



Africanized “killer” bees: a problem for North Carolina?

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Importance of honey bees

Why should I care about honey bees, anyway?



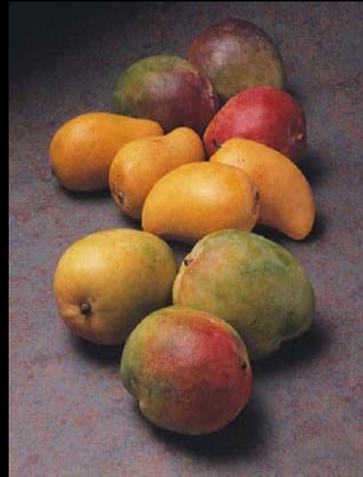
Obviously, honey bees are important for honey production...

Crop pollination

...but they are even more important for crop pollination. Beehives are often contracted to be placed temporarily into fields and orchards to help pollinate crops. Over 100 different crops rely on honey bee pollination, accounting for \$20 billion per year in added agricultural produce. African bees are much less amenable to transport and movement in agricultural contexts, which could ultimately increase the price of produce.



Fruits and Nuts



Vegetables and Melons



Field Crops



Total Economic Impact of Honey Bee Pollination

- Bee-dependent crops account for \$47.1 billion every year, of which \$14.6 billion is attributable to honey bee pollination
- In North Carolina alone, bees are responsible for an additional \$185 million in fresh produce per year
- Honey bees are responsible for one-third of everything that people eat every day



History

How the Africanized honey bees
(AHB) got here

European subspecies



European races

- *A. m. mellifera*
- *A. m. ligustica*
- *A. m. carnica*
- *A. m. caucasica*

The first honey bees to be imported to the new world were European honey bees (EHB).

African subspecies



The subspecies, or race, of African honey bees is *Apis mellifera scutellata*, which evolved in sub-Saharan Africa. They are adapted to tropical habitats. They were intentionally imported to improve honey production and the apiculture industry in Brazil in the 1950's.



The African bees escaped in 1956. Within 50 years, this tropically adapted race of bee colonized most of South America and all of Central America. It entered the U.S. in 1990 through south Texas and is now permanently established throughout the southwestern states and southern California. Throughout its range in the New World, the AHB shows a remarkable ability to displace resident EHB colonies.

Important facts about AHB

- Africanized bees can sting only once and then they die. You cannot be stung multiple times by the same bee.
- The sting of an Africanized bee is no more painful or harmful than that of a European bee.
- Swarms of Africanized bees and individual bees away from the hive are no more likely to sting than European bees.
- Far more people have died from lightning strikes or shark attacks than from Africanized bee stings, so their “killer bee” reputation is extremely overblown.

What are Africanized bees?

Some differences in the biology
between African and European
honey bees

Nesting behaviors



Unlike European bees, which must occupy large, well-insulated nest cavities for winter survival, AHB colonies can occupy smaller cavities and are more likely to build exposed-comb nests. Therefore, **AHB do not live in beekeepers' boxes.**



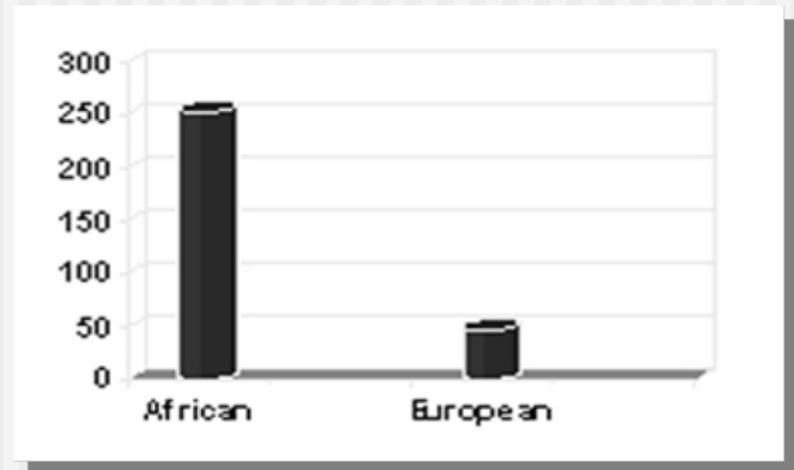
Morphology

Africanized honey bees

European honey bees

An AHB worker (left) and EHB worker (right). African and European bees look virtually identical, although African workers develop faster in the larval stage. AHBs sometimes have a darker color than EHBs, but color is too variable in both races to be used as a reliable identification mechanism. The two races differ more in how they behave rather than how they look.

Defensive behavior



AHB are well known for their high degree of nest defense (left). On the right are data comparing the number of bees captured while defending their colony in the first 30 seconds after a disturbance. About 5 times more African bees leave the colony than European bees in the same time interval. AHB workers also produce more alarm pheromone than EHB workers, which excites other workers to sting, and further contributes to greater colony defensiveness.

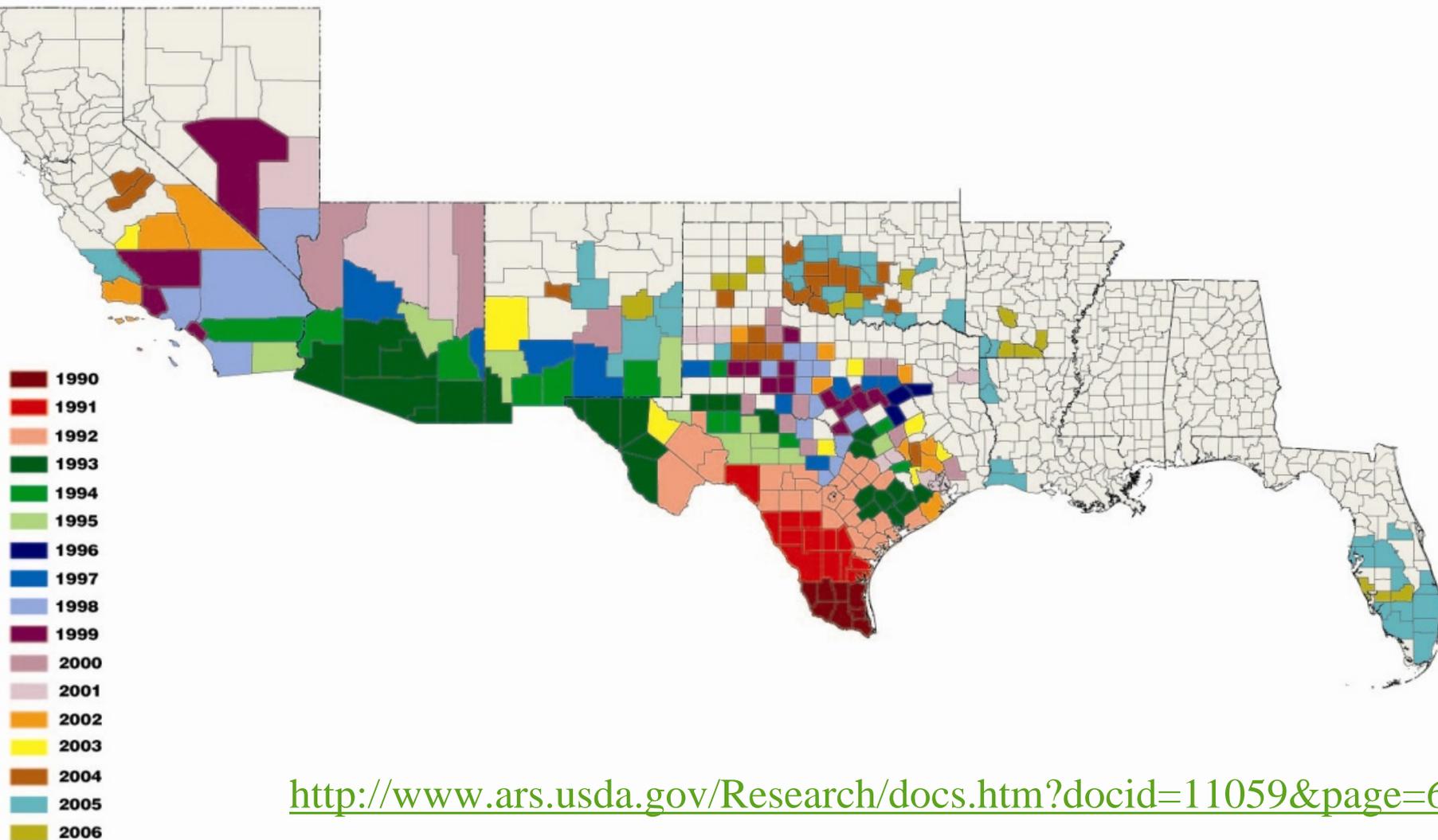
AHB in the US

Where are they now?

Spread of Africanized honey bees by year, by county

Updated January 2007

First found in southern Texas in 1990, Africanized honey bees are now found in much of the South.



<http://www.ars.usda.gov/Research/docs.htm?docid=11059&page=6>

AHB identification

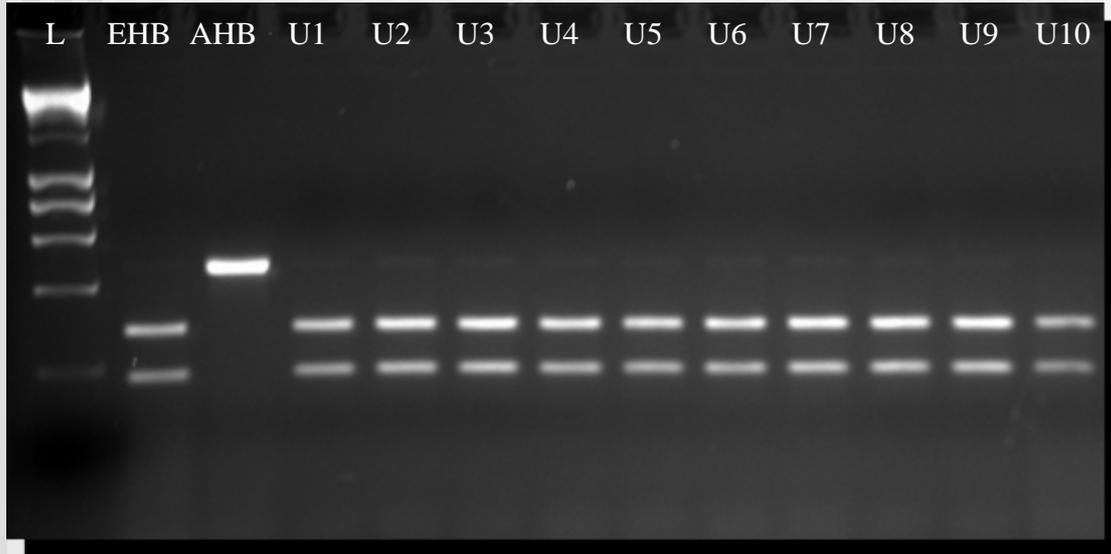
How scientists and officials can distinguish African from European honey bees

Morphometrics

Carefully measuring different body parts to distinguish AHB from EHB, since African bees are smaller, on average.



Genetic analyses

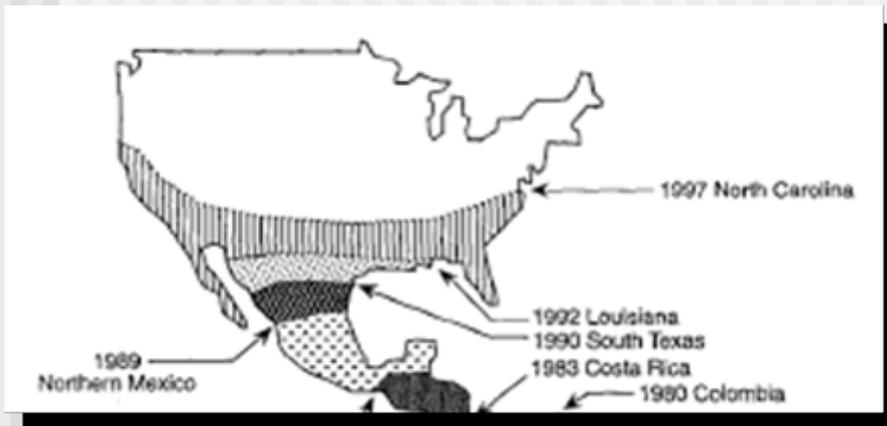


Mitotyping (left) analyzes maternally inherited genetic markers to determine the mother's lineage as either European or African. A recent survey found that all samples collected in NC were shown to be of European origin. **Thus there is no evidence that the AHB is in NC at this time.**

Will they ever get to NC?!

It is not a questions of whether or not the AHB will be introduced to NC, as they almost certainly will, but a question of whether they will become permanently established.

Predicted distribution



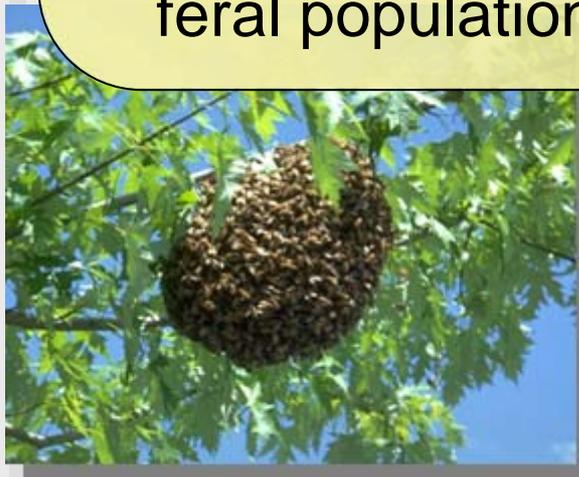
From Winston (1992)

Early predictions were based largely on temperature gradients and the distribution of *A. m. scutellata* in its native Africa. A common assumption is that the AHB cannot survive a prolonged winter, which will slow or prevent its movement into northern states. However, we now know that feral AHB populations are established in areas above 5,000 ft in Arizona and New Mexico and can survive through the winter. Thus, at this point, we do not know the extent to which the AHB will spread in the U.S. or how quickly the invasion process will proceed.

An important distinction...

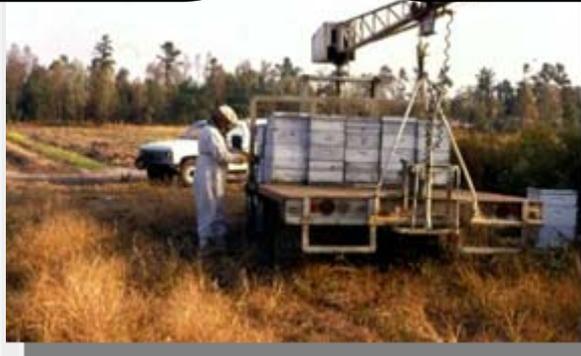
Method of movement #1:
natural dispersal

An established, permanent
feral population of AHB



Method of movement #2:
human-assisted transport

Point introductions but *not*
an established population



QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

Ultimate distribution

We cannot predict in which regions the AHB will become permanently established or be a “seasonal visitor,” in which colonies may migrate in during spring and summer but die out during the winter. The ultimate distribution of the African bee in the U.S. will depend on a combination of its inherent ability to spread and survive in new areas and human assisted movements that might transport the bee past barriers that otherwise would halt its progression.



What should I do?

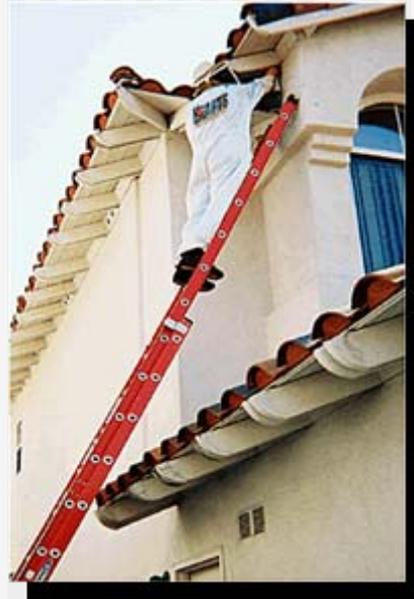
Things that *everyone* can do to
address the AHB issue

Be vigilant



1. **“Bee proof”** your house. Most Africanized bees do not live in boxes managed by beekeepers, but rather in structures or other man-made cavities. With a little know-how, these potential nest sites can be removed or made unsuitable for bee habitation.
2. **Check for unusual honey bee activity.** A few dozen bees visiting your flower beds is very typical and indeed beneficial for your garden. However, if hundreds of bees are clustered together or seen entering and exiting a single hidden location, it may be a sign that a colony has become established.
3. **Don’t keep pets tied or tethered.** If you have pets, livestock, or other animals living outdoors, you may consider taking precautions for them as well.
4. **Know the difference between honey bees and wasps.** Many people mistakenly believe that many wasp species—such as yellow jackets, European or Japanese hornets, and bald-faced hornets—are honey bees.

Be responsive



1. **Keep your distance.** If you locate a nest on your property, note its location but don't approach it. Bees and wasps are much more likely to react in defensive of their hive, so do not pose a threat to them.
2. **Call a professional.** Contact a licensed Pest Control Operator in your area. They will assess the problem, determine if they are honey bees or another species, and take appropriate action. We do not recommend that you exterminate the bees yourself.
3. **Remove the combs to prevent further damage.** Fermenting honey and spoiling wax can harm the structure in which the nest was located, so it is important to remove the combs as well as the bees. Because larger nests can do greater damage, *it is best to deal with the issue sooner rather than later.*
4. **For mass stinging incidents or allergic reactions, call 911.** In an emergency, seek immediate medical assistance. The fire department may respond with foam or surfactant spray to calmly and safely kill the stinging bees.

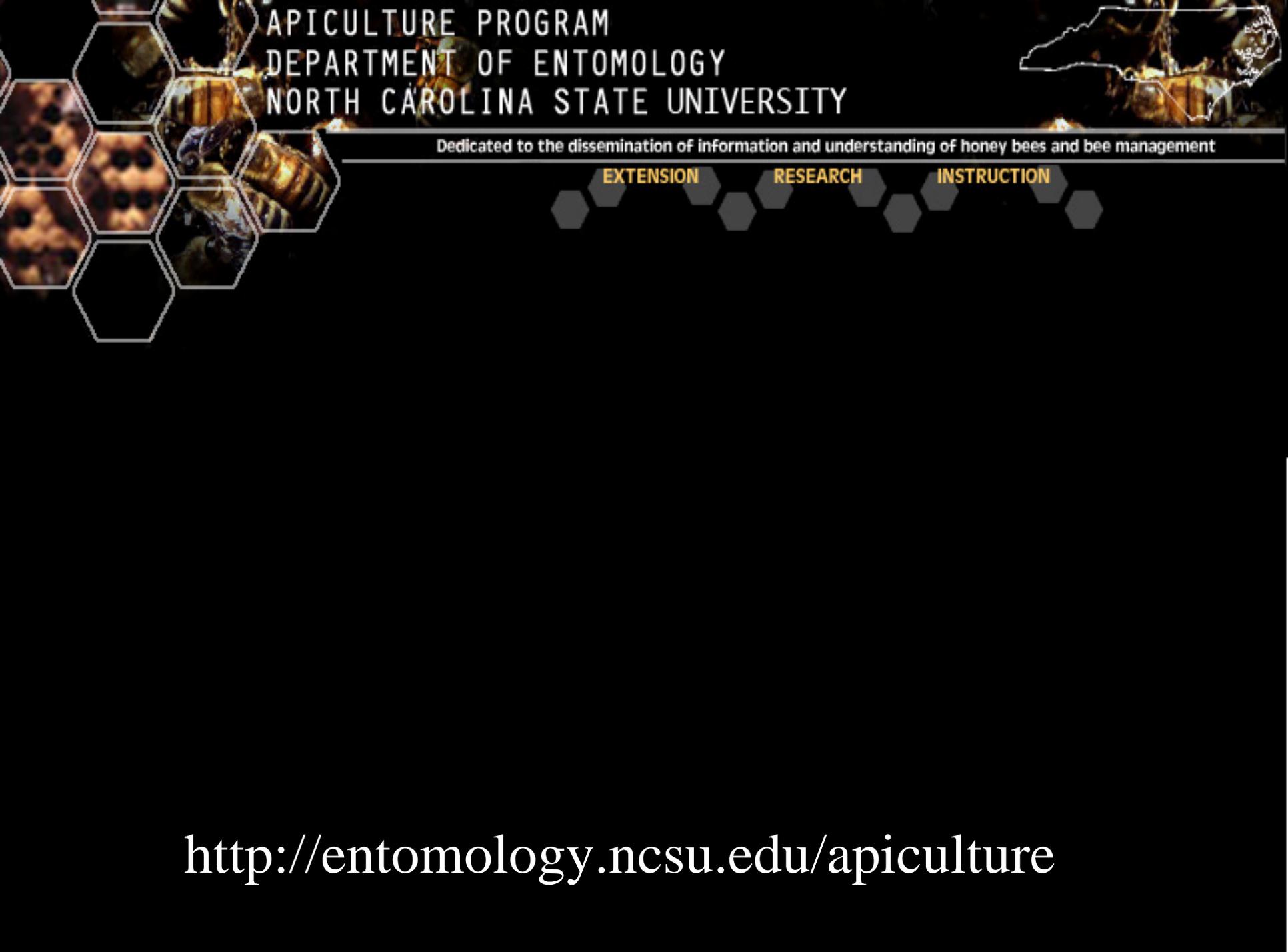
Be proactive



1. Realize that beekeepers are on the front lines of defense—**beekeepers are part of the solution**, not the problem.
2. **Be a good neighbor** and educate them about the benefits of honey bees and the relative risks of AHB.
3. Establish and **maintain lines of communication** between local beekeepers, first responders, and local officials.
4. **Become a beekeeper!**

More information can be found at:

<http://NCAHB.com>



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