

Training Educators to Protect Honey Bee Pollinators with Sustainable Pest Management

Final Report for ES03-069

Project Type: Professional Development Program

Funds awarded in 2003: \$126,648.00

Projected End Date: 12/31/2008

Region: Southern

State: Tennessee

Principal Investigator:

[Dr. John Skinner](#)

Univ. Tennessee

Project Information

Abstract:

Nine workshops for 68 county Extension agents and 83 beekeeping association representatives were conducted in Tennessee(3), Alabama(4) and Kentucky(2). Workshops started with 3-hour classroom presentations with one hour on basic honey bee biology and pollination, followed by two hours on pest detection and integrated pest management. Workshops concluded with 2-hour hands-on inspections of honey bee colonies. Two new publications and two powerpoint presentations were produced for attendees. Post-session testing indicated agents' knowledge after classes improved by 31% on average. Six new beekeeping associations were started as a result of this training with 2 new ones in each state.

Project Objectives:

The project was intended to increase county Agriculture Extension agents' awareness of the importance of honey bees as pollinators and demonstrate the tools and techniques used to establish and maintain healthy, productive honey bee colonies. Specific objectives included:

- 1) Increased educators' (extension agents and beekeeper representatives) knowledge about crop pollination and demonstrate how they, in turn, can train beekeeper-farmers to manage bees to improve pollination;
- 2) Increased educators' knowledge about new honey bee mite management tactics and how to use them effectively.
- 3) Improved extension agents' attitude about a subject that most are unfamiliar with.
- 4) A long-term, mutually beneficial relationship should be established when trained, confident educators interact with beekeepers having very diverse lifestyles who request information about protecting their bees. When beekeepers discover that agents care about their problems and have the skill to provide solutions, future interactions are more likely to be successful leading to lasting partnerships that can serve as a framework for more programs.

5) Improved recommendations, skill training and better rapport with educators should increase adoption of these management tactics by beekeepers throughout Alabama, Kentucky and Tennessee.

Introduction:

Honey bees are essential to the southern region as well as to all US agriculture: The annual value of the increased yield and quality of fruits and vegetables attributable to honey bee pollination has been estimated in excess of \$14.6 billion. Expanding pest problems have made it increasingly difficult to maintain healthy, productive colonies. Techniques and tools exist to mitigate these problems, but many beekeepers are unaware of them or of their correct use.

Educators including Extension agents should be aware of the pests that attack honey bees as well as detecting their damage. The most important pest, the parasitic varroa mite kills thousands of colonies yearly. The microscopic tracheal mite that lives within the breathing tubes of the bee is difficult to detect without proper training. A new pest, the small hive beetle feeds on bee larvae and food stores and is especially prevalent in the south.

Extension agents and beekeeping leaders should be kept informed of the advances made in the integrated management of the varroa mite. For example, treatment thresholds have been determined using bottom board sticky traps. Screened open bottom boards are used to physically exclude fallen mites from a colony. Queens expressing resistance are commercially available and several bio-rational treatments, such as Apiguard® are now registered for use against the pest.

Cooperators

- [James Parkman](#)

jparkman@utk.edu

Extension Assistant

Univ. Tennessee

2431 Joe Johnson Dr., 205 Plant Sci. Bldg.

Knoxville, TN 37996-4560

(865) 974-7135 (office)

- [James Tew](#)

tew.1@osu.edu

Associate Professor

Ohio St. Univ.

Honey Bee Lab, OARDC

Wooster, OH 44691

(330) 263-3684 (office)

- [Kenneth Ward](#)

kenneth.ward@email.aamu.edu

Assistant Professor

Alabama A&M University

Department of Plant and Soil Science,

P.O. Box 120

Normal, AL 35762

(256) 372-4249 (office)

- [Rufina Ward](#)

rward@aamu.edu

Research Assistant Professor

Alabama A&M University

Dept. Plant & Soil Science

P. O. Box 1208

Normal, AL 35762

(256) 372-4244 (office)

- [Thomas Webster](#)

twebster@gwmail.kysu.edu

Apiculture Research and Extension Specialist

Kentucky State University

Atwood Research Facility

Frankfort , KY 40601-2355

(502) 597-6351 (office)

Education & Outreach Initiatives

Objective:

Description:

Methods

Training workshop sessions were conducted for county Extension agents and beekeeper association representatives in Alabama, Kentucky and Tennessee on sustainable honey bee pest management, fundamentals of beekeeping and pollination.

Extension Agents within each Region were notified of the training sessions through their Regional Program Directors. Representatives of regional and local beekeeping associations located near the session sites were invited to attend.

Workshops consisted of a 3-hour classroom presentation beginning with one hour on basic honey bee biology and pollination, followed by two hours on pest biology, detection and integrated pest management. Workshops concluded with a 2-hour

hands-on inspection of honey bee colonies. To assess attendees' comprehension and retention of the sessions' lecture material, and our teaching ability, tests on beekeeping practices, pollination and pest management were completed by attendees before and after lectures. Evaluations of lecturers were also completed. (Not all participants completed the tests.)

The participant at each training session who made the most improvement on their test score received a colony of honey bees at a later date.

Extension agents were provided new beekeeping protective gear (veil and gloves) and a hive tool; and new educational materials were provided including: a video on the importance of honey bees as pollinators, a manual made for this training and two powerpoint presentations on CD.

Outreach and Publications

Two Publications:

Parkman, J.P and J.A. Skinner. 2005. Managing Varroa mites in Tennessee. The University of Tennessee Extension, Department of Entomology and Plant Pathology EPP Info 734.

Parkman, J.P and J.A. Skinner. 2005. Beekeeping for extension agents: fundamentals, crop pollination and pest management. The University of Tennessee Extension, Department of Entomology and Plant Pathology EPP Info 736.

Two Powerpoint Presentations:

1)Beekeeping for extension agents: fundamentals, crop pollination and pest management.

2)Varroa mite management

Poster Presentations:

Training educators about beekeeping, crop pollination and honey bee pest management in Alabama and Tennessee (poster display). P. Parkman, J. Skinner, K. Ward, R. Ward, and J. Tew. 5th National IPM Symposium. St. Louis, MO. April 2006.

Training educators about beekeeping, crop pollination and honey bee pest management in Alabama and Tennessee (poster display). P. Parkman, J. Skinner, K. Ward, R. Ward, and J. Tew. Entomology Society of America Southeastern branch Meeting. 2006. Wilmington, NC.

Outreach:

As a result of these training sessions for extension agents and beekeepers and the concerns about new challenges affecting honey bees, at least 6 new local beekeeping associations have been started with two new ones in each state. Local associations are very important sources of information and mentorship for new and experienced beekeepers. This is an important outreach success that extends far beyond a single training session to impact many more individuals for years to come.

Extension agents learned the basics, new information and strategies that will allow them to make the best and most appropriate recommendations, ultimately resulting in reduced use of traditional chemical pesticides, increased survival of bee colonies and more colonies available for pollination.

Outcomes and impacts:

Tennessee - Thirty-six agents and seven beekeepers attended the three training workshops held in Tennessee (at Jackson, Nashville and Knoxville) in summer 2004. After the lectures, test scores improved by an average of 24%, 16% and 49% at Jackson, Nashville and Knoxville, respectively. Average improvement in test scores pooled across all sessions was 32%. Having thirty-seven of Tennessee's 95 counties

represented at the trainings across the state indicates that agents realize the importance of bees to their clientele.

Alabama – Because of restructuring of the Alabama Cooperative Extension System (ACES) and reduced travel funding, fewer agents (10) attended these workshops; however, many more beekeepers participated (76), perhaps because ACES does not have a resident Extension Apiculturist. Beekeeper attendees were classified as experienced or beginners based on skill and experience. Test scores improved by an overall average of 26.1% with 10%, 46.2% and 30% improvement for experience beekeepers, beginners and extension agents, respectively.

Kentucky

Test scores of the 22-two agents from training sessions in Kentucky in 2006 improved 32% on average with an improvements of 31.8% and 32.2% in Prestonburg and Bowling Green, respectively.

Overall: Post test scores of agents improved 31% on average indicating that agent knowledge in Tennessee, Alabama and Kentucky substantially improved as a result of this training. They now are better informed about basic beekeeping, the importance of bees as crop pollinators, and management of honey bee pests. This satisfies objectives one and two above.

Workshops were well received with 94%, 97% and 94% of attendees in Tennessee, Alabama and Kentucky, respectively rating the overall program as excellent or very good and 100%, 97% and 94% of attendees rating the materials provided as excellent or very good. Agents appreciated receiving protective gear and were excited to participate in apiary demonstration that allowed them to hold a frame of live bees. Many indicated that they now had the confidence and better appreciation of what a beekeeper does. The most improved test score participants that received the honey bee colony were excited and more motivated to learn a new activity.

Project Outcomes

Project outcomes:

In 2004, the publications (E&PP Info 736 "Beekeeping for Extension Agents: Fundamentals, Crop Pollination and Pest Management") and Varroa mite management were developed for distribution to training session attendees. The training was developed as two powerpoint presentations and provided to participants on CD. Materials for conducting training were sent to all cooperators prior to trainings including a manual and cd, pre and post tests and evaluation forms.

Tennessee - 2004:

Tennessee training sessions were held in Jackson (west TN) on August 24, in Nashville (central TN) on August 25 and in Knoxville (east TN) on September 2, at each of the Extension District headquarters. Sessions consisted of a 3-hour lecture followed by a 2-hour, hands-on demonstration in honey bee colonies. Pesticide Safety Education Program re-certification points were offered to attendees in seven categories of certification.

Alabama - 2005

Because of restructuring of the Extension Service in Alabama in 2004, training sessions there were postponed until 2005. (Consequently, a 1-year, no-cost extension was requested and approved for the project.) Four training sessions were conducted in Alabama: May 13 in Tuscaloosa, June 3 in Huntsville, June 24 in

Dothan, and July 8 in Auburn.

Kentucky - 2006

Due to personnel changes, training sessions in Kentucky were delayed until 2006. Training sessions conducted, sessions in Bowling Green (west-central KY) and Prestonburg (east KY) were held. At least two more sessions will be held in central and eastern KY.

Recommendations:

Future Recommendations

There will always be a need to update information available to extension agents and beekeepers concerning the many threats to the beekeeping industry that are of serious concern to the southern region as well as all of North America. Training programs like this one have established communication links among beekeepers, agents and extension personnel that will continue to function as new information becomes available.

More training projects should be funded to establish linkage throughout the south and extend to other regions.

Electronic methods using eXtension and other internet venues should be fully utilized to assure current research based information is available and sustainable in it's own right.

Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture or SARE.



Sustainable Agriculture
Research & Education [US Department of Agriculture](#)



This site is maintained by SARE Outreach for the SARE program and is based upon work supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, under award No. 2019-38640-29881. SARE Outreach operates under cooperative agreements with the University of Maryland to develop and disseminate information about sustainable agriculture. [USDA is an equal opportunity provider and employer.](#)