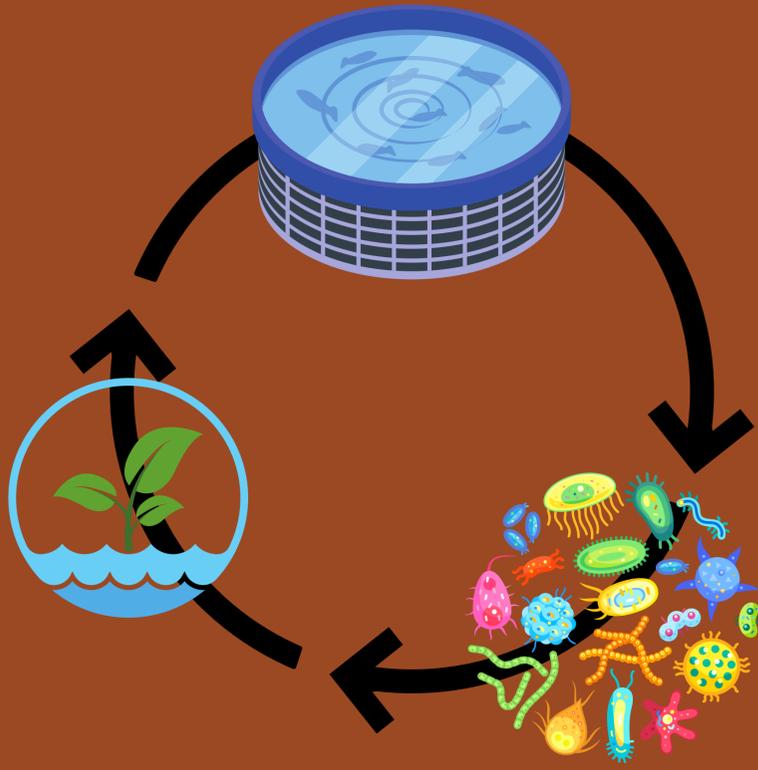


Common chicory production and nutrient accumulation in floating rafts and substrate cultivation methods in aquaponics

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Introduction

Aquaponics

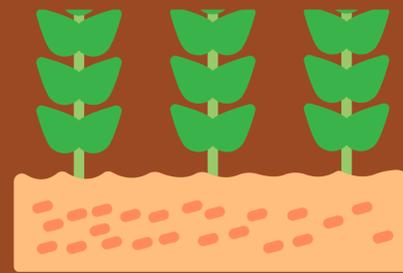


Cultivation methods

Floating rafts



Substrate



Methodology



The aquaponics component consisted of two interdependent lines with two treatments and six repetitions, comparing the two cultivation methods of (1) floating rafts and (2) substrate in two cycles

Treatments

Floating



Substrate



Common Chicory (*Chicorium intybus*)

Evaluated: performance and the composition of the plant tissue in two production cycles



Statistics

Comparison of phytotechnical parameters between treatments and between cycles for each treatment. Normality and homogeneity - Lilliefors and Bartlett tests, respectively; F test (variancy); Tukey test ($p < 0,05$);



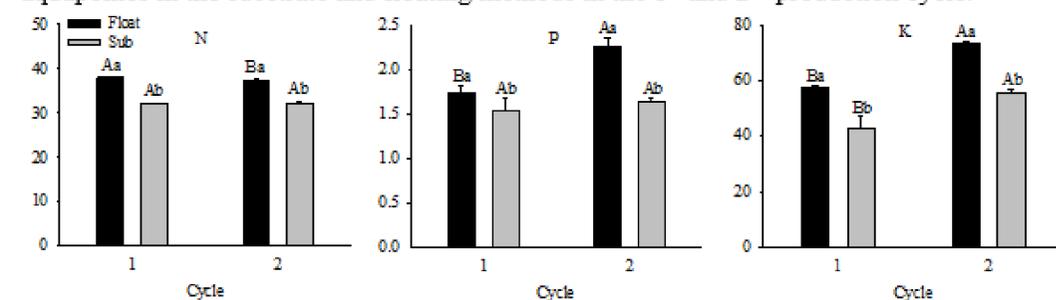
Results

Table 1: Growth parameters of common chicory grown in aquaponics in the substrate and floating method in the 1st and 2nd cycle (n = 3).

| Treatment | NL | | | LLL | | | FM | | | DM | | |
|-----------|-----------------------|-----------------------|------|-----------------------|-----------------------|-------|-----------------------|-----------------------|-------|-----------------------|-----------------------|-------|
| | 1 st cycle | 2 nd cycle | CV% | 1 st cycle | 2 nd cycle | CV% | 1 st cycle | 2 nd cycle | CV% | 1 st cycle | 2 nd cycle | CV% |
| Substrate | 7.00 bB | 9.00 aA | 9.34 | 17.85 aA | 17.71 aA | 6.67 | 11.71 bB | 14.28 aA | 12.78 | 1.06 bA | 1.00 aA | 20.08 |
| Floating | 9.00 aA | 8.00 bB | 8.4 | 17.21 aA | 12.42 bB | 10.06 | 18.07 aA | 7.07 bB | 17.36 | 1.61 aA | 0.93 bB | 26.01 |
| CV% | 9.75 | 7.96 | | 8.07 | 8.46 | | 17.06 | 9.68 | | 25.49 | 19.6 | |

NL: number of leaves; LLL: longer leaf length; FM: fresh matter; DM: Dry matter. Lower-case letters indicate difference between treatments for each cycle (lines) and upper case letters indicate differences between cycles for the same treatment (columns) (Tukey, $p < 0.05$).

Figure 1: Concentration of N, P and K in the leaf tissue of the common chicory grown in aquaponics in the substrate and floating methods in the 1st and 2nd production cycle.



Float: floating rafts; Sub: substrate. Identical capital letters do not differ between the same treatment in different cycles and equal lower-case letters do not differ between treatments in the same cycle (Tukey, $p < 0.05$).

Growth Parameters

1st cycle better growth Floating > Substrate
2nd cycle better growth Substrate > Floating
This results is due perhaps an accumulation of organic matter in the substrate followed by mineralization of nutrients making them available to plants in the substrate treatment.

Nutrient Accumulation

The vegetables grown in the floating method accumulated higher concentrations of N, P and K in the leaf tissues in both cycles
Differences in the mineral composition of common chicory grown in aquaponics suggest that the floating system facilitates prompt absorption of these elements.