

7. 30 polybags are prepared with the same method and labeled with A80%N20%, A60%N40%, A50%N50%, A40%N60%, A20%N80%, and constant.
8. The seedlings are immersed in warm water for a night. This is to allow imbibitions of water by the seedlings which will fasten the rate of germination.
9. Two seeds is planted in each polybags prepared in 1.7. This is to ensure each polybags will germinate. If two seeds germinate in a polybags, one of the plants is uprooted to avoid competition.
10. Mol of Ammonium Hydroxide solutions is prepared from 25% of pure Ammonia. 25% NH₃ solution has 25g of NH₃ and 75g of H₂O. It has a molarity of $\frac{25 \times 1000}{18 \times 75} = 18.518$ Mol
11. Dilution formula is used ($C_1V_1 = C_2V_2$). Following the formula, $C_1 = 18.518$, $C_2 = 5$, $V_2 = 1000$, and therefore $V_1 = 270$. 270 ml of Ammonia solution is needed to be diluted in 1L of distilled water make 5 Mol of ammonium hydroxide solution.
12. 270 ml of Ammonia solution is measured with a measuring cylinder.
13. The Ammonia solution is diluted in 1L distilled water in a beaker.
14. Step 10 and 11 is repeated to make 5 Mol Sodium Nitrate salt solutions from Sodium nitrate.
15. 425g sodium nitrate is weighed using an electronic balance.
16. The sodium nitrated is then dissolved in 1L of distilled water in a beaker.
17. The diluted solution is then transferred into volumetric flasks.
18. 1 part of both ions solutions are added to 5 parts of plants watering. To make it simple, 100 ml of both sodium nitrate and ammonium hydroxide solutions are added to 500 ml of distilled water. This is because to directly add the treatments to the plants will damage the plants, as 5 Mol of solution is strong.
19. 20ml ammonium hydroxide and 80ml sodium nitrate are added to 500ml of distilled water and shaken well.
20. The solution is then transferred into 1.5ml mineral water bottle and labeled with A20%N80%.
21. Step 19 and 20 is repeated with 40ml ammonium hydroxide and 60ml sodium nitrate labeled A40%N60%, 50ml ammonium hydroxide and 50ml sodium nitrate labeled A50%N50%, 60ml ammonium hydroxide and 40ml sodium nitrate labeled A60%N40%, 80ml ammonium hydroxide and 20ml sodium nitrate labeled A80%N20%, and constant.
22. Each plant is watered with 25 ml of their own treatment. Plants labeled A20%N80% are watered with treatment labeled A20%N80%. The same applied to all plant.

$$\text{Growth rate} = 0.4786 \text{ cm/day}$$

4. The standard error of the growth rate is calculated:

$\frac{\Delta \text{rate of plant growth}}{\text{rate of plant growth}}$

$= \frac{\Delta \text{Difference between final and initial height of } Abelmochus \text{ esculentus}}{\text{Change in average height of 5 } Abelmochus \text{ esculentus}}$

$$= \frac{0.3194 - 0.1924}{29.22 - 2.42} \times 0.4786$$

$$\text{Standard error} = \left(\frac{0.3194 - 0.1924}{29.22 - 2.42} \right) \times 0.4786$$

$$\text{Rate of reaction} = 0.00227$$

Treatments	Average length of 5 <i>Abelmochus esculentus</i> (cm)							
	W 1	W 2	W 3	W 4	W 5	W 6	W 7	W 8
Distilled Experiment (Constant)	2.42	4.50	8.32	12.08	15.86	19.18	25.18	29.22
Ammonium 20%: 80% Nitrate	2.42	5.78	12.44	20.42	29.60	38.20	48.20	54.94
Ammonium 40%: 60% Nitrate	2.44	4.70	10.34	18.46	25.58	33.14	41.66	47.88
Ammonium 50%: 50% Nitrate	2.28	4.58	9.56	16.32	23.14	31.60	36.24	42.38
Ammonium 60%: 40% Nitrate	2.56	4.70	7.42	13.14	19.32	25.40	31.36	37.70
Ammonium 80%: 20% Nitrate	2.46	4.70	6.26	10.32	17.60	22.32	28.84	34.22

Table 4: Shows the average progress height of 5 *Abelmochus esculentus* throughout 8 weeks tested with different proportion of Ammonium to Nitrate

Ratio of Ammonium and Nitrate added to watering	Change in average height of <i>Abelmochus esculentus</i> (cm)	Growth rate of <i>Abelmochus esculentus</i> over 8 weeks (cm day ⁻¹)
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