



Three P's in a Pod: Pests, Parasites, and Pathogens of Washington Bee Hives

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Who cares about pollinators?

- Required for 13 crops
- Increase yield in an additional 78 crops

(Klein et al, 2007)



The 4 P's



PESTS

Varroa Mites



PATHOGENS

Virus, Fungus, etc.



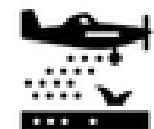
POOR NUTRITION

Where are the flowers?



PESTICIDES

Necessary Exposure



A colony is alive, a hive is a box.



Honey bees reproduce through swarming.



Frames hold the combs of wax within a hive.



Supers are placed on a hive and filled with honey.

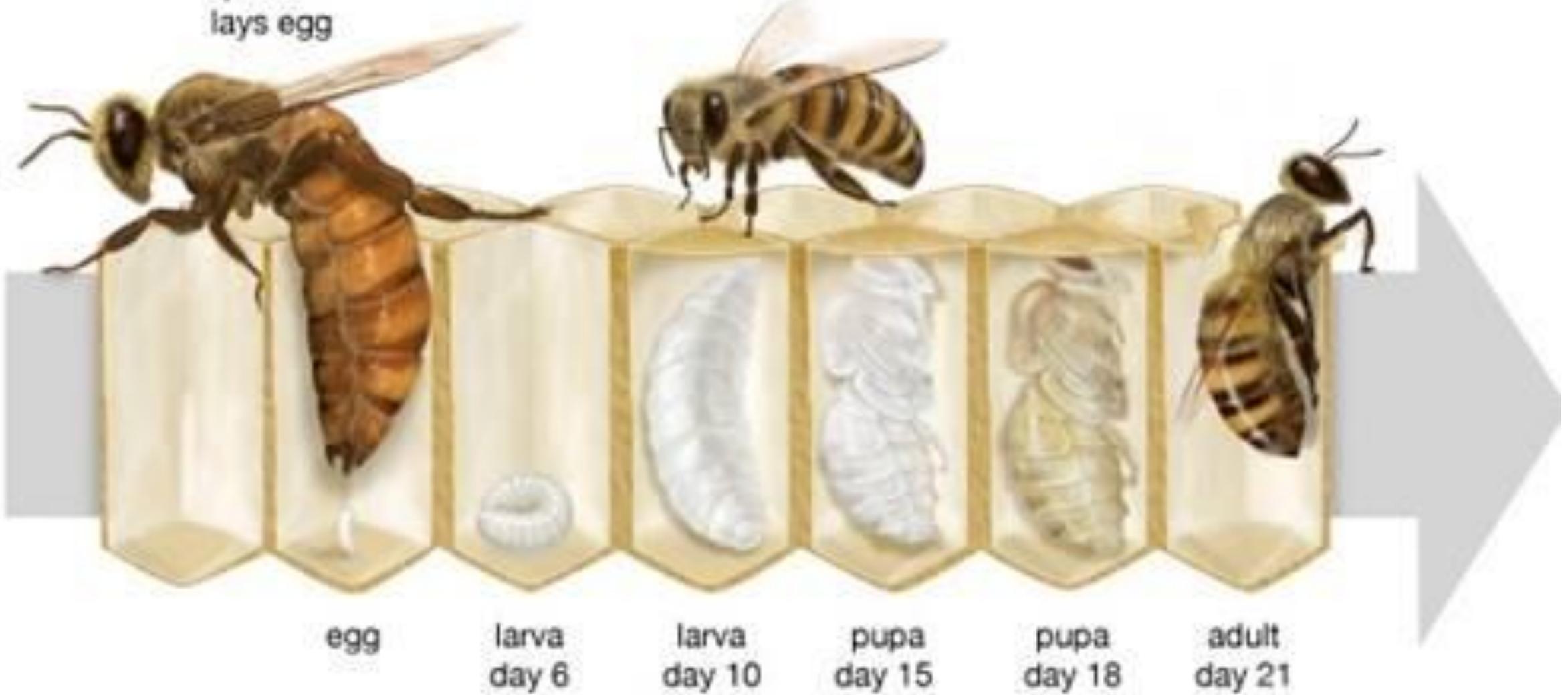
Supers



Life cycle of honeybees

queen
lays egg

worker feeds larva and seals cell
once larva reaches full growth

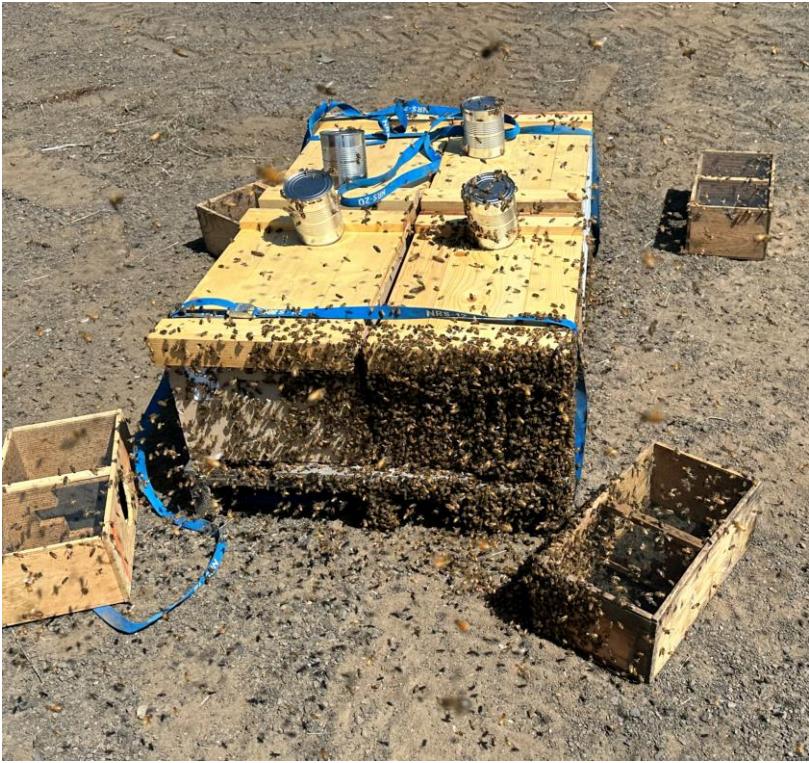


Not all bees are the same.



Photo courtesy of TNAU Agritech Portal

How do you get bees?



Pests

Wax moths can quickly destroy stored comb.



Photo courtesy of Sam Weiland

Wax moths can be repelled, killed, or trapped.

Phostoxin®



Photo courtesy of pestfix.co.uk



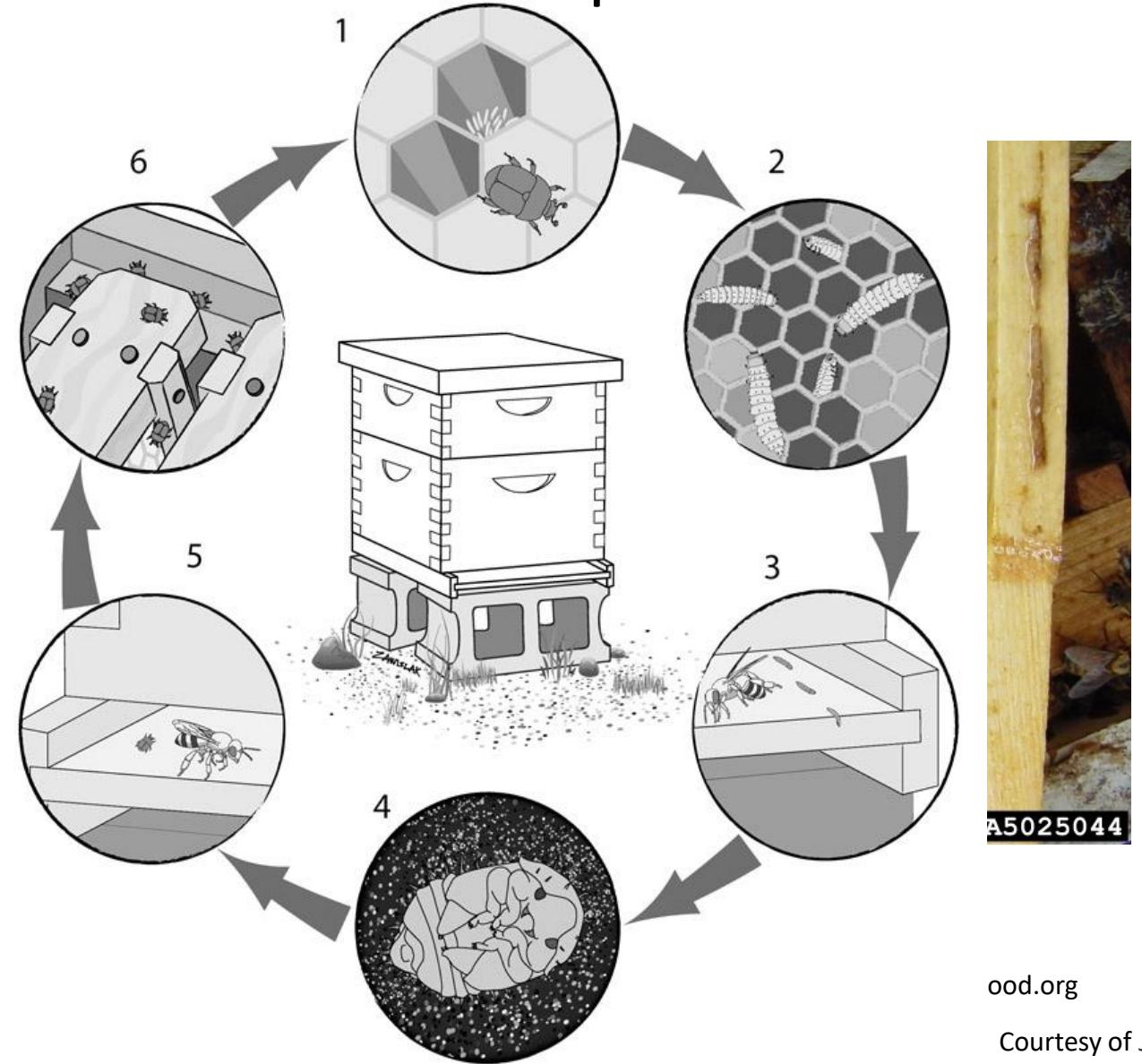
Photo courtesy of Meyer Bees



Photo courtesy of Dadant



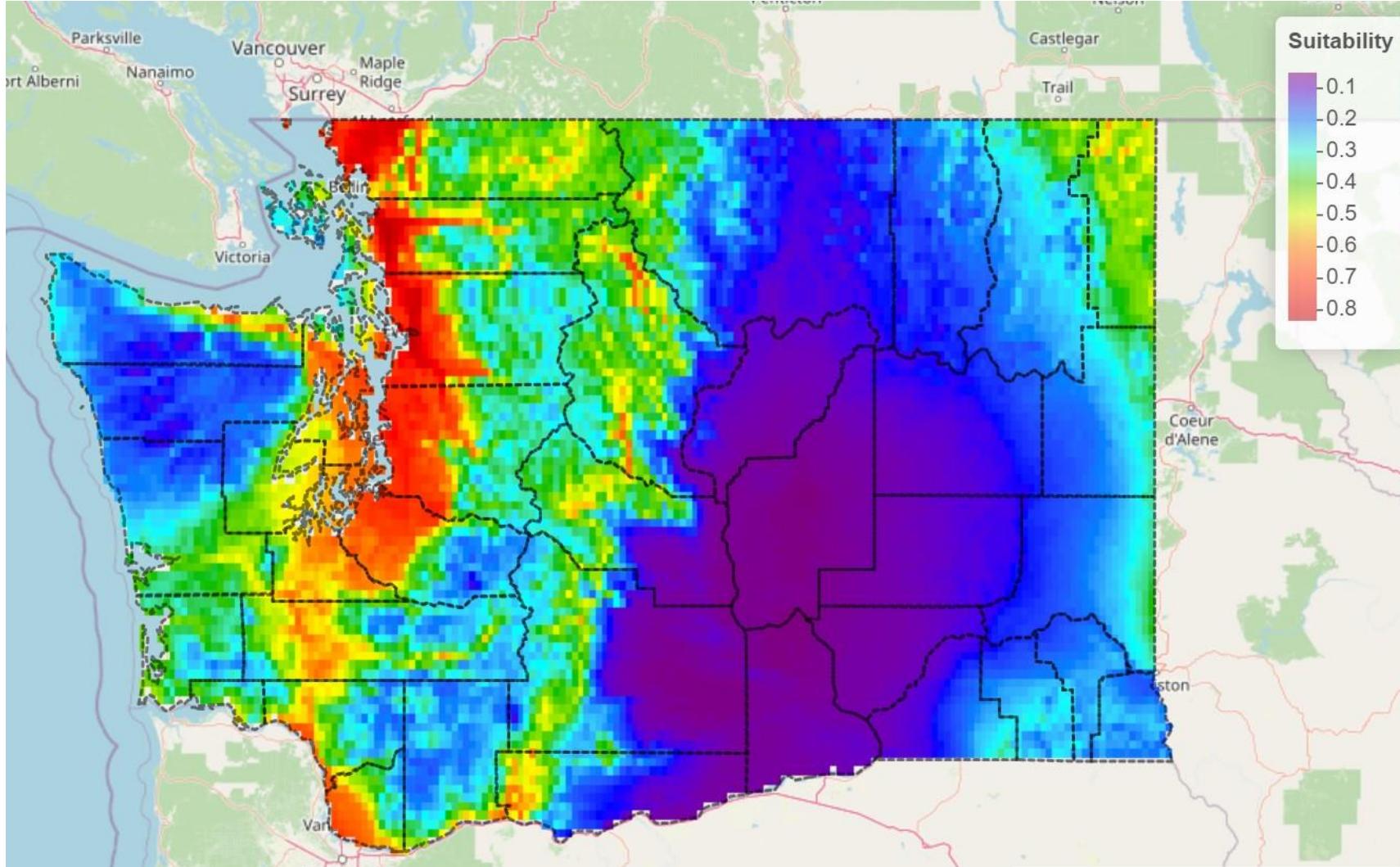
Small hive beetles are a common pest in the southern US.



ood.org

Courtesy of Jon Zawislak

Small hive beetles may become a common sight.



Courtesy of Gengping Zhu

Small hive beetles are controlled through traps or pesticides.



Photo courtesy of Meyer Bees



Photo courtesy of Y-Tex



Northern giant hornets have not been seen for several years.



Photo courtesy of Karla Salp, Washington State Department of Agriculture, Bugwood.org



Photo courtesy of Karla Salp, Washington State Department of Agriculture, Bugwood.org



Photo courtesy of Dr. Scott Camazine, Agriculture, Bugwood.org

Sizing up the northern giant hornet



Sphecius sp. Yakima
Cicada killer



Sphex ichneumoneus
Great golden digger wasp



Vespa crabro Missouri
European hornet
(does not occur in WA)



Cimbex sp.
Elm sawfly



Vespa mandarinia
northern giant hornet



Vespula pennsylvanica
Western yellowjacket



Polistes dominulus
European paper wasp



Apis mellifera
Western honey bee



Dolichovespula maculata
Bald-faced hornet



Tremex columba
Pigeon tremex



Bombus flavifrons
Yellow head bumble bee

Yellow Jackets become major pests in the fall.



Photo courtesy of Joseph Berger, Bugwood.org



Ants occasionally attack colonies.



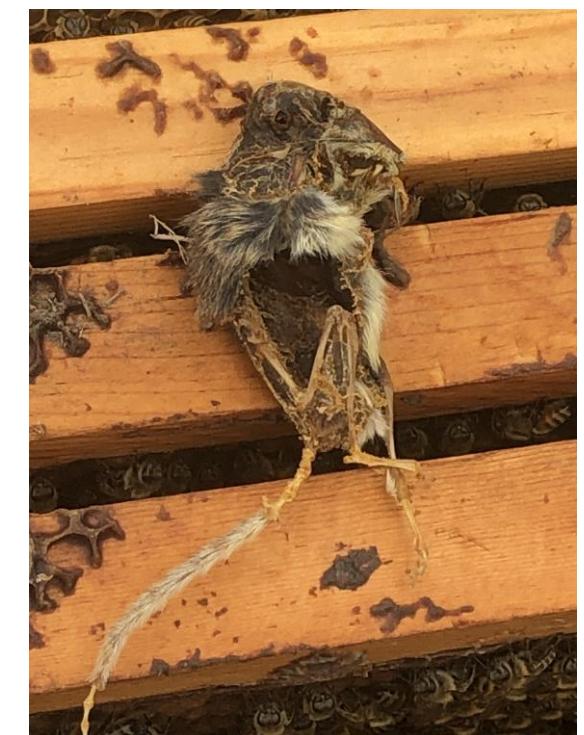
Hives can provide warm homes for mice.



Photo courtesy of afuturewithbees.com



Photo courtesy of afuturewithbees.com



Skunks are best avoided using fences.



Photo courtesy of Wallace Keck, City of
Rocks National Reserve



Photo courtesy of Randy Oliver, Scientific Beekeeping

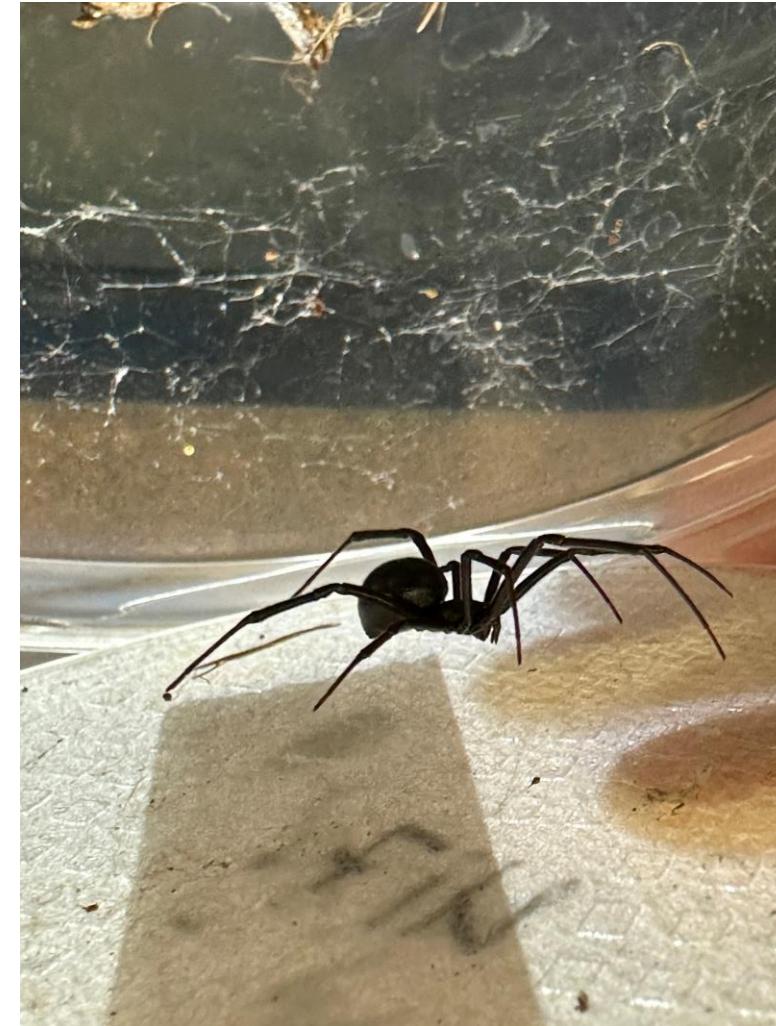
Bears can be deterred with electric fences.



Photo courtesy of Penn State Department of Entomology

Photo courtesy of Missouri Department of Conservation

Black widows and rattlesnakes can both be found in the apiary.



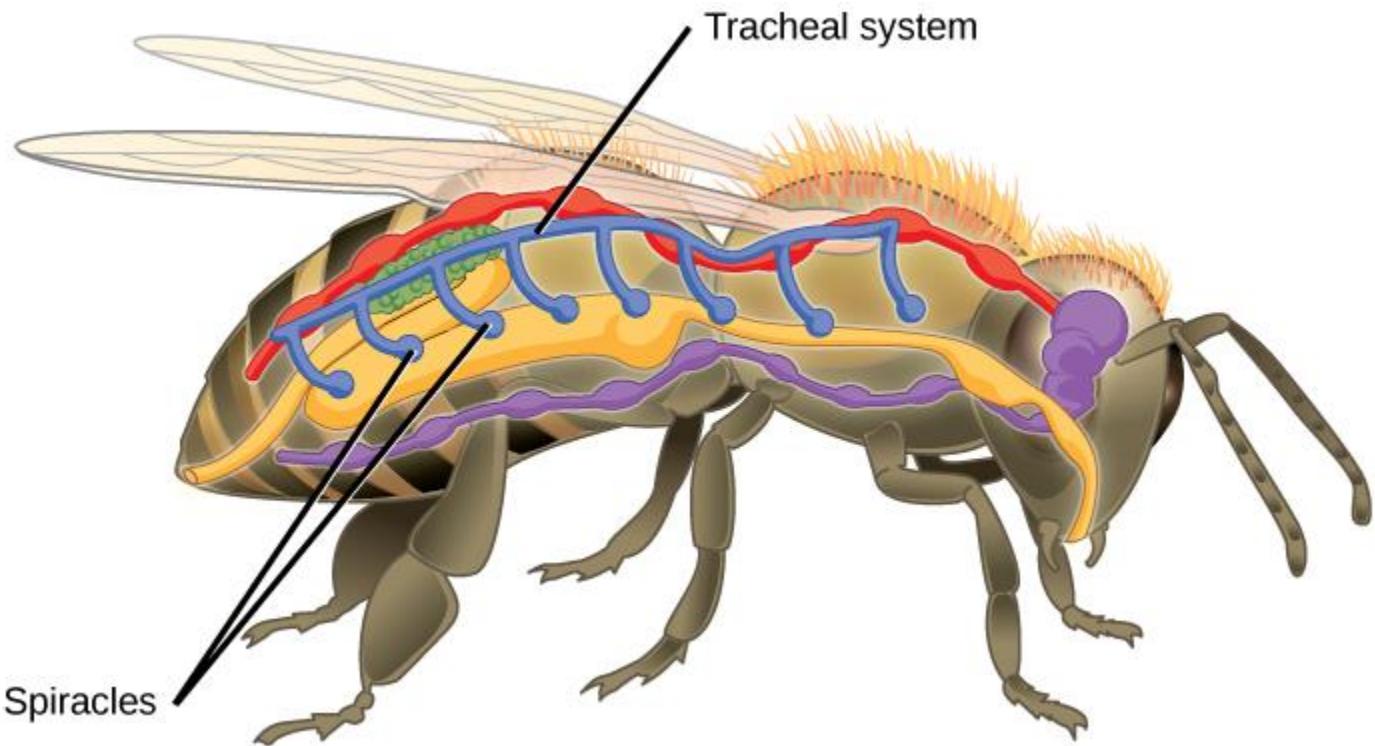
Parasites

Tracheal mites are rarely an issue anymore.



Lilia De Guzman, Bugwood.org

What are trachea?



Whitney Cranshaw, Colorado State University,
Bugwood.org

Photo courtesy of OpenEd CUNY

Bee lice look strange but are harmless.

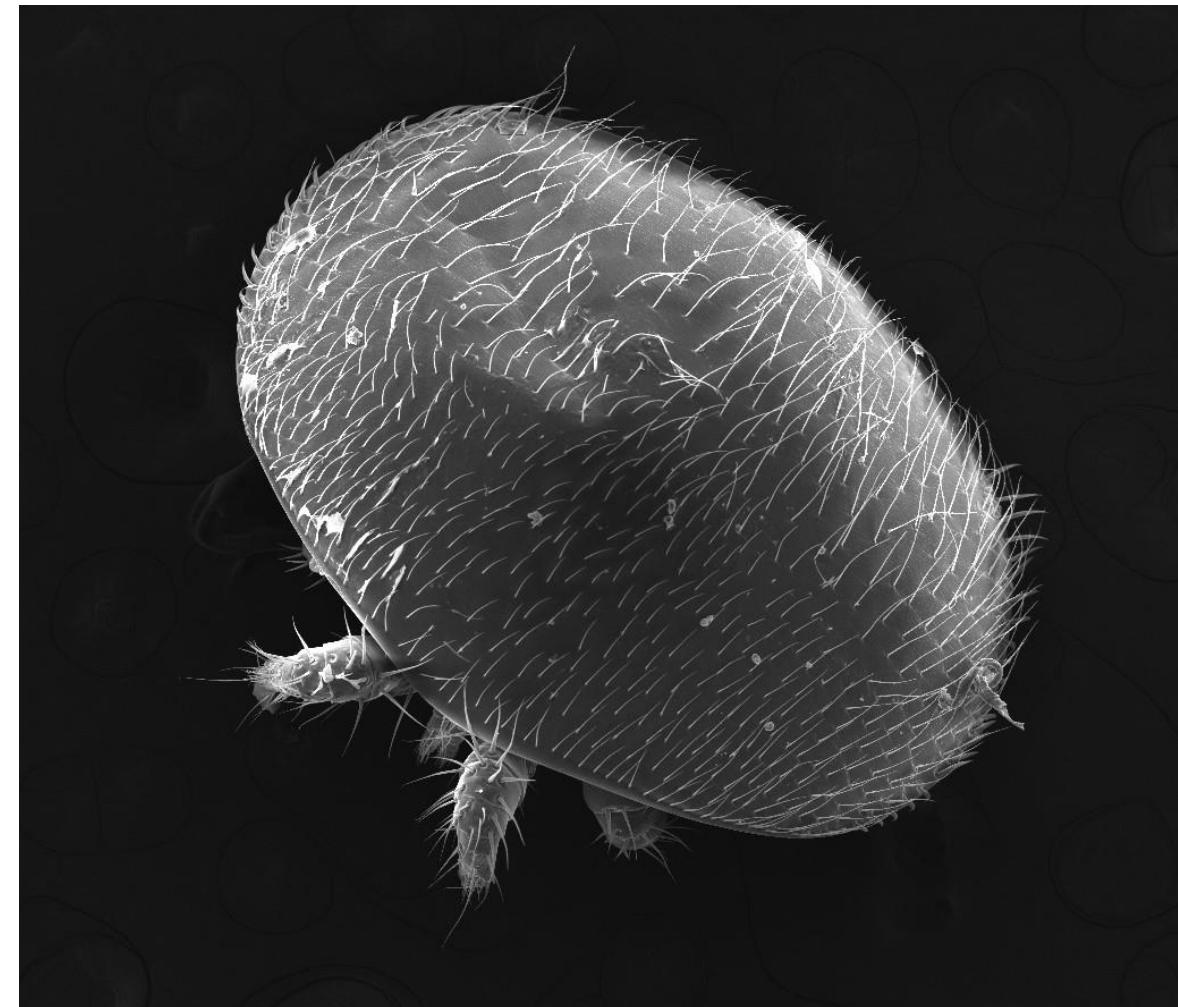


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Varroa mites are the biggest threat to honey bees.



Sampling for Varroa



Chemical control

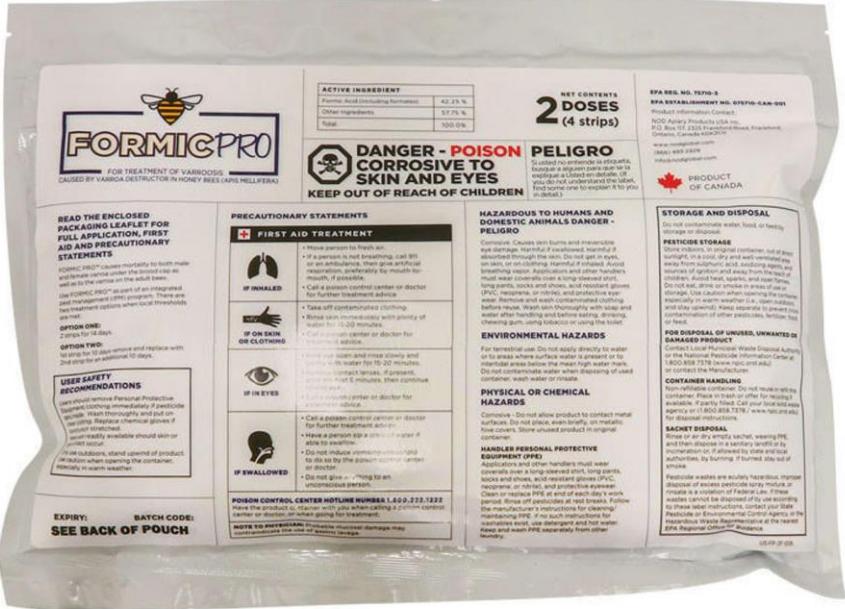
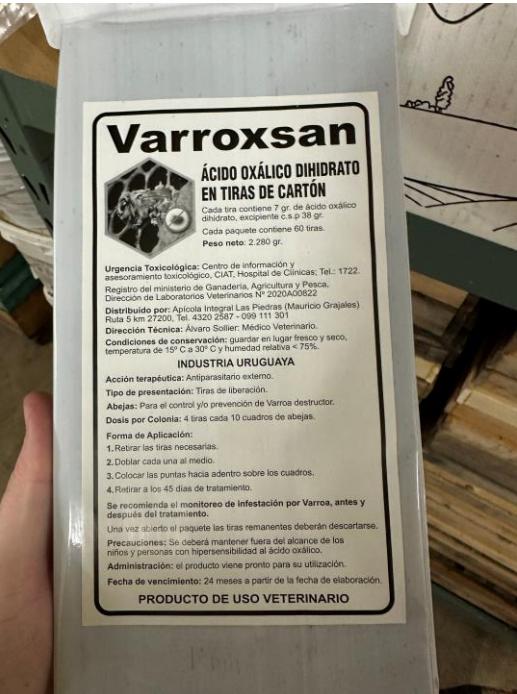
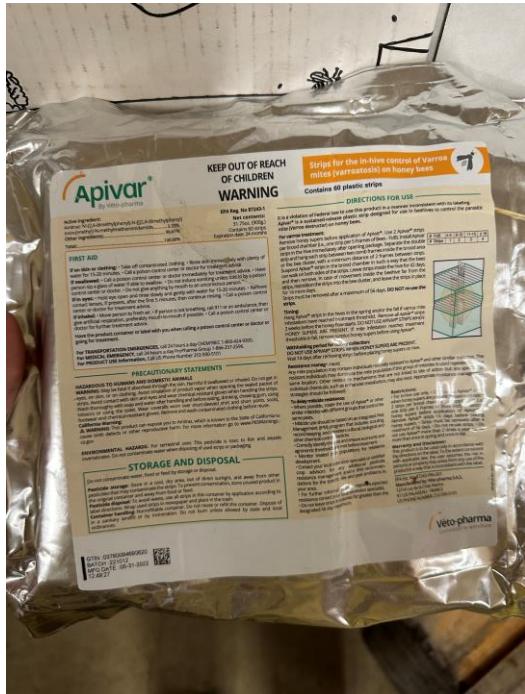


Photo courtesy of Mann Lake

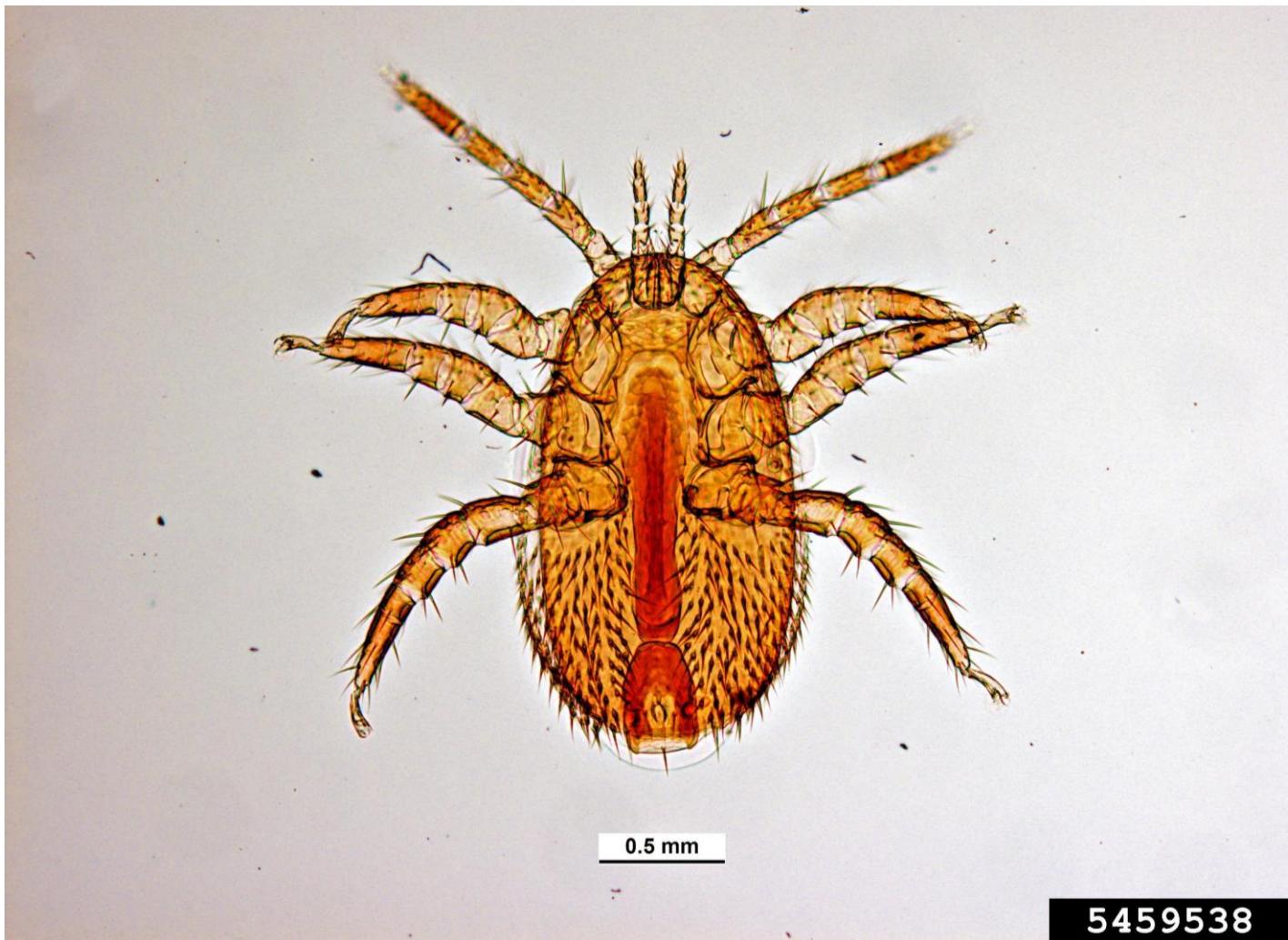


Photo courtesy of Meyer Bees

Cultural control



Tropilaelaps are luckily not here yet.



Pathogens

Bacteria

American Foulbrood is the most dangerous disease of bees.

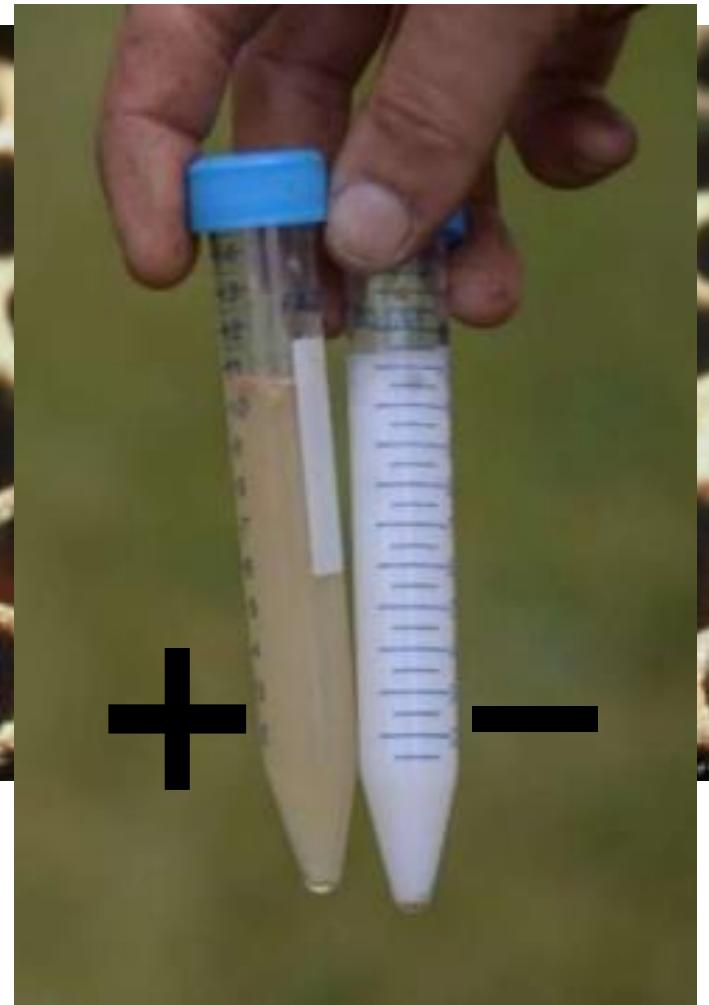
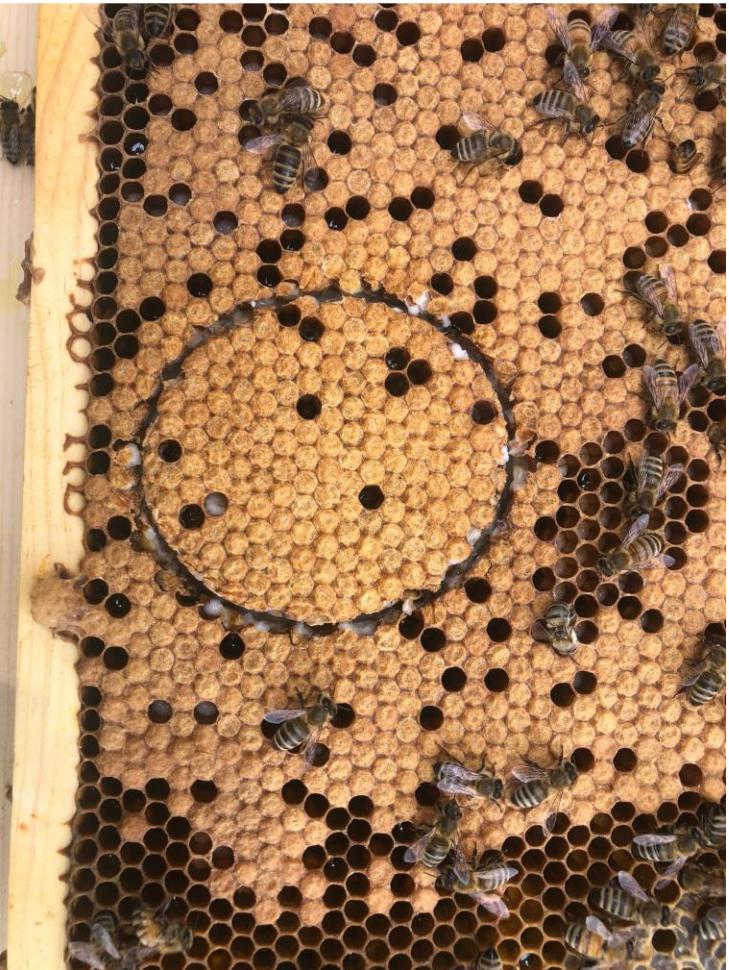


Photo courtesy of beemaster.org

Photo courtesy of Sarah B. Scott

Hygienic behavior can help prevent AFB.



Current treatments are far from ideal.



Photo Courtesy of The Management Agency, National American Foulbrood Pest Management Plan New Zealand



shutterstock.com · 224219440



Photo courtesy of Nelson Labs



European foulbrood is much more curable.



Photo courtesy of Rob Snyder,
beeinformed.org

Diagnosing is easiest with a test kit.

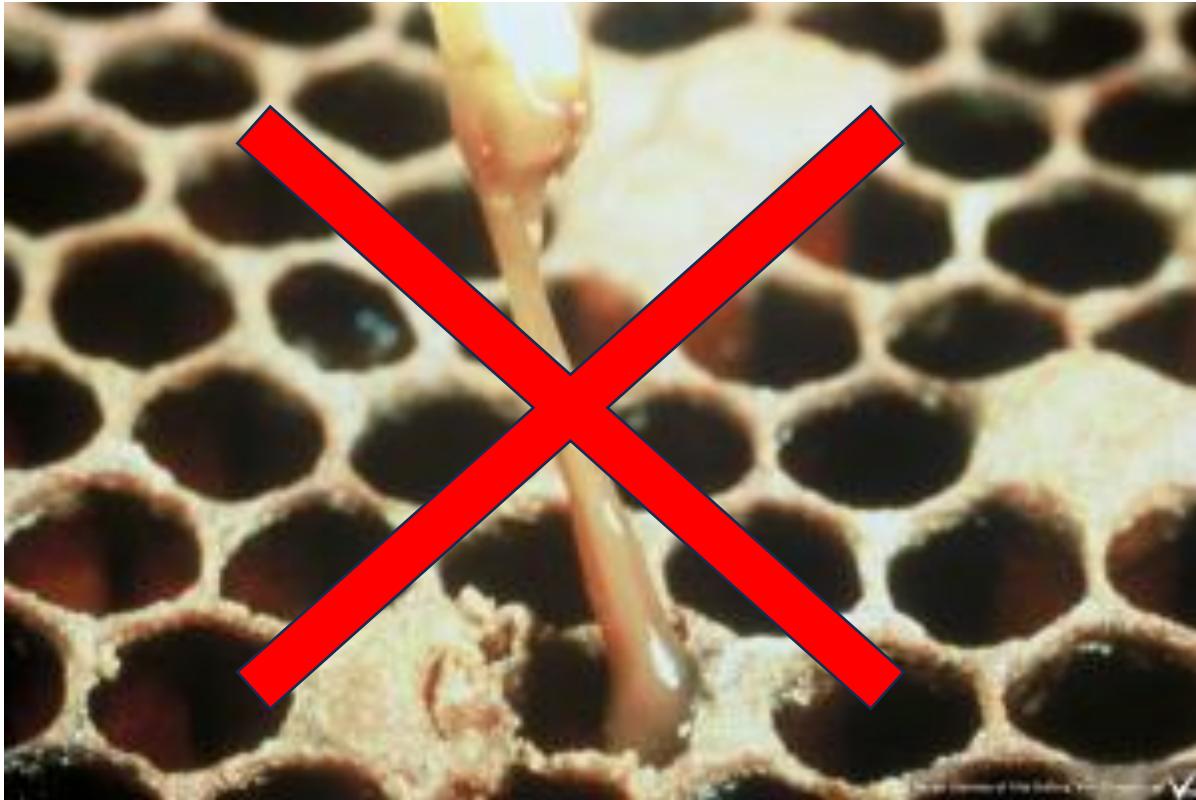


Photo courtesy of Vita Bee Health



Photo courtesy of Meyer Bees

Antibiotics can only be used with a prescription.

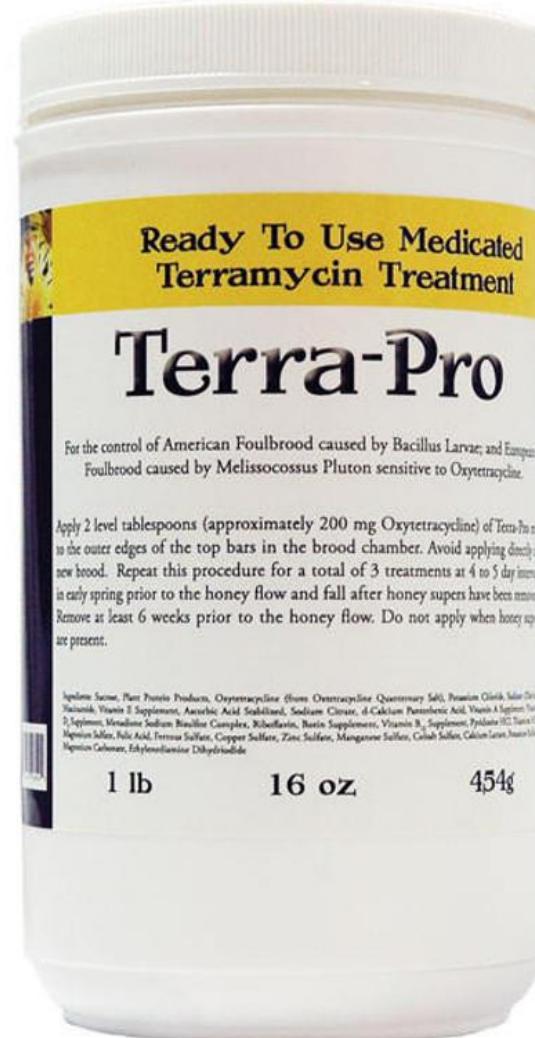


Photo courtesy of Mann Lake



Fungi

Chalk brood is most common when humidity is high.



Dysentery is the most common sign of Nosema.



Photos courtesy of Ray Civitts, mountainsweethoney.com



Photo courtesy of Mann Lake

Mold can usually be cleaned up by a strong hive.



Photo courtesy of Chris Kulhanek



Photo courtesy of Honey Bee Suite

Viruses

Deformed wing virus is usually associated with high varroa infestations.



Paralysis viruses cause bald, “greasy” bees.



Photo courtesy of The Food And Environment Research Agency (Fera), Crown Copyright

Black queen cell virus
kills developing queens
and turns the queen cell
a dark color.



Other hive visitors

Mud daubers love nesting in empty hives.

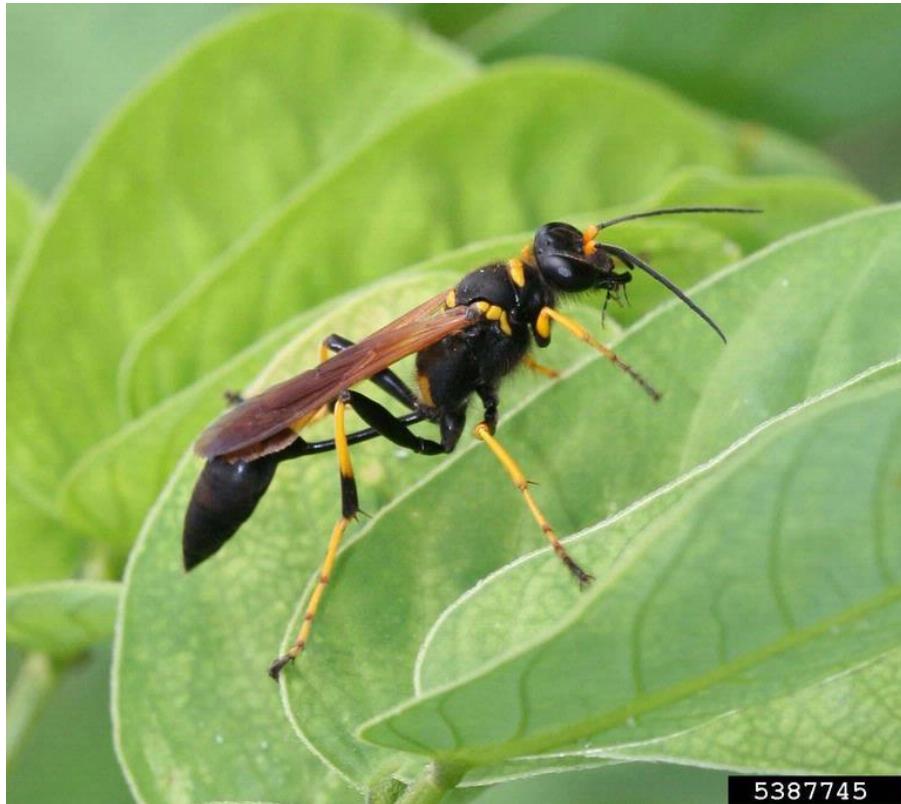


Photo courtesy of Johnny N. Dell, Bugwood.org



Photo courtesy of Mohammed El Damir, Bugwood.org

Paper wasps generally leave bees alone.



A praying mantis
will never kill
enough to hurt a
colony.



Bumble flower beetles can't eat enough honey to hurt a colony.



References

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