CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Andres Acevedo, Jr.

Project Number
J2001

Project Title
Will a Colored Sheet Protector Affect a Plant's Growth?

Abstract

Objectives/Goals
The objective of my project is to distinguish if colored sheet protectors act like a greenhouse trapping all of the heat and keeping it in there. If it does help the plants, than farmers could use them therefore helping our plantrs and crops grow bigger and better.

Methods/Materials
Obtained 60 pinto beans. Then, placed 15 blue sheet protectors over a set of beans, 15 red sheet protectors over a set of 15 beans, and the same for the clear sheet protector set. However I left 15 beans uncovered as my control group. I placed the seed 5.08cm from the bottom of the pot and watered the beans every other day. After 5 weeks I measured the plants.

Results
After I gathered my data, and created my charts it was obvious to conclude that the beans with the blue sheet protectors grew the most. On average the blue sheet protectors grew one or more centimeters than the red, clear, and variable beans.

Conclusions/Discussion
My conclusion determines that if you want to grow green plants, use a blue sheet protector in order to get the best results.

Summary Statement
My project tries to discover if the beans would grow more with colored sheet protectors over just planting the plants the usual way, having nothing over them.

Help Received
Neighbor helped measure beans;Dad helped plant the beans;Dad helped paste board;Brother edited my mistakes.

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Anam Aslam

Project Number
J2002

Project Title
Soil Wars

Abstract

Objectives/Goals
The purpose of my project was to compare the growth rates of tomato plants and lima bean sprouts in sterilized, fertilized and compost soil. I hypothesized that my bean sprouts would generally grow faster than my tomato plants. I also hypothesized that the compost soil would potentiate the growth of the plants, because it would provide the plant with more nutrients.

Methods/Materials
1-Five days ahead of time, I spread fertilized soil (control) on a cookie sheet and sterilized it by baking it for three hours at three hundred and seventy-five degrees. 2- I cut up and apple on the same day I sterilized my soil and I let it sit in the sun, so it would decompose. 3-Five days later, I labeled six flower pots, mixed my compost into the soil, poured my sterilized and fertilized soils into its pots, and planted my tomato seeds and lima beans in its correctly labeled pots. 4- I watered, measured and observed the plants daily for twenty-eight days.

Results
In both trials, the bean sprouts were growing effectively comapared to tomato plants. This proved the first part of my hypothesis correct. The sterilized plants were measured to be +13 centimeters, compared to the fertilized soil and compost soil. The fertilized soil plant growth went from +5 centimeters and the compost plant growth was measured to be less than 4 centimeters. Thus, proving the second part of my hypothesis to be incorrect.

Conclusions/Discussion
After conducting my experiment, I discovered that my bean sprouts grew faster than my tomato plants overall, because they are originally fast-growing plants. The sterilized plants grew the fastest from the three, whereas the compost plants grew the slowest. I believe that since the sterilized soil had all its bacteria eliminated, it prevented microorganisms from invading it during its growth process. The reason the compost soil grew the least was because it had various nutrients that microorganisms preyed on and inhibited its growth.

Summary Statement
I compared the growth rates of tomato plants and bean sprouts in fertilized, sterilized and compost soil.

Help Received
Mother helped decorate board; Gardener helped set the ideal growing environment for plants; Father supplied me with all materials needed for experiment.

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Brent D. Butler

Project Number
J2003

Project Title
How Will the Salt Percent Threshold in the Wisconsin Fast Plants Affect Its Next Generation of Offspring?

Abstract

Objectives/Goals
The purpose of this experiment was to document the different rates at which the two generations of plants grew to determine if the salt percent threshold affects it next generation of offspring. If I grow plants in different salt concentrations then plan the seeds for a second generation, then I expect the offspring's will have similar characteristics in terms of their growth as the parent generation.

Methods/Materials
In order to grow the plants for both generations, I built a growing chamber. This consisted of a water pad, plastic containers, water and salt, anti-algae squares, plants, diamond wicks and soil. I placed the four growing chambers under the light house and watered them with pure water, 1% salt solution, 2% salt solution and 3% salt solution. I harvested the seeds from the first generation to grow the second generation. I used pollination wands over the flowers to pick-up and distribute the pollen.

Results
The first generation plants watered with 1% salt solution grew the most at 13.8 cm. The second generation plants watered with the 2% salt solution grew the most at 17.3 cm. First generation plants watered with the 3% salt solution grew the least at 3.5 cm. Surprisingly, the second generation plants were taller than the first generation plants.

Conclusions/Discussion
My hypothesis was partially supported because the water, 1% salt solution and 2% salt solutions in the second generation grew at relatively the same rate. However in the plants watered with the 3% salt solution, this did not occur based on my data results. The first generation of plants were much shorter than the second generation.

Summary Statement
Document the different rates at which the two generations of plants grew to determine if the salt percent threshold affects its next generation of offspring.

Help Received
My mother helped me type the project abstract and my father helped me on a few occasions to record my growth data.

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Ethan T. Duval

Project Number
J2004

Project Title
Nature's Phoenix

Abstract

Objectives/Goals
My objective was to find out what type of grass sod grows back best after burning.

Methods/Materials
Six types of grass sod from the same company were cut into sections and placed in roasting tins. The samples were given time to dry out in a warm place. After this they were taken outside and burned down to the root, except for one of each type that was kept as a control. Then the samples were watered and given time to grow back. After a week the number of blades that had grown in each tin was measured with a special scoring system to show the results.

Results
The Dwarf Fescue samples grew back more of their former bulk than the other samples in the same time as the others, even though all the samples were under the same growing conditions. The Bentgrass grew back the least of its former bulk in the same time as the others.

Conclusions/Discussion
From this experiment it was learned that the Dwarf Fescue from the Park Avenue Turf company grows back fully after burning and watering, where as the other types will not. This information proves useful in fire prone areas when one is wondering what type of grass will grow back fuller, quicker after getting burned down.

Summary Statement
This project is a simple way to measure, judge, and compare the growth quality of burned grass sod.

Help Received
Teacher and father Anthony Melville helped obtain materials and assisted with burning. Mother helped with data entry and obtain background information. Park Avenue Turf Company donated the sod.

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Rina M. Goldman

Project Number
J2005

Project Title
Caffeine: Help or Hindrance?

Abstract

Objectives/Goals
To find out whether caffeine has any affect on plant growth.

Methods/Materials
Materials: 12 peace lilies, box of regular coffee, measuring glass, hot water, an area with direct sunlight, and measuring utensils.
Procedure:
1. Place the plants on a table where they can receive the same amount of sunlight.
2. Make a pitcher of coffee according to the instructions on the back of the instant coffee mix. Make enough that it will last one week and then let it sit for 30 minutes. Fill up a pitcher with water.
4. Prepare the solution for each group of plants and place them in different containers, there will be 4 solutions: The first solution is 100% water. The second solution is 25% coffee and 75% water. The third solution is 50% coffee and 50% water. The fourth solution is 75% coffee and 25% water.
5. Divide the plants into 4 groups of 3 and label them according to what they are being fed.
6. Measure the height of the plant on day 0 and count the number of leaves on the plant as well. Give each plant 1/4 a cup of the appropriate liquid each day. Do not water on Saturdays and Sundays. Every day, measure the height of the plants and count the leaves. Record this data. Repeat for 28 days.

Results
According to the data, the plants that were given the mixture of 25% coffee grew the most and the plants that were given 75% coffee grew the least.

Conclusions/Discussion
The experiment showed that some coffee was beneficial and too much was harmful, however, it is unclear if the results are due to caffeine or some other property of the coffee. Further experimentation to isolate the effect of caffeine might include feeding them regular and decaffeinated coffee. If they respond to regular and decaffeinated coffee in the same way, then there is another property in the coffee that is affecting the plant growth. People responded to this experiment by suggesting that the coffee affects the pH of the soil (making it more acidic) and that the plants (Peace Lilies) respond well to a slightly more acidic environment. In order to control for this in the above experiment, one would have to measure the pH of both the regular and decaffeinated coffee mixtures to ensure they were the same. Another way to determine if caffeine is responsible would be to find another way to feed it to the plant. In the end, the experiment has partially answered one question and raised several others which can be the subject of future experiments.

Summary Statement
This project is about the effect that caffeine has on plant growth.

Help Received
Parents helped create graphs and proofread and the nursery sold me the plants.

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Alejandro G. Gonzalez

Project Number
J2006

Project Title
A Continuous Magnetic Pulse Increases the Mass of a Pinto Bean Seedling

Abstract

Objectives/Goals
The objective of my project was to determine if pinto bean seeds exposed to a slow continuos magnetic pulse would stimulate growth, causing the seedling to show an increase in mass.

Methods/Materials
I tested a total of 68 pinto bean seeds that each weighed 0.35 grams. These seeds were divided into two equal groups that had 34 seeds each. One group was exposed to a slow continuous magnetic pulse. This magnetic pulse was created by four magnets that rotated 25 cm apart along a looped conveyor belt that was 100 cm long. Each magnet created a magnetic field strength of 2 Newtons and attracted metal objects that were at least 3 cm away. The seeds were centered between the rotating magnetic conveyor belt and a tin plate that were 2.5 cm apart. The seeds were exposed to a continuos magnetic pulse every three seconds. The control group was in an identical environment without the magnetic pulse. Approximately every 8 hours the seeds were rinsed and received drops of water from a graduated pipette (0.30 ml for the first five days; 0.45 ml for days 6 through 12; 0.60 ml for days 12 through day 14). Using a digital scale all seeds were weighed on days 5, 8, 10, 12, and 14. The seeds were observed daily until seedlings developed.

Results
After 14 days the seedlings exposed to a magnetic pulse showed an increase in mass in comparison to the control group of seedlings.

Conclusions/Discussion
My conclusion is that a magnetic pulse does stimulate growth. Seedlings that are exposed to a magnetic pulse will show an increase in mass compared to seedlings with no magnetic pulse.

Summary Statement
Pinto bean seeds exposed to a continuos magnetic pulse will stimulate growth, causing the seedling to show an increase in mass.

Help Received
Dad helped make tin plate. Mom and dad proof read report.

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Aidan S. Gross

Project Number
J2007

Project Title
Speedy Plants

Abstract

Objectives/Goals
The purpose of my experiment is to determine what color of light; red, white or blue, will make a plant grow the fastest. In this way, we can determine which electromagnetic wavelengths make plants grow the fastest. Different colors of light in the visible light spectrum have different wavelengths. I hypothesized that the plants would grow fastest under white light since that is the usual condition under which plants grow outdoors.

Methods/Materials
I chose seeds of Wisconsin Fast Plants (Brassica rapa) which I planted in three (3) separate containers. Each of the three (3) separate containers were made of similar 2-liter plastic soda bottles. Each growing container had its own hydroponic system of watering made out of rope. I placed each growing container in a separate cardboard box. Each box was custom cut the same and fitted with a hanging light socket, each with a different color fluorescent light bulb. One plant was grown with a white fluorescent, one with a red fluorescent and one with a blue fluorescent bulb. Besides these differences in light color, all three plants were grown under similar conditions, including temperature and duration of light each received. The dependent variable was the amount of plant growth. The independent variable in my experiment was each different color of light I used.

Results
A measuring stick in centimeters recorded the plants' height. The results of the experiment at the end of nine (9) days showed that the plant under the red fluorescent light grew the fastest.

Conclusions/Discussion
My hypothesis was that the plant under the white light would grow the fastest. The results of my experiment show that my hypothesis was incorrect and unacceptable since the red light actually grew the seeds the fastest. My experiment proves that the longer the wavelength of the color of light used, in this case red, the faster the rate of plant growth under similarly controlled conditions. If I were to do this experiment again, I would try to grow similar plants, except I would use all of the colors of light from the visible light spectrum; expanding my independent variable to include a larger studied group.

Summary Statement
To determine what color of light; red, white or blue, will make a plant grow the fastest thus revealing the relationship of light color and its wavelength to the rate of a plant's growth.

Help Received
Mother helped typeset report. Father ordered seed and helped engineer the light growing boxes due to possible fire hazards.

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Katherine P. Gruenhagen

Project Number
J2008

Project Title
Effect of Soil Type and Fertilizer Amounts on Sunflower Growth

Abstract

Objectives/Goals
The objective is to determine the effects of sand/soil ratios (0, 40, and 80% sand) and fertility (0, 10, and 20% fertilizer solution) on sunflower growth.

Methods/Materials
Plant height was measured daily over 27 days for each of the nine treatments, and plant survival and final weight were recorded at the end of the experiment.

Results
Plants grown in pure potting soil (0% sand) with 20% fertilizer were the tallest and heaviest, whereas the plants grown in 80% sand, regardless of fertilizer level, grew little and did not survive to the end of the experiment.

Conclusions/Discussion
The hypothesis that soil type and fertilization affect plant growth was supported, because plants grew poorly in sandy soil or low fertilizer. The highest level of fertilization (20%) was beneficial when applied to 0 or 40% sand, but deadly when applied to 80% sand. Future experiments could identify how much fertilizer a plant could receive before it dies, and whether there is a way to grow a plant in 80% sand 20% fertilizer to survive after 19 days.

Summary Statement
The experiment tested whether three concentrations of fertilizer and three soil/sand ratios affected sunflower height, weight, and survival over 27 days.

Help Received
Mother (Dr. Elaine Backus) provided advice and performed statistical analysis; Father (Dr. Ned Gruenhagen) helped set up the experiment and took pictures; plants were weighed at CSU-Fresno under the supervision of Dr. Fred Schreiber.

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Lily A. Hallmark

Project Number
J2009

Project Title
Affecting Aquatic Plant Growth by Varying the Ratio of Nitrogen to Phosphorus

Abstract

Objectives/Goals
An efficient use of nitrogen (N) and phosphorous (P) in agriculture could improve plant production and decrease the chances of pollution runoff. I tested how the N:P ratio would affect the growth of aquatic plants. My hypothesis was that plants grown in water with the Redfield ratio 16:1 would grow better than plants grown with other ratios.

Methods/Materials
I used the compound KNO3 as a source of N and KH2PO4 as a source of P. I determined how much N and P are in each compound by dividing the atomic mass of the compound by the molecular weight of N or P. Using the compounds I made six different N:P solutions: a control 0:0, the Redfield ratio 16:1, and four others 1:16, 8:1, 1:8, and 8:8. I tested the growth of two types of plants (Lysimachia nummularia and Lemna minor) in each solution for a total of twelve conditions. I measured plant growth and decay by counting the number of new and dying leaves/fronds on days 8, 17, and 24.

Results
Conditions with more N had better plant growth by day 24 than either the control or conditions with more P. L. nummularia in the 16:1 and 8:1 conditions had 10 new leaves as compared to the control (7 leaves), 1:16 and 8:8 (5) and 1:8 (3). The results for L. minor were similar the 16:1 condition had 15 new leaves on day 24 as compared to the control (2). Out of the losses for L. nummularia the Redfield and the 1:8 ratios had the least of amount of leaf decay (10). For L. minor the Redfield had the least decay (11) and 8:8 had the greatest decay (18).

Conclusions/Discussion
More N than P in the water led to increases in the number of leaves. For farmers to improve their crops they should put at least a ratio of 8:1 in their fertilizers. Controlling the N:P ratio could make crops grow quicker and maybe not as many people would go as hungry.

Summary Statement
Determing the best nitrogen to phosphorous ratio that leads to good plant growth.

Help Received
Mom and Dad taught me basic chemistry and helped me type, prepare solutions, and put together board.

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Joseph M. Hayward

Project Number
J2010

Project Title
Respiration

Abstract

Objectives/Goals
The objective of this investigation was to see whether germinating corn kernels would use more oxygen respiring in the light or the dark. The hypothesis was that the plant would consume the same amount of oxygen in both conditions.

Methods/Materials
A respirometer was set up with sprouted corn kernels and non-sprouted corn kernels as a control. First, the rate of respiration of the corn kernels in the light was observed over a time period of 38 minutes, at two minute intervals. The volume of gas, in mL, at time X was subtracted from initial volume gas in the respirometer, and the mililiters of oxygen consumed was determined. This process was repeated two more times, to reduce error. Second, the rate of respiration of the corn kernels in the dark was observed over a period of 38 minutes, at two minute intervals. The same procedure as above was followed. The process was again repeated twice.

Results
The results showed that the average mililiters of oxygen consumed in repiration was the same for the corn kernels respiring in the light and the dark.

Conclusions/Discussion
The hypothesis that the corn respiring in the light and the corn respiring in the dark would consume the same amount of oxygen was correct. This experiment demonstrated that the respiration process in plants does not require sunlight.

The processes of respiration and photosynthesis in plants are vital to all living organisms. I am interested in this topic because I would like to learn more about deforestation and its connection to global warming. I would like to do further experimentation on subjects regarding various plant life and their benefits to the environment.

Summary Statement
This project compares respiration rates in plants in the dark and in the light.

Help Received
My mom helped type and glue.

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Taylor Y. Hurlock

Project Number
J2011

Project Title
Funky Fertilizer

Abstract

Objectives/Goals
Most plant-growers believe that more fertilizer (plant food) is better for plant growth and crop production. This experiment determined the amount of fertilizer pellets needed for the best production of a crop of Brassica rapa seed. The objective of this study was to assist all farmers growing crucifers in the knowledge of the proper amount of fertilizer pellets to use for optimal production: the recommended amount-3 pellets, double the recommended amount-6 pellets, and triple the recommended amount-9 pellets. The hypothesis stated that the recommended amount (3 pellets) would increase the growth, development, and/or reproduction the most because over-application of slow- or fast-release fertilizers can kill plants by effectively burning them.

Methods/Materials
12 Brassica rapa seeds were used in this experiment, 4 seeds per trial. Three trials were conducted at the same time. During each trial, 3 plants had 3 different amounts of 14-14-14 fertilizer pellets added to them, 1 amount per plant. The other plant had no 14-14-14 fertilizer pellets added to it. At day 20 of the experiment, the growth rate (height in mm), development rate (number of leaves on the main stem, including cotyledons), and reproduction rate (number of flowers/flower buds) of the plants were measured by a ruler and by carefully counting, with close observation.

Results
The results of this experiment stated that adding triple the recommended amount of fertilizer (9 pellets) increased the growth rate and reproduction rate of the plants the most. The results correlate with the purpose because the results told of the amount of 14-14-14 fertilizer pellets to use on Brassica rapa, a plant very similar to a crucifer, for optimal production.

Conclusions/Discussion
The results did not support the hypothesis, so the hypothesis was proven wrong. Information from this project expands our knowledge about environmental science because it told of the amount of 14-14-14 fertilizer pellets to increase the growth and reproduction of crucifers the most.

Summary Statement
This project was conducted in order to determine how much 14-14-14 fertilizer was best for the production of a crop of Brassica rapa seed.

Help Received
Mother helped take pictures of plants and helped put board together; Father answered questions about the computer; Mr.Ballard, teacher, gave instruction about how to conduct my experiment and how to create all parts of report and board.

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Elyssa S. Lawrence

Project Number
J2012

Project Title
Salty Solutions

Abstract

Objectives/Goals
The reason I did this experiment is to see if plants would grow in saltwater. If not saltwater, different salt solutions. Specifically, I tested the different salt solutions on mung beans, and their ability to germinate with different amounts of salt.

Methods/Materials
I had three trials to my experiment for each different solution. I used petri dishes and each petri dish held ten mung beans. My control was water and as you would think, by the end of the three-day experiment, all of the sprouts in the three petri dishes had germinated.

Results
The 100% salt solution had a few sproutings but the mung beans were unhealthy. The in-between solutions varied. The ones closest to the saltwater solution had less growth but gradually, when the solution goes to become closer to the control, the number of mung beans germinated became greater.

Conclusions/Discussion
My experiment lead to the conclusion that plants can be grown with saltwater, but grew more efficiently as the salt levels in the solution decreased. As land and water become less available, we should consider saltwater for growing food.

Summary Statement
My project is about the possibility of growing plants in saltwater.

Help Received
I used lab equipment at school under the supervision of my teacher, and her help also with the graph.

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)

Gabriella N. Lewin

Project Number

J2013

Project Title

The Interaction of the Phototropic and Gravitropic Effects on the Growth of Cress Seedlings

Abstract

Objectives/Goals

The objective of this project is to determine the relative potency of effects gravity and light on the growth of cress seedling

Methods/Materials

Materials: cress seeds, soil, cups, lamp, cardboard box, black spray, protractor, knife, maker, masking tape, mesh, toothpicks, rubber bands, and blocks. Paint inside of the box black; place three ounces of soil and one cress seed each in cup. Grow in normal conditions (light directly above) until stem is ~3". Three experiments performed all with the seedlings were inverted and suspended in a box and endpoint was deviation of the seedlings stem from vertical (DFV). Experiment 1: light was shown only from below - gravitropic and phototropic effects opposed. Experiment 2: no light - the gravitropic effect is measure. Experiment 3, exposed to ambient light (from above) - here gravitropic and phototropic effects are in the same vector.

Results

Experiment 1, the seedlings showed very little DFV - mean DFV = 1.6 degrees. Experiment 2, there was significant DFV- mean DVF = 83.3 degrees. Finally, in experiment 3 there was significant DFV again noted - mean DFV = 85.2 degrees. The pair T-test was used to compare the deviation of experiment 1 vs. 2, 1 vs. 3 and 2 vs. 3. There was a significant difference in DFV in experiment 1 vs. 2 ($p = 2E-12$) and 1 vs. 3 ($p = 4.9E-14$), however, there was no significant DFV found between experiment 2 vs. 3 ($p = 0.3$).

Conclusions/Discussion

Experiment 1 there was little deviation from vertical. Since the phototropic effect was in the exact opposite vector as the gravitropic effect, it can deduce that phototropism is more potent than gravitropism since the seedlings did not deviate significantly from vertical toward the vector of gravitropism. Experiment 2 was designed to show the gravitropic effect in the absence of the phototropic effect. The seedlings deviated from vertical significantly towards the gravitropic effect vector. Experiment 3 examined the potency gravitropism in ambient light. There was significant deviation of the seedlings towards the gravitropism vector. From this it can conclude that, in the absence of direct opposition by light, gravitropic effect was not reduced.

Summary Statement

This project determines the relative potency of effect of gravity and light on a cress seedling.

Help Received

My father helped me design and carry out my experiments, he helped with my research paper, and he helped keep me organized. He also did the statistically analysis for me and helped me use Microsoft Excel.

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Amanda C. Lu

Project Number
J2014

Project Title
The Juiciest Apple

Abstract

Objectives/Goals
For my science fair project, I wanted to find out which type of apple, Red Delicious, Fuji, or Granny Smith, produced the most juice, using pectinase to extract it. I hypothesized that the Red Delicious Apple would have the most juice.

Methods/Materials
The materials I used to perform the procedure included 3 different types of apples, pectinase, beakers, water bottles, a water bath, a balance, coffee filters, pipettes, plastic wrap and funnels. I used the pectinase to extract the juice from the same amount of apple (50 grams) using a technique I found online.

Results
The Granny Smith Apple produced the most juice, with 23 grams, while the Red Delicious Apple generated 21 grams of juice. The Fuji Apple created only 19 grams of juice. The results proved my hypothesis was wrong.

Conclusions/Discussion
I think that the Granny Smith was the juiciest because it was the most acidic apple, or had a lower pH than the other apples. Using these results, I concluded that the Granny Smith Apple was the juiciest of the apples I tested. The results of my project can help people decide which apples they would use everyday for cooking and other things. If I were to do this experiment over, I would try to obtain pH strips to test the level of acidity in each type of apple before I conducted my experiment.

Summary Statement
My project was about extracting juice from different types of apples and discovering which type was the juiciest.

Help Received
Emily Dykes helped write results and conclusions; Sister helped conduct experiment; Father helped obtain materials

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Yecenia M. Martinez

Project Number
J2015

Project Title
Effect of Increased Gravity on Root Growth

Abstract

Objectives/Goals
My objective was to see what effect increased gravity would have on root growth (not on root direction). I wanted to see if increased gravity would result in increased root length.

Methods/Materials
4 different sets of red bean seeds were germinated. 3 sets were spun at different RPMs (33, 45 and 78)to provide the increased force, and the 4th set was germinated with no spin. After 7 days, the root lengths of the germinated seeds were recorded and the seeds were planted in cups and placed back on the turntables to continue growing for the next 22 days. At the end of the 22 days, the roots were rinsed and measured and the root lengths were recorded and graphed.

Results
The roots of the plants spun at 78 RPM were significantly longer than the roots of the plants spun at 33 RPM or 45 RPM, or the roots of the plants that were grown with no spin. The shoots of the 78 RPM plants were significantly shorter than the roots of the plants spun at a lower RPM or not spun at all.

Conclusions/Discussion
Increased gravitational force increases root length, but decreases shoot length.

Summary Statement
My project is about the effect of increased gravity on root growth.

Help Received
I used school record players for turntables. My teacher helped me take the pictures

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Marc J. Matossian

Project Number
J2016

Project Title
The Effects of Intense Pulsed Lighting on the Growth Behavior of Bush Bean Plants

Abstract

Objectives/Goals
The objective of my science project was to compare the growth characteristics of Bush Bean plants under intense pulsed and continuous lighting conditions.

Methods/Materials
Plant height, leaf color and leaf size were used to assess growth characteristics of Bush Bean plants. All plants were grown in plastic containers with the same volume, and at the same temperature, to rule out container and temperature effects. Pulsed lighting was achieved using strobe lamps to provide intense pulses of light with the same average total light level as a continuous light source. Continuous lighting was achieved using fluorescent lamps. A Silicon solar cell was used to measure the pulsed and continuous lighting conditions and to ensure all plants were exposed to the same average total light levels. The pulsed-lighting strobe lamps and the continuous-lighting fluorescent lamps were operated on a timer to turn ON every day for 8 hours. Bush Bean plants without any illumination were used as controls. My hypothesis was that the intense pulsed lighting would reduce the growth characteristics of Bush Bean plants compared to continuous lighting.

Results
1. Plants exposed to intense pulsed lighting had about a 40 % reduced plant height compared to constant lighting at the same average light level.
2. Plants exposed to intense pulsed lighting had about a 50 % reduced leaf diameter compared to constant lighting at the same average light level.
3. Plants exposed to intense pulsed lighting had less intense leaf color compared to constant lighting at the same average light level.

Conclusions/Discussion
Bush Bean plants exposed to intense pulsed lighting had reduced growth characeristics (plant height, leaf diameter, and leaf color) compared to plants exposed to continuous lighiting with the same average light level.

Summary Statement
Plants exposed to intense pulses of light have reduced growth compared to plants exposed to continuous light.

Help Received
Disscussed my major findings with Professor Thomas Sharkey of Michigan Technical University, Father helped set up oscilloscope.

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Sanam Mehta

Project Number
J2017

Project Title
Plant Growth and Smells

Abstract

Objectives/Goals
My objective was to find out whether smells affect plant growth and which smell will affect it the most. I do think that smells will affect plant growth. I am not sure which smell will affect it the most.

Methods/Materials
Materials
- 12 plants
- 6 plastic boxes
- 5 Glade Sprays
- Tap Water
- Measuring Cup
- Camera
- Place with sufficient sunlight
- Tape
- 12 cotton balls

Procedure
1. Buy all materials.
2. Label plants as follows: A, A1, B, B1, C, C1, D, D1, E, E1, F, F1.
3. Tape two cotton balls to the side of the boxes.
4. Keep the plants uncovered for 1 hour at the same time of day every day.
5. One hour later, spray a scent on the cotton balls.
6. Water the plant with 100 milliliters of tap water.
7. Repeat Steps 4-6 daily.
8. Take pictures.

Results
The plants that grew the most were the plants which were given the Fruit Explosion scent. None of the plants were affected negatively.

Conclusions/Discussion
I conclude that smells definitely do affect plant growth by enhancing the number of blooms, quality, and speed of plant growth. Using strawberry plants, I finally did get to grow strawberries, but they are not currently ripe (as of 3/2/10).

Summary Statement
I conducted a controlled experiment in which I tested the effects of smells on plant growth by exposing 12 plants to smells.

Help Received
Mom # helped buy materials for testing (plants, boxes, smells, etc.), Mr. Briner (science teacher) # answered questions about testing, Dad # helped decide exactly how to expose plants to smells

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Matthew C. Moropoulos

Project Number
J2018

Project Title
Electrifying Soil: Year Two

Abstract

Objectives/Goals
The purpose of this project was to confirm and refine results of a previous experiment conducted last year by myself regarding the effect of electricity on plants. A.C. current will accelerate plant growth, while D.C. current will stunt it.

Methods/Materials
Methods were: 1)soil uniformly with water, 2)distribute to bins, 3)plant pea and lettuce seeds, 4)set up electrical setup (see schematic diagram), 5)monitor and record growth while watering every two days. Be sure to monitor the levels of electricity in containers, keep at normal levels, about 16V and 20mA. Grow to maturity, pick pea pods off plants. Photograph, record weight, open, photograph, record diameter of peas, perform taste test. Use low pressure hose to wash dirt away from the root systems of the plants. Photograph and record plant weight.

Results
Results from last year were confirmed. A.C. made plants grow faster, bear larger fruit, and respond to stimulus faster. D.C. stunted growth, made plants bear smaller fruit, and root systems very weak. In some cases the root systems completely detached themselves from the plant, causing the plant to shrivel and die. In the case of peas grown by the plants, there was no distinguishable difference in taste between all three classes of plants, D.C., A.C., and control. A.C. had a considerable effect on lettuce, causing every plant to be nearly two times larger than control or D.C. plants of the same species. A.C. current has had a very noticeable effect on all species on which I have tested, causing them to grow faster, larger, and healthier.

Conclusions/Discussion
Since the amount of current that I used is easily attainable using solar power, this may be a new way of cleanly accelerating plant growth, producing more surplus food, and boosting the agricultural industry.

Summary Statement
My project was to test the physical effects of electricity and plant growth, including speed of growth, size, and taste.

Help Received
My dad helped me build the greenhouse I used, and assisted in some of the electrical setup.

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Mehar Nangia

Project Number
J2019

Project Title
Do Plants Grow Better in Composted, Ground, or Fertilized Soil?

Abstract

Objectives/Goals
To determine whether using compost and fertilizer actually help in plants growth.

Methods/Materials
Procedure. Blend assorted fruit peels and meats to make compost. Put soil in the pots. Add plants to the pots. Add fertilizer to plants, two of each of the three types. Add compost to plants, two of the remaining four of each type. Place all the plants in an area of equal sunlight. Water the plants. Measure the length, no. of leaves, no. of stems, and color of each plant. Take readings every 3 days over a period of 6 weeks. Materials. 6 Basil, 6 Mint and 6 Rosemary Plants, 18 Pots, 1 Display Board, 1 Notebook, Miracle Gro, Potting Soil, Assorted Fruits, Blender, Water.

Results
1. Plants with Fertilized soil were dying but had shiny leaves. 2. After 2 weeks, Basil & Mint plants started to flower, Composted plants flowering first and in plenty. 3. After 6 weeks, the Rosemary plants started to spread, starting with Compost first but the Ground plants spreading more. 4. The Composted plants had the darkest colored leaves and stems, followed by the Ground and the Fertilized plants. 5. Surprisingly, the Fertilized Mint plants began to spread when the other Mint plants were growing taller. 6. Also, Plant 16, a Fertilized Mint, was the only plant that lost 3 stems by the end of the 6 week; all others recording growth. 7. Only in one case did a Fertilizer plant grow more in length compared to a Ground plant, the Fertilized plants growing significantly less in all other cases.

Conclusions/Discussion
The key conclusions of my 6 weeks study for 18 plants of 3 different types, are: The Composted plants registered the best growth in all the 3 categories. The Composted grew 37% more in length than the other two soil types and 26 % and 48% more leaves compared to the Ground and the Fertilized plants respectively. The stems of the Composted plants also grew 26% and 63% more than the latter two. The Composted Basil plants again showed significantly better results; growing 32% and 48% more leaves, 25% and 30% more in length, and 32.5% and 62.5% more no. of stems, for the Ground Basil and Fertilized Basil plants respectively. The Composted Mint and the the Rosemary plants showed similar results. So my investigative question, #Would a plant grow better in Composted, Ground, or a Fertilized soil?# gets fully answered. And my hypothesis that the Composted soil is better for plant growth, is proven correct.

Summary Statement
Do plants grow better in composted, ground, or fertilized soil?

Help Received
My parents for helping me with the recording of the plant growth and for buying me the necessary supplies for this experiment. Ms. Babish for providing me the necessary rubrics and answering any questions. The Biologist at the Ask the Scientist night for helping me choose the plants.

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Emily Nevens

Project Number
J2020

Project Title
The Effects of Organic, Fish, and Chemical Fertilizers on the Growth of Tomato Plants

Abstract

Objectives/Goals
To determine which of the following plant fertilizers; organic, chemical or fish produces the maximum growth and fruit production in tomato plants.

Methods/Materials
To determine the objective, the experiment was conducted on 12 tomato plants of the same species and size.
The tomato plants were divided to 4 groups of three and planted in the soil. Plants 1,2 & 3 (control plants) were fed only water every other day for 10 weeks. In addition to watering every other day, plants 4, 5, & 6 were given a dosage of Fish Fertilizer once per week for ten weeks while plants 7, 8, & 9 were nourished with Chemical Fertilizer, and plants 10, 11, & 12 were fed Organic Fertilizer.

Results
The growth of each plant was measured and recorded on a weekly basis. While the control plants achieved the greatest total growth of all the plant groups, the Fish and Chemical Fertilized tomato plants produced the most fruit averaging 8 tomatoes on each plant. Organic fertilizer produced the least fruit and growth rate.

Conclusions/Discussion
The location of the plants from a large white reflective wall was found to be an important factor influencing the plants growth. Although fertilizer plays an important role, other variables such as light intensity are as important as soil nutrients and irrigation.
The Fish fertilizer proved to be more effective than its counterparts in optimum growth and fruit production.

Summary Statement
To determine which of the three fertilizers (Organic, Fish, and Chemical) encourage maximum growth and fruit production in Tomato plants.

Help Received

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Ania Kaila Osuna

Project Number
J2021

Project Title
Analyzing Which Plant Is Most Adaptable to Car Exhaust

Abstract

Objectives/Goals
My primary goal was to determine which of my three plants would survive in car exhaust contaminated climates and to determine which of my plants were the most adversely effected.

Methods/Materials
I used six Strawberry plants, Brussels Sprout plants, and Basil plants. Three of each went into a greenhouse exposed to car exhaust and the other three went into a greenhouse not exposed to car exhaust. I used car exhaust, because it is one of the main air pollutants in our valley. I used Strawberries because they are an ever bearing fruit that would survive through the weather of my experiment. I used Brussels sprouts, because they cope well with both hot and cold weather. I used Basil, because it is an annual herb.

I labeled the plants exposed to car exhaust A and the plants not, B. I replanted them and placed two clear plastic containers over them, this container acted as my greenhouse. I had nine plants in each greenhouse. One greenhouse would house the plants and contaminated socks (A)and the other would house the plants (B).

For my source of car exhaust I secured two socks around the muffler of a car. At the end of each day I removed the socks, replaced them with two more, recorded the daily mileage, and placed the removed socks in greenhouse A. This experiment lasted eight weeks.

Results
I used six weeks of data for my final analysis, because of a variable I had not anticipated. I concluded from my six weeks that strawberries were the least adversely effected and Brussels sprouts the most.

Conclusions/Discussion
I discovered my hypothesis to be incorrect. My hypothesis asserted that the Basil would flourish and thrive better than the rest of the plants. I also maintained that the Strawberries would be susceptible to the effects of car exhaust. The end results proved that the Strawberries were least affected by car exhaust and that Brussels sprouts were the most affected. Strawberries exposed to car exhaust grew only four (4) cm less than the control group and Brussels Sprouts grew a total average of eight point four (8.4) cm less than the control group.

In conclusion, car exhaust affects Strawberries least. Even though precautions are being implemented to clean up air pollution, planting plants that can withstand the effects of pollution caused by car exhaust, such as strawberries, might help agriculture remain a strong industry in our Valley.

Summary Statement
I investigated the effects of car exhaust on three different plants in order to determine which is least effected by it and thereby, more likely to thrive in the San Joaquin Valley where car exhaust is one of the main air pollutants.

Help Received
Mother assisted me in aquiring all my equiptment and best way to place sock around muffler without affecting the vehicle.

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
W. Brock Oury

Project Number
J2022

Project Title
Coastal Pines: Ability of Needles to Condense Moisture

Abstract

Objectives/Goals
The Torrey Pine (Pinus torreyana) is able to condense water from coastal fog with such effectiveness that it is able to supplement San Diego's coastal annual rainfall in order to survive in this typically arid climate. I hypothesized this was not just due to salt nucleation sites or needle length helping to condense water, but was also due to some advantage in the microscopic structure of the Torrey Pine needle that increased the surface area of the needle. I hypothesized that the surface area of each Torrey Pine needle was greater than that of the Canary Island Pine (Pinus canariensis), Aleppo Pine (Pinus halepensis), or the Japanese Black Pine (Pinus thunbergiana), and this allows the Torrey Pine to be more efficient at collecting and condensing water from the air.

Methods/Materials
I constructed a fog chamber using two humidifiers. I monitored the humidity using a hygrometer. I tested and compared the same weights of needle samples in each of five trials. I measured the water precisely and graphed five trials of data that compared the four species. I recorded how much condensation was produced, the hourly rate at which the water condensed, and the percent of efficiency to condense the fog. I examined the needless of the four test species under a 60x microscope and photographed the images. I also photographed cross sections. All of the needles were collected from the trees at the same location more than three miles from the coast. No needle type had any salt advantage.

Results
From the results of the 20 tests, the Torrey Pine was the most effective species at condensing the humid air and was significantly more effective at collecting water than the next most effective species, the Aleppo Pine. The Torrey Pine also appeared to have a greater density of microscopic projections along its needles than the other three needle types. The Torrey Pine needle projections appeared to be more prominent and larger than the projections in the other species.

Conclusions/Discussion
It appears the Torrey Pine may have unique adaptations which successfully help turn the fog of the San Diego coast into condensed water, creating #rain# for the root system. Based upon the findings, I would recommend further study of these microscopic features of the Torrey Pine needles to discover how the features might relate to the efficiency of condensation.

Summary Statement
I compared the effectiveness of the Torrey Pine needles versus other needles to condense fog and examined the needles at 60x to look for microscopic structural differences that might provide advantages for the needles.

Help Received
I would like to thank my science teacher for providing guidance and helping me with the Intel microscope. I would also like to thank my grandfather for helping me get my needle samples, for monitoring me throughout my project, and for helping me do the cross sections of the needles safely.

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Matt S. Pandol, III

Project Number
J2023

Project Title
The Effect of Worm Casting on Plant Growth

Abstract

Objectives/Goals
The objective is to determine how different percentages of the Coachella worm casting can affect the growth of radish plants in biomass.

Methods/Materials
Planted ten containers of six different percentages of worm casting mixed with sterilized peat moss and placed three radish seeds each. The percentages were 0%, 20%, 40%, 60%, 80%, and 100% of worm casting. The containers were color coded. Plants were placed in a green house to grow for the next 31 days. After four days, I thinned the plants out and left only the biggest plant to grow in each container. Plants were watered on a daily basis with the same amount of water. After 31 days the plants were uprooted, soil removed, and weighed. Then the radishes were removed and reweighed them separately.

Results
The results show that the plants that grew in the 80% worm casting had the most biomass and the 0% had the least. The order of smallest to greatest biomass is as follows: 0%, 100%, 40%, 20%, 60%, and 80%. In weighing just the radishes the 60% weighed the most.

Conclusions/Discussion
In conclusion my hypothesis was not fully supported by the data. I expected the 20% worm casting to produce the most biomass. With the 60% and 80% worm casting the plants had more biomass than the 20%, but the radishes were mutated, or oddly shaped. With the 20% worm casting, radishes were the most uniform in shape. This shows that too many nutrients can be harmful to plants and can affect the food it produces.

Summary Statement
How different percentages of Coachella worm casting can affect plant growth.

Help Received
Carl Gwilliams for providing the worm casting, electrical conductivity meter and obtaining the soil sample from the lab.

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)

Celine Payne; Denise Tien

Project Number

J2024

Project Title

Survival of the Dragons

Abstract

Objectives/Goals

We chose to do this project because it addresses whether carbon monoxide emissions have an effect on plants. Carbon monoxide can sometimes be trapped under a layer of warm air close to the ground where plants may grow. By doing this experiment, we hope to find out whether plants can survive when carbon monoxide to learn more about our environment.

Methods/Materials

Materials:12 Snapdragon plants, La Bella Yellow;Tap Water;2 Clear Plastic Storage Boxes, With Lids;Carbon Monoxide Cylinder;Fluorescent Light (longer than double the size of 1 plastic storage box);Tube;Needle Valve;Table;Drill+Bit;Carbon Monoxide Sensor;Regulator;Crescent Wrench;Swagelok

Methods: Turn the clear plastic storage boxes over (upside-down). Label one "Experiment," one "Control." Divide the plants into 2 groups.;Drill holes into "Control" box.;Drill a hole ontop of "Experiment" box, seal it with glue.;Fill the bottom of lids with water with a light hanging over.;Strap the CO cylinder to a wall.;Use a crescent wrench, to attach the 2 stage regulator. Attach the needle valve to the output of the second stage.;Using Swagelok fittings, connect tube to the output side of the needle valve.;Close the needle valve and second stage output valve.;Open the cylinder valve. Pressure on regulator first stage should be around 1500 psi.;Rotate regulator knob until pressure on second-stage is 10 p.s.i.;Open second stage valve to allow gas to flow into needle valve.;Turn the needle valve so there are about 45 bubbles per minute.;Every two days record plant height and number of leaves, and take observations.;Before taking any heights or observations, turn the needle valve off and the knob next to it.

Results

In our project, the #Control# group of plants began shorter than the #Experiment# group. However, they grew taller than the #Experiment# group of plants towards the end. For the layers of leaves, when averaged, both groups had the same layer count at the beginning. At the end, both of the groups# averaged layers of leaves were the same.

Conclusions/Discussion

There was no significant difference between the heights of the plants in the two groups. Therefore, our experimental hypothesis was incorrect. The #Experiment# group that had received CO survived. Our null hypothesis was correct. According to graphs we created, in an environment of concentrated carbon monoxide, plants are able to grow, only slightly slower than normal circumstances.

Summary Statement

"Survival of the Dragons" tested whether Snapdragon plants could live in conditions where Carbon Dioxide was replaced with Carbon Monoxide.

Help Received

Alexander Payne (Father of Celine) helped work with Carbon Monoxide; Teacher helped with formatting and some editing of document

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Ruben C. Renteria, Jr.

Project Number
J2025

Project Title
The Comparison of Chromatographic Results Between Deciduous and Evergreen Trees

Abstract

Objectives/Goals
I will determine which type of tree, evergreen or deciduous, will have a thicker chromatographic result.

Methods/Materials
I went to my local nursery and got about ten leaves of each evergreen and deciduous tree. I took some leaves, tore them up, placed them in a beaker, and poured 10 milliliters of alcohol into the beaker. Then after a day I put strips of coffee filter paper in barely touching the fluid and waited another day. Next I recorded the data by making measurements of the color thickness of the bands.

Results
My results show that the deciduous trees have a slightly thicker chromatography intensity demonstrated and measured by the color band thickness.

Conclusions/Discussion
I found that my hypothesis about the thickness of the chromatography bands for deciduous and non-deciduous trees was incorrect. The chromatography between these two groups of trees did not show much difference perhaps because all leaves were picked while they were still green on the tree. It would be interesting to test leaves which have completely changed their color while still on the tree. This information is important to the consumers who want to plan the perfect landscape. It allows people to decide if they want the greenest evergreen or color their world.

Summary Statement
My project was to show the difference between the chromatography of evergreen and deciduous trees.

Help Received
Mother helped with typing; dad helped with graphs; siblings helped with setting up board.

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Marianna Ripa

Project Number
J2026

Project Title
DNA Extraction

Abstract

Objectives/Goals
My objective is to find out how to extract DNA from plants using household materials that can be accesible to any person.

Methods/Materials
Method: I broke down the plant cells by blending the plant using salt for that can be easier to extract the DNA. From there I put a layer of rubbing alcohol over the solution, that way the DNA would rise into the layer and I would have a visual.

Materials: Alcohol (isopropyle), clear glasses, iced water, distill water, measuring cup, salt, clear detergent, spoon, plastic bag, blender, paper coffee filter, ruber band, drainer, toothpick or popsicle stick, vegetables or any kind of plant.

Results
I was successful in separating DNA from approximately 73% overall from the chosen samples. In the case of the vegetables I had a 75% overall success rate. In the case of the plants I had a 70% overall success rate. Comparing the two groups, there is a consistent outcome of approximately 73%. The variable of the experiment was the time to separate the DNA from the solution. The extraction of the DNA from the peas took 10 minutes loger due to the thickness of the solution.

Conclusions/Discussion
I was able to extract the DNA using household materials, accesible to any person.

Summary Statement
How to extract DNA from plants using household materials.

Help Received
Science teacher revised report and mother helped getting materials.

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Joseph Rutten

Project Number
J2027

Project Title
Bright Ideas

Abstract

Objectives/Goals
I recorded and evaluated the growth of house plants when exposed to different light sources. I was trying to find the best light source to grow house plants with.

Methods/Materials
9 pepermint plants, 3 light sources(ultra violet,incondesant,floresent) 3 cardboard boxes, tinfoil, lighting fixture, dark space. I placed 3 plants per box, covered with foil and exposed them to the three different light sources(one box per light source) I recorded and observed the growth for 10 days. I averaged the data and determined the results.

Results
the results of averageing the growth of the three house plants in a 10 day period with ultra violet rays was 9in. the incondesant rays were 7.9in. and the floresent rays were 7.7in.

Conclusions/Discussion
After measuring and evaluating the growth of house plants in a time span of 10 days with 3 different light sources (ultra violet, incondesant,and floresent)I found the ultra violet rays to be the best lighting source for house plants.

Summary Statement
Determining the best form of light which promotes the best growth of house plants.

Help Received
Mom took me to the store to buy the plants.

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Philip B. Sanfilippo, III

Project Number
J2028

Project Title
Go Bananas

Abstract

Objectives/Goals
The purpose of this investigation is to determine if the air flow around bananas changes how fast they ripen. If you change the air flow around the bananas and therefore change the presence or concentration of ethylene gas will the bananas ripen faster or slower? I think the bananas with the least air flow will ripen fastest.

Methods/Materials
I used one hand of stage 2 green bananas separated into 3 clusters of 3 bananas and 3 banana hangers that I made from wood. I put the banana hangers on my kitchen shelf. I covered one cluster of bananas with a clear plastic bag and partially closed it with a bag clip. I set up a small fan near another cluster and put it so the air was blowing on the bananas. I observed the ripening stage for all 3 clusters of bananas every 12 hours until they were all at stage 7 based on the UC Davis staging chart.

Results
In the beginning the bananas in the control cluster and the fan cluster were ripening at about the same pace. The cluster in the bag ripened faster and continued to ripen faster until the fifth day of observation when the control cluster caught up. Then the control cluster reached stage six first but the bag cluster ripened quickly during the last 2 days and was the first to reach stage seven. The cluster with the fan blowing on it ripened most slowly until it got to stage 5 and then it ripened quickly and caught up to the control cluster.

Conclusions/Discussion
The bananas in the bag ripened the fastest and the fan cluster ripened slowest. The cluster in the bag had an enclosed environment with the least airflow. By changing the environment to increase the concentration of ethylene gas the bananas ripened faster. Although my hypothesis was correct and the bananas ripened at different rates they were not as different as I expected. A possible explanation for this result is that the concentration of ethylene in the air is not as important as the ethylene gas in the banana itself. This may also explain why near the end of ripening the bananas all ripened quickly. I also noticed that the speed of ripening in all three clusters got faster the riper they got. Maybe once a certain level of the gas is reached the bananas ripen quickly. Another reason the fan cluster may have ripened more slowly is that the moving air may have slightly cooled the bananas due to evaporation. This might have slowed down the ripening process.

Summary Statement
By changing the air flow and therefore the concentration of ethylene gas around bananas during ripening the speed of ripening changes.

Help Received
I got help from my sister in decorating my project board. I asked my friends and family sometimes to confirm my banana ripening score. My Dad helped me build my banana hangers. My whole family talked about my project and helped me proofread.

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Anna Tada

Project Number
J2029

Project Title
Lasting Flowers

Abstract

Objectives/Goals
In Japan, it is said that if you put a 10yen coin in a flower vase, the flower will last longer. So I wanted to test if that is true. Additionally I also wanted to test on American coins for similar results. I wanted to include the flower food in this experiment as well to see how well those chemicals functions. Then, I started my project to see which coins will last the flowers longer. My objective for this experiment was to find a better way to preserve cut flowers.

Methods/Materials
Put one brushed and sterilized 10yens, $1coins, quarters, dimes, nickels, and pennies inside 40 plastic containers individually. Pour 100ml of water to each 40 plastic containers. Put one table spoon of flower food to each five plastic containers out of 40. Then cut 40 very similar looking carnations into 15cm. Place the carnations into the 40 plastic containers. Now, use a glue gun to place the digital camera where you can take pictures of my experiment every night.

Results
The flower food lasted for 23days in average and 10yen lasted for 22.6days in average. The third place was water(lasted for 20.6days in average) and penny(lasted for 20.2days in average). The others were in this order: quarter, nickel, $1coin, and dime.

Conclusions/Discussion
From my background research and the results, it seems like the composition of the coins are affecting these results. Flower food, 10yen, and penny had composition of copper and zinc. I looked in the article and it said that copper has ability to kill germs and bacteria. For zinc it said that zinc is an element that is like a fertilizer, which is what stimulates plant growth. $1coin, quarter, dime, and nickel had the composition of nickel in common. I looked in an article and it said that nickel is very harmful element and it is very toxic to plants. Now I understand why and how it came up with these results. Also when I look at the composition of flower food I found out that it is very similar to fertilizers. So the flower food is giving out the nutrient to plants. For 10yen and penny, they both have composition of copper and zinc. Like mentioned before, the copper has ability to kill germs and bacteria and zinc is an element that is like a fertilizer which is what plants need. By knowing that, copper kills germs and bacteria inside water, so the flower can live longer. Now I know the difference in between flower food and 10yen and penny.

Summary Statement
An observation about how long the flower will last when I put a coin.

Help Received
My mother helped me buy materials and make graphs; My father helped my how to write my report and set up my project; and Mr. Cady helped me by answering questions that I had.

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Emily Y. Wang

Project Number
J2031

Project Title
Fruity Fermentations

Abstract

Objectives/Goals
My project determines how certain fruit's ripening process are affected by ethylene gas.

Methods/Materials
One of five different kinds of fruits,cherimoya, banana, avocado, pear, and mango, in same numbers and comparable sizes, were place in airtight bags and one were left in the open air. The fruit enclosed in the airtight bag were stored with two apples and the fruit in the open air were surrounded by multiple apples. The fruits were tested for two weeks. To test the extent of ripeness for each fruit, I cut open each fruit and applied iodine starch solution.

Results
My results showed that the cherimoya in the open air was most effected by the apples, but the cherimoya in the bag was least effected by the apples. However, the banana in the airtight bag was more effected by the ethylene gas than the banana in the open air.

Conclusions/Discussion
Except for bananas, all fruits tested ripened faster in the open air than in enclosed bags, with cherimoya showing the most effected by the ethylene gas created by the apples.

Summary Statement
What effects ethylene gas, created by apples, have on the ripening of various fruits.

Help Received
My science teacher, John Briner, critiqued the procedure and experimentation of my project. My partns and sister helped on the assembling of my board.

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Brooke L. Weber

Project Number
J2032

Project Title
Investigating the Effects of Nitrogen, Phosphorus, and Potassium on Foliage

Abstract

Objectives/Goals
My objective for this project was to determain what effects nitrogen, phosphorus, and potassium had on foloiage. I thought that the plants would grow faster because of the nitrogen. Also I believed that the roots would grow longer and stronger due to the phosphorus. I believed that the color would improve from the potassium. For the sod I believed that it would grow longer but won't have that much noticeable change.

Methods/Materials
For my project i used many materials. Some of the importaint ones were the green houses, the Fescue, the Pansies, small backing pans, cups, the Nitrogen, Phosphorus, Potassium, and 8-8-8 fertilizers, fertilizer mixing containers, a color wheel, a centimeter ruler, and the record sheets. To begin my project I had to transfer my flowers into larger cups and the sod into backing pans. Afer, I put them in green houses. To test my project I had to mix fertilizers into water, then put it in the individual plant section. Every other day i would measure the stems, pedals, and leaves, and the blades of grass then record them on the record sheets. For each section of foloiage I would observe the color using a color wheel, then record it on my record sheets. At the end I measured the roots of the plants.

Results
My result were that the nitrogen did not cause any growth to happen for the leave, stems, pedals, or roots of the flowers and it had little growth for the sod blades. The Phosphorus and potassium had growth in all five tested areas. The leaves, stems, pedals, roots, and blades of grass all had growth. For the triple eight fertilizer it only caused growth to occure in the leaves. For the color change the pedals, stems, leaves, and blades of grass of the potassium and phosphorus did not have a noticable color change when compared to the control. The nitrogen and triple eight's color turned to a very light green.

Conclusions/Discussion
My conclusion did allow me to attain my objective which was to determain what effects the three main macro-nutrients for plants had on pansy flowers and fescue sod. My conclusion did not match my hypothesis exactly. I believed that the plants would grow faster because of the nitrogen; incorrect. I also believed that the roots would improve because of the phosphorus; correct. I believed that the color would improve due to the potassium; incorrect.I believed that the sod would grow just a little. Out of the four only two grew and a little at that.

Summary Statement
My project is about what effects the three main macro-nutrients, which are nitrogen, phosphorus, and potassium, have on foloiage, such as fescue sod and pansy flowers.

Help Received
My parents helped by supplying me with the materials I needed. Jeffery Weber helped by giving me professional advise on my project and answering any questions I had, since he is a pest control advisor.

CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Catherine H. Williams

Project Number
J2033

Project Title
Factors Affecting Sweet Pea Tendril Growth

Abstract

Objectives/Goals
The goal of my project was to determine how the growth pattern of sweet pea tendrils is affected by the presence of a magnetic field, blowing air, or having their tips cut off.

Methods/Materials
Twelve young sweet pea plants were divided into four groups with three plants each. The plants were placed in individual pots which included bamboo lattice support structures. All groups were subjected to identical growing conditions except for the manipulated variables. One group was the control, one group was subjected to a magnetic field, one group was subjected to faintly blowing air, and the last group had the tips of their tendrils cut off once they touched a lattice. Over a period of twenty days, observations were made and recorded regarding the number of sweet pea tendrils which touched and then wrapped around their lattices.

Results
The control group had the most number of tendrils touching and wrapping, and the magnetic field group had the fewest number of tendrils touching and wrapping. The fan and magnetic field groups had lower ratios of tendrils wrapping to tendrils touching than the control and snipped tip groups.

Conclusions/Discussion
The results indicate that the plants in the non-control groups may have been negatively affected by the forces that they were subjected to. Because the magnetic field group plants had the fewest tendrils touching lattices, and a slightly lower ratio of tendrils wrapping to touching lattices, the presence of the magnetic field may have decreased the growth and wrapping tendency of the tendrils more than the other factors. The data also indicates that snipping the tendril tips did not seem to affect the amount they curled around the lattice. Improvements can made to this experiment in the future in order to decrease error and produce more reliable results.

Summary Statement
This experiment was conducted to determine if sweet pea tendril growth patterns could be affected by various external factors.

Help Received
My parents helped me purchase the materials; My parents helped me assemble the project, and with photography and with using Microsoft Excel on the computer.