The Effect of Agricultural Pesticides on the Early Growth and Development of Z. mays

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The purpose of this study was to determine whether or not agricultural pesticides have a negative impact on the root and coleoptile growth of Z. mays seeds. Five seeds were grown per resealable bag, with a damp paper towel to initiate germination. The paper towels were soaked in three concentrations of a pesticide, 32%, 60%, and 100%, along with a control group of only water. After one week, the length of the root and coleoptile of the 140 seeds were measured using ImageJ. Those results were evaluated using a one-sample ANOVA test with an alpha level set at .05, which returned a p-value of .0005 for root length and 8.75 x10^-11 for coleoptile length. A post-hoc Tukey test revealed Dmin values of .712 for root length and .316 for coleoptile length. Those values determined that root growth showed statistically significant difference in all seed groups except between 0% and 100% of pesticide, while coleoptile growth showed statistically significant difference in all seed groups except between 60% and 100% of pesticide. Even though the data was shown to be significant, the research hypothesis, which stated that if Z. mays seeds are exposed to varying amounts of pesticide during germination, then the seeds exposed to the highest concentration of pesticide will have the shortest root growth and shortest coleoptile, was not supported. In conclusion, pesticide exposure to Z. mays seeds significantly affected the early growth of their coleoptile and roots.

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