

**PLANT NUTRITION
ASSESSMENT TRIAL
YEAR 10**

AIM: To establish a pot culture designed trial to investigate the effects of Phosphorus and Nitrogen on plant growth.

- METHOD:**
- 4 plastic pots.
 - Vermiculite.
 - Oat Seeds (20/pot) = 80 seeds
 - Nutrient Solutions as followed;
 - i) Solution 1 - Distilled Water (1 litre)
 - ii) Solution 2- Distilled Water (1 litre)
 - add ~ 1.0g Calcium Nitrate
 - ~ 0.5g Potassium Chloride
 - ~ 0.5g Magnesium Sulphate
 - ~ 1.0g Potassium Hydrogen Phosphate
 - ~ Trace Ferrous Sulphate
 - iii) Solution 3 - As for Solution 2, BUT replace Calcium Nitrate with 1.0g Calcium Chloride.
 - iv) Solution 4; As for Solution 2, BUT leave out Potassium Hydrogen Phosphate.
 - Prepare 2 of each of the following labels,
ONE on the POT
ONE on the JAR of solution

SOLUTION POT	CONTENTS	LABEL
1	Distilled Water	NIL
2	ALL Essential Nutrients	COMPLETE
3	NO Nitrogen	- N
4	NO Phosphorus	- P

PROCEDURE:

- Plant 20 seeds in each pot
 - water each pot with distilled water to germination
 - remove weak seedlings to leave 10 plants in each pot
 - keep soil moist by adding 100ml of solution to pots once a week
 - observe the plants in each pot at intervals for:
 - ^ Germination %
 - ^ Growth in centimetres, fortnightly basis: 10 weeks+2 weeks establishment
 - ^ description of plants:
appearance; colour; blade diameter & width of leaves in the tables below
- * Establishment date of Trial:

RESULTS:

Table 1; Germination Percentages:

Date: _____

TREATMENT No.	Germination Percentages					Class Av.
1. Distilled water						
2. Complete						
3. NO Nitrogen						
4. NO phosphorus						

Table 2; Growth of Plants (cm) Week: 2 Date: _____ Averages:

TREATMENT No.	Growth Rate (cm)										Group	Class	
1. Distilled water													
2. Complete													
3. NO Nitrogen													
4. NO phosphorus													

Table 3; Growth of Plants (cm) Week: 4 Date: _____ Averages:

TREATMENT No.	Growth Rate (cm)										Group	Class	
1. Distilled water													
2. Complete													
3. NO Nitrogen													
4. NO phosphorus													

Table 4; Growth of Plants (cm) Week: 6 Date: _____ Averages:

TREATMENT No.	Growth Rate (cm)										Group	Class	
1. Distilled water													
2. Complete													
3. NO Nitrogen													
4. NO phosphorus													

Table 5; Growth of Plants (cm) Week: 8 Date: _____ Averages:

TREATMENT No.	Growth Rate (cm)										Group	Class	
1. Distilled water													
2. Complete													
3. NO Nitrogen													
4. NO phosphorus													

Table 6; Growth of Plants (cm) Week: 10 Date: _____ Averages:

TREATMENT No.	Growth Rate (cm)										Group	Class	
1. Distilled water													
2. Complete													
3. NO Nitrogen													
4. NO phosphorus													

Table 7; Plants Description **Week: 2** **Date:**

TREATMENT	Appearance (Colour,Blade Diameter,Width of leaves)
1. Distilled Water	
2. Complete	
3. NO Nitrogen	
4. NO phosphorus	

Table 8; Plants Description **Week: 4** **Date:**

TREATMENT	Appearance (Colour,Blade Diameter,Width of leaves)
1. Distilled water	
2. Complete	
3. NO Nitrogen	
4. NO phosphorus	

Table 9; Plants Description **Week: 6** **Date:**

TREATMENT	Appearance (Colour,Blade Diameter,Width of leaves)
1. Distilled water	
2. Complete	
3. NO Nitrogen	
4. NO phosphorus	

Table 10; Plants Description **Week: 8** **Date:**

TREATMENT	Appearance (Colour,Blade Diameter,Width of leaves)
1. Distilled water	
2. Complete	
3. NO Nitrogen	
4. NO phosphorus	

Table 11; Plants Description **Week: 10** **Date:**

TREATMENT	Appearance (Colour,Blade Diameter,Width of leaves)
1. Distilled water	
2. Complete	
3. NO Nitrogen	
4. NO phosphorus	

DISCUSSION:

** Graph the Average group and Class average results for plant height in centimetres over the duration of the trial.

** Explain your results using the following points in the discussion;

- what are treatments; list the treatments of this trial
- which treatment responded the best and why?
- which treatment should have responded the best and why?
- why use a control in any experimentation process.
- how could you best improve the results of this trail

Research the following aspects regarding plant nutrition:

a) The general importance of plant nutrients both the major and minor nutrients in maintaining a healthy and productive plant.

b) Identify the main needs of plants that farmers need to aware of for successful plant production.

c) If plants are unable to obtain sufficient nutrients from the soil environment, they reflect this by developing various symptoms of deficiency in their overall plant growth.

For the following plant nutrients:

1. Nitrogen 2. Phosphorus 3. Potassium

Indicate the plant deficiency symptoms that plants will show if these nutrients are limiting.

You may use diagrams & pictures to assist in your discussion.

CONCLUSION:

Relate the conclusion back to the aims of the trial and the outcome of your results.

Use examples of the trial results to give depth in the conclusion.