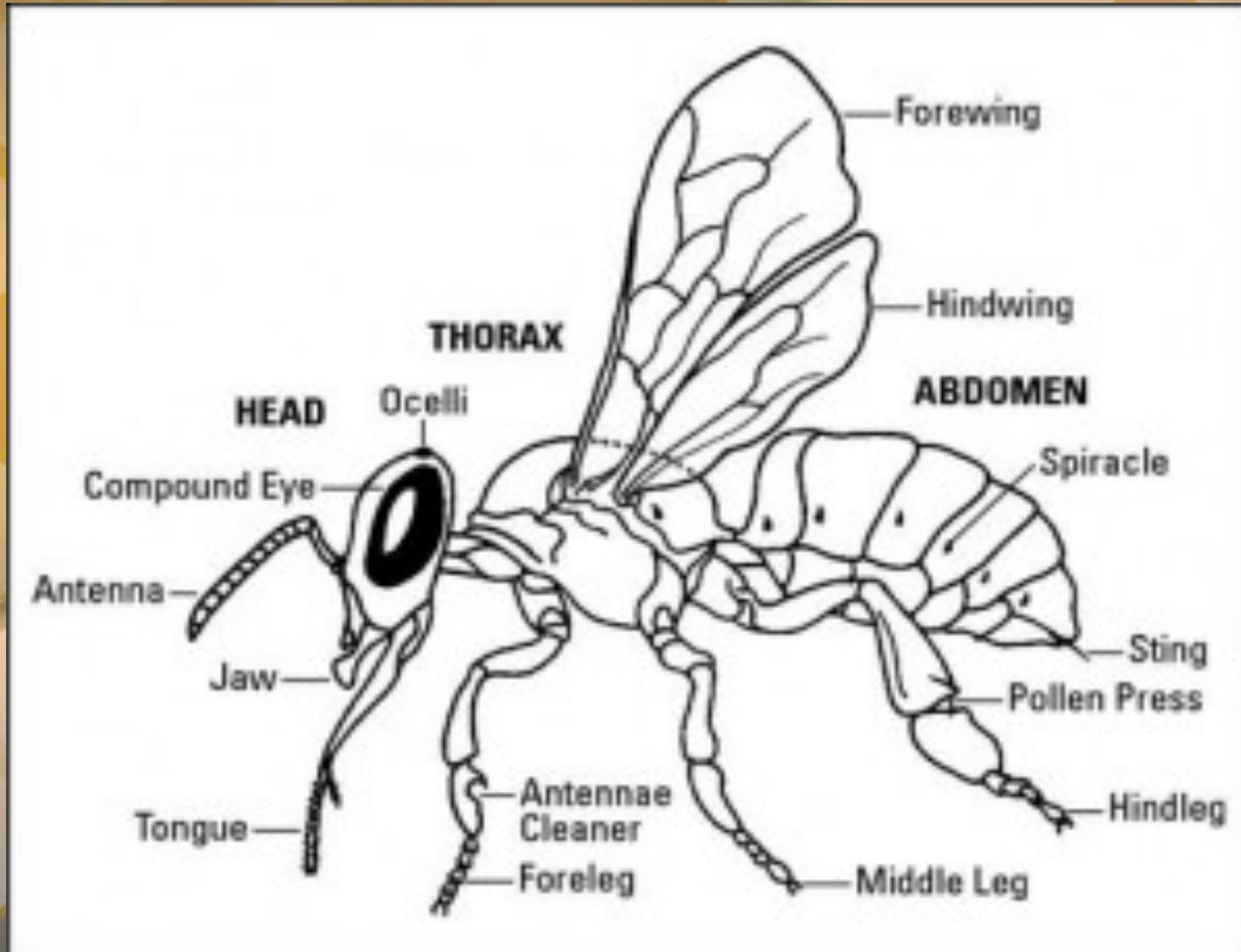


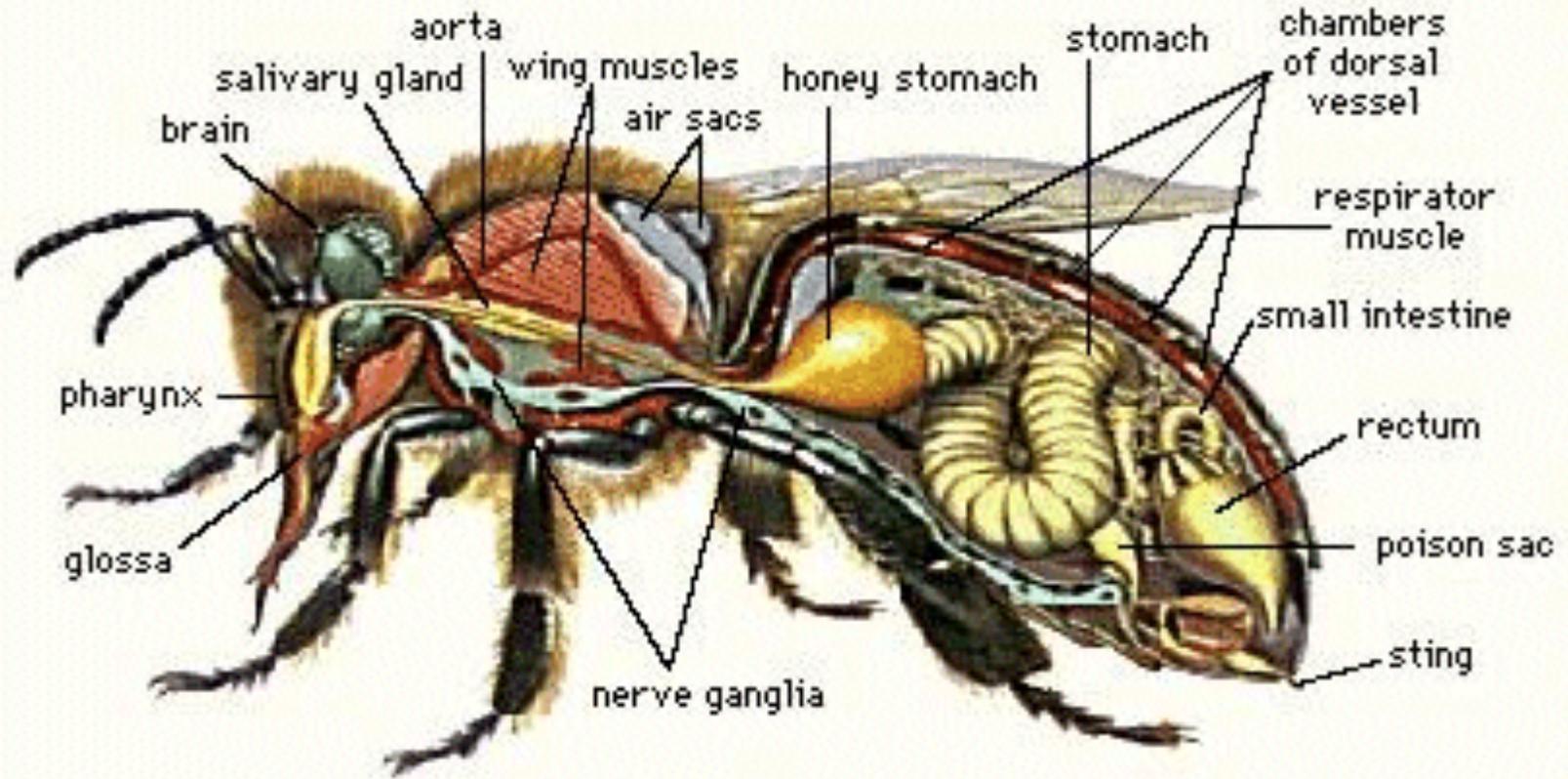
Bee Biology

Presented by Rick Moranz

Basic Bee Body Parts



Internal anatomy



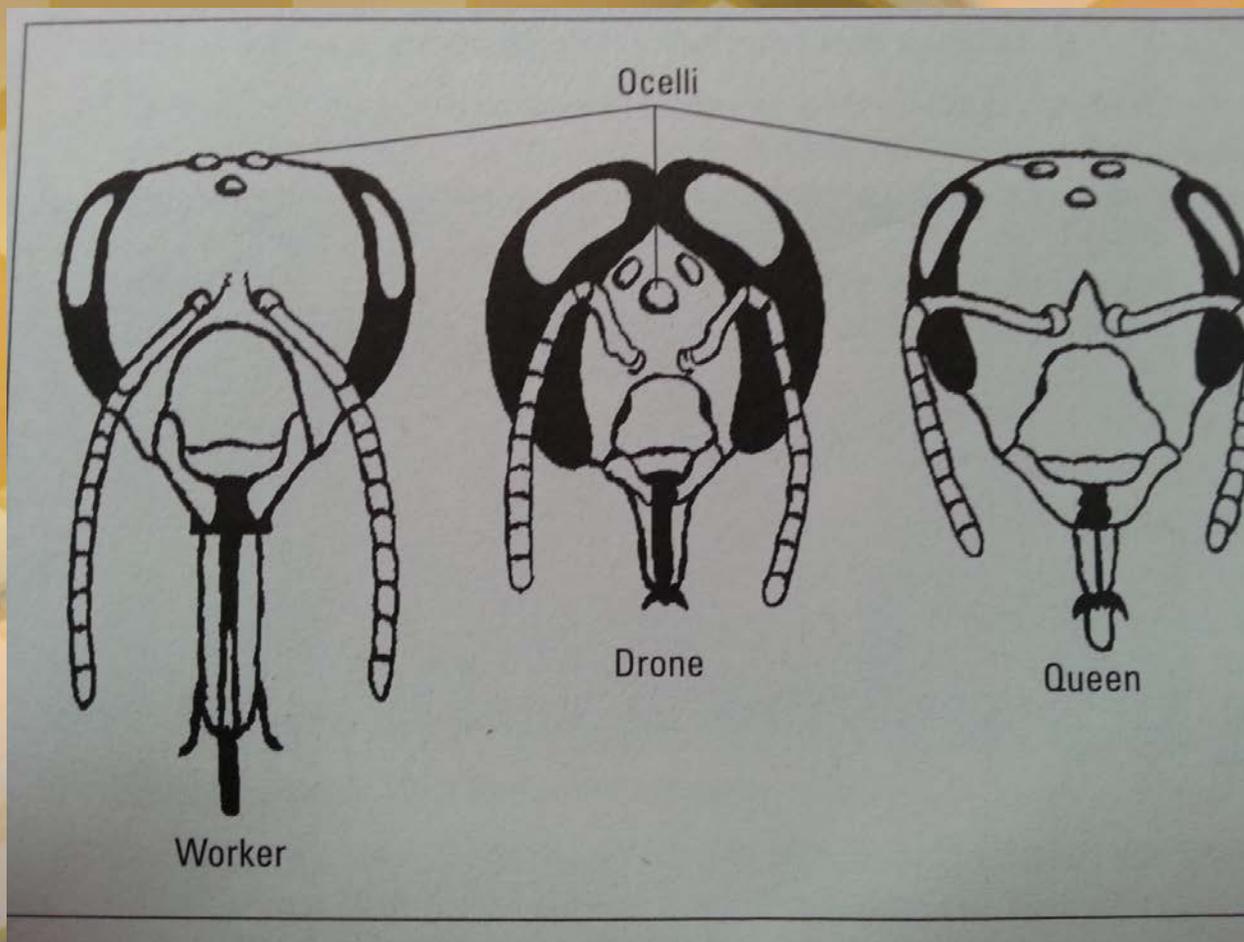
Bee secreting wax



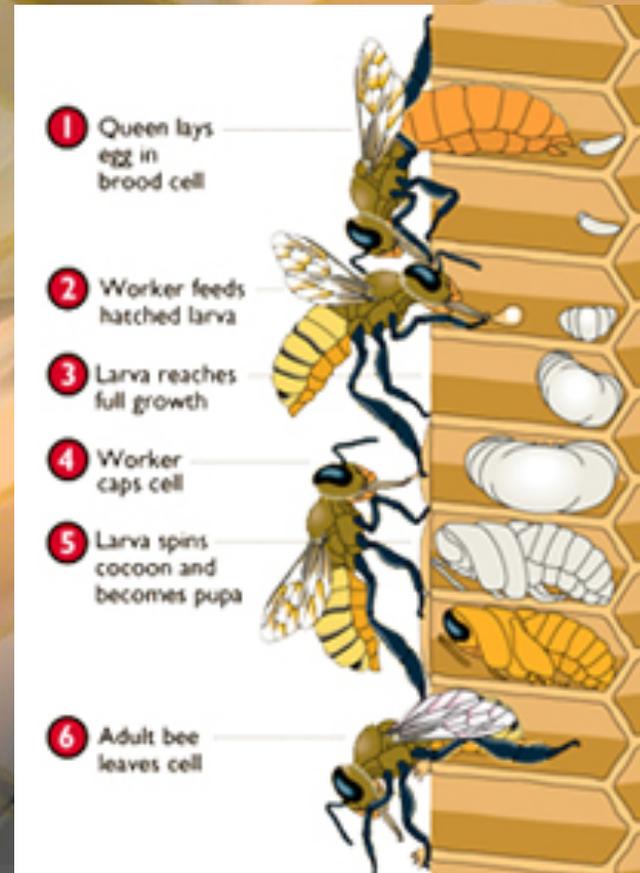
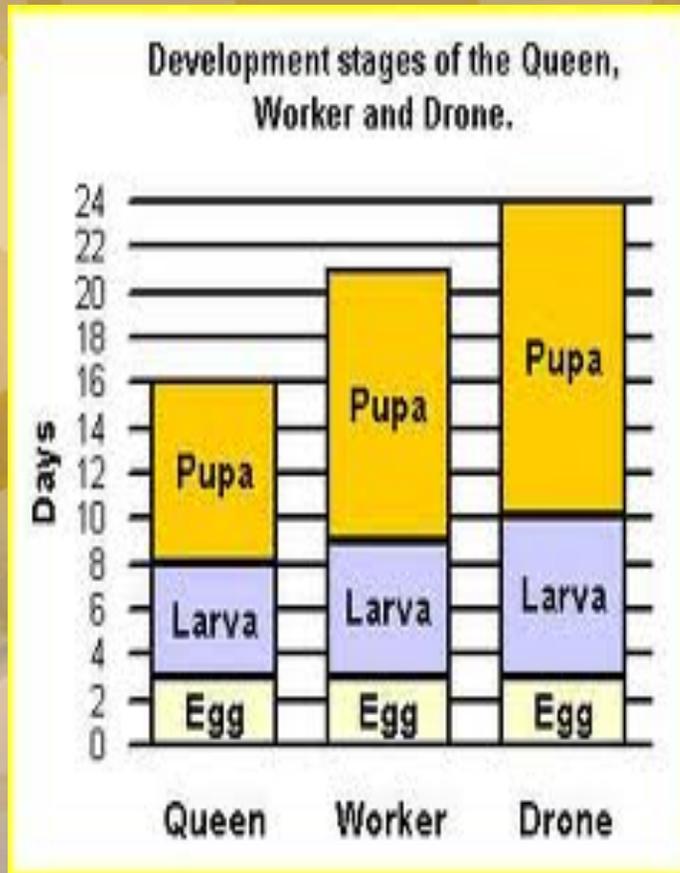
Bee Castes



Head Comparison



Development from egg to adult



Worker Duties

- Cell-tending worker - first 2 days cell cleaning, capping, keep brood warm.
- Feeding worker - 3 to 11 days old feed larvae and tend to queen.
- Housekeeping worker - 12 to 17 days old produce wax, build combs, pack pollen, receive and transport nectar within the hive.
- Guardian worker -18 to 21 days old ventilate and guard the hive
- Field worker 22 days and older collects pollen, nectar, propolis, and water specialize in the collection of either pollen (protein) or nectar (carbohydrates).

Queen mating flight

http://www.liveleak.com/view?i=333_1379000243

Queen laying eggs

http://www.youtube.com/watch?v=cPJCXB-ch_A

Larvae developing and emerging worker

<http://www.arkive.org/honey-bee/apis-mellifera/video-09b.html>

Different ages of bee larvae



www.beeidgraphy.com

© Zachary Y. Luang

Capped brood, larvae, pollen and honey



Queen cells, capped worker brood, larvae and eggs



Stinging



Bee Communication: Pheromones

- **Queen Pheromone:**
 - Lets the colony know it is in residents
 - Stimulates many worker bee activities
 - Acts as a sex attractant to potential suitors
 - Regulates drone population in hive
- **Worker Pheromone:**
 - Helps guide foraging bees back to the hive
 - Triggers sudden aggression from colony
- **Brood Pheromone:**
 - Lets workers know:
 - Brood's gender
 - Stage of development
 - Feeding needs



**Using the Nassanoff gland to
guide other worker bees**

**Workers attending to
Queen**



Choreographic

HONEY BEE DANCE COMMUNICATION

After foraging, a bee performs a complex dance to communicate information about its source of food

Dance Sequence

A. Waggle run

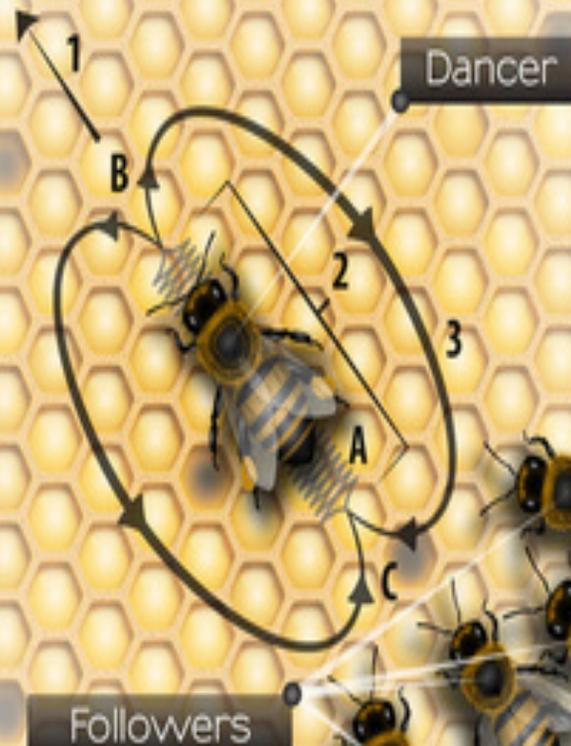
Bee vibrates abdomen from side to side and moves in a straight line

B. Turn

Bee turns left or right (alternating) after waggle run

C. Return

Bee returns to waggle start position



Dance Language

1. Food Direction

Orientation of waggle

2. Distance to Food

Length of waggle

3. Quality of Food

Number of dance repeats (1 - 100)

"Liveliness of the dance"

Dance followers observe the dance and interpret the information encoded within it

Reference: Couvillon. 2012. Insect. Soc. 59: 297-306

a science fried art infographic

<http://www.youtube.com/watch?v=-7ijlg4iHlc>

Seasonal Management

WHAT TO DO	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
catch up on reading	x	x										x
Check for activity on warm winter days, remove dead	x	x	x									x
Get equipment ready	x	x	x									x
Check food reserves	x	x	x					x	x	x		
Feed if low on capped honey	x	x	x	x			x	x	x	x		
Check for eggs and queen			x	x	x	x	x	x	x	x		
Reverse hive bodies and clean bottom board				x				x	x			
Install new bees				x	x	x						
First comprehensive inspection of season			x	x								
Check for capped brood and brood pattern			x	x	x	x	x	x	x			
Feed a pollen substitute		x	x	x								
Look for swarm cells				x	x	x	x	x	x			
Add and check honey supers				x	x	x		x	x			
Harvest honey						x	x	x	x			
Check ventilation							x	x		x	x	
Medicate for nosema			x	x					x	x		
Check for small hive beetle and put traps in				x	x	x	x	x				
Treat tracheal mites with grease patty or menthol				x	x	x		x	x	x		
Test for varroa mites treat with powdered sugar, drone comb, or other				x	x	x	x	x	x			
Prepare hives for winter									x	x	x	
Add mouse guard									x	x		
Check entrance for blockage	x	x	x									x
Order new bees	x	x	x									
Split strong colonies				x	x	x						
Requeen				x	x			x	x			

Feeding

Pollen patty



Sugar syrup

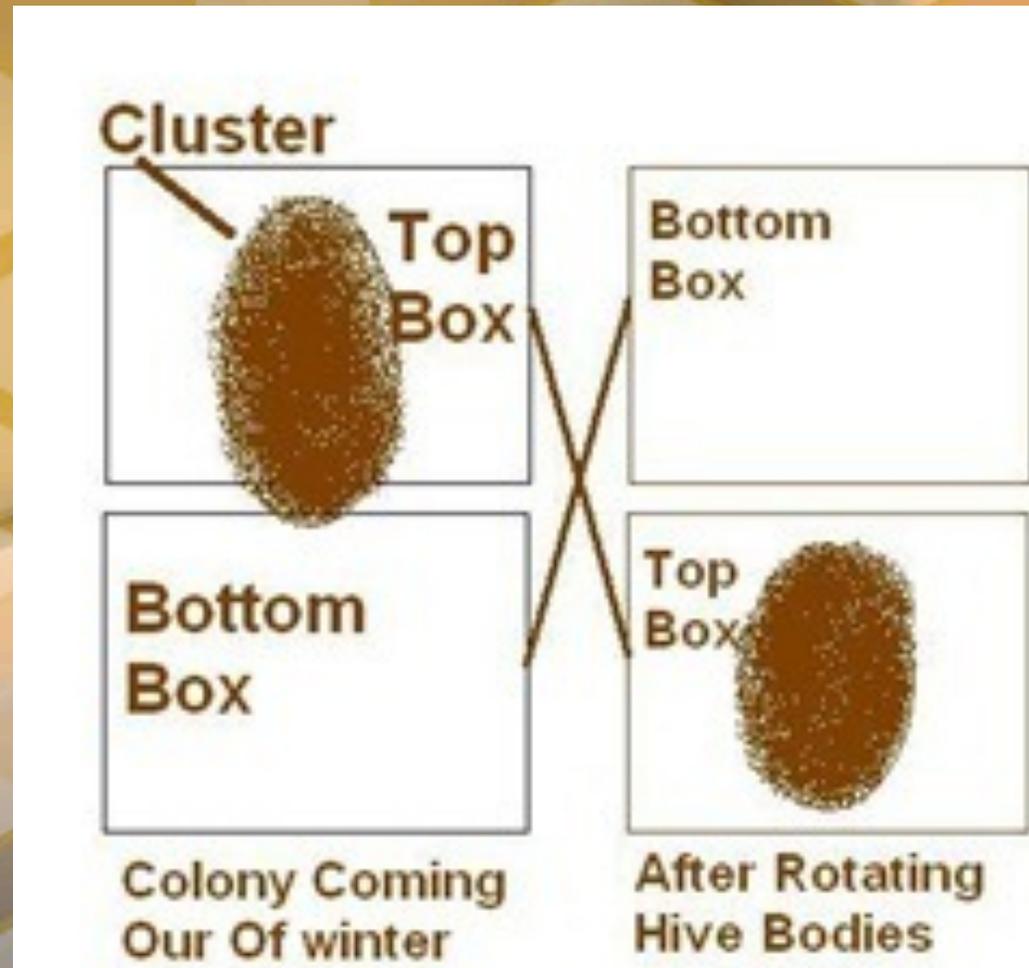


Treating for Nosema

Add Fumagillan to spring and fall syrup feeding. No honey supers on.



Reverse hive bodies in spring



Checking for eggs and queen



Laying worker



Checking brood pattern



Good

Bad



Swarm cells



Tracheal mite treatment

Recipe for grease patty

1 part crisco
2 parts sugar



Varroa mite control

Drone comb



Powdered sugar shake



Small hive beetle control

Fill half way with
vegetable oil



Trap placement



Check ventilation



Prepare hive for winter

- **Install mouse guard**
- **Check food reserves**
- **Feed**
- **Treat for varroa mite**
- **Ventilate**

Advantages of GCBA

- **Providing seasonal bee education**

- **meetings**
- **field day and conference**
- **mentors**

- **How to participate**

- **Come to meetings**
- **Ask questions**
- **Use a mentor**
- **Make new friends**
- **Volunteer**