

INTRODUCTION

In our project, we wished to test the hypothesis that with varying levels of fertilization, our *Brassica rapa* plants would grow bigger and more quickly than the control with no fertilizer. Although the conditions of these "dark" plants are predetermined to "grow well in a small indoor space, with little soil, under artificial light" (Van Pelt), our experiment intended to see whether or not the addition of little, 2 generic fertilizer pellets, to significant, 8 pellets, would significantly increase the life cycle and growth of the plant. If the plants had more nutrients from the fertilizer, according to our hypothesis, there would be more chlorophyll produced resulting in more glucose for plant growth. Our control plant with no additional fertilizer would allow us to prove our hypothesis right or wrong.

Methods

First, we washed a 5-l water mix with water that had 2 to 3 ml of liquid detergent in it. Then we rang it out and repeated this two more times. The last one we did we ring it out and replaced this two more times. The last one we did we ring it out and replaced this two more times. The last one we did we ring it out and replaced this two more times. The last one we did we ring it out and replaced this two more times.

To plant the seeds we used quads, four-celled planting units used for growing, and wicks, diamond-shaped felt used to conduct the water from the soil to the potting mix in the quads. We placed one wick into each of the cells so that the bottom tip reaches 1 cm through the hole in the bottom of the quad. We then filled the cells halfway with the potting mix. We used five quads and in the quads placed 0, 2, 4, 8, and 8 pellets respectively. We added more potting mix and placed these seeds into each cell. We then covered the seeds up with a thin layer of potting mix. We then labeled the quads based on how many fertilizer pellets were in each quad. Then we saturated the seeds with a pipet until water was dripping from the tips of the wicks and placed the quads on the water mat. We then placed the reservoir underneath the light bank that was assembled for us earlier in the experiment.

After the planting we came in everyday to check on the plants for a week. We made sure the plants were getting enough water, the potting mix was moist, and we filled the reservoir when needed.

We recorded data throughout the next couple of weeks and observed growth. After a few days, we thinned the plants out making it one plant for each cell so the plants had enough room to grow. We continued recording data every few days until the plants died.

WORK CITED

"Fast Plants Introduction." <http://www.daphnegruppen.org>. 28 Nov. 2008.

Authors:
Chris Allderdice, Jane Diehl, May Thansum

THE EFFECTS OF DIFFERENT LEVELS OF FERTILIZATION ON BRASSICA RAPA PLANTS



October 1, 2006



October 4, 2006



October 10, 2006

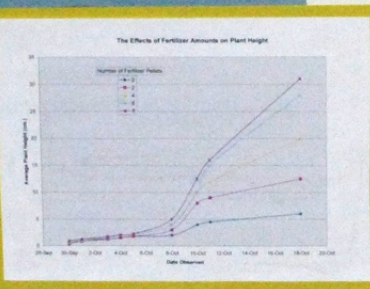


Figure 1

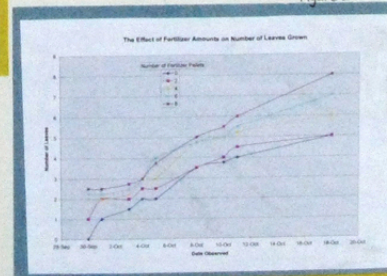


Figure 2

RESULTS

Our graphs demonstrate that plant growth was increased corresponding with the number of fertilizer pellets added during planting. Figure 1 displays the average heights of each set of plants with different fertilizer amounts over the period of observation. Figure 2 shows the average number of leaves that appeared on each plant (0, 2, 4, 8, & 8) while Figure 3 shows the average number of biomass.

Beginning in the first few days after planting, the pods containing 8 fertilizer pellets sprouted through the soil before the other groups. These plants continued to grow at a much faster rate and appeared to be healthier than the plants given with no pellets (the control group). As the plants continued to grow, we observed this consistent pattern with the pods containing greater amounts of fertilizer increasing in height and sprouting leaves and biomass at a faster rate. All of the pods (0, 2, 4, 8 & 8) grew in direct proportion to the number of pellets in the soil in all cases with the control (0) remaining the shortest set of plants while the 8 pellet pods grew the tallest and most developed plants.

Although the rate of development including height and number of leaves and biomass differed greatly among all of the samples, the number of successfully developed plants did not. Before we removed all but the most developed plant from each of the four sections of the pod, each section had four plants that had begun to grow regardless of the amount of fertilizer. This data suggests that the amount of fertilizer present in the soil did not affect the initial sprouting of the plants. The amounts of fertilizer only served to increase the growth of plants as greater amounts were added during the planting process.

CONCLUSION

The results we observed and collected supported our hypothesis that the more fertilizer pellets we added during the planting process, the greater the rate of the plants growth and development. The results of this experiment display the vital nature of fertilizer in relation to plant growth. Simply by manipulating this one aspect of a plant's maturation, we can control both the size and growth rate of the plant.

If we were to repeat this experiment, one potential change would be the size of the pods. Because we manipulated the amount of nutrients the plants were receiving, we expected them to be much larger in size than other experimental plants. This experiment should be conducted using larger pods for each plant because they grow quickly and eventually outgrow their containers. This is an important factor because it is essential to know that the growth rates of the plants are not limited by the size of the area they are growing in. Also, the plants should be used for a state immediately when they begin to drop from the weight of their leaves. This ensures that the growth rates are not affected and that the plants continue to grow upward and remain in their designated pod allowing for more accurate results. Because we discontinued the experiment after three weeks, we do not know if the plants grown without fertilizer would be permanently stunted. It would have been nice to track these plants using a larger amount of pellets to measure the conclusions and differences in a future experiment.

If we had used more than 8 pellets in the maximum amount, there may be a point at which the fertilizer pellets do more harm than good for the plants. If used in excess, the fertilizer may harm the growth of the plants in some ways. It would be interesting to test these plants using a larger amount of pellets to measure the conclusions and differences in a future experiment.