

Entomology Detective Instructional Materials

For students

Background information:

One of the issues associated with sustainable agriculture is pesticides. Pesticides can have a negative impact on the environment and are an additional cost to farmers. On the other hand, pesticide use can increase crop yields. Is there another way of reducing crop damage from pests such as insects that does not have the negative environmental impact? One way is to enlist natural predators such as other insects and spiders. To study this, scientists need to understand which insects (those that harm crops and predatory insects) are present in different agricultural settings.

In particular, they are interested in answering the following question:

“Which agriculture settings are associated with healthy populations of beneficial predatory insects?”

Before Reading

1. How would you design an investigation of the general insect population in and around a crop field?
2. How would you design an investigation that focused on the predatory insect population?
3. What technology would be helpful in these investigations?

After Reading

4. How were Dr. Landis’s investigations alike and different from the ones you designed?
5. What do you think the implications are of this study for a farmer growing corn?
6. What are four different things that members of Dr. Landis’s team do?

For the teacher

1. Handout the student worksheet and read and discuss the introduction as a class.
2. Have students answer questions 1 – 3 individually. Pool students’ ideas about how to design the investigations.
3. Have students read the *Entomology Detective* and answer questions 4 – 6.
4. As a class compare the techniques described in the story to those devised by the students.

Extensions:

This story can be used as an introduction to students’ own investigations. See related GLBRC hands-on activity, [Field Investigations: Bug Biodiversity and Ecosystem Benefits](#).

Standards

Next Generation Science Standards (2013)

Performance Expectations:

Middle School:

- **MS-LS2-5.** Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

High School:

- **HS-LS2-7.** Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

Scientific and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Asking questions and defining problems Planning and carrying out investigations	LS2: Ecosystems: Interactions, energy, and dynamics	Patterns Cause and effect: Mechanism and explanation