

Using Bats for Pest Management

Presented by
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World's
Largest
Bats:

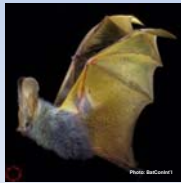


Flying Foxes



World's Smallest Bat:
Kitti's Hog-Nosed Bat

Bats Come In All Colors



Bats eat (or likely eat) these adult insects

Most of our insecticides do not control adults

MOTHS (LEPIDOPTERA)

- Noctuidae moths
- Green Fruit worm
- Red humped caterpillar
- Western tentiform leafminer
- Oriental fruit moth
- Codling moth
- Obliquebanded leafroller
- Pandemis leafroller
- Fruit tree leafroller
- European leafroller

BETLES (COLEOPTERA)

Rainbeetles

TRUE BUGS (HEMIPTERA)

green and brown stinkbugs,
leafhoppers and sharpshooters.



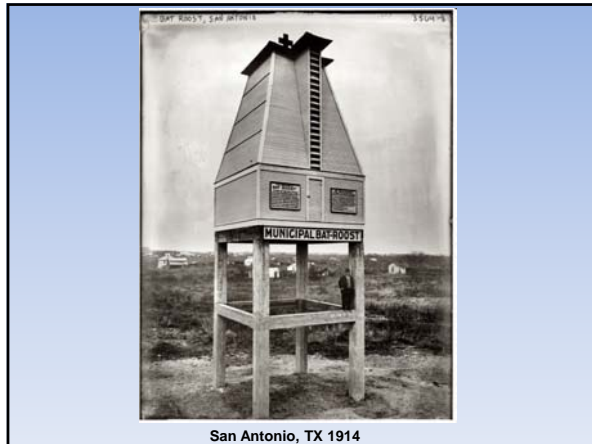
And In All Shapes



Bats are "Death From Above" to mosquitoes

- Some bats will eat almost 1,000 mosquitoes every hour during the mosquito swarming season


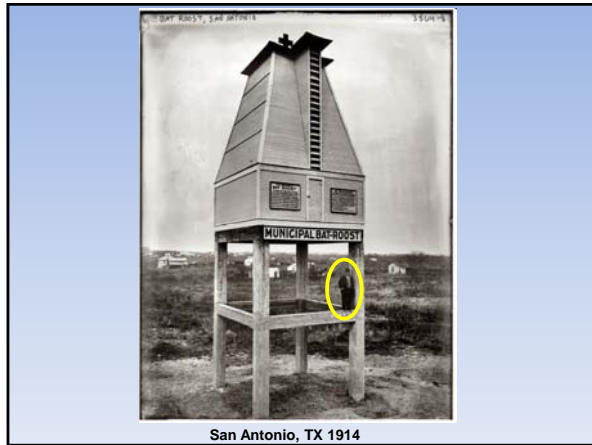




San Antonio, TX 1914

Bats are the original mating disruptors



- When moths “hear” a bat getting near they take evasive action & disrupt their search for mates.
- Studies indicate that moths avoid areas where bats are hunting (BatCon Int'l)

San Antonio, TX 1914

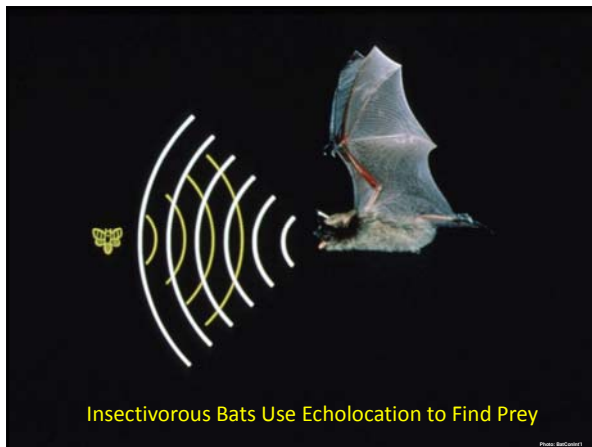
Codling Moth Damage in Walnut Orchards

*California's Central Valley
B. Hogan, Univ. of California, Davis
M.S. Thesis*

Orchards <1 mile
<5% damage



Orchards >2 miles
up to 60% damage



Mother Bats vs. Codling Moth Math

- Little Brown Bats weigh about 25 grams
- ARS lab data show 38 codling moths/gram
- Studies show bats diets are 35% moths but can be significantly more during peak moth flights
- Nursing bats eat their own body weight in moths nightly

$25 \text{ grams/bat} \times 38 \text{ codling moth/gram} \times 35\% \text{ moth diet} =$
333 codling moths per night

How do I attract bats to my farm?

Photo: BatCave11

Photo: BatCave11

And Shelter:

Bats often rely on man-made structures including buildings...

Photo: BatCave11

Photo: BatCave11

Photo: BatCave11

They Need Food...

Photo: BatCave11

Bats in Orchards: if you build it they will come.

SPECIES OF BATS THAT USE BAT HOUSES

- Pallid Bat (*Antrozous pallidus*)
- Big Brown Bat (*Eptesicus fuscus*)
- California Bat (*Myotis californicus*)
- Little Brown Bat (*Myotis lucifugus*)
- Long-legged Bat (*Myotis volans*)
- Yuma Bat (*Myotis yumanensis*)

Photo: BatCave11

Habitat Type	Occupancy	# Houses
• Orchards	83%	n = 103
• Pastures	64%	n = 307
• Row Crops	61%	n = 199
• No Farmland	56%	n = 295

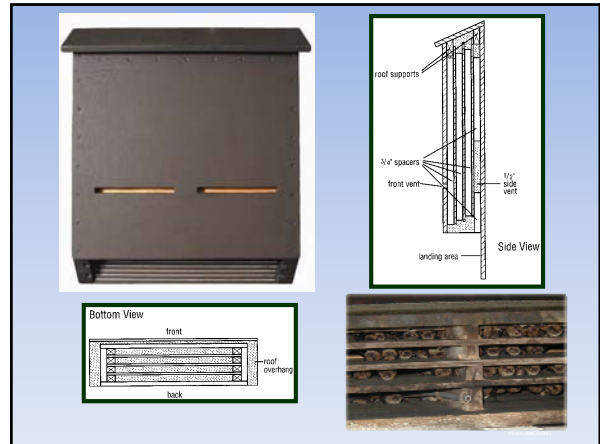
Water...

Photo: BatCave11

Provide alternate roosts by installing a bat house.

Key to success with bat houses:

- Sufficient thermal mass (bigger is better).
- Bats thrive in hot temperatures (>100F). If its too hot for you its perfect for bats.
- Keep the bat house in the sun for most of the day.
- Mounting to buildings works best- but not metal buildings.
- Mount high enough for bats to exit properly- ten feet minimum. Higher is better.



A bat box with proper design, color, size and installation will get bats over 80% of the time.



Bat houses need to be large



Criteria for installation


- **Criteria for install:**
- 10' or higher
- Morning sun & late afternoon shade (or no shade)
- Well sealed
- Within ¼ mile of water
- Well made to spec: ¾" = ¾"
- Dark in color
- Bigger is better
- Move if not in-habited within 3 years



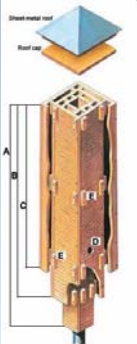


Mounting on a structure

- Morning sun & late afternoon shade (or preferably no shade)
- Make sure its at least 10 feet off the ground
- Don't mount to metal buildings
- Be sure that the bat guano wont be an issue



Rocket Boxes: Perfect for bats if they are supersized!



Questions?
omegorchards.com
Tucksdwellings.com
Batcon.org

