Soybeans Really can get Sick
What role does the environment play?

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Target Grade Levels: 9-12
Subject Areas: Agriculture, Biology

Time Required: 6-8, 45-minute class periods, non-consecutive over 2 months

Lesson Objectives:
1. Develop and use a model
2. Analyze and interpret data sets
3. Critical Thinking Skills
4. Plan Investigation to determine which environment promotes the growth of SDS
5. Communication Information

Materials Required:
• Availability to SDS susceptible soybean seeds
• Infested sorghum
• Paper cups
• Soil mix
• A place to keep the cups, in the dark and light (preferably a greenhouse)
• Google classroom or something similar

http://pulitzercenter.org/blog/untold-stories/still-eating-tofu

Lesson Summary

Sudden Death Syndrome (SDS) is the second biggest disease that affects soybeans, next to soybean cyst nematodes. This plays a huge impact on the farmer’s yield and the economy in general. For this experiment, students will be examining what kind of environment SDS tends to thrive in.

Students will plant a SDS susceptible soybean seed into infected soil. ISU will provide the susceptible seeds and sorghum that is infected with SDS. The sorghum will be added to the soil to infect the soil. There will be two groups of cups. One will be in the greenhouse (or somewhere sunny and warm) and will be kept dry. The other group will be kept extremely damp and in the dark. After planting these students will keep an online blog with their observations through the experiment. They will be given feedback through the experiment.

At the end of the experiment students will make a poster of their observations. Student will also research about the disease and will include background information about SDS and what they think could be done next to help find a cure for this disease. The poster will receive feedback and give the students a chance to fix any mistakes. They will then present their final work.

Feedback will be given through Dr. Leandro’s lab at Iowa State University for both the online blog and the poster the students are to make.
Lesson Plans

For this project it works best if the students are divided into groups. Group size varies depending on the size of the class. Each group should be responsible for both infested and non-infested plants, giving every student the opportunity to observe both environments and which SDS prefers. Students should have been previously exposed to the online blog that the teacher has chosen to use. After the initial set up students will take daily notes on how the plants look and any symptoms they see. This can include anything from where on the plant symptoms are located, any discoloration they see, if they notice a size difference between the two groups. The previous research done will aid in this knowledge. Once data collection has been completed groups will start the poster making process.

Teaching Tips

Allowing time for students to do research on the variety of soybean that will be used and the different symptoms of Sudden Death Syndrome in soybeans is recommended before starting the project. Also, surveying students to see which environment they think will produce more symptoms before starting the experiment may be beneficial when wrapping up the experiment and discussing the results.

Differentiation

Students will be prompted as to what they are looking for

Students will share responsibilities including: research, watering, recording data

There will be extra plants available for those students who finish early if they want to test another variable

Partner Scientist

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