Luke
Science D-Block
10/27/2003

Introduction:

The goal of this project is to see if there is any difference between plants grown in Sweet Home's arsenic laden soil and Corvallis soil. We will determine the differences between the growth and maturity rate of each plant. The plants will be tested many times and the data will be written down so the class after us can continue any other studies on this subject further.

Arsenic is a hazardous element to animals, but what is it to plants? Many studies have shown that arsenic content was found in six garden crops: lettuce, onion, beetroot, carrot, peas and beans. In that survey, various vegetables were analyzed and the amounts of arsenic, on a fresh weight basis, were reported. The amounts in corn averaged, 1.8 mg/kg and the amount averaged in potatoes were, 0.86 mg/kg (#1). This meaning that one of the plants absorbed more arsenic then the other. The information will go to help understand what effect arsenic has on the plants in the community. It could also go to help find out what the effects are to humans and animals. Arsenic was used in many things like wood treatment and insecticide. This was to kill bugs but it also affected other things like, plants and animals. One of these plants could be English Ivy or many other plants like it.

The plant to be studied is known as English ivy (*Hedera helix*). This plant is from England, it traveled here by boat then it was sold as an ornamental type plant. Now it has spread as a weed across the northwest (Bregar). Even though it will be hard to grow they believe that it will be a perfect specimen for the test.

The information that we find would be very useful to the people in Sweet Home. If I were to live in Sweet Home and grow a garden, I would like to know what plants the toxic element affects, so I could grow a garden without problems. What I hope to find is that there is no difference between soil with arsenic and soil without arsenic. If we did discover that there was a difference in the plants, we could help stop it from affecting anyone.

This information could be very useful to a scientist because it could help find the answers to some very big questions. It could help a scientist solve a major weed problem. Or it could be used in some experiment on different varieties of plants. Although arsenic is toxic to humans there is always a use for it.

The site of exploration will be at an accessible near by park. We need to first access the land and get a permit to dig there. The location is not decided yet. There are many possibilities of places for us to work at one is Ames Park or even by Ames Creak. The amount of possibilities is endless; I hope we can find a permit for some of these sites soon.

We expect to see that the plants will have no difference externally but internally we will see some sort of difference. We think this because arsenic levels tend to increase in the plant tissue with increasing amounts of arsenic in the soil (#1). This would be a cause for concern in Sweet Home's arsenic laden soil. Sometime I hope that the findings will benefit Sweet Home citizens in the future.

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Methods:

In order to find out if arsenic levels in the soil affect the plant growth, our plant is English Ivy. We are getting soil samples from Crescent Valley High School Corvallis Oregon and Sweet Home Oregon. First Sweet Home Oregon we will collect the soil samples. The Soil samples will be four-six inches deep the seventh inch will be the soil that we gather (Jim Childs 1999). We find the exact position with a GPS so this can be duplicated. Then after the soil has been collected put evenly into the eight pots, fill to four inches uncompressed. Label each pot state the depth and where it was in the digging sight. Then wrap the pot in plastic wrap, to prevent Air-drying of the soil samples. Store the samples in a cabinet at room temp. Repeat this procedure at Crescent Valley High School Corvallis Oregon the next day.

After the samples are collected and all stored in the same spot, we then take the English Ivy Seeds and plant two in each pot. We will the place the pots under the florescent light for a certain amount of time, and then we will analyze the growth every Friday. The way we are analyzing is by measuring the growth and comparing the plants too each other. We will water them with the same amount of water every other day from the first day on. While we are doing this we will also send a sample down to the OSU reactor to have it analyzed.

Materials:

- Sixteen flowerpots
- Sixteen English Ivy seeds
- Soil from CVHS
- Soil from Sweet Home
- Two large plastic bags
- A yard stick
- ruler
- Water
- A small steal hand shovel
- GPS
- OSU reactor
- A specific environment
- Plastic wrap
- Florescent light

References

David E. Stilwell (March 2002) *Excerpts on Uptake of Arsenic by Plants Grown Near CCA Preserved Wood* http://www.noccawood.ca/stilwell1.htm

Jim Childs, *Garden Gate* Issue 29, October 1999
Colorado State University Cooperative Extension, 1995-2003, www.ext.colostate.edu.

Dan, Bregar; In Class Discussion, http://www2.corvallis.k12.or.us/cvhs/bregard/index.htm

By David Kemp and Paul Briskey June 5, 2003 AP Physics D Block
http://www2.corvallis.k12.or.us/cvhs/science/David-Paul-Report.doc