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# Bee Culture

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Summertime beeyard. (photo by Kim Flottum)

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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

Publication Assistant – Sharon Garceau, Ext. 3255, Sharon@BeeCulture.com

#### Contributors

Clarence Collison • James E. Tew • Ann Harman

Malcolm T. Sanford • Steve Sheppard

Larry Connor • Connie Krochmal

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#### Contact Information

V800.289.7668 • V330.725.6677 • F330.725.5624 • www.BeeCulture.com  
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# Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

AUGUST 2006 VOLUME 134 NUMBER 8

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## Correction

In the *Research Review* article in the July issue the dose of imidacloprid necessary to kill 50% of the subjects was printed as 33 grams. It should have been 33 micrograms.



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## Enjoyed July Cover

I just wanted to let you know how much I enjoyed that hysterical cover on the July issue! I was feeling kinda low on my way out to the mailbox; we've had too much rain and my property is all flooded. Water and bees don't mix well. I had such a laugh to see that crazy beginning beekeepers class! The squirrel jumping out of a hive, the PETA guy taking pictures; what a hoot! Thanks for a great magazine.

Amie Tara  
Oregon, OH

## The Honey Man

For many years I have been called (as have others) "The Honey Man" or "Bee Man." I was just a small hobby beekeeper and met lots and all kinds of people.

As I look back, it is in great awe and amazement. Thank you Lord!

My honey was sold in over nine grocery and hardware stores (including two large local department stores to advertise a new Italian soap with beeswax in it), craft fairs and my home. My honey has been carried or sent by customers to all over the U.S. and the world.

I had great experience in promoting beekeeping locally through the local association. As VP and President and on my one, through malls, radio and TV, newspapers, talks to garden clubs, letters to editors of the bee magazines and etc.

As a southern gentleman (mostly), I call all ages of females "Honey," a term of endearment, love and hope.

Most of my "bee buddies" are gone now. I am old and worn and am still called a honey/beeman and requests for more honey. What an honor!

This is not "bragging" but to show that beekeeping can be advertised. Thanks for what you do.

Voron Baughan  
Chattanooga, TN

## Disappointed in BC

I am overwhelmingly disappointed with Bee Culture's decision to print A. Gary Shilling's commentary about education, sideline beekeeper or not. Mr. Shilling's rant is not only biased and dripping with

bigotry, it has nothing whatsoever to do with beekeeping. His false generalizations mean as little as the statistics he lists and the opinions he boasts.

As a hobby beekeeper and a proud teacher, I hope Bee Culture will use better judgment when this kind of garbage lands on the editor's desk.

Otherwise, I enjoy your magazine very much.

Jessica Pyle  
Monterey, VA

## Quality Assurance

Whereas the "Quality Assurances" program being promoted by the NHB falls entirely on the U.S. beekeepers and whereas 60% of the honey sold in the U.S. comes from imports on which there is no quality control, therefore, be it resolved that any Federal Quality Assurance program be at the packer level on imported honey. Be it further resolved that any quality assurance program on domestic beekeepers be administered at the state level.

Passed unanimously by the South Dakota beekeepers at their annual meeting in Spearfish, SD on June 24, 2006.

Paul Hendricks  
Englewood, CO

## Shipping Problems

We need your help with pending legislation.

The ability to ship bees is being threatened by actions of some animal rights groups and the inability of the Post Office and their air carriers to deliver them in a timely and efficient manner.

Although the U.S. Constitution and federal statutes enacted by Congress mandate and guarantee that postal patrons receive "prompt, reliable and efficient" postal service "to all communities," this has not been the recent experience of postal patrons within the beekeeping industry.

We are writing to ask your help by supporting SB 2395, introduced into the Senate on March 6, 2006, by Senator Charles Grassley, which is a bill to amend Title 39 U.S. Code to require that air carriers accept as

## Bee Culture Information



mail shipments of certain live animals. Although this bill was introduced for the benefit of the poultry industry, its passage has implications for the beekeeping industry as well. It is our hope that this bill will include language insuring the timely and efficient delivery of live bees, since the ability to ship live bees is being threatened by recent changes in U.S. Postal Service policies.

The importance of bees to farmers in American agriculture cannot be dismissed. If your business would endure hardships if you could not send or receive bees through the mail, please take time to contact your Congressional representatives and urge them to back SB 2395 in support of your state's bee industry. You can get your Congressmen's phone numbers at [www.senate.gov](http://www.senate.gov) and [www.house.gov](http://www.house.gov), or call the Senate and House Operator at 202.224.3121 (Senate) or 202.225.3121 (House).

Gus Rouse  
Kona Queen Hawaii, Inc.

## MN Discontinues Registration

Letter to Minnesota Beekeepers:

Effective this year, the annual apiary registration requirement and fee has been discontinued. The discontinuation of this registration requirement is the result of the repeal of the Apiary Statute Chapter 19. Recognizing that a number of beekeepers transport bees to other states during the Winter months and that destination states sometimes require an inspection or certification of those bee colonies, new language was drafted that au-





thorizes the Minnesota Department of Agriculture to provide inspection services for a fee. A copy of this new statutory language is attached.

With the repeal of the apiary statute, the MDA will no longer conduct routine apiary inspections, distribute newsletters, nor maintain a publicly available data base of apiary locations. The MDA will provide requested Fall inspection services for beekeepers moving bees to states that may need certification that those colonies are free of specific pests or disease. A schedule of fees for this service is being developed and will be posted on the MDA internet web page. Registration fees already submitted for the 2006 year will be returned.

The MDA recognizes and appreciates that the apiary industry is an important component of Minnesota agriculture and, as such, we will continue to do our best to support the needs and activities of the industry as best we can. However, with this legislative change, our formal role or responsibility in the apiary industry is significantly reduced. Please be aware that despite this reduced "apiary inspection" role, that the MDA still retains full authority to regulate pesticides and as such will continue to inves-

tigate reports of pesticide misuse or misapplication and take appropriate regulatory action. Pesticide regulations are administered by the Pesticide and Fertilizer Management Division (PFM). PFM will continue to utilize an apiary inspector in conjunction with pesticide investigations when conducting apiary-related investigations. PFM may be contacted at 651.201.6055 to report possible pesticide misuse or 651.201.6292 or myself at 651.201.6174 if you have questions or concerns.

Geir Friisoe  
MN Dept of Ag

#### **Response from Jeff Anderson, MN Beekeeper:**

MDA has been chaffing for a number of years over several beekeepers insisting that pesticide labels be followed and applicators being cited for abuse. The bee industry should be well informed that our MN Supreme Court gave bees more protection than they have in most other states. Here is where the rub comes in. The Supreme court decision stated that property owners are responsible to protect bees if they are "on notice" of the bees presence. All persons required to be licensed under MDA are listed on the MDA website. The interesting twist to honeybees is because the beekeepers 'place of business' is also his bee locations, individual bee location information is available for the whole world to see.

By repealing the statutes beekeepers can no longer register with

the MDA therefore, no one is "on notice". What this means in real life, in my opinion, is that if a beekeeper takes a significant pesticide hit which he feels justified in trying to recoup his losses, he will only be able to put the offender, "on notice" not to do it in the future, unless is has specifically 'notified' ahead of time.

The other thing that makes the apiary statute repeal so crazy is that last year MDA pesticide enforcement division was audited by the Legislative audit committee. The ONLY recommendation from the committee to the legislature is that beekeepers wanting pesticide application information be notified of the impending application. That had to REALLY catch in MDA's craw... About a week before the close of legislative session, the Minnesota Honey Producers had an executive meeting in which they pressured the Vice President into resigning. Our Vice President had politicked against repeal this season so that we could circumvent the loss of protection and take time to assess what statutes had value and which had out lived the value. I believe it was May 19th, three days before close of legislative session the AG committee decided on repeal. (again in my opinion)... MDA got EXACTLY what they wanted, beekeepers off their backs. Most Minnesota beekeepers are IGNORANTLY pleased as punch that it happened and that they no longer have to 'deal with MDA'.

On June 5th MDA sent out the letter above. I want to key on a carefully worded sentence... "Please be aware that despite the reduced "apiary inspection" role, that **MDA still retains full authority to regulate pesticides and as such will continue to investigate reports of pesticide misuse or misapplication and take appropriate regulatory action.**" If you think for a minute that MDA is talking about an 'outside' pesticide misuse, look at their past history. At least under the old statute, MDA had to give a 24 hour beekeeper 'accepted' notice before they could inspect the beekeeper's business.

Jeff Anderson  
California Minnesota Honey Farms  
Oakdale CA & Eagle Bend MN



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# National Honey Board Industry Round Table

Ann Harman

About every two years the National Honey Board (NHB) hosts the Honey Industry Roundtable – a forum for those active in the industry to discuss the ups and downs of events in the world of honey. This year the Roundtable, held on June 28, 2006, was attended by representatives of the American Beekeeping Federation, the American Honey Producers Association, the National Honey Packers and Dealers Association, the Western States Honey Packers and Dealers Association, Sioux Honey, members and incoming members of the National Honey Board, and members of the NHB staff, all led by Facilitators from the National Honey Board. Also in attendance were interested members of the honey industry. Six speakers had been invited to present information on topics that affect honey and its production and marketing.

After about five years of discussion among many members of the honey industry about changing the nature of the National Honey Board, a Packer/Importer Honey Board proposal was formally presented to the USDA in March 2006. Information on establishing this proposed board was given by Chuck Parrott, Associate Deputy Administrator of the USDA Agricultural Marketing Service (AMS), Fruits and Vegetable Programs. As with all the scheduled speakers and topics, questions and comments from the participants followed the presentation. Parrott explained the steps needed for a smooth transition, as well as the procedure for forming a new Board. USDA will review the proposal and request further information if needed.

In March of 2006 a petition was filed with the Food and Drug Administration (FDA) to develop a Standard of Identity for honey. Although the trend of the FDA today is away from such standards, the honey industry feels that a standard is necessary to reinforce the value of pure honey in the marketplace. The Codex Alimentarius, an international document, gives standards and is the basis for adoption of a US Standard of Identity. The two speakers, Martin Stutsman of FDA and Kristen Gunter, attorney, outlined how the honey industry should proceed in adoption of a honey standard using the Codex. It is felt that the standard will aid in controlling adulteration and other deleterious practices.

Martin Stutsman, FDA, explained the labeling regulations of FDA and the process for filing complaints about false or misleading labels. Various marketing surveys

will be necessary to determine the extent of consumer confusion with current labeling of both sweeteners and food products. At this time honey labeling is not a priority item for FDA. Stutsman also spoke on the position of the government on establishment of maximum residue levels in honey of medicines and other chemicals used for disease and parasite control.

Much discussion centered on the Voluntary Quality Assurance Program, Plant Audit portion. The information was presented by Zac Browning, Chairman of the NHB Voluntary Quality Assurance Committee and Jerry

Probst, NHB Quality Assurance Consultant. The goal of the program is to raise the standard of honey quality through voluntary inspection of extraction facilities. Inspectors from USDA will be trained by honey industry members. A fee for the inspection will be determined.

Both Browning and Probst, along with their committee, will continue to establish a pilot program for inspection.

Judy Hirigoyen of the Wild West Gang – no, they are not wanted by the local Sheriff for bank robbery – is the very creative director of an agency that finds marketing opportunities. Her presentation focused on the opportunities for honey in school lunch programs now that HFCS will no longer be used. The school lunch programs would be a large market for a natural sweetener such as honey. The lunch programs could be approached on several levels, local, statewide and national. The trend in school lunches is away from junk food offerings to healthy and natural. Although the cost of honey is higher than HFCS, its benefits are in its favor as a sweetener. Recipes and technical advice can be provided by the NHB.

The NHB offers grants for research into health-related uses of honey. Gordon Brown, Technical Director, Honey Solutions, presented ways in which science-based marketing could increase both the image of honey and its sales.

The day concluded with discussion of the NHB Crisis Management Program – Readiness Plan. The plan provides guidelines for the Readiness Team to handle any serious problem that occurs within the honey industry. The Plan and its procedures were discussed by those attending the Roundtable. It is a workable and effective plan.

The Roundtable concluded with a feeling of accomplishment and agreement on a productive day. **BC**

- Honey Packer Board •
- Standard Of Industry •
- Misleading Labels •
- Audit Program •





# INNER COVER

**T**hese are interesting times we live in. Just in case you've spent the last few months on a beach somewhere, let me review the most recent highlights, in no particular order of weirdness, importance or timing.

In New Zealand, in spite of heroic but futile efforts, *Varroa* mites have moved from the North Island to the South Island. Now, plans are being considered to eradicate the mites from the South Island. To accomplish this managed hives in the South Island will be 'depopulated', and poison bait stations will be placed every half mile or so on a grid to get rid of all the feral colonies. This will cost millions of New Zealand dollars.

To get crops pollinated, bees will be brought in, do their thing, and they will be 'depopulated'. Like California almonds, pollination will be imported. This will cost millions of New Zealand dollars.

Which begs the question, I think. Despite a quarantine program of epic proportions *Varroa* crossed that watery gap – obviously on the back of a duck – once (at least). So...will it only be once, and never again? Apparently.

Who polices the police? Time will tell if packers begin enforcing voluntary quality assurance programs for U.S. honey producers without some kind of financial incentive. It's fairly easy to have a state regulatory agency visit a beekeeper's place of business and do the three-sink, white glove test. And if the beekeeper fails – well, too bad. But who, I wonder, visits the extraction campsite of that Chinese beekeeper? Or who even knows where imported honey comes from, really? Will U.S. honey packers squeeze U.S. honey producers, or will they actually police imported honey with the same enthusiasm? What would you guess?

I suspect U. S. producers and producer/packers are going to get their fill of foreign favoritism and strike out on their own. This will, of course, leave some fussy packers with only honey made in shipping containers. And some, no doubt, will be carefully blended with other sweeteners. Aunt Jemima and Mrs. Butterworth will enjoy the company, I'm sure.

So, can Paramount Orchards really make beekeepers move more than two miles away from their mandarin orange orchards? Bees in mandarin orchards means seeds in mandarin oranges – Clementine's by another name – and seeds mean less money to the grower. So – keep your bees out of our orchard is the rule of the day. Or is it? It looks like a Judge will decide.

Just like a Judge decided in Oregon that genetically modified canola can't be grown there because cross pollination between genetically modified crops with local, normal, crops could contaminate those local, normal crops with that suspect DNA. So in one place, bees are being kept out of a local crop because it will screw up the crop; and in another place, they know bees will come in and spread around pollen and screw up other crops. You need a score card for this one.

The Minnesota Department of Agriculture seems to be a real sore loser. They got dinged last year for supporting lax, or non-compliance of existing pesticide spray laws affecting beekeepers. So, they made the regulations go away, essentially, so there are no longer laws to enforce. Oh, they left some of the laws on the books – they can still check out the three-sink, white glove rules. That'll show 'em.

Currently, there's a postal regulation affecting the air shipment of 'some' live animals, including poultry, honey bees, and others. The regulation now states, in my simplified language, that when the Post Office contracts with another air carrier to carry its cargo, the carrier it contracts with, 'May' choose to carry chicks, or bees, or crickets or mice. May doesn't mean it has to. It means they may, or may not.

There's an amendment pending to change this regulation so that those who contract with the Post Office 'Shall' carry chicks, bees, crickets and other two, four and six legged creatures. That means if you want Post Office business, you 'Must' carry bees and the rest by air. That's primarily queens

– probably only queens, but I don't know that it excludes packages. It just says honey bees, not the kind of containers honey bees are carried in.

Right now, I'm told, contracted carriers like UPS and FedEx, if not refusing to carry these animals, are making it difficult, and service is often less than the best these carriers have to offer.

Here's where the weird part comes in. Once the amendment was requested, the whole thing was referred to, are you ready – The Department of Homeland Security. I'm going to rest better tonight knowing that the fine folks in charge of FEMA are finding out whether honey bees should be air lifted anywhere. I'm sure they'll do a heck of a job.

I sometimes think the world would be better off if we only had a Department of Common Sense, don't you?

This is the month you really have to check for *Varroa* in your colonies. Whether you do sticky board, sugar or ether roll – check and check again. If you have lots of *Varroa* now, as drone populations decline and mites move to worker brood – the worker brood they are chewing on now will be the nurse bees that take care of the bees that go into Winter. A damaged nurse bee can't take proper care of those Winter bee larvae, and those Winter bees, in turn, end up damaged, too. And in February your colony crashes and burns.

Yes, it may come to a choice of Fall honey now, or live bees next Spring. If you've let it get this bad by now – by not monitoring, by not using drone brood removal, by not making Summer splits, by not doing a Spring treatment, by not using resistant bees – then yes, it comes to that simple choice – honey now or bees later.

That Department of Common Sense does rule here, if not elsewhere. You will pay dearly for procrastination. And so will your bees.

*Ken Johnston*

Interesting Times;  
and, Check For  
*Varroa* Now



# AUGUST - REGIONAL HONEY PRICE REPORT



## Where Are We Now -

We asked reporters about last Winter, Spring and colony buildup, the current honey crop, this year's prices and next years colonies. Here's what we found out about why we are where we are.

**Region 1** - A mild, dry Winter with a cold, wet Spring still gave a pretty good Spring buildup, but a cool Summer has produced a lean crop. Prices are rising, and next year sees the same number of colonies.

**Region 2** - A mild, dry Winter and Spring gave good Spring buildup, but a cool wet Summer has an only average crop so far. Prices steady to increasing, and colonies about the same next year.

**Region 3** - A cold, but mostly dry Winter, with a generally average Spring gave an average Spring buildup, and a slightly dry Summer gave a good crop so far. Prices steady, but colonies increasing next year.

**Region 4** - A mild, damp Winter, and a warm Spring gave a good Spring buildup, but a warm, dry Summer gave only an average crop so far. Prices steady to rising a bit, means the same number colonies next year.

**Region 5** - A dry Winter and Spring gave a less than stellar buildup, and a dry Summer so far gives a below average crop so far. Prices steady, growth lackluster next year.

**Region 6** - A mild but pretty dry Winter, followed by a mostly warm Spring let colonies build fairly well this Spring, and a warm, dry Summer has an average or a bit less crop so far. Prices are rising, and colonies will increase next year.



When honey bees visit the flowers on these plants

they help to make more and better quality fruits and vegetables.

Asparagus Lima Beans  
Coconut Orange  
Grapefruit Peppers  
Lemons

**Region 7** - A normal Winter, but a mixed Spring (warm and dry, cold and wet, depending on where you are), led to a slow Spring buildup, but an only average Summer so far, with some cooling, has a below average crop. Prices increasing, and colonies stable.

**Region 8** - A mild, dry Winter, warm Spring, average buildup and OK Summer gave a good crop, so far. Prices steady, colonies increasing next year.

**Region 9** - A mild, dry Winter, and a warm and dry Spring have been too dry for Spring buildup, and the dry has continued for a below average crop so far. Prices increasing, and so will colonies next Spring.

**Region 10** - A normal Winter, a dry Spring, and mixed buildup is reported, and a dry, dry Summer to date - a below average crop. Prices mixed, colonies next year stable.

**Region 11** - A mild, but dry Winter and a warm but dry Spring gave an average or so buildup, and average Summer weather gives an average crop - so far. Pricing steady to up, and colonies steady.

**Region 12** - A wet Winter, and very erratic Spring gave at least an average Spring buildup, but a mixed Summer has given at best an average crop, below in many places. Prices increasing, colonies steady for next year.

## REPORTING REGIONS

|                                                                     | 1      | 2     | 3      | 4     | 5     | 6      | 7     | 8     | 9      | 10     | 11     | 12     | SUMMARY      |        | History    |           |
|---------------------------------------------------------------------|--------|-------|--------|-------|-------|--------|-------|-------|--------|--------|--------|--------|--------------|--------|------------|-----------|
|                                                                     |        |       |        |       |       |        |       |       |        |        |        |        | Range        | Avg.   | Last Month | Last Year |
| <b>EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS</b>    |        |       |        |       |       |        |       |       |        |        |        |        |              |        |            |           |
| 55 Gal. Drum, Light                                                 | 1.02   | 1.05  | 1.00   | 1.11  | 1.03  | 1.03   | 0.93  | 1.12  | 1.02   | 0.92   | 0.96   | 1.04   | 0.92-1.12    | 1.02   | 1.00       | 0.98      |
| 55 Gal. Drum, Ambr                                                  | 1.01   | 1.05  | 0.85   | 1.17  | 0.85  | 0.90   | 0.82  | 1.01  | 0.75   | 1.01   | 0.95   | 0.97   | 0.75-1.17    | 0.94   | 0.98       | 0.81      |
| 60# Light (retail)                                                  | 105.50 | 91.75 | 105.00 | 99.17 | 93.00 | 118.33 | 90.29 | 92.50 | 130.00 | 103.69 | 135.00 | 106.67 | 90.29-135.00 | 105.91 | 112.26     | 97.48     |
| 60# Amber (retail)                                                  | 107.00 | 90.33 | 102.00 | 99.35 | 91.00 | 98.75  | 83.75 | 85.00 | 120.00 | 101.41 | 135.00 | 99.00  | 83.75-135.00 | 101.05 | 110.79     | 101.10    |
| <b>WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS</b> |        |       |        |       |       |        |       |       |        |        |        |        |              |        |            |           |
| 1/2# 24/case                                                        | 40.88  | 37.50 | 32.80  | 38.93 | 38.03 | 40.00  | 37.36 | 38.03 | 38.03  | 38.03  | 32.50  | 47.35  | 32.50-47.35  | 38.29  | 37.26      | 41.25     |
| 1# 24/case                                                          | 70.72  | 72.60 | 53.60  | 57.18 | 54.00 | 61.00  | 60.02 | 55.80 | 69.80  | 89.65  | 73.70  | 71.52  | 53.60-89.65  | 65.80  | 62.84      | 61.78     |
| 2# 12/case                                                          | 65.70  | 46.60 | 61.20  | 54.59 | 45.00 | 53.00  | 55.94 | 64.89 | 45.20  | 64.89  | 42.10  | 62.52  | 42.10-65.70  | 55.13  | 57.85      | 56.27     |
| 12 oz. Plas. 24/cs                                                  | 49.56  | 50.40 | 44.39  | 48.09 | 48.00 | 55.20  | 50.02 | 42.00 | 46.96  | 48.00  | 59.25  | 56.24  | 42.00-59.25  | 49.84  | 55.50      | 53.69     |
| 5# 6/case                                                           | 61.25  | 51.20 | 66.75  | 57.70 | 65.03 | 58.00  | 61.63 | 51.85 | 55.80  | 51.00  | 58.00  | 72.00  | 51.00-72.00  | 59.18  | 61.76      | 59.48     |
| Quarts 12/case                                                      | 87.00  | 91.50 | 86.27  | 79.76 | 78.00 | 81.67  | 81.92 | 77.33 | 84.00  | 110.88 | 80.50  | 88.38  | 77.33-110.88 | 85.60  | 89.16      | 82.04     |
| Pints 12/case                                                       | 53.50  | 69.39 | 60.55  | 45.95 | 48.00 | 52.17  | 60.25 | 49.50 | 54.00  | 49.50  | 50.00  | 53.94  | 45.95-69.39  | 53.90  | 51.87      | 51.30     |
| <b>RETAIL SHELF PRICES</b>                                          |        |       |        |       |       |        |       |       |        |        |        |        |              |        |            |           |
| 1/2#                                                                | 3.12   | 1.96  | 2.00   | 2.46  | 3.04  | 2.60   | 2.47  | 1.59  | 2.63   | 2.57   | 2.70   | 3.00   | 1.59-3.12    | 2.51   | 2.40       | 2.45      |
| 12 oz. Plastic                                                      | 3.66   | 2.87  | 3.08   | 2.97  | 2.79  | 3.07   | 3.07  | 3.43  | 3.22   | 3.28   | 3.17   | 3.45   | 2.79-3.66    | 3.17   | 3.29       | 3.17      |
| 1# Glass/Plastic                                                    | 4.00   | 3.62  | 3.71   | 3.91  | 3.49  | 3.70   | 3.55  | 4.32  | 3.89   | 4.35   | 3.93   | 4.42   | 3.49-4.42    | 3.91   | 3.96       | 3.85      |
| 2# Glass/Plastic                                                    | 7.60   | 5.77  | 6.53   | 6.08  | 6.49  | 6.12   | 5.74  | 7.75  | 6.34   | 5.65   | 6.30   | 7.53   | 5.65-7.75    | 6.49   | 6.62       | 6.54      |
| Pint                                                                | 6.75   | 7.50  | 6.35   | 5.08  | 6.13  | 5.04   | 5.73  | 5.15  | 5.13   | 7.00   | 5.02   | 6.00   | 5.02-7.50    | 5.90   | 5.92       | 5.56      |
| Quart                                                               | 14.00  | 12.00 | 11.80  | 8.85  | 8.48  | 7.69   | 8.46  | 8.66  | 8.75   | 14.10  | 8.57   | 10.66  | 7.69-14.10   | 10.17  | 9.70       | 8.75      |
| 5# Glass/Plastic                                                    | 12.55  | 12.46 | 15.76  | 12.80 | 13.38 | 13.50  | 13.02 | 15.99 | 13.85  | 12.50  | 13.57  | 14.50  | 12.46-15.99  | 13.66  | 14.62      | 14.81     |
| 1# Cream                                                            | 4.25   | 4.99  | 5.70   | 4.49  | 5.70  | 3.83   | 5.26  | 4.54  | 5.70   | 5.12   | 5.01   | 5.15   | 3.83-5.70    | 4.98   | 4.71       | 4.82      |
| 1# Cut Comb                                                         | 7.33   | 5.46  | 4.89   | 4.99  | 7.26  | 4.38   | 6.65  | 4.47  | 7.26   | 6.00   | 6.50   | 6.52   | 4.38-7.33    | 5.98   | 5.42       | 5.59      |
| Ross Round                                                          | 8.99   | 3.87  | 4.25   | 4.33  | 5.71  | 4.79   | 6.19  | 3.50  | 5.71   | 6.00   | 6.50   | 5.00   | 3.50-8.99    | 5.40   | 4.96       | 4.91      |
| Wholesale Wax (Lt)                                                  | 2.94   | 2.83  | 2.20   | 2.06  | 2.20  | 2.56   | 2.40  | 2.50  | 2.99   | 2.20   | 1.87   | 2.60   | 1.87-2.99    | 2.45   | 1.85       | 2.48      |
| Wholesale Wax (Dk)                                                  | 2.38   | 2.35  | 1.80   | 1.59  | 1.83  | 2.08   | 1.73  | 2.80  | 2.25   | 1.80   | 1.70   | 3.33   | 1.59-3.33    | 2.14   | 1.70       | 2.23      |
| Pollination Fee/Col.                                                | 49.20  | 37.67 | 43.00  | 38.33 | 41.00 | 44.00  | 47.50 | 75.71 | 35.00  | 75.71  | 75.00  | 63.00  | 35.00-75.71  | 52.09  | 56.32      | 44.44     |



# RESEARCH REVIEWED

## The Latest In Honey Bee Research

Steve Sheppard

*"The researchers were able to measure pronounced effects due to inadequate pollination."*

Cranberries are one of the traditional foods served during Winter holidays in the U.S. and, in recent years, have been marketed in dried snack form and various juice formulations. While there is considerable literature on the importance of insect pollination to maximize cranberry yields, it is always useful to be reminded that, as with many other crops, honey bees play an essential role. In a recent paper on the subject, researchers from the University of Minnesota evaluated production and pollinator activity in several cranberry beds in Wisconsin relative to the presence or absence of honey bees (Evans and Spivak, 2006).

In the first year of the experiment, the authors utilized four cranberry beds at three locations with either two or three honey bee colonies added per acre and evaluated honey bee foraging and cranberry yields in different beds. At the end of the first season, differences in honey bee forager density in the beds could not be attributed to the different colony densities, due to the lack of replication (repetition of the treatments in the experimental design). The authors pointed out that without replication, differences in management of the crop such as fertilization, irrigation or pest control may have been responsible for the observed flower visitation differences. However, at the location with the higher colony density (three colonies/acre) they did observe more honey bees in the sampling transects, both throughout the course of the bloom period and throughout the day.

In the second year of the experiment, one of the high density beds (three colonies/acre) from year one

was grown without the addition of honey bee colonies (0 colonies/acre). In this case, the researchers were able to measure pronounced effects due to inadequate pollination. For example, the mean density of foraging honey bees when three colonies per acre were present was more than 30 foragers per 100m<sup>2</sup>. With no colonies present on the same bed in the second year, no honey bees were found in the transect sampling. More importantly for cranberry growers, the yields were significantly different between years in this same cranberry bed, with berries weighing almost twice as much in the year when honey bees were present.

The authors also assessed the deposition of pollen grains on the receptive stigmas of cranberry blossoms during the early, middle and late portions of the blooming period in the second year. During the early and late periods of bloom, there was no significant difference in pollen grain deposition between the beds with and without added honey bees. However, during the middle period of the bloom, when the most blossoms were present and in need of pollination, significantly more pollen grains were deposited on stigmas in the cranberry bed with added honey bees. From another perspective, in the absence of honey bees, a large percentage (>40%) of measured stigmas received insufficient pollen grains to set fruit during the mid-bloom period. The researchers also reported that, in the absence of honey bees, the yield of cranberries was significantly higher near the edge of the bed than at locations closer to the center.

In their Discussion, Evans and Spivak concluded that the presence

of honey bee colonies increases yields in large cranberry beds. Populations of bumble bees and other non-honey bees were inadequate to achieve high cranberry yields under the conditions of their study, even though individual bumble bees may have been better pollinators. Yield differences relative to the presence or absence of honey bees were quite large and the authors remarked that without foraging honey bees, such differences "...could lead to a significant reduction in the number of bushels produced by the cranberry grower." Based on the overall data of the number of pollen grains on stigma ("stigma loading"), the authors indicate that the mid- and late-bloom period is probably the most critical time to make sure honey bees are present on cranberries. They also indicate that the number of colonies needed to pollinate cranberries could vary based on the number of wild pollinators present, which in turn may depend on the vegetation and level of disturbance of the surrounding land.

The research reported here not only confirms previously reports of the need for insect pollination on cranberries, but also demonstrates clearly the potential cost of failure to provide such pollination. In large commercial settings, honey bees must be considered to be almost a necessity for this task. **BC**

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

Evans, E.C. & M. Spivak. 2006. Effects of honey bee (Hymenoptera:Apidae) and bumble bee (Hymenoptera:Apidae) presence on cranberry (Ericales; Ericaceae) pollination. Journal of Economic Entomology. 99: 614-620.





**T**he history of the Africanized honey bee in the Americas attests that most of the "problems" associated with this insect have to do with its unpredictable behavior. This is because its habits are unfamiliar to folks, including beekeepers themselves, who are used to those of European bees introduced to the Americas from the temperate lands of the Old World. The New World, tropically adapted Africanized honey bee is truly another breed, and as such it emulates the human population in the Americas, which also developed a rougher, less-refined version of its European forbearer.

In general, the Africanized honey bee (AHB) is far more defensive and migratory, and much less finicky when it comes to choosing nesting sites. While no self-respecting European honey bee would nest in the ground, the AHB does. It also will be found cheek by jowl with humanity in other unlikely places. One that comes to mind is the ubiquitous water meter. First found to be a favorite nesting site in the West, who would have thought that the same would occur in humid Florida. Yet at least one county in the Sunshine State has hired a beekeeper to monitor meters in its area for honey bees, thereby adding another employee equivalent to its already strained budget.

Besides water meter readers, other at-risk populations come to mind, including birders, trail bikers, hunters, off-road vehicle enthusiasts, campers, etc. One that I hadn't thought much about was brought to my attention by a colleague in the Department of Entomology and Nematology who is a Civil War reenactor. Thomas R. Fasulo, an entomologist and mild-mannered civilian, once a Marine Corps officer in the Vietnam conflict, now on weekends often becomes a Private in the 13<sup>th</sup> Indiana/8th Florida Infantry, which is involved in re-creating the Battle of Olustee, reenacted each year near Lake City, Florida, just south of the Georgia state line. He also manages the award-winning web site dedicated to this historic engagement<sup>1</sup> and a series of others supporting the Department's educational outreach to the pest control industry.<sup>2</sup>

Fortunately, for reenactors, Tom is a trained entomologist and so understands how those involved in his

Malcolm T. Sanford

## At Risk Populations For AHB: The Case Of Civil War Reenactors



**"It makes little difference if your uniform is blue, or gray."**

"hobby" are likely to be affected by AHB. The following are his thoughts taken from a recent publication:<sup>3</sup>

"In March, a participant of February's Battle of Olustee reenactment in Florida posted an article on the Web complaining that there were too many regulations at the event, and stated that he was even told 'not to swat at Federal bees.' This 'Federal bee' warning resulted from a notice I gave the event organizers about the confirmation of established Africanized honey bee populations in Florida. As a result, organizers and participants of Olustee and other Civil War events in the southeastern U.S. need to educate themselves about these bees and their aggressive habits.

"I hate to tell you this but research into why AHB attack is not good news for reenactors. However, let me preface this by stating that individual foraging AHB are usually not a threat to the general public, except for individuals who are allergic to insect stings. The danger arises when AHB feel the need to defend their colonies. The general experience since 1956 reveals that:

- 1) AHB have a greater tendency to attack people wearing dark vs. light colors (And we thought we already had enough trouble getting reenactors to galvanize to Union blue for the day.);
- 2) AHB have a greater tendency to sting people wearing wool clothes as the hooks on their tarsi (feet) get stuck in the tangled fibers (Will this begin a trend to polyester uniforms?);
- 3) AHB have a greater tendency to sting people wearing strong scents or who smell of sweat (And who does not sweat after run-

ning around a battlefield wearing wool?);

- 4) AHB have a tendency to attack people when disturbed by loud noises or vibrations such as those produced by lawnmowers, farm equipment, gas powered pruners or weeders (Or as in just one rifle, not counting hundreds, or a cannon being fired.);
- 5) AHB have a greater tendency to attack horses on principle (Horses are often dark and have a strong odor.), even when they are just walking by an AHB colony;
- 6) AHB are attracted to facial hair and hair on your head (It is about time more of the Rebs started shaving!).

"Imagine what might happen when we bring thousands of noisy, sweating people into a normally quiet area for one weekend a month? I suspect that future events will see a requirement for an onsite response team, to include trained, properly equipped personnel and a tank truck with foam capability. There is no way distant emergency personnel can respond quickly in the traffic snarls we now experience at events.

"At a recent seminar in my department, an entomologist who has worked with AHB since their early days in this hemisphere, stated that we would eventually see 300 to 400 swarms per square mile. When I asked if that included unmanaged pine woods, he said yes. Remember that one very common honey source in the southeast U.S. is palmetto.

"The good news is that reenactors will not have the primary responsibility to educate those who attend our



## “Experience has shown that the group most likely to be stung in an AHB attack are young males between the ages of 16 to 25.”

events, although we can help. For example, the State of Florida is gearing up for a major education effort in the media, in the schools (as Texas already does), and for government agencies at all levels. In the future, an onsite response team capable of controlling AHB will probably be mandated by Federal, state and county government regulations at large events of all types. To secure an AHB colony that is not already in “attack mode” requires that the colony be contained within a few seconds. This requires the proper clothing and equipment (usually a foam generator). While fire fighters have discovered that their normal clothing is not suitable for AHB encounters, most fire equipment already standing by at large events already have foam generators.

“One thing we need to start doing at events is being more observant about our surroundings. Here are some examples: events organizers need to make a good examination of the spectator area at the battle (stands, trash cans, nearby woods, etc.) before spectators start moving into the area. They also need to give the area a once-over before the sutlers and reenactors arrive. When the reenactors arrive, they too need to be more observant. If you are going to be the first to take a bale from that hay stack, or wood from the pile, both of which may have been sitting there for days or even longer, you might want to check for bees moving into and out of the hay and wood. Remember, AHB will colonize areas that European honey bees would not.

“The cavalry will especially want to examine their camping areas. Horses are usually killed by AHB because they are confined to a small area or tired up and unable to run away. The same is true for dogs who are usually tied to a stake or other object. For several years, fur-bearing animals, except for horses, have been banned from the Olustee Reenactment for other reasons. While not always popular, this may become a common rule at other events.

“So who needs to be concerned

about AHB? Should our pards in more northern states dismiss AHB as a southern problem, as they do with the red imported fire ant? Entomologists used to think that the range of AHB would be limited by temperature, but this is no longer the case. I have seen maps that project AHB moving up the East Coast and Midwest into Canada. At this time we do not know if this will actually occur. Some scientists now believe that the AHB range will be limited by rainfall or altitude. Perhaps this might be a good time to invest in that mountain retirement property.

“What do you do if you discover AHB in your camp, at an event, or anywhere else where they pose a threat to people, pets or livestock? If the colony is not in ‘attack mode,’ the best thing to do is report it to local authorities, such as event organizers or law enforcement personnel. Do this at the same time you are alerting people to *quietly* move out of the area.

“If the colony is already attacking you or others, then RUN or SEEK SHELTER. AHB will follow you for long distances, often up to one-third of a mile or more. While running, protect your face with your arms and hands. Your body can sustain many more stings on your arms and torso than on your face. Do *not* wave your arms about you as you run. This just attracts more AHB to you. If you can enter a car or building – do so. It is better to be stuck in a vehicle with 20 or 30 AHB that you can swat and kill, than to stay outside with thousands. Once in a safe place, do not attempt to pull out the stingers in your body as grasping the fleshy part hanging on to the stinger just pumps more venom into you. Instead, use something with a flat edge to scrape the stinger loose.

“Unlike European honey bees which probably deliver 20 to 30 stings to drive you out of the immediate area of their colony, AHB can deliver thousands of stings to an individual.

Even if you are not already allergic to insect stings, where one or two stings might cause complications or death, thousands of stings can result in kidney failure due to the amount of venom, or a heart attack due to the stress and pain of the attack. Kidney failure usually occurs when an individual receives 28 mg/kg of venom, or about eight to nine stings per pound of weight.

“Here is some good news for the ladies. Experience has shown that the group most likely to be stung in an AHB attack are young males between the ages of 16 to 25. This is due to no other reason than this is the group which contains people most likely to say, ‘Hey, watch what happens when I hit that bee swarm with a rock.’ Unfortunately, as the ladies well know, men in older age groups who are reenacting for the weekend, often act as if they were considerably younger (if not – yes, I will say it – immature).

“Have I frightened you? Good, as that was my intent. If you are concerned about AHB, then you will take steps to protect yourself, your pards, your loved ones and others while at an event. Now I am going to put AHB into perspective. In the 50

years since AHB

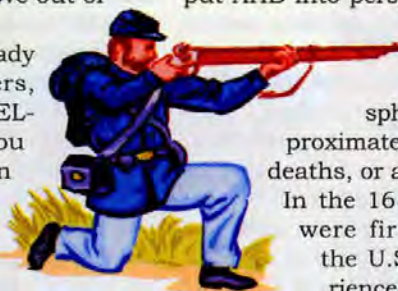
have been in the Western Hemisphere

there were approximately 1,000 recorded deaths, or about 20 per year.

In the 16 years since AHB were first discovered in the U.S., we have experienced about one death per year. Compare this to

the 16,337 people who were killed while riding in cars (this does not include pick-up trucks, vans or commercial vehicles) in 2002. Yet every day the vast majority of us come out of our homes, climb into our ‘killer cars’ and travel the roads of America. And we share those roads with people in other vehicles who are thinking about anything but driving, who are speeding, running through red lights and stop signs, and often have a cell phone attached to their ear.”

In my discussions with Tom, I have asked what role honey bees played in the Civil War. There is evidence that they were used in battles during Greek, Roman and the European Dark and Middle Ages. Can you imagine what a colony, conveniently





housed in a straw basket (skep), hurled at and collided with a knight in shining armor might have done? So far, we have found little information that honey bees were used in any role other than perhaps supplying energy (honey) to exhausted troops during the War Between the States.

As the AHB population grows in the Southeast and extends on good days in fair weather further north, it is intriguing to speculate what an entrenched population of tropically-adapted, over-defensive honey bees nesting at or below ground level might have meant to both Union and Confederate troops in the 1860s. It's possible we may find out in a modern reenactment of an actual battle, should a stinging incident become a reality, initiated by Africanized bees incited to defend their nest against an army of wool-uniformed, sweating, gun-firing, shouting humanity, accompanied by horses.

One thing is for sure. The bees will take no sides, rendering the decision of whether or not to "swat a Federal bee" as academic at best. Both Johnny Reb and Union blue coats will be on the run. **BC**

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

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1. <http://extlab7.entnem.ufl.edu/Olus-tee/>, accessed June 20, 2006.
2. <http://pests.ifas.ufl.edu>, accessed June 20, 2006.
3. Fasulo, Tom. 2006. Civil War News, Vol. 31, No. 5.

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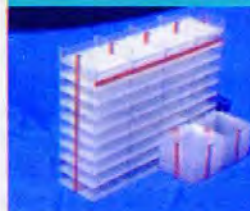
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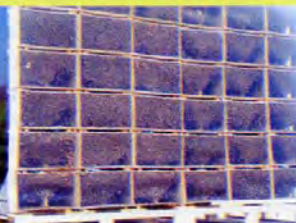


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# Getting A Honey Crop

## The Mississippi Example

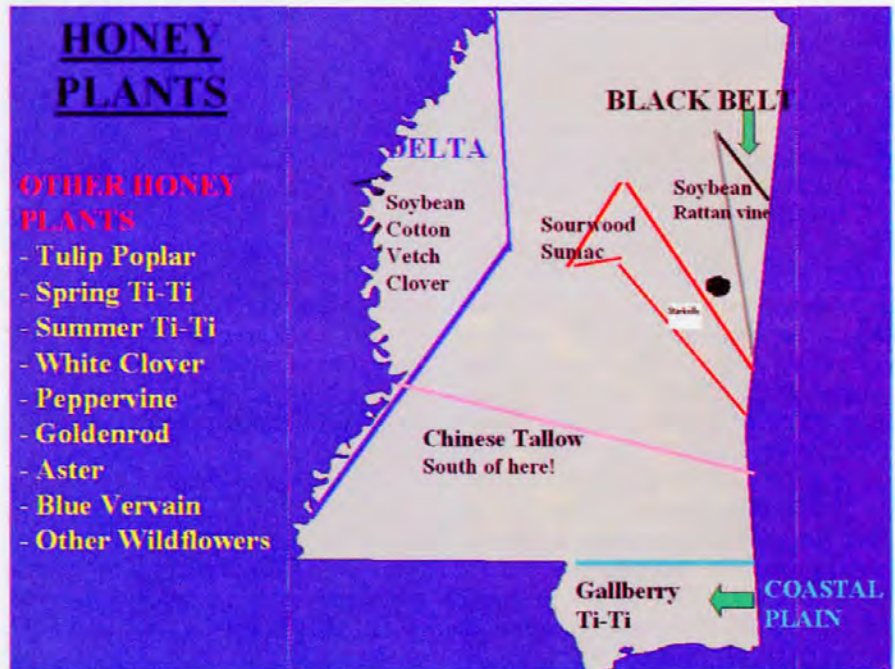
Harry Fulton

*No matter where you are, could you be some place better?*

Some beekeepers are like some farmers! They try to make a crop where Mother Nature just does not intend one to be made. Some terrains and soil types are not honey producers; some better than others and some produce honey at different times of the year and not at the same time.

So what is a beekeeper to do? Solution – get to know the major nectar producing plants, where they occur, when they bloom and which soil and weather conditions condone nectar secretion. The situation for a major honey crop may be just down the road, depending on soil type, farming or forestation practices, and other environmental effects.

Soil types (classifications) vary tremendously throughout most states and produce different flora; some great for honey production and some



### Flatwoods

Rattanvine



Ladino Clover



Beggartick-

Boneset



Goldenrod

Aster

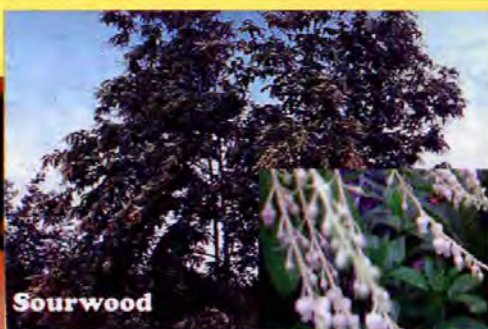




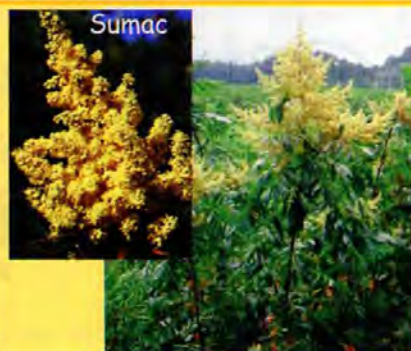
## High Hill Country



Tulip Poplar



Sourwood



Sumac

not at all beneficial to honey bees. For instance, I have divided Mississippi into six areas according to the type nectar flow, the season and the major plants (see map). Other states have similar situations and variabilities. Using such a map beekeepers can keep colonies on a honey flow from mid-February through October! Doesn't that excite you migratory beekeepers?

In this article and the following one(s), I'll explain the quality of honey produced, the major plants producing honey and when each blooms for the six areas in Mississippi. Just maybe it can inspire someone to assess the honey producing areas in other states.

For this article I'll use myself as an example to illustrate the situation in three of the areas in north Mississippi; the Flatwoods area, the high hill counties, and the prairie/black belt. You may refer to the map where I am located in Starkville. It sits on the edge of the prairie belt in the flatwoods. The high hill country lies 30 miles to the west/southwest. Combined these three areas have significant nectar flows throughout the season and beekeepers could easily move colonies to and fro to take advantage of them (provided Mother Nature cooperates). In my younger years I moved colonies back and forth on trailers. During the best year, my partner and I produced 73 drums of honey on 350 colonies moving 120 of the colonies three times. Due to work loads at other jobs, we did not move some that were on locations that produced good crops in the prairie during Spring and Summer.

Let's look at each area.

**Flatwoods:** This area is adjacent to the prairie belt on the east side of the state, about 20 miles wide and 60 miles long. It has two major

flows, Spring and Fall. In the Spring rattanvine and clovers produce most of the honey. The soil PH is basically acidic (below six), except along the prairie where it could be around six or slightly above. A Spring honey crop of 50 to 100 lbs. of light amber honey is possible. Rattanvine blooms for 10-14 days beginning around May 1. Strong colonies may store and cap a deep super of honey in five days. Rattanvine honey is unique in that it produces a thixotropic honey (it's viscosity decreases when it is stirred). It hardly ever granulates under normal storage conditions. Beekeepers should look along grownup fence rows and find areas where it grows abundantly.

White clover begins blooming abundantly at the exact same time as rattanvine, so it is hard to know specifically what percent of the honey is one vs. the other except by knowing which plant is predominant near beeyard(s). In the more acidic soils, clover is less likely to produce honey if the pastures are not limed to keep the PH at six or higher.

In the Fall when adequate soil moisture exists, the flatwoods can produce honey crops of 50 to 80 lbs. of surplus honey in addition to Winter stores. Plants of the genus, *Bidens* (Spanish needle, beggarticks), boneset, goldenrod and asters are the honey producers. Honey should be harvested before October because it could be mixed with a very odiferous and foul tasting honey from coyote bush (*Baccharis centennial*).

**High Hill Country:** This area is characterized by having a Spring and Summer flow; however, the Summer flow is usually more pronounced, provided it is not too dry. Tulip poplar and wild berries provide the Spring flow while sourwood and sumac can produce a crop of 50 to 80 lbs. of

light amber honey. The Spring crop is usually a dark amber honey, much stronger to the taste. Tulip poplar in this area blooms from mid-April until mid May. Several species of sumac bloom over the six week period beginning in early June and are abundant in re-forestation areas. Stag horn and smooth red sumac bloom are the main species. Sourwood also blooms at the same time. All the plants need intermittent rain showers to prevent the blossoms from drying out and temperatures must remain below 85°F. for a prolonged nectar flow and good crop of mixed sumac and sourwood honey.

**Prairie/Black Belt:** Generally speaking of the three areas this is the area most favorable for honey production. Spring, Summer and Fall flows do occur, provided apiaries are near soybeans, pastures, wooded areas, and fallow lands (Conservation Reserve fields). Wooded areas provide rattanvine, pastures provide clovers, row crop areas provide cotton and soybeans, and the CRP lands provide a variety of fall flowers. If mother nature cooperates with adequate moisture but not too much rain in the Spring, heat stress in the Summer (70°F. or less at night during soybean bloom), and adequate soil moisture for shallow rooted fall plants an overall average season-long crop of 100 lbs. or more can be expected.

Rattanvine blooms in early May. Various clovers bloom in May and into June if soil moisture is adequate. Soybeans bloom in July and August. Boneset is the first Fall flower to bloom in late August, followed by goldenrod, *Bidens spp.*, asters and finally the foul *Baccharis* bush in October. Asters will bloom until heavy frost kills them.

**Four important plants common**



**in most areas of north Mississippi:**

Blue vervain, Chinese privet hedge and peppervine. Vervain begins blooming in June and will bloom until late Summer/Fall. It is characterized by having a square stem and multiple small blue flowers at the top of the stems. It can reach heights of five to six feet. With adequate moisture and its abundance in CRP and fallow fields can produce significant honey crops over the long blooming period.

Privet blooms at the exact same time as rattanvine and for the same length of time. On certain years when adequate soil moisture exists and in areas where it is abundant it can produce 50+ lbs. of honey; however, bees prefer to visit rattanvine during that period.

Peppervine also begins blooming in June. It requires intermittent rain and humid conditions to really produce a crop of honey. It will bloom for six weeks and can produce a super of honey, which is dark and strong and not a good table honey.

Smartweed or heartsease blooms September through October until frost. It occurs in marshy areas where beaver ponds exist or areas that flood routinely. A super of light amber honey can be produced with an unusual tangy flavor.

**Sure it is true**, an abundance of other minor nectar plants, such as wild blackberries, vetch, mints, wild grapes, poison oak/ivy and milkweed occurs in some areas of north Mississippi which add to the honey stores. However, the above mentioned plants produce a vast majority of the honey.

If a person regularly moved bees to the three areas as described below honey crops of 150+ lbs. per hive could be expected often if environmental conditions hit just right for each flow. However, as beekeepers know, we can expect that situation to occur only rarely. You would be lucky to hit gold on two to three of the four moves.

**Overwinter** in the flatwoods or prairie where the best fall flow can occur on select locations around reforested lands and CRP fields. No Fall flow occurs in the high hills. Bees must be fed.

**First Move:** Move to Prairie (if

**Prairie/Blackbelt**

Soybeans



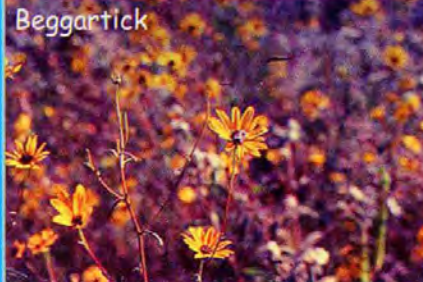
Berseem Clover



Boneset



Beggartick



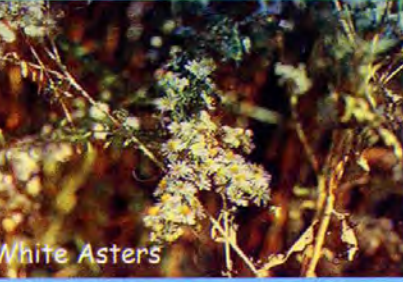
Rattanvine



Cotton



Goldenrod



White Asters

not there already) in late March to locations near abundant rattanvine and clover. Better pollen resources for Spring buildup and over-wintering will occur in these regions. Can expect up to 80 lbs per strong hive.

**Second Move:** Remove Spring crop and move to high hill country

in early June. Can expect 50 lbs. on strong hives.

**Third Move:** Remove sourwood/sumac crop and move back to Prairie in early July around soybean and cotton fields. Can expect 50 lbs. per strong hive.



## Northern Mississippi

Blue Vervain



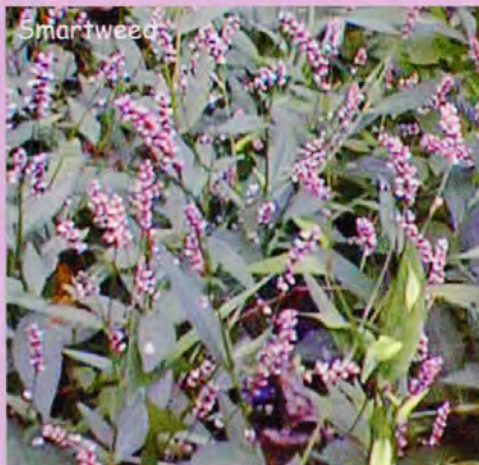
Chinese Privet



Peppervine



Smartweed



**Fourth Move:** Remove soybean/cotton honey and move back to flatwoods for Fall flow and overwintering, if good locations can not be found then in the Prairie. Can expect 40 lbs. surplus per strong hive with sufficient Winter stores in brood chambers.

This illustration is not make believe or pie-in-the-sky. You can easily

see why it is important for beekeepers to know the honey producing regions of their state, and the different flows, especially those near to them. Join a beekeeping association and talk to beekeepers from all around your area. They will tell you when the flows occur in their areas and how dependable they can be. Just think, a matter

of a few miles and an extra move can mean an extra honey crop. In the next article we will look at the other three areas of Mississippi, the Delta, Central, and Coastal area. **BC**

*Harry Fulton is the Chief Apiary Inspector for the State of Mississippi, and an expert in local honey plants.*

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# Colony Splits - Some Personal Experiences

## Nothing new

Splitting bee colonies is nothing new. In the years before bee packages were commonly available to beekeepers, splitting (frequently called dividing) bee colonies was the only way to make colony number increase – other than chasing swarms. For many years packages have been readily available and competitive in price, so in most cases it was cheaper to buy packages and keep your strong colonies as honey producers. The present day cost of packages and queens has inspired me to review the process of making colonies from my existing colonies. It is not an exact process. Other in-depth articles and books have presented details on making colony splits. My intent here is to review some of the fundamentals of making colony splits, but also to include the actual bee yard situation and the extraneous things that happen that make beekeeping challenging.

## Splits from my own colonies

In this discussion, I will need to say several times that there are no “standard” splits. True, there are types that are more common than others, but in general, the size of a split is very nearly a personal thing.

This past Spring, from 24 established colonies, I arbitrarily chose to make ten splits. I have an abundance of four-frame and six-frame nuc boxes. I chose to make six-frame splits. I spent more time than I care to confess scraping and preparing old comb for reuse in the nuc boxes. This was a concession on my part for I had considered phasing out these old frames – for no other reason than they were old. Increasingly, as have so many others, I have become concerned that these combs are carriers of some unknown ailment like dysentery, chalkbrood, or even worse, American foulbrood, or even worse yet – miticide residues from previous mite control programs. But I have no definitive proof that any of these problems were present and I had the combs in proper numbers readily available. Then, the cost and labor of assembling new frames had to be considered. Hence, when the split day came, I used the old combs.

So much as possible, I put in three empty frames and two frames with residual quantities of honey, a frame of mixed brood (some of both open and capped brood) and



*Bees on the front of a freshly filled nuc box.*

just the right number of adult bees (Probably a pound and a half or so). Some nucs got more while some got less. But I felt that I had a bit of a security blanket in that the small, confused colony at least had a bit of food for a few days. (*As it worked out, they would need it.*) I didn't paint the nuc boxes but they were scraped reasonably clean and were otherwise suitable for short-term use.

## Why use nuc boxes at all?

Why use nuc boxes at all? The splits – if all went well – would out grow the nuc boxes quickly. Why not just put the split directly into a single deep box and forego the preparation and moving the nuc boxes? That poses an excellent question and one for which I am not sure I have ready answer. I have only the thinnest bit of science but a much stronger gut feeling that a small colony is more “balanced” in a smaller hive box. Robbing by stronger colonies is a concern. Additionally, the labor in forming, closing, and loading the nuc boxes is less work (initially) than dealing with the extra equipment of a full hive. Finally, and most importantly, I could have the nuc boxes ready much more quickly than I could prepare the single-deep hive. So I used nuc boxes.

## Queens

### Availability and cost

I bought queens from a local supplier, who in turn, got them from a California producer. I can only guess how long the queens had been caged. They cost me \$18.00 each.

As would be expected, I had to hold the queens for nearly five days waiting for my schedule and for the seasonal rain to subside. During that time, I carefully removed dead workers from the cages and daily gave each caged queen a single, small drop of water. They seemed okay, but I still felt the need to worry.

### Queen management within the split

As is described in the “Tips” list, I prefer to release my queens directly rather than use the slow release method. I can get a good idea of the caged queen's potential reception by the way the bees are treating the cage. Additionally, since I want this splitting process to go as quickly as possible, there is a chance that I unintentionally took



James E. Tew



An aside...In my earliest adult life, I worked in a paint store doing all aspects of paint store things. The cheapest grade of paint was about \$3.50 - \$5.00 per gallon. The absolute top grade of exterior paint cost \$12.99 per gallon and one-coat coverage was guaranteed. When I told customers the selling price, I had trouble looking them in the eye. When I was shopping for paint to paint the full-deep colonies from which to move the nucs, I found the price had now risen to \$49.00 per gallon for the best quality. The same name and quality of paint that I was selling for \$7.00 per gallon now sells for \$29.00 per gallon. I suddenly felt very old. I managed to get it for \$24.00 and felt that I had driven a bargain. Why tell you all this? Because \$18.00 per queen continues to shock me. I have mentioned this before. In my beekeeping past, paying \$7.50 for a "bug" was bad enough, but paying \$18.00 has forced me to review my bee monetary investments. The penalty is now much greater for making simple mistakes. But hey, I'm paying \$1.69 for a small bottle of water. It's only money.



*Transferred nucs just after the heavy rain.*

the parent colony's queen. My new queen would be killed if she were released into this environment.

Additionally, I want to confine the queen as long as it takes for her to be accepted in a friendly manner. Some splits take longer to accept new queens than others. Due to the scarcity and costs of new queens, the common recommendation has become to allow the queen to stay caged longer. I completely agree with this increased time, but with a couple of caveats; (1) leaving the queen caged longer – depending on the style of the cage – will result in significantly increased amounts of burr comb around the cage and (2) leaving the caged queen in longer will expose her to the vagaries of internal and external colony temperatures. I worry that my costly queen and her cage will be too far from the bees' area of activity. I worry that the nights become too cold or too hot. So on one hand – yes – leave her caged longer. It's safer. On the other hand, get her out as soon as possible. The risk of holding her in an improperly positioned cage is greater than a short introduction period. Neither philosophy is correct every time. In general, I am tending to leave queens in the cage longer and worry more.

### Split day

The colonies to be split were on location in apple orchards where they were providing pollination. We loaded the truck with the necessary nuc boxes and protective equipment. The first two colonies – a bit like fishing – had good flight activity, but upon opening the colonies, I found that they were only so-so colonies. Not exactly a good start. I could have taken a single frame or two, but then I would have to move to the next location and would lose bees when I reopened the nucs. Close everything up, secure the lighted smokers in closed galvanized refuse cans, and off to the second location we do go. I had better luck here. As I have tried to previously describe, splitting a hive is a very relative thing – not totally unlike breaking up a clump of Day Lilies to develop more Day Lilly clumps in new places. I followed some basic rules.

### A few bee yard tips for making splits

1. Wear a good bee veil and keep the smoker puffing freely. Don't forget your hive tool.
2. Scan each frame carefully for the colony's queen, but don't spend more than a minute or so before a decision is made to take or leave the frame. You get too many bees in the air if the process selection drags out.
3. Unless you are prepared to use shallower size frames, don't spend any time with them. I find it to be too much trouble to remove tight shallow frames just to shake a few bees.
4. Putting one or two frames of brood in the nuc box seems to reduce the number of bees flying out when you open the box to add more bees or brood.
5. Due to #4, so much as possible, keep the nuc box closed.
6. Keep the amount of brood transferred comparable to the adult brood population transferred. This always requires guessing.
7. While I never do it, it is a good idea to record which splits came from which parent colony, in case I inadvertently take the parent queen.
8. The shorter time the bees in the nucs are confined, the better.
9. To avoid excessive drifting, don't position the nucs any closer than necessary when opening.
10. Unless you move the nucs several miles away, expect some of the bees to drift back to the parent colony.
11. I put the caged queen in the split in the field in an effort to calm the bees as soon as possible. I always use the direct release method rather than the candy plug slow release method.
12. With bees flying everywhere and exposed frames all about, expect to feel a good deal of uncertainty and confusion. Good news is that you can adjust the population of the split during the next few days.

### Buying splits from the colonies of others

Based on availability, beekeepers can buy colony splits – of multiple sizes and varying prices – from other beekeepers – with or without queens. Everything is negotiable. Buying splits eliminates all the work of getting set



up and searching through your strong colonies for proper frames and compatible number of bees. Right? Well, not really. I just end up paying someone else to guess on my behalf. And then there are other unexpected challenges. Witness the following saga.

I purchased 12 five-frame splits from another established and competent beekeeper. Due to all the requirements of frame exchange and nuc box return (or me hauling nuc boxes to the beekeeper, but then there is the hassle of transferring the nucs to my boxes with the concurrent escape of bees or I could help with the splits and put them directly in my boxes, but that would take much more time. On and on it goes.) Why this contorted discussion? Because I paid more for the nucs choosing not to implement frame-exchange and the beekeeper used paper corrugated board nuc boxes that could be discarded when I transferred the splits at my site. So I didn't haul my own nuc boxes to the split-site, opting to use the paper nucs instead.

I drove the 100 miles to the beekeeper's yard as heavy thunder clouds formed. We loaded the splits as quickly as possible and used tape to stick the paper tops to the paper nuc boxes. I really, really, didn't want the boxes to get wet. I drove home pertly without restroom or food stops. Heavy, ominous clouds threatened the entire way and a few light showers came my way.

Upon my arrival at home an hour before dark, I discovered that four of the twelve tops had come off and blown away. I had scatted some unknown number of bees over the last 100 miles. Now, the clouds and wind was significant - even bad. My small beekeeping staff began to rush about, but it was clear that this wind would de-

stroy the paper nucs and blow them all about. What to do? What to do? What to do - now? Radio word came of tornadoes in the area. While some nucs had no tops, all of the soft boxes were leaking bees and sagging. In frantic desperation, we put our box truck in a stand of pines and transferred the beleaguered nucs from the open truck to the box truck. Tops were re-supplied to those nucs not having them. I left the roll-up door ajar two feet and opened the splits in the dark truck box just as torrential rain began falling. I went home and worried. I had more than \$1000 in the box truck, but more importantly, I was supposed to know what to do and I really didn't.

The next day was also rainy. Two days later, amidst bee confusion, we took the paper nucs from the truck box and installed them in standard equipment. Drifting and confused bees were everywhere, but at least they were in the general area. I sat a single nuc in the truck box to pick up stragglers. A day later, I sat that colony on the ground and moved the truck. I am very, very happy to tell you that all the nucs survived and look as good as they can at this time (I have essentially had no nectar flow this season).

My point here is that none of this was planned and none of my procedures can be considered traditional split implementation and management. What will I do differently next time? Nothing but hope for good luck and better weather. **BC**

Dr. James E. Tew, State Specialist, Beekeeping, The Ohio State University, Wooster, OH 44691, 330.263.3684, Tew.1@osu.edu; <http://www2.oardc.ohio-state.edu/agnic/bee/>; <http://beelab.osu.edu/>

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# Feedbee® Balances Growth

## Feeding colonies with a nutritious pollen supplement is beneficial.

A.M. Saffari<sup>a</sup>, P.G. Kevan<sup>b</sup>, J.K. Atkinson<sup>c</sup>

### Introduction

During the shortage or complete absence of pollen, or in the presence of only poor quality pollen, beekeepers often feed colonies of honey bees with either pollen substitute (with no pollen) or supplement (with pollen) diets. These are ideally materials that provide required nutrients to bees.

Most researchers have thought any protein source such as dried egg yolk, meat scraps, milk products e.g. whey and wheat, and soy products could be used as a substitute for pollen without considering the issues of palatability, nutritional content, nutritional requirements of bees, and biological effectiveness of the proposed materials.

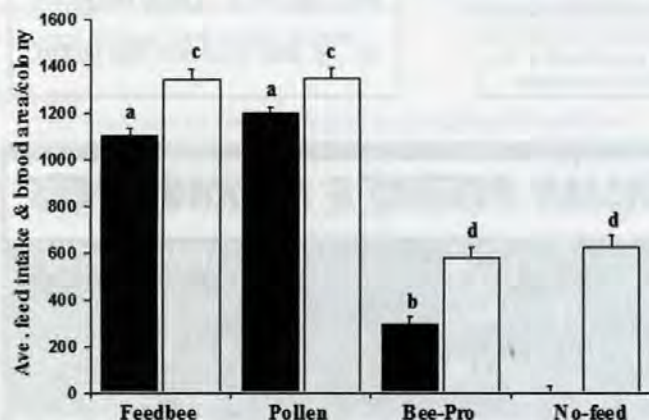
Some animal feed ingredients such as, soybean products, have been so popular that even after their failure (Flores 2003, Nabors 2000, Rana *et al* 1996, Chhuneja *et al* 1993, Zaytoon *et al* 1988, Kulincervic 1982) to be of any benefit to honeybees. Investigators and beekeepers still use them simply because they are the most cheaply available feedstuffs.

Pollen supplements or substitutes can be evaluated by a variety of means, the relationships between which are often obscure. To be of nutritional value for animals and insects, the diet must be a collection of various potential feed ingredients as alternative sources of required

nutrients similar to their natural food sources, have proper texture and consistency, and then be accepted by the animal. Once ingested, the diet must be digestible by that particular animal or insect, be free or freed from any toxins or anti-nutritional factors, have a long shelf life in various conditions, be easily available, and be economical. Considering all these issues Feedbee® was formulated to accommodate balanced nutrition, palatability, and low cost.

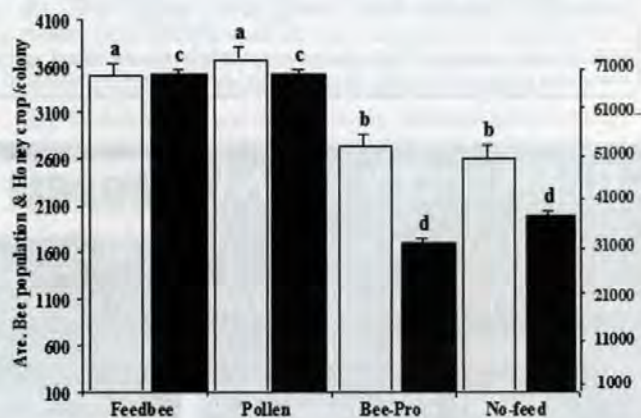
### Materials and Methods

28 colonies were selected at the University of Guelph apiary. All queens in the colonies were two year old sisters and all the colonies were located in one apiary. The colonies were given equal areas of capped brood, three frames of honey, and three to four empty drawn combs (depending on the number of brood frames), and equal weight of bees. Out of 28 equalized colonies 24 of them were randomly selected and divided into four experimental groups. These groups received only one of the three feeds (Feedbee®, Bee-Pro®, or pollen) in patty form and the fourth control group did not receive any feed other than what they obtained themselves from their routine foraging throughout the experiment. The feeding trial was made in early Spring 2004 for a period of 30 days and feed intake data were collected over three 10 day periods. The



**Fig. 1** – Total mean feed intake ■ and total mean capped brood area □ of 23 equalized honey bee colonies that received Feedbee®, pollen, Bee-Pro®, or no-feed (control) in Spring 2004 fatty feeding trial.

Different letters denote a significant statistical difference at  $p < 0.05$ .



**Table 6** – Total mean bee population □ and total mean honey production ■ of 23 equalized honey bee colonies that received Feedbee®, pollen, Bee-Pro®, or no-feed (control) in Spring 2004 fatty feeding trial.

Different letters denote a significant statistical difference at  $p < 0.05$  by Tukey's test (GLM Process of SAS program).



brood area and bee population data were collected in three months (May, June, & July). The honey production data was collected at the end of the honey harvest season.

## Results

### Feed Intake

The total mean feed intake (g/colony) is presented in black columns in Fig. 1. For Feedbee®, the feed intake was 1103 g ± 51.02 and for pollen it was 1194 g ± 36.37 which were not significantly ( $p < 0.05$ ) different. These values were significantly ( $p < 0.05$ ) higher than the feed intake for Bee-Pro® (295 g ± 80.78).

### Capped Brood Area

The capped brood area (cm<sup>2</sup>/colony) is presented in white columns in Fig. 1. The mean capped brood area of colonies treated with Feedbee® was 1338.11 cm<sup>2</sup> ± 85.80 and for pollen it was 1344.43 cm<sup>2</sup> ± 129.50 which were significantly ( $p < 0.05$ ) higher than for colonies fed Bee-Pro® (577.86 cm<sup>2</sup> ± 67.71) and control (unfed) group (627.17 cm<sup>2</sup> ± 52.17).

### Bee Population

The total mean bee population is presented by weight (g/colony) in white columns in Fig. 2. The weight of bee population for Feedbee® was 3.49 kg ± 0.07 and for pollen it was 3.66 kg ± 0.08 which were significantly ( $p < 0.05$ ) higher than for Bee-Pro® (2.73 kg ± 0.10) and control (unfed) group (2.61 kg ± 0.16).

### Honey production

The mean honey production (kg/colony) is presented in black columns in Fig. 2. The colonies received Feedbee® and pollen produced 71 kg ± 5.45 and 71 kg ± 6.30 of honey respectively which were significantly ( $p < 0.05$ ) higher than honey produced by Bee-Pro® (33 kg ± 4.35) and control (unfed) (39 kg ± 4.37) groups.

### Discussion

The results indicate that consumption of Feedbee® was statistically similar to that of pollen in all experimental colonies when presented in patty form, and also these two diets were equally superior to Bee-Pro®. This is consistent with the results of the previous feeding trials (Saffari *et al.* 2004, Saffari *et al.* 2006), where pollen and Feedbee® in both patty and powder forms were equally accepted by bees. This clearly indicates that Feedbee® is highly palatable and is easily accepted by bees in absence of pollen. The results also indicated that feeding the colonies with Feedbee® and pollen equally enhanced brood rearing which was attributed to the higher nutritive quality of these diets. The proper nourishment of brood in Feedbee® and pollen treated groups resulted in greater bee populations. These diets were nutritious enough for young bees to gain weight and grow to the foraging stage; thus leading to higher honey production than was seen in two groups.

The evidence from all of the experiments and analyzed parameters (feed intake, capped brood area, bee population and honey yield) in this study indicates that in order to promote brood rearing and to increase colony population at a time of pollen dearth, feeding honey bee colonies with extra pollen or a pollen substitute diet is beneficial. However feeding honey bee colonies with bee collected pollen raises the risk of spreading diseases and could also be a costly practice. Thus, it is economical and beneficial to substitute pollen with an equally palatable and nutritionally balanced pollen substitute diet such as Feedbee®, which can be fed in both patty and powder forms all year round. **BC**

### Acknowledgement

We are grateful to Margaret Quinton, Zahra Tayarani, Jalal Fatehi, Victoria MacPhail, Mahyar Heydarpour, George Birinyi Sr. (Grain process Enterprises), Ontario Beekeeping Association, David Evans, Ali Toosi, Ali Ehsani, and Jeff Boone.

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<sup>a</sup>Grain Process Enterprises Ltd., Canada, [amsaffari@yahoo.com](mailto:amsaffari@yahoo.com)

<sup>b</sup>Environmental Biology, University of Guelph, Canada, [pkevan@uoguelph.ca](mailto:pkevan@uoguelph.ca)

<sup>c</sup>Animal & Poultry Sciences, University of Guelph, Canada, [jatkinso@uoguelph.ca](mailto:jatkinso@uoguelph.ca)



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# All The BUZZ in...

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*Hello Friends,  
Welcome to my fun bee pages,  
where curious kids go.  
My name is Bee B. Queen and I am a  
honeybee. I'm the queen, so I lay loads of  
eggs. I wanted to take some time from my  
busy schedule to share some cool stuff  
with each and every one of you. I will be  
seeing you again in October!*

**PACK  
A BEE-  
FRIENDLY  
PICNIC**

## Let's Pack a Picnic

KIDZ... Here's your mission this month, if you choose to accept it... Plan, prepare and pack a honeybee picnic to share with your family and friends.



## A Bee Friendly Picnic!



That's easy.  
Pack some  
honey and some  
pollen for the  
bees - done!

Wait a minute.  
Not a picnic FOR the  
bees but a picnic with  
foods that the  
honeybees helped  
to make.

Nanny nanny  
boo boo...  
you can't find  
me!



This is only the beginning. Use the information from the Find-a-Word Game on the next page to help you with your menu. Put on your detective hat and find two more lists of food bees help to make. They are hidden somewhere in this magazine. Look for me, Bee B. Queen.

O.K. Grab a pen and paper and make a menu for your bee friendly picnic.

Send your Bee Friendly picnic menu to us and be entered into a drawing for a special prize.

Pack your picnic with these foods that absolutely need the pollination help of honeybees. How about things to eat that include these foods?

Hints: What dessert can you make with apples?



Allspice  
Blackberries  
Broccoli  
Cabbage  
Cauliflower  
Cinnamon  
Dill  
Garlic  
Mango  
Mustard  
Onions  
Parsley  
Peaches  
Pumpkin  
Raspberry  
Squash

## Foraging (FOR- ij- ing)

This is what a worker bee does when it is out searching for food (nectar or pollen) or other things they need like water or propolis.

## Cool Facts:

A worker bee will visit between 50 and 100 flowers on one trip to gather nectar or pollen.



# ... Bee Kid's Corner

## POLLINATION CELEBRATION

Honeybees pick up pollen on their hairy legs and bodies when they land on a flower to forage for nectar or pollen for their food.

Every time they fly from one flower to another some of the pollen falls off the bee into that flower.

The pollen works its way down into the flower where it can help to produce a fruit, a vegetable, or seeds. This is very important not only for the food we eat but so we can have seeds to have another plant to have another flower to have another seed to have another plant... You get the idea.

### HAVE BEES, WILL TRAVEL

Some beekeepers move their hives around the United States just to help pollinate different crops. Almost all commercial beehives (about 95%) travel to help produce the following crops. I'm getting hungry just thinking about it.



Search for these foods in this Find-a-Word Puzzle!

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ALMOND  
APPLE  
AVOCADO  
BLUEBERRY  
CHERRY  
CRANBERRY  
CUCUMBER  
KIWI  
MELONS  
PEARS  
PLUM  
SUNFLOWER  
VEGETABLE SEEDS

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### RIDDLE

Q: What is the quietest bee?

A: a mumble bee



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# The Minimum . . .

*A minimum standard for a beekeeping operation.*

Larry Connor

There is a question that has come back to me several times over the past few months that I want to discuss: What is the minimum a beekeeper should do to obtain successful colonies? As a beekeeper myself (now a struggling hobbyist with a mixed bag of colonies of vastly different strengths), I wonder what I need to do for myself, and wonder if my needs translate into something a majority of the *Bee Culture* readers need as well. In discussions with a range of beekeepers with a just one or two hives to those with hundreds of colonies, I've settled on three general ideas, themes really, that make up a suggested minimum standard for a beekeeping operation.

**First**, I do not enjoy working bees that are defensive. While on a recent truck ride to a commercial apiary location I noticed the bees striking the windshield of the truck before we even turned off the engine. That old line from the movie *Tootsie* passed through my brain: Brace Yourself Effie! It isn't that the bees were unnecessary defensive – nothing approaching African stocks – but a passing weather front and the forgotten smoker made the act of supering very much less than ideal. There are wide differences in the gentleness of bees, and I see no real reason to have unpleasant bees in an operation, especially in a sideline or hobby outfit.

Selecting stocks for gentleness is not usually my primary motive for selecting a particular line or queen source for propagation. But the decision to eliminate a queen from a highly defensive hive is often the first reason I give when I've decided to kill a queen. This is especially true when I visit an apiary and there is one defensive colony the beekeeper avoids or leaves until last. Lately I have been somewhat outspoken, asking "Why are you keeping a colony of such disagreeable bees?" Some beekeepers may have a perfectly well thought-out rational for keeping such winged beasts, but honestly, I have to be convinced that the level of *Varroa* mite resistance or increased honey production justifies the additional stings and increased liability exposure.

One beekeeper showed me his face test, where he places his unveiled face right on the top of the brood frames after he smoked them. He says he is sniffing for American foulbrood while also checking the personality of the hive. The bees in his apiaries seem relatively quiet and were pleasant to work, but there are other perfectly acceptable ways to test a hive for defensiveness that do not involve putting one's good looks at risk! His approach does keep the overall apiary calm and pleasant to work. And that's good.

If a colony has AFB, I smell its sulphury odor through the veil, and usually at some distance. If I find something that smells suspicious, I am able to inspect the frames later after I have shaken the bees back into the hive.

Remember to wash your hive tool, smoker surfaces and hands with rubbing alcohol or hot soapy water after you find this bacterial disease in your apiary. Then plan for the elimination of the colony.

There are complex behaviors that have been documented to describe the defensive process in bees that leads to stinging. Some lines of bees stop this sequence before stinging, and hit the veil and exposed surfaces as often as they can, but do not sting. Others seem to sting first and then keep up the attack sans stinger!

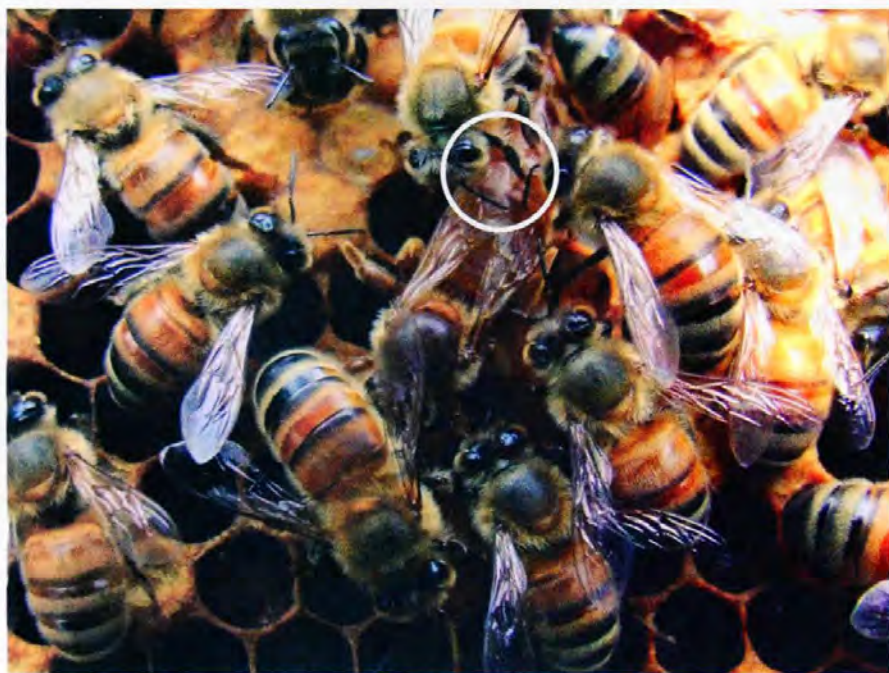
This "temper" issue in bees can be complex. Yet there are many colonies of bees that do not attack when worked rationally with moderate smoke. Clearly, for the vast majority of the readers of this magazine, and for most beekeepers everywhere, we need gentle bees of good temper.

While we are at it, we should seek those colonies with good "temperament" as well. These are bees that stay quiet on the combs and do not run or drop off the frame as we work the colony. I gently place my fingers on the nurse bees of a colony of good temperament and find that the bees remain quiet and do not move away as I lift my hand. Not only are the bees gentle, but they remain quiet for a hive inspection, queen finding, or other activities. These are bees I want in my apiary.

**Second**, I've decided I must have hygienic bees. After three seasons of chalk brood, a so-called minor brood disease that has killed tens of thousands of immature bees in some of the colonies I try to manage, I want a colony that removes all sick brood and takes all trash out of the hive. Hygienic bees give you a clean bottom board – one you do not have to scrape in the Spring or as you work the hives. The recent discovery that the SMR (suppressed mite reproduction) stain of *Varroa*-tolerant bees is actually a form of hygienic behavior shows the link between hygienic bees and low mite loads. The SMR bees were ones that were eliminating cells of worker brood that contained developing *Varroa* mites, leaving only mites that do not reproduce in the cells, leading to the concept of suppressed reproduction. The process of opening (uncapping) and emptying the parasitized pupa prevents *Varroa* mites from emerging. Apparently the hygienic behavior crosses over all infections, from American foulbrood, chalkbrood, and *Varroa* infestations and more.

For me to add hygienic stock to my little apiary is to obtain daughters from instrumentally inseminated hygienic bees or stocks mated in isolation that carry these traits. I put these queens into colonies this year and produce large armies of drones from them next year when I will set up new colonies as part of Summer increase. By adding some hygienic material to my local drone gene pool, I hope to influence all the colonies in the neighbor-





*Notice the worker grasping the queen's abdomen.*



*She lets loose with a cluster of eggs.*

hood so there is a reduced rate of AFB, chalkbrood and *Varroa* mites, just for starters. I hope you all join me in this effort. After a year or two I will test the level of hygienic bees by using pieces of nitrogen-frozen brood.

If you are like me (and I realize most of you are not) when you were taught beekeeping, you learned about the classic genetics study of the double recessive gene disease resistance mechanism worked out by Ohio State's Walter Rothenbuhler. It took two genes, both recessive (one for uncapping infested cells and one for emptying them), to get a colony to demonstrate resistance to American foulbrood. (Later other diseases were shown to be controlled by these two genes).

Additional disease resistance mechanisms undoubtedly exist. That we may not have given them a proper definition and description does not prevent them from helping us in the bee yard. So you and I both can have colonies with clean bottom boards, disease and mite free brood – colonies we are pleased to

show off to others. I'm not there yet, and I have some distance to go to get there. Considerable distance.

**Third**, I want a productive colony. Well, of course I do! By productive I want one that survives the Winter, builds in the Spring without swarming and generates a huge number of flowers. Bees that die over the Winter automatically lose my vote. Likewise, colonies that swarm when other colonies do not are placed on my list of colonies to be broken apart and made into new Summer increase colonies to over Winter with new queens. This is a little bit like "I don't get mad, I get even" as a method of keeping colonies. I don't get mad at a colony for swarming, I just deal with its lack of cooperation in such a manner that the colony no longer exists when I am finished making nuclei. As I have written before, a lot of readers have one major honey crop each year, and if they lose a huge chunk of their nectar-gathering workers just as that flow begins, the colony will not fill supers with honey. So, I might as well take that colony and rework it into three or more hives that may give me young and hopefully desirable queens mated to wonderful disease resistant drones, all ready to over Winter as a nucleus.

What have I lost? A honey crop? Probably not much of one, if the swarm was large and the population took a big hit. A special queen? Maybe, but only if she was otherwise productive and was gentle. I hope she made a lot of drones before she accidentally ran into my hive tool.

What I have lost is a potential "welfare" hive that may slumber through the Summer and may or may not have enough honey to survive the Winter. Cut bait, fish, catch fish, clean fish, eat fish. Get on with it and stop fooling around with these hives that tie up your time and drag down your production. I mean it, get busy. Take your bee losses *now* and make up new colonies for the next season.

Hopefully these "minimum" suggestions will be helpful to you.

I am pleased to be writing this from my mother's kitchen in Michigan, where a cool, late evening Spring breeze cools the large brick house after a warm and sunny day in mid June. Mom has gone to bed and left



*"So okay, sometimes you keep a few welfare hives around to learn from them. When things like this happen to me I am reminded how little we really know about bee behavior."*

me to work by myself. At 91, she fixed a meal for life-long neighbors this afternoon and we took it up for supper tonight. With my very minimal help she thinks of many things she can do for others; because she so enjoys doing it. She struggles with vision and drives only a little. Today we went to a favorite store that she no longer feels confident to drive to. The trunk was filled with staples, but when I put it away in the cupboards, it was already well stocked. I think it was the cookies she ran out of long before I arrived on the doorstep.

This trip includes workshops and talks in Ohio, Nebraska, Michigan, Indiana and then Ohio again. My new book, *Beekeeping Essentials*, is finally in the hands of the Root/Bee Culture team who will electronically ship it off to the printer, so I really do hope the book is ready for distribution when you read this. I am reminded that all good things take time. I hope that is true in this case.

Beekeepers along the trip speak of entirely different conditions. In Connecticut, many colonies swarmed, even one of my three package colonies (the one that had an entrance reducer left in by mistake). Taking my own advice, I made up three new colonies with the frames of brood possessing swarm cells. The three packages did not experience queen failure, and I am hoping that by holding queens in the cage for at least five days helped this Spring. The package was installed on a Monday and the queens released on Friday. The first thing all three queens did was rush over to an open cell of honey/nectar and take a long drink. Then a few worker bees attended to her with their antennae. Acceptance is not a flashy moment in the beehive.

When I return I will requeen or tear apart the only colony that survived the Winter. In early April the colony had less than a thousand bees and about one-third frame of brood. I was intrigued to see what might happen. Before I left for this trip (second week in June) the bees had built to about three and a half frames of brood and bees. Swarming was clearly not on this colony's agenda. I shot a number of photos of the queen, purchased from Hawaii last Summer, and when looking at the pictures found an interesting sequence. I caught one worker hugging the queen's abdomen – something I have not seen before – and rapidly brushing the tip of the body with her hind legs. When viewed on the computer, one of the next frames showed a mass of eggs just below the end of the abdomen. It makes me suspect that the queen has some sort of blockage in her median oviduct, perhaps residual mucus from mating. Because she is producing a normal number of eggs, she has not been superceded. That's my theory.

So, okay, sometimes you keep a few welfare hives around to learn from them. When things like this happen to me I am reminded how little we really know about bee behavior. How did that worker know to move her legs

over the tip of the queen's abdomen? Is this a behavior the bees use following mating? If I find out more, I will share it with you.

In Kansas in early June the season was quite advanced. The white sweet clover was coming in as the yellow sweet was fading. Cecil Sweeney (Mid-Con) and I drove to an apiary where he and wife Jolie Winer had made Spring nucs with purchased queens. The queens were from California, and even the queen producer knew the unsunny California weather had affected the quality of the queens.

Every hive but one in the apiary was in the process of supercedure. It was sad, for while the nectar flow was on the bees were occupied replacing their queens. Colonies that should have been moving from two deeps into the supers were still filling the brood chamber with stores because of the break in brood rearing. To make it worse, the farmer had disked down the sweet clover for a green manure crop. It hurts to see dozens of acres of open soil with sprigs of sweet clover sticking out. It's just not right to do that.

So far this Summer I've given twilight meetings for about three-dozen beekeepers interested in queen rearing. The goal is to keep it simple and direct, using a classic starter and finisher unit, and giving everyone a try at grafting. Not everyone can carry that off, and we review other methods. But it is encouraging that there may be so many motivated beekeepers raising queens, Summer queens, for use in northern states. Maybe they will be able to supply queens, cells and virgins for local beekeepers in years to come. Such a step is essential to the self-dependence of queen stocks.

Proofed in Iowa on the way to Nebraska! **BC**

*Larry Connor is on the road most of this Summer, but can be reached by email at [LJConnor@aol.com](mailto:LJConnor@aol.com). His new book *Increased Essentials* should be available now.*



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# Little Momma

Walt Wright

Most yarns have a moral, and a lesson. This has both.

a level that would cause her to increase in size. Shirley gave them a few shallow frames of honey over-head and wished them well for Winter.

This story has a happy ending, but let me digress for a minute. Early in my beekeeping there was an article about misapplication of your time. The writer contended that you must get tough to avoid spending a large amount of your time on items that produce the least returns for time spent. I don't remember the exact ratio, but it was something like spending 80% of your time on 20% of your bees. The 20% are those you pet, pamper, or baby through a crisis with questionable success. The writer recommended you get tough enough to write those feeble colonies off, and apply that time to the colonies that would provide the most return for time spent. It's easy to see the sense to that recommendation but difficult to do. If you care about

My mother's family of German descent were great story tellers. A story that pushed the limits of believability was called a "yarn." With the escapades of nine brothers and sisters, there was no shortage of yarns, but the favorites were often retold at family gatherings. The consistency of the telling added some credibility to the most outrageous.

Mr. Flottum tells me that the "big boys" of beekeeping don't have time in the Summer months to read their magazines. That gives me the opportunity to inject a yarn that is marginally informative. This yarn, and other possible selections, will be those that have some potential for a useful moral or lesson. The most outrageous on my list is about a 17-queen swarm, but no lesson is seen in that one and will not likely invite your suspicions of my truthfulness.

Little Momma was a smallish queen hived with a very small swarm. She was not much larger than the queen you receive in the cage from the queen sources. The swarm wouldn't fill a medium baseball cap. Together, their chances for survival were very bleak. They appeared late in the Spring flow at a strong outyard of 12 colonies on the opposite side of the logging road access. They were hived directly below the limb where they settled. To say Little Momma and her crew had a bleak prospect of survival is an understatement. In this area, with a "split season", there are at least two months in mid Summer when field forage is iffy, at best. This tiny swarm didn't have chance.

The late wife Shirley helped me in my rounds at the time. She had a soft spot for struggling colonies, and was not going to let Little Momma and her gang perish. When we had rippled through the strong colonies for whatever the mission of the day, she had to check on Little Momma. She would pilfer a frame of honey, brood, or pollen to support the swarm survival. Her efforts were successful in helping them through the Summer doldrums, but they didn't grow much. In the Fall they hadn't filled their deep with comb. And Little Momma was still smallish. The colony had not increased the demand for eggs to



the little devils, you naturally want to help. It took me perhaps eight years to get tough enough to shake out a colony of laying workers in front of colonies that could use some extra bee power. If I knew where to look, I would be happy to give credit to the writer for his opinion.

The mention of laying workers gives rise to another diversion to this yarn. We'll get back to Little Momma in yet another minute. Promise.

A laying worker colony was successfully resurrected by the following procedure. At weekly intervals, a frame of capped brood and a frame of eggs and larvae were taken from another colony in that outyard. They were exchanged for two frames of laying worker brood in the queenless colony. The literature reports that brood inhibits laying workers. The donor colony, receiving some drone brood in worker cells is not going to be hurt by a few dwarf drones. The

receiving laying worker colony maintains strength from the supplemental brood added.

On the third or fourth installment of eggs and brood, the laying worker colony started a queen cell and re-queened themselves. This approach was only tried once and cannot be recommended as a cure all. If your time is cheap, you might try it and see if it works for you.

Back to Little Momma: In February, a colony in another outyard was found to be queenless. They had a good cluster size but no brood. With a queen, they had the potential for being a producer that season. Queens are not normally available at that point in the season from stateside sources. Perhaps Little Momma would tide them over until a replacement queen would be available. Without much confidence in the results, Little Momma and crew (down to two frames of bees at that point) were newspapered on the queenless colony.



## Tip Of The Month

Acquire a small bubble level to add to your bee tool caddy. Especially on sloped terrain, your eye cannot be trusted. The reference is tilted. Use the bubble level to deliberately elevate the rear of hives to insure bottom board drainage.

The next time I saw her, she was magnificent. Dark colored, so that there was no doubt it was Little Momma, herself, she actually sparkled in the sun. She radiated good health and purpose. Large and majestic, she had become the reigning monarch of #5, outyard #6. A replacement wasn't ordered, and #5 equaled production of others in that outyard that had a better start.

The moral of this yarn is that seeing the queen does not help you much. She is at the mercy of her support troops. Although she is the repository for the genetics of her offspring, extenuating circumstances, like field forage availability can impact the best genetics. The literature is big on inspection of the queen and brood patterns. I find that a waste of time.

A queen is seen occasionally, but I don't look for her. Queens look pretty much like queens. There is more information contained in the comb she is on than her appearance. I don't remember ever seeing a queen whose appearance caused concern. Further, excepting laying worker comb, I don't ever remember seeing brood patterns bad enough to get my attention. Some of my good fortune with queens could be attributed to annual supersedure. A supersedure queen from a strong colony is the best you can get. She is better quality than the best store-bought model.

The workers typically will sense a queen problem long before it will be obvious on periodic inspection. If they sense a problem and start supersedure, your rooting around in the brood nest can interfere in that process. Then you do have a problem. Inspect for brood. If you see worker brood of any age, you know you had a functional queen three weeks earlier. Open brood cuts that period into less than half. You don't need to see the queen. And what do you know when you see her? I've looked into quite a few colonies in my time, and have yet to see a problem that the bees did not have corrective action in process. Mite problems are an exception. They haven't learned to cope yet.

Example: Pulled out a brood frame where the outside

band of capped brood had an occasional drone capping. Their queen was running out of juice. The next band outside was empty cells. This told me that the colony had the problem in hand and were superseding. I backed out gently and let them do it their way. Supersedure was completed without interference.

My hive management approach is oriented to getting the most production with the least time and effort possible. If you have time to burn, by all means, learn as much as you can – and pay the penalty in colony disruption.

An off-line lesson of this yarn concerns the queenless colony that brought Little Momma to *Her Majesty* status. At that time on my learning curve, most of my wintering losses were from queenlessness. In a season where 6 of 130 were queenless in February it was noted that some were slightly tilted backward. The propolized bottom board would collect and retain a puddle of frigid water over the Winter. Ice might be less damaging, but frigid water would chill the clumsy queen instantly, and the workers are powerless to save her.

Add to the above scenario another observation and some conjecture. The wild colony nest in a tree hollow has no "communication holes." Comb is anchored at the sides continuously from top to bottom, and the comb is a solid slab. The wintering brood nest is conveniently located near the bottom of the comb where a space is left between the comb and the cavity bottom. This arrangement suggests that the queen is escorted around the bottom of the comb to get to the other side. She wouldn't have to make a major mistake to find herself in the cold puddle less than a half-inch away.

This conjecture is supported by results. Insuring positive bottom board drainage was incorporated in the Fall maintenance checks. Hive stands sometimes settle with production loads, and need to be checked annually. Normally done at the same time as installation of entry reducers, a bucket of shim stock does not slow progress much. The problem of overwinter queen loss virtually vanished with incorporation of the precautionary effort.

It seems that the art of yarn spinning is not a heritable trait. Uncle Dody or Uncle Monk would have made this yarn interesting, if not entertaining. I'll have to practice. **BC**

*Walt Wright is a retired engineer and a hobby beekeeper in Tennessee. He is a frequent contributor to these pages.*

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# Bert Wustner

## Missoula, Montana

Bert Wustner knew he wanted to be a beekeeper at the age of 22 when he got a taste of it one summer while working for his brother's uncle and father. Years before though, in high school, he would have thought people were crazy if they told him he was going to keep bees.

"I just fell in love with it immediately," Wustner said. "I love the outdoors, and I must admit - I hunt, fish and ski, so I like beekpeeping because I get time off during hunting season."

While Wustner is hunting during his months off in October and November, his bees are down in California pollinating almond orchards for the winter. Come Spring, the bees are driven up to Washington to pollinate apples and then back to Montana for the Summer months of May through October.

Wustner has about 1,000 hives of bees spread throughout the Missoula valley in approximately 50 locations from East Missoula to Rock Creek. Bert and his bees, as his company is called, produces nearly



# Jerry McGahan

## Arlee, Montana

"What I love about beekeeping - you have to work slow. I work slow, deliberate, even and no hurrying. It's almost like meditating. It has an effect like Tai Chi. It's like swimming across a big lake. It's wonderful, really wonderful."



Jerry McGahan became interested in bees 33 years ago when he worked as a teacher's assistant in an animal behavior class. He immediately fell in love with bees after setting up an experiment for them.

"I was self-taught," McGahan said. "I just read a lot of books and made a lot of mistakes." McGahan used to own many more hives than he does today and produced nearly 880,000 pounds of honey a year.

Producing that much honey, it was only natural that his children grew up in the honey business. But in 1996 and 2003, he sold part of the business and now owns two hives, doing it simply as a hobby.

With his spare time, McGahan has had the opportunity to experiment uses for honey. In addition to using it on cereal and in tea, McGahan accidentally discovered the sweet taste of a honey and garlic spread for toast.



*Rebecca Stumpf is a photo-journalism student at the University of Montana in Missoula.*



100,000 pounds of honey a year that goes to honey packers, large retailers, and bakeries locally and nationally.

"My favorite part of beekeeping is moving the bees," Wustner said. "I also really like watching them grow and taking honey off during a good year - that's really exciting."

Wustner's profession has been more than just a job - it's been a family business along the way. His three children, now all grown, worked with bees growing up. Although they enjoyed it at the time, it looks as though none of them will follow in their father's footsteps and continue the tradition.

"Every beekeeper is just a little quarky - a little different."

"If someone told me I was going to do this in high school, I would have told them they were crazy."



## Bill Fluke Arlee, Montana

"I've already got three this morning," Bill Fluke said as he shrugged off his bee stings. Fluke has been in the business nearly 45 years -- too many to count the number of times he has been stung.

"Most times you get stung when you are doing something you aren't supposed to do," he said.

Fluke began working with bees with his dad when he was ten years old. Since then, he hasn't gone back.

Fluke now owns Arlee Apiaries in Arlee, Montana. He produces nearly 240,000 pounds of honey a year that he sells and distributes to local and national grocers. For Fluke, it's a lifestyle -- a love.

"Being outdoors is my favorite, I'm not a person to be locked up behind a desk," he said. "There's enough going on with bees to keep it interesting."



"I don't think there's a commercial beekeeper out there that hasn't wondered if they're insane or crazy."

"I used to go out and watch bugs in jars just like all kids do."

"There's something about the bees - once you get bit by them, you never go back."



# An Elegant Honeyed Meal

Michael Young

This month, Michael Young travels from his home in Belfast, Northern Ireland, to Young Harris, Georgia to prepare some of his elegant honey dishes for the attendees. We hope you can attend, but if not, here is what he is preparing. Enjoy!

Honeyed roast pork, frog legs, beehive skep potato filled with creamed parsnip, accompanied with a minted, pea and basil puree and a port and rosemary juslie. Serves 6

## For the Honeyed Pork

2.25kg (5lb) Pork Loin  
4 Tablespoons of oil  
½ jar of honey  
1 carrot  
1 onion  
Salt  
For basting 7 oz. butter melted and 7 oz. honey  
Garnish chives, parsley

Pre-heat oven to 200°C; 400°F. For the pork, prepare a roasting tray by adding cooking oil as well as some roughly chopped carrots and onions. To help prevent the honey from burning on the base of the tray just add a little water. Prepare the pork loin by scoring the skin in a criss cross design with the tip of a sharp knife. Rub some salt well in the incisions followed by some honey all over the skin.

Place the pork on top of the vegetables and then into the oven on the middle shelf. Turn down the heat to around 300°F to slowly bake. Cook for 10 minutes per pound, or 15 minutes per pound for a more well-done joint. During the cooking, baste the meat with melted butter and honey. Make sure that the honey has not got too brown; if this happens, lower the temperature a little more or cover with aluminum foil. When cooked, remove the joint from the roasting tray and allow to rest in a warm place.

## Port and rosemary juslie

1 sprig of rosemary de stemmed  
300ml (½ pint) beef stock  
150ml (¼ pint) Port  
½ onion  
2 tsp crushed black peppercorns  
2 tsp corn flour dissolved in 2 tbsp water  
Salt and pepper, to taste

## For the sauce

Skim off any fat from the roasting pan. Add finely chopped onions and the peppercorns to the tray and fry.

Add the stock, rosemary and port, to the remaining juices in the pan. Bring to a boil then reduce the heat and maintain at a simmer over a moderate heat for five minutes, stirring constantly, scraping the bottom of the roasting tray to de glaze. Check for seasoning. Remove from the heat and add the cornflour (mixed with water), return to the heat and reboil stirring well, strain and set aside.

## For the frog legs

2 tablespoons clarified butter  
12 frog legs, thighs only  
7 oz. plain flour sifted  
Salt and pepper to taste

For the frogs' legs, push the meat on down the tip of the legs toward the thigh joint to expose the bone. Dip into flour and remove any excess. In a large sauté pan, heat some clarified butter over medium heat season and fry the legs until golden brown. Place on a paper towel to drain and reserve, keeping warm.

## Mint, pea and basil puree

1 Sprig of mint leaves stemmed  
1 shallot, peeled and minced  
1lb frozen peas  
300ml (½ pint) chicken stock  
5 basil leaves  
Salt and pepper to taste

## Minted pea and basil coulis

For the mint and pea puree, add frozen peas, basil, diced onion and mint in a medium saucepan, over medium heat, and cook until tender. Once the onion is cooked place the ingredients into a hand held mixer and blitz until smooth. Pass through a fine sieve, transfer to a medium saucepan over low heat, and season. Keeping warm.

## Potato beehive skep filled with creamed parsnip

2.2 lbs. potatoes peeled  
3 eggs yolks  
2 oz. butter  
3 parsnips peeled  
3-4 Tablespoons of cream  
Salt and pepper to taste

## Creamed parsnip

Boil the parsnips until soft, drain and let them dry out. Mash and put them through a sieve or blitz. Season then add the cream. Put to the side.

## Potato beehive skep

This dish is best prepared earlier. Make a potato mash as normal. Then just add three egg yolks and the butter,





mash well. Place the mash into a large piping bag with a large star nozzle. Pipe the potato mixture into 2½ inch (6.5cm) circles onto a greased oven tray. Let's imagine you are piping a Walnut whip. (see the photo) When piping, half way up stop, then press a crater size hole inside the half finished potato skep. Fill the crater with the creamed parsnip. Then continue piping the potato mash on top until it resembles a beehive skep. Make six large beehive skeps. Bake in a hot oven until nice and brown.

**Foie gras placed on honeyed caramelized beet root, topped with puree of honeyed figs, drizzled with balsamic reduction and curry oil.**

#### For the Foie Gras

2 lbs. Foie gras  
3.5 oz. butter  
3.5 oz. oil  
Salt and pepper to taste

#### Preparing the foie gras



This exercise is done at the last minute when the beet root is ready on the plate. Foie gras is much better cooked from semi frozen, about one minute each side. Season lightly and place into a hot pan with a little butter and oil for a few minutes on each side. Once the foie gras is cooked place it straight on to the beet root.

#### Curry oil

This is much better prepared weeks in advance as it settles and becomes much clearer. Place 12 oz. of curry powder into a thick bottomed saucepan, add two quarts of cooking oil and place on the stove. Slowly cook for 30 minutes on a low heat stirring every so often. Do not let it overheat. When the oil is cooked, strain it through muslin or a fine cloth and leave to settle for a day or two. Once settled gently decant leaving the sediment at the bottom. Bottle the oil for later use. Whilst in the bottle, over time it will become crystal clear and then decant again. This oil is great with all types of salads, fish and meats.

#### Balsamic and honey reduction

1 jar of honey  
2 jars of balsamic vinegar

This is a simple recipe. Add the honey and vinegar together in a large saucepan. The mixture will double in size when boiling therefore its important that a large saucepan is used. Boil the mixture until it becomes as thick as warm honey. Strain through a cloth or muslin. Bottle and let cool. This dressing is excellent for all types of food especially on fresh strawberries.

#### For the honeyed fig purée

9 Ripe figs  
3.5 oz. honey

3 beets

Firstly prepare the fig puree by selecting ripe figs. Cut the figs into half and with a small spoon remove the pulp. Place this into a small bowl and add the honey. Mix into a rough puree and place to the side. For the beet root, cut three slices per guest and brush liberally with honey. Pan fry or grill until caramelized. Place on a paper towel for later use.

#### Earl Grey and Honey Sorbet

For the sorbet  
1¼ cups water  
6 heaped loose teaspoons of Earl Grey  
100ml (5 Table spoons) of honey  
Juice from half a lemon

#### For Garnish

1 sprig of mint

To prepare the sorbet. Place the honey and water into a saucepan and bring to the boil. Add all the other ingredients. Stir and mix in whilst bringing the liquid to the boil, simmer for one minute. Filter the mixture through a strainer to remove all ingredients. Taste the mix and add further lemon juice if required for sharpness to taste. The process of freezing the sorbet is best using a blender and freeze process. If like myself you don't have one however, I must state it's much better if a blender is used. Pour the mixture into a suitable lidded container with a large base and place in the fast freeze section of the freezer. Once the mixture starts to freeze (one to three hours depending

on your unit) remove from the freezer and immediately place in the liquidizer for 30 seconds or whisk briskly. Place again in the fast freezer. The sorbet should have a blend similar to crystallized honey. To serve place a ball of sorbet in a frosted cocktail glass and decorate with a mint leave. **BC**

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# Sunflowers!

Connie Krochmal

Once scorned as noxious weeds, the annual sunflower has come full circle. Now this native species is a moneymaker for farmers and a desirable ornamental for landscapes. Its increasing popularity since the 1970s has turned out to be great for beekeepers. This is an excellent nectar and pollen plant.

Brash and bold, these fast-growing flowers are well known for their ability to move in the direction of the sun, a trait known as phototropism. The Latin name for this genus (*Helianthus*) comes from the Greek words for sun and flower.

Ancestral plants of cultivated sunflowers have been traced to the Southwest and the Missouri-Mississippi Basin area. These were first domesticated by American Indians in the Ozark Bluff. Remains of the plants have turned up in archaeological sites dating from 3000 B.C.

## Description

Because sunflowers are such cheerful, easy going annuals, gardeners tend to overlook their coarse, lanky nature. These plants range considerably in size from a foot to 12 feet or more in height. All parts of this flashy, flamboyant plant are covered with coarse hairs. Often, the thick, erect, robust stems will be mottled.

The coarse, toothed foliage can vary from four inches to a foot or so in length. This appears on long leaf stalks. Depending where they're located on the plant, these can look markedly different. While the lower ones are opposite and heart-shaped, those on the upper part of the stem tend to be alternate and egg-shaped. The leaves feel harsh on both surfaces.

Sunflowers are much loved for their spectacular flower heads. They come in a vast array of colors. Among these are creamy white and all the warm colors, such as various shades of yellow, orange, gold, and red. In addition, their palette extends to bronze, burgundy, mahogany, brown, and purple. Those with bicolor flower heads display contrasting rings of color in the petals. Around the outer rim, the flower heads are surrounded by green bracts.

Depending on the cultivar, the flower heads come in

various sizes from two inches to over a foot across. According to the Guinness records, one measured over 30 inches in diameter. These open anywhere from 55 to 100 days after the seeds are planted. When growing wild, sunflowers normally bloom between July and November.

Like other daisies, sunflowers are composites. The showy, sterile petal-like, ray flowers surround the center disk, which contains thousands of tiny, tubular florets. Often the disk and rays will contrast greatly in color. Usually, the former tends to be brown or purplish. As the florets age, they change from greenish-yellow to yellow, and finally to brown.

While it's true that many cultivars of sunflowers produce a single flower head, others are multi-branching with a large number of heads. The total can differ from one variety of sunflower to another.



*Sunflowers offer beauty, variety, nectar and pollen*

## Growing Conditions

Easy to grow, sunflowers are adapted to a range of climates from coast to coast. They are one of the most versatile species. All they really ask for are warm, sunny conditions.

Tolerant of most soil types, these perky flowers reach their best growth in loose, rich, moist soils. Regarding pH, they tolerate some alkalinity. Sunflowers may be adaptable to most situations, but they don't like poorly drained conditions. However, they do withstand salinity.

Planting Sunflowers

## Planting Sunflowers

If you are planting a large plot of sunflowers, it is best to till the area first. At that time, composted manure, other kinds of organic matter, and fertilizer can also be added very easily.

True to their name, sunflowers crave sunlight and warmth. So, wait until the weather is warm and settled in the spring before planting them. Though sunflower seedlings can tolerate light frost, hard freezes will kill them. For best results, wait until the soil temperatures reach the 70s.

When laying out your plot, allow three to four feet between rows. This will make it easier to care for the





*Ring of Fire*

plants. The proper planting depth depends upon the seed size. The small-seeded kinds should be covered to a depth of  $\frac{1}{2}$  inch. For the larger-seeded sunflowers, increase this to one inch. Space the seeds about six inches apart within the row.

Sunflower seeds will germinate in about five to 10 days. Keep the soil moist until this takes place. Once the seedlings emerge and develop their first true leaves, thin the plants to  $2\frac{1}{2}$  feet apart in the rows.

For constant blooms during the summer and fall months, stagger plantings of sunflowers about a week apart.

### **Caring for Sunflowers**

For the most part, sunflowers are tough, carefree plants that require minimal attention from beekeepers. The taller types with large heads benefit from staking. They have a tendency to droop as the seeds develop. For that reason, install stakes right after you plant in the spring. Doing so later can damage the plants.

Though sunflowers will tolerate drought once they're established, the plants will bloom more profusely if they receive supplemental waterings during dry periods. If possible, avoid getting water on the foliage for this can increase the likelihood of disease outbreaks.

To conserve moisture and suppress weeds, apply several inches of organic mulch around the stems. Weeding is generally needed only when the plants are young. When most sunflowers reach their mature size, they can out-compete most other species.

Regarding fertilizer, a general purpose one, such as 5-10-10, can be mixed into the soil before you plant. Slow-release types also work well. Additional nutrient is needed only if you are growing large-

headed varieties, such as Mammoth Russian. Apply the second application as a top dressing once the flower heads begin to develop. It's easy enough to tell if the plants need fertilizer. When they're deficient, the lower leaves will begin turning yellow.

Even when they receive the best possible care, sunflower plants often become careworn and bedraggled by the end of the growing season. This is particularly true once the seed heads begin to ripen. In addition, heavy winds and rainstorms often tear the edges of the leaves.

### **Problems of Sunflowers**

For the most part, sunflowers are reliable plants. But, they do suffer from a few problems. My worst pests are slugs, which are particularly destructive to seedlings. So, I sprinkle Escar-go! Slug and Snail Bait from Gardens Alive! in the rows after I plant the seeds. This non-toxic product is safe for pets and humans. Rabbits and other animals have also been known to munch on the tender, young plants.

Insects usually pose minor problems. The most common ones seem to be aphids, flea beetles, and caterpillars.

Of the diseases, powdery mildew occurs most frequently. In my plots, this typically occurs late in the season, and has limited effect on flowering. To prevent mildew and other diseases, practice proper sanitation by removing all the plant debris at the end of the growing season.

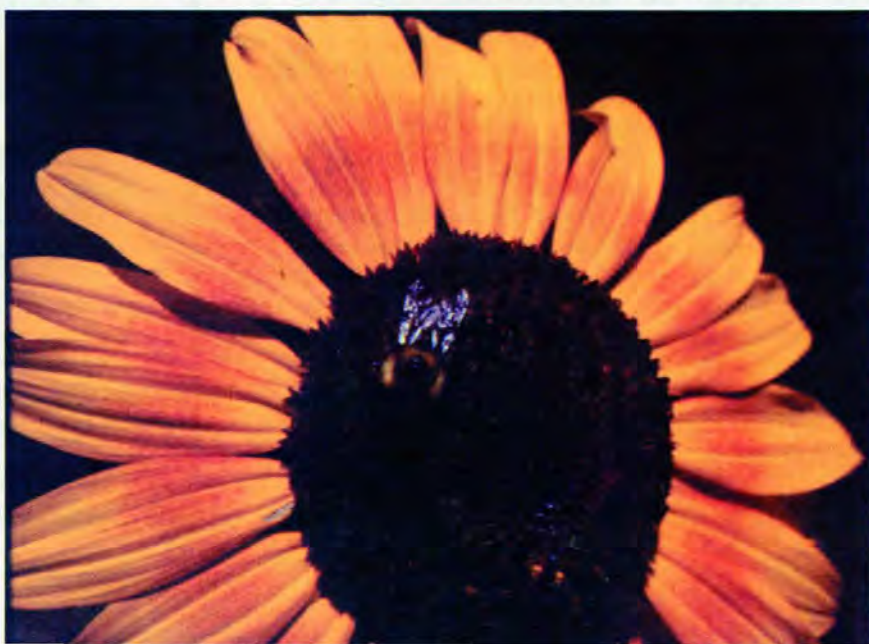
### **Sunflowers in the Bee Garden**

There are various ways beekeepers can incorporate sunflowers into the bee garden. The branching, multi-flowered kinds make excellent landscape plants. Tall varieties can be included in vegetable plots. For informal screens, tall to medium-sized cultivars are great. Flower gardens, beds, and borders often have room for dwarf and multi-flowered types. For container gardens, the best choices are miniature and dwarf types. Some of these only grow to a foot or so in height.

Seeds for over 40 varieties of sunflowers are available. These plants can differ considerably in overall size, growth habit, number of flower heads, and floral characteristics. The ones with large, single flower heads are grown mostly for their edible seeds, which are enjoyed by birds

and humans alike. While it is true that all sunflower seeds are edible, humans find the small-seeded ones are hardly worth the trouble. So, these are best left for the birds.

For bee gardens, certain kinds of sunflowers are less desirable. These include varieties bearing semi-double or double flowers as well as the pollen-less ones. The latter were introduced





in 1988 specifically for cut flowers. Normally, the pollen-less types won't produce seeds unless they've been cross-pollinated with the pollen from a normal sunflower.

So far as individual varieties are concerned, the following are among the most reliable.



#### *Mammoth Russian*

This was originally introduced in the 1870s. By far the most widely grown, Mammoth Russian typically reaches from nine to 12 feet in height. Under good growing conditions, it can be 20 feet tall. Opening in 65 to 80 days, the single flower head is typically a foot to 1½ feet in diameter. Yellow petals surround the brown center.

#### *Soraya*

Soraya was an All-America Selections winner in 2000. This was the first true orange-petaled variety. A long-blooming, heavily branched, sturdy, self-supporting plant, it grows from five to six feet in height. This can bear over two dozen flower heads, each of which is four to six inches wide. Borne on sturdy, 1½-foot-long stems, these are rich orange with a gold-flecked, mahogany center. The blossoms begin to appear about 80 days or so from the time of planting.

#### *Ring of Fire*

This became an All-America Selections winner in 2001. Only four to five feet in height, Ring of Fire sunflower is a heavily branched plant. It is small enough to use in flower beds and borders. This bears blazing, bi-colored blossoms that begin to open in 70 to 75 days. Its flower heads grow to six inches in diameter. Surrounding the chocolate brown center, the striking petals are golden yellow along the edges and dark red towards the base.



*Soraya*

Sunspot is one of the best miniatures for container gardens and flower beds. This variety has become a classic. Just the right size for growing in an eight-inch pot, it grows to two feet in height. This variety is early to bloom. The single flower heads begin opening in about 70 to 80 days. These fea-

ture golden yellow petals around the golden brown disks. Up to a foot across, the heads can produce lots of seeds if given a chance. Since Sunspot plants are dwarf, they can be planted quite close in flower beds – about one to 1½ feet apart.

#### **Related Species**

The native sunflower has a number of wild relatives that can be found throughout the country. There are around 70 or so species and sub-species with nearly half of these being perennials. Often grown as a vegetable, the Jerusalem artichoke is one of the better known ones.

#### **Sunflowers in the Wild**

Though the common sunflower began with a limited distribution thousands of years ago in North America, this species has now expanded its original range. Now, it is found from Canada to Minnesota westward to Washington, and southward to California and Texas. This native has also naturalized throughout the East as well.

In the wild, this species favors particular kinds of habitats. Among these are moist bottomlands, swales, ditches, and other areas with rich soil. It also grows along railroad tracks and in sandy woodlands. In addition, this frequents disturbed sites, particularly where road grading and construction has occurred.

#### **Sunflowers as Bee Plants**

Sunflowers yield copious quantities of pollen and nectar. These are considered major honey plants in the Southeast, the Plains, and the Southwest.

Each individual floret on a sunflower head provides nectar for a period of two to three days. These must be pollinated in order to produce seeds. In addition, extrafloral nectaries are located in the edges of the bracts underneath the flower heads and along the base of the upper leaves.

Large plantings of sunflowers have a good honey potential. They can give an average of about 65 pounds per colony. This honey ranges in color from very light amber to various shades of yellow and gold. Sometimes, the crop will have a greenish tinge. The honey has a distinctive, light, slightly tangy flavor with a hint of bitterness. It makes a wonderful creamed honey due to the fine granulation, which sets in fairly rapidly.

During the Summer and early Fall months, the annual sunflowers offer rich opportunities for foraging honey bees. **EC**



# Kids 'n Bees

Ann Harman

"Can I?" "PUL-EEZ can I?" "WHY can't I, huh? Huh?" Why not? Kids belong in beeyards. Are Mom and Dad leaving the kids behind looking at TV while Mom and Dad are busy in the beehives? Perhaps Mom and Dad will be afraid of the kids getting stung, or slowing down the tasks that need to be done.

Children are wonderful observers. They tend to focus intently on small aspects of a situation while adults tend to look at the whole picture. What a great partnership in a bee colony – parents and kids! Mom and Dad are looking over the brood pattern. Looks good, but who spots the cell with a hole in the cap, the bee with a hitchhiking *Varroa*, the bee

with the crumpled wing? The kids.

Now let's see how we can get those kids into the beeyard.

The first thing they need are some bee clothes. There is one problem with children – they grow. Whatever fits today is too small tomorrow. Several of the beekeeping equipment catalogs have bee suits – coveralls and veil in children's sizes. Even gloves. If you have several children you can invest in a suit and then play the hand-me-down game. But there are other ways to outfit children without spending a fortune. The 4-Hers showing dairy cows wear white shirts and white pants, and they are not as expensive as bee suits. The big problem is a veil. Well, if you are

handy with a needle and thread and even some duct tape, buy one of the tulle veils and adapt it to fit a hat. If you are really handy you can create a veil and shirt combination. Gloves are more of a problem, especially for the younger ones. Here you might have to invest in a pair of the children's bee gloves. But if your bees are gentle and you work them with bare hands, your children can, too. But let that be their decision.

The normal hive tool is quite large for a child to handle. However you can find a seven-inch standard-type hive tool and a seven-inch Maxant-style hive tool. For most children these will work fine. If you cobble together

some bee clothing for your kids, don't forget to put a pocket or strap to hold the hive tool. That makes it look quite professional.

Now for the subject of stings. Yes, at some point the kids will get stung. Please don't tell them they won't get stung. Well, they are probably clever enough not to believe you. You certainly can tell them it is OK to cry – just don't use some of the words they hear Mom and Dad say. A good approach is to present the kids with their own sting relief kit. These are available in equipment supply catalogs. So the child gets stung. With the kit they can feel in charge of the situation. Even the little ones can get busy taking care of their own sting. By the time they get the kit out of their pocket and begin to apply the contents most of the pain is over. But the feeling of being in charge of their own sting is the really important part. You may hear them boasting about their sting and their cure for several days.

Children's books about bees are plentiful. Some equipment suppliers have a selection. Look in the public library. Some schools have study units about bees so your children may already have a very good idea about the bees in the hive – the queen and the workers. Although the Magic School Bus video about bees may seem fanciful to us as adults, it really is quite good and is much loved by young children.

When you go to the beeyard you usually have a plan in mind – brood pattern, looking for disease, looking for nectar and pollen. Give the kids a project and tell them in advance what needs to be done. Are you going to requeen today? Kids will find the old queen faster than you can. They usually want to save an old queen for reasons only they can think of. That's fine but explain that they have to take their saved queen out of the beeyard so she does not attract a clump of bees.





Your children could be hired to inspect *Varroa* sticky boards. However, an important lesson needs to be emphasized. You cannot cheat and count bits of wax or miscellaneous dirt as *Varroa* mites. Children can easily do a sugar shake. If you want to scoop the bees into the jar, that's fine. Then give the jar to a child to put in the powdered sugar, shake, then shake the sugar out onto a white surface and find the *Varroa*. For some reason searching for the *Varroa* in the sugar and finding them turns out to be fun.

But beekeeping does not all take place in the beeyard. There is equipment to be built, repaired and painted. Hammering the big nails into brood boxes may have to be the adults' job but the kids can create a production line. They can set out the parts to be built in order of assembly, count out the necessary nails, put the assembled frames in the hive bodies. And then there is painting. Yes, children use too much paint. Yes, they get it on their nose, in their hair and on their clothes. So what. Some soap and water will clean them up and the old clothes can be kept as "painting clothes" or tossed out.

Children do like to decorate things. If one wants to paint flowers on a hive body "to make the bees happy," why not? If one wants to paint starbursts and swirls of outer space on a hive body, why not? Man has been decorating hives for centuries. We have just become too busy to spend time decorating hives. Von Frisch studied patterns painted on hive fronts to see what shapes bees could distinguish. There's a good lesson for the children. You can find the von Frisch patterns in some beekeeping books.

Extracting honey is a great family project. It is sticky and can be messy but just use lots of newspaper and have plenty of water handy. If you are new beekeepers you may set up extracting in the kitchen. With all the family participating it may take a bit longer than you think, so set aside plenty of time and have some fun. If the kids each "own" a hive they may wish to keep their honey separate. That's fine. They can sell their very own honey to their circle of friends and make some money.

Uncapping, with heated knife or not, should be delegated to the adults. Children can put the un-

capped frames in the extractor but a word of caution. The honey-coated frames are slippery and more than one may land on the floor. Turning the crank of a hand-operated extractor is definitely appropriate for the children. Opening and closing the extractor gate and watching how full the bucket is becoming is an excellent assignment. Mom and Dad tend to forget about watching the bucket, which is why bucket alarms are sold. Kids don't want to waste a drop so they keep a careful eye on the bucket.

Extracting is over. Now everyone has to participate in cleaning up. Honey is in the settling buckets and has to be there for a few days. Next comes the bottling. Mom and Dad want some nice glass jars. The kids want squeeze bears. Fortunately the squeeze bears can be purchased in boxes of 10 or 12, as well as cases of 250 or so. For beginning beekeepers and small hobbyists – and children – the small boxes of bears are really a good buy. Each child can have a supply of bears to fill.

While waiting for the honey to settle the kids can be creating their own labels for their bears. Mom and Dad should start them out right in labeling. The word "honey," their name, the net weight (which comes with the bear). Other than that whatever they wish to put on the label is fine. Everyone will have to find a way to stick the label to the bear. Or you can buy some of the plan white Avery® labels and let the kids use those.

Filling containers is a technique that has to be learned. The settling buckets should be fitted with the plastic gates. But positioning the container and when to shut the gate simply has to be learned through sticky experience. Here is where the

very young children may need some help. Put a bowl on a stand under the gate so overflows are caught. Filling containers presents another lesson – giving the customer the right amount of honey.

Now let the children decide what they wish to do with their honey. Will they give a bear to Grandma and Grandpa? What about Uncle Ned? How many will they keep for themselves to put on cereal and peanut butter sandwiches? And will they plan to sell some to their friends?

Here is another lesson – and one that Mom and Dad need to think about, too. What to charge for the honey? Consider the price of container and lid. Consider the market. A kid to kid sale may involve only a dollar. A kid to adult sale should be several dollars. Mom and Dad need to receive an appropriate price for their honey, taking into consideration the price of the container, lid and label. Most hobbyist beekeepers work for the vast sum of \$0 per hour – because the pleasure of keeping bees is their reward.

The involvement with bees extends beyond the beeyard. Children will notice bees visiting flowers and wonder which hive the bee calls home. Bees in the vegetable garden lead to an understanding of our food sources and the role bees play in pollination. Honey for sale in the supermarket will be noticed and the price will become a topic of discussion. Soon an observation hive will be a focus of attention in the home. Beekeeping is really a family affair. Give your children and grandchildren an early start. **BC**

*Ann Harman keeps her bees and teaches parents and their kids about beekeeping near her home in Flint Hill, VA.*

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# ? DO YOU KNOW ?

## Honey Bee Behavior

Clarence Collison  
Mississippi State University

The activities of the colony are regulated by their environment, natural laws and interactions of the individuals making up the society. Bee behavior in its simplest sense would be defined as the automatic reactions of an individual to stimuli found within or in the immediate area of the bee's body. Individual bees may react differently to

similar stimuli because sense organs may have different levels of sensitivity related to genetic composition, and age and hormone levels.

Please take a few minutes and answer the following questions to determine how familiar you are with these topics.

### Level 1 Beekeeping

1. \_\_\_\_ The defensive behavior of a colony and its propensity to sting are impacted both by genetic and environmental factors. (True or False)
2. \_\_\_\_ The intensity of dancing in the hive is related to the quality and quantity of the food source. (True or False)
3. \_\_\_\_ The first observed change in worker behavior associated with the loss of a queen in a colony with brood is:  
A. construction of queen cups  
B. apparent nervousness, aggressiveness and increased walking throughout the colony  
C. increased scenting behavior  
D. the production of a roaring sound  
E. the production of emergency queen cells
4. \_\_\_\_ The retinue of attendants that form around a queen first occurs:  
A. within the first 24 hours after a virgin queen emerges from her queen cell.  
B. when the queen returns from her mating flight.  
C. after the queen begins to lay eggs.  
D. just before the queen is ready to take her mating flight.  
E. when the queen is three days old.
5. \_\_\_\_ Chemicals produced internally that only affect the individual that produces and secretes them are known as pheromones. (True or False)
6. \_\_\_\_ The presence of empty comb in the hive enhances the level of defensive behavior by a colony. (True or False)
7. Define colony homeostasis. (1 point)
8. \_\_\_\_ Individual worker honey bees can accelerate, delay, or even reverse their behavioral development in response to changes in the colony's internal and external environment. (True or False)
9. \_\_\_\_ As honey bees age they graduate from simple to more complex tasks. (True or False)
10. \_\_\_\_ Removing or destroying drone brood in colonies encourages it production. (True or False)
11. \_\_\_\_ All colony activities are controlled by the queen. (True or False)
12. \_\_\_\_ Virgin queens pay little attention to unsealed queen cells. (True or False)
13. \_\_\_\_ Nurse bees will provide better care for worker brood than drone brood if rearing conditions are marginal. (True or False)

### Advanced Beekeeping

14. \_\_\_\_ Most deadly honey bee virus among all the

honey bee viruses that have been described.

- A. Cloudy wing particle virus      B. Virus X  
C. Virus Y      D. Kashmir bee virus  
E. Black queen cell virus
15. \_\_\_\_ Black queen cell virus is a common infection of adult bees in the field, however, the symptoms are only expressed in the queen cells that develop dark brown to black cell walls. (True or False)
16. \_\_\_\_ The hemolymph of the diseased honey bees become milky white and densely filled with small bodies.  
A. Acute bee paralysis virus  
B. Filamentous virus  
C. Sacbrood virus  
D. Chronic bee paralysis virus  
E. Cloudy wing particle virus
17. \_\_\_\_ A worker honey bee that has been a forager and is forced to revert back to being a nurse bee experiences an increase in its juvenile hormone level in its hemolymph. (True or False)
18. \_\_\_\_ During the Winter queens receive less attention from workers than they do in the Spring and Summer. (True or False)
19. Describe the effect of increasing levels of juvenile hormone on honey larvae and adult honey bees. (2 points)
20. If you established a colony from only newly emerged worker honey bees, bees as young as \_\_\_\_ days old can be induced to forage and perform dances to recruit other foragers.  
A. 14      B. two      C. 10      D. seven      E. four
21. \_\_\_\_ As a worker honey bee ages it becomes more sensitive to colony disturbances. (True or False)
22. \_\_\_\_ Queen substance is a very volatile substance and is distributed in the hive by fanning bees. (True or False)
23. \_\_\_\_ The construction of queen cell cups is partially inhibited by pheromones from mated laying queens, virgin queens, and immature queens. (True or False)
24. The predominant component of the mandibular glands of virgin queens and worker bees is \_\_\_\_.  
A. (E)-10 hydroxy-2-decenoic acid  
B. 10-hydroxydecenoic acid  
C. (E)-9-hydroxy-2-decenoic acid  
D. (E)-9 oxo-2-decenoic acid  
E. 8-hydroxyoctanoic acid
25. \_\_\_\_ Queen substance inhibits ovary development in workers but not in queens. (True or False)

ANSWERS ON NEXT PAGE



# **?Do You Know?**

## **Answers**

1. **True** Although honey bee defensive behavior is partially determined by genetics, it also may be greatly affected by environment.
2. **True** The number of foragers dancing in the hive is related to the quantity and richness of the food source. This adjusts the activity of foraging bees from a colony relative to the abundance and richness of available nectar.
3. B) apparent nervousness, aggressiveness and increased walking throughout the colony
4. D) just before the queen is ready to take her mating flight.
5. **False** Chemicals produced internally and effect the individual that produces them are known as hormones. Pheromones are secreted externally and effect other individuals of the colony or same species.
6. **True** Empty comb within the hive enhances defensive behavior. Unidentified pheromones in empty comb lower the threshold of response to intruders. Colonies with empty comb respond to disturbances twice as fast and sting twice as much as colonies with little empty comb.
7. Constant-level homeostasis is the maintenance of nest temperature and other environmental factors.
8. **True** Honey bee workers change jobs as they age, and age polyethism has been shown to have a high degree of plasticity. Bees can accelerate, delay, or even reverse their development in response to changes in the colony's environment.
9. **True** As honey bees age they graduate from simple to complex tasks. The first thing that an emerging bee does is clean cells, then she becomes a nurse bee, feeding the young, then she may remove the dead, process honey, control temperature and humidity, etc. Finally, a worker becomes a forager, the most difficult and dangerous task.
10. **True** Drone comb construction and brood production are
11. **False** The queen has influence, however, she does not guide or organize worker activities.
12. **True** Virgin queens seek out capped queen cells when they emerge, but they pay little attention to unsealed queen cells.
13. **True** Drone brood production occurs when prosperity reigns or when the colony is doomed because of queen problems. If rearing conditions are marginal, worker brood receives better care than drone brood. If conditions are poor, drone brood is destroyed.
14. D) Kashmir bee virus
15. **True** Black queen cell virus is common in adults. The symptoms of the infection are only expressed in the queen cells that develop dark brown to black cell walls.
16. B) Filamentous virus
17. **False** The juvenile hormone controls the rate in which a bee moves from one task to another. Foragers have more juvenile hormone than young bees. A worker that has been a forager and is forced to revert back to nursing has less juvenile hormone in its hemolymph than it did when it was a forager.
18. **True** During the Winter queen honey bees receive less attention from workers than they do in the Spring and Summer.
19. In the larval stage, an increasing level of juvenile hormone in the blood causes the next developmental stage to remain larval rather than causing it to become a pupa, therefore it appears to keep the immature insect "juvenile." In adult worker honey bees, an increasing level of juvenile hormone, possesses a maturing effect in the behavioral development of the worker, instead of the juvenilizing effect found in metamorphosis. Juvenile hormone levels in blood typically increase with adult age; they are low in bees that perform in-hive tasks such as nursing and comb building and high in foragers.
20. E) four
21. **True** Workers in a single

colony show variability in their defensive responses, older bees generally more sensitive to disturbances, partly because of their location within the hive. Older bees are normally found in the outer regions of the brood nest, and are also more sensitive to alarm pheromones than younger bees.

22. **False** Queen substance is not very volatile. It must be contacted directly by the bees and received on a regular basis or the effects of the chemical will not function properly. Some bees must be in direct contact with the queen and the pheromone is passed to other bees in the colony via food transmission.
23. **True** The construction of queen cups is at least in part inhibited by pheromones from mated laying queens, virgin queens, and immature queens, the first being most effective.
24. A) (E)-10-hydroxy-2-decenoic acid
25. **True** While the pheromones associated with the queen's mandibular glands are effective in inhibiting the development of worker ovaries, the ovaries of a queen honey bee develop normally. Even the injection of the pheromone into the queen's blood fails to influence ovary development. Apparently the queen has the ability to deactivate the effect of the pheromone in some way.

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

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

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



# GLEANNINGS

AUGUST, 2006 • ALL THE NEWS THAT FITS

## Chimps & Man The Enemy

### AHB & STINGLESS BEES

In the first study of native African honey bees and honey-making stingless bees in the same habitat, humans and chimpanzees are the primary bee nest predators. Robert Kajobe of the Dutch Tropical Bee Research Unit and David Roubik from the Smithsonian Tropical Research Institute report in a recent issue of *Biotropica*.

Batwa Pygmies, who have traditionally harvested honey for food, located 228 bee nests (both honeybees and stingless bees) for the study. Roubik identified the bees and found that Pygmy names for the bees corresponded to scientific names, except for a black and a brown form of *Meliponula ferruginea*. Honey bee (*Apis*) nests were numerous compared to other sites in the tropics, whereas honey-making stingless bee nests were relatively scarce. Nest abundance did not vary with altitude, nor did pollen collection or the seasonality of flowering.

Both honey bees and stingless bees make honey. *Apis mellifera*, the most commonly cultivated honeybee, is native to Europe and Africa. *Apis mellifera* subspecies *scutellata*, the very defensive tropical African honey bee, was transplanted from Africa to Brazil as part of a scientific experiment to boost honey production in 1956. From Brazil, it invaded the Americas, working its way northward and is now found in southern U.S. states.

Dave Roubik has followed the

progress of Africanized honeybees in the New World, documenting effects of pollen and nectar collecting and nesting ecology on native-American stingless bees. Kajobe invited Roubik to visit the Bwindi-Impenetrable National Park in southwestern Uganda, where African honey bees coexist with five or more species of honey-making stingless bees in their native habitat.

Chimps in the Park peel and chew the tips of vines and twigs to make honey dipsticks. Roubik notes that indigenous groups in the Americas use similar honey brushes to harvest honey in areas where Africanized bees are relative newcomers.

"Bwindi-Impenetrable is the only place on earth where gorillas, chimps and humans partition forest resources. Given the importance of honey as one of the most concentrated sources of sugar in the forest, and the fact that the park management plan allows collection of non-timber forest products, there is an abysmal lack of ecological information about the role of honey-making bees and the role of their natural predators in this ecosystem. Nothing is known about the amount of honey produced in nests of different species. Nothing is known about how often bee species found new nests. Unfortunately, this dearth of information about native bees will continue unless more funding for basic natural history research is forthcoming," asserts Roubik.

## USDA NEWS

In the FY07 budget, USDA provides over \$2 billion a year for research and related programs. According to the agency, overall, USDA research programs are effective. However, the programs do not adequately target research to priority areas due to statutory requirements of formula grants and the earmarking of funds. Over \$1 billion of this funding supports approximately 1,200 individual projects conducted by USDA scientists at over 100 Federal facilities. A roughly equal amount is provided in the form of grants for research, education and extension programs, largely to State land grant universities and State agricultural extension agencies. The Administration believes very strongly that taxpayer funding should go to the highest priority programs that meet national needs. For that reason, the Budget includes increases of \$107 million for research by USDA scientists in priority areas such as food safety, emerging and exotic diseases, bioenergy, plant and animal genomics and genetics, and human nutrition. The Administration strongly favors the use of competitive awards as the most effective way of assuring quality. In order to promote this objective, the Budget:

- Increases funding for the competitive National Research Initiative by \$67 million (an increase of 37%), up from \$181 million to \$248 million. • Indirect cost cap is eliminated in order to make USDA-CSREES competitive grants more competitive with competitive grants from other agencies.
- Proposes to expand and continuously re-compete the Hatch multi-State awards.

Farm subsidy programs were introduced in the 1930s largely due to concern for chronically low, and highly variable, incomes of U.S. farm households. Today commodity-based support programs are still prominent, though income and wealth of the average farm household now exceed that of the average nonfarm households – by a large margin. Farm income continues to be highly variable, but the small set of farm households most at risk for income variability – because farm income represents more than one-third of household income – are those operating large farms. And they have substantial net worth, which cushions uncertain farm income.

Crop production is shifting to much larger farms. Since government commodity payments reflect production volumes for program commodities, payments are also shifting to larger farms. In turn, the operators of very large farms have substantially higher household incomes than other farm households, and as a result government commodity payments are also shifting to much higher-income households. Since the changes in farm structure appear to be ongoing, commodity payments will likely, under current policies, continue to shift to higher income households. This brief uses 2003 Agricultural Resource Management Survey (ARMS) data to detail the shifts.

### ANIMAL ID SYSTEM IMPLEMENTATION PLAN

Agriculture Secretary Mike Johanns announced (April 6) the release of an implementation plan that outlines timelines and benchmarks for the establishment of the National Animal Identification System (NAIS), along with a plan for the initial integration of private and state animal tracking databases with NAIS. "Developing an effective animal identification system has been a high priority for USDA and we've made significant strides toward achieving a compre-

hensive U.S. system," said Johanns. "We recognize that this represents one of the largest systematic changes ever faced by the livestock industry, and we have welcomed suggestions from stakeholders to ensure that we continue to gain momentum. The plan we are releasing will guide our efforts as we continue to work with our State and industry partners to implement a nationwide system." Bees aren't on this list yet.

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## OBITUARY



Reg Shuel was born March 24, 1920 and died March 30, 2006. He received his Bachelor of Science in Agriculture from the Univ. of Toronto in 1941. His academic career was interrupted by World War II. He served as a Captain until 1945. He continued his studies at the Univ. of Toronto for his MS in Agriculture (1948) and then at the Ohio State University for his Ph. D (1950). From 1950 to 1985 he was a distinguished professor, first in the Apiculture Department, and then in the Department of Environmental Biology. He served as co-ordinator of the Apiculture program for many years, and from time to time acted as Chair of department. His extensive

publication record spans 44 years, and lists over 50 publications. He served as Editor of the Journal of Apicultural Research from 1981 until after his retirement in 1985.

A retrospective of his decades of academic activity has left us with a harvest of memories. His concern for his friends, colleagues, and students extended into his involvement, and the tensions, of the very first brief that represented the views of the Faculty Association to the President of the Board of Governors. He served on the University President's committee on pensions, and was influential in international development, participating in training of Kenyan students at home and in Canada. He contributed consistently to the activities of the Ontario Beekeepers' Association, and to national concerns in beekeeping, honey production, pesticide problems.

Our memories can be summed up in the values that seemed to motivate and inform his actions. The commanding value was "for the good of the whole," and we can pay an academic colleague and friend no greater compliment. He will be missed by his wife, Helena; three daughters, Jane, Deirdre and Olivia; and three grandchildren.

Stu Dixon and Peter Kevan

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## MISLEADING LABELS ON IRISH HONEY

Tests by the Food Safety Authority of Ireland have found that a quarter of 'Irish' honey turned out to be imported and some contained antibiotic residues.

The work was undertaken to investigate concerns raised by the Federation of Irish Beekeepers' Associations that a greater amount of Irish honey was being sold than was produced in Ireland.

The authority urged the food industry to be vigilant when sourcing honey labeled as Irish.

The action came after a survey of 20 randomly-selected Irish honeys, sourced from various manufacturers and retail outlets throughout Ireland, identified that five were found to be non-Irish, four of which were labeled as Irish, and one carrying a misleading label of origin.

One sample was found to contain 410g/kg sulfadiazine-sulfamethazine - and less than 10g/kg of other sulfonamides.

As a result of the breaches uncovered by analytical methods, a total of five food business operators were fully audited including packers, brand owners and/or retailers of the samples.

"In audits carried out with the food business operators, the level of record keeping was insufficient to facilitate traceability or product recall," the authority said. "The food business operators audited also demonstrated

a lack of awareness regarding legislative requirements."

The authority said it is working with retailers to ensure the affected products are removed from sale. Corrective action was also ordered to ensure the relevant legislation is complied with.

The survey, conducted between July 2005 and April 2006, was undertaken to establish if honeys sold as Irish honey on the Irish market complied with EU labeling legislation.

As part of the survey, analysis of the floral origins of honeys was carried out by identifying the pollens found in the honey.

The five non-Irish honey products identified by the survey:

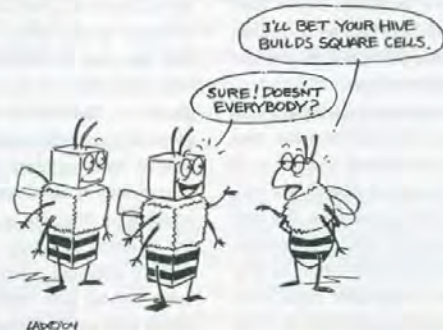
Molaga Pure Honey - the label inferred Irish origin but the survey indicated honey of Mediterranean/Spanish origin;

Kilkenny Pure Irish Honey - labeled as Irish but the survey indicated honey of Mediterranean/Spanish origin;

Natural Ireland Honey - labeled as Irish but the survey indicated honey of Mediterranean/Spanish origin;

Irish Honey- Wheelock's Fruit Stall - labeled as Irish but the survey indicated honey of South American, possibly Brazilian, origin;

Wexford Honey - Jim Kenny - labeled as Irish but the survey indicated honey of Eastern European to Chinese origin.



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# Australia Guards Against Varroa

Alan Harman

Australian research has identified a novel way to control the *Varroa* mite that would safeguard Australian honey producers against losses in the event of an incursion.

The Commonwealth Scientific and Industrial Research Organization (CSIRO) method involves locating the bee signal that triggers the female *Varroa* mite reproductive program, then manipulating or modifying the signal to produce *Varroa*-resistant bee stock.

Researcher Denis Anderson of CSIRO's entomology division said in a report released by the Rural Industries Research and Development Corp. that the clarification of aspects of *Varroa* reproduction was the first stage in identifying that signal.

The aim was to find a procedure for differentiating the various internal tissues and organs of female *Varroa* mites. This procedure will be a crucial tool for second stage studies aimed at pinpointing the precise time when mite reproduction is first triggered. This, in turn, will allow for a detailed search for the signal.

The project is the first stage towards developing *Varroa*-resistant honey bees.

Anderson's report said the pathway that will be followed to develop resistant bees stems from recent information that has come to light on the complex relationships that exist between *Varroa* mites and their native Asian honey bee hosts strains of *A. cerana*, which now are known to have determined whether or not particular *Varroa* mites can use *A. mellifera* as an alternative host.

Research has shown that there are more than 20 different genotypes of *Varroa*, each a member of one of

several different species and each a native parasite of a particular genotype of *A. cerana* in Asia.

Only two of those genotypes, the so-called Korea and Japan genotypes of *V. destructor*, have become pests of *A. mellifera* because they recognize a signal released by *A. mellifera* larvae that allows them to produce offspring on the larvae.

The other 90% of genotypes have not become pests of *A. mellifera* simply because they fail to recognize that signal. Finding the signal will allow it to be manipulated in *A. mellifera* so that the Korea and Japan genotypes, like all the other genotypes, do not recognize it.

This could possibly even eliminate the *Varroa* mite as a pest of *A. mellifera*.

Research has shown that the signal that triggers egg laying in females of the Korea genotype of *V. destructor* is released by honeybee larvae during the first 70 hours after their cells are capped.

The Australian project is the first step towards finding that signal. The aim was to find a procedure that could differentiate the different internal body tissues of female *Varroa* mites.

This procedure is needed before second-stage studies, aimed at developing a model of the *Varroa* mite reproduction system, can begin. The model will reduce the field-of-search for the signal by pinpointing the precise time when mite reproduction is first initiated. The search for the signal will then become very directed.

The signal – or signals – that trigger *Varroa* mite reproduction will almost certainly be a chemical that interacts with a mite receptor. Identifying this signal could present a new way of controlling the Korea and Japan haplotypes of *V. destructor* on *A. mellifera*.

Once the signal has been found, then various approaches can be pursued to produce *Varroa*-resistant bees. The simplest would be to search for *A. mellifera* populations

that produce a signal profile that is outside the receptive range of the Korea and Japan genotypes of *V. destructor*. Such bees could be easily propagated in isolation to produce *Varroa*-resistant bee lines. Another approach might be to feed bees a chemical analogue of the signal to confuse mites.

Yet another approach might be to employ genetic engineering techniques to produce bee-lines with signal profiles that mites cannot recognize.

"This latter approach has the possibility of completely eliminating the *Varroa* mite as a pest of *A. mellifera*," the report said.

The signal that triggers egg-laying in female *V. destructor* is produced by the bee and is present somewhere inside the capped cell during the first 70 hours after the cell is capped, as it is during this time that the first egg is laid.

To narrow the field-of-search for the signal a model of the *Varroa* mite reproduction system will be developed. This model will pinpoint the precise time when egg laying is first switched-on, thereby allowing for a very directed search for the signal.

The model will be developed by tracing changes that occur in certain internal body tissues of female mites – such as nerve, fat and muscle tissue – after they enter susceptible bee cells up to the point where they commence egg-laying.

However, before work can commence on developing the model, a procedure is needed to allow those changes to be traced.

This, in turn, will allow for a directed search for signals responsible for initiating mite reproduction and then to the production of *Varroa*-resistant honey bees.

The researchers said this will open new markets for Australian-bred queen bees and safeguard Australian honey producers against losses in the event of a *Varroa* mite incursion. **BC**



Denis Anderson





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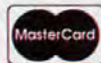
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ne afternoon while hanging out clothes in the backyard, I was startled by the sudden appearance of a strange woman.

She didn't even introduce herself. "You need to help me," she blurted, with more than a hint of desperation in her voice. "There's an enormous swarm of bees in front of my house, and they terrify me! I hate bees!"

I said, "I'm sorry that you hate bees, but today could be your lucky day, because I love the little darlings."

"They're awful! Please help me. Please come and take them away," she said.

She lived just down the road. After she confirmed that these bees were in fact clinging to a fence and not "flying around," I assured her I'd drop everything and take a look. Before you get in the truck, you always want to make sure that a swarm is a swarm is a swarm, or you'll find yourself smack dab in the middle of somebody else's yellow jacket problem.

I once drove 60 miles roundtrip to gather a "swarm" that turned out to be nothing more than honey bees merrily pollinating an apple tree. When I explained this to the homeowner, she said, "Well, can't you take them anyway?"

But the terrified woman from down the road had a real swarm on her fence. In fact, it was the largest swarm I've ever seen. It clustered on the fence directly opposite her front porch.

I leaned a super against the bees. Swarms like to draw comb once they get situated in their new home, so my super had more foundation in it than comb. I figured as long as I was getting free bees, I might as well get some free comb, too.

The lady watched from afar, occasionally squealing that it would be "such a relief" when these bees were in my truck and headed down the road.

When I came back a few hours later, the bees had basically ignored my offering and continued to cling to the fence. I didn't argue. I brought back a super filled with drawn comb and some honey, and started over.

By late afternoon, the super was full of bees, but half of the swarm remained on the fence. Clearly one super wasn't going to do the job. I drove home again, brought back yet another super, and made this a two-story operation.

The lady's husband said, "When are you going to have these bees out of here?"

I said, "As soon as they're all in the boxes, I can take them home. I'll check on them in the morning, if that's OK," I said.

"What time in the morning?" he said, eyeing me closely.

I said, "Seven?"

"I guess that'll be all right," he said.

Did he think I'd be peering into their windows while they got dressed? I suddenly felt like an uninvited guest.

There was something else going on in my life at the same time. Maybe I was making divisions. I don't remember. But I didn't get back to my swarm until late the following afternoon. The bees had filled both supers and basically moved in. Foragers zipped in and out of their new hive.

As I nailed the supers together, the lady of the house came out onto the porch. "I expect a jar of honey in return for this," she said.

Her request took me by surprise. "Really?" I said. "Maybe you ought to give me one."

She wheeled around and disappeared, and a couple of minutes later, her husband came out into the yard.

It started out pleasant enough. "Got 'em all gathered up, have you?" he inquired.

"Yup," I said.

"You know," he said, "you were rude to my wife just now. All she asked for was a little honey."

"I thought I was doing you the favor," I said. "Why would I give you honey, too?"

"You did us a favor? You got your bees didn't you? What's a jar of honey?"

"It's my livelihood," I said. "Normally I sell honey, not give it away."

"Well, it would have been neighborly of you to give my wife a taste," he said.

"I guess I'd rather not," I said.

"Look," he said, "Why don't you just load up your bees and leave?"

"I plan to," I said.

"Next time we see any bees we'll just poison them," he said, as I got into my truck.

Usually I feel like I've made new friends when I answer a swarm call, but I didn't much care for this little incident. I wondered if the bees were worth it.

The honey was beside the point. And in a way, the man was right. What's a jar of honey? That, and a bitter neighbor is a curse on your house.

So a couple of days later, I set a jar on the couple's gatepost. It promptly disappeared, but I never did hear from those people. Somehow I didn't expect to. That's fine.

About the same time, I read James Tew's piece in *Bee Culture* extolling the advantages of re-queening swarms. Now normally, looking for the queen in a strong two-story hive is something I just wouldn't do. But one day I was admiring a frame of drone comb foundation that my swarm colony had so nicely drawn out, and there she was – the darkest of dark beauties. She looked stunning. I hesitated for an instant before I pinched off her head.

Next I hollowed out a hole in the hive and popped in a five-frame nuc headed by an SMR/hygienic queen. Before long, those two supers were full of brood and dandelion honey, and in fact this was one of my first hives to receive a honey super this spring.

It continues to be one of my most productive colonies. I'm so glad that lady stopped by. I should have been more appreciative. I should have given those folks two jars of honey.

Ed Colby

## Two Jars Of Honey

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