

DATA *Nugget*

Do insects prefer local or foreign foods?

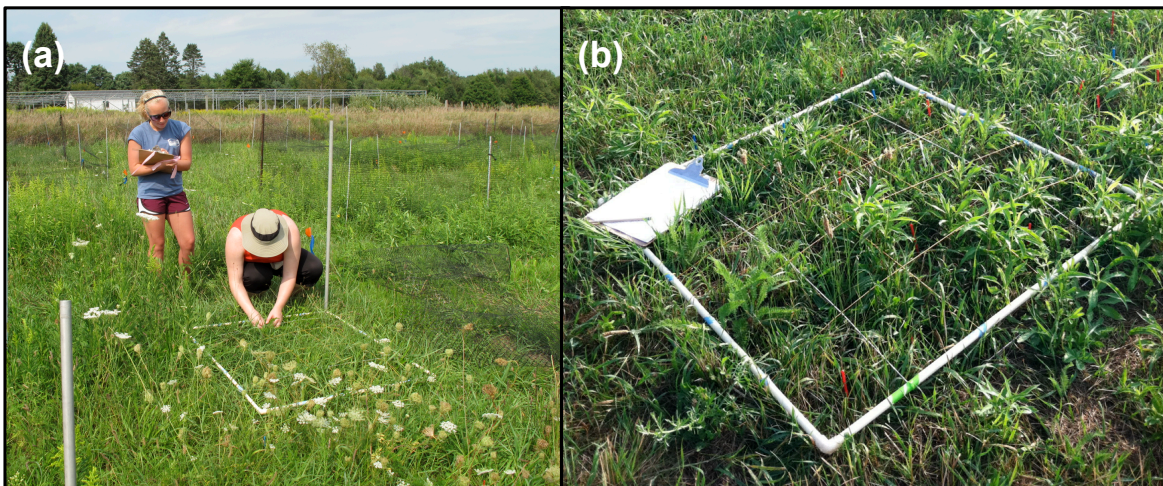
Data provided by and written by GK-12 Fellow Elizabeth Schultheis

Background Information:

Insects that feed on plants, called **herbivores**, can have big effects on how plants grow. They can change the size and shape of plants, the number of flowers and seeds, and even what species can survive in a habitat. For this reason, scientists study how insects and plants interact, and how much damage insects do to plants. A plant with more herbivore damage will most likely grow smaller and produce fewer seeds.

Plants can protect themselves from herbivores. For example, plants produce defense chemicals in their leaves or protect leaves with small hairs that make it hard for insects to take a bite.

Native plants are species that naturally occur in an area. Native plants and insects have grown together for thousands of years, so native plant defenses tend to be effective. An **exotic plant** is one that people have moved into new areas, and has the potential to become an **invasive species** that can take over habitats, such as garlic mustard or purple loosestrife. An exotic plant may not have defenses against the insects occurring in its new range, and therefore may receive more damage than native species. More damage could result in exotic plants not doing very well compared to native plants. However, we know invasive plants grow very well, so perhaps they will be less damaged when compared to native plants, which could explain how they are able to grow fast and make many seeds.



(a) Scientists collecting herbivory data on native, exotic, and invasive plants.

(b) Plants are located in a grid pattern so they are easier to locate.

Scientists at the Kellogg Biological Station (KBS) are studying the interaction between herbivores and native, exotic, and invasive plants. Scientists predict that herbivores may damage exotic plants more than natives, because exotic species have not evolved defenses against them, and so are unprotected. They also predict that invasive plants will receive less herbivore damage than native species, which might explain why invasives can take over habitats. To address these predictions, scientists collected data on native, exotic, and invasive plant species in Kalamazoo County, MI. They measured what percentage of leaves on each plant had damage from herbivores. The data they collected is found below and can be used to test which type of plant gets the most damage.

(A) DATA: Look at the data below, collected on 11 native, 11 exotic, and 6 invasive plant species. See if you can identify some potential patterns. Then, proceed to (B).

| | Native plants | Exotic plants | Invasive plants |
|----------------------------------|---------------|---------------|-----------------|
| % leaves damaged by an herbivore | 13.9% | 25.7% | 25.2% |

(B) Use the data given above collected by MSU scientists to answer the following question:

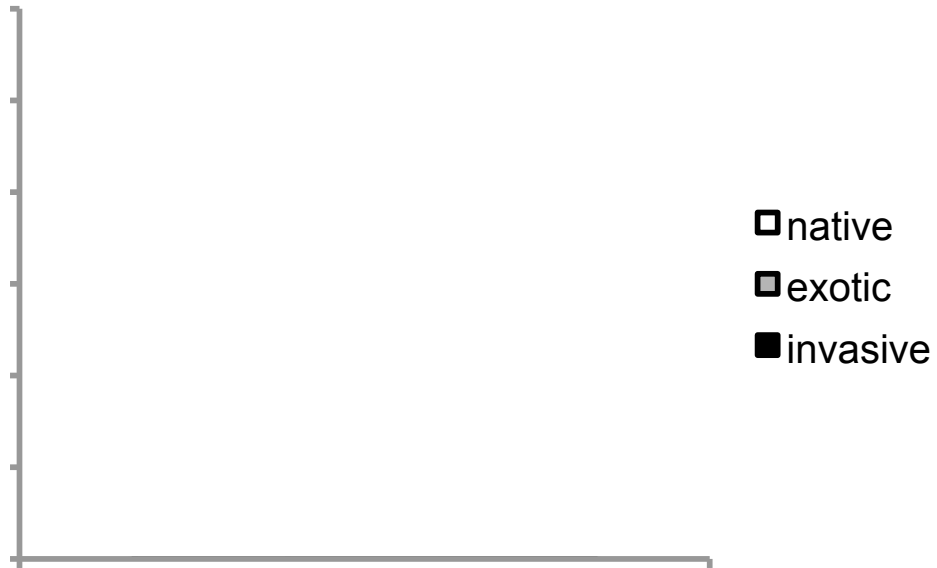
Scientific Question: Do insects prefer local (native) or foreign (exotic & invasive) foods?

Evidence: You will use the data in the table to answer the scientific question by making a *claim*. The data is the *evidence* that you will base your claim on, just like a lawyer would in a court case.

What is the **dependent** variable? _____

What is the **independent** variable? _____

Use the data given above collected by MSU scientists to draw a graph on the next page. Graph the relationship between ***type of species (native, exotic, invasive)*** and ***% leaves damaged by an herbivore***.



Claim: Write a conclusion that answers the above question.

Reasoning: How does this evidence support your claim?