

# DATA *Nugget*

## Mowing for monarchs, Part I

Featured scientists: Doug Landis and Nate Haan from Michigan State University and Britney Christensen and Gabe Knowles from Kellogg Biological Station LTER

### Research Background:

With their orange wings outlined with black lines and white dots, monarch butterflies are one of the most recognizable insects in North America. They are known for their seasonal migration when millions of monarch butterflies migrate from the United States and Canada south to Mexico in the fall. Then, in the spring the monarch butterflies migrate back north. Monarch butterflies are pollinators, which means they get their food from the pollen and nectar of flowering plants that they visit. The milkweed plant is one of the most important flowering plants that monarch butterflies depend on.



A monarch caterpillar on a milkweed leaf.

During the spring and summer months female butterflies will lay their eggs on milkweed plants. Milkweed plays an important role in the monarch butterfly's life cycle. It is the only plant that monarchs will lay their eggs on. Caterpillars hatch from the butterfly eggs and eat the leaves of the milkweed plant. The milkweed is the only food that monarch caterpillars will eat until they become butterflies.

A problem facing many pollinators, including monarch butterflies, is that their numbers have been going down for several years. Scientists are concerned that we will lose pollinators to extinction if we don't find solutions to this problem. Doug and Nate are scientists at Michigan State University trying to figure out ways to increase the number of monarch butterflies. They think that they found something that might work. Doug and Nate have learned that if you cut old milkweed plants at certain times of the year, then younger milkweed plants will quickly grow in their place. These new milkweed plants are softer and more tender than the old plants. It appears that monarch butterflies prefer to lay their eggs on the younger plants. It also seems that the monarch caterpillars prefer to eat the younger plants.

Britney and Gabe are two elementary teachers interested in monarch butterfly conservation. They learned about Doug and Nate's research and wanted to participate in their experiment. The team of four met and designed an experiment that Britney and Gabe could do in open meadows throughout their community.

Britney and Gabe chose ten locations for their experiment. In each location they set aside a milkweed patch that was left alone, which they called the control. At the same location they set aside another milkweed patch where they mowed the milkweed plants down. After a while, milkweed plants would grow back in the mowed patches. This means they had control patches with old milkweed plants, and treatment patches with young milkweed plants. Gabe and Britney made weekly observations of all the milkweed patches at each location. They recorded the number of monarch eggs in each of the patches. By the end of the summer, they had made 1,693 observations!



Mowing one of the milkweed patches.

**Scientific Question:** Do monarch butterflies prefer to lay their eggs on younger milkweed plants?

**What is the hypothesis?** Find the hypothesis in the Research Background and underline it. A hypothesis is a proposed explanation for an observation, which can then be tested with experimentation or other types of studies.

Scientific Data:

Use the data below to answer the scientific question:

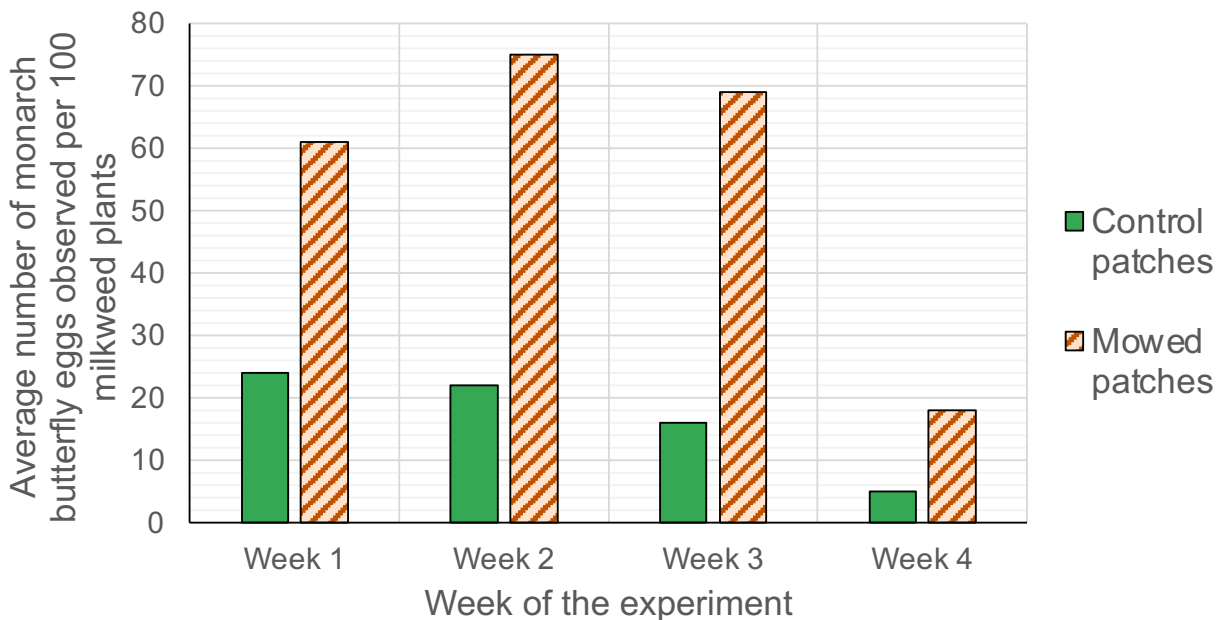
Average Number of Monarch Butterfly Eggs Observed per 100 Milkweed				
	Week 1	Week 2	Week 3	Week 4
<b>Control Patches</b>	24	22	16	5
<b>Mowed Patches</b>	61	75	69	18

What data will you graph to answer the question?

Independent variable(s): \_\_\_\_\_

Dependent variable(s): \_\_\_\_\_

Below is a graph of the data: Identify any changes, trends, or differences you see in your graph. Draw arrows pointing out what you see, and write one sentence describing what you see next to each arrow.



Interpret the data:

Make a claim that answers the scientific question, do monarch butterflies prefer to lay their eggs on younger milkweed plants?

What evidence was used to write your claim? Reference specific parts of the table or graph.

Explain your reasoning and why the evidence supports your claim. Connect the data back to what you learned about monarch butterfly preferences for where they should lay their eggs.

Did the data support Britney and Gabe's hypothesis? Use evidence to explain why or why not. If you feel the data are inconclusive, explain why.

Name\_\_\_\_\_

*Your next steps as a scientist:* Science is an ongoing process. What new question(s) should be investigated to build on Britney and Gabe's research? How do your questions build on the research that has already been done?