

## Introduction

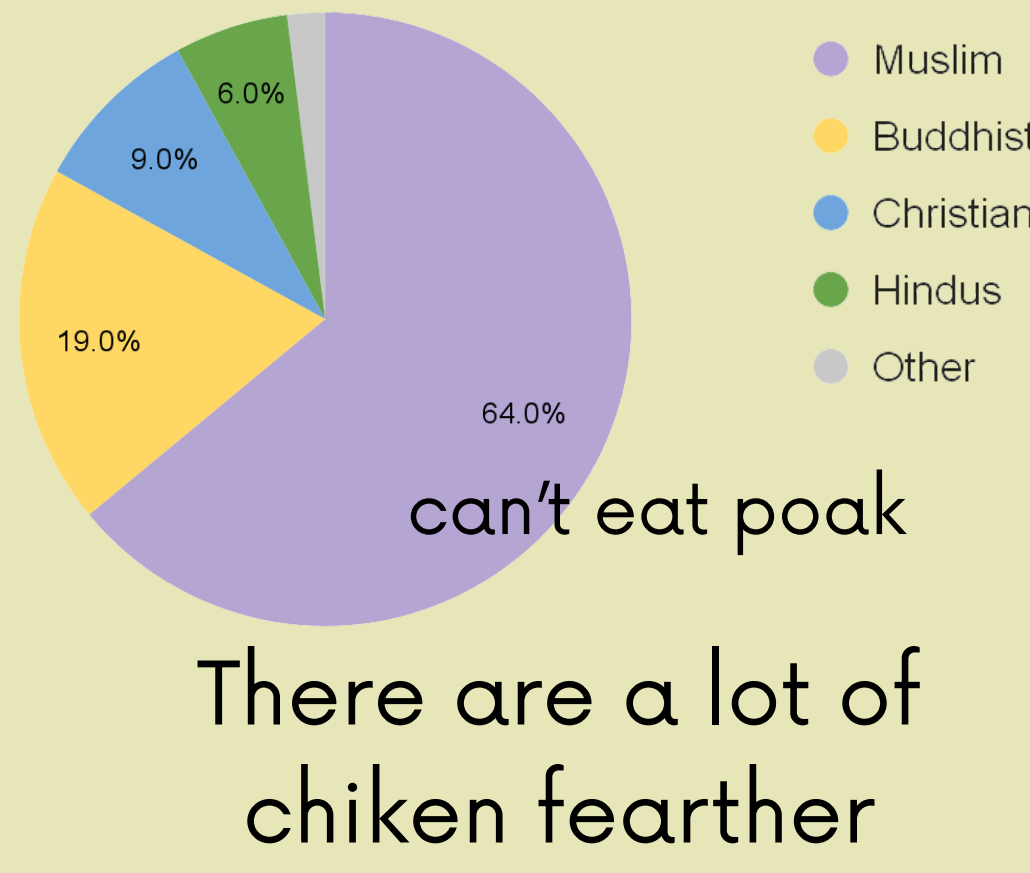
### Feather waste

In Japan

Down comforters are the **No.1** bulky waste item in Tokyo

In Malaysia

Religious Composition of Malaysia's Population



### Overusing chemical fertilizers

- Harmful to the environment and humans
- Often used to grow crops

### Large quantities of mesocarp fiber

Empty Fruit Bunch



Coco Peat



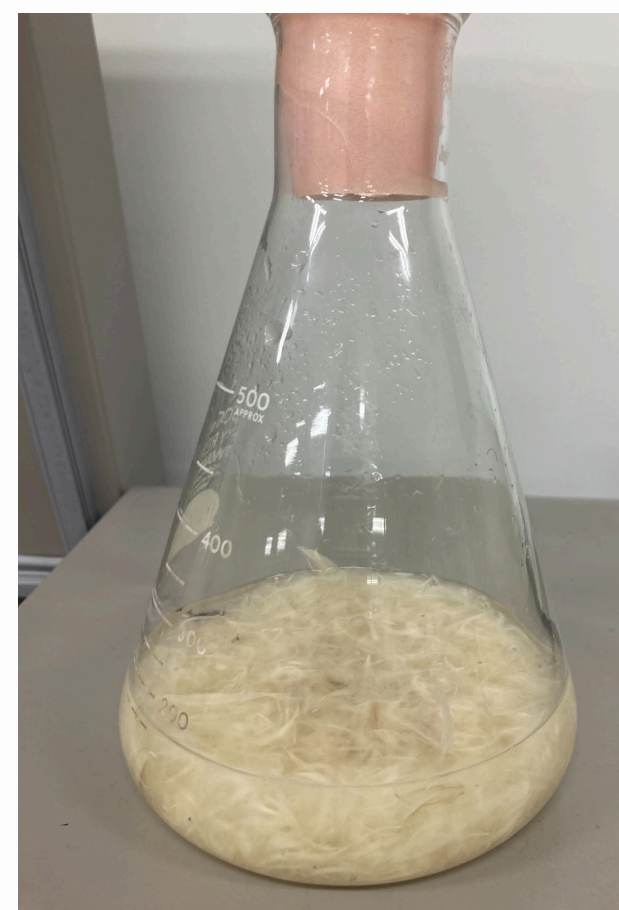
## Objective

Producing organic fertilizer from feather waste that is as effective as chemical fertilizer, and using it to grow vegetables in coco peat.

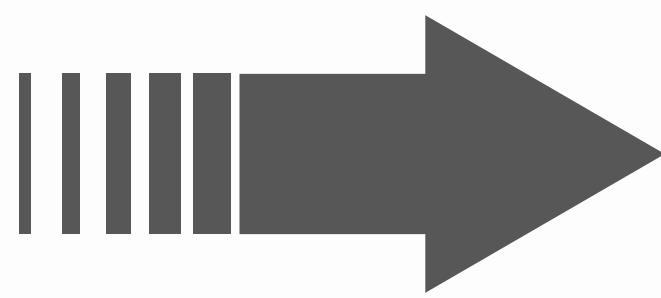
## Experimental Method & Results ①

Feather fertilizer (FF) preparation

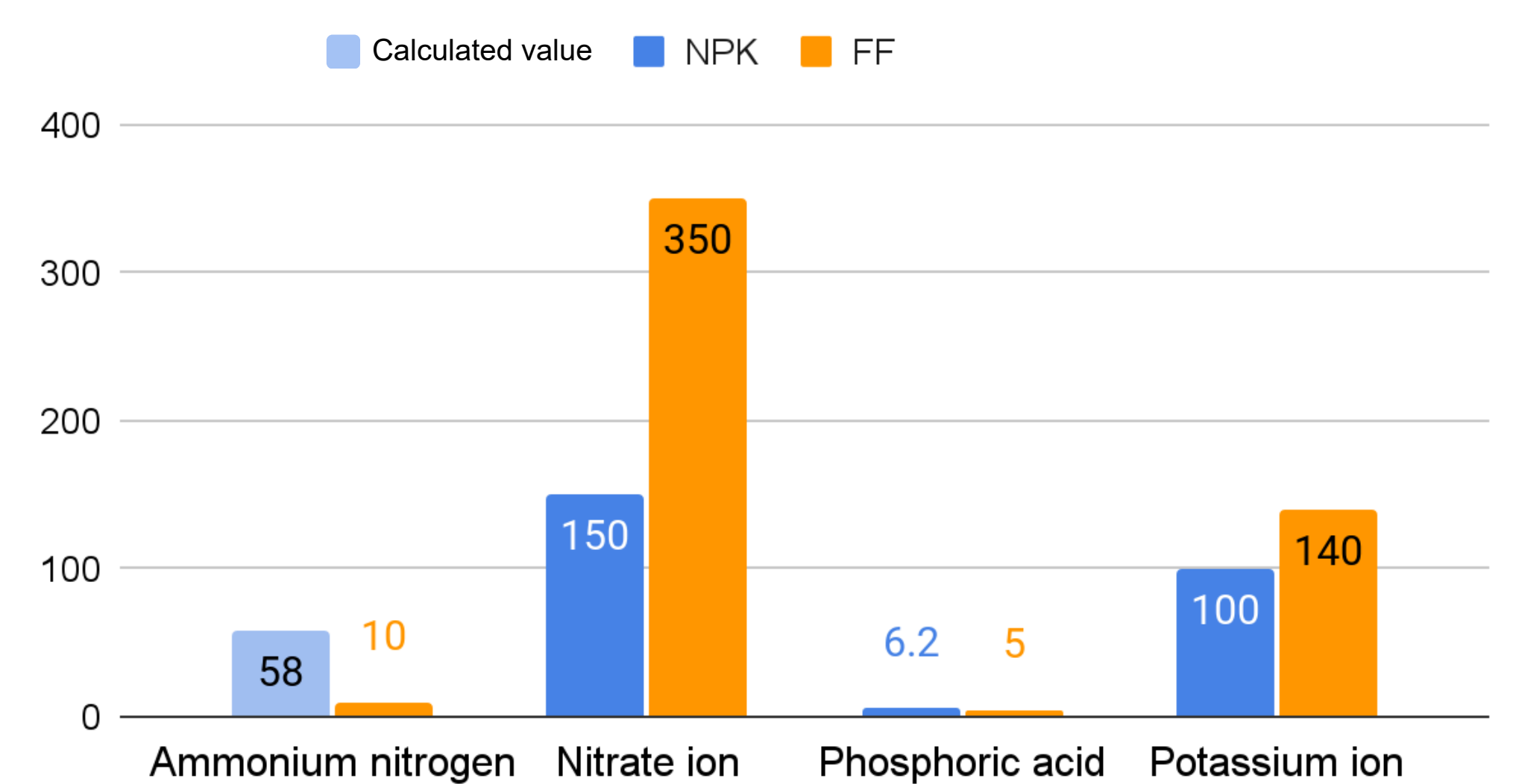
- feather
- salts
- bacteria
- water



Stir for 1~2 weeks



Nutrient content of fertilizer (mg/L)



## Experimental Method & Results ②

FF evaluation using spinach

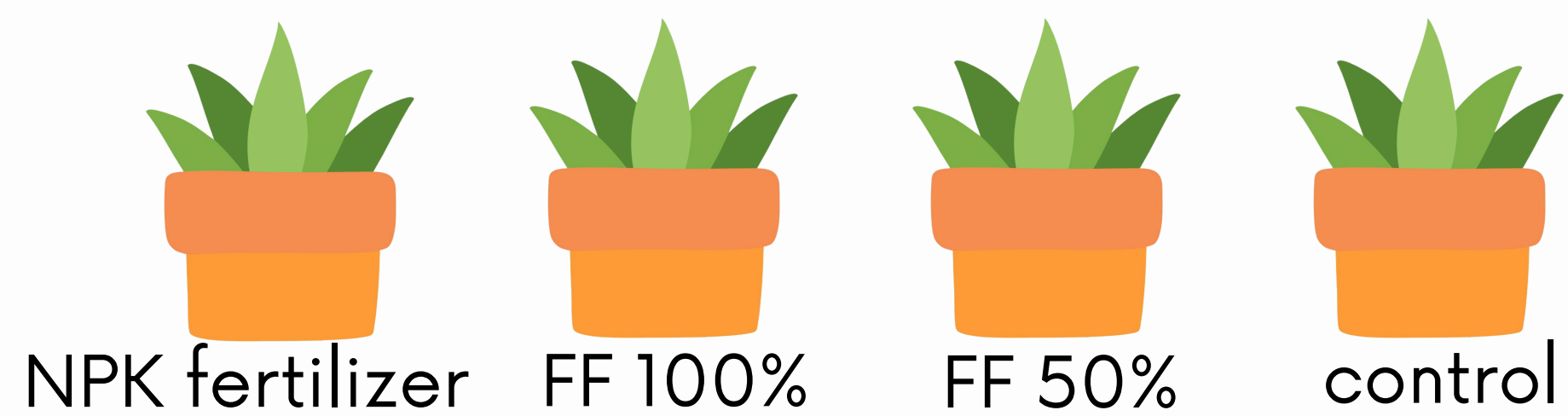
Day 0  
plated seeds

Day 7  
most have sprouted

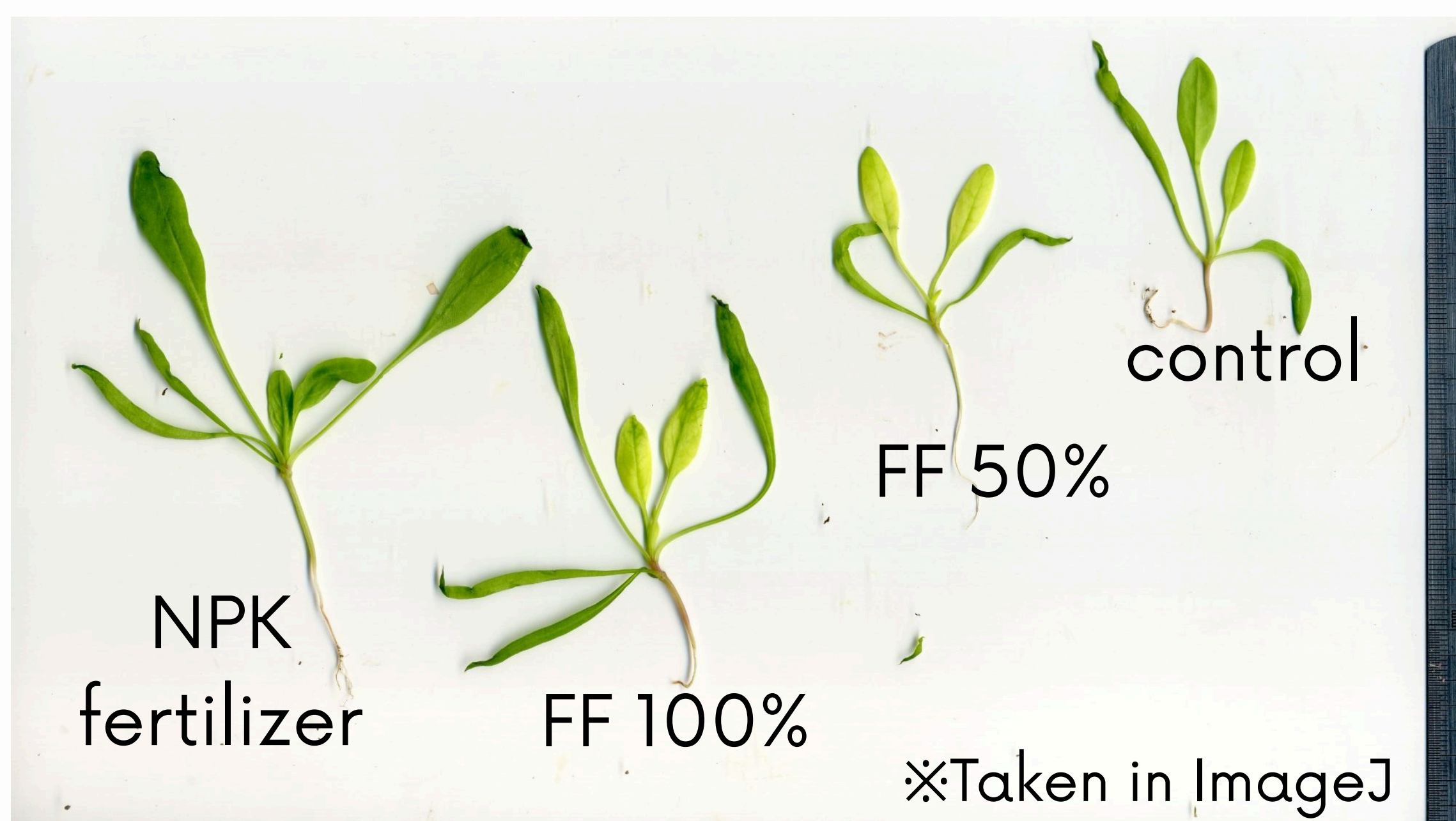
Day 16  
applied fertilizers

Day 35  
observe the effects

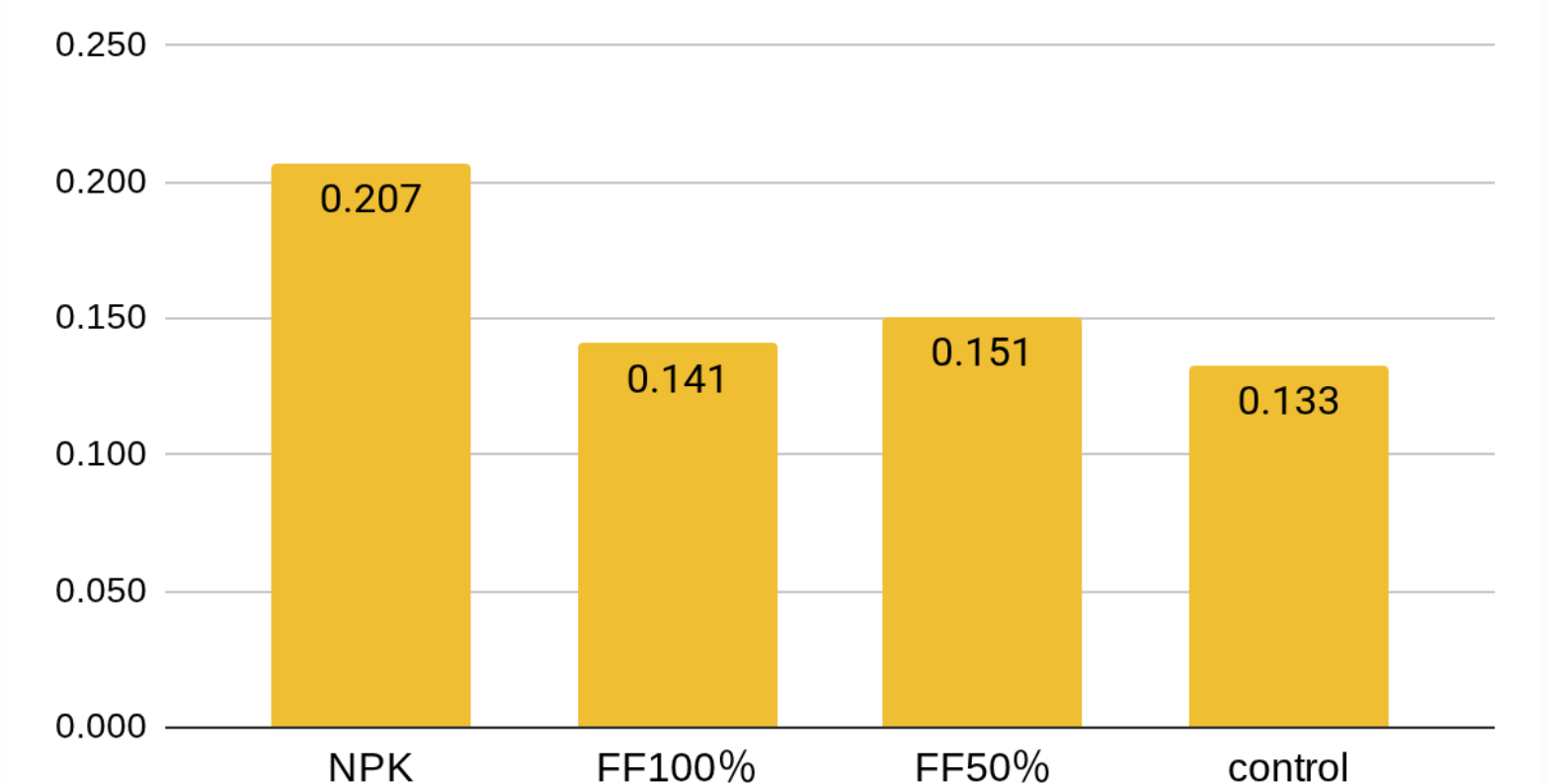
We compared:



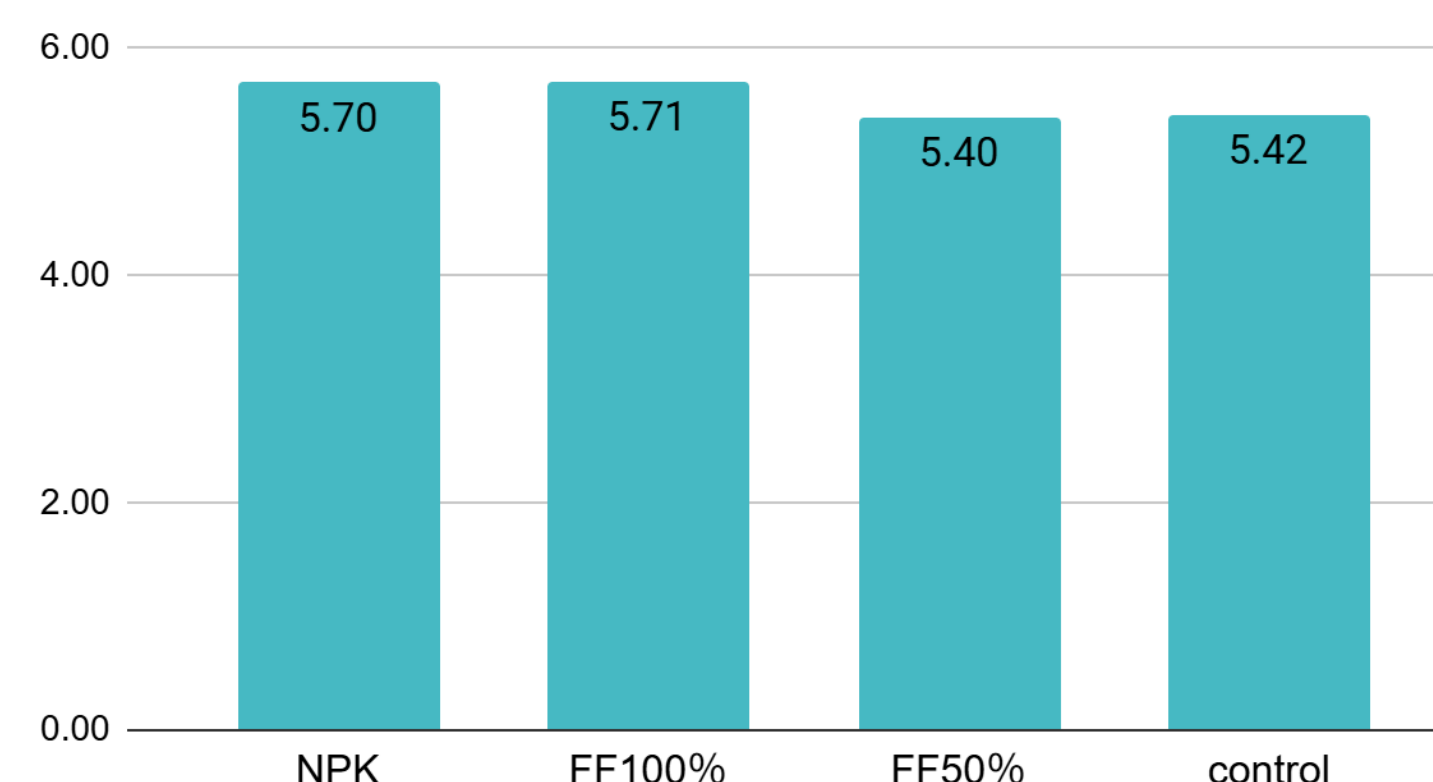
×10



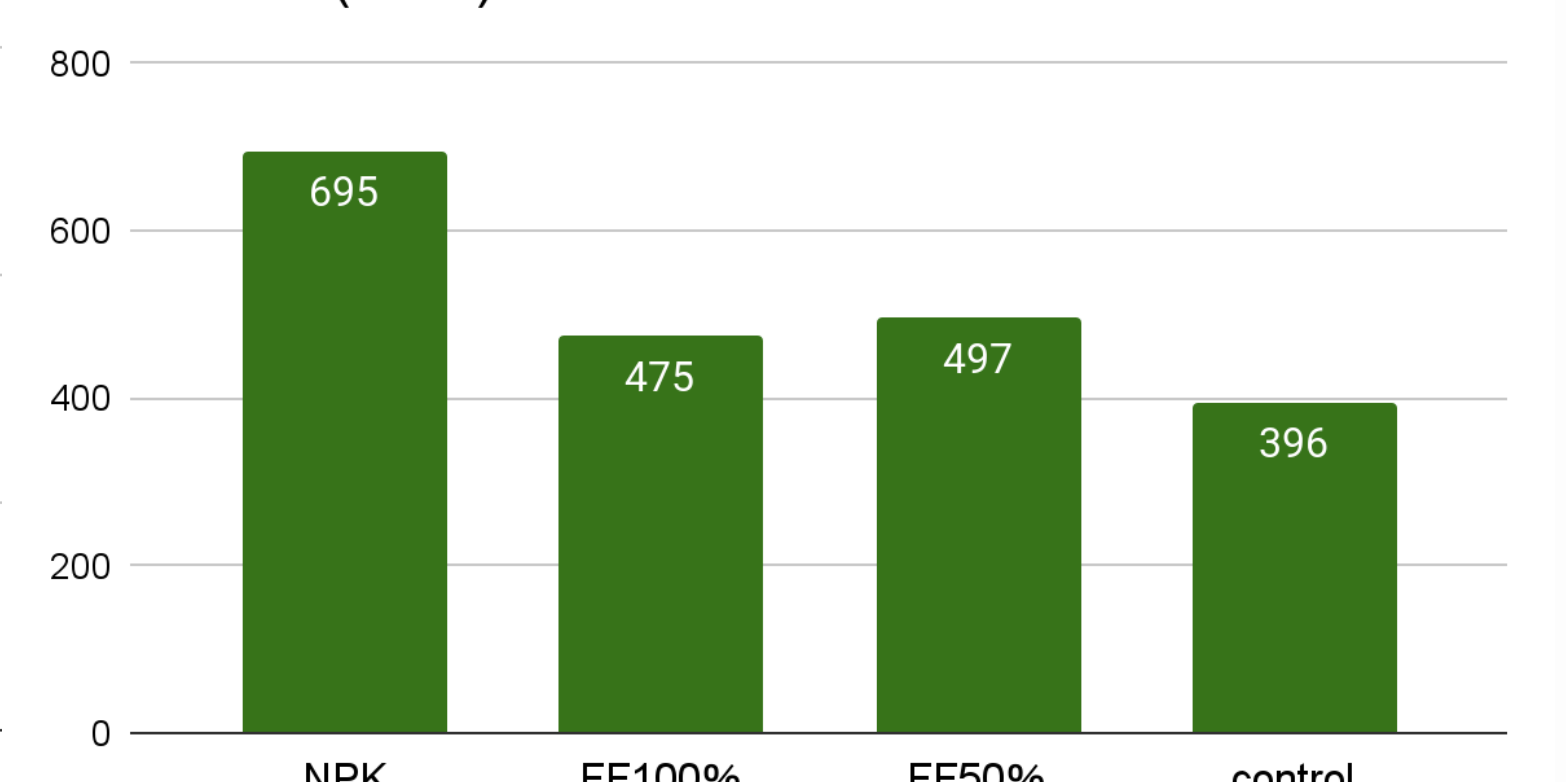
Total weight (g)



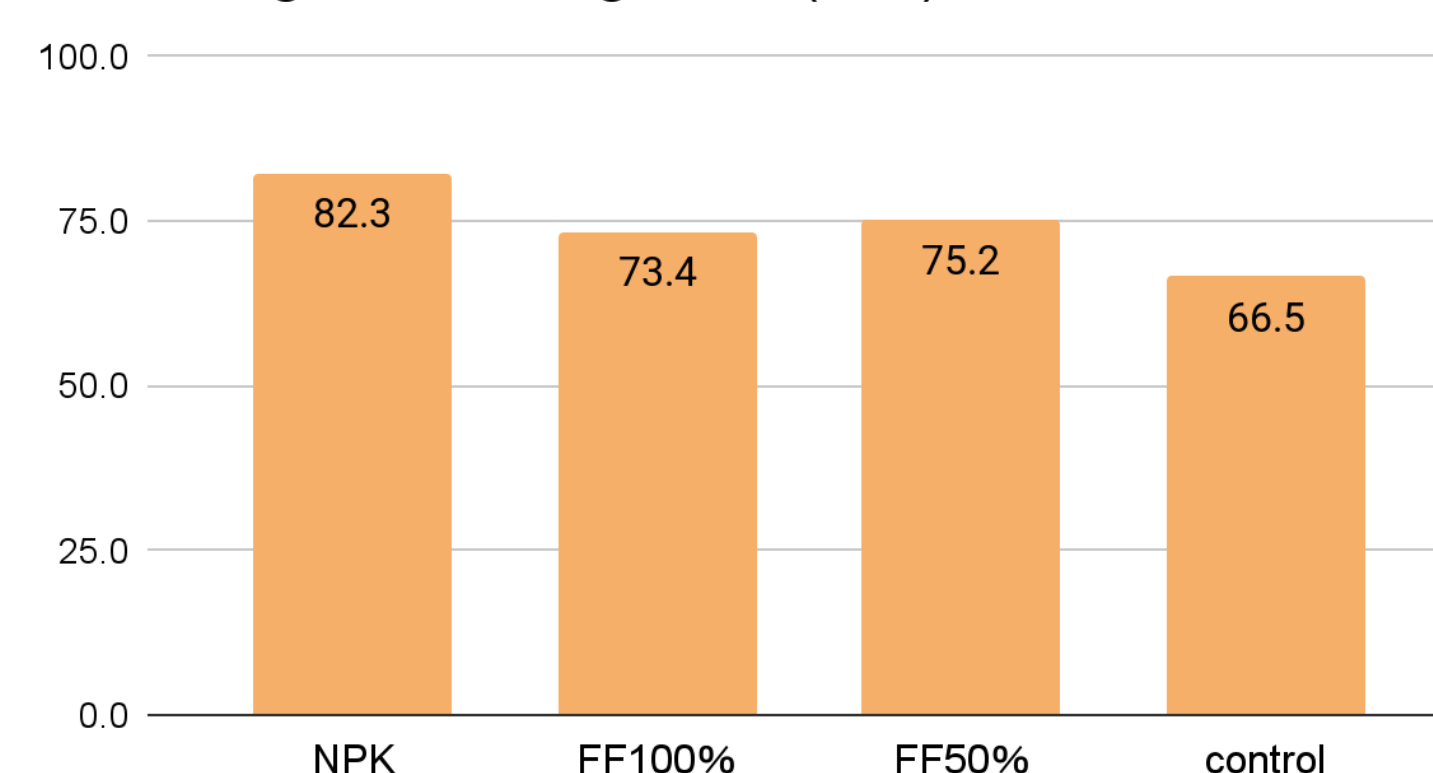
Number of leaves



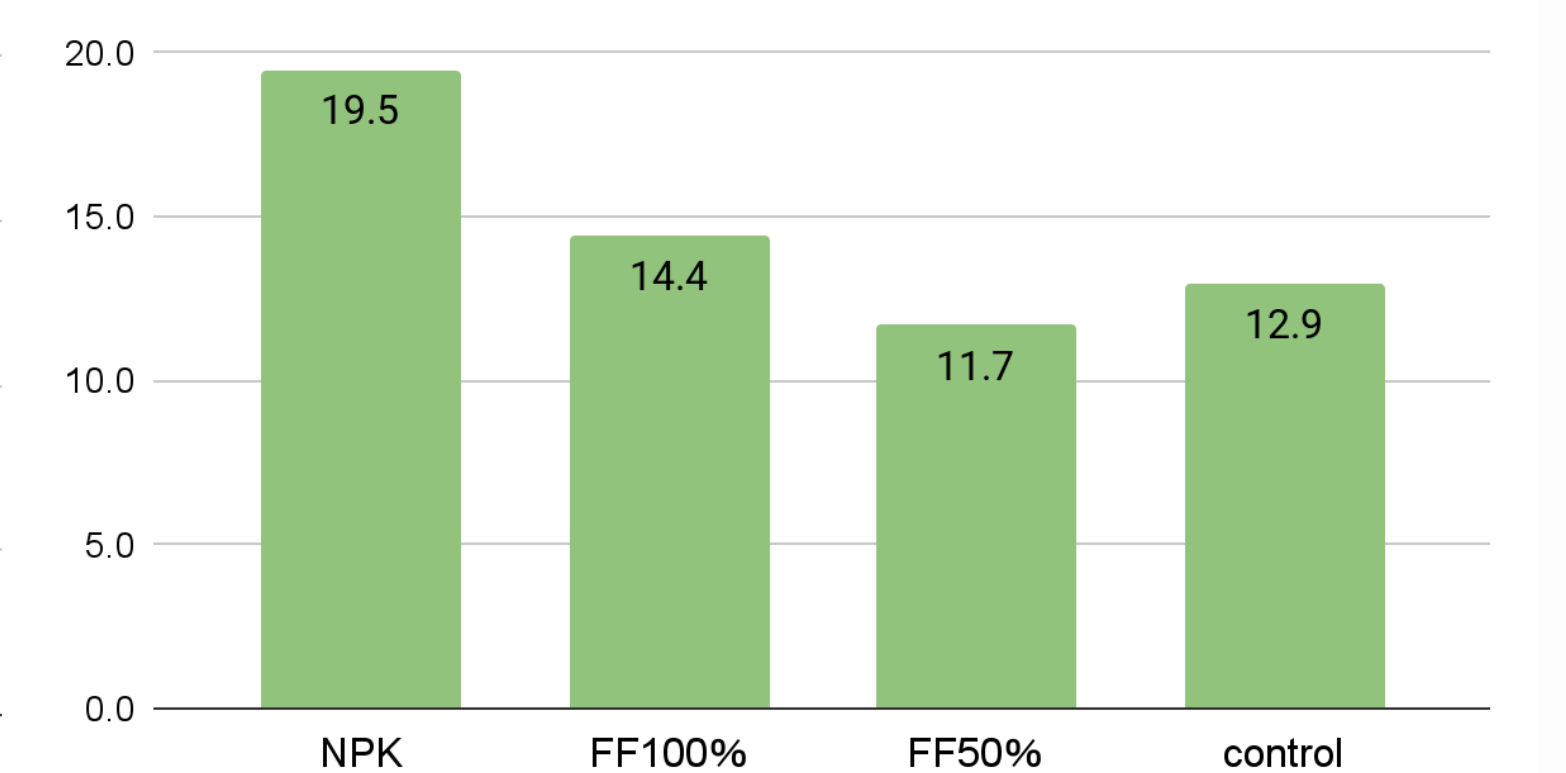
Leaf area (mm<sup>2</sup>)



Total length excluding roots (mm)



Chlorophyll content (SPAD)



## Consideration

1. The bacteria increased abnormally
2. The poor balance of nutrients in feather fertilizer

## Conclusion

A lot of nitrate ions was obtained from feather waste. FF is not as balanced as NPK fertiliser. Plants were grown using eco-friendly coco peat.

## References

- [https://www.env.go.jp/recycle/circul/venous\\_industry/pdf/env/h30/04.pdf](https://www.env.go.jp/recycle/circul/venous_industry/pdf/env/h30/04.pdf) (2025.12.18)
- <https://www.jseb.jp/wordpress/wp-content/uploads/09-01-003.pdf> (2025.12.18)
- [https://www.gdp.or.jp/wp-content/uploads/2020/06/gdp\\_web\\_catalogue.pdf](https://www.gdp.or.jp/wp-content/uploads/2020/06/gdp_web_catalogue.pdf) (2025.12.18)
- <https://www.mofa.go.jp/mofaj/area/malaysia/data.html> (2025.12.18)
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- <https://www.askul.co.jp/p/J856828/> (2025.12.19)
- [https://www.jst.go.jp/global/kadai/pdf/h3001\\_r3.pdf](https://www.jst.go.jp/global/kadai/pdf/h3001_r3.pdf) (2025.12.19)

## Acknowledgments

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