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## Background

The use of food waste fertilizer (FWF) is on the rise in sustainable agriculture research due to the challenges the agriculture industry and global population is being faced with when it comes to food production. Excessive food waste, food shortages, consequences of chemical fertilizer use, and the increase in hydroponic and vertical farming systems has brought about the ideal opportunity for new and innovative fertilizers.

**Objective:** To evaluate the impact of the pre-treatment and different electrical conductivity (EC) levels of FWF on the yield, productivity, and quality attributes in leafy vegetables

## Materials and Methods

### Fertilizer Types:

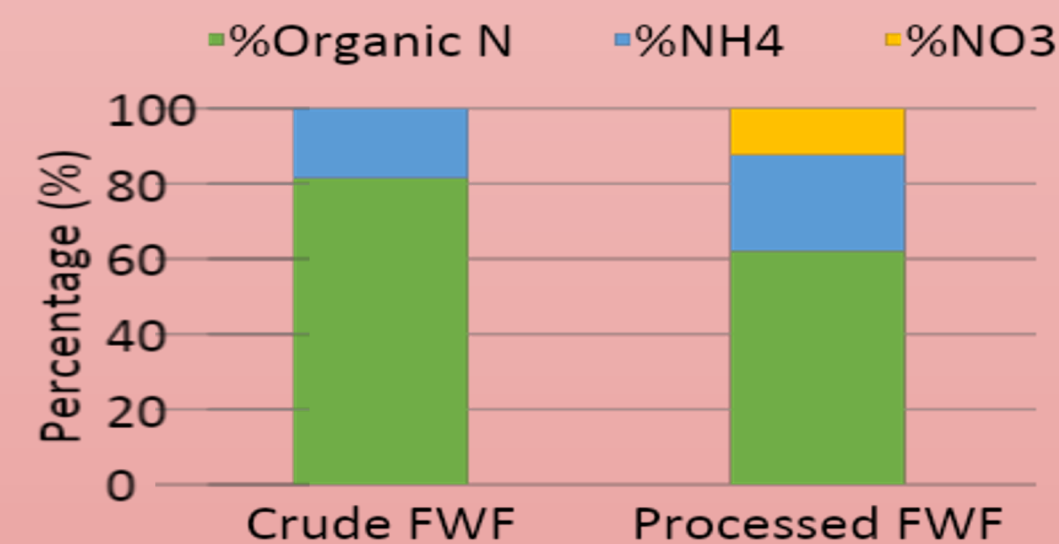


Fig 1. Organic nitrogen (N), NH<sub>4</sub>, and NO<sub>3</sub> percentage in the crude and processed food waste fertilizer (FWF).

### Fertilizer Treatments:

Table 1. The mean and standard deviation of electrical conductivity (EC) of fertilizer treatments across two replications.

Treatments	Type	EC (mS·cm <sup>-1</sup> )
Crude 1	Crude FWF	1.4 ± 0.4
Crude 2		2.4 ± 0.6
Crude 3		3.3 ± 0.3
Crude 4		4.4 ± 0.5
Treated 1	Treated FWF	1.9 ± 1.0
Treated 2		2.8 ± 1.1
Treated 3		3.9 ± 1.1
Treated 4		4.8 ± 1.3

## Materials and Methods

### Plant Cultivars:

- Butterhead lettuce (*Lactuca sativa*) 'Adriana'
- Green leaf lettuce (*Lactuca sativa*) 'Muir'
- Red leaf lettuce (*Lactuca sativa*) 'Roxy'
- Swiss chard (*Beta vulgaris*) 'Rhubarb'
- Kale (*Brassica oleracea*) 'White Russian'
- Pak choi (*Brassica rapa chinensis*)
- 'Mei Qing Choi'



### Environmental Conditions:

- Substrate: rockwool
- Nutrient solution pH: 5.5 – 6.5
- Air temperature: 22 °C
- Sole-source lighting: W+B+R LEDs
- PPFD: 200 μmol·m<sup>-2</sup>·s<sup>-1</sup>
- Photoperiod: 18 hour



## Results



Fig 2. Young plants grown for 4 weeks under eight fertilizer treatments. See Table 1 for information on the fertilizer treatments.

## Results



Fig 3. Shoot fresh mass of lettuce 'Adriana', 'Roxy', and 'Muir', Swiss chard, kale, and pak choi young plants grown for 4 weeks under eight fertilizer treatments. See Table 1 for information on the fertilizer treatments. Data represent the mean of 10 plants per treatment (n =10).

## Conclusion

- At an EC of 2 mS/cm, lettuce 'Adriana' and 'Roxy' and kale had higher shoot fresh mass under treated FWF compared to crude FWF.
- With crude FWF, shoot fresh mass of lettuce and kale was similar or greater under an EC of 1 or 2 mS/cm compared to that under an EC of 3 or 4 mS/cm.
- With treated FWF, shoot fresh mass of lettuce and kale was greater under an EC of 2 mS/cm compared to EC values of 1, 3, or 4 mS/cm.

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