

News For South Carolina Beekeepers



February 2008

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LOCAL NEWS

South Carolina Beekeepers Spring Meeting - The South Carolina Beekeepers will hold their spring meeting Saturday, March 1, at the Farm Bureau Building, 724 Knox Abbott Drive, Cayce, (West Columbia) SC. The meeting site can be reached easily from I-26 by taking the Airport Exit; go north toward Columbia which will run into Knox Abbott Drive. The building is on the left approximately 3 miles from I-26. Registration will begin at 8:00 AM and the meeting program will get under way at 8:30. Registration cost is \$5 per person, \$8 per family, or \$10 for non-SCBA members.

Our new President, Charlie Johnson, will be our first speaker and will welcome us and deliver his "President's Comments." South Carolina Senator Vincent Sheheen from Camden, who represents District 27 (Kershaw, Chesterfield, and Lancaster Counties) will give a "Legislative Update" and South Carolina Department of Agriculture Commissioner Hugh E. Weathers will bring us up to date on agricultural news in the state. Martin Eubanks, Marketing Director for the South Carolina Department of Agriculture Services Division, will discuss the SCDA's New Branding Campaign "Certified South Carolina." Fred Singleton, our State Apiarist, will address beekeeping regulatory issues. Mike Hood will discuss the current status of Colony Collapse Disorder and beekeeping in South Carolina. Bill Simpson, MD., Professor of Family Medicine – MUSC, will give a presentation on botulism, anaphylaxis, and bee stings. Larry Wessinger will give a report on the South Carolina State Fair and Bob Cole will share what he learned at Apimondia 2007, which was held in Melbourne, Australia. Steve Genta will follow with a presentation on the Eastern Apicultural Society events to be held in 2008. Skip Still, SC Department of Natural Resources Wildlife Biologist and bear specialist, will give us an update on bear problems in the state and inform us of what we can expect in 2008. You may refer to the program which is included in this newsletter for a listing of other topics and speakers. All beekeepers or anyone interested in honey bees and beekeeping are invited to attend this very informative meeting. For further meeting information, contact Mike Hood, Extension Apiculturist, Department of Entomology, Soils, and Plant Sciences, Clemson University (ph. 864-656-0346 or email <mhood@clemson.edu>).

Other News – Seven local beekeeper associations will offer Master Beekeeper Program certified level short courses this winter and spring. These courses are being hosted by the Aiken County Beekeepers, the Lakeland Beekeepers, the Lancaster County Beekeepers, the Oconee County Beekeepers, the Mid-State Beekeepers, the Pickens County Beekeepers, and the York County Beekeepers. The certified level courses normally run for 5-6 weeks and conclude with written and practical tests.

Small Hive Beetles – All regions of South Carolina now have small hive beetles. Beekeepers should practice good bee management practices to reduce colony stress which could lead to major small hive beetle problems. Colony stress conditions which may lead to beetle problems are the presence of European foulbrood, mite problems, queen failure, insufficient food, excessive swarming, and over-supernation. Any factor that reduces the ratio of the colony bee population to its comb surface that the bees are no longer able to protect the brood area adequately may lead to serious beetle problems. Under normal situations, strong, well populated colonies do not have beetle problems because honey bees have their own natural defense mechanism of confining beetles to the peripheral areas of the colony away from brood and pollen. When colonies become stressed and the bee population declines, the female beetles begin laying eggs in the pollen and brood area.

One small hive beetle control option available to beekeepers is the use of beetle traps placed within the hive to keep the beetle population to a minimum. There are several traps that beekeepers can manufacture or purchase, including the Hood Beetle Trap that was developed at Clemson University and marketed by Brushy Mountain Bee Farm <www.brushymountainbeefarm.com>.

Many beekeepers feed their colonies pollen substitute patties in winter to maintain healthy bees and/or to increase winter brood production. In research conducted at Clemson University in winter of 2007, small hive beetle adults laid eggs and various stages of larvae occurred in pollen substitute patties placed above the winter cluster on hive body frame tops. The small hive beetle larvae survived sub-freezing temperatures in the warm area just above the colony cluster during the project but were unable to complete their life cycle. In other words, the beetle larvae were unable to leave the hive to pupate in the soil and died on the colony bottom

board as a result of cold temperatures. Therefore, there is low risk to beekeepers feeding pollen substitute patties to colonies in winter. However, beekeepers should be conservative in feeding patties in late winter or early spring when mild temperatures are expected creating conditions favorable for beetle reproduction. This could lead to the first beetle generation occurring earlier than normal.

Beekeepers are advised to monitor their colonies for varroa mite infestation levels and treat only when necessary. There are several effective measures beekeepers can use to control varroa mites. Managing colonies headed by hygienic queens is one excellent way to control this pest. Several varroa mite control techniques or products are available to beekeepers. Read and follow all directions when using a product. We have received word that Check Mite + will be fully registered on a section 3 label this spring.

Calendar for 2008

Mar. 1 - South Carolina Beekeepers will meet in Columbia
Mar. 7-8 – North Carolina State Beekeepers will meet in Burlington, NC
July 10-12 – North Carolina State Beekeepers will meet in, Pinehurst, NC
July 17-19 – South Carolina Beekeepers will meet in Clemson
August 4-8 – Eastern Apicultural Society Annual Conference at Murray State University, Murray, Kentucky
<www.easternapiculture.org>

THE LATEST IN HONEY BEE RESEARCH "Will the causative agent please stand up?"

By Dr. Steve Sheppard

Colony collapse disorder (CCD) is one of the most recent maladies reported to afflict honey bees. The disorder has been characterized to include a rapid decline in the adult bee population, often leaving only the queen and a "handful" of workers in colonies containing substantial amounts of capped brood and food. While the prevalence of CCD throughout beekeeping operations in the U.S. and the numerical loss of colonies in 2006-2007 has been roughly estimated (23% of beekeeping operations losing an average of 45% of their colonies) much more certain is that the media coverage of honey bee losses and the possible decline in managed pollinator populations has brought unprecedented attention to the role of bees and beekeepers in agriculture.

Until now, one of the elusive aspects of CCD has been the somewhat strange assemblage of symptoms as described by beekeepers. Taken separately or in parts, some of the symptoms might be explainable by the usual suspects, such as parasitic mites, overwintering, pesticides, nutrition or stress. However, the general acceptance of CCD as a novel malady suggests that the cause maybe either a previously unknown pathogen or interaction among known factors. Progress toward

understanding a biological basis for CCD was recently made in a paper published by a team of scientists (Cox-Foster et. al. 2007). The collaborative nature of the search for microbes associated with CCD is evidenced by the fact that 22 different co-authors contributed to this scientific publication.

The team of researchers utilized "high throughput" genetic sequencing technology to screen samples of bees for the presence of a large set of microbes. The samples they examined included bees from CCD colonies taken from four migratory beekeeping operations from across the U.S. (with colonies that overwintered in Florida or California). Additional samples were taken from non-CCD sources in Pennsylvania and Hawaii, from "apparently healthy bees" imported from Australia and from four samples of imported royal jelly from China. The researchers extracted and sequenced nucleic acids from all the samples and compared them to published sequences of known organisms available in a large "public library" of sequences known as GenBank. Based on these comparisons, the authors were able to confirm the presence of a host of organisms within the bee samples including, bacteria, fungi, viruses, mites and trypanosomes. The description of the large set of associated organisms is fascinating information and includes for example, 81 distinct fungal RNA sequences. Based on all the data, the authors were able to rule out certain suspects as likely causative agents for CCD. For example, one of these, *Nosema ceranae*, was found in both CCD and non-CCD colonies.

One suspect found to be associated with CCD was Israeli Acute Paralysis Virus (IAPV). RNA fragments from this virus were found in all of the CCD colonies, in the Australian honey bee sample and in two of the four royal jelly samples. IAPV is a recently discovered virus that appears to be either a distinct lineage of Kashmir Bee Virus (KBV) or a new species. To further examine the relationship between CCD, these viruses and *Nosema*, the researchers examined pooled samples of bees from 51 colonies (30 CCD and 21 non-CCD). They found that the patterns of co-infection were very complex. However, with a single exception, IAPV was found only in CCD samples. Over 80% of the bee samples from CCD colonies contained IAPV. KPV was found in all CCD samples, although it was also present in 76% of the non-CCD samples. The authors noted that all the beekeeping operations sampled for CCD used honey bees imported from Australia or intermingled their bees with other operations that contained Australian honey bees. They further pointed out that the initial importations of Australian honey bees occurred in 2004, coincident with early reports of U.S. honey bee declines.

In conclusion, the authors discussed the utility of their approach (metagenomic sequencing) to provide a "comprehensive inventory of microflora in CCD and non-CCD populations...". The authors were also careful to point out that they had not "proven a causal relationship between any infectious agent and CCD...". However, given that the presence of IAPV occurred almost

exclusively in CCD operations and the coincident timing of the importation of IAPV-infected honey bees and reports of CCD, the authors noted that IAPV is a "significant marker for CCD." Undoubtedly, this paper will engender a closer look at viruses as part of the overall story of honey bee health. Whether a causative agent or simply a marker associated with the expression of CCD, this research represents a significant start along the path to understanding "whatever it is" that has been called CCD.

CITATION: Cox-Foster, D.L., S. Conlan, E.C. Holmes, G. Palacios, J.D. Evans, N.A. Moran, P-L Quan, T. Briese, M. Hornig, D.M. Geiser, V. Martinson, D. vanEngelsdorp, A.L. Kalkstein, A. Drysdale, J. Hui, J. Zhai, L. Cui, S.K. Hutchinson, J.F. Simons, M. Egholm, J.S. Pettis, W.I. Lipkin. 2007. A metagenomic survey of microbes in honey bee colony collapse disorder. Scienceexpress / www. scienceexpress.org / 6 September 2007 / page 1 / 10.1126 / science. 1146498

SOURCE: Bee Culture, Nov 2007

FRUIT FLY STUDY PROVIDES INSIGHT INTO BEE IMMUNE SYSTEM

Honey bees and other insects important to agriculture could get help from recent genetic studies of a major agricultural pest—the fruit fly, according to Agricultural Research Service (ARS) scientists and cooperators who have completed genome sequences of 12 fruit fly species.

The fruit fly, *Drosophila*, is often used as a model organism in genetic studies. The researchers analyzed immune genes in the 12 fly species and report that the study offers insights into the immune system of honey bees, a valuable pollinator beset by a variety of problems, including the highly publicized colony collapse disorder (CCD).

The analysis of the immunity-related genes in *Drosophila* was done by entomologist Jay Evans at the ARS Bee Research Laboratory in Beltsville Md., and researchers at Cornell University in Ithaca, N.Y., Emory University in Atlanta, Ga., and Umea University in Limes, Sweden. The study was published recently in *Nature Genetics*.

Having the complete genetic sequences for the 12 fruit fly species will provide researchers tools for dissecting the evolutionary history of the *Drosophila* immune system. Eventually, this may enable scientists to test immune predictions for honey bees and other agriculturally beneficial insects. That's because both insects share numerous disease resistance traits.

Insects' immune systems must constantly evolve to remain effective against a changing array of diseases and other threats. These changes are evident when examining the genes involved in immune response.

Before this sequencing study, general patterns have been difficult to discern, because previous studies focused on a small number of genes in a few particular species. The current study describes how the immune systems of the well-studied fruit fly group have changed

over time, strengthening comparisons to bees and other insects of agricultural importance.

SOURCE: USDA-ARS, December 10, 2007, taken from PCT Online.

TUCSON BEE LAB TO TEST HIGH FRUCTOSE CORN SYRUP

by D. Sammartaro & J. Finely

High fructose corn syrup (HFCS) is commonly used as a sweetener in consumer foods, especially in soft drinks (just read the labels). Beekeepers also feed large quantities of HFCS to bees to supply them with a source of carbohydrates for overwintering to provision hives for pollination, or to stimulate brood rearing in the spring. HFCS is used because it is inexpensive and easy to distribute to large populations of bee colonies. However, few studies have been done on the nutritional effects of HFCS fed to bees.

In the 1970s, there were reports that "off spec" or improperly stored syrup was killing honey bees (Anon, 1996). When the HFCS was examined, it was found to be detrimental to bees (Jachimowicz & Sherbiny, 1975) because hydroxymethylfurfural (HMF) was found in the syrup. HMF is a contaminant that originated from the acid-hydrolyzed process originally used to manufacture HFCS (Bailey 1966). Later, other studies were conducted examining the amounts of fructose, dextrose, sucrose and glucose in HFCS, and the effects it had on bees (Severson and Erickson 1984; Trumpeter, 1981). It was concluded that HFCS was not harmful to bees.

Since the 1970's, making HFCS has changed by using enzymes, rather than the acid process. In most cases, there has been no widespread problem in feeding this "new" HFCS to bees. In light of the current decline in honey bee colonies, and coupled with the increasing difficulties in producing healthy bees for crop pollination, our lab is re-examining HFCS used in American beekeeping.

We have collected samples of HFCS from various manufacturers, as well as from commercial beekeepers who use large quantities of the syrup. Our work includes testing the samples for contaminants and pathogens, analyzing the sugars in the syrups, and recording such values as pH, HMF concentrations and levels of other contaminants, including metals. We will also examine the nutritional value of HFCS and the effects of contaminants when fed to caged bees.

For example, our lab has studied HMF formation in some of the HFCS syrups by incubating them at various temperatures and monitoring HMF production through periodic sampling. We now know that if the HFCS is exposed to high temperatures, the HMF level increases, which could be detrimental or even lethal to bees.

Next we will begin feeding experiments on caged bees. In one trial we will conduct longevity studies, to assess the ability of the bees to survive if HFCS is the only

source of carbohydrates. In other trials, contaminants of HFCS will also be added in known quantities to determine their effects on bee health.

For those of you wondering how we get bees into cages, we collect capped brood on one day, and on the next day gently brush the one-day-old bees into tubs, and then weigh them before adding about 100 to our special feeding cages. We then provision each cage with various syrup solutions as well as water; and small pollen patties. All of the cages are placed in an incubator with temperatures and humidity similar to colony conditions.

We have many folks helping us in this task, including folks at Penn State University, Milagra Weiss, a new graduate student at the University of Arizona, and Dr. Blaise LeBlanc, a new chemist in the Tucson lab, who will be analyzing the different sugars in the samples. We are just getting results from our first caged bee trials, so stay tuned for the results.

SOURCE: *American Bee Journal*, Dec. 2007

FOR HONEY BEE QUEEN, MULTIPLE MATING MAKES A DIFFERENCE

The success of the "reign" of a honey bee queen appears to be determined to a large degree by the number of times she mates with drone bees.

That is what research by scientists in the Department of Entomology and W.M. Keck Center for Behavioral Biology at North Carolina State University suggests. Dr. Freddie-Jeanne Richard, a postdoctoral research associate; Dr. David Tarpy, assistant professor and North Carolina Cooperative Extension apiculturist; and Dr. Christina Grozinger, assistant professor of insect genomics, found that the number of times a honey bee queen mates is a key factor in determining how attractive the queen is to the worker bees of a hive. Their research was published Oct. 3 in the online scientific journal *PLoS ONE*.

A honey bee queen mates early in her life, Tarpy explained, but usually with multiple partners, the drones of another bee colony. Richard, Tarpy, and Grozinger found that the number of partners appears to be a key factor in making the queen attractive to the worker bees of a colony - the more partners, the more attractive the queen is and the longer her reign is likely to be.

The scientists also conducted experiments that suggest that the number of times a queen mates is a factor in altering the composition of a pheromone, or chemical signal, the queen produces. It is the composition of this pheromone that appears to attract the worker bees of a hive.

A honey bee colony consists of a single queen and several thousand sterile worker bees. Throughout most of her life, the queen's job is to lay eggs. However, early in a queen's life, she makes several mating flights. On

these flights, she mates - in midair - with anywhere from one to more than 40 drones. The average number of drones with which a queen mates is 12. The queen stores the semen from her mating flights for the remainder of her life, two to three years for a long-lived queen.

However, some queens are not so long-lived. They are rejected by the workers of the hive. The research of Richard, Tarpy, and Grozinger sheds light on this rejection mechanism.

Because queens mate early in their lives and store semen, it stands to reason that queens that have mated multiple times and accumulate more semen might be more valuable to a colony. But Tarpy said researchers have not studied the impact of the number of times a queen mates on her physiology until now.

To determine the effect mating has on honey bee queens, the scientists artificially inseminated queens. It's difficult to determine the number of times a queen mates under natural conditions. Some queens were inseminated with the semen from one drone, others with the semen from 10 drones. The scientists then put the queens in hives and observed them.

They found that worker bees paid more attention to the multiply inseminated queens. Worker bees demonstrate what is known as a "retinue response" to their queen; they lick her and rub their antennae on her. The retinue response to the multiply inseminated queens was more pronounced.

"This tells us the workers can tell how many drones the queen has mated with," said Grozinger.

Like many animals, honey bees use pheromones to communicate. When Richard analyzed pheromone produced in the mandibular gland of honey bee queens, she found that pheromone composition changes dramatically after queens mate and that the number of times the queen mates appears to be a key factor in determining the extent of pheromone alteration.

Richard added that when worker bees were exposed to pheromone from queens inseminated with semen from one drone and queens inseminated with semen from multiple drones, the workers showed a preference for the pheromone from the multiply-inseminated queens. Richard added that an analysis of the mandibular gland pheromone found differences in the chemical profile of pheromone from once-inseminated and multiply-inseminated queens. The scientists also found differences in the two types of queens in brain-expression levels of a behaviorally relevant gene.

"Our results clearly demonstrate that insemination quantity alters queen physiology, queen pheromone profiles and queen-worker interactions," the scientists write in the *PLoS One* paper.

Tarpy said the research could have implications for bee breeding and for beekeepers. The research suggests

that queens that mate with multiple partners are superior, so breeders may want to select for this behavior.

At the same time, beekeepers usually buy mated queens when they re-queen their hives. Tarpy said it should be possible to devise a test to determine if a queen has mated few or many times. Such a test would help beekeepers determine the quality of the queens they buy.

Citation: Richard F.J., Tarpy D.R., Grozinger C.M. (2007) Effects of Insemination Quantity on Honey Bee Queen Physiology. PLoS ONE 2(10): e980.doi:10.1371/journal.pone.0000980.

SOURCE: *Public Library of Science News Release, American Bee Journal, Dec. 2007*

CONRAD CALLS ON FDA TO BLOCK TAINTED HONEY / SENATOR WANTS SAFETY OF IMPORTED CHINESE HONEY ADDRESSED

Washington: Warning of potential health threats to consumers, Sen. Kent Conrad has called on the Food and Drug Administration (FDA) to implement stronger barriers that would prevent tainted honey from entering the country.

"Almost 70 percent of the honey consumed in our country is imported--most of it from China. Unfortunately, China has a long track record of exporting adulterated honey and engaging in other fraudulent conduct in the honey trade," Sen. Conrad said. "These actions not only hurt honey producers in North Dakota and across the country, they also present needless health risks to our consumers."

In a bipartisan letter signed by 15 Senators, Sen. Conrad also urged the FDA to act on a petition for a Standard of Identity for honey. A Standard of Identity would provide a uniform, legal definition of honey purity levels that would aid regulators. Imported honey is an ingredient found in a wide array of products including cereals, snacks, meats and beverages and is also a common ingredient in many health and beauty products.

In 2002 and 2003 the FDA and U.S. Customs seized multiple shipments of Chinese honey at U.S. ports which were contaminated with chloramphenicol, an antibiotic that is banned in food products in the United States because of its potentially life-threatening effects.

More recently, there are reports that imported honey is being blended with sugars or being labeled as a blend to avoid U.S. duties. This honey is subsequently sold to U.S. processors as pure honey. A long-time supporter of North Dakota's honey producers, Sen. Conrad recently called on the Secretary of Agriculture to address the growing problem of Colony Collapse Disorder, a mysterious condition destroying colonies of honey bees across the country.

North Dakota ranks number one among honey-producing states in the nation.

SOURCE: *American Bee Journal, Oct 2007*

BEES UP ON THE ROOF

By Alan Harman

Bees operating from two hives on the roof of Chicago's City Hall are expected to produce a combined 200 pounds of honey this season.

Veteran beekeeper Michael Thompson, who operates the hives, tells reporters the state average is 40 to 50 pounds a hive.

"They're doing well, and we're happy about it," Thompson says.

The harvest by the bees on Mayor Richard Daley's 20,300-square-foot green roof is about the same as last year but this time the honey is a rich amber color—a change from the light yellow-green color of previous seasons.

Thompson is quoted as saying he thinks the change is because the bees are going to Millennium Park and the prairie wildflowers and ornamentals planted there.

"I walk through and see thousands and thousands on the plants," he says. "They're especially going to the mint family."

There are also four hives on the roof of the Chicago Cultural Center.

The six city hives are expected to produce more than 300 pounds of honey this year.

The roof top honey, with a sweet, fruity taste, is sold in two-ounce jars for \$2 each. The money raised is used to support various city groups.

The \$1.5-million rooftop garden on the 11-story city hall in Chicago's Loop was first planted in 2000 as a demonstration project to test the benefits of green roofs and how they affect temperature and air quality. The beehives were added in 2003.

The garden consists of 20,000 plants of more than 150 species, including shrubs, vines and two trees. The plants were selected for their ability to thrive in the conditions on the roof, which is exposed to the sun and can be windy and arid. Most are prairie plants native to the Chicago region. The low-maintenance garden relies on a special blend of compost, mulch, and sponge-like ingredients that weighs less than regular topsoil and retains more water. It can retain 75% of an inch of rainfall before there is storm water runoff into the sewers.

SOURCE: *Bee Culture, Oct. 2007*

SPICE UP SPRING TRAINING SEASON

From the website of the National Honey Board

(www.honey.com)

Home Run Honey Sauce

(Makes 2 cups)

Ingredients

1 c water
4 t cornstarch
Nonstick cooking spray
1 t minced garlic
6 T green onion, thinly sliced
6 t fresh jalapeno peppers, chopped and seeded
2/3 c honey
4 T seedless red raspberry preserves
1/2 c ketchup
3 T hot sauce

Directions

In small bowl, whisk together water and cornstarch. Set aside. Lightly spray the bottom of a medium saucepan with non-stick spray. Over medium heat, sauté garlic, green onion and chopped jalapeño in the saucepan for 2 to 3 minutes until softened. Add honey, raspberry preserves, ketchup and hot sauce to pan and stir well to incorporate. Cook over medium heat for 1 to 3 minutes to infuse all flavors.

Whisk in water/cornstarch mixture and continue to cook over medium heat just until sauce thickens from cornstarch, about 3 minutes. Remove from heat and allow sauce to cool slightly.

Brush sauce onto one side of meat (chicken breasts, ribs and pork chops all work well) during the final 1 to 2 minutes of grilling. (Sauce will burn if left over heat too long.) Remove finished meat from grill and place onto serving platter. If desired, garnish top of meat with additional sliced green onion.

Double Play Honey Cranberry BBQ Sauce

(Makes Makes 3-1/2 cups)

Ingredients

2 c fresh or frozen cranberries
1-1/2 c honey
1-1/2 c ketchup
1 c red wine vinegar
2 T lemon juice
2 T Worcestershire sauce
1/2 t coarse ground black pepper

Combine all ingredients in a medium-large saucepan. Bring to a boil and simmer, covered, for 20 minutes. Remove cover and simmer for 20 minutes more or until thickened (mixture will thicken slightly as it cools). To can, pour hot sauce into sterilized jars, leaving 1/2-inch head space. Wipe tops and threads of jars with a clean, damp cloth. Place lids on jars so that the rubber sealing compound sits evenly on rim and screw rings on firmly.

Place each jar in a pot of water that comes 1 to 2 inches above the jar tops. Cover and bring to a boil. Hold water at a steady boil for about 45 minutes. Remove jars from pot and let cool on a dishcloth with space in between each jar. Store in a cool dark place. (In lieu of canning, sauce may be stored, covered, in refrigerator up to 1 month.)

Serving Suggestions

Serve over turkey, chicken or pork, or use as a dipping sauce for egg rolls or potstickers.

All-Star Tangy Sauce

(Makes 1-1/4 cups)

Ingredients

1 c catsup
1/4 c honey
1 T prepared mustard
1/2 t ground nutmeg

Combine all ingredients; mix thoroughly.

Spread on meatloaf, pork loin, ribs or chicken pieces during last 15 minutes of cooking or serve as dipping sauce.

All-Purpose Honey Teriyaki Sauce

(Makes 24 servings)

Ingredients

1 c honey
1 c soy sauce
1 c sake (rice wine)
*Dry white wine may be substituted.
1 clove garlic, minced
1-1/2 t grated fresh ginger root
1 t sesame oil

Combine all ingredients and blend well.

Marinate chicken, fish, beef or pork in All-Purpose Honey Teriyaki Sauce for 1 or more hours, depending on type of meat and cut. One recipe is enough for about 4 pounds of meat.

Variations:

Sesame Marinade: Add 1 teaspoon toasted sesame seeds to 1 cup All-Purpose Honey Teriyaki Sauce; mix well.

Stir-Fry Seasoning: Dissolve 1 Tablespoon cornstarch in 1/2 cup All-Purpose Honey Teriyaki Sauce to season 4 cups stir-fry ingredients. Serve stir-fry with sauce over rice, noodles or baked potato.

Respectfully submitted,



William Michael Hood
Extension Apiculturist

2008 SOUTH CAROLINA BEEKEEPERS ASSOCIATION SPRING MEETING
S.C. FARM BUREAU BUILDING, CAYCE, SC
MARCH 1, 2008
(Tentative Program)

Saturday March 1

- 8:00 AM **Registration & Coffee**
Meeting Registration Fee - \$5/person, \$8/family, \$10/non-SCBA members
- 8:30 **Invocation** – Buddy May, Piedmont Beekeepers Association, Greenville
Welcome & President’s Comments - President Charlie Johnson, York County Beekeeper
Introductions & Announcements - Mike Hood, Exec. Sec. SCBA
- 8:45 **South Carolina Legislative Update** – Senator Vincent Sheheen, Camden,
representing Senate District 27, Kershaw, Chesterfield, and Lancaster Counties.
- 9:00 **South Carolina Department of Agriculture (SCDA) News** - Commissioner Hugh E.
Weathers
- 9:15 **SCDA’s New Branding Campaign “Certified South Carolina”** – Martin Eubanks,
Marketing Director, SCDA Services Division, Columbia
- 9:45 **Regulatory News** - Fred Singleton, Apiary Inspector, Clemson University
Department of Plant Industry, Summerville
- 10:00 **BREAK**
- 10:25 **Door Prizes**
- 10:30 **Business Meeting** - SCBA President Charlie Johnson
- 10:45 **CCD and Update on beekeeping in South Carolina** -Mike Hood, Dept. of
Entomology, Soils, and Plant Sciences, Clemson University
- 11:15 **Botulism, Anaphylaxis, and Bee Stings - What All Beekeepers Need to Know**
William M. Simpson, Jr., MD, Professor of Family Medicine, Medical Director,
Agromedicine and Occupational & Environmental Medicine Programs, Medical University of
South Carolina, Charleston
- 11:45 **Lunch On Your Own**
- 1:10 PM **Door Prizes**
- 1:15 **State Fair Report** - Larry Wessinger, SCBA Director, Prosperity
- 1:30 **Apimondia 2007 Report**, Bob Cole, Todd, North Carolina
- 1:45 **Eastern Apicultural Society News** - Steve Genta, EAS Director, SCBA Director,
Piedmont Beekeepers Association, Simpsonville
- 2:00 **Bears and Bees** - Skip Still, South Carolina Department of Natural Resources, Clemson
- 2:30 **Bees in Warfare** - Mike Hood
- 3:00 **Africanized Honey Bees** – TBA
- 3:30 **Final Comments** - President Charlie Johnson

END - Have a Safe Trip Home & See You in Clemson on July 17-19.

*** SCBA Executive Committee will meet at end of Meeting**

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