Category: Botany **Table Number:** H0102

Student Name: Camille Payne
Team Members (if any):

Project Title: The Effects of Iron Solutions on Plant Life

Abstract: My project began with a study about Geneva Steel's soil composition. Significant amounts of iron were found in the soil. My hypothesis was that the iron would create many problems for the plants around there, such as withering, discoloration, and stunted root growth. The plants that I used were Wisconsin Fast Plants, pinto bean plants, and grass seed. Each plant type had one control and one experimental. The experimental part was sprayed every other day with an iron solution. Observations were taken every few days. Discoloration, spotting, stunted growth, and other negative effects were shown. The next experiment I used was to test germination rates. Lettuce seeds were put into Petri dishes and covered in either distilled water or iron solution. The roots were measured in millimeters in the next few days. These root measurements were found to have an interesting pattern. In general, the iron-treated seeds had longer roots. The control seeds were less numerous in how many actually germinated. The results from the germination tests suggest that iron helps plants in the first stages of life. However, the same pattern was not seen after these first few days in a plantâ€™s life cycle. The growing plants had a harder time and more negative effects from the iron. So, although iron is good for the first part of life, it is not beneficial in the long run. Plants around Geneva Steel will have a hard time growing with the iron level that is present in the soil.

Category: Botany **Table Number:** H0103

Student Name: Andrew Angerhofer
Team Members (if any):

Project Title: The Effects of Light Pollution on Algae Growth

Abstract: With the growth of cities comes an increase in light pollution. Light pollution is defined as the adverse effect of artificial light. Could light pollution have an effect on algae growth? In this experiment, several algae samples were allowed to grow in different light settings. The different light settings simulated different amounts of light pollution. In the experiment half of the samples were given fertilizer, and half were left fertilizer- free to see if a constant growth rate could be established. My hypothesis was that light pollution would effect the growth of algae, and that the samples that got the most light would grow the most. The results of the experiment supported my hypothesis that light pollution does indeed effect the growth of algae, and that the samples that received the most light grew the best. I also found that there was a direct correlation between the amount of light received and the growth of the algae.

Category: Botany **Table Number:** H0104

Student Name: Julianna Carter
Team Members (if any):

Project Title: Picked Pears...Now What?

Abstract: The question that I tested in my experiment was What are the best conditions for ripening Bartlett pears? Conditions commonly mentioned in my research in suggested methods were temperature, ventilation, and ripening on the tree as apposed to off the tree, which were all conditions that I tested. I had four experiment groups and one control, with five pears in each group. I had one group in refrigeration for the entire experiment, one ventilated in room temperature for the whole experiment, one group that was refrigerated for two days before put in room temperature, and one group that was kept in a paper bag at room temperature. The control was left to ripen on the tree. I had also done research on ethylene, which is a gas released by ripening fruit that also aids in ripening the fruit further. Judging by this research I hypothesized that the group kept in a paper bag would yield the best results as the ethylene would be trapped. After eight days of taking pictures and making observations, I made a firmness scale, 1 being hard and 4 being soft and used a color scale from a ripening manual that I used as research, where 1 was full green and 4 was full yellow. Afterwards I made two line graphs for firmness and color and those groups that had differences in stages were averaged to insure accuracy. My data showed that both of the groups in room temperature, ventilation and not, ripened the quickest.

Category: Botany **Table Number:** H0105

Student Name: Justin Taylor
Team Members (if any):

Project Title: The Combined Effects of Naphthalene Acetic Acid and Glyphosate on Bindweed

Abstract: Question: Can we increase the effectiveness of Glyphosate's herbicidal effects on Bindweed by also treating the Bindweed with Naphthalene acetic acid (NAA), a plant homone that stimulates root development? Hypothesis: The NAA will increase the Bindweeds circulation and help translocate the glyphosate deeper into the roots and Therefore more fully kill the Bindweed? Methods: Root segments of Bindweed were planted in pots and kept in a greenhouse for six weeks. Each pot was then sprayed with different concentrations of the plant hormone, Naphthalene acetic acid. one with 50 ppm, one with 25 ppm and one was left unsprayed as a control. After the Naphthalene solution dried all three plants were then sprayed with the Herbicide Glyphosate. Plants were then observed for the next few days. Results: the plants that were treated with NAA died slower and not as completely as the control but were slower to regrow new shoots. the control died quickly but immediately began to form new shoots. most of the new shoots on all three plants died eventually as well, leaving only a few shoots that grew back healthy. Overall the control seemed the to die the most effectively.

Category: Botany **Table Number:** HT101

Student Name: Michael Porter
Team Members (if any): Spencer McDonald, Kaitlin Wimmer

Project Title: Osmotic Priming

Abstract: Osmotic Priming Authors: Michael Porter, Spencer McDonald, Kaitlin Wimmer Osmotic priming is the process used to decrease germination time and to help seeds germinate in adverse conditions. The purpose of this experiment is to determine if there is a difference between the use of different priming agents. Polyethylene glycol is a commonly used priming agent so we hypothesized that it would be the best agent to use. The other priming agents we used were glycerol, mannitol, and distilled water. The seeds were prepared by placing them in a 5% by mass solution for 24 hours while being aerated. The seeds were then dried for 24 hours and planted. The planting consisted of placing 5 seeds in a coffee filter, placing the filter in a plastic bag, watering, and sealing the bag. Water with varying amounts of salinity was used, starting with 2 g of salt per liter of water up to 20 g/L, in increments of 2 g of salt. Three bags were prepared for each seed, each priming agent, and each salinity of water. The number of germinated seeds was recorded each day for a week. Contrary to our hypothesis, pure water appeared to be the best priming agent to use. We believe water was the best only because the seeds were dried for 24 hours. The next phase of the experiment is to dry the seeds for longer amounts of time.

Category: Botany **Table Number:** HT101

Student Name: Kaitlin Wimmer
Team Members (if any): Mike Porter and Spencer McDonald

Project Title: Osmotic Priming

Abstract: Osmotic Priming Authors: Michael Porter, Spencer McDonald, Kaitlin Wimmer Osmotic priming is the process used to decrease germination time and to help seeds germinate in adverse conditions. The purpose of this experiment is to determine if there is a difference between the use of different priming agents. Polyethylene glycol is a commonly used priming agent so we hypothesized that it would be the best agent to use. The other priming agents we used were glycerol, mannitol, and distilled water. The seeds were prepared by placing them in a 5% by mass solution for 24 hours while being aerated. The seeds were then dried for 24 hours and planted. The planting consisted of placing 5 seeds in a coffee filter, placing the filter in a plastic bag, watering, and sealing the bag. Water with varying amounts of salinity was used, starting with 2 g of salt per liter of water up to 20 g/L, in increments of 2 g of salt. Three bags were prepared for each seed, each priming agent, and each salinity of water. The number of germinated seeds was recorded each day for a week. Contrary to our hypothesis, pure water appeared to be the best priming agent to use. We believe water was the best only because the seeds were dried for 24 hours. The next phase of the experiment is to dry the seeds for longer amounts of time.

Category: Botany **Table Number:** HT101

Student Name: Spencer McDonald
Team Members (if any): Kaitlin Wimmer, Mike Porter

Project Title: Osmotic Priming

Abstract: Osmotic Priming Authors: Michael Porter, Spencer McDonald, Kaitlin Wimmer Osmotic priming is the process used to decrease germination time and to help seeds germinate in adverse conditions. The purpose of this experiment is to determine if there is a difference between the use of different priming agents. Polyethylene glycol is a commonly used priming agent so we hypothesized that it would be the best agent to use. The other priming agents we used were glycerol, mannitol, and distilled water. The seeds were prepared by placing them in a 5% by mass solution for 24 hours while being aerated. The seeds were then dried for 24 hours and planted. The planting consisted of placing 5 seeds in a coffee filter, placing the filter in a plastic bag, watering, and sealing the bag. Water with varying amounts of salinity was used, starting with 2 g of salt per liter of water up to 20 g/L, in increments of 2 g of salt. Three bags were prepared for each seed, each priming agent, and each salinity of water. The number of germinated seeds was recorded each day for a week. Contrary to our hypothesis, pure water appeared to be the best priming agent to use. We believe water was the best only because the seeds were dried for 24 hours. The next phase of the experiment is to dry the seeds for longer amounts of time.