collection simply by measuring the total pollen collected in pollen traps during an identical time period. Then cross daughters from the very highest pollen collector with drones from the next highest via instrumental insemination. I suggest you discuss your ideas with someone who conducts II. Dr Joe Latshaw in Columbus, Ohio is set up for this in the Midwestern U.S.

Something to keep in mind when you learn about bees and queen rearing:

Eggs Hatch – Adult Bees Emerge

When a bee egg hatches, there is no shell. The protective layer, the structurally complex but very thin chorion, simply softens and the tissue is reabsorbed by the larva that lies on the bottom of the cell. **BC**

Dr. Connor's books, including Bee Sex Essentials, are offered for sale through many bee supply dealers, and at his website, www.wicwas.com. A PayPal store is available on that site for those who want to have the convenience of purchase via this option. You can also find information about the Second North Central Queen Assembly, set for October 11, at the website, including a registration form and payment options.

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The Care & Feeding Of Speakers



Ann Harman

Well, well, you have just volunteered – or been chosen – to be the Program Chair for your beekeeping association. Sounds easy, doesn't it? Select a speaker, phone or e-mail speaker, speaker says "yes," and you are all set. Think again. You have just begun.

The first thing to realize is that your speaker is the Guest of Honor at your meeting. You selected this particular speaker because the information to be presented is valuable and useful. Your beekeepers said they were interested in having this speaker

Now you need to make a checklist of what needs to be done to make the chosen speaker welcome and willing to return to your association in the future. You do realize that if the speaker's visit is totally snarled up the word will get around and your association will find that nobody wishes to come.

The topic or topics. Do a little background work. Perhaps the speaker has given a good presentation to another association. If a bee scientist, what is the specialty of the speaker's research? Contact the speaker and discuss the program and be sure to discuss whether your speaker will give more than one presentation or a workshop. A few minutes spent on discussing program details will not only help you plan the meeting's program but also help the speaker decide what types of presentations will be effective.

Consider the audience, the beekeepers who will attend the meeting. Discuss this audience with your speaker. If the speaker wants to present a highly technical talk and your audience has a high number of beginning beekeepers, the presentation is apt to fly over their heads without contributing anything worthwhile.

Give the speaker a time frame. There is a big difference in a half hour time slot and 45 minutes, as well as between 45 minutes and one hour

Do you want to have questions after the main talk? Tell your speaker. Speak for 40 minutes and leave five minutes for questions. Or, speak for 45 minutes, no questions because the break is next and you can answer questions at that time. Such decisions made now keep the program

running on time.

By the way, this next piece of information is for the person running the meeting. Keep the meeting flowing on time. There is nothing that annoys speakers more than the previous talk running so far overtime that the speaker has to shift from 45 minutes to 30 minutes. It is just not

fair! Not fair to speaker and not fair to audience. Now the speaker has to decide what to omit or ends up flashing Power Point slides so quickly that they make no sense.

What You Need. You need to ask the speaker for information so you can make a good introduction, even if the speaker has been to your meetings before and even if you think the speaker is well known to everyone. Any new beekeepers in the audience may not have seen or heard of this particular person. Do you know how to pronounce the speaker's name? You won't have trouble with names like Smith but what about a very complicated-looking name. You don't want to mumble it, so get it correct right now.

What the Speaker Needs. PowerPoint is the main way to deliver a presentation these days. However, it is still good to ask what audio/visual needs are to be provided. Does the speaker need to bring a laptop? What about the now "old-fashioned" slide projector? Is the A/V equipment such that the speaker should bring a pointer? Some places have only a podium for the speaker, so ask if a table is needed for some display. Probably the most important question to ask is "If you are using PowerPoint, do you have your own projector?" If not, you'll have to rustle one up.

Information on Attendees and Venue. Your speaker would really like to have a rough idea of how many usually attend, especially if any pamphlets are to be given out or objects to be shown that illustrate the presentation. It is also a good idea to indicate whether many are new beekeepers or most have been keeping bees a very long time. Are there hobbyists or commercials attending? Describe the venue to your speaker. It may be a large auditorium or a small room. It does not matter what it is as long as your speaker knows what to expect.

Transportation. Here is one of the organizer's big problems. In addition it involves money from the association's treasury. Will the speaker be driving or flying? Let's look at driving first.

I hope you plan to give the speaker mileage or at least figure out mileage costs into an overall compensation. You can find the current government rates at www.irs.gov. Next are driving directions both to the speaker's motel and to the meeting venue. Some have nifty GPS in the car, others use MapQuest® and some use maps. However, it is best to review directions, especially if one-way roads, construction or bad signage complicate getting from there to here.



Airplane travel can really be a problem. Flights are delayed and canceled without warning. It simply is not a good idea to ask the speaker to fly into town in the morning for an afternoon presentation. You, the organizer, may be searching for a substitute while your speaker is stuck in East Cupcake and can't get a flight out until 6:00 p.m., after the meeting is over. Not a good situation. With airlines, plan ahead and don't be afraid to schedule an extra night in the motel. That can make the difference in a successful program or a patched together one.

If the speaker is flying will someone meet the speaker at the airport? Where? How will the speaker recognize the person? That's easy – tell the speaker you will be carrying (or wearing) a bee veil. If the speaker is renting a car be certain to provide driving directions, especially on how to get out of the airport and go in the right direction. Some airports have simply one way in and one way out. Others have roads that resemble a plate of spilled spaghetti.

Weather Factors. Summertime brings thundershowers. Winter brings snow and ice. Both of those can really snarl up your speaker's plans. Airports put planes on hold with dense fog or thunderstorms, even snow. Driving in a snow or ice storm is just plain dangerous. With weather reports available on the Internet you should have a look at expected weather conditions. And adjust plans accordingly. If weather promises to be ugly, contact your speaker to see if plans need to be rearranged. Yes, in spite of good planning, weather can cause you to adjust your meeting. Have a backup plan.

Money, Money, Money. Yes, compensation must be discussed! Actually the best time to discuss this is right after the speaker says "yes." How will the costs for transportation, meals, and motels be handled? Is a specific honorarium sum requested? Be certain you have covered all the details with the speaker. You will then need to inform your association's treasurer of what you have discussed so that nothing falls between the cracks. Does the treasurer need receipts for airfare, meals, motel and other miscellaneous expenses? If so, inform the speaker so that receipts don't get crumpled up and tossed out.

Not Money. If your speaker is from a long distance away a gift of a jar of local honey is appreciated. Perhaps someone in your association would donate a nice jar with

a nice label. Other gifts, such as wax items or craft items are appreciated.

Meals. Sometimes lunch is provided at meetings; other times the attendees will go to a nearby restaurant. This is not the time to abandon your speaker. You are the host. Take the speaker to a restaurant and invite two or three beekeepers to accompany you and the speaker. If lunch is provided at the venue, accompany the speaker to lunch, again with another beekeeper or two. It is always nice to put your speakers at the head of the line for lunches or buffets.

What about dinner? Again make plans. Remember your speaker may not have the faintest idea where restaurants are or which ones are nice. Don't forget breakfast if the speaker is staying overnight. What about a meeting with a banquet? You really should arrange to reserve a table for your officers and the speaker even if it is a "sit anywhere" banquet.

Motel or Beekeeper's Home. This choice is up to the speaker. Some may like to stay with a fellow beekeeper but just make certain that the home is not full of screaming babies or a teenager who plays the drums. Many times a speaker appreciates the quiet of a motel and the opportunity to review or even complete the presentations for the following day.

At the Meeting. The minute the speaker arrives at the meeting be certain that the speaker is given a nametag, handouts (if any), a copy of the program if appropriate, and the opportunity to become familiar with any A/V equipment. During a day-long program I have seen speakers standing around alone at meetings. Have you introduced them to anyone in your association? You really do need to do this. After all this may be the first time anyone has actually seen the speaker.

Break time is always interesting. The speaker has already made one presentation. Now it is time for a break. The speaker gets mobbed – by beekeepers eager to give comments, to ask questions. So there the beekeepers stand nibbling on homemade honey cookies and cakes and slurping coffee or sodas. And the speaker stands there empty handed trying to answer all the questions. You, the host, need to "run interference" to the break table with its goodies and something to drink. The speaker needs a break as much – or even more – than the beekeepers.

The Meeting is Over. As the meeting comes to a close a good host will thank all the speakers that have made presentations and workshops. They all need to know they have been welcomed and appreciated. And now your speaker is on the way home.

You are not finished yet. Please ask your association secretary to send a letter of thanks as soon as possible.

Now you are through – until next time. But it will be much easier then because you now have a checklist. **BC**



Ann Harman speaks at and also organizes many meetings around her home state of Virginia and all around the country.

Ross Conrad's

BIG GREEN BEE MACHINE

Converting Your Bee Truck To Burn Veggie Oil Is Good For You, Your Bees, And Clean Air

Ross Conrad

Of the plethora of challenges the beekeeping industry faces these days, there are two major issues that don't get a lot of space dedicated to them in the major bee journals. The first is the changing climate. Shifting weather patterns are effecting the timing and quantity of rain and snow fall, plant blooming cycles are shifting as a result of abnormal temperature swings, and the severity of storms, floods and droughts are increasing, all of which has an impact on our bees.

The second challenge is the rapidly increasing cost of fuel. Having more than doubled in the past few years higher gas and diesel prices hit full-time commercial, and

This deisel fuel transfer tank has been converted into a second fuel tanks and holds enough recycled vegetable oil when full to allow the truck to travel about 1800 miles before it needs to be refilled.



'Mother hen and her chicks appreciate the approximately 75 percent reduction in air pollutants that this work truck emits due to its vegetable based fuel modifications.

part-time sideline beekeeping operations the hardest. The effect of high fuel costs is magnified the more one's beekeeping operation is spread out. It used to be that we would spend a lot of time visiting those bee yards farthest from our honey houses, now we are spending a lot of time and money

The challenges of climate change and high fuel costs are intimately related since the primary modes of transportation that we have come to rely upon to move us and our bees around, (cars, trucks and planes) are among the largest producers of the climate altering gases being created and added to our atmosphere on a daily basis. One long-term solution to these twin challenges are transportation options that eliminate, or at least minimize, the production of pollutants and what have collectively become known as "greenhouse gases." When bees, or beekeepers, travel under their own power (by flying or walking respectively) these criteria are met. This is part of the reason why honey is rated as a food with one of the smallest carbon footprints. Since food production is a major contributor to energy use, with agricultural production, storage, distribution and consumption affect everything from greenhouse gas emissions to nitrous oxide and methane production. By taking up very little land area, utilizing a minimum of chemical inputs, and relying on the bees to gather and produce the honey, commercial honey production, and specifically local honey production, helps to offset the environmental negatives that are strongly associated with other agricultural endeavors.

On the road to developing long-term transportation solutions that are not fraught with the negative consequences of today's options, we need intermediate technologies, stepping stones that will help us make the transition. One such option is the use of vegetable oil to replace petroleum fuels for running diesel engines. Vegetable based biofuels are promoted as cleaner burning fuels helping to reduce pollution, are a renewable resource that can be produced domestically, are biodegradable,



The brains of the vegetable oil fuel system, the VO Controller is mounted on the dash where the ash tray used to be. The hole for the cigarette lighter was used to run the wiring to the controller. The large red button is hooked up to a heating pad that is attached to the bottom of the fuel tank in the truck bed in order to provide additional heat in Winter.



Due to the cold temperatures in Winter, the vegetable oil fuel lines and the antifreeze lines that run between the engine and the fuel tank in the truck bed have been bundled together and wrapped with insulation.

nontoxic, create jobs, and carbon neutral, meaning that the carbon emitted as the vegetable oil burns is the same carbon that the plants absorbed while growing. Thus, no new carbon is removed from its burial spot in the earth and released into the atmosphere as with petroleum fuels.

The use of vegetable oil as a fuel falls into two main categories: fuels made by modifying the vegetable oil so that it can be used in existing engines, or modifying existing diesel engines so that they can accept straight vegetable oil as a fuel. When the vegetable oil is modified through a refining process called transesterification, biodiesel is created. The transesterification process is a reaction between the oil, an alcohol (methanol), and alkali that removes the glycerin, which is a by-product of biodiesel production. Technically speaking, biodiesel is defined as vegetable oil derived mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats which conform to industry specifications (ASTM D6751) for use in diesel engines. Biodiesel refers to the pure vegetable based fuel, before it is combined with diesel fuel. Biodiesel blends are denoted as, "BXX" with "XX" representing the percentage of biodiesel the blend contains. (i.e. B20 is a blend of 20% biodiesel and 80% petroleum diesel, while B100 is pure, unblended biodiesel). Since the production of biodiesel involves special equipment and the use of expensive and hazardous chemicals, many folks (like myself) prefer to modify our diesel vehicles to run on straight vegetable oil (SVO) that has not been previously used, or waste vegetable oil (WVO). WVO is the oil that comes out of the fryers in fast food restaurants after they have used it for cooking french fries, chicken wings, etc. The modification process typically involves installing a second fuel tank (for the fryer grease), a fuel pump and filter for the vegetable oil fuel, along with a way to heat up the oil and switch back and forth between diesel (or biodiesel) and the vegetable oil fuel. SVO or WVO is typically too viscous to be used in a diesel engine. However, once vegetable oil is heated up to a temperature of approximately 160-190°F, its viscosity is decreased and the spray pattern it creates as

it is forced through the engine injectors is similar to that of diesel fuel, allowing it to burn the same. According to one VO conversion company, Rover Hybrids, a diesel engine running on veggie oil will operate within three to eight percent as efficiently in terms of miles per gallon and horsepower as compared to running on regular diesel fuel. On the road this translates into no noticeable difference for the operator. In fact, Rudolph Diesel, the inventor of the diesel engine, originally designed his engine to run on vegetable oil. Today's diesel engines are refined and improved versions of Rudolph Diesel's original design. They are often used to power ships, submarines, locomotives, large trucks, and in electrical generating plants. More and more however, diesel engines are being used in small trucks and cars due to their benefits. A diesel engine will get significantly more miles per gallon than the same size gasoline engine, and they last about twice as long before wearing out. After the installation of a SVO system, your car or truck will be able to operate on either diesel, biodiesel, SVO or WVO. None of these fuels will work in a gasoline engine. They can only be used in diesel engines. Most VO conversions are done on older model vehicles since automobile manufacturers will typically void the warranty on any vehicle that is modified to run on vegetable oil.

In order to address the growing environmental concerns, as well as try to lower my overhead costs, I have recently converted my bee truck, a 2001 Dodge Ram 2500 to run on WVO. I prefer to use waste grease collected from local restaurants as a fuel over SVO, due to issues surrounding the use of food as fuel which does not seem like a good idea to me. Local eateries typically have to pay to have their waste oil hauled away and are often glad to have someone local pick it up for free. Aside from collecting the used vegetable oil from a local fast-food chain, the only other work typically involves filtering the oil before pouring it into the vehicles veggie oil fuel tank. The better this pre-filtering process, the longer the on-board veggie oil fuel filter will last before having to be replaced.

My truck came with a 95-gallon transfer tank

installed in the bed of the truck that the previous owner used to refuel heavy equipment at a construction site. I had this tank converted into my vegetable oil fuel tank by having a Hot Fox in-tank fuel warmer inserted down through the middle of the tank. Hot engine coolant is piped from the engine back to the Hot Fox. The heat from the hot coolant warms the hot fox (and the oil around it) and then is redirected through the veggie oil fuel filter and two heat exchangers before going back to the engine. The vegetable oil fuel is drawn up through the in-tank fuel warmer and into the fuel filter. Then it runs through the two heat exchangers on its way up to the fuel injector pump that pumps the oil into the engine injectors.

A common feature of diesel engines is that they feed more fuel through the fuel lines to the engine than the engine can burn. Thus, there is typically a fuel return system that transports the excess fuel that the engine does not burn back to the fuel tank. The system that I am using also returns the unburned vegetable oil back to the veggie fuel tank. This feature makes it easier to remove air bubbles that may get into the fuel system and the warmed fuel returning to the fuel tank helps to warm the rest of the fuel in the veggie oil tank when the temperature is freezing. Other systems have a closed loop system that feeds the excess warmed veggie fuel back into the fuel line leading to the fuel injector pump in an effort to further heat up the fuel being introduced into the engine.

The final key part of a veggie oil system is a fuel switcher that allows the operator to switch between diesel (or biodiesel) and vegetable oil. Since the heat produced by the engine is used to heat up the vegetable oil, the veggie fuel will be cold when the engine is first started up. Unfortunately, engine damage may result when cold vegetable oil is burned as fuel in diesel engine, therefore all diesel engines must be started up on either diesel or biodiesel fuel first. Then once the engine has warmed up to operating temperature, the fuel can be switched over to vegetable oil. By the same token, before shutting off the engine, the fuel needs to be switched back again so that when the engine is shut down, diesel or biodiesel is in the fuel lines and the engine is thus primed and ready for a cold start later on. The engine can be shut down on vegetable oil as long as it will be restarted again within 15 minutes or so, before the vegetable oil (and the engine) has had a chance to cool off too much. The fuel switching valve is typically controlled by a switch that is installed on the dashboard of the vehicle. Thus, using grease to run your vehicle is typically more about increasing the number of miles per gallon your vehicle runs on diesel fuel rather than being able to replace one fuel for another.

The primary benefit of converting a diesel vehicle to run on vegetable oil is the reduced toxic emissions and its role in helping to wean us off imported petroleum. Financial benefits are possible if one is able to obtain used vegetable oil for free long enough to off-set the initial cost of parts and labor for installing the conversion kit. Depending on your vehicle and the sophistication of the conversion kit you install, it can cost anywhere from about \$800 \$5000 or more to convert a vehicle to run on vegetable oil. If you are mechanically inclined and have the tools available, you may be able to install

a veggie oil system yourself. Otherwise you will have to have someone else do it for you. You can save several hundred to well over a thousand dollars and assemble the parts you will need to convert your vehicle yourself. However this process can take a long time to complete and by purchasing a kit you take advantage of the trial-and-error process of others in assembling components that will work together without difficulty.

There are numerous enterprising individuals who have started their own businesses installing vegetable oil conversion kits in vehicles. Alternatively, if you know a mechanic who is adventurous and willing to learn new systems, you may be able to have them install it for you. It is recommended that you work with your installer (if possible) so that you are familiar with the system and have at least a basic working knowledge of it so that should the system need maintenance while you are away from home, you can explain how the system works and what is needed to others who may be trying to get you back on the road. I went with a higher priced system for my bee truck that utilized more rugged components that I felt were more appropriate for a work vehicle. Thus, in order to help keep the overall cost down, I had my local vocational technical center diesel shop class convert my vehicle over to vegetable oil as a class project. All I had to do was cover the cost of the parts and materials and make a small donation (so that one of the students could attend a diesel engine maintenance competition). One word of caution: you can't be in a hurry if you are going to let a class install a veggie oil system in your car or truck. A class typically only meets for a couple hours a day and many days are dedicated to other things such as holidays, teacher-in-service days, testing days, special projects, etc. Thus, you must be very patient as it can take four to eight weeks or more before the installation is complete. The upside is that because it is a class project, the installation will tend to be impeccably done, with time taken to be sure everything is installed as professionally as possible and teachers are more likely to take unexpected issues that come up during the installation in stride and treat them as learning opportunities for the students should the parts provided with the kit not exactly match up to the requirements of your vehicle.

My Dodge Ram conversion kit included a VO Controller device that activates the fuel switching valve automatically and helps make running the vehicle as foolproof as possible. The VO Controller monitors the temperature of the engine coolant and switches the fuel from diesel (or biodiesel) to vegetable oil when the coolant temperature reaches the appropriate level. While the engine is running on vegetable oil, the VO Controller continues to monitor the coolant temperature and will automatically switch the engine back to diesel fuel should the coolant drop below the optimum operating temperature. It will also monitor the vegetable oil fuel pressure and will automatically switch back to diesel should the veggie tank run dry, or the veggie filter clog up, causing the fuel pressure to drop. Then when the engine is turned off and the key removed, the VO Controller will automatically purge the fuel lines of vegetable oil and runs the vehicle on diesel for a short period to be sure all the veggie oil has worked its way out of the fuel lines before shutting the vehicle down. Manual overrides



The Fass Fuel filtering system includes a fuel pump that pumps the veggie oil from the fuel tanks, through the filter and up toward the engine.

allow you to switch between fuels manually should you choose. The VO Controller is worth the extra expense and a valuable addition if you are likely to have folks borrowing your vehicle who are not familiar with running a car or truck on vegetable oil.

The technology for running diesel vehicles on vegetable oil has come a long way in the last five years. While those who have experience with automobile mechanics may want to piece together their own system, there are numerous companies offering complete vegetable oil conversion kits on-line that often are customized to your particular make and model vehicle. One of the most exciting is the Elsbett Technology Company out of Germany. They provide a system that allows you to actually replace your petroleum based diesel fuel with vegetable oil. Elsbett offers single tank conversion kits that feature heavy duty glow plugs and

other modified parts that once installed allow you to fill your existing tank with vegetable oil and forego the need for a second tank or to start and stop on diesel or biodiesel. They currently offer kits for selected Ford and Dodge pickup trucks and unfortunately, mine was not among them, otherwise I would have probably gone with one of the Elsbett systems.

For those that want to go even farther in reducing their use of petroleum, look into the Renewable Lubricants company out of Hartville, Ohio. They offer vegetable based motor oil that replaces the petroleum based motor oil in your automobile thereby placing your engine on a totally vegetarian diet. Their nontoxic motor oils are manufactured to specifications equal to synthetic motor oils on the market today and can be used in both diesel or gasoline engines. I even use them in my mower and rototiller.

Given the lack of leadership shown by government and industry in the slow rate at which they are transitioning to non-petroleum fuels and vehicles with greater efficiency in an effort to wean us off our foreign oil addiction and stop aggravating global climate change, taking responsibility to convert one's car or truck to run on waste vegetable oil is something that concerned citizens can do today with existing technology. As a beekeeper, it may well mean the difference between earning a profit this year or taking a loss. **BC**

Ross Conrad is the author of *Natural Beekeeping*. You can reach him at P.O. Box 443, Middlebury, VT 05753, www.dancingbeegardens.com.

Resources:

- Elsbett <http://www.elsbett.com/>
- Fusel Diesel http://www.fusel.com/vegoil_sites.html
- Golden Fuel Systems - <http://www.greasel.com/>
- Grease Car <http://www.greasecar.com/>
- Rover Hybrid <http://www.roverhybrids.com/index.html>

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Fall Feeding

Jennifer Berry

If your bees need feeding, there's lots of right ways to go about it.

During the month of October it's great to be in Georgia. The days are cooling down and the evenings are just splendid. Plus, it's enjoyable working colonies once again. The steamy hot and humid (did I mention hot) days of July, August and sometimes September are gone. The days of wilting attitudes and heat exhaustion are just a bad memory. It's rough working colonies in Georgia during the Summer, especially the latter part (even though as I write this article it has been the coolest and wettest week in years thanks to the left over remnants of tropical storm Fay).

During the Summer the bees, at least in the Athens area, have nothing to do other than collect water to keep their colony cool. Very little is blooming so thousands of bored, frustrated, little foragers are stuck in the hive. And trust me they aren't happy about it and let you know each time you open that lid. Here's a typical August morning in a Georgia beeyard. By 8:30 a.m. you're completely soaked so the bees just stick to you, you can't see because the sweat is pouring in your eyes, the supers weigh a ton, honey is dripping everywhere, bees are popping you left and right, robbing becomes a huge concern, there's not a breath of air, chiggers are eating you alive, ticks on every blade of grass and there's snakes and black widows under every colony. I know some of you are shaking your head saying, "yep, been there, done that!"

But it's no longer August, it's October. Soon the leaves will begin showing off their magnificent colors and the sunsets will match the hues of the horizon. Fall is a spectacular time of year. But with Fall comes the end of many of our Summer pleasures. Gardens are rapidly cranking down and all those over abundant tomatoes, squash, cucumbers, cantaloupe, okra, and peppers you couldn't give away a few months ago, will once again become a precious commodity. Now is the time to plant our Winter gardens. It is also time to prepare our colonies for colder temperatures since they are just around the corner.

You can start by combining weaker colonies with stronger ones. If a colony has been limping along all

Summer, what is the point of keeping it around? Pinch the queen, and combine it with another colony, preferably one that needs a slight boost. Re-queening is also an option for queens that are past their prime. Older queens will stop laying too soon. You need a viable, young queen to continue laying into mid-November to insure a proper Winter population for survival. Also, check their pollen supplies. To enhance the queen's egg laying performance you will need fresh pollen coming in. If you don't see pollen coming in the front door add pollen patties. There are numerous pollen substitutes on the market. We tend to use natural pollen mixed with a pollen substitute and honey. The bees consume it quickly probably due to the presence of the honey.

Colony food supplies also need to be assessed this time of year. Here in the south we can experience a modest golden rod flow this time of year, depending on location. But my experience with the golden rod in the Piedmont region has been minimal to none. Don't rely on golden rod to supply your Winter needs (even in the



Plastic hive top feeder.



Pail feeder.



Plastic baggie feeder.

north). Colonies lacking in the amount of food required to survive the Winter need to be fed. If your colonies need a substantial amount of food you must start feeding today! Once the temperatures drop the bees won't be able to break cluster to collect the food. All the syrup in the world will be useless if the bees can't get to it.

Average sized colonies in this part of the country require a full *medium* super for Winter survival. If a colony is in need of this feed them roughly five gallons of 2:1 sugar syrup. I wouldn't recommend feeding the five gallons all at once because sugar syrup tends to go bad, especially in warmer temperatures. But feeding one to two gallons at a time has not been a problem for us.

Over the years I have tried practically every type of feeder available on the market and some not. I definitely have my favorites but every beekeeper or beekeeping situation is different. In the past we got into the habit of pulling most of the honey off our colonies in order to sell it on campus. Then we would have to feed in order for them to build up enough stores for the Winter. Yet, after doing the math it just wasn't adding up. By the time we set up the extracting equipment, pulled supers, uncapped, extracted, bottled, labeled, bought sugar, mixed up the sugar syrup, drove to all the apiaries and fed, plus paid for labor, it just didn't add up. Now, at least two medium (or shallow) supers are left on each of our colonies. Remember our nectar flow is over by June therefore each colony needs to endure nine months with little to nothing coming in the front door before the next flow arrives. To our north and south it is a different situation. Both regions experience a Summer and sometimes even a Fall nectar flow. But now the question at hand is how to deliver the feed necessary for their survival.

There are several different feeding options available to beekeepers: top feeders, buckets, zip-loc baggies, entrance feeders, and division board feeders. We have used them all but definitely prefer some to others. Most of the bee supply companies carry different versions of the same type of feeders but they all pretty much work the same.

Hive top feeders, as the name conveys, fit on top of the hive. To install all you do is remove the lid and inner cover, place the feeder directly on top of the upper super,

fill it with the appropriate amount of syrup, put the lid back on and walk away. There is little to no disturbance to the colony because you don't have to dig around inside manipulating frames. The bees will crawl up the hardware cloth from the super below and down to the syrup pool. They are made to fit a standard 10 frame hive body but there are ones available to fit nucs. Most now have a self enclosed, plastic unit holding one to five gallons of sugar syrup depending on the brand. These feeders tend to work the best, because they prevent leaking. You can also make your own top feeders (which we did once) but again, beware of leaking. If you need to put on a large amount of feed in a short amount of time this is a good option for you.

Years ago we made 50 hive top feeders out of plywood and such. The design was similar to the ones sold today with one exception; instead of a plastic insert we painted the interior with polyurethane. This lasted about a season, maybe two depending. Slowly over time they began to leak. And trust me this was a problem in our over crowded apiaries, especially in August. The slightest amount of sugar syrup that leaked outside the colony drew in bees by the thousands. Even the strongest of colonies were overwhelmed once clouds of bees forced their way inside. Another problem we experienced with the hive top feeders was the number of drowned bees (and yellow jackets) floating in the syrup. The bees were able to squeeze their way through the smallest of openings and under the inner cover/lid or they slide in-between the narrow openings in the wire mesh and outer wall. The newer hive top feeders have tried to eliminate this issue by making the feeders flush with the super and leaving no space for the bees to enter the syrup chamber. Finally there is the issue of cost. If you have more than one colony to feed the cost goes up considerably. I eventually got rid of all 50 of our hive top feeders.

Buckets are another way to apply large amounts of syrup at a time. The suppliers usually sell two gallon buckets with a removable plug in the center. You fill the buckets with syrup and turn it upside down with the plug intact. Vacuum suction keeps the liquid from pouring out. But be careful! If the seal has been compromised or



Boardman feeder.



Division board feeder.

the plug isn't inserted properly, the syrup may pour out all at once. Not a good idea to drench your colony with two gallons of sugar syrup. When feeding we bring a five-gallon bucket with us to the yard. Just prior to setting the bucket onto the colony we turn it upside down over the five-gallon bucket and let it drain. It's also best not to let it spill onto the ground around your colonies. It will attract robbers, ants, the beloved yellow jackets and other sugar seeking, hungry critters. Once syrup is no longer dripping we place it onto the colony. By the end of the day, depending on how many hives were fed, we may collect a gallon of syrup.

If your colony is close to starvation, place the opening of the bucket directly on top of the cluster. This allows the bees to use minimal effort to collect the syrup. Besides the syrup pouring out, there are other issues to consider when using buckets. One, the bees will propolize the metal grid attached to the plug which needs to be cleaned periodically. Second, you need an extra empty deep super per colony. Some beekeepers avoid this practice by placing the bucket directly over the opening of the inner cover and then laying the outer cover (lid) on top of the bucket, but I fear this approach. A good wind gust and both the lid and bucket will be tossed aside leaving an opening into your colony. However, I know several commercial beekeepers that use this method and have never had a problem. Plus, if your colonies are in the back yard this may be option worth considering. There is a way to avoid this all together. Cut a hole directly into the lid and add a plug. Then when you're ready to feed just pull the plug, place the bucket and walk away. This eliminates extra equipment needs plus the concern about weather affecting the woodenware.

The above two methods are the best for getting a good bit of syrup on at one time. But say you just need to get a few frames worth of honey into a colony. The past couple of years our method of choice has been to use zip-loc gallon baggies. We take the baggies, fill them with eight cups of syrup, smoke the bees off the top-bars, lay them on top of the frames, cut a four-inch slit (making sure not to slice into the bottom of the baggie), put an empty super on, add the inner cover and lid and move to the next colony. There is minimal cost involved, it's simple and there's little to no hive manipulation.

But as always there are a few problems associated with

this method too. If you are not extremely careful you can puncture the baggie (like placing it on the ground). You may not securely tighten the "zip-loc" allowing syrup to leak out the sides. Nails poking up through the top bars will puncture the plastic (happens while building frames). To check this run your hand or hive tool across the surface of the top bars where you plan to place the baggie. Trust me they are sharp enough to puncture the plastic. Also make sure the baggie is laying flat otherwise the syrup will leak out quicker than the bees can consume. Finally, environmentally speaking, the baggies can't be re-used again.

My least two favorite feeder options are entrance feeders and division board feeders but they do have their finer points. Entrance feeders are great for convenience. All you do is fill a quart jar, push the holder into the entrance, and plop the jar on. Easy enough and you can see when it is time to re-fill the jar. And again, you don't have to enter the colony. However, you are feeding only one quart at a time (although bigger feeders are available). This method could take months before you have any substantial amount of stores built up. Another problem is robbing (my favorite). The odor of the syrup will draw unwanted neighbors right to the front entrance, but if you only have a few colonies this may not be an issue. Finally, you can not use these during periods of cold weather.

Division board feeders eliminate the problem of robbing since the food is directly in the colony however you have to enter the colony and remove a frame in order for this to work. In addition to hive manipulation bees will drown, sometimes by the hundreds. In the past we added a piece of 8" hardware cloth cut to length and then folded and placed it into the feeder. This reduces the risk of bees drowning plus it helps keep the integrity of the feeder intact and open. Again you can't use it during cold weather because the bees are unable to break their cluster. Finally, during a nectar flow if you are not diligent about keeping syrup in the feeder they will fill it with comb. Best advice is to remove the feeder once a nectar flow is occurring.

Sometimes our bees just need a little assistance but just think what they give back in return.

Have a wonderful Fall.

See ya! **BC**

Stewarding At A Honey Show

En d Brown

Judge's Stewards, Sales Stewards, Teaching Stewards . . . There's Lots To Do At A Honey Show In Scotland

My first honey show was back in 1994. I had not received any instruction on how to present honey for show but decided it would be good to exhibit and learn. I asked the judge if I could stand in the background and listen to the comments made to his steward as he examined the different exhibits. I did learn a lot and from that year onwards I have exhibited at numerous shows, including the National Honey Show in London of which I am now one of the Judges.

It was in 1999 that I became Advertising and Publicity Convener for the Scottish Beekeeper's Association (SBA).

The first show that I organised was indeed a learning curve. The Scottish National Honey Show had always been held in Ayr as part of the Ayr Flower Show. The Council, at the last minute, decided the costs were too great and the show was cancelled. Organisers at The Dundee Food and Flower Festival were very accommodating and agreed that the Honey Show could be held there. They quickly made stands and allocated a corner of a marquee to the SBA. I attended with my exhibits and ended up attempting to organise the rest of the Honey Show as the Show Convener, at that time, was elderly and unable to attend. I soon realised I did not have enough people to help. Members of the public were keen to make purchases, ask questions on beekeeping and handle the exhibits, which is strictly forbidden. After that I made sure of more stewards to ease the burden.

Several years later the Show Convener's position on the SBA became vacant and I ended up taking that on

board as well. It seemed natural as I was attending different shows anyway with the Publicity stand.

I have a small Show Committee consisting of five people. We meet prior to the following two major honey shows and discuss the general running of the shows.

The Scottish National Honey

(RHS) which is held over five days. The first day is staging exhibits in the morning and judging in the afternoon. It is open to the public on the remaining four days. This year it was the 19th – 22nd June, 2008. The RHS is known world wide and is mainly agricultural with thousands of members of the public attending each day.

Because the SBA occupy a large marquee situated next to the main entrance of the show ground we are busy from 8:00 a.m. 7:00 p.m. each day. This show requires at least 30 stewards per day I am often asked what stewarding duties involve and I reply with 'having eyes in the back of your head' There is obviously more to it than that.

Firstly there are Judges Stewards. I will allocate one or maybe two stewards to each judge. It is the stewards job to make sure the judge has everything he/she requires. The steward will record any comments the judge may wish conveyed to the exhibitor. These comments are often left in note form under the exhibit for the exhibitor to retrieve after the show. The steward will also keep the tasting rods clean and record results. It is important that the steward informs the judge if he/she has an exhibit in a class that is to be judged. All exhibits are referred to by a number so the judge will not know the stewards exhibit. Judge's Stewards are often people who are working towards sitting their Judges Exam.

At most honey shows the stewards thereafter keep an eye on the exhibits as nobody, including stewards, should touch the display. They are encouraged to speak to the public, explain the show and beekeeping in general. This is often a good way of



Show has, over the years, expanded considerably and we now occupy a large area in a marquee. It now comprises of an educational area and a honey show. For this show, as well as two judges stewards, I require about six stewards per day and their duties are helping children make rolled foundation candles and general stewarding, keeping an eye on exhibits and talking to the public.

The SBA's other main show is The Royal Highland Show, Edinburgh



Stewards talking to a member of the public. Steward on the left is Ian Craig, President of the Scottish Beekeepers' Association.



Part of the wax display.

recruiting new beekeepers.

The RHS is slightly different due to the scale of the display. The marquee is divided into eight different areas – sales, honey show, honey tasting, candle making, mock apiary, observation hives, educational display and general stewarding. I have tried various ways to manage the tent and the present system seems to be the best although I say to the stewards that I am always open to comment.

After the judging and during the days the show is open to the public I divide the stewards into eight teams each with a team leader, preferably an experienced beekeeper. It is the Team Leader's job to give each team member a break and the opportunity to visit part of the show. By allowing only one team member away at any one time there is always plenty cover. Using the team system is also a good way for new beekeepers to help as there is always somebody to contact if asked an awkward question. The sales area will have a team who prefer to stay on sales while the others will

move round every two/three hours. This makes it more interesting for the stewards. We also have a lot of primary school parties visiting the marquee as part of the school education trail at the RHS.

Prior to the show I send all stewards a schedule so they know when and where to attend for duty and what their duties will involve. They are all asked to wear a white coat for cleanliness and identification. They are all warned that it is a long, tiring day but very rewarding.

I also have an SBA Committee member, Iain Steven, in attendance each day. The stewards report to Iain at the start of the day and he makes sure that all teams change over at the correct time. He is a roving steward, able to step into any position if required and between Iain and myself, see that everything is running smoothly.

Another benefit of having a large marquee is being able to erect my gazebo in one corner and this gives an area where the stewards can escape, sit down and have a cup of coffee. For

50p per day I provide tea/coffee, juice and biscuits. There is an urn with constant hot water and the stewards enjoy the seat and having a chance to chat to the others on duty.

When organizing a Honey Show it is worth being part of a large agricultural or flower show as that is the attraction to the public. Once in the Honey section of the show the public are amazed at the variety of the honeys and the different wax and related product displays. By having school parties attend it can 'sow the seed' for future beekeepers. Some adults visiting already have considered keeping bees and by talking to a keen steward they realise that it is not that hard and leave the tent with information on their local beekeeping group where there are often beginners classes and the opportunity to work with an experienced beekeeper. **BC**

Enid Brown runs about 70 colonies, and is the Advertising and Publicity Convener for the Scotland Beekeepers Association, and is also the show convener. She lives in Scotlandwell, Scotland.



Ian Craig, President SBA talking to a school party.



Part of the mock apiary where children open the hive and find pictures of bees on the frames.

MY LAWN – MY BEES

Must I choose one or the other?

Too much of anything

I suppose too much of anything can pretty much be a bad thing. I grew up near a large city swimming pool. It cost the ridiculously low fee of 10¢ to swim – per day. That was actually a nickel per morning and a nickel per afternoon. My Mom loved it. I was fenced in. I was monitored by professional life guards and it was cheap. I spent thousands of hours in that pool each Summer. Now, as an adult, I never, never have the urge to go swimming. Swimming is something I only do when I need to.

I sat underneath pecan trees at my grandparent's farm in the cab of a 1952 Dodge Pickup and practiced shifting the three-on-the-column transmission. My Grandfather was my instructor. I worked on it for months. I dreamed of the day I could legally drive (even though on back country roads I was already the primary driver). I was licensed at 16 and immediately drove everywhere for everyone. Over time, driving became routine. Over more time, driving became a chore. Now, driving is something I only do when I need to.

I have a whole list of these life's evolutions – water skiing, fishing, and hunting – but the one tired area I want to discuss with you here is cutting lawns. My first income-generating job was cutting grass. Times were different then. I and a friend – James – would push our mowers up/down various streets, looking for shaggy lawns. We were young teen businessmen. For \$1.25 (total) we cut an average urban yard. A larger yard – including trimming the curbs by hand – was \$2.50. Most people couldn't afford the higher quality job and just stayed with the basic cut. At our peak, we were cutting about twenty-seven lawns per week. Remember that the mowers were not self-propelled and we had to walk to each job pushing a mower. As time passed and I got better paying jobs, we reduced our numbers, but I kept some of the better yards into my very early 20s. I never grew to hate grass-cutting, but it was (and is) work. Now, cutting grass is something I only do when the lawn really needs it. But when and why does a lawn really need cutting?

When does a lawn really need mowing?

I realize that many of you have already put your mowers away for the year – but the next mowing season is not that far away. So you shouldn't feel too smug.

My mowing standards are liberal. I like to see grass clipping flooding from the mower chute. I like a clear, easy line to follow when I turn around. I don't use a vacuum mower, but I love self-propelled mowers. Since I don't use a lot of herbicides, I have a lot of weed contaminants. *Stop!* Why in the world am I putting you through all this non-bee related discussion? Simply because **it is bee-related**.

Everyone is a bit different.

I need to say that for all of you who mow regularly using vacuums or mulching mowers – or whatever – I am not criticizing you. Each of you reading this article has your personal reasons for managing your lawn in your way. But every year – every year – I am struck by the oddness of me feeling guilty for not regularly mowing lush clover that is alive with bee foragers and butterflies. But I can tell you flatly, that on my street of 40 or houses, I am the only one who is having these feelings. Take a drive down my street during the growing season. It will be easy to pick out my lawn. It's the dandelion-yellow one.

I don't have a good plan.

For several mowing seasons, I have tinkered with doing something other than just mowing flowering weeds and plants. This past season, I left nearly one-half acre completely unmowed for about 10 weeks. The grass, clovers and weeds grew nearly to my knees. I enjoyed multiple species of bees, butterflies, and a hoard of Japanese Beetles, on my run-away yard. Animal trails evolved. I truly liked the environment, but objectively, it looked a neglected mess. My neighbor, whose yard is literally picture perfect, at a social function asked, *"Say, I don't mean to pry, but what's up with your back yard?"* Another neighbor politely implied that the weed infestation in her yard was due to my lack of weed control. There is, no doubt, some truth in that suspicion. Even the city in which I live has a mowing ordinance. I wondered at what point was I in violation of that regulation. For these reasons, and others, I mowed the back yard. I did the deed in the early evening when all the foragers were home in bed. The next day, the place was quiet and still. Why didn't I feel good about it?

I need to be crystal clear.

I am not on a campaign to revert to pre-lawn days; however, I can remember those days. Remember the comments I made above about my grand dad teaching me to drive? He did it on a farmhouse front "lawn" that was about three acres of exposed sandy dirt and weeds. My grandmother diligently "swept" the yards once or twice per week with heavy stick brooms she made from local plants. Any grass sprig that tried to take root got hoed. There was a practical reason for this effort. Any bug that ventured onto the sand was considered to be chicken feed by free-ranging chickens. A venturesome snake that made a dash from the farm outbuildings to the house



James E. Tew

faced certain death on the trip. My grandparents could not conceive of anyone actually wanting grass to grow in the place of a nicely swept yard. In an article entitled, *The History of Lawns in America*¹ it is said, "Green, weed-free lawns so common today didn't exist in America until the late 18th century. Instead, the area just outside the front door of a typical rural home was typically packed dirt or perhaps a cottage garden that contained a mix of flowers, herbs, and vegetables." Apparently, that was a bad thing that needing improving. A well-kept lawn symbolized disposable wealth and an ability to appreciate the finer things in life². But before we all could really have a dependable lawn, we had to wait for both the water hose and the rotary mower to be developed. Along the way, sod and grass seed producers had to evolve. This was not an overnight transition.

Why grass?

How did clover get labeled as a weed? It fixes nitrogen. It smells nice. It is drought-tolerant. It reseeds itself. It provides food for insects and other wildlife and it feels nice under bare feet – but by present standards, it's a weed requiring chemical applications of herbicides. Back in 1915, when the USDA, in collaboration with the U.S. Golf Association developed suitable strains of grass for golf courses and lawns, why were other plant species not considered? I don't golf on either my front or my back lawn. But all my choices for my lawn are mowable, golf course-type grasses such as: Bermuda grass, Fescue, or Blue Grass.

You want cheese on that?

I like cheese fine, but I simply don't want it on everything I eat. Yet, it is a constant struggle to stop the addition of cheese to burgers, sandwiches, potatoes, eggs, grits, and salads. (I do want cheese on pizza.) I suppose that one day soon, it will be salt, pepper, and cheese that routinely sit on the table. It seems to me that, primarily through marketing, a product and a procedure becomes established like putting cheese on foods and maintaining grass lawns. It becomes a way of life. You *don't* want cheese on that? You actually *want* a plant option besides grass for your lawn? How weird is that?

Mr. Mouth

Up to this point, I have been Mr. Mouth, pointing out the various things I feel are wrong. Okay, so what do I want and what am I willing to do? I honestly don't know. I do know that I have few non-grass options (actually none) as lawn plant. I do know that, from a bee stand point, mowing flowering clover, is not a good thing to do. I do know that I killed innumerable bees of all species and drove away butterflies while running my mower. I do know that if left unmowed, a clover-based lawn looks shaggy and unkempt. I do know that animal life I don't particularly want to have as yard neighbors seemed to appreciate the bonanza, too (raccoons, ground hogs, rabbits, and deer). I don't want more flower garden space that requires weeding, pruning and maintenance. As it is, I can't even keep the grass mowed and I can sit on a mower with minimal effort for my part for that job. Re-



ally, what do you think several large flower beds would look like at my place?

Where are the beekeepers?

Gardeners are clearly doing their part. Lovely flower beds, neatly maintained, outlined with grass and stone paths look great. Most gardeners seem to do more with their lawn-land than just cut grass. Yet they must work at it. But where are the beekeepers? Twenty-six million of us paid professional lawn management people to do our lawn work. We spend about \$17,000,000,000 per year on our grass lawns. Why has the bee industry not been more involved in asking for alternatives to grass lawns? I have either presented or listened to innumerable talks on bee plants but that was all for gardens or landscaping. In all my beekeeping years, I have not heard a single presentation on ways to maintain a neat, non-grass lawn that was both manageable and bee friendly. I have never heard of one plant breeder who was trying to develop lawn-type non-grass plant species.

Certified back yards – an alternative to the modern grass lawn?

There are programs all across the country that will help homeowners "certify" their back yard as environmentally friendly. The grass lawn vs. non-grass lawn issue I have been discussing is only one of several primary points of these programs. These programs offer support for land



Bee forager on a "weed" – clover.

¹The History of Lawns in America. http://www.american-lawns.com/history/history_lawn.html

²The History Behind Lawns. <http://www.allaboutlawns.com>



Dandelions – colorful, plentiful and hard to control.

that is more than just chemically treated, fertilized and mowed. The National Wildlife Federation³ program has similar points as other certification programs. The main areas are:

- **Food Sources.** For example: Native plants, seeds, fruits, nuts, berries, nectar
- **Water Sources.** For example: Birdbath, pond, water garden, stream

³Create a Certified Wildlife Habitat. <http://www.nwf.org/backyard/certify.cfm>

- **Places for Cover.** For example: Thicket, rock pile, birdhouse
- **Places to Raise Young.** For example: Dense shrubs, vegetation, nesting box, pond
- **Sustainable Gardening.** For example: Mulch, compost, rain garden, chemical-free fertilizer

Upon meeting the requirements, a placard can be posted allowing you to boast that your yard is an ecological haven. I haven't done this and I don't know anyone who has, but there are abundant web references to these programs so someone is doing it.

My sense of uneasiness.

I've not done a good job in this article. I don't feel that I have explained by thoughts very well. I don't hate grass. I don't disapprove of people who are in the lawn care business. I don't look askance at people who mow on a regular basis. But I can't get away from my one persistent feeling – every mowing season, I feel badly about eradicating and mowing plants that are supportive of my bees. I don't know what else to do. If I don't mow, my yard goes wild. If I do mow, my yard looks like a poorly maintained golf course. I don't feel a need to manhandle my yard but would rather co-exist with it. I don't feel a pressing need to kill absolutely every weed. They are only going to grow back, but if I don't control them to some degree, they will overrun everything. There presently is no methodology for anything but a grass lawn. There must be an alternative. I just don't know what it is. **BC**

Dr. James E. Tew, State Specialist, Beekeeping, The Ohio State University, Wooster, OH 44691, 330.263.3684; Tew.1@osu.edu; www2.oardi.ohio-state.edu/agric/bee/; geelab.osu.edu/

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Dividing Bee Perennials & Bulbs

Papever orientale - Checkers

Conn e Krochmal

Perennials and bulbs in the bee garden tend to be pretty carefree. They generally require little attention. However, some species can eventually get crowded. When this happens, they should be divided.

Typically, division is only necessary every three to five years or so. Certain vigorous ones sometimes need it more often.

Perennial bulbs can be divided as well when they become overcrowded. Dahlias can be included in this category since these tubers can be dug and saved at the end of the growing season.

Why Divide Plants?

Dividing tends to keep bee plants healthy, vigorous, and floriferous. Often, overcrowded plants will start to falter. Flowering can become poor or non-existent, which is undesirable in the bee garden.

Certain bee plants can be short-lived if they aren't divided on a regular basis. Among these are lupines, cardinal flower, pinks and other kinds of dianthus.

At times, there will be clear signs that the plants need dividing. For example, the leavers in the center of a perennial are noticeably smaller than the others.

Sometimes, a plant can develop a dead spot in the center of the clump. For best results, divide before this happens.



Narcissus 'Salome'

Which Bee Plants Can Be Divided?

The best plants for dividing are those that form colonies where each new plant or offset has its own set of leaves and roots. Typically, such plants will spread by means of offsets, suckers, rhizomes, or similar underground structures.

Bulbs and related bulb-like species can also be divided. These include tuberous-rooted ones as well.

Ones that can't be divided include those with a woody stem, a single taproot, or a cluster of stems arising from a single crown.

When to Divide

Division is a shock, and temporarily weakens the plant. Make it as easy as possible by choosing the right time. Divide during the cool part of the day. Early morning or late evening is ideal. Choose an overcast day if you must do it at other times.

Generally, the best seasons are during the early Spring after the new growth begins emerging or in the early Fall. However, the preferred season can vary from one kind of bee plant to another. It depends upon when the plant normally blooms. In the Spring, divide those that bloom during the Summer.

Fall is the best time for hardy bulbs and those perennials that bloom during the Spring. Do this at least six to eight weeks before freezing temperatures arrive.

For more information on specific perennials, refer to the list later in this article.

Preparing to Divide Bee Plants

First, water the plants you intend to divide. For heavy soils like clay it may be necessary to do this a day or so before you plan to dig. The soil need not be soggy. Yet, it should be soft enough so you can easily remove the plants in question.

Assemble the tools you will need, such as dividing forks, spading forks, trowels, hand pruners, shovels, and sharp knives. Dividing forks, which are used in pairs, are similar to ordinary forks, only much larger. These have short handles, while spading forks have long handles like those on a shovel. Be sure your pruners and knives are sharp. You want to make clean cuts.

Before digging perennials, prepare the new planting holes. Avoid exposing the roots any longer than necessary as the root hairs can dry out.

Dividing Bulbs

Bulbs and bulb-like species are very easy to divide. Dig the clumps, and shake most of the soil loose. Now, separate the bulbs by pulling them apart.

With peonies, dahlias, and similar tuberous-like plants, it often helps if you wash the soil off the roots before attempting to divide them. This enables you to see where the cuts should be made.

Hardy bulbs can be divided once the foliage turns brown, which will usually be about a month after they bloom. They can also be divided during the fall. Here are tips for various kinds of bulbs and bulb-like plants.

True Bulbs

True bulbs include daffodils, ornamental onions, hyacinths, and tulips. These spread by producing offsets. Most of these will naturally separate into small clumps as you shake off the soil.

Before planting these, remove any offsets that have developed around the base of the bulbs. Though these may be small, they will eventually become full-sized bulbs. For example, daffodil offsets might take four years before they're large enough to bloom. So, be sure and replant these when you divide.

Large flowered daffodils will need dividing about every three to five years. It is best to do this during the Fall. Those species with small blooms rarely need dividing.

The Spring-flowering ornamental onions (*Allium spp.*) should be divided during the Fall. These include Naples onion, Ostrowsky onion, Rosenbach onion, and Siberian onion. Divide the Summer blooming ones in the Spring. Among the Summer bloomers are ballhead onion, big flower rosy onion, and the lily leek, which is also called golden garlic.

Grape hyacinths (*Muscari spp.*), snowdrops (*Galanthus spp.*), and squill (*Scilla spp.*) are true bulbs as well. They should be divided during the Fall.

Tubers, Tuberous Roots, and Corms

When dividing these plants, it is important to wash off the soil so the eyes or buds are clearly visible.

These plants have eyes or growth buds that are located at the end of the roots nearest to the main stem.

Each new division will need a part of the stem as well as some of the roots. Otherwise, they won't grow properly.

Wind flowers (*Anemone blanda*) rarely need dividing unless they self-sow very heavily and create huge, crowded clumps. Winter aconites (*Eranthis hyemalis*) should be divided every two or three years. Their tubers are easy to break or cut into small sections.

Dahlias grow from tuberous roots. The best time to divide these is right before you plant them in the Spring. Wait until the eyes on the roots begin to swell so that you can see where to divide them. Typically, these can be divided by cutting the root into two or three pieces.

Make the cuts so that each new dahlia division has at least one eye in each individual piece and a section of the crown or stem.

Corms, such as crocus, are similar to bulbs. These are usually divided several months after they bloom. If you must do it earlier, wait until the leaves die back in late Spring. Fall is the preferred time. Autumn crocus should be divided before they bloom during the Fall.



Aster

When dividing crocus and other corms, replant all the tiny cormels. Resembling tiny little cloves of garlic, these develop around the edges of the mother corms. Within several years, they will mature.

Peonies should be divided during early Summer. Wait until these become very crowded. They resent being disturbed, and take some time to recover from division and transplanting.

Peonies develop a number of crowns that can usually be separated by hand. Sometimes, it is necessary to cut the root into individual pieces. If so, be sure and leave three to five eyes per portion. Divide by making a clean slice straight down the root.

When planting the new peony divisions, place the eyes two inches below the soil surface. Avoid planting too deeply.

How to Divide Bee Perennials

Dig each perennial clump with a shovel. Dig and divide one clump at a time. After all those new divisions have been planted, move on and dig the next clump.

Begin outside the drip line of the plant. Dig all around the edges of each clump so that the entire root system is loosened. Lift it from the hole.

Crocus -
Ruby Giant



Shake the soil loose from the roots. You want to be able to see the root system. In some cases, it helps to wash the soil off in a tub or bucket of water.

Next, begin the dividing process. The goal is to leave the roots intact whenever possible. You want large, vigorous divisions that will re-establish quickly. This means each one needs its full share of the roots, stems, and leaves.

Start dividing on the outside edge of the clump. Some plants can be easily separated with your hands. Examples include dianthus, violets, and creeping phlox. Species that produce suckers, such as asters, can also be pulled apart.

Some bee perennials, such as garden phlox, will have a number of stems with eyes at the base. First, try pulling them apart. If that doesn't work, cut the plant so that each new division retains some of the roots.

Sometimes, plants have dense root systems that can't be pulled apart. In such cases, try dividing forks first. Insert the two forks back to back. Using a back and forth motion, work the roots apart.

Those species with several crowns, such as hellebores, can often be separated with dividing forks. Pull or pry these apart into several small clumps. If more pressure is needed, use a trowel.

When all else fails, it becomes necessary to cut or slice the roots into sections. This is sometimes needed when plants have large, fleshy roots. It is also done when tiny roots become entangled.

Cut the roots in a systematic manner. You want decent sized divisions with ample root systems.

Depending on the size of the clump, most bee perennials can be divided into three or four sections. Very small pieces aren't as good. They will be slow in getting established, and are less vigorous.

Choose Healthy Perennial Divisions

Retain strong, healthy pieces for replanting. Typically, the best ones will be from the outer portions of the plant. These should be free of insects and diseases. Discard those with unhealthy roots. Sections with tough, woody, or fibrous centers will produce very few shoots. These won't be as vigorous or floriferous.

Groom and Prune Divisions

After you've made the divisions, trim off any broken stems, dead or unhealthy leaves, and damaged roots.

Roots that are intact should be left undisturbed. When dividing in the Fall, cut the tops back several inches. This isn't necessary during the Spring.

Replanting Bulbs and Perennials

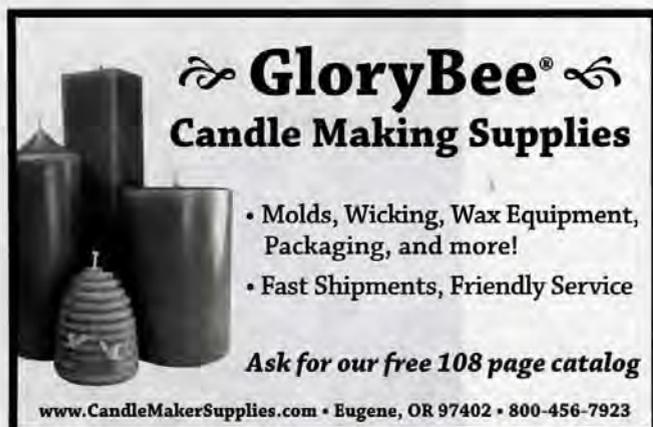
Place each division or bulb in the soil at the same level as it was previously. Giving them plenty of room, spread sprawling roots out as you plant. If placing divisions back in the same spot, refill the holes with compost.

Water newly planted perennials on a regular basis until they're well established.

Recommended Times for Dividing Bee Perennials

- Aster (*Aster spp.*) Spring
- Avens (*Geum spp.*) Spring or Fall
- Bellflower (*Campanula spp.*) Spring
- Blanket flower (*Gaillardia spp.*) Spring
- Blazing star (*Liatris spp.*) Fall
- Cardinal flower (*Lobelia cardinalis*) Spring or Fall
- Chives (*Allium schoeprasum*) Fall
- Coneflower (*Rudbeckia spp.*) Spring, every two to three years
- Coralbells (*Heuchera spp.*) Spring or Fall, every other year
- Coreopsis (*Coreopsis spp.*) Spring or Fall
- Creeping phlox (*Phlox spp.*) Spring or Fall
- Fleabane (*Erigeron spp.*) Fall, every two to three years
- Garden phlox (*Phlox paniculata*) Spring, every couple years
- Gas plant (*Dictamnus spp.*) divide only when absolutely necessary as division isn't always successful
- Hellebore (*Helleborus spp.*) Spring, only when very crowded
- Japanese anemone (*Anemone hupehensis, A. japonica*) Spring or Fall
- Lavender (*Lavandula spp.*) Fall
- Leopard's bane (*Doronicum spp.*) when dormant in Summer
- Lupine (*Lupinus spp.*) Spring
- Meadow rue (*Thalictrum spp.*) divide only when necessary, every five years or so
- Mints (*Mentha spp.*) Spring or Fall, every couple years
- Mums (*Chrysanthemum spp.*) Spring, every couple years
- Oriental poppy (*Papaver orientale*) when dormant in Fall, every three to five years
- Pinks, dianthus (*Dianthus spp.*) Fall, every two to three years
- Primrose (*Primula spp.*) Spring
- Rock cress (*Arabis spp.*) Spring or Fall
- Rock-cress (*Aubrietia spp.*) Spring or Fall
- Saxifrage (*Saxifraga spp.*) Spring blooming in Fall, Summer blooming in Spring or Fall
- Sneezeweed (*Helenium spp.*) Spring, every three years
- Speedwell (*Veronica spp.*) Spring blooming ones in Fall, Summer blooming ones in Spring
- Stonycrops, sedums (*Sedum spp.*) Spring
- Sunflowers, perennial (*Helianthus spp.*) Spring or Fall
- Thrift (*Armeria spp.*) Spring or Fall
- Violets (*Viola spp.*) Spring
- Yarrow (*Achilla spp.*) Fall **BC**

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



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ABF Meets In Reno In 2009

Plans are being made for an in-depth examination of *Varroa* mites at the 2009 North American Beekeeping Conference to be hosted in Reno, Jan. 13-17 by the American Beekeeping Federation.

Experts in every aspect of the parasite will look back at its past 20+ years in the United States; the present situation as beekeepers attempt to cope with its ravages of their colonies; and the future as new avenues of treatment and control become available through advances in research.

The North American Beekeeping Conference will be a gathering of beekeepers from across the continent. They will be able to renew friendships and make new ones as they compare methods and swap stories.

A free meet-and-greet reception will open the Conference on Tuesday evening. This will set the stage for the week when beekeepers will experience a mix of education about serious subjects – such as varroa and CCD – and plentiful social opportunities, both on the Conference schedule and in Reno in general. The Conference runs through Saturday evening and concludes with the ABF Annual Banquet.

The Serious Sideliner Symposium, a popular extra feature of recent ABF conventions will be back with two full days of topics of interest to the smaller beekeeper. Coordinated by Dr. Larry Connor of Wicwas Press, the SSS runs on Friday and Saturday. The Trade Show is expected to again be the largest in the U.S., and the Saturday morning, interactive workshops will be back.

The event will be at the spacious Nugget Casino Resort Hotel in Sparks/Reno. The Nugget is a self-contained adventure with nine restaurants plus casino and show entertainment all under one roof. The Conference rate is \$95. Check it out at www.janugget.com.

Details on the Conference are posted on www.ABFnet.org as they develop. For additional information, contact the American Beekeeping Federation, P.O. Box 1317, Jesup, GA 31598, ph. 912-427-4233, fax 912-427-8447, e-mail: info@ABFnet.org.



Mann Lake's Jack Thomas Addresses Beekeepers In Poland



Jack Thomas (right) enjoyed a glass of mead with conference host Janusz Kastelewicz and Alex Silchuk, assistant manager of Mann Lake's California office.

Hackensack businessman Jack Thomas knows very well the benefits of international trade and swift global transportation.

He and his wife Betty own Mann Lake Ltd., one of the nation's largest producers and distributors of beekeeping supplies.

From an office and manufacturing complex at the south edge Hackensack, Mann Lake Ltd. sells to hobby and commercial beekeepers in all 50 states and in countries around the globe. But Thomas also knows those benefits can have drawbacks.

International trade and speedy transportation also appear to be contributing to a major crisis going on in the beekeeping industry, Colony Collapse Disorder (CCD).

In early June Thomas traveled to Stozce, Poland, at the request of the Polish government, to address a two-day conference of 7,000 beekeepers from Poland, the Ukraine, the Czech Republic, Slovakia and Belarus. Total attendance at the July 5-6 event, including families, friends and the public, was around 18,000.

Thomas, the only American on the agenda, spoke twice on the topic, "Current Problems of U.S. Beekeeping."

The theme of this year's conference was "The causes and effects of mass deaths of bees (CCD)."

"Taken together (nutrition, mites, migratory beekeeping, viruses), these and other factors have weakened honey bee colonies to the point that when the bees leave the hive, they don't have the strength to return," he explained.

At the conference Thomas outlined the challenges that U.S. beekeepers are facing, what's being done to fight CCD, and assured his audience "that you are not alone; this is happening all over the world."

He said the conference's main purpose was to encourage dissemination of information and exchanges of ideas. Poland has been hit by CCD at about the same magnitude as the United States.

Mann Lake Ltd. has been working to fight CCD practically since the disorder was identified.

They are targeting the nutritional aspect of "the perfect storm" by developing an improved bee nutrition

Continued on Page 68

Dave Tarpy

Mapping the feral bee population just got easier.

As beekeepers, we have ample opportunity to go out and play with bees. Public citizens, however, have lately wanted to help honey bees but don't quite know how. Here is a way to encourage non-beekeepers to help honey bees, as well as beekeepers to help the public...

The standard line about feral or "wild" honey bee colonies is that there are 90-95% fewer of them now than there were before the *Varroa* mite was introduced in the mid-1980s. As a result, if you see a honey bee in your backyard garden, thank a neighboring beekeeper since it unlikely came from a feral hive living in a tree somewhere. Most of us, however, have heard reports of bees living in an old barn or oak tree, and – following the conventional wisdom above – have often chalked up these reports as isolated incidents: "Even though you've seen them there for at least 10 years, they couldn't have been the same bees but rather have died out and reoccupied by a new swarm every year"

But how many of these anecdotal reports do you have to hear before you start to doubt the conventional wisdom? How many times do you have to refer someone to a willing beekeeper to help remove a bee colony from their house? How many "bee trees" need to be found in the forest? The answers to these questions start with consolidating these anecdotal reports into one place so that we can get a better perspective of the feral honey bee population in the first place.

Ronnie Bouchon, a beekeeper in North Carolina and participant in the 2005 Cost-sharing program (see *Bee Culture*, **134 (9)**: 45-47), has developed a new website to help us do just that. Using Google Maps technology, he has established an online system for anyone to plot the location of a non-managed honey bee colony (of course, any and all personal information is kept strictly confidential and is not shared with anyone without consent). Aptly named www.SaveTheHives.com, the general purpose of the site is to simply collect all of the reports of wild honey bee nests and display them on a map. The display even plots a three-mile radius around each location so you can see the approximate foraging area covered by the feral population.

But the site offers much more than that. It provides useful information about the history of the feral honey bee population in the U.S., links to other efforts to help protect bee populations, and impressive instructions on how to find feral bee nests using the ancient art of

"beelining" (in short, following foragers making a bee line back to their nest). The hope is for nature enthusiasts, beekeepers and non-beekeepers alike, to take on the challenge of "hunting for bee trees."

What's more, mapping the feral bee population may have some important long-term benefits for honey bees in general. If the bees are living (and perhaps thriving) without the assistance of beekeepers, then how are they doing it? Is it possibly because they have developed a tolerance to *Varroa* mites, or because the mites they're living with are not as harmful? Recent research has suggested both may be the case, but more research is needed. For example, NC State Postdoctoral Fellow Dr. Deborah Delaney has recently secured a two-year USDA grant to compare the genetics of these putative feral bees to managed bees. If they are genetically similar, then it would suggest that these colonies are recent "escaped swarms"; but if they are genetically distinct, then it might suggest that these bees are "survivor stock" If the latter, they may offer some important insights into how we as beekeepers may cope with *Varroa* mites and other bee problems.



So what is www.SaveTheHives.com?

- A one-stop-shop for physically mapping the location of non-managed honey bee nests
- An information resource about feral honey bees (those not living in our beehives)
- An easy-to-remember web address to refer concerned citizens about honey bees

So what will www.SaveTheHives.com be used for?

- To track individual nests over time to determine if they survive or die off every year
- For georeferencing bee trees so that others may go out and verify their locations
- To possibly sample and analyze to determine what bees occupy the feral population and how they may be coping with *Varroa* and other pests

So please, encourage anyone who might know the whereabouts of a feral bee nest to visit www.SaveTheHives.com and plot the location of the colony. Together, we can see where these hidden bees are living, and we may even discover some important secrets that they may be hiding. **BC**

Dave Tarpy is the Apiculture Extension Specialist for North Carolina.

The Secret Life of Bees

A touching story about the need for love, family and redemption, *THE SECRET LIFE OF BEES* explores our undeniable desire for a sense of belonging and the often daunting journeys that we must navigate to achieve it. Set in South Carolina during the turbulent Civil Rights era, the home of the intelligent and independent honey-making Boatwright sisters (Queen Latifah, Alicia Keys and Sophie Okonedo) is suddenly thrust into upheaval with the arrival of 14-year-old Lily Owens (Dakota Fanning) and her caretaker Rosaleen (Jennifer Hudson). Surrounded by the unexpected comforts, grace and deep rooted spirituality Lily (Fanning) encounters in the Boatwright home, she forms a maternal bond with each of these women whose unique and special gifts help reconcile the loss of her mother. Lily ultimately comes to the realization that sometimes you must leave home in order to find it.

Owning and operating a successful bee farm and honey-making business, August Boatwright (Latifah) is the family matriarch running the household with a firm but loving hand with her sisters, the fiercely independent music teacher June (Keys) and the innocent childlike May (Okonedo). The Boatwright sisters' lives are disrupted when fourteen year-old Lily Owens (Fanning) and her caretaker Rosaleen (Hudson) appear on their doorstep seeking refuge. Lily, a lonely teenager haunted by the guilt of her role in the accidental shooting death of her mother, escapes the peach farm owned by her embittered and widowed father (Paul Bettany), who shows her neither kindness nor compassion. After fleeing with Rosaleen to Tiburon, South Carolina, a place surrounded by mystery and a strong connection to Lily's mother, they find shelter at the Boatwright household. Lily is immediately taken under the wing of August Boatwright (Latifah) as her new beekeeping apprentice. There she is given a comfortable place to explore and, for the first time in her life, just be. Lily also discovers joy in the simple pleasures of life through her deepening relationship with the Boatwrights and soon comes into her own, determined to enjoy the

sweet nectar of life for the first time. As a budding young woman who has left the place she once called home, Lily unexpectedly finds her true home and a family she has always yearned for.

Tristan Wilds stars as August's godson and Lily's newfound friend, Zachary Lincoln Taylor, a hardworking teenager who dreams of becoming a lawyer; Nate Parker as a young man head over heels in love with marriage resistant June Boatwright (Keys) and Hilarie Burton as the mother Lily only remembers in her dreams.

Julian Wooten, Bee Wrangler and beekeeper operates a berry farm and 100 colonies in Jacksonville, NC. Julian explains his involvement in the movie –

I was contacted in mid-December, 2007 about renting some of older beekeeping equipment for *The Secret Life Of Bees* (hand-cranked extractor, old hand cart, smoker, 60 (two and a half story) empty beehives with telescoping covers and bottoms). A few days later other studio folks contacted me about managing several colonies of bees for the movie. From there, I took a trip to the Herring peach orchard in Lumberton, NC where some of the movie was to be filmed, to see the bees. The bees were strong in population and gentle. Gina Prince-Bythewood, the movie director, observed the bees being worked and asked if I could teach the actors and actresses to manipulate the bees as she had observed. The answer was “yes, with some good weather and some time.”

They scheduled Dakota Fanning and Tristan Wilds to come to my farm for “bee school.” I went over near the set in Watha, NC to do training for Queen Latifah and for Tristan. We trained both outside and inside the heated greenhouse where the bees were. It was January and February and the weather was cold. We were fortunate to have warmer days for shooting.

Working with the actors was great! They were all good students and wonderful people. Queen Latifah had to be able to take a frame out of an active hive without gloves. She was a little nervous, as anyone would be, but came through with flying colors. She was easy to work with, and I was proud of what she was able to do. Dakota Fanning is an amazing young lady and a brilliant actress. She is incredibly bright and so warm and gracious – a real joy! Tristan Wilds is a very talented and personable young man. I thoroughly enjoyed teaching him about bees. He got stung once, but handled it exactly as he had been taught. He was happy when he “graduated” from bee school.

I prepared an observation hive from one of my colonies which I took to filming locations for show and tell for the cast and crew. The observation hive was also the source of the two worker bees that I needed to have walk across a cake plate while being filmed. Fortunately, we were able to pull it off. We also used bees from the observation hive when a single bee was needed. Casey Grimes, the bee assistant, was very helpful to me in taking care of the bees. She also prepared a bee basics packet to help the cast and crew. **BC**



Dakota Fanning and Queen Latifah.

CALENDAR

◆INTERNATIONAL◆

The 2008 Ontario Beekeepers' Association, Canadian Honey Council and Canadian Association of Professional Apiculturalists will hold their meeting December 11-13 in Niagara Falls, Ontario.
www.honeycouncil.ca or www.ontariobees.com.

◆ALABAMA◆

The 2008 Annual Meeting of the AL Beekeepers Association will be in Prattville, AL at the Imagine Suites on October 10-11. Speakers include John Skinner of the University of TN, James E. Tew of OH State University, and Jerry Hayes of *The Classroom* and the FL Department of Agriculture & Consumer Services. Check our website www.alabamabeekeepers.com for information.

◆ARKANSAS◆

The AR Beekeepers Association will hold their annual meeting October 10-11 at the Ozark Folk Center in Mountain View.
James Rhein 870.481.5392, www.arbeekeepers.org.

◆CALIFORNIA◆

The CA State Beekeepers Association will hold their 119th Annual Convention November 11-13 at Harrahs Lake Tahoe, Lake Tahoe, Nevada. Speakers - Jerry Bromenshenk, Michelle Flenniken, Eric Mussen, Sue Cobey, Steve Sheppard and Eric Olson.
Patti Johnson, castatebeekeepers@hotmail.com or 209.667.4590.

◆CONNECTICUT◆

Southern New England Beekeeping Assembly will be held November 22 in Hamden. This event will be cosponsored by The Back Yard Beekeepers Association and The CT Beekeepers Association and Wicwas Press. Speakers include Rick Fell, Kirk Webster, Blake Shook and Larry Connor.
For information visit www.sneba.com.

◆FLORIDA◆

The FL State Beekeepers Association will meet October 30 - November 1 at the FL Farm Bureau, 5700 SW 34th Street, Gainesville.
The theme is "Beekeeping In FL 15 Years From Now." The Master Beekeeper Apprentice Course will be Thursday and Lessons in Beekeeping on Saturday.
Visit www.floridabeekeepers.org or contact Nancy Gentry, 386.684.3433, farmbees@gmail.com.

University of FL Master Beekeeper Program Training and Examination will be held October 30 at the FL Farm Bureau Federation in Gainesville. The cost is \$30 per person and starting time is 7:30 a.m.
For more details visit www.UFhoneybee.com.

◆IOWA◆

Iowa Honey Producers will hold their 96th Annual meeting November 7-8 in Marshalltown at the Best Western Regency Inn, 641.752.6321. Speakers include Randy Oliver, Michael Bush, Warren Nelson and more.
Contact Melanie Bower, 207 S.E. Deihl, Des Moines, IA 50315, 515.287.9875 or MELRB@msn.com.

◆LOUISIANA◆

The Honey Bee Breeding, Genetics & Physiology Lab will hold their annual Field Day October 18 in Baton Rouge at the lab, 1157 Ben Hur Road.
The field day includes activities for beginners and advanced beekeepers. Gates open at 9:30 a.m. and the cost is \$10/adults and \$5/children which includes lunch.
Allen Sylvester 225.767.9291; www.labeekeepers.org.

◆MICHIGAN◆

Second North Central Queen Assembly will be October 11 at the Comstock Community Center, from 8:00 a.m. to 4:00 p.m. This event is sponsored by Wicwas Press.
Speakers include Joe Latshaw, Krispen Given, Larry Connor and others to be announced.
Wicwas Press, eebebooks@aol.com or 269.344.8027.

MI Beekeepers Fall meeting will be at The Valley Plaza Resort in Minland, October 31 & November 1. For reservations call 989.496.2700 or email tina@valleyplazaresort.com. Be sure to tell them you are a beekeeper to receive the special rate. Randy Oliver will be the main speaker.
Jim Dodder, 810.653.8547, Gemini7737@charterm.net; www.Michiganbees.org.

◆MISSISSIPPI◆

MS Beekeepers Association will hold their annual conference November 7-8 at MS State University, Starkville. A block of rooms has been reserved at The Holiday Inn Express, 662.324.0076.
Speakers include MS House of Representative Ken Morgan, Marla Spivak, David Tarry, Tom Rinderer, Clarence Collison, Richard Adee and more.
Harry, 662.325.3390; harry@mdac.state.ms.us or D.L. Wesley, 601.736.3272; dwesley39483@msn.com.

◆MISSOURI◆

The MO State Beekeepers will hold their Fall 2008 meeting October 31 - November 1 at the Lodge of the Four Seasons, Lake Ozark. Room rate is \$79 and for reservations call 800.843.5253; online www.4seasonsresort.com.
Speakers will be Marion and Susan Ellis.
For information visit www.mostatbeekeepers.org.

◆NEBRASKA◆

NE Beekeepers Association will hold their Chemical-Free Beekeeping Conference November 21-23 at Southeast Community College, 301 S. 68th Street Place, Lincoln.
Speakers include Dee Lusby, Corwin Bell, Dean Stiglitz and Michael Bush. Cost is \$95, deadline November 14.
Nancy Holman 402.437.2712, nholman@southeast.edu.

◆NEW HAMPSHIRE◆

The NH Bkprs Assn will hold their Fall meeting October 18, 8:30 a.m. to 2:30 p.m. at The Yard, Manchester.
Randy Oliver will speak on the state of Beekeeping In The U.S. and "Beekeeping In The 21st Century."
Contact Richard Dionne at beerich4u@msn.com.

◆NORTH DAKOTA◆

ND Beekeepers Association will hold their Annual Convention October 3-4 at the Best Western Doublewood Inn, 1400 E. Interchange Ave. Bismarck. For reservations 800.554.7077.
Contact Melanie Freeman, 701.448.9153.

◆OHIO◆

The OH State Beekeepers Association will hold their Fall meeting October 31 - November 1 at the Martin Janis Senior Center, 600 E. 11th Avenue, Columbus. Cost \$10/members; non-members \$20. Speakers include Malcolm Sanford and Kim Flotum.
Bob Hooker 440.774.1645; beekeeperbob17@hotmail.com.

◆OKLAHOMA◆

The OK State Beekeepers will hold their Fall Conference October 24-25. Topics include Mites and Hive Beetles, Pollination and Nectar Plants. CCD and more.
For more information visit www.okbees.org.

◆PENNSYLVANIA◆

The Capital Area Beekeepers' Association will hold their meeting at the Maclay Street Farm Show Building, Room B, October 17 at 7:30 p.m. in Harrisburg. Featured speaker will be Roy Hendrickson from OH.
Jim Hoover, 717.691.1413, hooverdron@aol.com.

◆TENNESSEE◆

The Tennessee Beekeepers Association will hold its Annual Conference October 17-18 in Memphis. Speakers include Jerry Hayes, Jamie Ellis, Amanda Ellis, Ed Levi and Kent Williams.
For information please visit www.tnbeekeepers.org.

◆VERMONT◆

Bennington County Beekeepers Club Limited will hold their meeting October 19 at the Vermont Veterans Home. The speaker will be Dewey Caron.
Jacob Esh, 802.447.0198, cbook@pngusa.net.

◆VIRGINIA◆

The VA State Beekeepers Association will meet November 1 at Blue Ridge Community College in Weyers Cave. The theme is "Research Related to Beekeeping, nearby and from unexpected sources." Speakers include Jose Fuentes, Wayne Esaias, Frank Linton, Wyatt Mangum, Rick Fell.
www.virginiabeekeepers.org; vabees@virginiabeekeepers.org.

◆WISCONSIN◆

WI Honey Producers Assn. will hold their Fall Convention November 7-9 at the Best Western Grand Seasons Hotel, Waupaca. For reservations call 715.258.9212.
Contact Dan Piechowski, 920.566.4132.

Mann Lake ... Cont. From Page 65

and feeding regimen. According to Thomas, beekeepers who follow it report having fewer problems.

Mann Lake Ltd. also is working on a new control for the *Varroa* mite.

"(International trade) brings in pathogens and invasive species from around the world," Thomas observed as he listed lampreys, Zebra mussels and others found in Minnesota. "They don't have natural enemies here, and they go wild!"

In addition to his two species, Thomas and Aleksandr (Alex) Sikchuk, assistant manager at Mann Lake's California branch were kept extremely busy at Mann Lake's vendor booth. Sikchuk speaks Polish and served as Thomas' translator. Thomas predicted that the Polish trip will produce new trade relationships in Eastern European countries.

The conference was hosted by beekeeper and honey producer Janusz Kastelewicz and was held at Sadecki Bartnik, his working estate near Storze.

"That place was unbelievable," Thomas declared, as he paged through a book of color photos of the estate's buildings and grounds. "Poland's a beautiful country, gorgeous with lots of history and rich resources."

In addition to honey, the estate produces cherries, apples and other fruit from sprawling orchards that the bees pollinate. A beekeeping museum on the grounds is open to the public.

The two-day event looked like a small version of the Minnesota State Fair, Thomas remarked.

"They had beer gardens, food vendors, arts and craft booths, merchandise, and lots of little stores selling honey-related products. It's a huge promotion! There's nothing like it in the U.S. We could learn a lot from them!"

Back in Hackensack, Mann Lake Ltd. is adding another manufacturing facility and may have yet another expansion in the works.

Mann Lake Ltd. is located at 501 First St. S., in Hackensack. For information or questions, call 218.675.6688. The website is www.mannlakeltd.com. **BC**

taken from the *Pilot-Independent Hackensack, MN*



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The postcard said everyone was invited and bring a friend. I took my 11-year-old daughter, Ariele, and her camera. We drove out of the village on a small road that wound up through a steep glen and stopped at an old barn. On the milk house we saw a rusty "Honey" sign. Cars, vans, and pickups parked haphazardly along the road. A dozen dilapidated hives sat in the barnyard.

People stood around talking. Some wore white coveralls and held brand new veils and gloves. Others wore blue jeans and flannel shirts and held tattered veils. We had come to watch Dan King, founder of the Steuben County Honey Bee Association, reveal his Spring hive management secrets. Dan gathered us around the hives for the first demonstration. The beginners immediately put on their new veils and gloves. The more experienced beekeepers waited in an unspoken contest of courage – last one to put on his veil wins. Dan didn't even bring one along.

"First, I am going to show you how to mark a queen," Dan announced. He held up a small tool resembling a magnifying glass frame with wire mesh instead of a lens. "I just bought this here queen marking kit." He looked through the frames until he found the queen. Laying that frame across the top of the hive, he caught the queen under the wire mesh, painted a dot on her back, and then released her "I can tell the age of a marked queen by the color of the dot. For queens hatched in years ending with two or seven, I use a yellow dot. Years ending in one or six are white, three or eight are red, four or nine are green, and five or zero are blue."

"Hey, Dan! What's wrong with your queen?" someone called. She was lying on her side kicking weakly.

"Well, I must have pushed down too hard." He replaced the frame and lid. "This is the first time I've used one of these queen markers. The way I always done it before was with two pieces of timothy grass stalks. You lay one over the queen to hold her down, dip the second in the paint and dot her on the thorax."

"Hey Dan! You've got a swarm!"

"Huh, what?" A softball sized swarm hung from a cherry tree 30 feet from the hives. "Now where did that come from?" Dan said. "It couldn't be any of these hives here. Must have just flown in from somewhere. Well, I'll catch them later. Now let me have your attention. I am going to demonstrate making splits. First, let's open this hive. It contains a brand new Carniolan queen. I'll find her so she doesn't accidentally end up with the new queen in the split."

Dan began pulling out frame after frame looking for the queen. The bees flying around the hive grew increasingly irritable. I slipped on my veil. Two other observers simultaneously began the "sting dance" – wildly gyrating while moving away from the hives and clawing at parts of their body. Some scientists believe that by plotting the trajectory and velocity of sting dance performers, you can determine the location, size and aggressiveness of a hive. Other scientists reject the theory. I believe more research is necessary.

"So, Dan, how often do you get stung?" asked one of the observers.

"Huh?"

"How many, say, stings per hour do you get when you are working bees?"

Dan shrugged. "I don't notice partic'arly." He was searching the third time through the brood combs and checking the sides and floor of the hive. "I just saw her this morning. I can't imagine where she could be."

"Hey Dan," someone called, "That swarm is taking off. I bet there goes your new Carniolan queen!" The swarm drifted over

the valley

Dan concluded his demonstration of hive splitting by showing us the double screened board he places between the mother hive and the split. He explained how you could let the splits make their own queen or buy a second queen for the split. Dan usually let his bees make their own queen because, he claimed, they were superior to "store bought" queens. In this case, Dan's Carniolan colony would have to make their own new queen.

Dan led us through his honey house – a converted milk house with an ancient four frame honey extractor and bulk tank. He showed us the workshop where he assembled hives. Dan has tried nearly every gimmick offered in the bee catalogs over the last 40 years. The useless inventions lined his barn walls.

The formal tour broke up as novices and old timers gathered in groups eating doughnuts and drinking coffee. The old guys told the wide eyed beginners bear stories, skunk stories, swarm stories, sting stories, and stories about customers who liked dead bees in their honey ("now I know this is *real* honey," they say). Ariele's camera battery had died an hour earlier. Now she was trying to squeeze through a six inch gap between the honey house and barn. That was her way of saying "Let's go home."

We left with two or three bits of new knowledge, a stock of interesting lore, a winter's supply of fireside tales and the realization that no matter how knowledgeable you become, honey bees will always surprise you.

Peter Sieling

Beekeeper's Field Day

BOTTOM BOARD