

**North Carolina Africanized Honey Bee
Action Plan
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North Carolina Africanized Honey Bee (AHB) Action Plan

I. Background Information:

The introduction of the Africanized Honey Bee (AHB) into the Americas resulted from a research experiment mishap in Sao Paulo, Brazil in 1956 (Rinderer 1988). African bees were imported into that area to determine if they were superior to European bees in honey production. The African bees escaped and mated with the European honey bees (EHB) in the area, producing "Africanized" bees. The bees have since been moving northward at a rate of 300 miles per year. The AHB is now established in Texas, New Mexico, Arizona, southern California, and southern Nevada. Recent citations note the AHB is now established in southern Utah as well.

It is currently unclear how far north the AHB will be able to spread in the U.S. Sub-zero temperatures are experienced by the AHB over much of its native range. Perennial colonies exist in Africa at altitudes of almost 2000 meters (6500 feet), where snow lasts for up to a week at a time, and absolute minimum temperatures of less than 0 degrees C (32 degrees F) are found for 6 months of the year (Fletcher 1978). Recent studies have shown the overwintering behavior of the AHB is very similar to the EHB (Dietz et al. 1988).

The North Carolina AHB plan is a joint effort of the North Carolina Department of Agriculture and Consumer Services (NCDA&CS) and North Carolina State University (NCSU). The plan has been developed within a framework established by the United States Department of Agriculture, Animal and Plant Health Inspection Service (USDA, APHIS) and other state plans. The North Carolina Africanized Honey Bee Action Plan takes a five fold approach to the AHB problem. The first step will be to utilize the North Carolina Honey Bee Identification Laboratory for accurate and timely analyses of honey bee races. The second goal is to initiate a vigorous program to educate the state's beekeepers, the general public, pest control operators, and the medical and public health community. Thirdly, quarantine initiatives will be established to slow the spread of the AHB into the state, and to manage the AHB after it becomes established. Fourth, research into the pollination ecology and swarming biology of the AHB is needed. Lastly, the plan calls for an organized effort to establish North Carolina as a self sufficient beekeeping community with ample queen and package resources to meet the needs of the state's beekeepers.

The NCDA&CS is experienced in restricting honey bee movement from out-of-state sources and has maintained a strict quarantine to prevent the introduction of the Varroa mite and other unwanted bee pests. As part of the quarantine, queen and package bees are allowed entry into the state only from establishments that have entered into a compliance agreement directly with the NCDA&CS. Migratory beekeepers have not been allowed to enter North Carolina since 1984. Fortunately, North Carolina's agricultural industry is self sufficient in terms of its pollination needs.

In 1987, NCSU&CS & NCSU in conjunction with the USDA, APHIS began preparations for the anticipated arrival of the AHB. The first measure taken was the establishment of "bee free zones" around the state's two ports at Morehead City and Wilmington. In November 1989, the state's first AHB incident occurred at the Morehead City Port. A feral AHB swarm was

discovered in the subflooring of an office trailer that had been shipped from Honduras to North Carolina. The hive was destroyed, and survey procedures were initiated to determine the extent of the infestation. The "bee free zone" encompasses a two mile radius around each port. Managed bees are not permitted in this zone. Due to the absence of bees in the area, survey procedures were greatly simplified. It was quickly determined that this was an isolated incident and that the AHB was not present in the area.

An AHB Advisory Committee was also appointed in 1987. Members of the advisory committee were selected to represent beekeeping interests from across the state. This initial committee was composed of representatives from the N.C. Beekeepers Association, commercial beekeepers, NCDA, NCSU, and the United States Department of Agriculture. The main function of the committee is to act in a planning and advisory role to minimize the potential impact of the AHB on North Carolina Agriculture. The committee has met at least once a year since it was first formed. The committee is also responsible for developing and approving the final draft of the North Carolina AHB Action Plan. In 2001, the committee's responsibilities were expanded to include all honey bee pests and the committee was renamed the North Carolina Honey Bee Advisory Committee. Current committee members are listed in Appendix A.

II. Africanized Honey Bee Characteristics

The AHB, *Apis mellifera* subsp. *scutellata* Ruttner, is a subspecies of the European Honey Bee (EHB), *Apis mellifera* L. While the two varieties of *A. mellifera* exhibit many similar biological and behavioral characteristics, there remain some very fundamental differences.

AHBs are probably most renowned for their defensive behavior. If AHB nests are disturbed, they will retaliate more quickly and in greater numbers than their European relatives (Rinderer 1988). It has been reported AHBs will pursue people or animals as much 600 feet from an apiary (Rinderer 1988). Reports also indicate stinging incidents can be as much as 10 times greater compared to the reaction of EHBs during a single encounter (Rinderer 1988). Fortunately, the AHB sting is very similar to that of a EHB in terms of the amount of venom administered and its chemical composition. Swarming AHBs are generally no more aggressive than their European counterparts.

The AHB has been observed to be a great deal more difficult to manage than the EHB. This is due in part to their tendency towards frequent swarming and absconding (a condition where all bees abandon the hive in mass). There have been documented examples of AHB swarms actually taking over queenless European colonies and usurping small EHB colonies by killing the queen (Otis 1986). Since the AHB is capable of producing adult bees more quickly than the EHB, the colonies become completely Africanized within a few weeks. Absconding generally occurs when an area's nectar or pollen supply becomes depleted (Winston 1988). The entire colony will abandon its nesting site and may seek out a new nest site some distance from the original. The swarming and absconding biology of the AHB may pose serious management problems for beekeepers who are not accustomed to dealing with such behavior.

The AHB is also noted for its diverse preference of nesting sites (Moffett & Maki 1988). For example, in South and Central America, AHB hives have been found in old rodent burrows, abandoned cars, discarded baskets, and buckets. Such locations are generally not considered

suitable to EHB colonies.

Should the AHB become established in North Carolina, beekeepers will no doubt be forced to learn new management techniques to adjust to a new age in beekeeping. It is a challenge that may discourage some beekeepers; however, many will eagerly meet the obstacles ahead. The AHB has never been in an area where the beekeepers are so well trained and have as many resources available as they do in North Carolina. Beekeepers, with the assistance of the applicable state agencies, should be able to deal with AHBs unless they are hindered by unfavorable public reactions (including municipal restrictions towards honey bees and beekeeping).

III. Value of Bees and Beekeeping in North Carolina

It has been estimated that the AHB's arrival in the U.S. will be felt most severely by the beekeeping industry. There are approximately 10,000 beekeepers in North Carolina who manage approximately 120,000 colonies of bees either for honey production, pollination services, or both. Collectively, North Carolina's honey yields average 5.5 million pounds annually.

When compared to the value of crop pollination, honey production makes a minor contribution to the beekeeping industry. According to agricultural statistics released by the NCDA&CS and the N.C. Cooperative Extension Service, crop pollination by honey bees is valued at over 68 million dollars annually. Crops requiring honey bee pollination (where the grower actually pays a fee for the service) include apples (\$21 million), blueberries (\$11 million), cucumbers (\$21.5 million), squash (\$5 million), melons (\$4 million), watermelon (\$5 million) and other minor crops (\$0.8 million). In addition, the estimated benefits from the direct pollination of crops, including beans, other fruits, and some forages, are estimated to be over \$171 million dollars. Honeybees also benefit wildlife by pollinating their food plants. It would be very difficult to estimate the ecological value of honeybees; however, it can be assumed that this value equals or perhaps surpasses their agricultural value. The financial hardships created by the AHB's arrival will no doubt be passed from the beekeeper to the farmer and ultimately, to the consumer.

There are several small, thriving queen and package bee producing establishments located in North Carolina. Collectively, they contribute a small but growing value to beekeeping in North Carolina.

IV. Potential Impact of the AHB in North Carolina.

The following is a list of potential problems and concerns that could occur once the AHB is present in North Carolina:

- A. Over dramatization of the AHB's aggressive behavior by the press may lead to public prejudice against the beekeeping industry.
- B. Public fear of the AHB in some municipalities will mandate unrealistic bee regulation over common sense and sound logic.
- C. Municipalities may pass restrictive ordinances against keeping bees.

- D. The swarming, absconding, and stinging behavior of the AHB may cause hobby beekeepers to lose interest and quit keeping bees.
- E. Quarantines may restrict the movement of bees into agricultural crop pollination locations.
- F. In crop pollination locations, the aggressive nature of AHBs may hinder the operation of farm machinery and prevent workers from entering fields.
- G. Due to the reproductive biology (swarming and absconding) and nesting behavior of the AHB, the public may be more likely to encounter AHB swarms and colonies in cities, parks, forests, and neighborhoods.
- H. The tendency of the AHB to abscond when their hives are transported for pollination will increase the cost and difficulty of crop pollination.
- I. The AHB could interfere with timber harvest, fire control, and recreation in National or State Forests.
- J. Concern over accidents/injuries associated with keeping AHBs may cause commercial beekeepers to go out of business.
- K. The cost of transporting EHB for pollination services could increase.
- L. Maintenance of EHB hives could increase due to the necessity of requeening hives yearly.
- M. The costs to inform the medical and public health community of possible precautions and potential problems with AHB sting encounters may rise.
- N. The beekeeping industry is already suffering from the impact of several bee pests and their problems will likely be compounded by the arrival of AHBs.

V. **Recommended Actions**

A. **Educational Initiatives**

1. **Beekeepers** - The primary means of educating beekeepers concerning Africanized Honey Bees will be the established "N.C. Master Beekeeper Program". This educational program was initiated by the N.C. Cooperative Extension Service in 1983 and currently has a large number (>3,000) of beekeepers enrolled. From the program's inception, educational and training programs relating to the AHB have been a priority. Beekeepers at all levels of the program receive training on AHBs, with the degree of training becoming a major component of the program for the Master (third) level of the program. This program was enhanced by including a new component, the "Good Neighbor Program" beginning with the 1990 Summer Convention of the N.C. State Beekeepers Association. All Journeyman (second level) and Master beekeepers of the N.C. Master Beekeeper Program will be urged to undergo training in the "Good Neighbor Program". This training will emphasize dealing with all honeybees (especially AHBs) to reduce the chance that the bees will become a nuisance or a problem, particularly in urban and suburban

areas. In addition to concentrating on the higher level participants of the N.C. Master Beekeeper Program (approximately 500 beekeepers) the N.C. Cooperative Extension Service will continue to distribute information and conduct educational programs for all of the state's beekeepers about the AHB. This effort will take the form of informational bulletins, slide sets, videos, and beekeeper meetings.

2. **Public** - The N.C. Cooperative Extension Service (NCCES) educates the public about the AHB by three general methods:
 - a. NCCES personnel will give presentations to school, commodity, and civic groups on the AHB.
 - b. Bulletins, slide sets and videos on the AHB will be produced for distribution throughout the state. This will also include working through the print and television media.
 - c. Master Beekeepers and qualified Journeyman Beekeepers from the N.C. Master Beekeeper Program will be trained and used to act as resources for providing local information on the AHB.
3. **Medical and Public Health Community** - Beekeepers who are also physicians have cooperated for the last several years to provide training to beekeepers on the use of emergency treatment of bee and insect stings, including the administering of epinephrine. These training programs will be continued and work will be initiated on providing information sessions to the state's medical and public health community concerning the aggressive stinging activities of the AHB.
4. **Pest Control Operators** - There are many environmental problems that could stem from inadequately trained groups attempting to control the AHB. These problems could include the destruction of certain beneficial insects, and the possibility of food, water, and structural contamination resulting from pesticide misuse.

The AHB is anticipated to arrive in the U.S. in the early 1990's. Historically, beekeepers have dealt with elimination of honeybees from areas where they were considered a nuisance. They did this as a public service without the use of pesticides. Because of its biology, the AHB may present a more visible problem in some locations than European bees. Without proper training, many beekeepers may not be equipped to deal with the new problem in a safe and effective way.

The N.C. Pesticide Licensing and Certification Program provides a groundwork for environmental protection. Training for a new group of bee handler/pest management technicians may be needed. The purpose of such a program would be to minimize the public health and environmental problems that may be associated with the entry of AHBs into North Carolina.

A cooperative effort should be established between the NCDA Pesticide Division and the NCSU Extension Service. The Extension Service should instruct potential bee handlers/pest management technicians in bee removal and structural pesticide application. The NCDA should add a licensing category to its public applicators licensing program to certify professionals passing the test. The two major goals are to: (1) reduce accident/injury associated with swarm control; and (2) minimize environmental hazards associated with pesticide use.

5. **Emergency Response Agencies**-The spread of AHBs throughout Texas has often resulted in Emergency Response agencies such as local fire and police departments being called upon to deal with the arrival of the bees. The agencies are often called upon for the first response to an emergency or assumed emergency situation and this will probably also occur in North Carolina if AHBs spread into the state.

It is essential that these agencies know how to obtain “expert” assistance to deal with AHBs or any other stinging insect situation, and also that their personnel have some basic knowledge regarding the insects. Pilot programs are also being developed by the N. C. Cooperative Extension Service to provide some basic training to the police and fire departments and to assist them in locating “expert” assistance as needed. In many instances, it will be the N. C. Master Beekeepers in an area who will serve as the expert assistance.

A training program was conducted in Graham, N. C. which involved all of the local and county police departments. This session introduced the participants to Africanized honey bees and covered the basic biology and behavior of the AHBs and related stinging insects such as yellow jackets and other wasps. This program will be expanded to include other county police and fire departments.

B. Quarantine Actions

1. Action Plan For Spot AHB Infestation in North Carolina

a. Managed Bee Colonies

Detection and Protocol:

If the AHB is detected or suspected in managed bee colonies in advance of a general infestation, then the following plan will be implemented:

- i. Drone and queen traps will be installed on all hives located in the suspect apiary to prevent the spread of reproductives.
- ii. Comb cells will be measured and colonies observed for AHB behavioral traits in order to select colonies that should be sampled for full morphometric analysis.
- iii. All suspect colonies in the apiary will be sampled to determine the extent of the AHB infestation.
- iv. All samples will be submitted to the NCDA&CS Honey Bee Identification Lab for AHB determination
- v. If AHB is confirmed, then the survey procedure will begin.

Survey Procedure:

The objective is to locate all feral or managed bees within a 3 mile radius of the suspected AHB find.

- i. Local beekeepers, especially N.C. Master Beekeepers, will be contacted through county and state beekeeping organizations, and the County and State Cooperative Extension Service.
- ii. Persons knowledgeable about the area of AHB infestation will be interviewed. Firemen, policemen, foresters, and game wardens may be able to provide information on feral and managed bee locations.
- iii. Local residences will be interviewed door to door using handouts and/or personal communication.

- iv. Any movement of honeybees in a 3 mile radius of the suspected AHB find will be monitored.
- v. All feral and managed bee locations will be plotted using a GPS.

Eradication or Control:

At the discretion of the State Apiarist, any or all of the following may be executed:

- i. A quarantine, under the authority of the Commissioner of Agriculture will be enacted to prevent further spread of the AHB. The quarantine will minimally encompass a 3 mile radius with the suspect yard at the epicenter. Additional quarantine areas will be initiated if needed. Movement of bees in the quarantine zone will be regulated.
- ii. Managed bee hives within the 3 mile radius will be sampled. Mandatory requeening of these colonies with certified EHB queens may be required.
- iii. Depopulation or mandatory requeening of all hives in the suspect apiary may be required, using queens of known European descent.
- iv. Bees in requeened hives will be monitored for AHB traits until released by the state apiarist.
- v. The state apiarist will use beelining and/or placement of poison bait stations for control of AHB infestations in the feral bee population. Identified feral colonies will be destroyed as necessary.

Chemical Control: Consult Current Copy of North Carolina Agricultural Chemicals Handbook

b. Feral Bee Colonies

Detection and Control

If swarms of feral bees are found in areas considered at high risk for AHB, then the following plan will be implemented. Examples of high risk areas in North Carolina include the state ports in Wilmington and Morehead City.

- i. Destroy the suspect swarm immediately using a "Wasp Freeze" type pesticide labeled for bees, wasps and hornets.
- ii. Collect a sample of > 200 bees; mail 100 bees in 70% EtOH to the Honey Bee Identification Bee Research Laboratory, Beltsville Agricultural Research Center-East Building 476 Beltsville, MD 20705 for AHB determination. The remaining bees that are preserved in EtOH should be forwarded to the NCDA&CS Honeybee Diagnostic Lab, 950 E. Chatham St., Cary, NC 27511 to determine the presence of Varroa mite (*Varroa jacobsoni*) and/or tracheal mite (*Acarapis woodi*).
- iii. If AHB or Varroa mite are confirmed, then initiate the survey procedures.

Survey Procedure:

Using the suspect find as the epicenter, a survey will be initiated encompassing a 3 mile radius.

The objective of the survey is to locate all managed and feral bees within the a 3 mile radius. The following methods may be employed in the survey if deemed necessary by the state apiarist.

- i. County and state beekeeping organizations and NC Master Beekeepers will be contacted.
- ii. County and state cooperative extension service will be contacted.
- iii. The news media will be contacted through the NCDA public affairs office.
- iv. Persons knowledgeable about the area will be interviewed. Firemen, policemen, foresters, and game wardens should be useful resources.
- v. The placement and monitoring of pheromone baited hives in the area will be employed.
- vi. Honey bee bait stations will be placed and monitored to determine the feral bee distribution in the area.
- vii. Sampling, removal or requeening of managed bees in the area will be required as appropriate.
- viii. Beelining and placement of poison bait stations may be employed as appropriate.
- ix. Any movement of bees into or out of the area may be regulated.

2. Action Plan For a General Africanized Honey Bee Infestation in North Carolina

- a. Destroy all Africanized bee colonies when encountered using an approved pesticide.
- b. Mandatory requeening of all honey bee colonies may be required on an annual basis (or more frequently if necessary).
 - i. Marked certified queens of European descent must be used.
 - ii. Unmarked queens must be destroyed and replaced.
 - iii. All aggressive colonies must be requeened or destroyed.
 - iv. Maintain requeening records and sales receipts to be shown to NCDA&CS Apiary Inspectors upon request.
- c. Conduct a vigorous program for controlling wild bee (feral) populations around apiaries.
 - i. Maintain swarm boxes in the immediate vicinity of all apiaries. Replace pheromone lures every six months or as needed.
 - ii. Inspect traps on a weekly basis and destroy all feral swarms encountered.
- d. Drone management
 - i. At least 10% of all colonies in an apiary are to be managed for EHB drone production.

C. Research Priorities

- 1. Pollination** - The major justification for a strong beekeeping industry in North Carolina is the pollination service bees provide. The arrival of the AHB would negatively affect that service in several ways, including the availability of bees for pollination and reluctance by growers to use bees which may be aggressive. Emphasis will continue through the N.C. Cooperative Extension Service on educating grower groups about the importance of honey bees for the pollination of selected crops (apples, berries, and vine crops) and the expected agricultural impact of the AHB arrival. In addition, research will continue at NCSU (Agricultural Research Service) on optimizing the use of honey bees in crop pollination. This work will include the use of bee attractants on crops, which may reduce the number of bees and amount of time required for adequate crop pollination. When the AHB arrives in North Carolina, research will also be initiated on reducing the tendency of AHBs to abscond when they are being transported for activities such as crop pollination. Earlier work will also be continued on the use of other pollinating insects (such as *Osmia* spp. And *Bombus* spp.) as supplementary pollinators.
- 2. Swarming Biology** - The AHB reproduces more rapidly than its European counterpart and thus it exhibits a strong tendency towards frequent swarming. Swarming is usually counter-productive to a good beekeeping management system, and methods of alleviating this condition will be examined. Primary emphasis will be placed on breeding and selection programs that minimize swarming. Currently, a program is being developed for selecting resistance to tracheal mites in honey bees. This program will also include the creation of an artificial insemination program for queen honey bees. Artificial insemination technology can be applied to a program of reducing swarming in honey bees.
- 3. Queen Rearing (Artificial Insemination)**-If the AHBs become established in North Carolina, then it will be essential to have stocks of known (certified) European honey bees that can be used to provide queens to requeen Africanized honey bee colonies. At the present time, most of the queen bee stock used in North Carolina comes from Florida and the southeastern states. Those sources of European honey bees may no longer be available if the AHBs become established in the states to the south of North Carolina.

One solution to this problem is to develop and maintain a queen rearing facility at NCSU which will emphasize artificial insemination to assure that known stock is being used to produce queen honey bees for dissemination to beekeepers throughout the state. NCSU is currently in the process of establishing a queen rearing operation for use in developing and maintaining resistance by honey bees to tracheal and Varroa mites.

The establishment of a queen rearing facility at NCSU that utilizes artificial insemination to control the genetics of the queen bee program would benefit the state's beekeepers in several problem areas. First, it would provide certified European honey bee stock that could be used to requeen Africanized honey bee colonies on an as needed basis. In addition, it could also be used to continue the NCSU research on developing honey bees that are resistant to tracheal mites and to Varroa mites.

D. Development of a Self-Sufficient Queen and Package Industry.

Recommendations:

1. Develop a state supported program to provide artificially inseminated EHB breeder queens to the state's queen and package producers. Nurture existing queen and package producers currently

operating in the state.

- a. Work with these businesses to obtain funding (grants, government loans) for expansion.
- b. Provide technical assistance to improve product quality.
- c. Encourage the development of new queen and package producers in the state.

VI. Literature Cited

- Deitz, A., R. Krell and J. Petlis. 1988. Survival of Africanized and European honey-bee colonies confined in a refrigeration chamber. Chapter 29 in: Africanized Honey Bees and Bee mites. Edited by G.R. Needham, R.E. Page, Jr., Mercedes Delfinado - Baker and C.E. Bowman. Ellis Horwood Limited, Great Britain. 572 pp
- Fletcher, D.T.C. 1978. The African Bee, Apis mellifera adansonii, in Africa. Ann. Rev. Entomol. 23: 151 -171.
- Moffett, J.D. and D.L. Maki. 1988. Venezuela and the Africanized Bee. Amer. Bee Jour 128: 827-830.
- Otis, G.W. 1986. Swarming and Population Growth of Africanized Bees. Session #1 in: Proceedings of the Africanized Honey Bee Symposium. American Farm Bureau. Atlanta, Georgia. 129 pp.
- Rinderer, T.E. 1988. Evolutionary aspects of the Africanization of honey-bee populations in the Americas. Chapter 2 in: Africanized Honey Bees and Bee Mites. Edited by Needham, G.R., R.E. Page Jr., Mercedes Delfinado-Baker and C.E. Bowman. Ellis Horwood Limited, Great Britain. 572 pp.
- Winston, M.L. 1988. The Impact of a tropical - evolved honey bee in temperate climates of North America. Chapter 16 in: Africanized Honey Bees and Bee mites. Edited by Needham G.R., R.E. Page, Jr. Mercedes Delfinado-Baker and C.E. Bowman. Ellis Horwood Limited, Great Britain. 572 pp.

VII. Directories

APPENDIX A North Carolina Honey Bee Advisory Committee

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**APPENDIX B
AHB ACTION LIST**

The following list is composed of representatives with AHB responsibilities from N.C. Department of Agriculture and Consumer Services, N.C. State University and U.S. Department of Agriculture. One of the persons listed below should be contacted first in the event of an incident where it is suspected that AHB is involved. This person will be in charge of contacting the State Apiarist or authorized representative to begin implementation of the N.C. AHB Action Plan.

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APPENDIX C
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APPENDIX D
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