

2014 Conference

EASTERN APICULTURAL SOCIETY

Kentucky State Beekeepers Association



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2014 Conference Program

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“Osiyo” is the Cherokee word for “hello,” and it is in that spirit of diversity and wealth of vocabulary that I would like to welcome you to the Commonwealth. Long before Eastern Kentucky University became known throughout the state as “The Campus Beautiful,” the area was known among the Eastern Woodland Indians as “Cane-Tuck” (or cane-break) where native habitat and limestone filtered watersheds creating bountiful and diverse hunting grounds and fishing pools.

Not only is the area a treasure-trove of opportunities, it has been a strategic center for agricultural planning and promotion via military endeavors. It is this history, combining 100 years of the Smith-Lever Act, that we celebrate with the theme of “Esprit de Bee,” and welcome you to visit our local forts, military parks, natural wonders and enjoy the foods for which our region is justly proud. Christian Sprengel once said that there should be standing armies of bees, and in KY, you may find that philosophy working with agricultural development.

A couple of things to be aware: EKU is now a non-smoking campus, which means that there is no smoking allowed anywhere on campus including the parking lots. We ask that you respect this policy.

Many local restaurants are offering a 10-20% discount if you take your EAS ID. There is a list of these restaurants in the Gift Bags.

Interestingly, another Native American tribe, the Lakota, has no word for “goodbye,” preferring instead the phrase, “travel well.” In this state, you will not have to travel far to “travel well,” and the Social Tours are designed to help you explore on your own and return in a short amount of time.

Let’s conclude with the Cherokee word, *tsu na li*, as friends. More than anything, I wish that you make and renew friendships with the bees, the beekeepers, and the history that has proven to be pivotal in apiculture for centuries.

Tammy Horn, EAS President



Horn, Tammy

- Author of *Bees in America: How the Honey Bee Shaped a Nation* (2005); *Beeconomy: What Women and Bees Teach us About local Trade and Global Markets* (2012).
- Started Coal Country Beeworks in 2008, with a beekeepers' gift
- Named Ky. State Apiarist in 2014
- President: KSBA, EAS

Welcome to EAS Kentucky. The state of Kentucky is indeed a very special home to EAS, offering to host our Society twice since I have been in office. Many of us fondly remember the hospitality and enjoyable atmosphere of Murray State University—Eastern Kentucky University will be no different.

I am not going to overwhelm you with the duke's mixture of activities that the Kentucky Team has planned for you this week. The long list (with pictures) of outstanding speakers in this program booklet speaks for itself. Nor do I remember having Greek food, square dancing, and quilting on the menu at any of my past conferences. So take some time to eat a gyro, bow to your partner, and drop a stitch while soaking up all of that knowledge from the lectures, workshops, and demonstrations.

I have two goals for you this week—to learn and have fun. The Kentuckians have planned an edifying, energizing, rich, and enjoyable experience for you. On the other hand, if you do have a gripe, if you find yourself unable to attend a session of your choice because a room is already full, if you are from a state that does not have the same charm and respect for other people as Kentucky, or if you are getting yourself all in a fizz and want to spread it around, come see me first—do not go off half-cocked and complain to other attendees or the EAS staff. Our conference volunteers have taken time off from their jobs and beekeeping chores to welcome you. Be nice to them and thank them for their help.

I look forward to the EAS convention each year. I'll reckon it's the only time to see many of you. Stop in, say hello, and catch up. If this is your first time at EAS, look me up, and I will introduce you to some of the most exciting people in the world. As always, if you have any problems or suggestions to make EAS conferences even better, let me know. At the end of the week, we want you to leave with your noggin filled with information and fun times. Y'all have a good time.

Jim Bobb, EAS Chairman



Queen Sponsors

Dan O'Hanlon "WV Queen Producers
www.mountainstatequeens.com"

Christopher Yates "Thank you for a great conference."

Tammy Horn "In memory of Bess Horn and Ted Hacker."

Linda Mizer



Worker Sponsors

Jeff Burd "Fresh from the Garden State -
Jeff Burd and NJBA"

At a Glance

Sunday Registration & Information Desk 3:00-7:00 PM
Monday Registration & Information Desk 8:00 AM-4:00 PM
Short Course 8:30 AM-4:00 PM
Latest Developments in RNAi Technology 7-9 PM
Tuesday Registration & Information Desk 8:00 AM-5:00 PM
Master Beekeeper Exam 9:00 AM-4:00 PM
Short Course 9:00 AM-4:00 PM
Book Signing and Mead Tasting 7:00-9:00 PM
Wednesday
Master Beekeeper Exam 9:00 AM-5:00 PM
Conference 8:30 AM -5:00 PM
Greek Social and Square Dance 7:00-9:00 PM
Thursday
Master Beekeeper 9:00 AM-5:00 PM
Conference 9:00 AM - 5:00 PM
Lifetime Members' Luncheon 12:00-1:30 PM
Fish Fry Dinner & Live Auction 7:00-9:30 PM
Friday
Conference 9:00 AM-5:00 PM
EAS Annual Meeting 11:00 AM - Noon
Master Beekeeper Results 3:00 PM-5:00 PM
Banquet 6:00-9:30 PM



Thanks to our Honey Show Sponsors:

Extracted Honey

Comb Honey

Black Jar Contest

Beeswax

Mead/Honey Beer

Gadgets

Honey Cookery

Photography

Sweepstakes Award

Best of Show

Arts and Crafts

Springhouse Gardens

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Abigail Keam

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Lani Basberg

American Bee Journal

Bluegrass Beekeepers

Betterbee

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Conference Campus Information

Housing:

The front desk is staffed 24 hours a day while a building is occupied and any camper or staff member who needs assistance may go there for any type of assistance.

Campers may also go to EKU Police located in Mattox Hall. Campus police may also be contacted at 859-622-1111. In Case of an extreme emergency please call 911.

To report a lost key, fob, or lock out please go to the front desk. There is a charge of **\$30 dollars each to replace a lost key or fob.**

To report a maintenance problem, go to the front desk.

It is expected that campers remove all trash from their rooms when checking out. Cleaning fees may be assessed to any group found to have left trash or other items in the rooms.

The kitchens within the residence halls are designed for individual student usage and are not commercial kitchens. Therefore, University Housing closes all residence hall kitchens to summer camps, conferences, and programs. All requests for common space in residence halls (i.e. study rooms, computer labs, TV rooms, etc.) must be made directly with Conferencing & Events.

Colonel 1 Card:

A representative from the summer program must come on a business day during business hours before the camp to sign out the camp cards from the Colonel One Card Office, their office hours are Monday-Friday 8am-4:30pm you can reach them at 859-622-2179. The Colonel One Card Office is located on the main floor of the Powell Student Center. **There is a \$30.00 replacement fee for all camp cards.**

We want your visit to “The Campus Beautiful” to be a wonderful experience for your group this summer! Please contact us if you have any questions or concerns. We may be reached at 859.622.8842 or e-mail at jesse.hood@eku.edu

Master Beekeeper Schedule

Meet and Greet Candidates	Monday	1:30 p.m.– 2:30 p.m.	New Science Building # 4112
Exam Study Groups	Monday	2:30 p.m.– 4:00 p.m.	New Science Building # 4112
MB Exam Volunteers' Dinner	Monday	5:00 p.m.– 7:00 p.m.	Casa Fiesta Mexican Restaurant 240 Eastern Bypass
Exam Study Group	Monday	7:00 p.m. – 9:00 p.m.	Crabbe Library # 128
Written Exams	Tuesday	8:30 a.m.– 12:30 p.m.	New Science Building # 4112
Oral Exams	Tuesday	10:00 a.m.–4:00 p.m. 10:00 a.m.–4:00 p.m. 12:30 p.m.–4:00 p.m.	New Science Building # 4116
Lab Exams	Wednesday	8:30 p.m.– 12:30 p.m.	New Science Building # 4112
Field Exams	Wednesday	10:00 a.m.–4:00 p.m.	NSB Beeyard
Annual Meeting (Requires lunch ticket)	Friday	noon– 1:30 p.m.	Regents Dining Room
Exam Review (Candidates receive scores and get questions answered.)	Friday	3:00 p.m.– 5:00 p.m.	New Science Building # 4112

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Registration Schedule

	New Science Building	Brock Auditorium (Walk-ins Only)
Sunday	3:00 p.m.– 7:00 p.m.	
Monday	8:00 a.m.– 4:00 p.m.	
Tuesday	8:00 a.m.– 5:00 p.m.	
Wednesday	8:00 a.m.– 5:00 p.m.	8:00 a.m.– 11:00 a.m.
Thursday	8:00 a.m.– 5:00 p.m.	8:00 a.m.– 11:00 a.m.
Friday	8:00 a.m.– noon	8:00 a.m.– 11:00 a.m.

*After hours, dorm keys are available at the dorm front desk.

If you are lost or cannot find the location for dorm check-in, please call EAS Chair Jim Bobb, 610-584-6778.

Annual Honey Show Schedule

Drop Off Show Entries (NSB Atrium)	Top Awards Presentation	Show Open to Public	Post-Show Pick Up of Entries
Tuesday 1:30-4:30 p.m.	Thursday <i>Auction, and Honey Show Awards Social</i> 7:00-9:30 p.m.	Thursday 1:30-5:00 p.m.	Friday after 3:00 p.m.
Wednesday 10:30 a.m.-noon & 1:30-3:00 p.m.		Friday 9:00 a.m.-3:00 p.m.	

Short Course Break Sponsors

Bluegrass Beekeepers Association



General Conference Break Sponsors



Society Meeting Schedule

(Requires lunch ticket)

EAS Board of Directors' Meeting <i>Long Term Budget Plan</i>	Tuesday	noon-1:30 p.m.	Regents Dining Room
EAS Board of Directors' Meeting	Wednesday	noon-1:30 p.m.	Regents Dining Room
Life Members Banquet	Thursday	noon-1:30 p.m.	Regents Dining Room
EAS Annual Business Meeting <i>Everyone is encouraged to attend.</i>	Friday	11:00 a.m.-noon	Keen Johnson

Short Course: Queen Rearing



Monday July 28, 2014	
	Class Description
Time	In the Classroom NSB # 3101
9:00-9:50	Overview: Life History and Biology of Queens and Drones
10:00-10:50	Why Rear Your Own Queens and How to Start? Importance of good queens, stock selection, breeder and drone mother colonies
11:00-11:50	Timing is Everything: Rearing superior queens starts months in advance
Time	In the Apiary O/S NSB ***Bring your own veil and other gear if you so need
1:00-1:50	Setting up Starter/Finisher Colonies: Various methods for starting and finishing queen cells
2:00-2:50	Hive Evaluations for Selecting Breeders and Record Keeping
Tuesday July 29, 2014	
	Class Description
Time	In the Classroom NSB # 3101
9:00-9:50	What You Will Need: Equipment and instructions necessary for queen rearing
10:00-10:50	Learn How to Graft: Hands on grafting session
11:00-11:50	Learn How to Graft: Hands on grafting session
Time	In the Apiary ***Bring your own veil and other gear if you so need O/S NSB
1:00-1:50	Setting Up Mating / Nucleus Colonies and Marking Queens
2:00-2:50	Non-Grafting Techniques
Wednesday July 30, 2014	
	Class Description
Time	In the Apiary ***Bring your own veil and other gear if you so need O/S NSB
10:00-11:50	Evaluation and Discussion: Checking on newly constructed cells, transporting into finishers/mating nucs and course summary



Course Descriptions

A

Advanced Honey Bee Queen Biology

Jeff Harris will explain advanced queen biology, pheromones, reproduction.

Advanced Honey Bee Biology

Wyatt Magnum will provide advanced discussions about queen, worker, and drone biology

African Honey Bees

Stephanie Tarwater, certified in FABIS, will discuss field tests for distinguishing European honey bees from African honey bees.

African Honey Bees

Dewey Caron - Africanized honey bees have colonized all but extreme South and North America. They are the ecological dominant honey bee, best adapted for tropical/semi-tropical America. Beekeepers have adapted their beekeeping and selected for manageable strains but do not need to control bee mites in colony care. They are a success story we can perhaps learn from as we seek to cope with heavy colony losses.

Artificial Swarming, a key concept in sustainability and honey production in small scale northern apiaries.

Erin MacGregor-Forbes will discuss the key concepts of artificial swarming and how beekeepers can work with the bees' natural instincts to improve colony health and increase honey production.

B

Basic Honey Bee Biology

Jeff Harris will teach about the development and anatomy of the three castes of honey bees: workers, drones, and queens. What colors do bees see? How do the bees sting? This session covers the individuals in the hive.

A Beekeeper's trip to China

Meghan Milbrath focuses on similarities and differences that she noted between beekeeping in Northern China and beekeeping in the Northern United States.

Beekeeping in town and urban areas

Tom Webster - City beekeeping is different from hive hives in the country. Many people are successful with having bees in backyards and roof tops, but there are some important considerations.

Bees in Burundi

Kelly Watson - In 2005, the small East African nation of Burundi emerged from a debilitating 12-year civil war. Today, the country is investing considerable effort into economic development, education, and political stability. One form of rural development is beekeeping, which has long been practiced using primitive hives and traditional methods, though only for subsistence or supplemental income. More modern methods of beekeeping offer potential as both a livelihood strategy and a means for conserving native vegetation.

Bees for Development

Nicola Bradbear will discuss information on her work in India and Africa countries using bees as economic development and a keystone species.

Bees in Costa Rica

Berry Brosi will present an insightful look into the benefits that beekeeping can do for smaller countries that are economically challenged.

Beeswax Pesticide Study

Maryann Frazier will reveal the results of an ongoing study to catalog the instances of pesticide contamination in bees wax.

British Honey Show

Michael Palmer is our honey show chairman. He will tell us about the origins of honey shows and the rich traditions that have continued in Europe.

C

Challenges of producing honey for international standards

Bradbear will explain the international tests to test honey and show how world honeys may measure or may be marginalized by the system.

Citizen Science Research, Bugonia: Research by and for the Beekeeper

Izzy Hill introduces Bugonia.com, a new online platform that enlists beekeepers to participate in honey bee research. Bugonia utilizes a database that is structured so that it can be used for nearly any type of honey bee field study and can easily support multiple research projects simultaneously. Research participants are also able to receive real-time comparisons of their results against the results of others in a study.

Common Bee Diseases

Tom Webster will discuss the honey bee diseases most common in our hives : American foulbrood, European foulbrood, Nosema disease (two types), chalkbrood, and the most prevalent viruses. This will include the biology of each disease, and strategies for identification and control.

Common Queen Problems

Jeff Harris will discuss some of the frequently seen problems that arise with queens both in the hive and when raising your own.

Common Honey Bee Parasites and Pests

Ernesto Guzman will describe and define those pests that can potentially take down a hive, from moths to mites and beetles to bacteria.

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HH-130 2 FRAME PLASTIC EXTRACTOR

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HH-160 STAINLESS 6/3 FRAME HAND CRANK EXTRACTOR

- Stainless steel 26 gauge
- Holds 6 shallow, 3 medium or 3 deep frames
- Includes a honey gate

\$329⁹⁵

Stand Not Included



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- Legs included

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HH-215

HH-215 MOTORIZED RADIAL 18/9 FRAME EXTRACTOR

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- Stainless steel basket
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E

EAS Guelph, Ontario 2015

Team EAS 2015 will offer a brief overview on preparations for this conference next year.

Effects of Neonicotinoid/Fungicide/Adjuvant Pesticide Combinations Commonly Encountered by Honey Bees on Pumpkins

Thomas Janini, EAS Research recipient with Reed Johnson, will present a study of the relationship between honey bee health and the combinations of chemical compounds they are likely to encounter while pollinating pumpkins.

F

From Hobby to Commercial Beekeeping

Rick Sutton will explain the preparations necessary to take to transition from hobby to commercial endeavors

Feeding Bees

Honey bees require food to survive and thrive. Mike Palmer will describe different scenarios under which one may choose to feed bees, various food options (sugar syrup, high fructose corn syrup, fondant, pollen substitute) that should or should not be fed to bees and a variety of types of feeders.

Flower Fidelity

Berry Brosi will discuss the latest research in pollinator-floral fidelity and how landscape use may impact this evolutionary relationship.

H

Hambleton Award Winner

As part of his award acceptance, Robert Danka will share "Reflections on my research: translating and applying research results in the real world of beekeeping."

Honey Bee Queen Biology

Jeff Harris will introduce basic info about the queen and her requirements

Honey Production

Ed Holcombe takes pride in being able to share lessons learned from a master Tennessee honey producer.

Honey Bee Removal

Cindy Bee will review honey bee removal as a means of income as well as providing an important service to the bees through proper relocation techniques. The logistics of what to say to a potential customer and how much to charge will be important issues to consider. Cindy Bee will discuss some of the ways to detect where a hive might be located within structures and how to access that hive so it can be preserved and reestablished in a proper location. Reconstruction methods for walls and flooring will also be reviewed. After-care of the bees also will be discussed.

Honey Bee Pheromones

Acknowledging that the hive is a collection of chemicals,

Maryann Frazier will discuss the pheromones that make communication possible within a hive.

Honey Bee Pheromones; Better SOCIAL Living Through Chemistry

Maryann Frazier, speaker. Honey bees communicate through dance language and chemical odors called pheromones. Our understanding of both systems is constantly evolving. Join us to learn the basics and latest on honey bee pheromones.

How to Rear and Use Nematodes as a Biocontrol for Small Hive Beetles

Izzy Hill will speak on the use of beneficial nematodes to control small hive beetles (SHB) Attendees will be taught how to rear nematodes using materials that can be found around the house, which species of nematodes to use for controlling SHB, and how to properly apply nematodes to achieve best results. Attendees will also learn about research being conducted to better understand nematode efficacy against SHB in the field.

I

Insemination of Queens

Jeff Harris will speak to the topic of Instrumental Insemination of Queens and the benefits of selective breeding.

International Programs

Bob Cole has been "around the world" working with beekeepers in other countries to establish best management practices among beekeepers.

Integrating Overwintering Nucs into your operation.

Erin MacGregor-Forbes will discuss the basics of making summer nucs from the resources in your apiary, goals and strategy for wintering nucs, and how keeping nucs increases sustainability in your operation.

K

Ky National Guard Agriculture team in Afghanistan

Col. Benny Richardson will report on how the Ky National Guard has been helping the Afghan people transition to a diverse ag economy by keeping bees.

L

Latest developments in RNA interference technology - Dr. Subba Reddy Palli

The ability of double-stranded RNA to silence genes known as RNA interference (RNAi) was discovered in the nematode. Within a few years of its discovery, RNAi was shown to function in nematodes, insects, plants and trypanosomes. Over the course of the next decade, numerous improvements to the design, synthesis and delivery of dsRNA or siRNA, led to the testing of RNAi applications in both humans and plants. This technology is being developed to target essential genes in insect pests to control them. The potential of this technology for use as a reduced risk method for insect management using transgenic crops or direct

application as well as its potential non-target effects will be discussed

Lifetime Members luncheon

Maryann Frazier, speaker. Title: “*Nature or Nurse.*” In the US and Europe, we have reached a point where we must NURSE our honey bees if they are to survive. However in East Africa, where NATURE is in charge, we see a profound example of “survival of the fittest” and it looks like honey bees there are extremely fit....even in the presence of Varroa.

M

Managing Bees for Honey Production

Ed Holcombe prides himself on being able to get the maximum yield out of his hives.

Marketing Honey

Rick Sutton will show the “do’s and don’ts” of selling honey. Topics will include labeling and label reading, bottling, weights and measures and storage concerns.

N

Nicotiana apis, A Novel Hybrid Plant for Foraging Pollinators

While developing novel tobacco varieties for non-traditional uses of tobacco Rich Mundell discovered that one of the hybrids produces a high number of flowers, and each flower produces very large quantities of high quality nectar. During the summer of 2013, Mundell began evaluating the hybrid as a potential source of sustenance for pollinators during the dry summer months.

Nutrition

Diana Sammataro, speaker. Learn the nutritional requirement of bees and how the bees utilize them. Topics will include nectar, pollen, beneficial microbes and supplemental feeding.

O

Overwintering

Ernesto Guzman will be discussing the steps necessary to successfully bring your hives through the winter from feeding to protection.

Organic Beeswax

Christy Hemenway will discuss the difference between commercially available wax and wax that is free of contaminants.

Organic Beekeeping - Sean Clark

What does 'USDA Certified Organic' mean and how can beekeepers transition to organic methods and get certified? Certified Naturally Grown, a grassroots alternative third-party certification, will also be covered as a more reasonable option for small-scale honey producers.

P

Pathogen Control

Meghan Milbrath will define the different pathogens that are problematic to the colony and ways to avert disaster from overexposure.

Pesticide Management

Les Eccles will define the compounds that are approved for use in the hive.

Pheromones Beehive Chemistry: Chemical Communication

Thomas Janini offers an overview from a chemist’s perspective of the chemical compounds honey bees use to communicate.

Pollinator Stewardship Council

Michele Colopy will discuss the adverse impact of pesticides on pollinators, and the PSC’s work to protect honey bees and native pollinators vital to a sustainable and affordable food supply.

Propolis Beehive Chemistry

Thomas Janini reviews the role of propolis in folk medicine to treat a variety of ailments over a long period of time. This talk will focus on the relationship between propolis’ chemical composition and its use by both honey bees and humans.

Q

Queens

Kent Williams will discuss the ups and downs of raising queens, how to raise good queens from good stock and what preparations are necessary for proper queen production.

Quilting Bee with Hope Johnson

Quilting was a social action group long before the advent of computers and telephones. Join Hope as she “spins the yarn” and “tacks the batting” on a piece of fabric that tells a story.

R

Running a Non-Profit

Nicola Bradbear will present the challenges of running a not for profit enterprise. She will discuss fundraising, an integral part of non-profit sustainability.

Running Migratory Bees

Stephanie Tarwater has traveled the East Coast, pollinating the crops that feed the nation. She will discuss the ups and downs of migratory beekeeping.

S

Seasonal Hive Management

Ernesto Guzman provides a basic timeline for beekeepers throughout the year, reviewing basics of hive buildup, pest management, honey harvest and overwintering.





Small Hive Beetle

Phil Craft will discuss this unwelcome guest and how to control its presence in the hive.

Soap Basics

Diana Sammataro will demonstrate how to make a marketable product with hive products. Soap is easy and fun to make. Learn the basics of making soap from scratch using lye, fats, water and your own honey and beeswax.

Sustainable Agriculture Research and Education

“A Comparison of Strength and Survivability between Package-started Colonies and Northern Requeened packages” – a **SARE** funded project.

Erin MacGregor-Forbes will discuss the results of this three year project comparing traditional packages and packages that were requeened with northern raised queens.

Swarm Removals

Cindy Bee will discuss the steps in finding a swarm, fielding a swarm and keeping them there after you get them home.

T

Testing Chronic effects of pesticides on honey bees

Jessica Louque. Recently, a specific testing methodology has been designed under the scrutiny of the EPA to be the standard for evaluating the potential effects of insecticides on honey bee colonies. These studies are designed to run for a period of 10 months in 12 locations while collecting exposure effects data on 84 hives.

The Toxic Hive

Maryann Frazier, speaker. Heavy pesticides loads have been documented in honey bee hives, especially those engaged in commercial pollination. However the pesticides found most often are beekeeper applied miticides for the control of Varroa mites. Our understanding of how pesticides in general can impact individual bees, colonies and populations will be discussed.

Top Bar Hive Beekeeping

Wyatt Mangum will give instruction on how to set up and maintain a top bar hive.

V

Varroa Mites and Resistance

Jeff Harris will discuss Varroa mites in terms of resistance to chemical controls as well as the resistance of the bees to Varroa infestations.

Varroa Mite Control

Ernesto Guzman will give insight into the “biggest little” invader of the hive. These pests bring with them a host of other vexations that can potentially destroy a hive.

In the Kitchen

Appalachian Cooking: Mountains Sweet and Savory- Appalachian Honey Recipes

With humor and sass, Joyce Pinson shares recipes and stories about cooking with honey. Drawing from her experiences as a young girl in her grandfathers' restaurant and beeyard, her years in the Appalachian Kitchen, and her relationships with trendy chefs, Pinson will educate and entertain your taste buds.

Honey cookery

Chef Jeremy Ashby will make the following: Warm ricotta cheese, made on the spot with local honey and rosemary bread. Sausage and gouda stuffed calypso rubbed chicken lollipops with Jeremy's signature smoked honey

Honey cookery - David Poulton, Chef at Boone Tavern, Berea, KY.

Mead

Blake Layne: Mead is the fastest growing segment of the alcoholic beverage industry. Topics covered will be history, mead, and its resurgence into today's market, and how you can get started making your own.



In the Lab

Advanced Honey Bee Anatomy and Necropsy

Don Coats: This advanced class will look into the organs and musculature of the dissected honeybee as it is examined to determine cause of death and/or infections or pathogens.

Appalachian Tree/Flower Pollen

Don Coats: Appalachia is its own unique ecosystem. Many of the trees and flowering plants are indigenous to this area and have specific identifiers in their pollen.

Basic microscopy for Beginners

Don Coats: This class reviews the basic parts and techniques with the compound and stereo microscope.

Bee Anatomy

Don Coats: Understanding the physiology of your charges is important in any phase of husbandry, and honeybees are no exception. Get a detailed look at the working parts of the honeybee.

Bee Anatomy

Martin Matisoff: A basic look at the internal and external parts of the honeybee. Skeletal and musculature as well as glands and organs will be identified.

Bee Necropsy

CSI in miniature, Coats will take you on an autopsy journey to discover the life and death of the individual bee.

Digestive systems of honey bees

Martin Matisoff: "Describe the anatomy and morphology of the organs associated with digestion. Demonstrate how food moves through the digestive system and the steps involved in the process. Discuss pathogens of the digestive system, with an emphasis on morphology and infectivity of *Nosema* spp.

Mite Anatomy

Diana Sammataro: In the exploration into the world of mites, what are they and how do they live, with an emphasis on the bee mites. Class will include a lecture and a series of microscope slides on the bees mites.

Mite Anatomy

Jeff Harris discusses *Varroa destructor* that vectors in diseases and immunological problems into the honey bee. A close up look at this opportunistic pest helps us to understand how to control and combat them effectively.

Nosema Lab

Meghan Milbrath: This presentation will allow beekeepers to see the *Nosema* spores by microscope, understand how to take bee samples, and how to prepare samples for examination by microscope.

Nosema lab

Tom Webster: This presentation will allow beekeepers to see the *Nosema* spores by microscope, understand how to take bee samples, and how to prepare samples for examination by microscope. The differences between *Nosema apis* and *Nosema ceranae* will be discussed.

Pollen Identification

Don Coats: Finding pollen in honey and on the pollen baskets or in the bloom is fascinating and easily done by the amateur at 400X - 1000X.

Tracheal Mites

Ed Holcombe: Invaders that give the bees a form of "Asthma". With 400 X microscope these pests can be seen and identified.

Tracheal Mites

Diana Sammataro will discuss the tracheal mite and also the tools with which to study them, including the scanning electron microscope, proteomics and molecular techniques.



In the Apiary

Basic Hive Inspection

Maryann Frazier: "What do your hives tell you?": What should you look for every time you open a hive and what should make you open a hive and look? Maryann will demonstrate basics such as Queen-rite, eggs, larvae and potential problems

Evaluation/Checking on Cells

Jennifer Berry will take the class out to the Bee Yard to check the progress of the hands on queen raising class. This course is a postscript to the Queen Rearing course.

Finding Queens in Top bar Hives

Christy Hemenway: Finding the queen can be a challenge even for the experienced beekeeper. Christy will show you where and how to look for the "lady of the house".

Finding Queens/Replacing Queens -

Tammy Horn will demonstrate some tips to finding/replacing queens in a hive.



Forklift demos

Stephanie Tarwater: Using big machinery may seem daunting to women. Tarwater will demonstrate how to use these labor-saving devices, so you can upgrade your operations.

Hives for people w/disabilities

Carl Jackson: After having back surgery and still having lifting problems, Jackson developed a beehive that would be easy to carry out routine inspection without that heavy lifting.

His design gives easy access to the complete hive with little physical effort resulting in less stress on bees. Management can be done if and when needed resulting in a healthy colony and higher yields.

Hygienic Bees

Sean Clark: What is hygienic behavior in honey bees? How can it be useful in breeding and propagating colonies and how can it be measured?

Keeping Hives in Bee Gums & Beelining

Gary Branson: Bee “gums” have been used for centuries. They are nature’s first choice for homesteading of the honey bees. Branson will discuss specifics for setting up gums and attracting or finding swarms to fill them.

Liquid Nitrogen Pour

Sean Clark & Martin Brock: Field demonstration of a method for testing honey bee colonies for hygienic behavior using liquid nitrogen to freeze-kill an area of sealed brood followed by measuring removal rates.

Managing Top Bar Hives

Christy Hemenway: Top bar hives are treated differently from Langstroth type hives. Learn best practice management techniques from Hemenway.

Making Nucs and increase

Wyatt Mangum: Nucs can be your greatest asset in your apiary, as they are easy to manage and easy to move and load. They also can be used as splits and combining stations.

Non-Grafting techniques

Hopkins/Keller: Not good at grafting or just can’t see that small? There are other methods that will produce queens that are just as viable as those grafted.

Nuc Management

Jennifer Keller: Nucs can be a source of extra income just from proper manipulation of the existing hives you have. Join Keller as she tells us how to care for these “half-pint hives.”

Organic Beekeeping

Sean Clark: What does 'USDA Certified Organic' mean and how can beekeepers transition to organic methods and get certified? Certified Naturally Grown, a grassroots alternative third-party certification will also be covered as a more reasonable option for small-scale honey producers.

Queen Yard

Jennifer Berry’s last trip to the bee yard will be to grade and “harvest” the capped queen cells.

Setting up Mating Nucs

Hopkins/Keller: If you are serious about raising your own queens, then you need to know how to set up a bank of mating nucs.

Smoker Basics

Jennifer Keller: Learn how to load and light a smoker, as well as different fuels and usage of the defensive tool in your arsenal.

Top Bar hives

Top bar hives are an alternative to “traditional” Langstroth hives. Christy Hemenway will answer your questions and fill you in on the pro’s and con’s of TBH.

Visual identification of diseases in the Hive

Know what to look for and how to field test for disease in the hive. Don Hopkins will show examples of the common and the critical.

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Speaker Bios

Chef Jeremy Ashby

- He received his culinary degree from Johnson & Wales University in Charleston, South Carolina in 2000.
- He has been an owner of AZUR Restaurant & Patio in Lexington, KY since 2007.
- Chef Ashby also earned a degree in business and hospitality from the University of Kentucky.
- “A meal should be about dining, not feeding. I like to mystify people with menus, but offer a flavor profile that comforts and tastes familiar. I love to convey a sense of place and season bringing friends to the table sharing the endless ways food becomes a common ground that ties together our lives and conversations.

Baker, Nancy

- Nancy’s doctorate is in Geography from Louisiana State University.
- She joined the U.S. Geological Survey in 1984 at the Louisiana Water Science Center.
- In 1991, Nancy relocated to the Indiana Water Science as part of the National Water Quality Assessment (NAWQA) Program. Her research focused on understanding how landscape characteristics and hydrologic setting affect transport processes and pathways of agricultural chemicals.
- In 2013 Nancy became part of the NAWQA National Monitoring Status and Assessment Team that is currently working on a national-scale assessment of the occurrence and behavior of pesticides in streams and ground water of the United States and the potential for pesticides to adversely affect drinking-water supplies or aquatic ecosystems.

Bee, Cindy

- Cindy holds an MFA degree in creative writing and also holds an MA in professional writing.
- She was the first woman to attain the level of Georgia Master Beekeeper, and in 2006 was awarded Georgia Beekeeper of the Year.
- For over thirteen years she owned and operated a honey bee removal business. She is the co-author of the book, *Honey Bee Removal – A Step-by-step Guide*.
- In 2012 she moved to Maine where she continues the removal of bees from structures as well as teaches beekeeping, speaks on beekeeping to national as well as local audiences, currently participates in a SARE grant to study northern raised queens, and helps run over one hundred colonies.
- Travel sponsored by Monsanto grant

Berry, Jennifer, Director of Queen Production Short Course

- For the past fourteen years, Jennifer Berry has been the research coordinator and lab manager for the University of Georgia Honey Bee Lab.
- Her research and extension objectives have concentrated on the sub-lethal effects of pesticides on honey bees, a queen breeding program, incorporating IPM techniques for varroa mite and beetle control.
- Jennifer operates Honey Pond Farm, a queen and nuc business, which focuses on rearing healthy bees while selecting for longevity, pest resistance and honey production.
- In 2006, she was the Eastern Apicultural Society president.
- Travel sponsored by Monsanto grant

Borges, Daniel - 2014 Student Award Winner

- Borges is a graduate student at the University of Guelph where he is working toward a master’s degree in honey bee pathology.
- His research focuses on the honey bee parasite *Nosema ceranae* and its treatment using natural compounds.
- He received a BS from McMaster University as well as a BE from the Ontario Institute for Studies in Education at the University of Toronto.
- Daniel has a passion for entomology and hopes to keep bees of his own one day.



Bradbear, Nicola, Director of Bees for Development (Wales)

- Director of the United Kingdom based organisation *Bees for Development*. This unique organisation, founded by Bradbear in 1993, trains and educates people to practise sustainable beekeeping, and is helping to alleviate poverty throughout the developing world. This in turn has a positive effect on biodiversity and ecosystems, Nicola's other passions.
- From her travels and consultancy work in the 1980's, Nicola realized that although beekeeping was already widely practiced in the developing world, remote and isolated beekeepers often found it difficult to create significant income from bees. She wanted to provide educational support to the poorest, most marginalised people, enabling them to generate income and sustain their communities.



Branson, Gary

- Keeps bees in traditional bee gums in Harlan County, KY
- Learned forest-based beekeeping from his grandfather
- Travel sponsored by Center for Appalachian Research, Entrepreneurship and Stewardship



Brock, Martin

- Professor of Chemistry at ECU since 1990
- Professional development for teachers with Appalachian Math and Science Partnership and the Partnership Institute for Math-Science Education Reform
- Honors Program: SEEing Science in Appalachia: The Bee Sustainability Project
- Spearheads ECU's campus pollinator efforts



Brosi, Berry

- **Dr. Berry J. Brosi** is an Assistant Professor in the Department of Environmental Sciences, Emory University.
- He is an ecologist and conservation biologist whose research program involves basic and applied research on the community ecology of mutualisms, with a particular focus on the causes and ecosystem functional consequences of ongoing pollinator declines.
- His work on pollinators spans both native bees and managed honey bees.
- Having grown up in Berea, Kentucky, Dr. Brosi earned a BA from Wesleyan University; a Master of Environmental Science degree from Yale University; and a Ph.D. in Biology from Stanford University.



Caron, Dewey, Director of 2014 EAS Master Beekeeper Program

- Cornell University (PhD in Entomology with Dr Roger Morse). I spent 40+ years teaching, doing bee extension and bee research at Cornell, University of Maryland (1970-1981) and University of Delaware (1981-2009) with 3-way split Teaching, research extension appointments).
- I have been active in EAS since 1967 meeting including organizing Short Course/Annual Meeting numerous times, served as board chair for 8 years (1991-99), as President, and as EAS Foundation Chair (1999-2009).
- I am currently Master Beekeeper program advisor, and serve as VP of the Oregon State Beekeepers. I have been very active in Spanish speaking overseas extension development programs since 1981.
- President/Executive Board of western Apiculture Society



Clark, Sean

- Associate professor in the Agriculture and Natural Resources program at Berea College. He directs the college's educational farm, which includes horticulture, apiculture, aquaculture, field-crop, and livestock enterprises in addition to a retail store.
- His research is focused on the environmental and economic performance of food production systems.
- Technical advisor for the Organic Association of Kentucky



Coats, Don. Microscopy DVM

- Light-microscope for honey bee diagnostics.
- Applying tools and concepts used in clinical practice of small animal medicine, he hopes to build on the foundation of existing methods of evaluating honey bee health and disease.
- Also introducing other beekeepers to the exciting, often basic discoveries provided through microscopy
- Don and several associates plan to publish a pollen identification guide for beekeepers, forthcoming in 2015



Cole, Bob

- He served EAS for five years as Chairman of the Board. He is a professional beekeeper, honey producer and packer, and a teacher of beekeeping.
- He serves as a volunteer for foreign aid programs to developing and third world countries and has assisted beekeepers in 20 countries and has received three presidential volunteer awards for his work overseas.
- Bob's awards for beekeeping include the EAS Divelbiss Award, a Distinguished Service Award from the So. States Beekeepers Fed., Beekeeper of the Year from the N. C. State Beekeepers Association. He also studied beekeeping at NC State University and the instrumental insemination of queen bees at the Ohio State University.
- Bob Cole is certified as a Master Beekeeper by the Eastern Apicultural Society of North America.



Colopy, Michele

- Ms. Colopy has nearly twenty years of experience in nonprofit organizations, and holds a Master's degree in Nonprofit Management from The University of Akron.
- Her nonprofit experience includes work in the performing arts, housing and homelessness, foreclosure prevention, community development, and health and wellness.
- Her father was a beekeeper in Ohio.



Craft, Phil

- Phil served as the Kentucky State Apiarist from 1999 through 2011.
- He is a graduate of Oberlin College in Ohio (BA in biology), and of the University of Kentucky.
- Phil communicates with beekeepers through his "Ask Phil" question/answer column which appears monthly in Bee Culture magazine, and through his webpage, Philcrafthivecraft.com.
- He is also the U.S. technical adviser for Veto-pharma, the maker of Apivar.



Danka, Robert

- 2014 Hambleton Award Winner
- Studied sublethal effects of insecticide during apple pollination at Penn State.
- Studied behavior of Africanized bees in pollination at LSU .
- Research Entomologist USDA, ARS Honey Bee Breeding, Genetics and Physiology Laboratory
- Research on several other aspects of Africanized bees, some work on pollination of regional crops (blueberries, soybeans and cotton. Expanding research on bees with VSH-based resistance to varroa mites.
- His research involves everything from molecular genetics, through behavior and chemical ecology, to breeding for beekeeping functionality.



Downs, Toni

- Ms. Downs began beekeeping in Kentucky in 2000
- She moved to St. Croix in 2011
- Her passion is bees and bee removal in the Caribbean
- Owner Queen CariBEE specializing in Value-Added hive products



Eccles, Les

- Tech-Transfer Program Lead.
- Bachelor of Science in Agriculture from the University of Guelph.
- Les developed his interest in beekeeping and research at the University of Guelph Apiculture Research Centre with Paul Kelly and Ernesto Guzman, and has been instrumental in various research projects and presentations.
- Les also spent two years in Mexico; working with beekeepers and development organizations to transfer beekeeping technology into the field, and certify beekeeping operations for honey exportation to European markets.



Forbes, Erin

- Erin studied beekeeping in Maine and Georgia, earning her Journeyman level certification through Cornell University’s Master Beekeeper program and becoming fully certified as a Master Beekeeper at the 2008 Eastern Apicultural Conference.
- Erin teaches beekeeping at all levels.
- Erin and her partner Cindy Bee have also begun the state’s only Advanced Intermediate Bee School through the Cumberland County Cooperative Extension which began in January 2012.
- Owner: Overland Apiaries



Frazier, Maryann

- Maryann received her B. S. in Agriculture Education from Penn State University in 1980. In 1983 she completed a Masters of Agriculture in Entomology, specializing in apiculture.
- She was assistant state apiary inspector in Maryland and for two years a beekeeping specialist in Sudan and in Central America.
- Currently Sr. Extension Associate in the Department of Entomology at Penn State
- She works with members of PSU Department of Entomology on pesticide impact on honey bees and other pollinators. She works with a team of U.S. and Kenyan researchers to understand the impacts of newly introduced *Varroa* mites on East African honey bee and helping Kenyan beekeepers become more productive.



Guzman, Ernesto

- Dr. Guzman is a Professor and Director of the Honey Bee Research Centre in the School of Environmental Sciences at the University of Guelph in Ontario Canada, since 2004.
- He was born and raised in Mexico, where he started to keep bees in 1978. He obtained M.Sc. and Ph.D. degrees in Entomology from U.C. Davis in 1989 and 1992, respectively.
- In 1994 he was appointed director of the National Apicultural Research Program for the Mexican Department of Agriculture. Dr. Guzman has ample academic and research experience.
- He has graduated more than 40 D.V.M., M.Sc. and Ph.D. students. His research has been focused on the genetics, behavior, and parasitic mites of honey bees.



Harris, Jeff

- Currently an assistant professor of apiculture in the Department of Biochemistry, Entomology and Plant Pathology at Mississippi State University.
- His research focuses on possible effects of chemical residues in comb on reproductive physiology of queens and drones that develop in the combs
- He has worked as Research Entomologist in the USDA, ARS Honey Bee Breeding, Genetics and Physiology Laboratory in Baton Rouge, LA (1999- 2012).
- He selectively bred lines of honey bees for resistance to Varroa mites (collaboration with John Harbo, Bob Danka and Jose’ Villa). Now sold by commercially.
- Harris plans to breed VSH bees in a close-population arena. He studies various aspects of the behavior and genetics of the trait.



Hayes, Gerald

- Jerry Hayes is the Honey Bee Commercial lead for Monsanto's newly formed BioDirect business unit.
- Previously Chief of the Apiary Section for the Florida Department of Agriculture and Consumer Services. He was responsible for the regulatory health of the 350,000 colonies in Florida.
- For 30+ years, Jerry’s desire has been to create sustainable honey bee management practices while partnering with other segments of agriculture. The cornerstone has been to educate others that honey bees are key pollinators and the critical role they play in agriculture; while in parallel encouraging the development of multi-dimensional landscapes for the benefit of all pollinators.



Hemenway, Christy

- Christy strives to keep the focus on the “spirit” of beekeeping
- Dedicated to the goal of treatment-free beekeeping in top bar hives, Christy believes that “It’s all about the wax!” - about clean, natural beeswax, made BY bees, FOR bees!
- An engaging speaker and teacher, Christy is the author of *The Thinking Beekeeper - A Guide to Natural Beekeeping in Top Bar Hives*
- She is the founder of Gold Star Honeybees
- Travel paid for with Monsanto grant

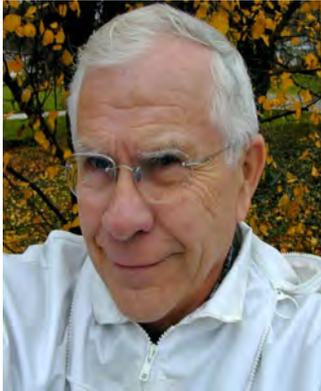


Hill, Izzy

- Izzy is the Director of the Center for Urban Bee Research and is affiliated with the Mid-Atlantic Apicultural Research and Education Consortium.
- Her research combines aspects of agriculture, ecology, and the social sciences and creates opportunities for beekeepers to participate in honey bee research.
- Currently, she is working with her research team to examine how beekeepers can best use and rear their own beneficial nematodes as a biocontrol option for controlling Small Hive Beetle. In June 2014, her team launched an online platform, Bugonia.com, where beekeepers can actively participate in large-scale honey bee research studies using their own hives.

**Holcombe, Edwin, Backwood Apiaries**

- Ed Holcombe received a beehive as a wedding present in 1960 and has been in love with bees and his wife Elaine ever since.
- He has been a honey producer, queen producer, father to three Honey Queen/Princesses and avid supporter of American Beekeeping Federation and Eastern Apiculture Society.
- He received a SARS grant to work on tracheal mite resistance and continues to provide extension services to Coal Country Beeworks and teaches at bee schools.
- Holcombe was the recipient of the 2006 Dovelbiss Award

**Hoopingarner, Roger**

- 2014 Roger Morse Award winner
- Started beekeeping 67 years ago through the Boy Scouts
- Doctorate from University of Wisconsin
- 38 Years at MSU Entomology Department teaching apiculture and doing research and extension work.

**Hopkins, Don**

- Don Hopkins started with bees in NJ as a youngster before moving to NC as apiary inspector.
- He has been active with Partners of Americas in beekeeping development in Haiti and Bolivia as well as Kazakhstan.
- He is active with Short courses and workshops and helped train new NC beekeepers with the Golden Leaf Project (funds from tobacco settlement used to establish new beekeepers).

**Jackson, Carl**

- After having back surgery. Jackson developed the Royalty Beehive that would be easy to carry out routine inspections without lifting.
- The Royalty Hive gives easy access to the complete hive with little physical effort resulting in less stress on bees and management practices can be done if and when needed, resulting in a healthy colony and higher yields.

**Janini, Thomas**

- EAS Research Grant Recipient
- Thomas is an Associate Professor and Chairman of the Arts, Science and Business Technologies Division at Ohio State ATI in Wooster, Ohio.
- He currently teaches courses in general chemistry, organic chemistry and biochemistry.
- Dr. Janini is the faculty advisor to the ATI Student Bee Club. His current research interests include the impact of man-made chemicals on honey bees.



Johnson, Hope

- Johnson studied studio art, including fiber art with Carol D. Westfall, and earned a certificate for Art Education K-12 and Bachelor of Arts degree in Psychology from Montclair State University, Montclair, NJ in 1982.
- She was inspired by the early work of the quilter Jinny Beyer and starting with a hand-quilting class taught by Gail Hausler. Hope went on to create original art quilts and eventually taught quilting to adults in West Orange, NJ.
- Quilt Shows: the S.P.A.C.E. Gallery in Burlington, VT and the Town Hall Theater Jackson Gallery in Middlebury, VT. Commissions: beekeepers in North Carolina, California and New Jersey. Her quilts are in private collections in the Northeast.



Keam, Abigail

- **Keam** graduated with Distinction from the University of Kentucky with a degree in Middle Eastern Civilization. She then went into private business and kept bees as a hobby.
- Retiring in 1999 after a life-threatening asthma attack, Abigail became a full-time beekeeper, launching Abigail's, making honey/beeswax-based natural products.
- Keam has won sixteen honey awards at the Kentucky State Fair and was the first recipient of the Barbara Horn Award, given to those scoring a perfect 100 for a beekeeping-related entry at the Kentucky State Fair.
- *Death By A Honeybee* was her first mystery novel and won a Gold Medal Award from Reader's Favorite in 2010. *Death By Drowning*, her second novel, won a Gold Medal Award for best mystery sleuth in 2011. Both books were listed as Finalists for USA BOOK NEWS—Best Book List of 2011.



Keller, Jennifer

- **Jennifer Keller** is the Apiculture Technician at NC State University.
- Her multiple responsibilities include coordinating all of the field research in the Apiculture program (including queen rearing and instrumental inseminations),
- Maintaining the Lake Wheeler Honey Bee Research Facility south of NC State's main campus, and
- Conducting numerous extension activities all across the state.



Layne, Blake

- Mead making
- Layne was in Paris, France,, teaching wine-making classes at the time of printing
- Member of the Allen County Beekeepers Club, KY



Louque, Jessica

- Jessica is a Senior Study Director and Manager of Pollinator Effects Studies for Smithers Viscient, a contract research company.
- She has been managing large-scale honey bee effects and residue studies for over five years in seven states, as well as owning a business selling bees and hive products.
- Jessica also writes a monthly article for *Bee Culture* magazine entitled “The Bigger Picture” about her beekeeping and homesteading efforts with her husband and four children.



Mangum, Wyatt

- Dr. Mangum is an internationally-known, top-bar hive beekeeper. In high school, he had 125 frame hives and was producing honey by the ton. In 1986, he switched to top-bar hives.
- A monthly columnist for the *American Bee Journal* on biology, Dr. Mangum speaks at bee meetings across the US, and travels, working with beekeeping systems in India, Bangladesh, Bolivia, South Africa, Thailand, and Brazil.
- Dr. Mangum built a 200 top-bar hive operation to pollinate cucumber fields in North Carolina.
- As an Apicultural Historian, that perspective helps to avoid repeating past mistakes in designing beekeeping equipment and keeps the top-bar hive equipment practical. His scientific approach makes sure the new equipment works from the bees' perspective.



Matisoff, Martin

- Marty is a research entomologist at Kentucky State University
- Currently, he studies anatomy and pathology of the honey bee digestive system.
- Marty collaborates with histologist Cecil Butler to develop new histological and microscopical methods for examining healthy and *Nosema* infected tissue.
- Marty and Cecil have developed several new microdissection techniques that have led to improvements in histological staining of healthy and diseased tissue.



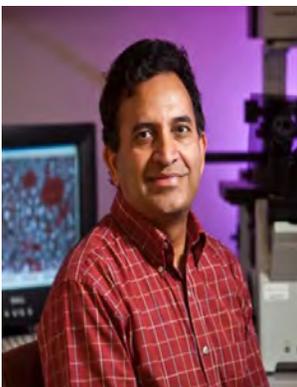
Milbrath, Megan

- Dr. Meghan Milbrath is a beekeeper and an infectious disease researcher.
- She has been keeping bees for over 20 years, and in 2012 had the opportunity to apply her background in disease risk to study microsporidia infection in honey bees.
- She is current president for the Ann Arbor Backyard Beekeepers Association, and is active in the Center of Michigan Beekeepers club, the Michigan Beekeepers' Association, and the South East Michigan Beekeepers Association. She teaches beekeeping management, and is the chair of the Northern Bee Network.
- Dr. Milbrath raises northern queens on her farm in Stockbridge, MI.



Mundell, Rich

- Mundell is a 1990 graduate of Berea College in Berea, Kentucky.
- Since 2001, Rich has been with the UK's KTRDC where he conducts applied field and greenhouse research on alternative uses for tobacco and other native plant species that have the potential to benefit Kentucky farmers.
- Rich has developed several interspecific hybrid tobacco lines that were specifically developed for new uses. Honey bees have been an essential component of his research.
- One of the hybrids has been found to produce very large quantities of high sugar nectar and may be a very beneficial plant for pollinators' world wide.



Palli, Subba Reddy

- Dr. Palli played a key role in development of Ecdysone Receptor based Gene Switch technology that is being tested in clinical trials for regulation of anticancer genes in humans and production of bioplastics in plants.
- Dr. Palli's research focuses on hormonal regulation of gene expression in insects with a goal to identify proteins that play key roles in signal transduction of ecdysteroids, juvenile hormones and other hormones and use them for developing novel environmentally safe pest management methods.
- Recent research from Dr. Palli's laboratory helped to develop RNAi technology based methods for controlling insect pests as well as to fight insecticide resistance in beetles and bed bugs.



Pinson, Joyce

- Pinson writes a food-article for the *Appalachian News-Express* in Pikeville, KY
- Her blog, *Friends Drift Inn*, focuses on Appalachian foods, seeds, recipes, and local gardeners and farmers
- A University of KY Ag grad, she also hosts a televised cooking show and is writing a cookbook.
- Travel sponsored by CARES [Center for Appalachian Research, Entrepreneurship and Stewardship]



Red-Laird, Sarah: Kids and Bees Camp

- Sarah Red-Laird is the founder and Executive Director of Bee Girl.
- She brought her affinity for beekeeping with her to the University of Montana where she chose honey bees and Colony Collapse Disorder as her Davidson Honors College research thesis.
- Trained with Dr. Jerry Bromenshenk at the UM Honey Bee Lab. She graduated with honors, and as a University Scholar from UM's College of Forestry and Conservation with a degree in Resource Conservation.
- Sarah is the US Ambassador of the International Bee Research Association's (IBRA) BEEWORLD project, the Kids and Bees Director for the American Beekeeping Federation.
- Travel sponsored by the Foundation for the Preservation of Honey Bees



Col. Ben Richardson

- Native of Wayne County, Kentucky
- 31 Yr. Veteran of Kentucky National Guard
- BS in Agriculture from University of Kentucky.
- Named Deputy Commander of 2nd Ky. Agribusiness Development Team (ADT II) in 2009 and deployed to Afghanistan May 2010 to Apr. 2011
- In 2012 Named Acting Director for National Guard Coordination Center, Arlington Virginia.
- Currently J-1 Personnel Director for Kentucky National Guard



Sammataro, Diana, USDA Carl Hayden Research Bee Lab, Tucson (Ret.)

- Dr. Sammataro began her illustrious career in the Philippines as a Peace Corps, working with farmers to cut down on pesticides, incorporate beekeeping into farm management and teach value-added products.
- When she returned to the United States, she went to graduate school, worked at the USDA Bee Lab in Wisconsin, worked on bee nutrition.
- She co-authored *The Beekeeper's Handbook* with Al Avitabile, now in its 4th edition.
- She has earned numerous awards, grants, authored many published articles, and now is officially retired!
- Travel sponsored by Monsanto grant



Sutton, Rick

- Commercial Migratory Beekeeper
- ECU Alumnus
- Owner: Sutton Honey Farm
- Auctioneer for the 2014 EAS Honey Show



Tarwater, Stephanie

- Tarwater is a third-generation beekeeper.
- A graduate of Pellissippi College, Tarwater has been a migratory beekeeper in GA,, TN, SC, and all points in between
- A Fast African Bee Identification Service inspector in Florida,
- A nuc producer and honey producer in Tennessee
- Travel sponsored by Monsanto grant



Watson, Kelly

- Watson is an assistant professor of geography at Eastern Kentucky University and a second-generation beekeeper from Florida.
- She earned a Ph.D. in geography from Florida State University in 2010, where she was awarded a Ford Foundation Fellowship for her research on the tupelo honey industry.
- She continues to examine the geographies of apiculture and is currently working with beekeepers in rural regions of the East African nation of Burundi.



Webster, Tom

- Graduate of University of California, Davis
- Specializes in Nosema Ceranae
- Research for the development of sustainable controls of Nosema and inexpensive identification methods for the modern Beekeeper.
- Extension, Research and Teaching at Kentucky State University

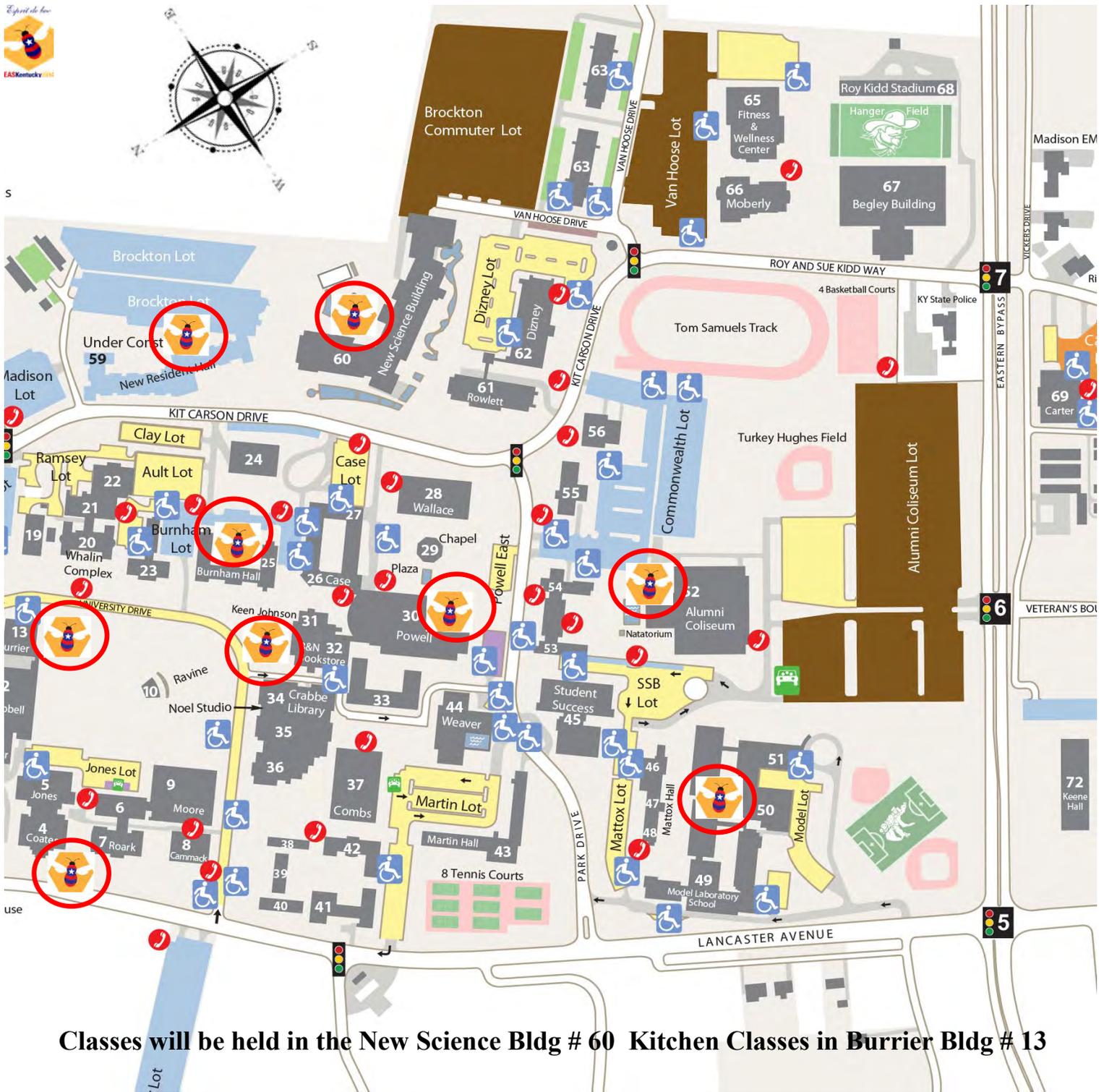


Williams, Kent

- President of EAS 2008
- Vice Chair of EAS 2014
- Master Beekeeper
- Queen producer



S



Classes will be held in the New Science Bldg # 60 Kitchen Classes in Burrier Bldg # 13

Plenary Sessions will be in the Brock Auditorium in the Coates Bldg # 4

Lodging will be in New Dorm # 59 and in Burnham Hall # 25

Banquet & Awards will be presented in the Keen Johnson Bldg # 31

RNAi Technology Developments presentation will be in Crabbe Library Bldg # 34

Square Dance and Greek Gyros in Auxiliary Gym # 52 Campus Security Bldg # 47

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2014 EASTERN APICULTURAL SOCIETY SHORT COURSE, Mon. July 28, 2014

ZumBEE Auxiliary Gym	6:30-7:30 AM	ZumBEE (sponsored by Overland Honey), meet in Auxiliary Gym						
Powell Dining	7:00-8:00 AM	Breakfast						
New Science Building	Starts 8:00 AM	REGISTRATION IN THE NSB ATRIUM						
Welcome	8:30 - 8:50 AM	Welcome to Eastern Apicultural Society, EKU						
		Beginners Classroom	Advanced Classroom	LAB - 12 per Class	Queen Course-- Jennifer Berry	Apiary-- Hopkins/Keller	Honey Show	Master Beekeepers
	<u>Time</u>	<u>NSB # 5101</u>	<u>NSB # 4105</u>	<u>NSB # 5116</u>	<u>NSB # 3101</u>	<u>OUTSIDE NSB</u>	<u>NSB Lobby</u>	<u>NSB # 4112</u>
SESSION 1	9:00 - 9:50 AM	Bee Biology for New Beekeepers Jeff Harris	Advanced Honey Bee Biology Wyatt Mangum	Digestive System of Honey Bees Marty Matisoff	Overview: Life history of Queens and Drones, JB	Smoker Basics Jennifer Keller	Honey Show Michael Palmer	
SESSION 2	10:00 - 10:50 AM	Seasonal Hive Management Ernesto Guzman	Honey Bee Pheromones Maryann Frazier	Mite Anatomy Diana Sammataro	Why Rear Your Own Queens and How to Start, JB	Managing Top Bar Hives Christy Hemenway	Honey Show Michael Palmer	
	10:50-11:00 AM	Coffee Break						
SESSION 3	11:00 - 11:50 AM	Common Honey Bee Diseases Tom Webster	Pesticides Management Les Eccles	Basic Microscopy for Beginners Don Coats	Timing is Everything: Rearing Superior Queens Months in Advance, JB	Making Nucs and Increase Wyatt Mangum	Honey Show Michael Palmer	
	12:00 - 1:30 PM	LUNCH						
SESSION 4	1:30 - 2:30 PM	Honey Bee Nutrition Diana Sammataro	Nicotiana Apis, Hybrid Plant for Foraging Pollinators Rich Mundell	Pollen Identification Don Coats	Setting up Starter and Finisher Colonies, JB	Organic Beekeeping Sean Clark	Honey Show Michael Palmer	Master Beekeepers meet and greet
	2:30-3:00 PM	Coffee Break Sponsored by Bluegrass Beekeepers						
SESSION 5	3:00 - 4:00PM	Common Honey Bee Pests and Parasites Ernesto Guzman	Honey Bee Queen Biology Jeff Harris	Nosema Tom Webster	Hive Evaluations for Selecting Breeders and Record Keeping, JB	Forklift Demos Stephanie Tarwater	Honey Show Michael Palmer	Master Beekeepers Study Groups
	5:00-7:00 PM	Dinner at local Restaurants (check sponsoring establishments)						
Crabbe Library-- # 108	7:00 - 9:00 PM	Latest Developments in RNA interference Technology, Dr. S.R. Palli (University of KY Entomologist) & Gerald Hayes, Monsanto Inc., Open to Community						
Crabbe Library-- # 128	7:00-9:00 PM	Master Beekeepers Exam Review, Dewey Caron						

2014 EASTERN APICULTURAL SOCIETY SHORT COURSE Tues. July 29, 2014

ZumBEE Auxiliary Gym	6:30-7:30 AM	ZumBEE (sponsored by Overland Honey), meet in Auxiliary Gym							
Powell Dining	7:00-8:00 AM	Breakfast							
New Science Building	Starts 8:00 AM	REGISTRATION IN THE NSB ATRIUM							
		Beginners	Advanced Beekeepers	LAB - 12 per Class	Queens--J. Berry	Apiary-- Hopkins/Keller	Bee Culture	Master Beekeepers	Master Beekeepers
	<u>Time</u>	<u>NSB # 5101</u>	<u>NSB # 4105</u>	<u>NSB # 5116</u>	<u>NSB # 3101</u>	<u>OUTSIDE NSB</u>	<u>NSB # 4125</u>	NSB # 4112	TBA
SESSION 1	9:00 - 9:50 AM	Honey Bee Queen Biology Jeff Harris	Small Hive Beetle Phil Craft	Bee Anatomy Marty Matisoff	What you will need: Equipment and Instructions for Starting with Queens, JB	Finding Queens in Top Bar Hives Christy Hemenway		Master Beekeepers	Master Beekeepers
SESSION 2	10:00 - 10:50AM	Beekeeping in Town and Urban Areas Tom Webster	Varroa Mite Controls Ernesto Guzman	Advanced Honey Bee Anatomy and Necropsy Don Coats	Learn How to Graft: Hands on Grafting Session, JB	What do your hives tell you: Basic Hive Inspection Maryann Frazier		Master Beekeepers	Master Beekeepers
	10:50-11:00 AM	Coffee Break							
SESSION 3	11:00 - 11:45 AM	Top Bar Hive Beekeeping Wyatt Mangum	From Hobby to Commercial Beekeeping Rick Sutton	Mite Anatomy Diana Sammataro	Learn how to Graft: Hands on Grafting Session, JB	Visual Identification of Diseases in the Hive Don Hopkins		Master Beekeepers	Master Beekeepers
Powell Dining	12:00 - 1:30 PM	LUNCH [*EAS Board discuss Long-Term Budget in Regents Dining Rm in Powell Cafeteria]							
SESSION 4	1:30 - 2:30 PM	Common Queen Problems Jeff Harris	Managing Bees for Honey Production Ed Holcombe	Nosema Tom Webster	Resistance Queens, JB	Hopkins/Keller Setting Up Mating/Nuc Colonies & Marking Queens	Quilting Session Hope Johnson	Master Beekeepers	Master Beekeepers
Vendor Break New Science Building	2:30-3:00 PM	Break Sponsored By Bee Informed Partnership - Please Visit Our Vendors							
SESSION 5	3:00 - 4:00 PM	Overwintering Ernesto Guzman	Marketing Honey Rick Sutton	Tracheal Mites Ed Holcombe	Drones, JB	Hopkins/Keller Non-Grafting Techniques		Master Beekeepers	Master Beekeepers
Dinner	5:00 -7:00 PM	Dinner at local Restaurants (check sponsoring establishments)							
Walnut Room in Keen Johnson	7:00 - 9:00 PM	Abigal Keam, Authors Booksigning & Mead Tasting							



2014 EAS GENERAL CONFERENCE -Wed, July 30, 2014

ZumBEE Auxiliary Gym	6:30-7:30 AM	ZumBEE (sponsored by Overland Honey), meet in Auxiliary Gym							
Powell Dining	7:00-8:00 AM	Breakfast							
Brock Auditorium in Coates Bldg	Starts 8:00 AM	REGISTRATION IN BROCK AUDITORIUM							
Brock Auditorium	8:30 - 9:00 AM	Chair and President's Welcome							Master Beekeeper Lab/Apiary
Hambleton Award Brock Auditorium	9:00 - 9:50 AM	Robert Danka: Reflections on My Research; Translating and Applying Research Results in the Real World of Beekeeping.							NSB # 4112 Lab/Apiary
Plenary--Brock Auditorium	10:00 - 10:50 AM	Nicola Bradbear: Challenges of Nonprofit Organizations in International Extension/Education							Lab/Apiary
EAS Research Grant Brock Auditorium	11:00 - 11:50 AM	Thomas Janini: Effects of Neonicotinoid/Fungicide/Adjuvant Pesticide Combinations Commonly Encountered by Honey Bees on Pumpkins							Lab/Apiary
Powell Dining	LUNCH	LUNCH (EAS Board Meet in Regents Dining Room in Powell Cafeteria)							
Afternoon Sessions in New Science Building		Beginners	Big Pictures	Advanced Beekeepers	Apiary-- Hopkins/Keller	Lab - 12 per Class	Cultural Topics	International Interchange	Master Beekeepers
	Time	NSB # 5101	NSB 4105	NSB #3101	OUTSIDE NSB	NSB # 5116	NSB # 4125	NSB # 3104	NSB # 4112
BREAKOUT SESSION #1 NSB	1:30 - 2:15 PM	Honey Production Ed Holcombe	International Programs Bob Cole	Beeswax Pesticide Study Maryann Frazier	Hives for People with Physical Challenges Carl Jackson	Tracheal Mites Diana Sammataro	Mead Making Blake Layne	Bees in Burundi Kelly Watson	Lab/Apiary
Vendor Break New Science Building	2:15-3:00 PM	Break Sponsored by Veto-Pharma - Please Visit Our Vendors							Lab/Apiary
BREAKOUT SESSION #2 NSB	3:00 - 3:45 PM	Organic Beeswax Christy Hemenway	British Honey Show Michael Palmer	Varroa Mites and Resistance Jeff Harris	Jennifer Berry Evaluation/ Check on Cells	Nosema Megan Milbraith	Honey Cookery David Poulton	Canadian Tech Teams Les Eccles	Lab/Apiary
BREAKOUT SESSION #3 NSB	4:00 - 4:45 PM	Swarm Removal Cindy Bee	African Bees-FABIS Stephanie Tarwater	Sustainable Agriculture Research and Education- Maine Erin Forbes	Finding Queens / Replacing Queens Tammy Horn	Bee Necropsy Advanced Don Coats	Quilting Bee Hope Johnson	A Beekeepers Trip to China Meghan Milbraith	Lab/Apiary
Auxillary Gym	6-7:00 PM	Dinner Catered by Athenian Grill, Lexington, Ky.							
Auxillary Gym	7-9:00 PM	Square Dance @ Alumni Coliseum, Caller:Frank Jenkins - Reel World String Band Sponsored by W.T. Kelley's							



2014 EAS GENERAL CONFERENCE -Thur. July 31, 2014

ZumBEE Auxiliary Gym	6:30-7:30 AM	ZumBEE (sponsored by Overland Honey), meet in Auxiliary Gym						
Powell Dining	7:00-8:00 AM	Breakfast						
Brock Auditorium in Coates Bldg	Starts 8:00 AM	REGISTRATION IN BROCK AUDITORIUM						
Plenary: Brock Auditorium	9:00 - 9:50 AM	Opening Session: Bob Cole & Col. Ben Richardson, Foreign Assistance in Beekeeping; Volunteer and Military						
Plenary: Brock Auditorium	10:00 - 10:30 AM	Nancy Baker: USGS, Agricultural Pesticide Use in the U.S.						
Plenary: Brock Auditorium	10:30-11:00 AM	Presentation of Student Award Winner: Daniel Borges, Nosema Control						
Plenary: Brock Auditorium	11:00 - 11:50 AM	Dewey Caron: Africanized Bees in the Americas						
Powell Dining Regents Dining Room	LUNCH 12-1:30 PM	LUNCH (Lifetime members Luncheon in Regents DR) Spkr. Maryann Frazier: Nature Vs Nurses						
Afternoon Sessions in New Science Building		Beginners	Big Pictures	Advanced Beekeepers	Apiary-- Hopkins/Keller	Lab - 12 per Class	Cultural Topics	Social Tours
	<u>Time</u>	<u>NSB # 5101</u>	<u>NSB 4105</u>	<u>NSB #3101</u>	<u>OUTSIDE NSB</u>	<u>NSB # 5116</u>	<u>NSB # 4125</u>	<u>NSB # 3104</u>
BREAKOUT SESSION #1 NSB	1:30 - 2:15 PM	Pheromones Thomas Janini	Running a Nonprofit Nicola Bradbear	Pathogen Control Meghan Milbrath	Hygienic Bees Liquid Nitrogen Pour Clark & Brock	Basic Microscopy for Beginners Don Coats	Quilting Bee Hope Johnson	Nosema Control Using Natural Compounds Daniel Borges
Vendor Break New Science Building	2:15-3:00 P.M.	Break Sponsored by Gamber Container - Please Visit Our Vendors						
BREAKOUT SESSION #2 NSB	3:00 - 3:45 PM	Overwintering Erin Forbes	Running Migratory Bees Stephanie Tarwater	Drones Jennifer Berry	Nuc Management Jennifer Keller	Appalachian Tree/Flower Pollen Don Coats	Pollinator Stewardship Council Michelle Colopy	Bees in the Tropics Toni Downs
BREAKOUT SESSION #3 NSB	4:00 - 4:45 PM	Cut outs, Trap outs & other Relocation Means Cindy Bee	Organic Beekeeping Sean Clark	Nematode Rearing Izzy Hill	Keeping Hives in Bee Gums, Beelining Gary Branson	Mite Anatomy Jeff Harris	Kids and Bees Sarah Red-Laird	Unstoppable & Unflappable : Panel of women beekeepers
Keen Johnson Bldg	7:00-9:30 PM	Dinner, Fish Fry, Honey Awards & Live Auction @ Keen Johnson Ballroom						



2014 EAS GENERAL CONFERENCE - Fri. Aug. 1, 2014

ZumBEE @ The Ravine	6:30-7:30 AM	ZumBEE (sponsored by Overland Honey), meet @ the Ravine								
Powell Dining	7:00-8:00 AM	Breakfast								
Keen Johnson Bldg	Starts 8:00 AM	REGISTRATION IN KEEN JOHNSON BUILDING								
Opening Welcome Keen Johnson Bldg	8:30- 9:00 AM	Presentation of Roger Morse Award to Roger Hoopingarner: Honey Bees and their Lineage								
Plenary #1: Keen Johnson Bldg	9:00 - 9:45AM	Nicola Bradbear: Challenges of Producing Honey for International Standards								
Plenary #2: Keen Johnson Bldg	10:00 - 10:45AM	Berry Brosi: New Research on Flower Fidelity								
Keen Johnson Bldg	10:45-11:00 AM	EAS 2015 in Ontario								
Keen Johnson Bldg	11:00 - 12:00 PM	Annual EAS Business Meeting								
Powell Dining	12-1:30 P.M.	LUNCH (Master Beekeepers meet in Regents Room)								
Afternoon Sessions in New Science Building		Beginners	Big Pictures	Advanced Beekeepers	Apiary-- Hopkins/Keller	Lab - 12 per Class	Kitchen	Kids Bee Camp-- Berea College	Bee Culture	Master Beekeepers Exam results
	<u>Time</u>	<u>NSB # 5101</u>	<u>NSB 4105</u>	<u>NSB #3101</u>	<u>OUTSIDE NSB</u>	<u>NSB # 5116</u>	<u>Burrier Bldg</u>	SRL, Berea, KY	<u>NSB # 3104</u>	<u>NSB # 4112</u>
BREAKOUT SESSION #1 NSB	1:30 - 2:15 PM	Queens Kent Williams	Pollinator Stewardship Council Michelle Colopy	Propolis Thomas Janini	Hygienic Bees Sean Clark	Bee Anatomy Don Coats	Honey Cookery, Azur chef Jeremy Ashby	Kids Bee Camp - Berea, KY	Soaps Diana Sammataro	
Vendor Break New Science Building	2:15-3:00 PM	Break Sponsored by Dadant - Please visit Our Vendors								
BREAKOUT SESSION #2 NSB	3:00 - 3:45 PM	Citizen Science Research Izzy Hill	Testing Chronic Effects of Pesticides on Honey Bees Jessica Louque	Artificial Swarming Erin Forbes	Queen Yard Jennifer Berry	Trachael Mites Ed Holcombe	Appalachian Cooking Joyce Pinson	Kids Bee Camp - Berea, KY	EKU-NSF Grant Martin Brock	Master Beekeepers Exam results
BREAKOUT SESSION #3 NSB	4:00 - 4:45 PM	Feeding Bees Michael Palmer	Bees in Costa Rica Berry Brosi	Insemination of Queens Jeff Harris	Top Bar Hives Christy Hemenway	Nosema Meghan Milbrath	Appalachian Cooking Joyce Pinson	Kids Bee Camp - Berea, KY	Bees in Burundi Kelly Watson	Master Beekeepers Exam results
Keen Johnson Bldg	6-9:30 PM	Banquet, 6-9:30 p.m.								



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EAS Ontario, August 10-15, 2015

Dear EAS Members:

We are excited that EAS has chosen University of Guelph at Guelph Ontario for the next great gathering of this amazing organization!

Guelph is known as the "Royal City" as its name was once the last name of the Royal family before that name was changed to Windsor during the Great War. Guelph is located about a one hour drive west of Toronto and about one and a half hours northwest of Niagara Falls to give you a general idea as to its location. Guelph and surrounding communities have many tourist attractions as does the Province of Ontario. Go on the web and explore and be sure to plan some extra time to take in the sights of Ontario when you are here.

The EAS Short Course will be held Monday-Wednesday, August 10-13, 2015; the EAS Conference will be Wednesday-Friday, August 13-15, 2015

The scientific program and short course are being organized by Dr. Ernesto Guzman, Professor of Apiculture University of Guelph; Les Eccles, Manager of Ontario Tech Transfer Program; and Paul Kozak, Provincial Apiarist of Ontario. We will feature many Canadian speakers to discuss the research that they are doing with the honey bee. You will also meet all of the Tech Transfer workers from across Canada

There will be lots of social activities including an afternoon and evening trip to a honey winery; and two large commercial beekeepers with an evening barbeque at the second beekeeping establishment

There will be a honey show, which when judged, will be the center piece of a very large display room where we plan to have a very large trade show.

There will be lots of bee colonies to play with under the direction of Paul Kelly, University of Guelph beekeeper! Bring your personal bee suits and equipment

You will be able to choose between accommodations on campus in typical student dorms or from a wide spectrum of excellent hotels where the EAS has already set aside blocks of rooms.

Plan to come to EAS 2015 Guelph; we are sure that you will have a very memorable time.

The Planning Committee of EAS 2015 Guelph

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American Beekeeping Federation

2015 North American Beekeeping Conference & Tradeshow

Make your plans now to join 600+ of your closest beekeeping friends at the 2015 North American Beekeeping Conference & Tradeshow. The conference will be held at the **Disneyland Hotel in Anaheim, California, January 6-10, 2015.**

Features of the conference include:

- One and half days of general sessions complete with presentations from industry leaders on best practices and the latest developments in beekeeping
- Track sessions for varying levels of beekeeping presented by industry experts
- 24+ hands-on interactive workshops
- Tradeshow with industry vendors showcasing outstanding product and services
- The 2015 American Honey Show
- The 2015 Honey Queen and Princess coronation
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The ABF has negotiated a discounted group rate of \$109.00 per night single/double occupancy plus tax (currently at 17%).

For additional information and to register for the conference, please visit www.nabeekeepingconference.com

Note: Non-member rates include a one-year membership to the ABF.

Tentative Schedule At-A-Glance:

[subject to change]

Tuesday, January 6:

Afternoon Committee Meetings

Wednesday, January 7:

Morning Opening General Session
Noon Tradeshow Opens
Afternoon Shared Interest Group (SIG) Meetings
Evening Welcome Reception with Entertainment in the Tradeshow

Thursday, January 8:

Morning Auxiliary Meeting (optional) *
All Day General Session
All Day Tradeshow
Afternoon Live & Silent Auctions in the Tradeshow
Evening Social Activity/Dinner (optional) *

Friday, January 9:

Morning Track Sessions
All Day Tradeshow
Noon Foundation Luncheon (optional) *
Afternoon Keynote Presentation
Afternoon ABF Business Meeting
Afternoon Honey Show Live Auction in the Tradeshow

Saturday, January 10:

Morning Tradeshow
Morning/Afternoon Interactive Workshops
Evening ABF Annual Banquet (optional) *

** Additional registration fee required*

Registration Categories	Early Registration by 10/15/2014		Regular between 10/16/2014 - 12/10/2014		On-Site after 12/10/2014	
	Member	Non-Member	Member	Non-Member	Member	Non-Member
Single Registrant	\$235.00	\$295.00	\$285.00	\$345.00	\$335.00	\$395.00
Family (2 people)	\$345.00	\$405.00	\$395.00	\$455.00	\$445.00	\$505.00
Single Day Rate - Wednesday	\$75.00	\$90.00	\$90.00	\$105.00	\$105.00	\$120.00
Single Day Rate - Thursday	\$75.00	\$90.00	\$90.00	\$105.00	\$105.00	\$120.00
Single Day Rate - Friday	\$75.00	\$90.00	\$90.00	\$105.00	\$105.00	\$120.00
Single Day Rate - Saturday	\$75.00	\$90.00	\$90.00	\$105.00	\$105.00	\$120.00
Family Day Rate - Wednesday	\$105.00	\$120.00	\$120.00	\$135.00	\$135.00	\$150.00
Family Day Rate - Thursday	\$105.00	\$120.00	\$120.00	\$135.00	\$135.00	\$150.00
Family Day Rate - Friday	\$105.00	\$120.00	\$120.00	\$135.00	\$135.00	\$150.00
Family Day Rate - Saturday	\$105.00	\$120.00	\$120.00	\$135.00	\$135.00	\$150.00

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