

Investigation to find out if Variation of Water/Fertiliser Ratio Has Any Effect on the Growth of Grass Seeds

In this investigation I will grow grass from seeds. I will use eight seeds in each container and grow them in compost. I will use liquid fertiliser and prepare it by pouring the needed amount into a measuring cylinder. I will use the same amount of liquid given to the seeds, but the strength of the fertiliser will be changed. I will do this to make it a fair test. During the experiment I will measure the plant growth during the experiment. I will take readings four times a week, then work out the mean, so there will be five results.

I will measure the shoot growth with a 30cm ruler, and then change to a 1m ruler if the shoots exceed 30cm. The measurements will be accurate to 1mm. I will keep my plants on a windowsill in room temperature - 20 degrees. There will be a fairly equal amount of lightness and darkness. The warmth and light are necessary for the shoots to grow.

I will be changing the strength of fertiliser on purpose to record the difference in growth of the grass shoots.

I will keep the type and amount of seeds in each container equal, also the type and amount of compost, the containers will be the same size, material and mass. The temperature and sunlight will also be tried to keep the same, but these elements are more difficult to control.

I am going to control most variables, and change only the fertiliser strength, as I want to investigate to effects of different strength fertiliser, and no other aspects.

What I think may happen is that the seeds with the recommended amount of fertiliser will grow bigger and stronger than the other seeds. I think that the seeds with half strength will grow more than the water or double-strength given seeds.

I think this may happen as the recommended amount of fertiliser has the right amount of minerals that the shoots need to grow strong with. If the plants get too many minerals, above the recommended amount, then the plants may get harmed and as a result of osmosis water may pass out of their roots. The seeds with less fertiliser will grow more than the seeds with just water as, even though they won't get the required amount of minerals, they will get more than the seeds with just water, therefore, growing bigger.

My Method for this experiment was:

I collected my equipment together; making sure everything was equal. I punctured holes in the bottom of each container, for drainage, then filled the containers with equal amounts of compost. I put eight seeds on an equal level under the compost, then watered the seeds with just water firstly, as the fertiliser was too strong for just seeds and could only be used on shoots. I then labelled each container with the dosage of fertiliser, or water I would use on the shoot. When the seeds developed into shoots I began to use fertiliser. I measured the amount and strength of fertiliser needed for each container, then poured it in. I replaced the containers back in the position they were in, after measuring and recording the shoot growth. I repeated this five more times for the results.

Apparatus/Equipment

Measuring cylinder with mm measurements

Containers (4)

Ruler with mm measurements

Labels

Compost

Seeds

Water

Fertiliser

I will choose this equipment as the measuring cylinder and ruler accuracy will minimise possible error, I can use the measuring apparatus again and again to get accurate reproducible measurements. To make sure the experiment was safe I did not drink excessive amounts of fertiliser, and made sure I knew what to do if it got in my eyes or on my skin i.e.: rinse it straight away.

From my results I can see that the recommended amount of fertiliser was the most effective in making the plants grow. The plant with double amount of fertiliser grew the least. The plants with just water were second smallest and so the half strength grew largest, although there was not much of a difference between them so they were almost as effective as each other, which was surprising.

Each of my graphs has an upward growth curve, which means none of the plants stopped growing. My results coincide with my predictions, even though the half-strength fertiliser was much more effective than I thought it would be.

The effect the double strength fertiliser had on the plant was that it stunted its growth, compared to the other plants. This was in accord to the instructions on the fertiliser, and how much was needed for the plant. Too much fertiliser, the instructions claimed would damage the plant, which it obviously did, as the plant with double-strength fertiliser grew the least.

As with my experiment there were many limitations, such as missed lessons and an inability to control the exact amount of light and heat that got to the plants. I could improve this experiment by controlling the exact amount of light and heat getting to the plant, and I could make sure I ran the experiment with all the necessary time needed. These things would make my experiment fair, and therefore a better experiment, with more information being taken.

