Interactions between genetically modified and non-genetically modified soybean plants

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Innovate: IA Project Showcase

Problem Statement:

There is still uncertainty surrounding the interactions between GMO plants and non-GMO plants. Specifically, there is only minimal information regarding the genetic exchange between organic and genetically altered crops.

Research Question:

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Abstract

We are researching the interactions between GMO and non-GMO soybean seeds. We want to test whether organic soybeans can obtain certain characteristics from GMO soybeans when grown in the same environment, particularly resistance to herbicide. The data we collect can show coloration differences, height changes, and growth time.

Background

GMOs have many advantages (ex. herbicide resistance and increased yield). However, these advantages bring drawbacks (ex. cancer, antibiotic resistance, and ethical concerns). We wanted to research how GMO and non-GMO crops would interact with each other, and examine if there are beneficial, harmful, or no impacts when grown.

Materials

To test our hypothesis, we planted GMO soybean seeds and non-GMO soybean seeds in specific growth environments. Based on if the batch was part of the control group or experimental group, we added herbicide spray, since we were testing if the organic crops inherited the herbicide resistance gene.

Method and Process Steps

Method: Experimental Method with a main subject of interest being studied and manipulating different variables to observe changes to our subject during the experimentation process.
Independent Variables: Herbicide
Dependent Variables:
Herbicide resistance/yield
Constant Variables: Light, Water
Experimental Groups: With Herbicide, Without Herbicide
Control Groups: GMO (With Herbicide), Non-GMO (With Herbicide)

Hypothesis or Criteria for Success

We hypothesize that there will be genetic interactions between the organic crops and GMO crops. We also predict that the organic soybean seeds would show differences based on genetic interaction, such as coloration, height, yield, and herbicide resistance.

Conclusion

Due to complications while growing the soybean seeds, the seeds failed to sprout and grow, and the experiment could not be continued. This resulted in a lack of data to be used to reach a conclusion with our research question. However, based on our background research on this topic, we can reach a speculative conclusion on our experiment. Most of the current literature on this topic include factors such as cross pollination from bees and butterflies that would cause changes in non-GMO plants when grown with GMO plants. Considering the controlled indoor growth environment, these factors would not play any role and based purely on literature, I don't believe we would have seen significant impacts on the non-GMO and GMO plants when grown together.

Next Steps

Though the experiment did not proceed as planned, and had to be scrapped, I believe that more research like ours should be done because genetic modification technologies are still very new and so many unknown and effects and consequences are possible in this field. For our next steps I believe we should adjust our research topic and approach to consider sudden complications like we experienced in this project, while also reconsidering the lens with which we analyze this topic.

Acknowledgements

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