

Using Bats for Pest Management

Presented by
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Bats Come In All Colors



And In All Shapes



**World's
Largest
Bats:**

Flying Foxes



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

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



Photo: BatConInt'l

BETLES (COLEOPTERA)

Rainbeetles

TRUE BUGS (HEMIPTERA)

green and brown stinkbugs.

leafhoppers and sharpshooters.



Photo: BatConInt'l

Bats are “Death From Above” to mosquitoes

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

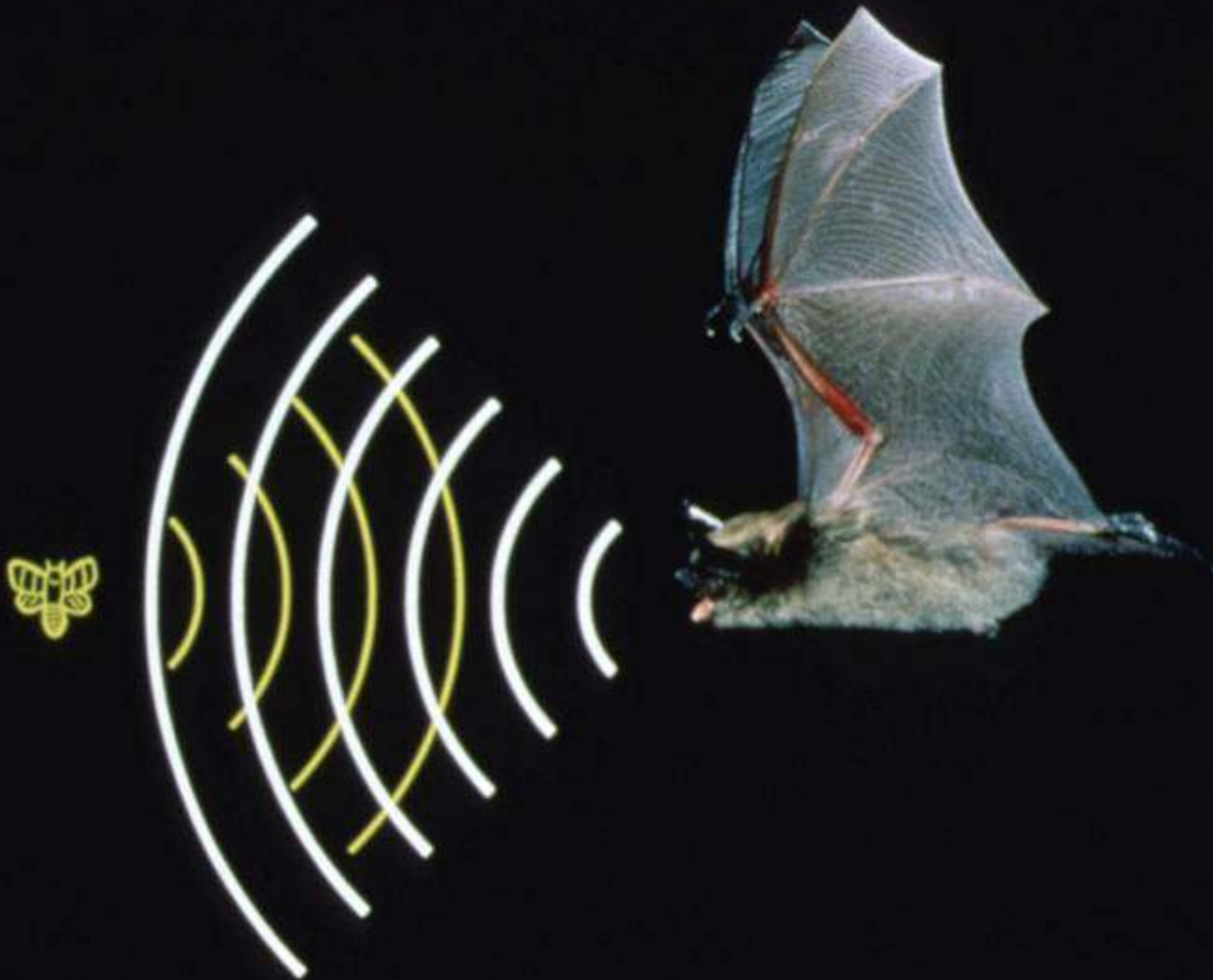




San Antonio, TX 1914



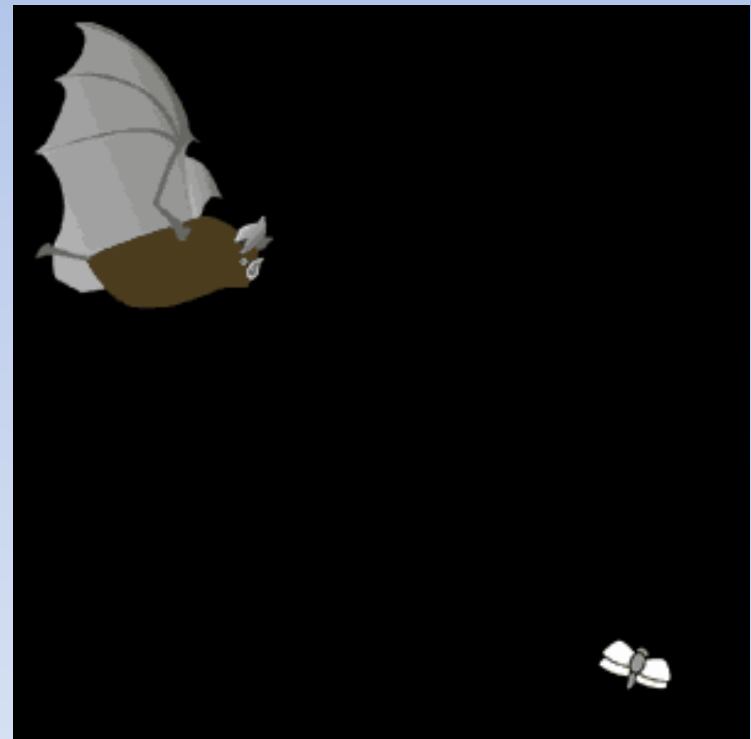
San Antonio, TX 1914



Insectivorous Bats Use Echolocation to Find Prey

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)



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 grams/bat x 38 codling moth/gram x 35% moth diet =

333 codling moths per night



Photo: BatConInt'l



Photo: BatConInt'l

How do I attract bats to my farm?



They Need Food...



Water...



Photo: BatConInt'l

And Shelter:

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



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*)



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

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.



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**

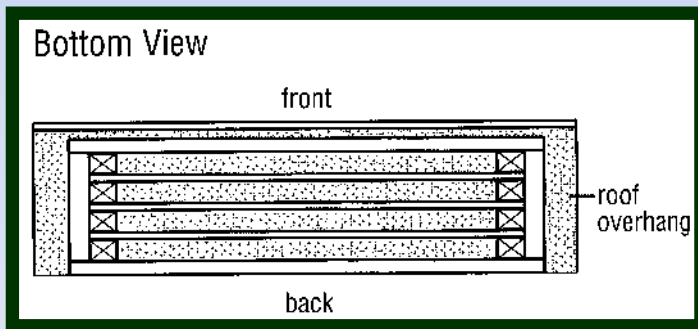
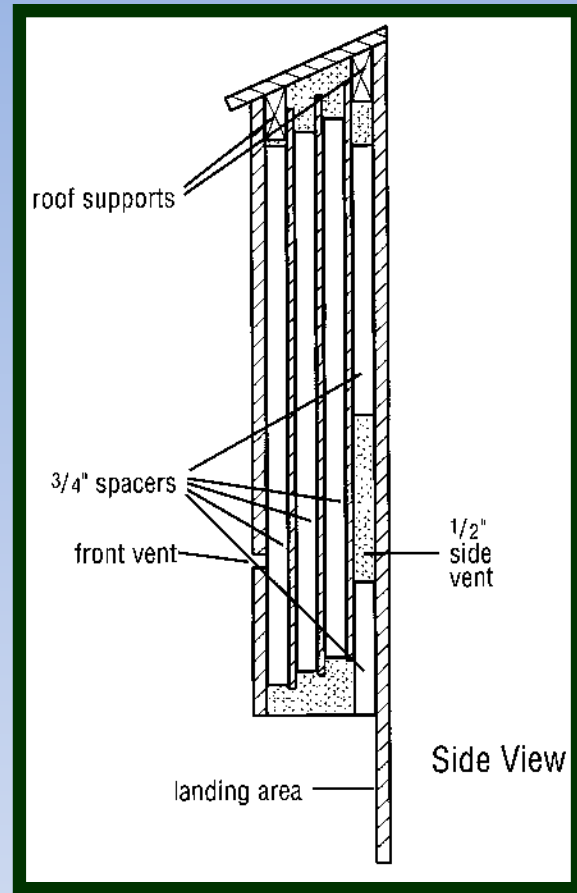


Photo: BatConInt'l

Bat houses need to be large





**The internet is full
of badly designed
boxes and box
plans. Be aware!**

Go to: Batcon.org

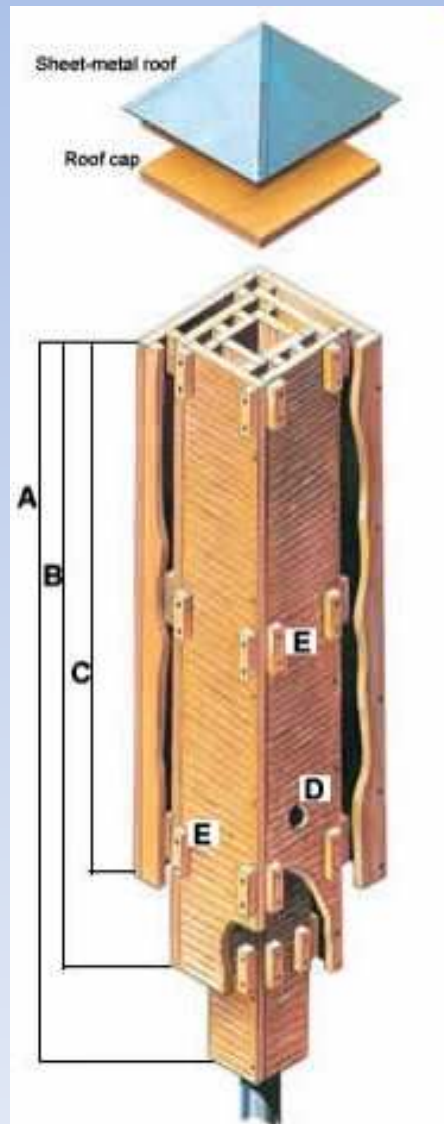


Mounting on a structure

- **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!



Super Sized Rocket Box





Questions?

omegorchards.com
Tucksdwellings.com
Batcon.org

