

## Will the Addition of Potato Skins Effect the Growth of Plants

### Abstract:

The hypothesis that the addition of potato skins on the top of soil increases the height of a plant was tested. To test this hypothesis, Brassica rapa seeds were planted using the Wisconsin Fast Plant instructions.<sup>¶</sup> To determine the difference in growth, sixteen plants were treated with potato skins on their soil and sixteen received no treatment. The results showed that while there was a minor difference between the two growths, it was not convincing enough to prove the hypothesis.

### Introduction:

People have been using different kinds of products on their plants to improve growth. People continue to look for the best product to help their plants. Many believe that it is beneficial to place potato skins on top of the soil around the base of the plant to greater the height and the amount of leaves it has. Today, most farmers prefer to use a fertilizer on their plants that specifically contain nitrogen, phosphorous, and potassium.<sup>¶</sup> Does the addition of potatoes on top of the soil of increase the height of a plant?

In order for plants to grow, they require vital elements such as potassium, calcium, magnesium, phosphorous, carbon, oxygen and hydrogen. The most common deficiencies in plants are of phosphorous, potassium, and nitrogen. Calcium is essential in the growth of plants as well as strengthening of the cell walls. The function of potassium in plants is to maintain a water balance which will prevent desiccation.<sup>¶</sup> Potatoes are a good source of potassium, phosphorous, calcium and magnesium, along with many other nutrients.<sup>¶</sup>

The potato skins were placed on the top of the soil because the topsoil is the most important layer for the growth of plants. The topsoil is where the plants are nourished by soil solution, water, and dissolved minerals from the potato skins.<sup>¶</sup>

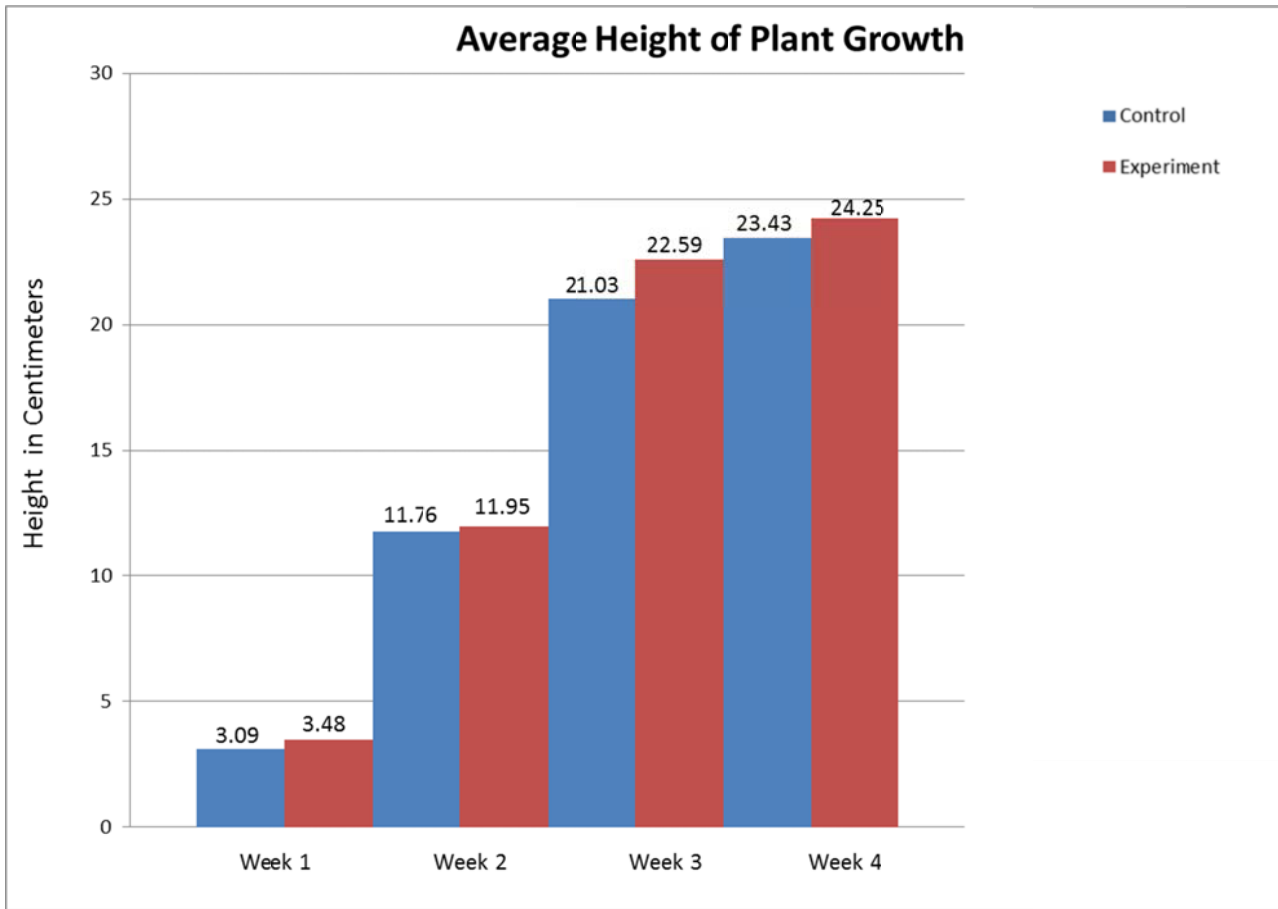
### Materials and Methods:

Many materials are necessary in order to start the Fast Plant experiment and to test the hypothesis that potatoes increase the growth of plants. The fast plant seeds that are used are called Brassica rapa which are known to have a flowering time of only fourteen days.<sup>¶</sup> The Wisconsin Fast Plant Manual was used with the addition of treating sixteen plants with potato skins and sixteen with just water. In this experiment, potato skins were cut into small pieces, placed on top of the soil, and watered for the plants to grow.

Results:

Heights of Individual Brassica Rapa Pants (cm)

Cell	Week 1 Control	Week 2 Control	Week 3 Control	Week 4 Control
1	3	10.6	23.5	
2	3	11	22	
3	5	13	26	
4	3	19	28.5	
5	2.1	5	7.5	
6	3.2	12.5	30	
7	2.9	16.2	13	
8	3	6	12	
9	3.5	16.7	29	
10	4	17	29	
11	2.6	11	17.5	
12	2.1	10.8	18	
13	2.9	5.5	8	
14	3.2	16.3	31	
15	2.9	10	22.5	
16	3	7.6	19	
Cell	Week 1 Experiment	Week 2 Experiment	Week 3 Experiment	Week 4
1	3.1	11.6	18.5	
2	4	15	25	
3	3.6	12	18	
4	3.5	13.2	26.5	
5	4	12.3	28.5	
6	3.9	10	27	
7	3.4	9	24.5	
8	1.2	8.6	17	
9	4	7	17.5	
10	4.1	13	19.5	
11	2.9	15.3	29.5	
12	4	14	20.5	
13	3.5	13.2	22.5	
14	4.7	11.2	26	
15	3.5	13.6	19	
16	2.2	12.2	22	



A two sample t test was conducted to determine if there's a difference in plant growth between the control and experimental groups.

$H_0 = \mu (\text{potato skin}) - \mu (\text{Control}) = 0$

$H_a = \mu (\text{potato skin}) - \mu (\text{Control}) \neq 0$

#### Statistics

Mean of Control (cm): 23.44

Standard Deviation (Control): 7.14

Total number(Control): 16

Mean of Experimental (cm): 24.25

Standard Deviation (Experimental): 4.15

Total number (Experiment): 16

#### Results:

Degrees of Freedom: 24.11

P value: 0.697

T Value: -0.3936

A P-value of 0.697 indicates that there is significant evidence to conclude that there is no difference in growth between plants that were treated with potato skins as compared to plants that received no treatment.

### Discussion/Conclusion:

Although there was a slight difference in growth due to the addition of potato skins, it was not significant enough to prove our hypothesis that potato skins increase the height of plants. Some sources of error in this experiment include incorrect measurements of each plant and adding the potato skins too late. For example, the potato skins were not added to the plants until they had already started sprouting. If they were added prior to growth the potato skins may have had a more drastic effect on the height of the plants. Also, the control and experimental groups should have been the same height when the treatment started to provide more accurate data. Therefore, the plant should be measured before and after the treatment was added to find the difference in growth.

### Notes

- 1) Carolina Biological Supply Company, "Wisconsin Fast Plants Growing Instructions." Accessed December 10, 2011.
- 2) Reece, Jane B., Lisa A. Urry, Michael L. Cain, Steven A. Wasserman, Peter V. Minorsky, and Robert B. Jackson. *Campbell Biology*. Pearson Benjamin Cummings
- 3) Ibid
- 4) Prokop, Sylvana, and Janice Albert. Food and Agriculture Organization of the United Nations, "Potatoes, nutrition and diet." Last modified 2008. Accessed December 10, 2011.
- 5) Reece, Jane B., Lisa A. Urry, Michael L. Cain, Steven A. Wasserman, Peter V. Minorsky, and Robert B. Jackson. *Campbell Biology*. Pearson Benjamin Cummings
- 6) Carolina Biological Supply Company, "Wisconsin Fast Plants Growing Instructions." Accessed December 10, 2011.

### References

- Prokop, Sylvana, and Janice Albert. Food and Agriculture Organization of the United Nations, "Potatoes, nutrition and diet." Last modified 2008. Accessed December 10, 2011.  
<http://www.potato2008.org/en/potato/factsheets.html>
- The FAO's information on the nutrition of potatoes was useful to our research because it provided nutritional facts about potatoes. Knowing the nutrients in potatoes supplied background information to support the hypothesis that the addition of potatoes on top of the soil will increase the growth of a plant.
- Reece, Jane B., Lisa A. Urry, Michael L. Cain, Steven A. Wasserman, Peter V. Minorsky, and Robert B. Jackson. *Campbell Biology*. Pearson Benjamin Cummings
- Chapter 37, Soil and Plant Nutrition, of *Campbell Biology* was helpful in providing background information on plants. Page 786 gives a definition of topsoil and why it is the most important layer. Pages 790-791 explain the important nutrients that plants need in order to grow and the function of each element.

Carolina Biological Supply Company, "Wisconsin Fast Plants Growing Instructions." Accessed December 10, 2011.

- The Fast Plant instruction manual was followed for the procedure and materials. With the exception of the addition of potato skins, every step of the procedure for this experiment was performed while reading the instruction manual.