Oral History of Illinois Agriculture

Natural Science Lesson

Illinois State Museum

Http://avbarn.museum.state.il.us

Insect Inventory—Backyard or School Yard

The early audio oral interviews in the ISM Oral History of Illinois Agriculture Web Project show that insects have been a threat to crops since the late 1800s.

Farmers tell of their frustration with the chinch bugs and corn borers, for example. Mid-20th century farmers tell of the coming of chemicals to control them. Search for audio and video clips about pests or insects and listen to them. List the pests they mention.

Then go outside of your home or school building and look around. What insects are all around us?

To find out, take an inventory or census of insects in an ordered way that can give a good idea of what insects live there, what they are eating, and when in their life cycle they are dangerous to crops. Search the recent interview clips for reports on insects, listen to some results, and list them.

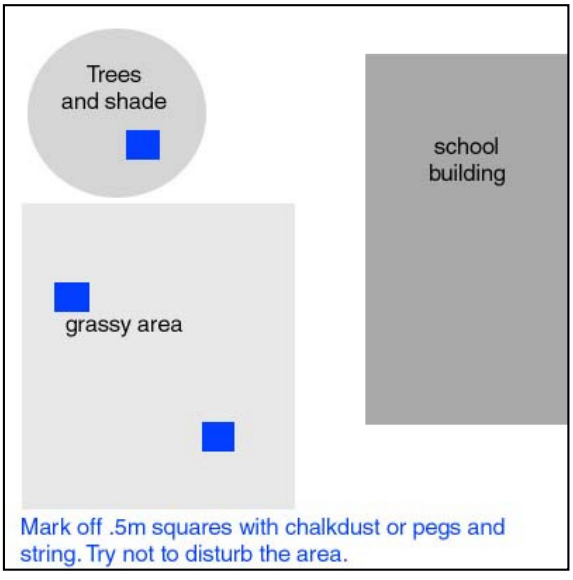
Soybeans in a farmer's field. What insect pests might help or harm this crop?

Insect Inventory— step one

Special points of interest:

- Oral interviewees on insect pests
- Insect inventory
- For Parents/Teachers
- Learning Standards
- Assessment
- Fun Learning

Decide where to inventory and how to do it. One way is to mark out .5-meter squares at various locations in your schoolyard or garden. Two or more squares will give you more valid and reliable information than just one spot would. See the diagram showing how to mark squares out in different areas (if you should have varied ecosystems, such as a grassy area and an area of trees). (continued page 2)



Mark off .5m squares with chalkdust or pegs and string. Try not to disturb the area.

Inventory, step one, continued

Alternatives:

1) Strings could be laid in lines across the ground. Search in one-centimeter strips on either side of the string and name and count the insects found along the line. This line may cross different ecosystems, like sun and shade or grass and trees. This could make for a different outcome than the squares would produce.

2) If your are surveying a garden, each person could inventory one plant of each type in the garden (one sunflower, one zinnia, one rose bush, one marigold, etc.) and compare the types of insects found one each plant. Were most of the beetles found on one species, etc.?

Insect Inventory—step two

The second step is taking the inventory. Two to three people can man each square. One will finger through the square slowly in an organized pattern, such as one-to-two centimeter strips from one edge to the other.

A second person is ready with pencil and paper to write down the type of insects seen and add slash marks for multiples found.

A third person could be the checker as to which insects are found and how many, and note down what the insects were doing when found (munching on a leaf (pick a sample leaf), walking on the soil, etc).
It is best not to collect insects, but they could be temporarily and carefully captured in small pill containers for identification and release later.

***Plants**: You may want to take samples of the grasses or make note of the tree species or other plants found in the square.

The particular plants, if food for the insects, may be the reason for their being found in that area at that time of year.

Insects do not land on plants by chance. They seek out their food plants or the plants on which they lay eggs.

Plant damage may give clues as to the kinds of insects nearby. There may be damage to stalks, leaves, buds, blossoms, and fruits.

Honeybees are native to the Mediterranean and Middle East areas. They arrived in Massachusetts in the early 1620s and spread west to the Mississippi River by 1792. They provide a source of sugar and wax through their honey production and pollinate many farm and orchard crops. They compete for nectar with our native bees.

The Japanese beetle was first seen in the U.S. in New Jersey in 1916. Since then it has spread westward. For several years, it has been a nuisance in Illinois, especially to roses and grapes.

Graph Your Results

Identification and verification of findings. Summarize your findings by tallying up the insects by species. Compare statistics in the different habitats (sunny grass versus shady shrubs)

Species Name	Square 1	Square 2	Square 3
Ant	10	60	23
Grasshopper	1	3	5
Lady beetle	3	0	5
Green bug	36	12	0

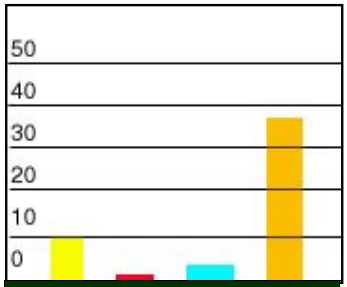
Bar Graph
Create bar graphs that record visually how many insects of each type were found (see right). (Bar graphs do not assume that you have found 100% of all of the insects in the square of garden.)

Analysis of findings: Write an analysis of your findings.

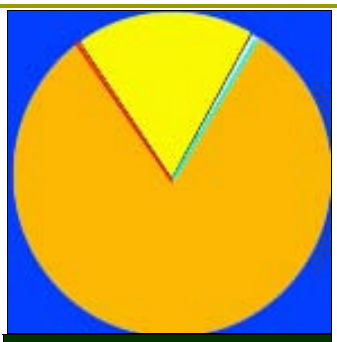
Try to match the plants found as food plants (food and habitat) for insects by consulting a field guide.

Try to identify each insect type with a field guide, too.

You may be able to distinguish among types of ants or beetles, breaking down a category into parts.



Bar graph for Square 1 in the table above



Pie Graph
Create charts and graphs to look at the statistics in different ways. Total the number of insects found in each square and find the percentage of each type of insect (out of all insects found) for each square.

Create a pie chart like this one (for Square 1). Compare graphs for the squares and discuss. Why might there be big differences between squares in the number of one type of insect?

Postulate several reasons. (conditions- sun or shade, grass or trees, presence of food plant).

Make a large pie graph that combines the findings of all squares. How does it compare with the individual square's graphs? Which is more meaningful of actual local conditions?

For Parents and Teachers

On the next page are assessments and learning standards addressed by this activity.

Parents who do this activity with their children can keep in mind the natural science and math skills that are practiced: measurement, counting, statistics, graphing, species identification with a field guide by paying attention to insect anatomy and activity.

A quick online insect database is at

http://www.insectidentification.org/insect-search.asp

Identify insects and spiders in the ISM online collections:

http://www.museum.state.il.us/ismdepts/zoology/collections.html

Kaufman Field Guide to Insects of North America and others can be taken into the field.

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State Learning Standards

ISBE Science Standards for Insect Inventory
Late Elementary:
11.A.2a Formulate questions on a specific science topic and choose the steps needed to answer the questions.
11.A.2b Collect data for investigations using scientific process skills including observing, estimating and measuring.
11.A.2c Construct charts and visualizations to display data.
11.A.2d Use data to produce reasonable explanations
11.A.2e Report and display the results of individual and group investigations.

Image from the Daily Green—outdoor activities,

The **National Standards** for late elementary students state that the abilities necessary to do scientific inquiry include "asking questions, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, constructing and analyzing alternative explanations, and communicating scientific arguments."

Assessment

Sample Square:

- Square should measure .5m² (or .5 yd²).
- Search is methodical (side to side by 1-2cm width each swath)
- Count and notes on each species found is accurate and recorded.
- Location and ecosystem is recorded. (e.g., Sunny grassy area near building)

Graph: Graph elements should be obviously representative of the numbers. Axes should have name labels.

Analysis: Summary should contain statements about species desription, habitat, food, and their relationships.

MORE FUN LEARNING

http://www.museum.state.il.us/pdfs/Beetles-and-Beatles.pdf
Learn about beetles and The Beatles with this .pdf book from a Museum Super Saturday program.

Learn about some of the insects that roamed the Illinois Prairie.
http://www.museum.state.il.us/muslink/prairie/htmls/eco_insects.html

Museum scientists do research to protect endangered species.
http://www.museum.state.il.us/muslink/behind/htmls/cr_zoo_end.html

Moths and butterflies play tricks on your eyes in this protective coloration online interactive.http://www.museum.state.il.us/flashapps/clink/protectiveColoration.swf