

# News For South Carolina Beekeepers



February 2005

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## SOUTH CAROLINA NEWS

**SPRING MEETING.** The South Carolina Beekeepers will host a joint spring meeting with the North Carolina State Beekeepers on 4-5 March 2005 at the Baxter Hood Convention Center, York Technical College, Rock Hill, South Carolina. You will find included in this newsletter a tentative meeting program. The Baxter Hood Convention Center is conveniently located near Interstate I-77. Take Exit 79 off I-77 onto Dave Lyle Blvd.-West toward the city of Rock Hill. Go approximately 1 mile and take a left on South Anderson Rd. The Baxter Hood Convention Center will be on your left just after turning on S. Anderson Rd.



This will be a very informative meeting and we hope to have a good turnout of South Carolina beekeepers to welcome our beekeeping friends from the Tarhill State. You will note on the tentative program that we have some outstanding speakers scheduled for the meeting. Sue Cobey from The Ohio State University will be speaking on queen issues. Jeff Pettis from the USDA/ARS Beltsville Bee Lab in Maryland will give an update on research being conducted by bee scientists in Beltsville. Jerry Hayes, Florida State Apiarist, will speak on various beekeeping concerns in Florida. Other speakers will give presentations or workshops which you will find very interesting and informative.

The meeting program will include a Friday evening meal which will be catered by Jackson's Restaurant, Clover. An advance headcount for the meal is required so attendees will need to make advance reservations for the meal. A blue grass band from the Rock Hill area will entertain us during the evening event. Naturalist Rudy Mancke, School of the Environment, University of South Carolina, Columbia, will be our keynote speaker following the meal. Mancke is host of the popular South Carolina ETV program "Nature Scene" which has been aired since 1978. He is well known for his field trip broadcasts nationwide, his numerous articles on the environment

and his knowledge of the complex, inner-workings of different ecosystems.

There will be a \$10 extra meeting registration cost to beekeepers who show up and have not pre-registered. To receive a meeting registration packet which includes an advance registration form for paying registration cost and securing advance meal tickets, contact Mike Hood at phone: 864-656-0346 or email: [mhood@clemson.edu](mailto:mhood@clemson.edu). The meeting registration deadline is 17 February.

You must make your own hotel reservations by contacting the hotel of your choice. Two local hotels (Hampton Inn [\$64] - Ph. 803-325-1100 and Ramada Inn Limited [\$50] - Ph. 803-329-7900 which are located about 1 mile from the convention center have offered beekeepers attending the meeting a special discounted rate. Mention that you are a beekeeper when making reservations which should be made by 2 February 2005 to get the special rate.

**OTHER NEWS** - Api Life Var has been approved by EPA for use in honey bee colonies for suppression of varroa mites in South Carolina in 2005 under a Section 18 Emergency Use Label. Api Life Var contains 74.08% thymol, 16% eucalyptus oil, and 3.7% L-menthol. All applicable directions, restrictions, and precautions on the label must be followed.

Api Life Var applications can be made in any season in which all applicable restrictions, precautions, and directions for use can be followed. Do not use when surplus honey supers are in place. Use when daily temperatures are between 59 and 69 degrees F. Do not use the product at temperatures above 90 degrees F.

A maximum of two treatments per year may be made. A treatment (3 tablets) consists of the following: take one tablet and break into four equal pieces. Place pieces on the top corners of the hive body. Avoid placing pieces directly above the brood nest. After 7-10 days, replace with a fresh tablet broken into pieces as above. Repeat procedure again 7-10 days later and leave last tablet for 12 days. After

12 days, remove residuals from the colony. To prevent bees from gnawing the tablet either enclose each piece of tablet in an envelope of screen wire (8 mesh/inch) or place the uncovered pieces above a sheet of metal screen that prevents bees from contacting it.

Api Life Var must be removed from hives at least 1 month prior to harvesting the honey. Do not use during honey flows and do not harvest honey from brood chambers or colony feed supers that have been exposed to the product.

**BEEKEEPER SHORT COURSES.** Several beekeeper short courses for beginners will be offered this winter and spring. Some of those offering courses are the Lakeland Beekeepers in Greenwood, the York Beekeepers in York, and the Mid-State Beekeepers in Columbia. Some courses begin in January and February so advise anyone interested to contact the local association soon to enroll.

**SUMMER MEETING.** The South Carolina Beekeepers will host a summer meeting at Clemson University on 7-9 July 2005. Two prominent guest speakers have already been confirmed for this meeting. Laurence Cutts, retired Florida State Apiarist and now a commercial beekeeper in Chipley, Florida, will be returning to our summer meeting to give us an update on his activities and opinions. Dewey Caron, Chair-Dept. of Entomology & Applied Ecology, University of Delaware, will be joining us for the first time in South Carolina. Dewey has a long career as an outstanding apiculture professor and instructor and has authored many beekeeping texts. We look forward to welcoming Dewey to Clemson. Make plans now to participate in the summer conference and have a great time.

## **BEE DECLINE MAY SPELL END OF SOME FRUITS, VEGETABLES**

*by John Roach*

*Bees, via pollination, are responsible for 15 to 30 percent of the food U.S. consumers eat. But in the last 50 years the domesticated honey bees population – which most farmers depend on for pollination – has declined by about 50 percent, scientists say.*

Unless actions are taken to slow the decline of domesticated honey bees and augment their populations with wild bees, many fruits and vegetable may disappear from the food supply, said Claire Kremen, a conservation biologist at Princeton University in New Jersey.

Anecdotes of farmers losing their crops owing to the honey bee shortage appear to be on the increase, Kremen said. Last February, for example, there were insufficient honey bees for all the almond blossoms in California. As a result some farmers failed to meet expected yields.

"There are shortages [like this] that pop up from time to time," Kremen said. "Whether there are more [shortages] than there were 20 years ago, one would guess yes, as there are fewer bees to go around, but it's not well documented."

Maryann Frazier, a senior extension associate in the department of entomology with Pennsylvania State University in State College, said honey bee shortages are not yet impacting commercial producers of crops, but that community farmers "are struggling to get bees for pollination."

In fact, Dewey Caron, an entomologist at the University of Delaware in Newark, started to study the problem of the honey bee decline when he noticed that farmers in the northeastern U.S. increasingly lacked sufficient bee colonies to meet their pollination needs.

"Growers didn't have options if they didn't like the quality [of the bees] they got from one fellow," he said. "So, we started to ask, Well, what is affecting the bees? What can we do to keep them healthier?"

### **Bee Decline**

The honey bee decline, which is affecting domesticated and wild bee populations around the world, is mostly the result of diseases spread as a result of mites and other parasites as well as the spraying of crops with pesticides, scientists say.

Among the greatest problems is the varroa mite, a bloodsucking parasite that attacks young and adult honey bees. Attacked bees often have deformed wings and abdomens and a shortened life span.

"The varroa mite is also really effective at transmitting disease, particularly viruses," Frazier said. Left untreated, a varroa mite infestation can wipe out a bee colony within a few months.

Another major bee pest is the tracheal mite, which gets inside adult bees and clogs their breathing tubes, essentially suffocating the insects. The tracheal mites also impede the bees' ability to fly, making them useless as pollinators, entomologists report.

According to Caron, both the varroa and tracheal mites lead to the death of the bees by puncturing holes in their bodies that serve as pathways for viruses. The viruses are what technically kill most of the bees, he said.

Decades of pesticide use has also taken its toll on honey bees, though farmers are beginning to refrain from pesticide applications while their crops are blooming. "People are definitely smarter than they used to be about how they apply pesticides," Kremen said.

## Pest Management

Knowing that the use of pesticides, even those targeted specifically at mites, can be fraught with negative consequences, researchers are devising alternative measures to control the mites.

"Pesticides have a role. They can be very useful, but they should be down [on] the list of things we attempt," Caron said.

Toward the top of the list is the search for so-called biological control agents. One such agent scientists are looking at is a fungus that attaches mites but not the bees. However, research has yet to find a way to effectively deliver this fungus to a bee colony.

Researchers are meeting some mite-control success by increasing the ventilation of managed bee colonies. Most colonies are air-tight by design, to protect honey bees from the elements. Caron likens the effect of such systems to traveling on an airplane.

"If anyone on an airplane has a cold, you are exposed to it. If they are sneezing, you have the potential to catch that cold," he said. "Bee colonies, too, are airtight. Once the pathogen is in there, it will have a better chance of spreading."

By opening colonies up to greater ventilation, Caron and his colleagues have found that the mites are less successful at reproducing. The bees can better cope with temperature fluctuations than previously believed.

Researchers are also busy combing the world's bee populations in search of bees that are resistant to – or have reduced susceptibility to – the mites. If the researchers can isolate the genes responsible for such mite-defying qualities, they could breed those genes into domestic honey bees.

"The work is very, very slow to develop those techniques," Frazier said. "And, of course, the beekeepers are desperate. If they don't use pesticides to protect their colonies, they are out of business. So, it is a real difficult situation."

Kremen's efforts are focused on augmenting the declining domesticated honey bee populations with wild bees. We'll learn more about her research in a future story.

**SOURCE: National Geographic News, October 5, 2004**

## SAVING BEES: FUNGUS FOUND TO ATTACK VARROA MITES

Parasites known as *Varroa* mites infest honey bee colonies, sucking blood from the bees and causing

weight loss, deformities, diseases, and reduced lifespan. These mites, which can nearly destroy an entire colony within a few months, now infest honey bee colonies across most of North America.

The honey bee is critical to maintaining natural vegetation, transferring pollen between flowers as it collects the pollen and nectar for its hive. And more than 130 agricultural plants in the United States are pollinated by honey bees. Every year, beekeepers send their best bees throughout the country to help pollinate crops, one farm at a time. In 2003, the value they added to U.S. crops was estimated at \$10 billion, not including the honey, beeswax, and royal jelly also produced. USDA's National Agricultural Statistics Service reported more than 2.5 million honey bee colonies – up 1 percent from 2002 – and U.S. honey production increased 5 percent, to 181 million pounds.

Since 2000, scientists in the ARS Beneficial Insects Research Unit (BIRU) at Weslaco, Texas, have been looking for a disease-causing agent, or pathogen, that can stop *Varroa* mites. The mite has developed resistance to the only approved chemicals – fluvalinate and coumaphos – now used for control, and coumaphos is on the U.S. Environmental Protection Agency's "hit list" for possible removal from the market. So the researchers have looked at various disease agents, tried different dosages and application methods, and conducted toxicity tests. Finally, they selected a strain of the fungus *Metarhizium anisopliae* that was highly pathogenic to *Varroa* mites.

This potent fungus, which also kills termites, doesn't harm bees or affect their queen's production. To test it, the scientists coated plastic strips with dry fungal spores and placed them inside the hives. Since bees naturally attack anything entering their hives, they tried to chew up the strips, spreading the spores throughout the colony.

In field trials, once the strips were inside the hives, several bees quickly made contact with the spores. Within 5 to 10 minutes, all the bees in the hive were exposed to the fungus, and most of the mites on them died within 3 to 5 days. The fungus provided excellent control of *Varroa* without impeding colony development or population size.

"We've tried to find a pathogen of *Varroa*, and we did it!" says ARS entomologist Walker A. Jones (Clemson University, M.S. '76, Ph.D. '79), research leader of the BIRU. Tests showed that *Metarhizium* was as effective as fluvalinate, even 42 days after application. "Commercial beekeepers are very edgy about using fluvalinate and coumaphos and are eager to see this natural control get to market," Jones says.

This research was begun by Rosalind James, formerly with the Weslaco unit. Lambert H.B. Kanga, former

BIRU research associate and now chair of the Entomology Department at Florida A & M University at Tallahassee, continues to collaborate on the project. "While *Metarhizium* doesn't kill as fast a fluvalinate and coumaphos, the result is the same," Kanga says. "*Metarhizium* gets the job done, and we won't have to worry about *Varroa* becoming resistant to the fungus."

The scientific team is now fine-tuning the strategy for transfer to producers.

**AUTHOR: Alfredo Flores, Agricultural Research Service Information Staff.**

**SOURCE: October 2004 issue of *Agricultural Research* magazine.**

### **MORE ANSWERS ON THE VARROA-KILLING FUNGUS**

The publication of the Agricultural Research article on the identification of a fungus to control *varroa* mites spawned a spate of questions directed to Dr. Walker Jones, research leader of the Beneficial Insects Research Laboratory at Weslaco.

In an e-mail to interested persons, Dr. Jones said, "There have been so many inquiries regarding the Agricultural Research article that I could not possibly answer each one [in a timely manner]. Since many of the questions were similar, I'm copying in the initial response that I asked Dr. Lambert Kanga, my former post-doctoral associate – who conducted the work – to answer .... questions that I think the article did not address."

Q. How long will the strips be allowed to remain in the hive; 42 days, or longer?

A. The strips were removed after 42 days to simulate the time requirement of Apistan strips, hence to compare chemical treatments (Apistan) with fungal treatments (*M. anisopliae*). The fungal strips can be removed from the hives at the same time Apistan strips are removed. They can also be left in the hive if the beekeeper chooses to do so, as the strips do not impede brood production.

Q. Do the strips need to remain in the hive to keep the fungus effective after the initial kill, or does the fungus create new spores as a result of the infection on the *varroa*?

A. During the 42 days that we collected data daily, we found out that the fungus continued to kill the mites as they emerged from the sealed brood. The establishment of a disease cycle within the hive, as a result of mites infected with the fungus, has not been fully investigated yet; it is part of our future research plan, however we

also found out that mites were still infected with the fungus even 60 days after the treatments were initiated.

Q. How long do the spores in the hive remain effective?

A. At least 42 days, but maybe longer, and it will depend on the number of applications, the concentration of the fungus, and the conditions inside the hives (temperature, moisture).

Q. How long will an application protect the hive?

A. In a broodless colony, one application of 3 grams of the fungus could protect the hive from 21 to 42 days. It also depends on the conditions inside the hive and the level of mite infestation.

Q. Will annual applications be necessary?

A. Yes, the fungus will need to be applied more than once, Judicious choice of the time of the applications is very important.

Q. Will a dusting application be considered, especially in the event that the strips would have to be removed after 6-8 weeks?

A. The strips coated with the fungus provided better results than dusting the hive with the fungus.

Q. Is there any concept, at this time, of when this may be brought to market?

A. We are currently working with a fungus producing company to fine tune the technology and to determine when the product will be available on the market.

**SOURCE: Speedy Bee, September 2004.**

### **LATEST BUZZ IN RESEARCH: INTOXICATED HONEY BEES MAY CLUE SCIENTISTS INTO DRUNKEN HUMAN BEHAVIOR**

Inebriated bees could give researchers better insight into alcohol's effects on human behavior, a new study suggests.

"Alcohol affects bees and humans in similar ways – it impairs motor functioning along with learning and memory processing," said Julie Mustard, a study co-author and a postdoctoral researcher in entomology at Ohio State University.

"On the molecular level, the brains of honey bees and humans work the same. Knowing how chronic alcohol use affects genes and proteins in the honey bee brain may help us eventually understand how alcoholism

affects memory and behavior in humans, as well as the molecular basis of addiction."

Researchers gave honey bees various levels of ethanol, the intoxicating agent in liquor, and monitored the ensuing behavioral effects of the drink – specifically how much time the bees spend flying, walking, standing still, grooming and flat on their backs, so drunk they couldn't stand up. The researchers also measured the level of ethanol in the bee's hemolymph – the circulatory fluid of insects that's akin to blood.

Not surprisingly, increasing ethanol consumption meant bees spent less time flying, walking and grooming, and more time upside down. The appearance of inebriation occurred sooner for bees that were given a larger dose of ethanol. Also, blood ethanol levels increased with time and the amount of ethanol consumed.

This study is preliminary – the researchers simply wanted to see what effects ethanol had on honey bee behavior. In the future, however, they hope to use honey bees as a model for learning more about how chronic alcohol use affects humans, particularly at the molecular level.

"The honey bee nervous system is similar to that of vertebrates," said Geraldine Wright, a study co-author and a postdoctoral researcher in entomology at Ohio State.

Mustard concurred. "On the molecular level, the brains of honey bees and humans work the same. Knowing how chronic alcohol use affects genes and proteins in the honey bee brain may help us eventually understand how alcoholism affects memory and behavior in humans, as well as the molecular basis of addiction."

The researchers presented their work on October 23 in San Diego at the annual Society for Neuroscience conference.

Honey bees were secured into a small harness made from a piece of drinking straw. The researchers then fed bees solutions of sucrose and ethanol, with several ethanol concentrations ranging from 10 to 100 percent. The 10 percent solution was equivalent to drinking wine, Wright said, while the 100 percent solution, which contained no sucrose, was equivalent to drinking 200-proof grain alcohol. A group of control bees was given sucrose only.

The scientists fed the bees and then observed them for 40 minutes, tracking the insects' behaviors – how much time each bee spent walking, standing still, grooming, flying and upside down on its back.

Blood ethanol concentrations increased with time and with the amount of ethanol each bee had consumed.

Behavioral differences between the bees depended on the amount of ethanol ingested.

The bees that had consumed the highest concentrations of ethanol – 50, 75 and 100 percent – spent a majority of the observation period on their backs, unable to stand. This effect happened early on, within the first 10 minutes of the observation period. They also spent almost no time grooming or flying.

"These bees had lost postural control," Mustard said. "They couldn't coordinate their legs well enough to flip themselves back over again."

Except for the control bees, bees that had consumed the least amount of ethanol – 10 percent – spent the least amount of time upside down. Even then, it took about 20 minutes for ethanol's effect to set in and cause this behavior.

The researchers hope to learn how alcohol consumption affects social behavior as well as gain a better understanding of the basic mechanisms that drive alcohol addiction and tolerance.

"Honey bees are very social animals, which makes them a great model for studying the effects of alcohol in a social context," Wright said.

"Many people get aggressive when they drink too much," she continued. "We want to learn if ethanol consumption makes the normally calm, friendly honey bee more aggressive. We may be able to examine how ethanol affects the neural basis of aggression in this insect, and in turn learn how it affects humans."

Mustard and Wright conducted this research with Ohio State colleagues Brian Smith, a professor of entomology, and Ian Maze, an undergraduate student studying microbiology.

**SOURCE: SCIENCE BLOG, [www.scienceblog.com](http://www.scienceblog.com)**



## 2005 SCBA/NCSBA SPRING MEETING SCHEDULE

(TENTATIVE SCHEDULE, January 2005)

### Friday, March 4, 2005

- 12:00 Noon Meeting Registration – Baxter Hood Conference Center Lobby  
Late Registration Fee - \$10 Extra Individual and Family  
Exhibitor Setup - Baxter Hood Conference Center Lobby  
Room Registration at Hotel
- 2:00 Invocation – Gene Weathers, York County Beekeepers Assoc. Chaplain  
Welcome to Rock Hill and Legislative Update - Senator Wes Hayes, District 15
- 2:20 Announcements and Introductions - Mike Hood, Extension Apiculturist, CU, and David Tarpy, Extension Apiculturist, NC State Univ.
- 2:30 President's Comments - Clyde McCall (SCBA) and J. D. Foust (NCSBA)
- 2:45 "Bee Breeding and Selection Programs" - Sue Cobey, The Ohio State University
- 3:15 BREAK
- 3:40 Door Prizes
- 3:45 "Update on Varroa Mites and Small Hive Beetles in Florida" - Jerry Hayes, Chief Apiary Inspector, Department of Plant Industry, Florida Department of Agriculture
- 4:15 "A Review Apicultural Research at the USDA/ARS Beltsville Bee Lab" - Jeff Pettis
- 4:45 Panel Discussion, (Questions from the Audience)  
Panelists: Sue Cobey, Jerry Hayes, Jeff Pettis, David Tarpy, Don Hopkins, Kerry Owen, Charlie Johnson
- 6:00 Adjourn
- 7:00 Banquet - Baxter Hood Center - Advance Tickets Required (\$12)  
--Food  
--Keynote Speaker – Naturalist Rudy Mancke, School of the Environment, University of South Carolina, Columbia, SC  
--Blue Grass Band
- 9:00 Adjourn for Evening

### Saturday, March 5, 2005

- 8:30 a.m. Announcements and Door Prizes
- 8:45 "Topic TBA" - David Tarpy, Extension Apiculturist, NC State University
- 9:15 "What We Know and What We Don't Know about Small Hive Beetles" - Mike Hood, Extension Apiculturist, Clemson University
- 9:45 Break - Visit Exhibitors
- 10:10 Door Prizes
- 10:15 "Queen & Drone Rearing and Simple Tests to Determine Their Quality" – Sue Cobey
- 10:45 "A Review of Varroa Mite Control Options in the US" - Jeff Pettis
- 11:15 "Highlights from The Classroom" - Jerry Hayes
- 11:45 Associations Meet for Business
- 12:30 **LUNCH on your own**
- 1:45 **Announcements and Introduction to Workshops**
- 2:00 45 Minute Concurrent Workshops (All sessions will begin at 2:00, 3:00 and 4:00)
1. Instrumental Insemination - Sue Cobey
  2. Varroa Mites - Jeff Pettis
  3. Small hive beetle - Jerry Hayes
  4. Pesticide Use Training - Stephen Gibson, Agric. Extension Agent, NC Cooperative Extension Service, Cleveland County
  5. Pollen and Propolis Collection - TBA
  6. Baking with Honey and Making Creamed Honey - J. D. & Betty Jean Faust (offered first 2 sessions only)
  7. Promoting Local Beekeeper Associations - June Ponder, Oconee County Beekeepers Association
- 5:00 **End - Have a Safe Trip Home !**

## RECIPES

### *Honey Hot Cocoa*

½ cup honey  
½ cup unsweetened cocoa powder  
½ cup water  
1 teaspoon vanilla extract  
3 cups hot low-fat milk

In small saucepan, combine honey, cocoa powder and water; mix well. Cook over low heat for 5 minutes or until mixture is slightly thickened. Remove from heat; stir in vanilla. Set aside until ready to serve. To serve, stir chocolate mixture into hot milk. Serves 4.

**SOURCE: National Honey Board**

### *Holiday Party Punch*

2 cups boiling water  
¾ cup honey  
4 cups cranberry juice  
2 cups orange juice  
1 cup lemon juice  
1 quart ginger ale  
Ice cubes  
Sliced lemons, limes, oranges, or strawberries (optional)

Combine boiling water and honey, stirring to dissolve. Chill. In large punch bowl combine cranberry, orange and lemon juices. Stir in honey mixture. Just before serving add ginger ale, ice cubes and fruit garnish. Makes about 12 servings.

**SOURCE: National Honey Board**

### *Easy Honey Chicken Wings*

½ cup honey  
1/3 cup soy sauce  
¼ cup chili sauce  
1 teaspoon garlic salt  
¼ teaspoon pepper  
8 drops red pepper sauce  
3 pounds chicken wings or drumettes

Combine honey, soy sauce, chili sauce, garlic salt, pepper and red pepper sauce. Arrange chicken in a single layer in greased 9 x 13-inch baking pan and pour on sauce. Turn chicken over to coat with sauce. Bake at 350°F for one hour, turning over once. Cool slightly and serve. Makes 8 servings.

**SOURCE: National Honey Board**



### *Strawberry Cereal Shake*

1 cup Fat Free Milk  
1 cup unsweetened frozen strawberries  
½ cup Fruit & Bran Cereal with Dates, Raisins & Walnuts  
1 Tbsp Honey

Place all ingredients in blender; cover. Blend on high speed 30 seconds or until well blended. Pour into large glass. Serve immediately. Makes 1 serving.

**SOURCE: Kraft Food & Family**

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'William Michael Hood'.

William Michael Hood  
Extension Apiculturist

#### **2005 Calendar**

##### **March 4-5, 2005**

SC Beekeepers/NC Beekeepers Joint  
Spring Meeting  
Rock Hill, SC

##### **July 7-9, 2005**

SC Beekeepers Summer Meeting  
Clemson, SC

##### **July 14-16, 2005**

NC State Beekeepers Summer Meeting  
Marion, NC

##### **August 9-13, 2005**

Eastern Apicultural Society Meeting  
TBA

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