



The University of Georgia

College of Agricultural and Environmental Sciences
Department of Entomology



Vol. 19 No. 1

April 2008

Editor: Jennifer Berry, Agricultural Research Coordinator

2008 Young Harris Beekeeping Institute



Young Harris College and the University of Georgia are offering the seventeenth annual Beekeeping Institute, May 15-17, 2008, on the campus of Young Harris College, Young Harris, Georgia. Since its inception in 1992, the Institute has become the most comprehensive beekeeping educational event in the Southeast, offering classes and workshops for beekeepers at all levels of experience. It is home to the Georgia Master Beekeeper Program and serves as North America's affiliate of the Welsh (UK) honey judge certification training program.

The approach is a mixture of basics for the beginner and newest practical science for the more experienced. Confirmed speakers for 2008 include Ross Conrad, author of *Natural Beekeeping: Organic Approaches to Modern Apiculture*; Kim Flottum, editor of the Bee Culture Magazine and author of *The Backyard Beekeeper: An Absolute Beginner's Guide to Keeping Bees in Your Yard and Garden*; Shane Gebauer, general manager for Brushy Mountain Bee Farm; and Jerry Hayes, Apiary Inspection Chief for the state of Florida. Workshops and lectures focus on the latest information on Colony Collapse Disorder, non-chemical management, and new technical breakthroughs. A honey show, art show, great food, and beautiful mountain scenery round out the experience. Best of all is the fun and fellowship you'll enjoy with other beekeepers from all over.

Go to our website at www.ent.uga.edu/bees and click on the Young Harris Bee Institute icon. You will find program information and registration forms. Or, you can request a hard copy by calling Ms. Terry All at (706) 542-3687.

We look forward to seeing you at the 2008 Beekeeping Institute!

Beekeeping Added to Annual UGA Farm Gate Survey

The UGA Department of Agricultural and Applied Statistics have been surveying Georgia county extension agents annually since 1999 to derive the annual Farm Gate Value Report <http://www.caed.uga.edu/publications/annual.html> . This is the most reliable estimate of the annual contribution of farming to Georgia's economy. 2007 marks the first year that beekeeping was included. The 2007 report shows that beekeeper revenues from bees and hive products were over \$18 million. When the value of honey bee pollination is inserted, the 2007 contribution of honey bees to Georgia's economy is estimated at over \$77 million. The table indicates an average 4-year annual contribution of \$79 million.

2007 beekeeping economic impact	2006	2005	2004
Honey produced	5,529,538		
Pollination fees	1,454,880		
Packages, queens, nucs	11,695,225		
Sum revenues	18,679,643	17,745,661 (estimated)	17,390,748 (estimated)
Yield enhancement	\$59,175,303	\$66,644,957	\$63,062,176
Total	\$77,854,946	\$85,324,600	\$80,452,924
			\$70,724,641

Pesticide Contamination

Last January I attended probably the largest groupings of beekeepers and honey bee researchers to assemble under one roof at the same time. The National Honey Board, American Association of Professional Apiculturists, American Honey Producers Association, the Apiary Inspectors of America and a thousand other attendees interested in bees were in attendance. It was a week long conference with everything from CCD to apitherapy to the latest laws regulating honey. But probably the most compelling information I came away with was Maryann Frazier's report on pesticides detected in honey, wax and pollen.

Maryann Frazier is a senior extension associate for the department of Entomology at Penn State. Her research over the years has focused on pollination and IPM to control honey bee diseases and mites. Maryann along with pesticide toxicologist Chris Mullin and insect physiologist Jim Frazier have been investigating the link between pesticides and the decline in honey bees. Now with CCD on the rise their work has taken on a whole new light. For instance, samples of pollen tested revealed numerous substances including insecticides, fungicides, and herbicides. Recently, Maryann wrote a short article discussing their research. Here is that article.

Hazardous Working Zone

Maryann Frazier
Chris Mullin
Jim Frazier

Department of Entomology; Penn State University

Honey bee exposure to chemical pesticides has long been a concern of beekeepers and growers alike. A large portion of the countries 2.4 million colonies are utilized for crop pollination and are typically employed to pollinate several different crops a season. These colonies are potentially at risk of exposure to the pesticides used by growers to control pest insects. Likewise the need to use chemical pesticides within the hive to control varroa mites has long been a concern in terms of the potential impacts on developing bees, especially queens, and the possible contamination of hive products. In the past, our experience with pesticides has been associated with lethal exposure and the obvious symptom of a pile of dead bees on the ground in front of the hive. But we are increasingly concerned about how pesticides may affect bees at sublethal levels, not killing them outright but impairing their behavior or their ability to fight off pathogen infections. For example, pesticides at sublethal levels have been shown to impair the learning abilities of honey bees. For these reasons, pesticide exposure is one of the potential factors contributing to honey bee decline under investigation.

In 2007 we conducted a survey of pollen (bee bread), wax and brood to determine if pesticide contamination is occurring and might be a potential factor in declining honey bee health and possibly Colony Collapse Disorder (CCD). In a total of 92 pollen samples analyzed, 43 different pesticides and five other metabolites were identified. Up to 17 different pesticides per sample were found. On average samples contained five different residues. Only three of 92 pollen samples lacked detections. The total pesticide load in the majority of the samples is of concern relative to bee health.

Of particular concern, Aldicarb metabolites, ranging up to 1236 ppb, were found at 2 locations in Florida, where trees were being treated for citrus greening disease, and represent a combined level in pollen that exceeds current food tolerances for human safety. These multiple residues of different pesticides including insecticides from several chemical classes with fungicides and less commonly together with herbicides, result in a total pesticide load in pollen that raises concerns about the possible combined effects these may have on honey bee health from both acute as well as chronic exposure scenarios.

CCD operations and analysis

A large number of samples were analyzed as part of an in-depth, on going study on the cause of CCD. Out of a total of 41 samples including 18 pollen (bee bread), 18 wax and 5 brood samples analyzed to date (from CCD and control operations), 29 different pesticides were detected with as many as 13 detections per sample. Fluralinate and coumaphos were found in 100% of the wax and brood samples and fluralinate was found in all but one of the pollen samples, although coumaphos was less frequent in

pollen. Chlorpyrifos and fenprothrin were also present in most of the bee bread samples, whereas chlorpyrifos and clorothalonil frequently occurred in wax.

The most significant difference in pesticide levels relative to bee health was that fluvalinate residues tended to be higher in pollen, wax and brood of weak, dead and recovering colonies relative to strong colonies. Highest levels of pesticides were found in the wax, followed by the pollen and brood, but levels in wax were much more variable than in pollen or brood. The fluvalinate levels found in brood are within a lethal range for honey bees.

Conclusions

The toxic chemical burden of honey bees is primarily a combination of both in-hive and out-of-hive pesticide exposures, the latter associated with residues in pollen and nectar brought into the hive. Unprecedented amounts of fluvalinate at high-frequency have been detected in the wax, pollen and brood of honey bees. Another in-hive miticide, coumaphos, and numerous environmental insecticides along with fungicides and herbicides have also been widely detected in these hive matrices. The large numbers and multiple kinds of pesticides could result in potentially toxic interactions. These chronic levels of pesticides in pollen, wax and brood at potentially acute levels need to be further investigated in regards to their causative role in CCD. It is anticipated that increasing the breadth of multi-residue pesticide analysis of brood and adult bee samples and its correlation with related pollen and wax pesticide residues will provide valuable insight into recent declines in honey bee health.

Have Your Wax Samples Tested

The past few months I have been in search of pesticide-free wax, specifically free of miticides used to control varroa mites. I acquired two samples of cappings wax from colonies which had no known history of pesticide use. Samples were sent to the National Science Laboratory in North Carolina to be analyzed for coumaphos (CheckMite[®]), and fluvalinate (Apistan[®]). Both samples came back with detectable amounts of coumaphos, fluvalinate and the breakdown metabolite from coumaphos. This analysis was disturbing to both myself and the beekeepers involved.

If you would like your wax tested, you can send a sample to the USDA Agricultural Marketing Service. They can test samples for anyone who is interested. For amitraz (plus metabolites), coumaphos (plus metabolites), and fluvalinate the fee is \$126.00 per sample. If you would like a comprehensive test (about 170 pesticides), the fee is \$252.00 per sample. Below is the contact information.

USDA Agricultural Marketing Service
Roger Simonds, Supervisory Chemist
National Science Laboratory
801 Summit Crossing Place, Suite B
Gastonia, NC 28054

Senators Become Concerned

On March 19, 2007, the democratic Senator from California, Barbara Boxer, led 18 senators in the writing of a letter to the Chairman and Ranking Member of the Senate Appropriations Subcommittee on Agriculture. The contents of the letter stated that \$20 million dollars be allocated for funding research focusing on the decline of honey bees. Finally, they, as millions of Americans, are concerned with the bee population decline we have experienced these past years. But what finally woke up congress was the fact that without honey bees the agricultural industry in the US would be severely impacted. At this point the

bill has passed the Senate but is currently stalled in the House. The following is the letter sent to Senators Herb Kohl (Chairman) and Robert Bennett (Ranking Member).

Dear Chairman Kohl and Ranking Member Bennett,

We are writing to request that the Agriculture Appropriations Subcommittee allocate \$20 million in Fiscal Year 2009 funding for honeybee and pollinator research projects. These funds will go a long way in providing sustainable research and combating Colony Collapse Disorder (CCD) in managed honeybees. The President's budget proposal only includes an increase of \$780,000 from FY2008 for CCD.

As you know, the Senate-passed version of the farm bill includes language authorizing \$100 million over five years for CCD and pollinator related research initiatives. We feel that the vital role pollination services play in the nation's agricultural industry merits a FY2009 appropriation in line with the levels authorized in the farm bill.

As former U.S. Agriculture Secretary Mike Johanns starkly warned in June of 2007, the continued decline in honeybees and emergence of CCD "has the potential to cause a \$15 billion direct loss of crop production and \$75 billion in indirect losses." Pollinators are responsible for the production of one-third of the nation's food supply, yet Federal support of pollinator and honeybee health research has historically been unreflective of the importance of pollination.

We have taken for granted the indispensable services honeybees and other pollinators provide our nation. The number of managed honeybee colonies in the U.S. has dropped in half since 1960, while demand for their services in agriculture has continued to grow. Ninety percent of the nation's existing hives are predicted to be needed to pollinate California's 2012 almond crop alone. In other states, farmers who produce apples, melons, berries, peaches, squash, and many other fruits and vegetables depend on healthy pollinators.

Because of the importance of honeybees/pollinators in the production of the nation's food supply and their impact on the stability of our agricultural economy, it is essential that the Federal government help establish sustainable, long-term, research initiatives dedicated to protecting pollinator health and finding immediate solutions to CCD.

With a \$20 million investment this year in CCD and pollinator health research, we can begin to take steps toward providing the scientific community with the resources it needs to pursue vital investigations into the complex pollinator systems that our nation's agricultural activities are dependant upon.

With broad consensus from farmers, beekeepers, scientists and legislators on the need to fund pollinator research, we hope your Subcommittee will see the appropriation as more than a justifiable expenditure, and make a decisive investment in the future and safety of our nation's food supply.

Thank you for your time and consideration of this important matter.

Sincerely,

U.S. Senator Barbara Boxer, U.S. Senator Debbie Stabenow, U.S. Senator Joseph R. Biden Jr.
U.S. Senator Hillary Rodham Clinton, U.S. Senator Christopher J. Dodd, U.S. Senator Robert P. Casey,
U.S. Senator Bernie Sanders, U.S. Senator John F. Kerry, U.S. Senator Tim Johnson, U.S. Senator
Charles E. Schumer, U.S. Senator Robert Menendez, U.S. Senator Daniel K. Inouye, U.S. Senator Arlen
Specter, U.S. Senator Richard J. Durbin, U.S. Senator Jack Reed
U.S. Senator Ron Wyden, U.S. Senator Bill Nelson, U.S. Senator Sherrod Brown

Update on 2008 CCD Losses

Dr. Jeff Pettis was quoted last month saying CCD losses for 2008 appear to be worse than last year. He surveyed 22 commercial beekeepers which came from 10 different states. According to his survey, about 37% of their colonies have perished with CCD like symptoms. All of these beekeepers took their colonies to California for almond pollination. The total number of colonies involved in the survey is 230,000 which represent only about 16% of the total colonies needed to pollinate blooms for the continually growing almond industry. Last year at this time there was only a 30% loss recorded.

Management Calendar: April - May in Georgia



On a brighter note, as I look out my window there is an ocean of pink peach blossoms flooding the view. Out the other window there are streaks of white from the Bradford pears, magenta bursts from the red buds and rivers of purple henbit and other tiny wild flowers, (which from a distance almost resemble the heather fields of Ireland). It is spring time in Georgia and Mother Nature has come to life. What a great time to be a beekeeper. However, sitting here in front of my computer this time of year is absolute torture. I would much prefer being outside playing with the bees. Come July, I will probably eat these words when the temperatures are hovering in the mid 90's with the relative humidity topping off at about 93%. But for now, life is good.

This month our over-wintered colonies are busting out and exploring the new landscape of color and light. However, with all these fresh blooms supplying pounds of pollen and a trickle of nectar, colonies have one other thing on their mind: swarming. At the end of February our lab started receiving "swarm" calls. Most of the callers on the other end were calm and just want someone to come remove the massive swarm of bees that have landed on their favorite rocking chair on their front porch. But others aren't so calm. "PLEASE.... help us and the children from being ripped apart from limb to limb!!!! And, by the way, if you come and get the bees we won't charge you a dime to keep them".

So far this year we haven't had a single colony swarm but we have worked hard implementing swarm management techniques. We started splitting colonies in early March. Even then we were seeing swarm cells. Splitting your colony into two is one of the best ways to discourage swarming. There are many different techniques to splitting a colony but let me explain one way we accomplish the task here. If the colony has already begun constructing swarm cells, we remove the "old" queen and half the frames with bees and brood and transfer them into a new hive box. All queen cells on these frames accompanying the queen are removed (cut) before being placed into the hive. Frames in the now "queenless" hive we leave intact queen cells. If at all possible move the colony off site for a few days so the foragers will not return to the original colony. If the colony has not yet built queen cells, follow the above steps but make sure the "queenless" colony has a frame of eggs or very young larvae. This way they are able to construct their own queen cells. Basically by removing the old queen and letting the colony re-queen itself, you have artificially created a swarm. Now you're not out of the woods yet, there are still many swarming months ahead. Cutting queen cells, re-queening, and equalizing colonies are all good ways to reduce swarming. Good Luck!

Here at the lab nectar is starting to drip out of the cells and pollen has been coming in by the truck loads. However, even with nectar coming in the door it may not be enough to sustain the increased number of bees and brood. For the next few weeks keep an eye on your colonies' food supplies. Also, keep an eye on mite levels. If levels are above the economic threshold reducing mites is important sooner than later. There are options available other than chemical ones that can reduce mite levels (drone brood trapping, powder sugar drops, and bottom screens).

Hopefully, we won't experience a late freeze like last year and instead have an above average nectar flow (plus fresh blueberries, and peaches).

Electronic Delivery of *Georgia Bee Letter*

If you would like to receive *Georgia Bee Letter* via email, send me your address at jbee@uga.edu. Please put in a reference in the subject line that you are requesting the GBL. If you have sent me your address and not received *GBL*, please send it again. We sometimes experience computer viruses on campus. Also, notify me if there are changes to your club meeting times or contact persons.

How to Get Georgia Bee Letter

GBL can be received electronically by emailing your request to jbee@uga.edu

Regular Meetings

Bartow Beekeepers Association	7:00 pm, second Tuesday	Agriculture Services Building, Cartersville (320 West Cherokee Ave)
Chattahoochee Beekeepers Association	7:00 pm bimonthly, second Monday	Oxbow Meadows Nature Center, Columbus
Cherokee Beekeepers Club	7:00 pm third Thursday	Cherokee Arts Center, Canton
Coastal Empire Beekeepers Association	6:30 pm second Monday	Southbridge Tennis Complex, Savannah
Coweta Beekeepers Association	7:00 pm second Monday	Coweta Fairgrounds Conference Center
East Central Georgia Bee Club	7:00 pm fourth Monday, (bi-monthly)	Burke Co. Office Park Complex
Eastern Piedmont Beekeepers Association	7:30 pm first Monday	Bishop Community Center, Bishop
Forsyth Beekeepers Club	6:30 pm fourth Thursday	Forsyth County Main Library, Cumming
Heart of Georgia Beekeepers Association	7:00 pm third Tuesday	Houston Co. Gov't Building, Perry
Metro Atlanta Beekeepers Association	7:00 pm second Wednesday	Atlanta Botanical Garden, Atlanta
Mountain Beekeepers Association	7:00 pm first Tuesday	Mountain Regional Library, Young Harris
Northeast Mountain Beekeepers Association	7:00 pm second Thursday	Northeast Georgia Regional Library, Clarksville
Northwest Georgia Beekeepers Association	7:00 pm second Monday, Jan - June & Sept	Walker County Agric. Center, Rock Spring
Southeast Georgia Beekeepers Association	7:00 pm fourth Tuesday, Aug-March	Wacona School Building, Waycross
Southwest Georgia Beekeepers Association	7:30 pm last Tuesday, even months	Swords Apiaries, Moultrie
Tara Beekeepers Assn (Clayton Co. area)	7:30 pm third Monday	Reynolds Nature Preservation

Beekeeping Subscriptions

<i>American Bee Journal</i> , Hamilton, Illinois 62341	(217) 847-3324
<i>Bee Culture</i> , 623 W. Liberty Street, Medina, Ohio 44256	(330) 725-6677
<i>The Speedy Bee</i> , P.O. Box 998, Jesup, Georgia 31598-0998	(912) 427-4018

Resource People for Georgia Beekeeping

Bartow Beekeepers Association Bill Posey (770) 386-3311 billbeefarm@yahoo.com	Georgia Dept. of Agriculture Barry Smith, Manager Apiary Program P.O. Box 114 Tifton, GA 31793 (912) 386-3464 bsmith@agr.state.ga.us	Tara Beekeepers Association Gary Cooke, President (770) 507-4661 Lcooke77@aol.com
Chattahoochee Valley Beekeepers Assoc. Jim Harris, President 34333 Pontiac Drive Columbus, GA 31907 (706) 563-4186 hhonybee@bellsouth.net	Heart of Georgia Beekeepers Association Steve Nofs ganofs@cox.net	Town County Coordinator Robert Brewer Georgia Master Beekeeper Coordinator PO Box 369 Hiawassee, GA 30546 (706) 896-2024 RBrewer@uga.edu
Cherokee Beekeepers Club Ryan A. Sarks, President (770) 639-0868 beehavenapiaries@gmail.com	Metro Atlanta Beekeepers Richard Kiefer, President rokmak@comcast.net	University of Georgia Jennifer Berry Apicultural Research Coordinator 1221 Hog Mountain Rd. Watkinsville, GA 30677 (706) 769-1736 jbee@uga.edu
Coastal Empire Beekeepers Association Greg Stewart, President 124 St. Ives Way Savannah, GA 31419 (912) 232-6734 grstewart@bellsouth.net	Mountain Beekeepers Association Larry Sams, President 158 Needlemore Drive Hayesville, NC	University of Georgia Keith S. Delaplane Professor of Entomology University of Georgia Athens, GA 30602 (706) 542-2816 ksd@uga.edu
Coweta Beekeepers Association Charles Olsen (770) 304-2737 ceolsenga@juno.com	Northeast Mountain Beekeepers Assoc. John Haaseth, President (706) 865-1085	
East Central Georgia Bee Club Edwin S. Stephens, President 522 Pine Needle Rd. Waynesboro, GA 30830	Northwest Georgia Beekeepers Association Dave Reed, President 6807 Cedar Wood Court East Ridge, TN 37412	
Eastern Piedmont Beekeepers Assoc. Bill Owens, Chairman (770) 266-6619	Southeastern Georgia Beekeepers Assoc. Bobby Colson 945 Sinkhole Rd. Register, GA 30452 (912) 852-5124 bcolson@statesboroga.net	
Forsyth County Beekeepers Andy Bailey (678) 859 1899 andy.bailey@siemens.com	S.W. Georgia Beekeepers Sonny Swords 5 - 28th Avenue N.W. Moultrie, GA 31768 (912) 941-5752	 Jennifer Berry, Research Coordinator

County Extension Coordinator