

INSECTS!

Entomology, the study of insects

Identify common insect pest of Northwest Ohio Crops

Communicate about insects

Use Information to manage insects

Describe process and acquire knowledge to obtain commercial operators license

Identify insect infestations remotely

ENTOMOLOGY

- The study of insects, traditionally included arachnids, myriapods, and crustaceans, but today only insects

INSECTS

- Benefits of insects?
- Two minutes to list as many benefits of insects as you can. GO!

INSECTS

- Value
 - Pollinators, 75% of agronomic crops need an insect pollinator
 - Biological control of other pest (insects are the largest consumer of insects, and weeds)
 - Environmental benefits, scavengers, soil improvements, medicinal benefits
 - Nutrition, (grasshoppers as protein source, honey) bird and other animal food
 - Industrial products, (silk, wax, shellac, dyes)
 - Aesthetic, how lovely is a butterfly?
 - Scientific research, Drosophila, fruit fly experiments

INSECTS

- 1.4 BILLION insects per person on Earth
- 1.3 million described insect species
 - 300 times as many described species of insects as all other members of the animal kingdom and many species have not been described!
- 1 million per acre

INSECTS

- Very different from other species
 - 6 legs
 - 3 body segments
 - 2 pair of wings
 - Unique life cycles (metamorphosis, complete and incomplete)
 - Breathing tubes
- Hand lens to review insects....

INSECTS

- Why study?
 - Identify because they are controlled in different ways,
 - Insect damage often mimics or leads to other damage on crops, need to know exactly what we are dealing with
 - Don't want to treat in excess (remember some insects are beneficial) and some damage is not an economic problem.
 - Pass the commercial pesticide applicators license

INSECT EXOSKELETON

- Benefits:
 - very protective,
 - barrier to desiccation,
 - barrier to excess water,
 - sensing,
 - supportive/strong,
 - jointed movement

INSECT EXOSKELETON

- Drawbacks
 - restricts growth,
 - inflexible,
 - modifications needed for senses,
 - molting (but not all insects molt)
 - is a serious risk for predation/hunger.

INSECTS BODY SEGMENTS

- Head,
 - mouth parts,
 - eyes,
 - antennae,

INSECT BODY SEGMENTS

- Thorax,
 - legs,
 - wings,
 - jointed/segmented legs,
 - two part wings

INSECT BODY SEGMENTS

- Abdomen
 - Digestive system
 - Excretory system
 - Nervous system
 - Respiratory system
 - Circulatory system
 - Reproductive system
 - Muscular system

INSECT LIFECYCLE

- Eggs,
- larvae,
- pupa,
- adult

- Eggs,
- Nymph
- Adult