

# Rooftop Beekeeping:

# Entomology Service- Learning

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# Objectives

- Service-Learning
- Why Bees and Beekeeping?
- History of Entomology Outreach and Service-Learning
- Rooftop Beekeeping
- Outline of the rooftop beekeeping project
- Goals and partnerships



“Tell me and I forget. Teach me and I remember.



*Involve me and I learn.*”



- Benjamin Franklin

# Service-Learning

- Five Tenants
  - Linked to the Curriculum
    - Formal or In/Non Formal
    - K-12
    - Higher Education
    - Professional Trainings/Workshops
  - Reflective
  - Community Partner
  - Mutually Beneficial
  - Sustainable

# Bees?

- Importance of honey bees
  - Honey, wax, candles, ingredient in foods and beverages
- Pollination



## Cross-pollination

pollen grains

1. Pollen from stamens sticks to a bee as it visits a flower to collect food.



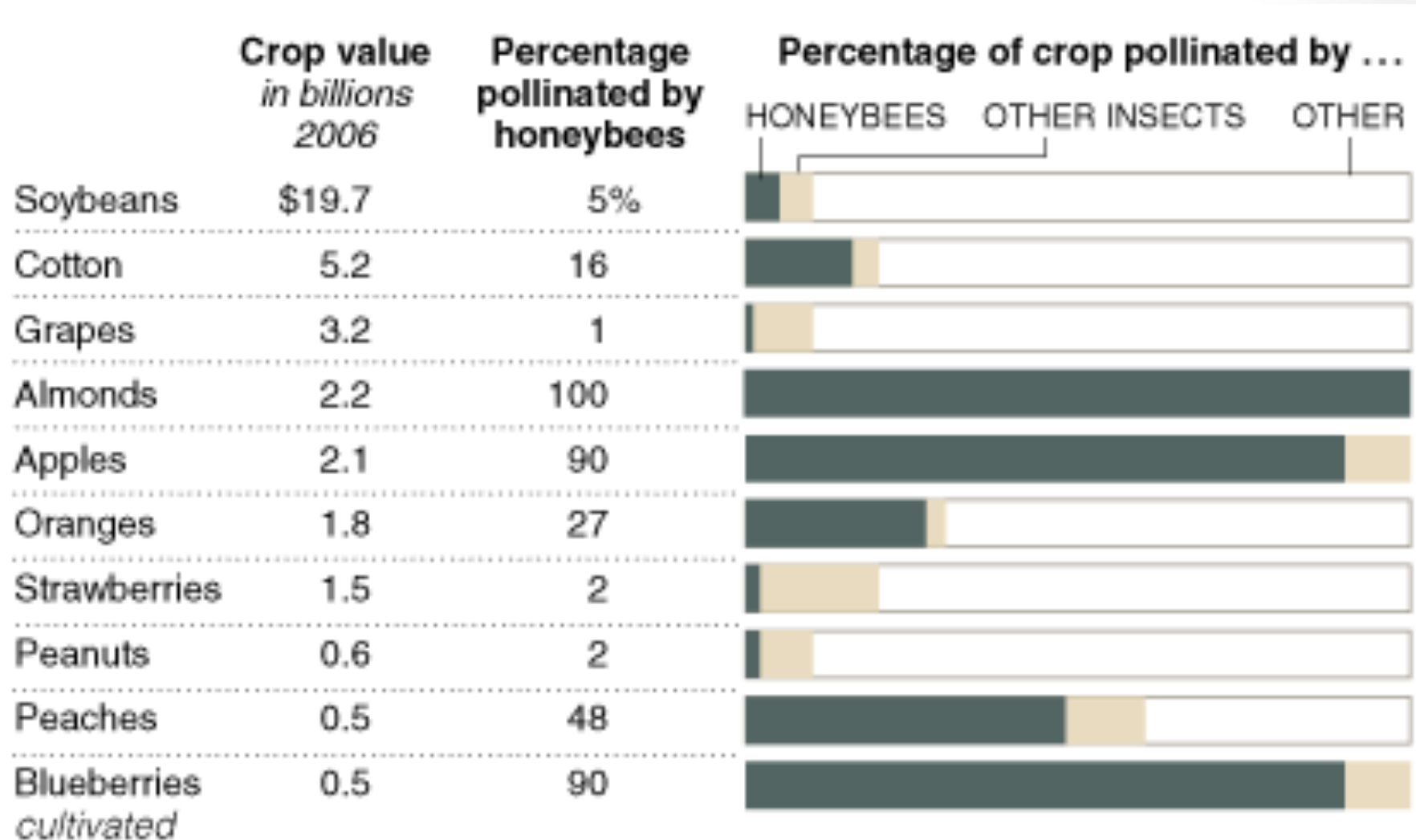
2. The bee travels to another plant of the same type.

3. Pollen on the bee sticks to a pistil of a flower on the other plant.

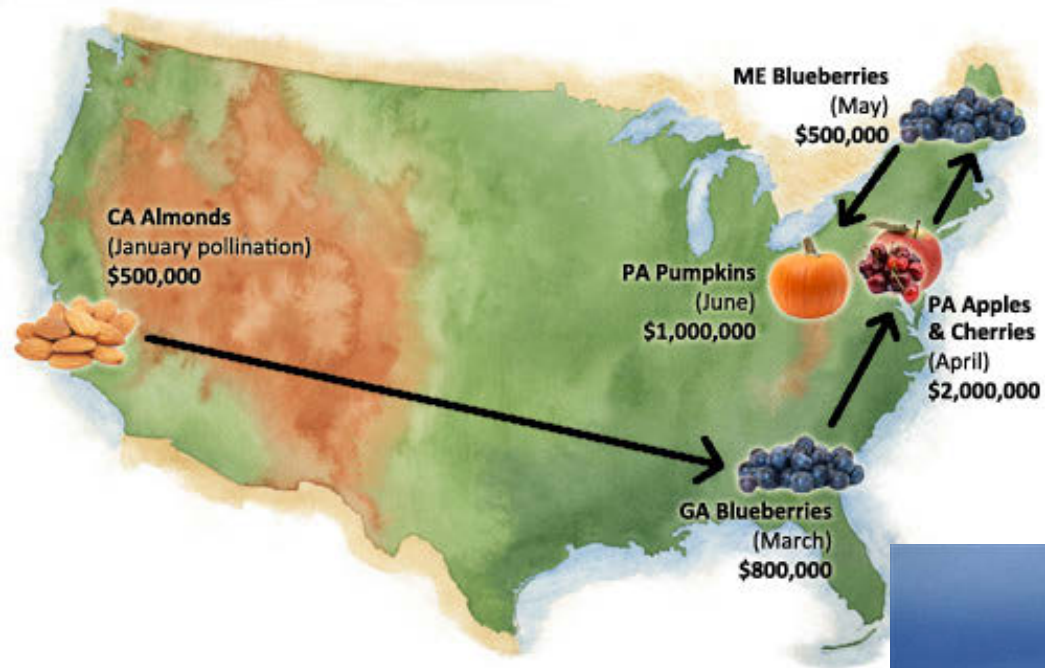


# Economic Benefit

- Bees are said to be responsible for one out of every three bites of food we consume, pollinating about 90% of the world's food crops.

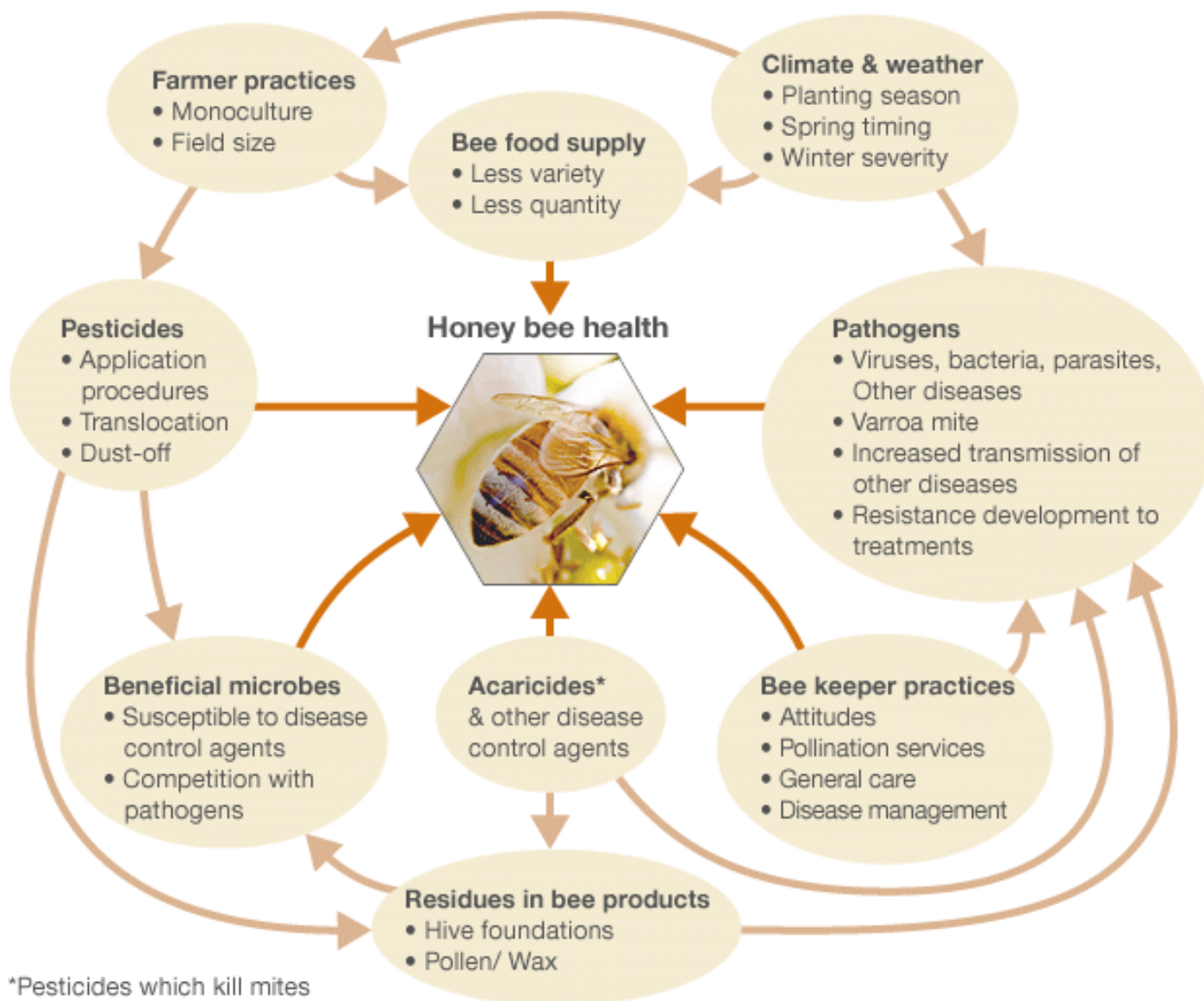


# Moving our Bees



# Colony Collapse Disorder

## Stress factors in honey bee populations



\*Pesticides which kill mites

Source: OPERA Bee health in Europe, 2013

# Entomology Outreach and Service-Learning at UGA

- 2005 – ENTO 3900, Special Topics with section title “Outreach and Service-Learning”, offered Fall and Spring, 1-3 hours = # of community outreach hours with the Insect Zoo and/or community projects,
  - Over 15,000 Georgians visited annually by the Insect Zoo thru class, museum, nature center or camp visits and community festivals
- 2006 – Bee Hives installed at local High School
- 2011 – Octobeefest (Fall Semester)
- 2012 – The Beers and the Bees (Spring Semester)
  - UGA Bug Dawgs (the students who take the Insect Zoo into the community)
- 2013 – Rooftop Hives Installed
- 2014 – ENTO 3300S, Outreach and Service-Learning, 3 credit hours



# Why Rooftops?

- Urban Farming
- Sustainable Agriculture
- Green Spaces
- Local Foods
- Untapped Resources



# Rooftop Beekeeping

- Hotels & Airports
  - Ritz Carlton - Charlotte
  - Fairmont Hotel – 21 North America, Asia, Africa, Bermuda and Mexico
  - Seaport Hotel – Boston
  - W Austin Hotel – Austin
  - Brown Palace Hotel and Spa – Denver
  - Waldorf-Astoria – New York City
  - Montage Deer Valley – Park City
  - St. Ermin – London
  - Salish Lodge & Spa – near Seattle
  - Intercontinental New York Barclay Hotel
  - Marriott – Chicago
  - Hyatt Regency Atlanta
  - Four Seasons Atlanta
  - Cardiff's Royal Hotel - Wales
  - Alto Hotel - Melbourne
  - Lambert-St. Louis International Airport
  - Chicago O'Hare International Airport
  - Seattle-Tacoma International Airport



# Rooftop Beekeeping

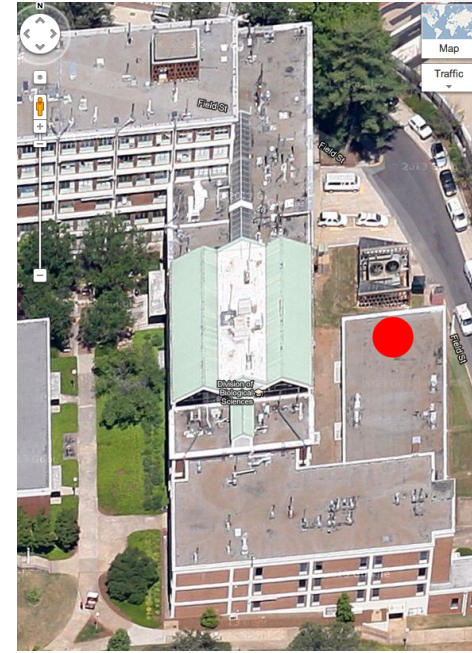
- Museums and Famous Buildings
  - The Whitney Museum of American Art – Manhattan
  - Lloyd's Building – London
  - Opera Garnier - Paris
  - Natural Resources Defense Council - Manhattan

# Rooftop Beekeeping

- Higher Education
  - Harvard
  - University of Montreal
  - McGill University
  - Emory
  - University of Georgia
  - Georgia Tech
  - University of Wisconsin Madison

# UGA Rooftop Bee Hives

- ENTO 3900 student project
  - Created a budget and list of supplies
  - Chose location
  - Received approval from the Facilities and Maintenance Division
  - Built and painted the frames, supers, top and bottom boards for 3 hives
  - Purchased 3 nucs (3 frame starter bees) from independent beekeeper
  - Installed the hives on the roof











# Goals and Partnerships

- Teaching and Research Colonies on campus for entomology, biology, ecology, science education, scientific illustration, art
  - The UGA Bee Lab is located ~10 miles from campus
- The community partners = K-12 groups visiting campus for educational tours, UGA Bug Camp local clubs and organizations (Boy Scouts/Girl Scouts, Master Gardeners, etc.)
- Similar programs could be started at peer institutions to have teaching colonies incorporated into instructional avenues.
- Promote local beekeeping
- Promote pollinator friendly habitats



# Thanks for your time!

