Effects of Bisphenol A On Germination of Soybean Seeds
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Abstract
Endocrine disruptors such as bisphenol A (BPA) have been shown to have an effect on humans and animals. Therefore this research is exploring the effect of BPA on soybean seed germination. Different concentrations of BPA in deionized water were used to wet soybean seeds in multiple germination trials. The germination rates were analyzed to determine significant difference. The data showed near 100% germination without BPA exposure, and an average of 13% decrease in germination when exposed to 100 parts per million(ppm) BPA. Further research is needed to determine the actual average levels of BPA to which soybean seeds are exposed. This may influence the outcome of other research involving soybean germination if the seed has been exposed to significant levels of BPA.

Introduction
The manufacture of plastics uses bisphenol A (BPA) as a hardening agent. It is also used in the resin lining of metal cans. Since BPA is water soluble and plastics are used in a variety of applications in soybean culture, the possibility of BPA exposure exists. Previous research at Wilmington College on how BPA affects the growth of soybean plants was inconclusive so this research focuses on the possible effects of BPA on germinating soybean seeds. It is important to know what level of concern BPA contamination poses in order for production practices to be adjusted, and manufacturing and legislative measures to be taken.

Materials
- Soybean seeds from Asgrow, variety Ag 2933 were used in all trials.
- Seeds were placed on standard industrial paper towels.
- Solutions of deionized water (DI) and Aldrich 99+% BPA were sprayed on the seeds using 32 oz. Garden Treasures spray bottle.
- Germination trials were incubated in a Precision Scientific, Gravity Convection Incubator.

Results
- The control trials had nearly one hundred percent germination.
- The trials using 100 ppm BPA had the lowest and most variable germination rates.
- The trials using 50ppm BPA experienced slightly less variation in germination.

Conclusion
Germination rates showed a statistically significant decrease between the control trials and the trials with 100ppm BPA. The variability between trials was also much greater for the trials with 100ppm BPA. This shows a need for further research to determine the actual BPA contamination levels due to exposure in transport, storage and handling. Also, this may impact the interpretation of other research involving soybean germination if the seed has been exposed to significant levels of BPA.

References

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