

Honey Bees

Gary Keuffer

Different Types of Bees Worldwide ~25000



Bees in the United States ~4000



NATIVE BEES OF EASTERN NORTH AMERICA

PHOTOS BY CLAY BURY | AMERICANBEEKEEPERSOCIETY.COM | WILDLIFEINFORMATIONSERVICE.COM



Bees in Ohio ~500



Bald-faced Hornet *Dolichovespula maculata*



European Hornet *Vespa crabro*



German Yellowjacket - *Vespula germanica*



European Paper Wasp

Polistes dominula



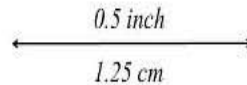
Honey Bee

Apis mellifera



Common Eastern Bumblebee

Bombus impatiens



Bees, Wasps, and Other Beneficials

How Different Types of Bees Live - Colonies



How different bees live solitary



Native Bees

- Bumblebees - A generalist bee that dwells in a social society in the ground
 - Mated queen only lives through the winter
- Carpenter Bees – nests in wood
- Sweat Bee – nests in the ground
- Mason Bees – nesting holes
- Squash Bees – a specialist bee that nests in the ground



Honey Bees

- Honey Bees are not native to the US.
 - They were introduced in 1622 from Europe
 - By 1853, Honey bees had made it all the way to California
- Far and Away the most important pollinator
- Why?
 - 50,000 to 60,000 bees in the colony during summer
 - Easy to transport
 - Timing can be controlled to assist pollination of crops



What Does the Honey Bee Do? Honey



What Does the Honey Bee Do? Pollination



Why is Pollination Important?



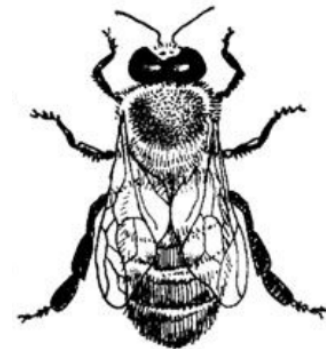
Who are the Bees and their Duties

- Colony is 99% female
- Workers - females with various duties throughout colony
 - Cleaning; nursing young; security; care for the Queen, foraging, etc
- Drones – Males. Only duty is to mate with a queen
- Queen Bee – Most important bee in the colony

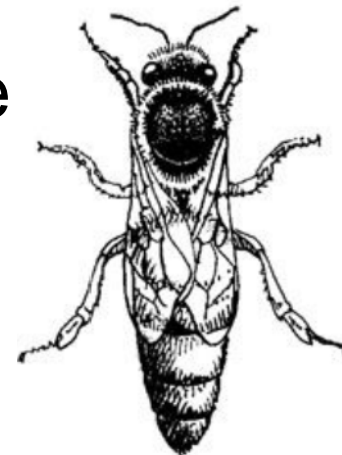
Worker



Drone



Queen



Parts of the bees

A Honeybee

Two **antennae** help the bee touch, taste and smell.

Big eyes are made up of many tiny parts. These **compound eyes** see all around.

This long tongue is called a **proboscis**. The bee uses it to sip nectar from flowers.

Sturdy **wings** let a bee fly up to ten hours a day.

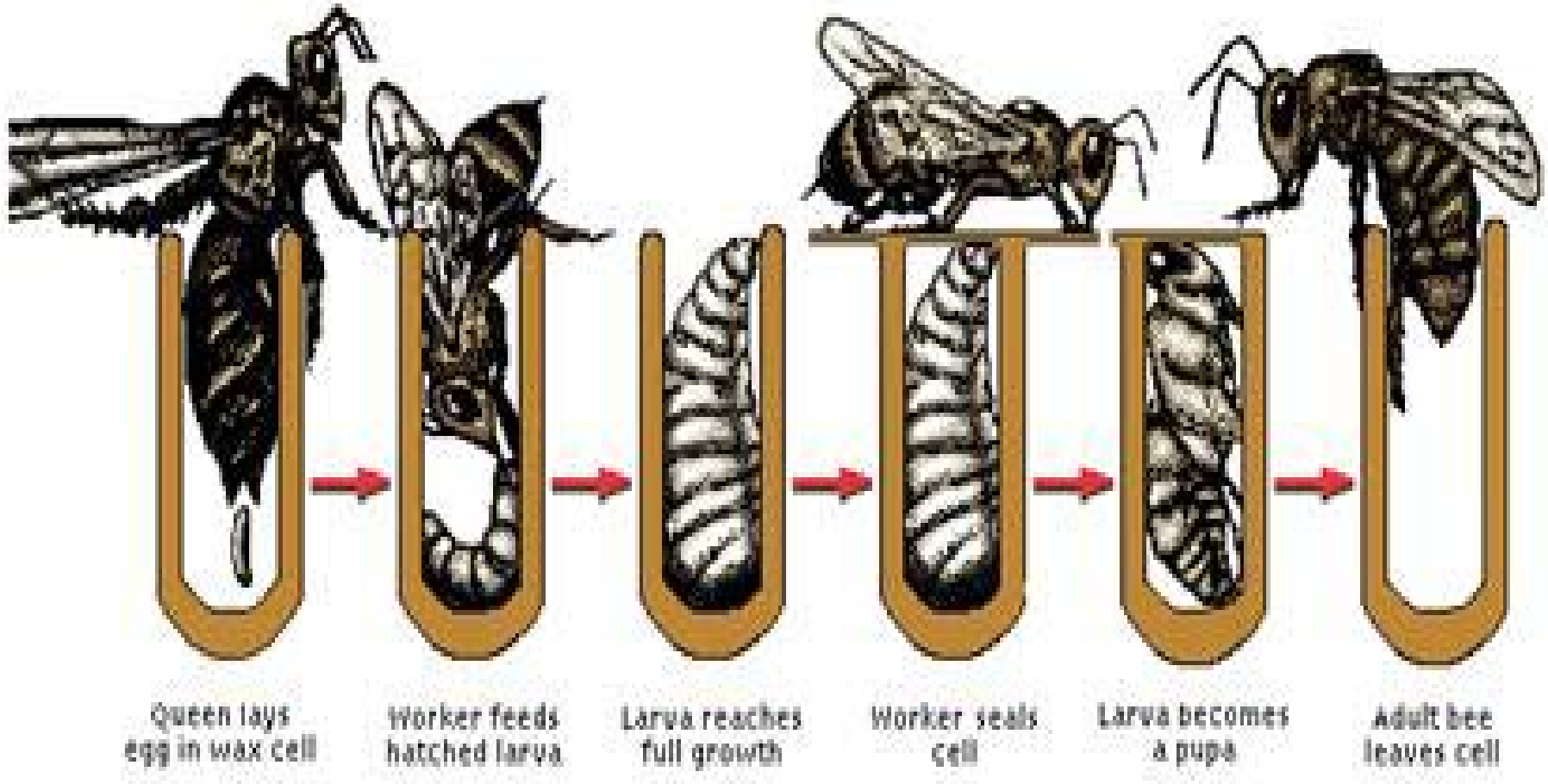
The **honey stomach** stores nectar and turns it into honey.

Bright **stripes** warn enemies away.

The sharp **stinger** pokes out only when the bee is about to sting.

Pollen baskets hold the pollen (flower dust) that a bee collects. Bees feed pollen to their babies.

How Do Bees Develop?



Honey Bees

- Highly social Insects
- Live in dense colonies
- Require a sophisticated set of senses for communication
- Use senses for seeking food to threat detection



Honey Bees

- Most bees sensory organs are located in their two antennae
 - Drones : 15,000 sensors
 - Workers: 3000 sensors
 - Queens: 1500 sensors
- Antennae can smell, touch and taste
- Sensors can tell temperature difference of 0.5 C
- Detect humidity and CO₂ levels in the hive
- Detect difference between full sister and half sister



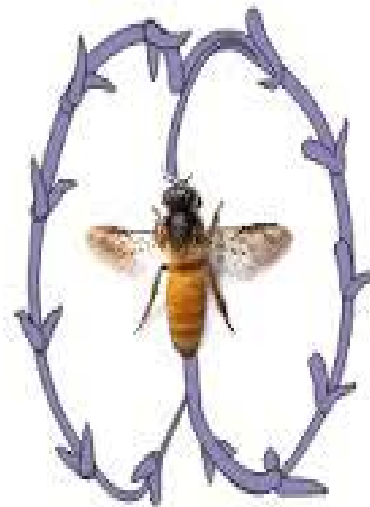
Honey Bee Communication

- Movement

- Dance Language- Worker bees perform a series of movements to teach other workers the location of the food sources
- Round Dance – 10 to 30 meters away from hive
- Waggle Dance- 40 meters or more from the hive



round dance



waggle dance

Honey Bee Communication

- Touch
 - Feel vibrations –In the air and on the comb
 - Touch during dance language
 - With unusual vibrations they become upset and suspect danger
 - Touching spreads pheromones through contact



Honey Bee Communication

- Sound
 - Sounds transmitted during round and waggle dances
 - Buzzing of worker bees when the hive is disturbed
 - Queen bees piping, quacking and tooting



Honey Bee Communication

- Taste
 - During dance language – a sampling of nectar
- Smell
 - Honey bees have 170 odor receptors in their antennae
 - Their sense of smell is 100 times more refined than a human's
 - Bees can smell a flower or toxin from at least two miles away
 - Detecting airborne pheromones



Honey Bee Communication

- Pheromones
 - Each task in the hive is regulated by different pheromones
 - Often a combination of different pheromones
 - Bees sense pheromones in different ways
 - They can smell with their antennae
 - Touch pheromones with their mouth ,feet and antennae
 - Virtually all bees activities are directly stimulated and coordinated to a large degree by pheromon



Bee Breeds and Characteristics

- Types of Bees
 - Italians
 - Carniolans
 - Caucasians
 - Buckfast
 - Russians
 - Africanized
- Qualities to look for:
 - Gentleness
 - Spring Build-up
 - Over-wintering ability
 - Swarming
 - Propolis
 - Disease resistance

How Will You Obtain Bees?

- Order a 'package' of bees
 - 3 lb package; roughly 11,000 bees
- Buy a Nucleus colony (Nuc)
 - Pre-established 5-Frame colony
- Purchase an established colony
- Capture a wild swarm of bees

- Note: when buying it may be a good idea to get a 'Marked Queen'



How Many Bees in the Hive?

- Spring
 - Population builds up for swarming and nectar flow
- Summer
 - Population peaks 60,000 ~ 80,000
- Fall
 - Population declines; Drones cast out
- Winter
 - Population at lowest during year 10,000 ~ 15,000

Products of the Bee Hive

- **Honey**
 - All natural sweetener
- **Beeswax**
 - Used for furniture polish, cosmetics, creams, candles, etc
- **Propolis**
 - Used in medicine for its antibacterial and antifungal properties
- **Pollen**
 - Used by herbalists as a treatment for a variety of medical conditions such as allergies
- **Royal Jelly**
 - Collected and sold as a dietary supplement

How Honey is Made?

CHECK OUT HOW HONEY IS MADE!



A BEE GATHERS
NECTAR FROM FLOWERS



NECTAR GOES INTO
A SPECIAL HONEY STOMACH
CALLED A "CROP"

WHICH EACH BREAK DOWN THE
NECTAR IN THEIR CROPS
UNTIL IT BECOMES HONEY



THEN THE HONEY
GETS BARFED INTO
A HONEYCOMB CELL



AND FANNED BY THE
WINGS OF BEES TO



CONTENTS OF THE CROP
ARE SPIT UP INTO A NEW
BEE'S MOUTH



THE NEW BEE BREAKS DOWN
THE SUGARS OF THE NECTAR
WITHIN HER OWN CROP.

THIS PROCESSED NECTAR
IS PASSED ALONG TO
SEVERAL MORE BEES



LASTLY, IT'S SEALED WITH
BEESWAX TO KEEP IT SAFE
(UNTIL IT'S EATEN)



...did you
say barf?



What is a Bee Swarm?



Why Bees are Disappearing?

- Parasites
- Pesticides
- Pollution
- Lack of Habitat



Hive Location

- Is it legal?
- Be a good neighbor
- Location abundant with beneficial plants
- Access to clean water
- Not on top of a hill nor in valley
- Access to morning sun and south facing orientation

Apiary Registration

- Due by Jun 1
- Each beekeeper must complete one Registration form
- Multiple apiaries (sites) can be submitted on one form
- Each location costs \$5
- This supports the State/County inspection program
- Authority Ohio Revised Code section 909.02



8995 E. Main Street Bldg 23
Reynoldsburg, Ohio 43068
614 | 728 6373
apiary@agri.ohio.gov

APPLICATION FOR APIARY REGISTRATION

For certificate year _____, June 1 - May 31

THIS SECTION TO BE COMPLETED BY APIARY PROGRAM OFFICE		IDENTIFICATION NUMBER:	CERTIFICATE NUMBER:
Check applicable box:	<input type="checkbox"/> Registered Previously	<input type="checkbox"/> Additional Locations	<input type="checkbox"/> New Beekeeper
Company Name:			
Beekeeper Name:			
Address:			
City, State, Zip:		Phone:	
Email:		County:	

A registration fee of \$5.00 per apiary location (property address) is due. Make checks payable to "Ohio Department of Agriculture"

- Please include payment with application. **DO NOT SEND CASH.**
- Applications postmarked after June 1 are subject to a \$10.00 late filing fee.
 - Exceptions to the late fee: New Beekeepers or adding Additional locations.

Number of Apiary Locations: _____ @ \$5.00 each = Total Amount Enclosed \$ _____

Payment Method: Check # _____ Money Order # _____

Apiaries	# of Colonies	County	Township	Apiary Location Address or Description	Property Owner's Name	Are Queens or Nucs sold from or at this location?
1						<input type="checkbox"/> Yes <input type="checkbox"/> No
2						<input type="checkbox"/> Yes <input type="checkbox"/> No
3						<input type="checkbox"/> Yes <input type="checkbox"/> No
4						<input type="checkbox"/> Yes <input type="checkbox"/> No
5						<input type="checkbox"/> Yes <input type="checkbox"/> No

*Please write on back of form to provide inspector with additional directions and/or hive location information, if needed.
(GPS coordinates are helpful and appreciated; please indicate by Longitude and Latitude, in Decimal Degrees.)

My signature below certifies that the information provided above is true and accurate to the best of my knowledge.

Signature: _____ Date: _____

1st Year Goals



- Observe and learn
 - Learn from the bees
 - Research, read, attend bee school, etc
- Inspect hives periodically
 - Use checklist and keep records
- Facilitate growth and expansion of colony
 - Ensure bees have enough space to grow from ~11,000 bees to 50,000 ~ 60,000 bees during spring/summer
- Help the bees survive their first winter
 - The bees will need 60-70 pounds of honey for winter
 - May have to provide supplemental feeding
 - Normally no surplus for beekeeper during 1st year

Wrap up

- Order your bees
- Get and assemble your hive parts and equipment
- Buy tools and protective equipment
- Set up your hives in good locations
- Install your bees
- Register your hives
- Increase your knowledge – Bee school
- Enjoy yourself and the world of beekeeping!

Questions

