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# Beans for Brains

## Introduction: My project was designed to see which amounts of Nitrogen Potassium and Phosphate in fertilizer works best on plants. 7 bush bean plants were planted from seed in a box. There were four boxes. The first box was watered with an 8-7- 6 mixture of fertilizer that’s an 8 % Nitrogen, 7 % Phosphate and 6 % Potassium. The second Box was fertilized with a 0-10-10 mixture. No nitrogen, 10 % Phosphate and 10 % Potassium. The third box was a 5-30-5 mixture. 5% nitrogen, and 30 % Phosphate 5 % Potassium. The last box was a control and was watered with no fertilizer.

Hypothesis: I think that if Bush beans are plants that need nitrogen then they will grow the best with the Miracle grow 8-7-6 combination because it has the highest nitrogen amount.

Materials:

4 planting tubs

1 bottle Miracle grow 8-7-6 fertilizer

1 bottle Safer Bran 0-10-10 fertilizer

Schultz 5-30-5 fertilizer

1. bags of vermiculite

1 10 ml graduated cylinder

2 packages of Bush Beans

1 Drill

1 ½ inch drill bit

Experiment Procedure:

Step 1

Fill the planting box with 3 inches of soil. Then make a one-inch deep hole every 2 ¾ inches and then fill in the hole.

Step 2

Drill a ½ inch hole in the bottom of each tub. Place the hole in the middle of the tub.

Step 3

Put a piece of paper towel folded in half under the hole you drilled. Place the tubs in a Green house to grow.

Step 4

Pour 1000 ml of water into each tub.

Step 5

Measure and record any growth after about a week and a half. Water w/fertilizer if needed.

Step 6

Water when soil becomes dry.

## Results:

(Note: many of the plants moved from their original locations due to the vermiculite being moved around when water was added many of the seeds shifted location and became closer to other plants.)

Tub 1 didn’t not have the results I had expected. It had the highest nitrogen level of any of the fertilizers and also had moderate levels of Phosphate and Potassium. The plant seemed to be doing well in its earliest days and closely resembled the control plants. After the first leaves had formed the plants in tub 1 did not grow as tall as the other plants rather they tended to stay small and compact forming small tight compact bunches of leaves. The color was a little bit darker than the control and looked fairly stable. The soil did not appear to have changes in color to it. A trend that appeared to be the same in all of the tubs was that when many plants grew closer together they grew taller and produced more leaves and beans started to sprout sooner. The plants that were farther away from others tended to be small while having many leaves the leaves dwarfed those of the other plants. As illustrated in table 1.2a and Figures 1.2b-1.2d the Plants located at the center on the box tightly packed together had the best growth height wise. Table 1.2b shows how the plants at the center had the most leaves.

## Tub 2 had moderately successful results. The plants grew to the height of those in tub 1 in greater numbers. They had the same clumping affect as tub 1 and grew better in the center of the tub. As shown in Figures 1.3b and 1.3d three plants clustered together in the center and three in the back of the tub. Table 1.3a shows how the clustered plants survived as opposed to the lone plant that grew much slower producing no leaves and eventually dying. The soil appeared to be the same color as when the experiment was started. The leaves were lighter than those of the control plant were.

(Note: When the Fertilizer for tub 2 hit the pavement it began to fizz, no other fertilizers do this when coming into contact with the cement.)

Tub 3 was by far the most successful. The plants grew higher than that on any other tub. Plants were spread out fairly well and did not follow the trend of closer together means better results. The plants grew roughly the same height with plant 4 growing the tallest as shown in Table 1.4a and 1.4b. In the later days of the experiment the plants did not seem to have adequate support and often had their bases bent over so the plant grew to side of where the seed was. The leaves also turned a very dark green along with the soil that after watered would form a dark green layer as shown in figure. 1.3d. During November and December the top of the soil would form mold. The first plant grew through the soil but failed to grow leaves and it’s cotyledons dried up and turned brown.

## Tub 4 had nothing added to it; it was used as the control. The control plants faired well only receiving the nutrients that were in the water. Shown in table 1.5a and 1.5b the plants grew to roughly the same high being within and each in height except for plant 1. The plants looked fairly light in color as shown in Figure 1.4b and 1.4d with no apparent changes in soil color. The plants stayed spread out in the tray with equal space between them and no dramatic changes in location from where they were planted.

## Conclusion