

Monitoring the Growth of barley seeds

Introduction

The reason barley is so important is because it is in our food. Farmers have the job of knowing what is in their crops and they need to know what they are putting on the crops. We are doing an investigation on the growth of the barley. We are going to monitor how much the barley grows over a period of time. We are comparing the growth of the barley seed with the nutrients it needs.

Planning

Factors affecting barley growth

There are control variables, which can be used to change the growth of a plant. Such as the soil type, temperature, light intensity, concentrations of all the other minerals except the one under test. They are called controlling variables because they can change the growth of the plant. When we did this experiment we needed something to hold the plant up. You can use soil or as we did cotton wool to hold to plant up. The temperature, which was surrounding the plant, can also be controlled. It doesn't matter whether the barley was kept in perfect sunlight or in a dark cupboard it would have still grown. With all these control variables I decide whether I keep the temperature the same or whether I use soil it's all up to me how I want the plant to grow. If we wanted we could control the concentrations of nutrients, which are nitrogen, phosphorus and potassium but it depends on the nutrients under investigation. We have set the experiment by putting the plant in water instead of soil this is so we have put tinfoil around the test tube so that no light can get in and green algae doesn't form.

Monitoring and controlling variables

I have decided that I will be monitoring the growth of the stem and the roots. When I'm looking at the plant I will be looking at the length of the stem and the diameter of the stem. I will also be looking at the length of the roots. Another way that I could be monitoring the barley plant is to

count the leaves and look at the area of the leaves. The only thing that I would change in this experiment is the nutrients. For each plant the temperature, light and humidity will stay the same.

Monitoring the growth of barley

I will be monitoring the growth of barley for about six weeks. I have decided six weeks so that the plants get a chance to grow properly. I will be looking at the length of the stem, the length of the roots. I will be measuring both of these with a ruler. I will also be looking at the colour of the leaves to see if they change colour over the six weeks.

Safety points

I had to be really careful with the solution and I made sure that I washed my hands afterwards. I had to be careful when handling the test tube cause the seeds had pesticides on them after I had handled them I had to make sure that I washed my hands afterwards.

Materials and method

When I did this experiment I had to test five test tubes each one had a barley seed but a different solution in each test tube. This is how I did it

- ❖ I first had to get out the equipment, which was five test tubes, a test tube rack.
- ❖ We had five nutrients, which I put into the test tubes. In one I put distilled water, the other had of three nitrogen, potassium, phosphorus.
- ❖ Then in one I put minus nitrogen in one test tube.
- ❖ I then had to wrap cotton wool around the barley seed.
- ❖ Once I had done this I then had to wrap tin foil around the test tube.
- ❖ Then I did the same for minus potassium, minus phosphorus into a test tube.
- ❖ I have set it up like this because it is an easy way to measure the roots and stem.
- ❖ And I can see how much the roots have grown better

RESULTS roots

At week 0 all the barley seeds were at 1.5 cm Or 15mm

| | <u>Week 1</u> | <u>Week 2</u> | <u>Week 3</u> | <u>Week 4</u> | <u>Week 5</u> | <u>Week 6</u> |
|-----------------|----------------|---------------|---------------|---------------|---------------|---------------|
| <u>COMPLETE</u> | <u>11 cm</u> | <u>13cm</u> | | | | |
| <u>H2O</u> | <u>13 cm</u> | <u>14cm</u> | | | | |
| <u>-N</u> | <u>13 cm</u> | <u>18cm</u> | | | | |
| <u>-K</u> | <u>12.5 cm</u> | <u>19cm</u> | | | | |
| <u>-P</u> | <u>9.5 cm</u> | <u>24cm</u> | | | | |

Stem

| | <u>Week 1</u> | <u>Week 2</u> | <u>Week 3</u> | <u>Week 4</u> | <u>Week 5</u> | <u>Week 6</u> |
|-----------------|----------------|---------------|---------------|---------------|---------------|---------------|
| <u>COMPLETE</u> | <u>15 cm</u> | <u>28.5cm</u> | | | | |
| <u>H2O</u> | <u>13 cm</u> | <u>14cm</u> | | | | |
| <u>-N</u> | <u>14 cm</u> | <u>16cm</u> | | | | |
| <u>-K</u> | <u>16.5 cm</u> | <u>27cm</u> | | | | |
| <u>-P</u> | <u>15.5 cm</u> | <u>2cm</u> | | | | |

Evaluation

When I was doing the experiment I came across a few problems. I had to be careful with the small plant they could easily break. I had to make sure that the small plant could fit in the test tube. It was also hard when I had to fill the test tube with the chemicals because I had to make sure that I filled each test tube at the same point so that it was a fair test.