



Trouble at Grainly Farms

Student Guide

1. Identifying the Problem

Consider your observations for each of the three soybean fields. What trend(s) do you see?

1. What are some possible problems, if any, in each of these fields? Describe some of the evidence that might support your conclusion.

2. Using the information provided and what you already know, consider what may be going on that has caused a problem. List at least three possible causes of the problem with the soybeans.

2. Evaluating Possible Causes

After viewing the videos and documents on the Plants Get Sick page, re-consider the possible causes you identified for the soybean problem. Make sure to cite specific information from the documents and supporting videos to support your decision.

1. Which of the possible causes you listed in Part 1 can be ruled out as a cause of the problem? What are some of the reasons you might rule out these causes?

2. At this point, what do you think might be the likely cause of the reduction in yield?

3. Understanding Nematodes

Soybean cyst nematodes (SCN) have an interesting way of interacting with the soybean plant. After viewing the videos and documents on the website, answer the following questions.

1. In your own words, describe what a nematode is.
2. Where are some of the possible places nematodes can be found in nature?
3. What are some examples of both good and bad nematodes?
4. What are some of the things that a nematode does to a soybean plant, and what are some possible ways that this can lead to a reduction in yield?

4. Evolution of a Crop and a Pest

Since soybean plants and nematodes are both living things, they are constantly evolving and adapting to their environment. After viewing the videos and documents on the website, answer the following questions.

1. In your own words, explain how soybean plant populations have adapted and thrived to become a major agricultural product.
2. What are some ways that natural and artificial factors influenced this adaptation?
3. How can SCN populations adapt to changing soybean populations?
4. How might farmers, plant breeders, and scientists use knowledge of the evolutionary process to improve or sustain soybean yields?

5. Managing Nematode Populations

Farmers have different options to consider to reduce nematode populations and maintain a high soybean yield.

1. List three options for managing SCN populations. For each option, state how that approach might impact the nematode population in the first year.

2. Considering what you know about genetic variability and adaptation, what would happen to SCN populations if you used only one method over several years?

3. What management approach do you recommend for Grainly Farms? Explain why this is the best approach.