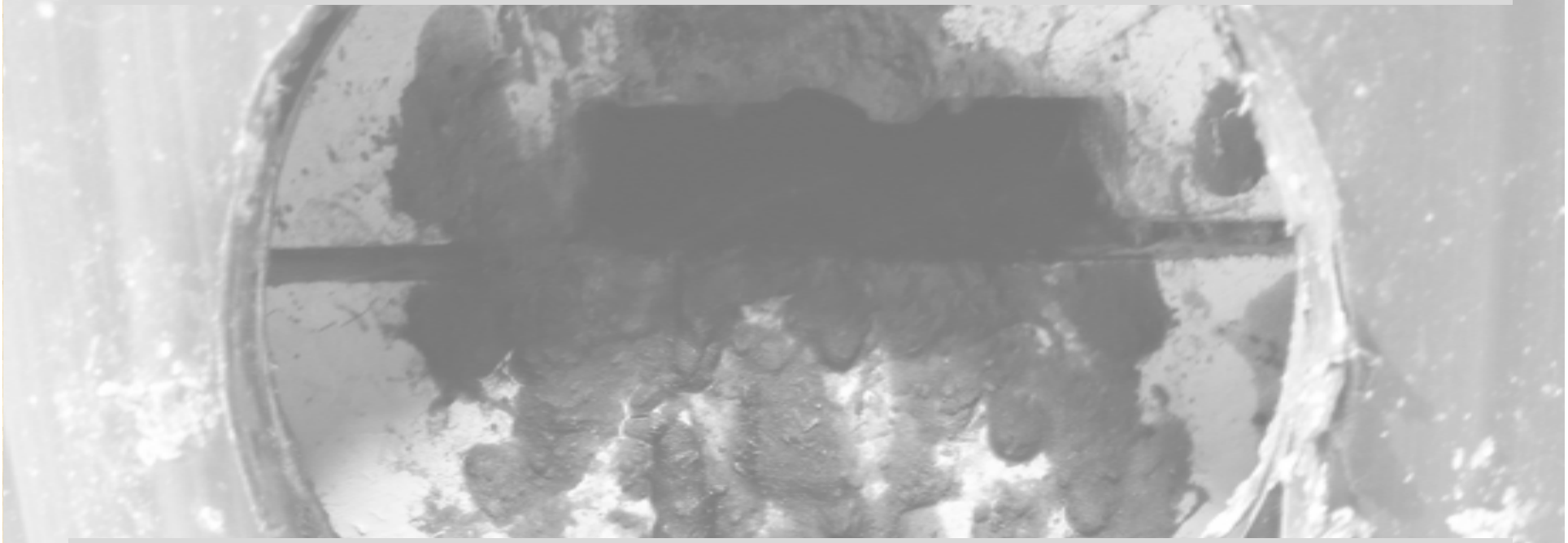
INTEGRATED PEST MANAGEMENT

May 15th, 2011

Disease & Pest Identification



CAPA Honey Bee Diseases and Pests Publication.

OBA Beekeeping Manual

Tech-Transfer Website - http://techtransfer.ontariobee.com

American Foulbrood (AFB)

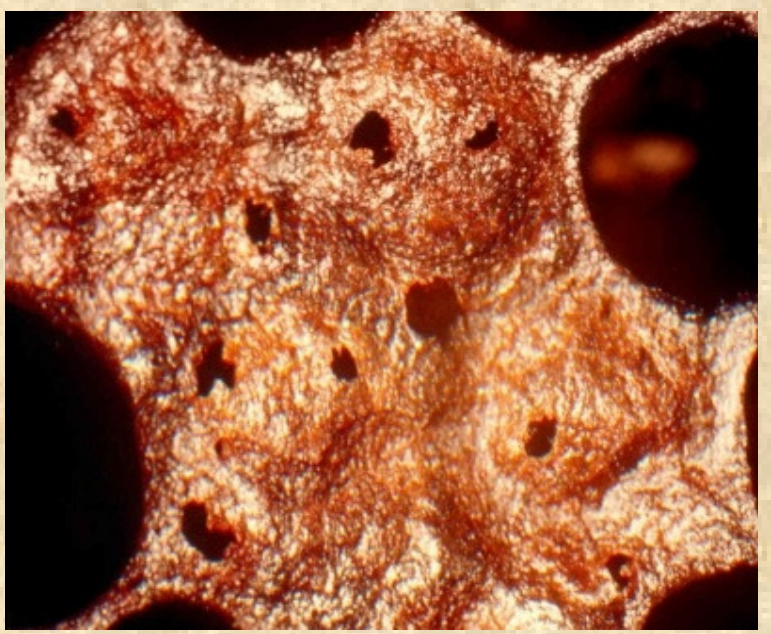
- A bacteria affecting brood (*Bacillus larvae*)
- Found on every continent
- Spores remain viable indefinitely on beekeeping equipment
- Larvae are susceptible up to 3 days after hatching
- Spores germinate in the midgut, then penetrate to body cavity
- Spread by robbing and drifting bees and through transfer of hive equipment

AFB

- Combs of infected colonies have a mottled appearance
- Cell cappings containing diseased larvae appear moist and darkened
- Larval and pupal colour changes to creamy brown, then dark brown
- Unpleasant odour in advanced stages
- Death in the pupal stage results in the formation of the pupal tongue
- Diseased brood eventually dries out to form characteristic brittle scales adhering tightly to the cell wall

- Monitoring - visual exam every time hive is opened

AFB



AFB Diagnosis

- Ropiness test

Use twig or matchstick to 'stir' larvae
2 cm 'rope' will be attached to stick

- Microscopic examination

Spores resemble slender rods in chains

European Foulbrood (EFB)

- A bacteria affecting brood
- Not as widespread as AFB
- Larvae are infected by nurse bees

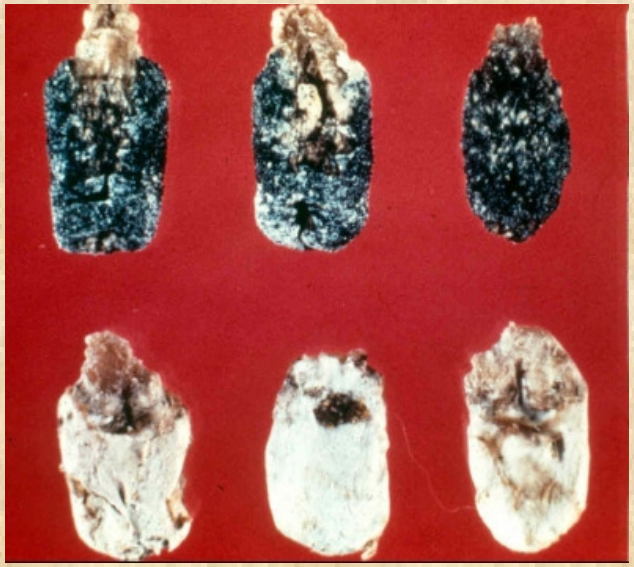
EFB

- Twisted larvae
- Slight ropiness
- Monitoring - visual exam

Chalkbrood

- A fungus affecting brood
- Patchy brood
- White/black “mummies” in cells, at hive entrance, on bottom board

- Monitoring - visual exam



Sacbrood

- A virus affecting brood
- Patchy brood, punctured cells
- Larvae are like a watery sac
- Shriner's shoe

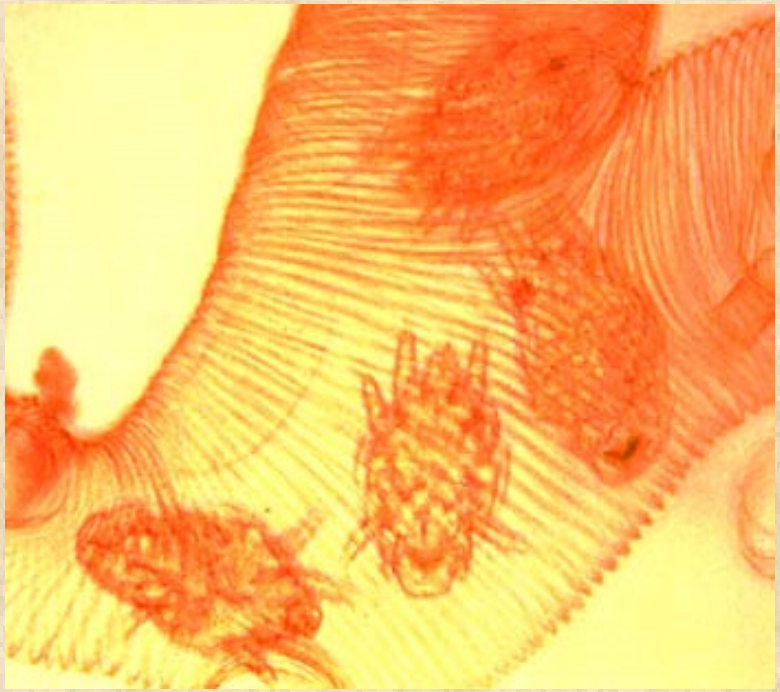
- Monitoring - visual exam

Honey Bee Tracheal Mites (HBTM)

- A parasite affecting adult bees (*Acarapis woodi*)
- No visible symptoms

- Monitoring - sample bees in alcohol for dissection

HBTM



HBTM

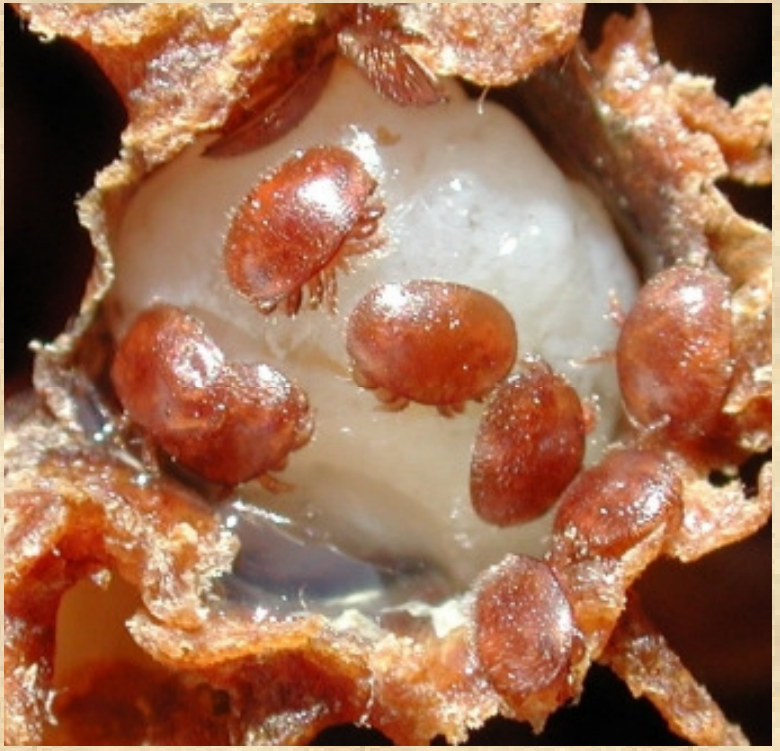
- Parasitic mites found in prothoracic trachea of adult bee
- Mite enters trachea through spiracle near base of wing and lays eggs
- Mature females leave trachea, crawling onto the exterior of the bee to seek a new host

HBTM

- Mites puncture the tracheal wall and feeding on the bee's hemolymph
- Wounds affect the health of the bee
- Large numbers of mites cause a physical blockage
- Bee respiration is affected
- Infested colonies will have decreased honey production and higher winter mortality

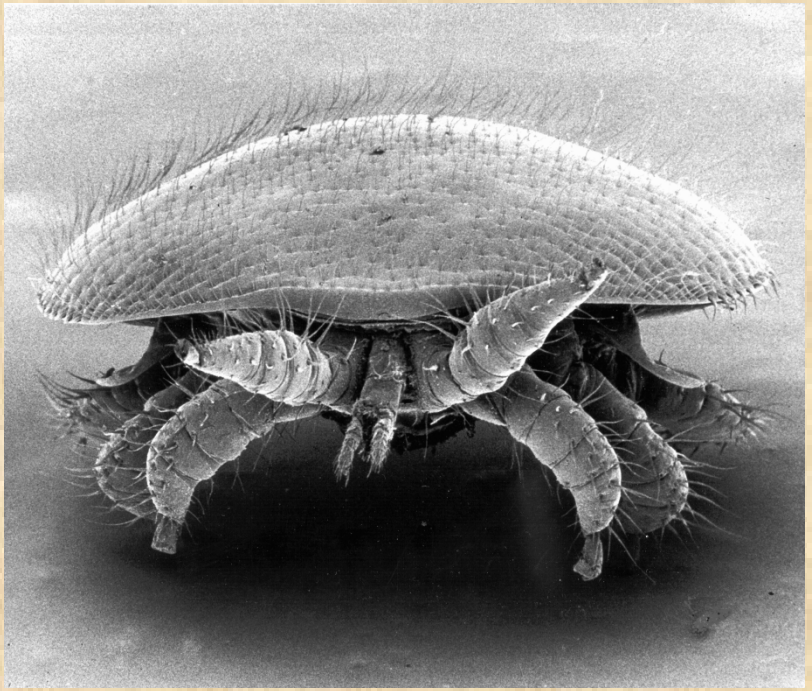
Varroa Mites

- External parasite of the honey bee (*Varroa destructor*)
- Will infest adults, larvae and pupae
- Visible to the unaided eye



Varroa Mites

- Fertile females enter brood cells, soon to be capped, to reproduce
- Each varroa can go though several reproductive cycles
- They are able to develop resistance to some treatments



Varroa Mites

- Tattered wings on emerging bees
- Patchy brood
- Mites on bees, comb

- Monitoring - visual exam of bees and brood, ether roll, alcohol wash, sticky board, sugar dusting

Nosema disease

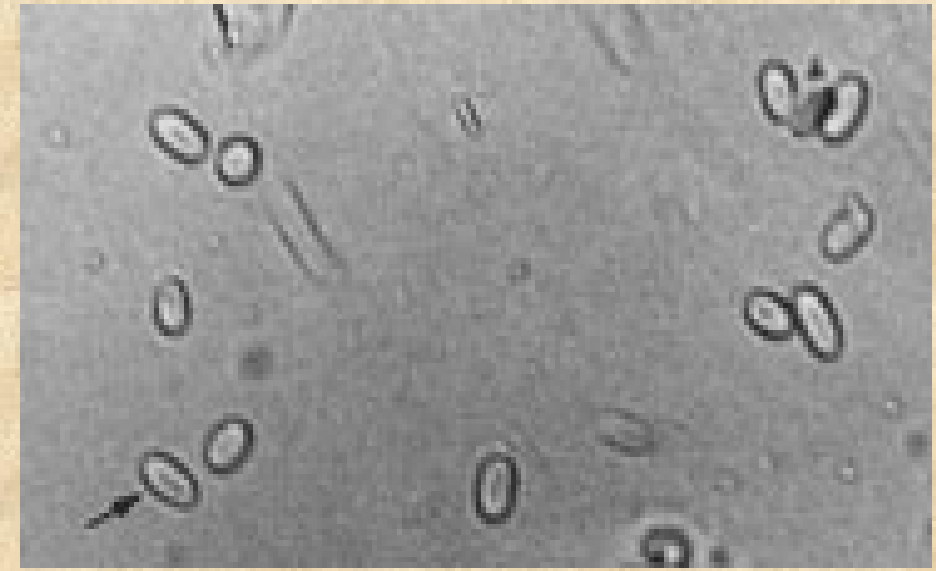
- Caused by microsporidians: *Nosema apis* & *Nosema ceranae*
- Most widespread of adult bee diseases
- Reduces bee's lifespan

Nosema apis

- Disjointed wings
- Distended abdomen
- Loss of sting reflex
- Defecation inside and on hive
- Infection spread by bees cleaning fecal matter

Nosema apis

- Microscopic examination of bees or fecal matter
- *Nosema apis* spores are large, oval bodies
- Develop within cells lining the gut
- Monitoring - collect bees or fecal matter
- Highest levels observed in spring



Nosema ceranae

Symptoms of *N. ceranae*:

- GRADUAL COLONY DEPOPULATION, YEAR ROUND
- HIGHER FALL/WINTER MORTALITY
- LOW HONEY PRODUCTION

Dysentery not associated with *N. ceranae*

N. ceranae considered to be more aggressive than *N. apis*

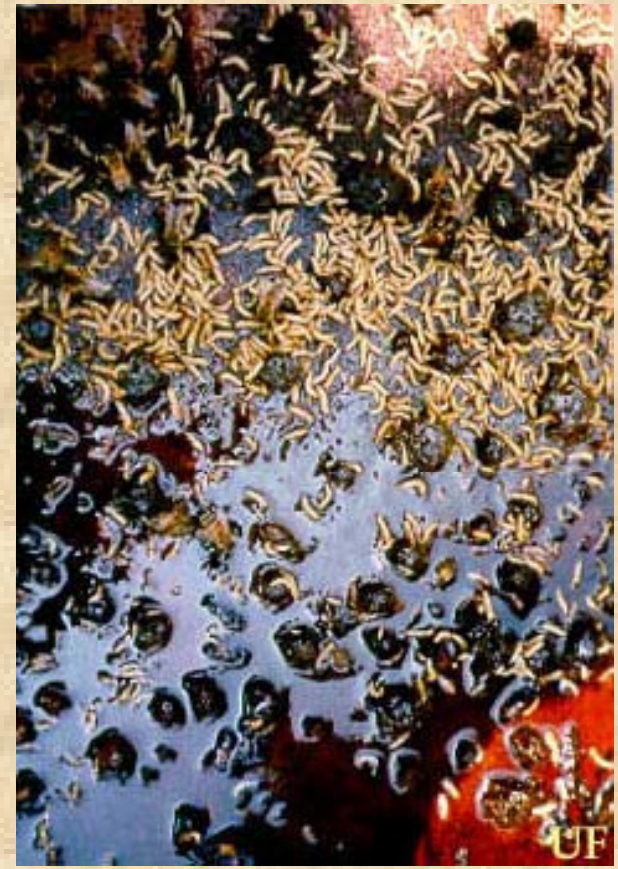
Small Hive Beetle

2006 - Found in Alberta & Manitoba
2008 to 2010 - Found in Quebec, at U.S.A. border, in Sentinel Hives
2010 - Found in Southwestern Ontario
2011 - Found in queen cages from Hawaii.

Small Hive Beetle

* BLACK OR DARK BROWN
* 5 - 7 mm LONG
* 3 - 4.5 mm WIDE
* CLUBBED ANTENNAE
* SHORTENED WING CASES
* BEETLES MOVE QUICKLY AND WILL TRY TO AVOID LIGHT
* FEED ON BEE EGGS AND POLLEN

SHB Larvae



* 10 - 13 mm LONG
* ROWS OF SPINES ON BACK
* 3 PAIRS OF PROLEGS
* FEED ON POLLEN AND BROOD
* BURROW THROUGH WAX
* CONTAMINATE HONEY
* LEAVE HIVE TO PUPATE IN SOIL

Small Hive Beetle

- Adults feed on bee brood, pollen and rotting fruit
- Females lay eggs within hives
- Eggs are 1.2 mm long and white
- Eggs hatch into larvae after 2 to 4 days
- Larvae are mature by 21 days at most
- Larvae burrow through wax and can contaminate, honey
- Larvae leave hive to find soil to pupate

SPREAD OF SHB

While the beetle is spread mainly by the movement by beekeepers of beehives and bees, direct spread by flying beetles up to seven kilometres is possible.

The beetle pupates in the soil, so the movement of soil from apiary sites could possibly spread infestation.

Wax Moth

Adults 1/2 to 3/4 inches long and grayish in color
Female deposits eggs in cracks
The larvae grows to about an inch length
Larvae causes most damage
Web like strands, spin cocoons, deep burrows

Symptoms of wax moths:

1. Live larvae (wax worm) and webbed like tunnels in combs.
2. Cocoons attached to wooden parts of frames and hive body.
3. Destroyed comb.

Other Pests

Bear - complete destruction of hives, equipment scattered around, fecal matter in yard, foot prints

Raccoon - scratch marks at front of the hive, fecal matter

Skunk - similar to raccoon, smell!

Mice - nests in extra equipment, fecal matter in equipment, holes chewed in frames, equipment

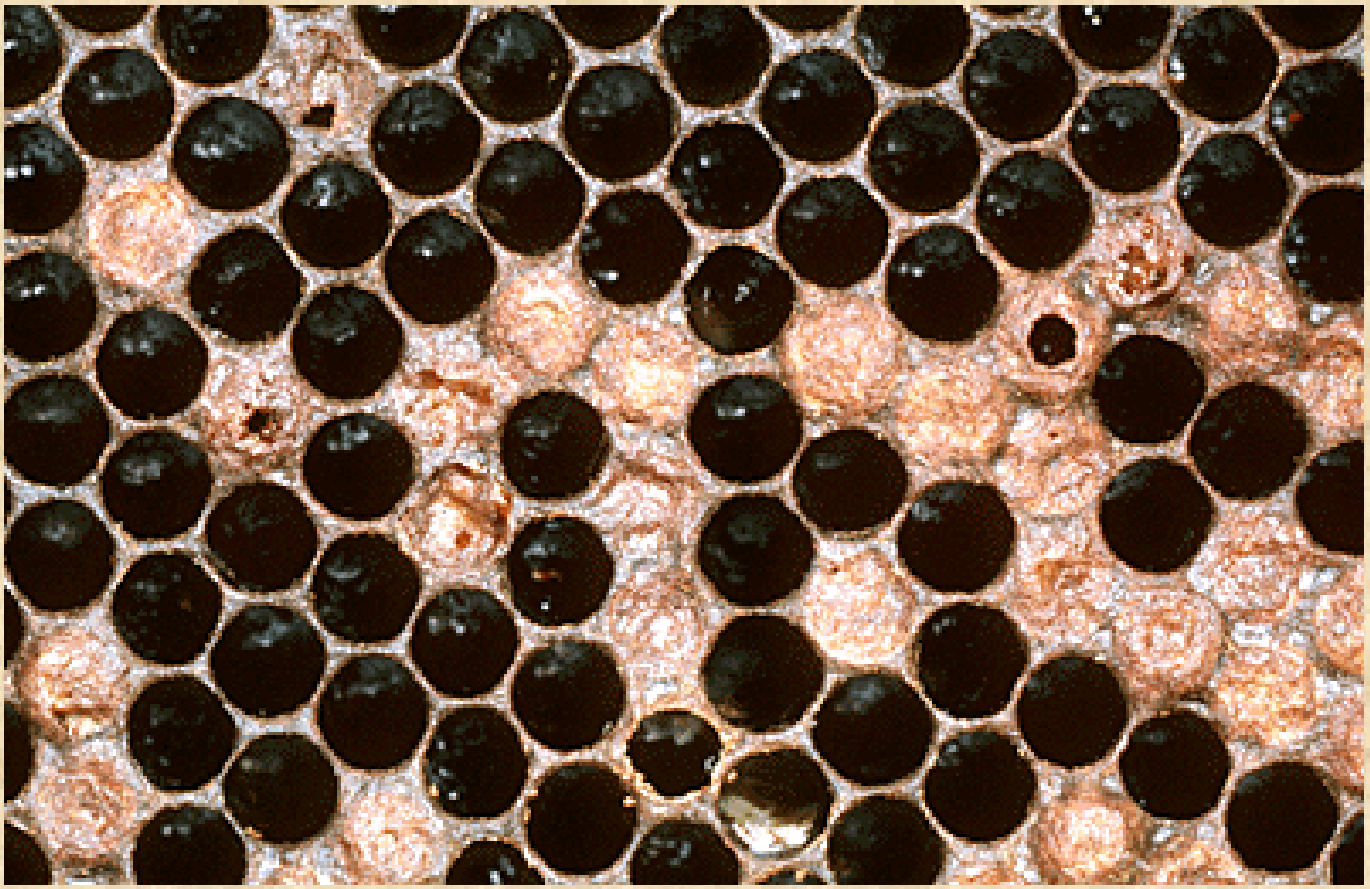
See Manual, books, websites for more information.

TIME FOR A QUIZ!

Name the Disease

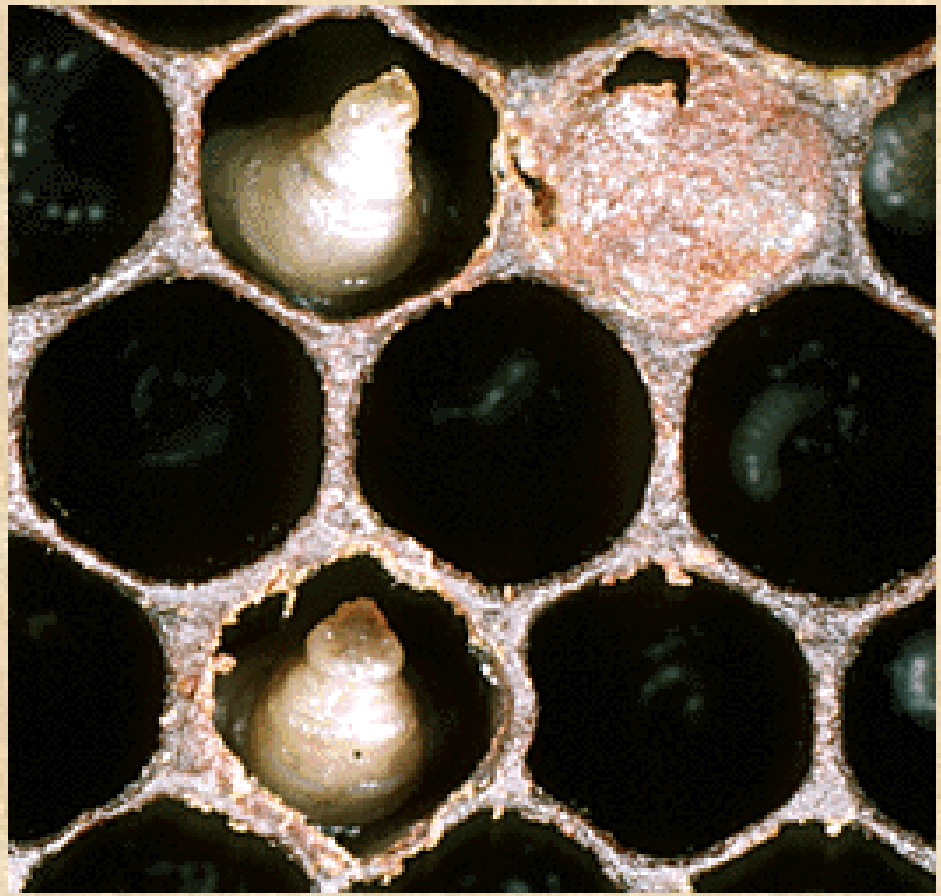
- Chalkbrood

Name the disease



- AFB

Name the Disease



- Sacbrood

Name the Disease

- No problems here!

Any Questions?