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RESEARCH & INNOVATION CENTRE



NEREA Validation for greenhouse potted plant production

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Overview

- Physical and chemical properties
- Chrysanthemum rooting
- Gerbera
- Lettuce and basil



Physical properties

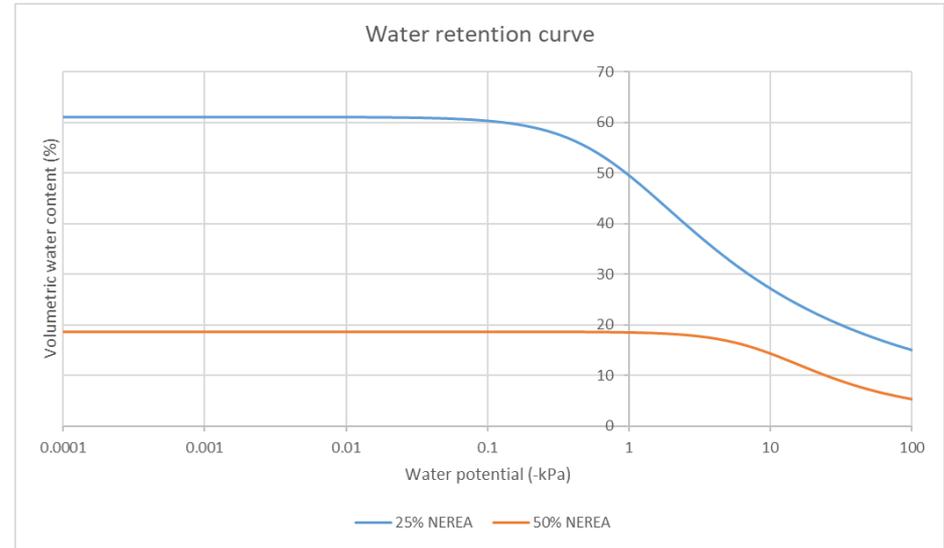
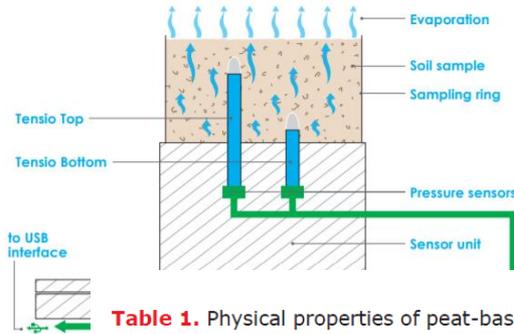


Table 1. Physical properties of peat-based substrates mixed with different percentages of zeolite or perlite.

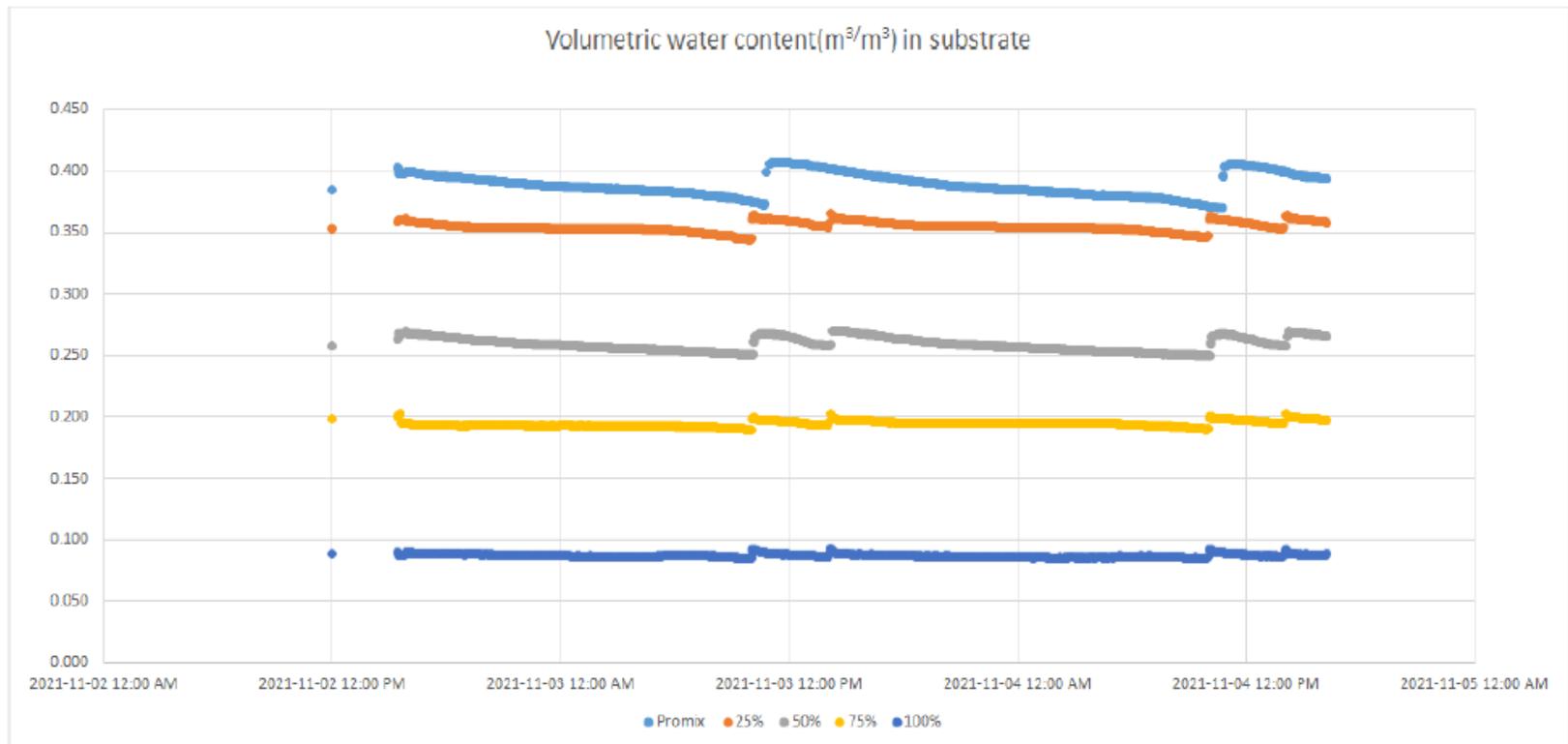


Substrates ²	Bulk density (g/cm ³)	Total porosity (%)	Air space (%)	Container capacity (%)	Easily available water (%)	Water buffering capacity (%)	Field capacity (%)	Permanent wilting point (%)
25% Zeolite	0.47	87.12	37.77	49.35	16.6	22.39	26.99	8.07
50% Zeolite	0.81	87.69	69.13	18.56	1.75	4.39	14.27	2.23
25% Perlite ³	0.10	78.00	-	68.00	26.4	9.4	-	12.3%

² Easily available water refers the amount of water released from water potential of -1 and -5 kPa; water buffering capacity refers the amount of water released from water potential of -5 and -10 kPa; field capacity measures volumetric water content at -10 kPa; and permanent wilting point measures volumetric water content -1.5 MPa.



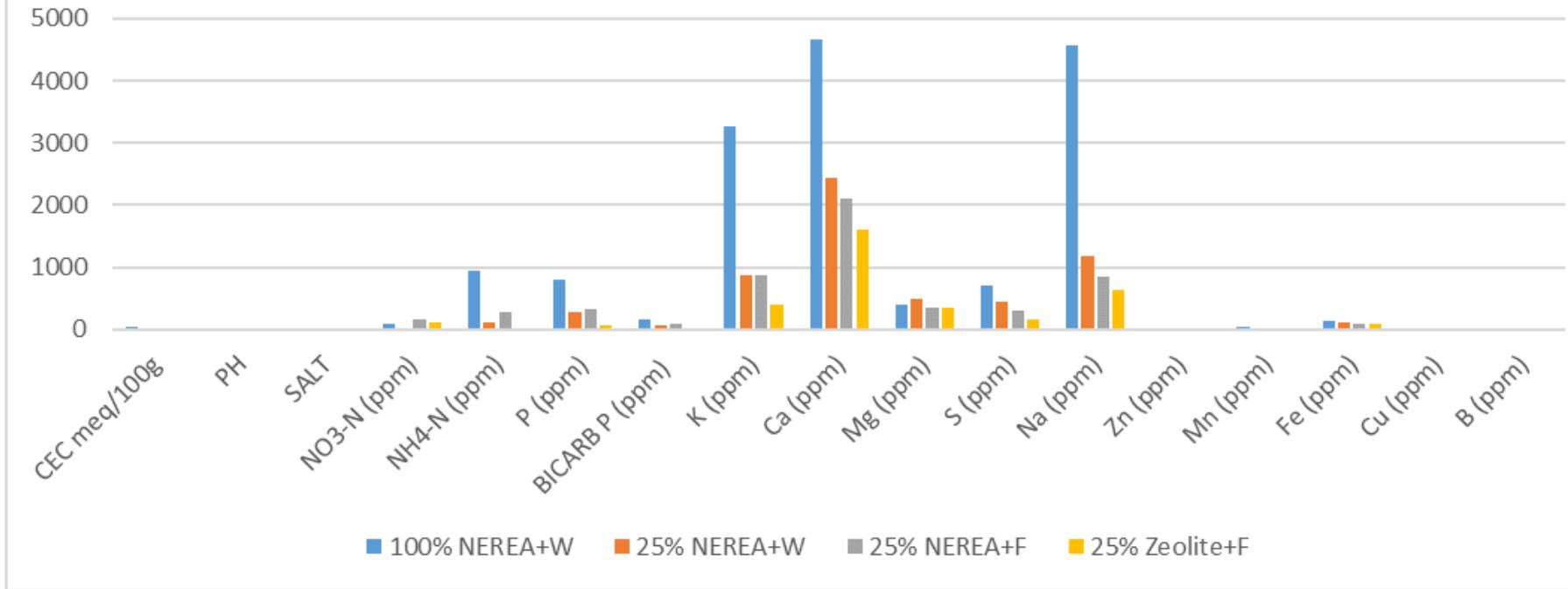
VWC monitoring



Chemical properties

At the end of the crop cycle

Substrate chemical analyses



Chrysanthemum rooting

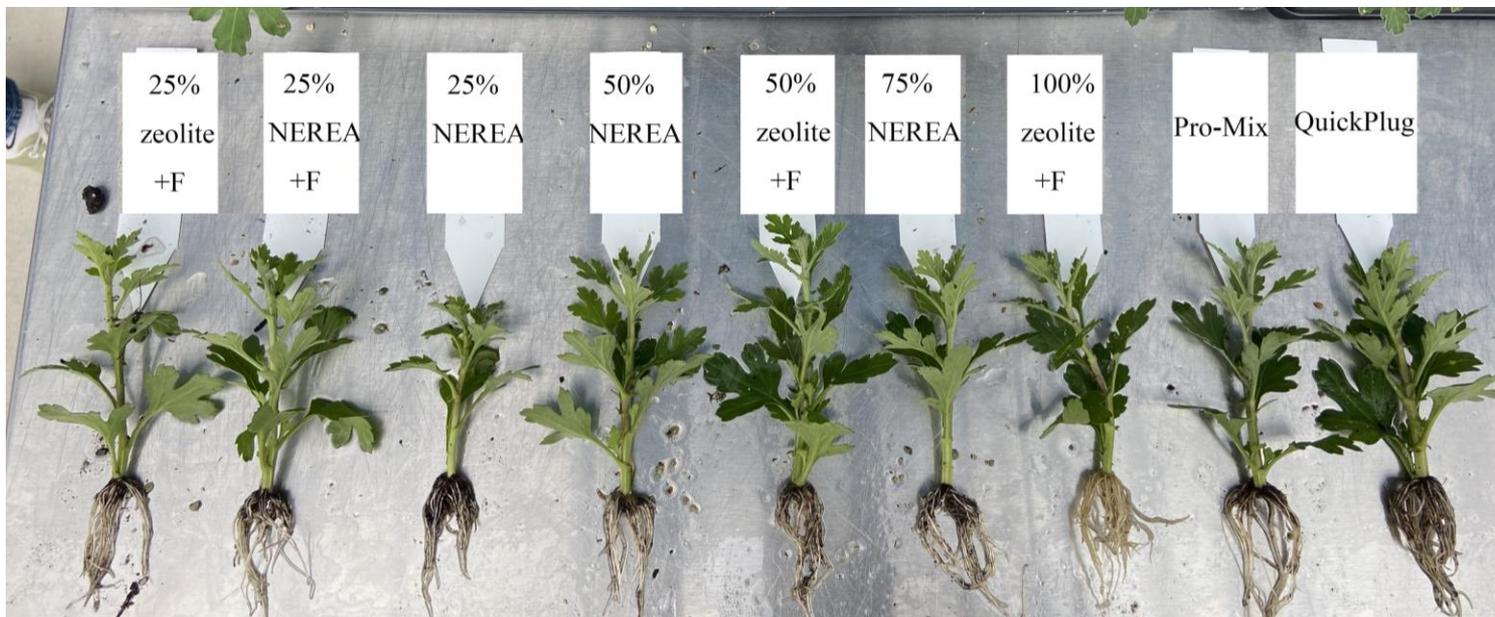
- Sep. 27th to Oct. 7th
- 30 cuttings/treatments
- Misting 10s/5 mins for the first 5 days,
5s/10 mins after 5 days

A	B	C	D	E	F	G	H	I
Quick plug	Pro-mix PGX	25% NEREA +FT	25% Zeolite +FT	50% Zeolite +FT	100% Zeolite +FT	25% NEREA +W	50% NEREA+W	75% NEREA+W

- Measurements:
Shoot length, the longest root length
Shoot fresh & dry weight
Root fresh & dry weight

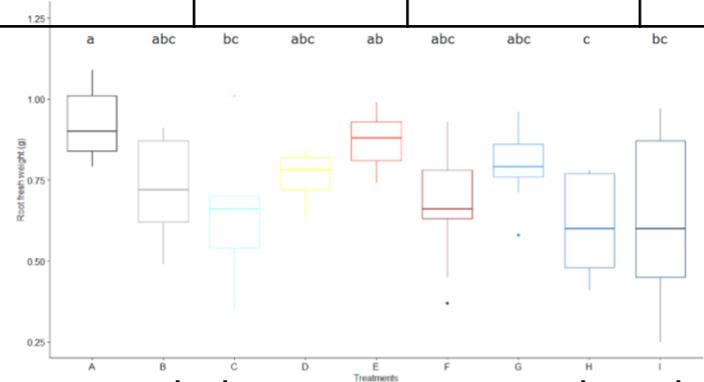
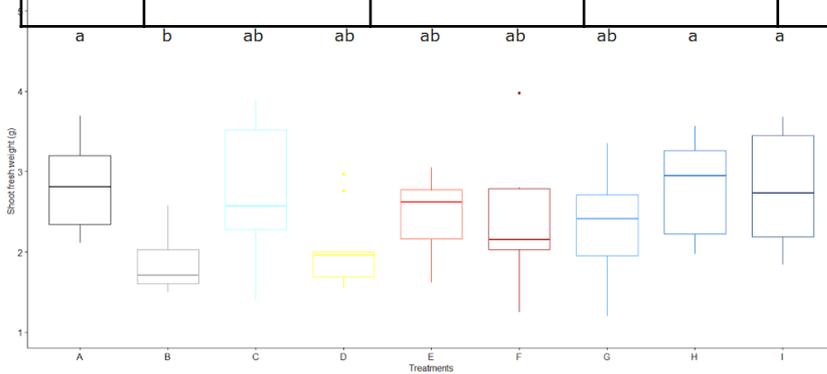


Chrysanthemum rooting



Chrysanthemum rooting

A	B	C	D	E	F	G	H	I
Quick plug	Pro-mix PGX	25% NEREA +FT	25% Zeolite +FT	50% Zeolite +FT	100% Zeolite +FT	25% NEREA +W	50% NEREA+W	75% NEREA+W



- 50% and 75% NEREA promoted shoot growth but compromised root growth
- 25% zeolite and 100% zeolite with fertilizer, or 25% NEREA with or without fertilizer resulted in at least comparable growth to Pro-mix, in terms of both root and shoot development
- Plants grown with QuickPlug were still the best



Gerbera potting trial

A	B	C	D	E	F	G
Pro-mix + FT	25% NEREA + FT	25% zeolite +FT	25% NEREA +W	50% NEREA+W	75% NEREA+W	100% NEREA+W

- From Sep 22nd, 2021
- 25 seedlings/treatments
- Hydroponic with flood table



Gerbera potting trial



Watered once/day with
Ornamental fertilizer 17-5-17



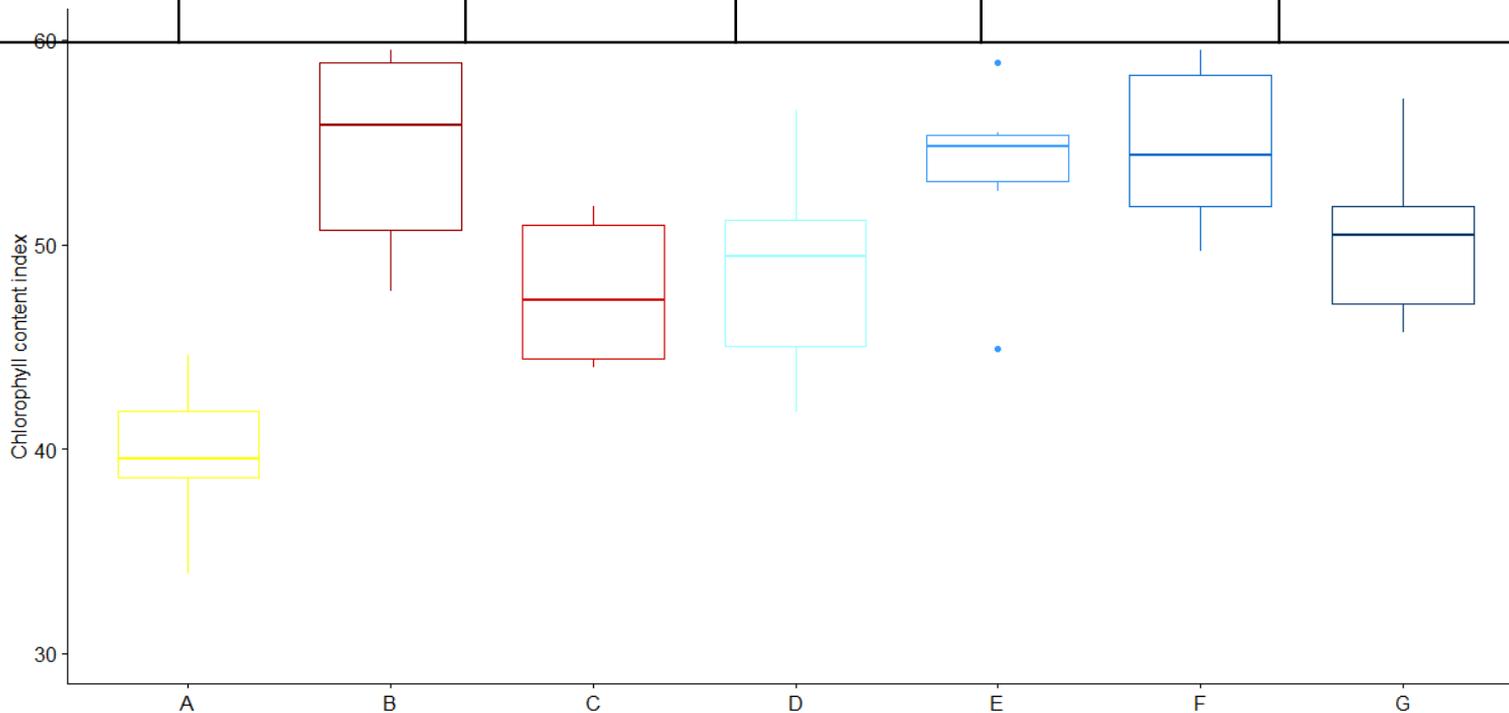
Watered twice/day
Additional hand water for
75% and 100% NEREA



Gerbera trial

Oct 13th

A	B	C	D	E	F	G
Pro-mix + FT	25% NEREA + FT	25% zeolite +FT	25% NEREA +W	50% NEREA+W	75% NEREA+W	100% NEREA+W



Gerbera grown under Promix had lower chlorophyll content compared to all NEREA or NEREA mixed substrates ¹.



Gerbera potting trial



Chlorophyll content index	39.73 c	54.63 a	47.68 b
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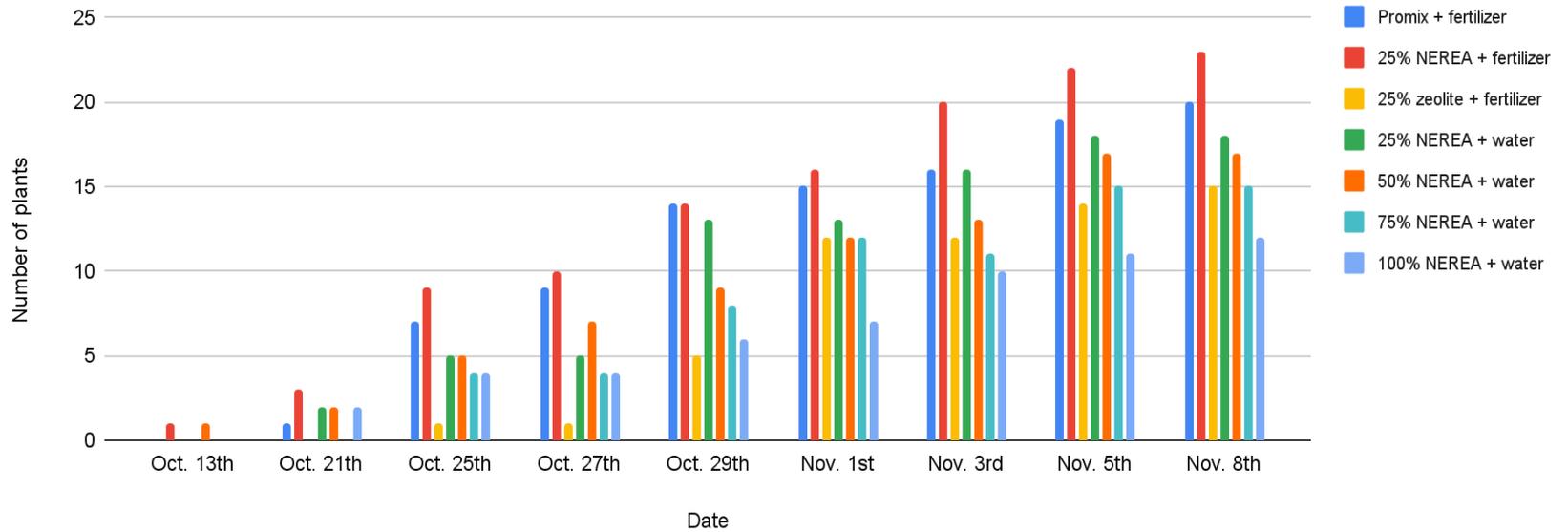
Leaves are darker green (with higher chlorophyll content) as compared to zeolite and promix grown plants with the same fertilizer rate.



Gerbera trial

Days to flower

Gerbera days to flower



Gerbera trial



Basil trial

17 DAS



25%NEREA +F 25%zeolite+F Pro-mix+F 25%NEREA+W 50%NEREA+W 75% NEREA+W 100%NEREA+W

25% NEREA + FT	25% zeolite +FT	Pro-mix + FT	25% NEREA +W	50% NEREA+ W	75% NEREA+ W	100% NEREA+ W
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Basil seedling established the best (stem length, leaf size and appearance) under 25% NEREA and 100% with water.

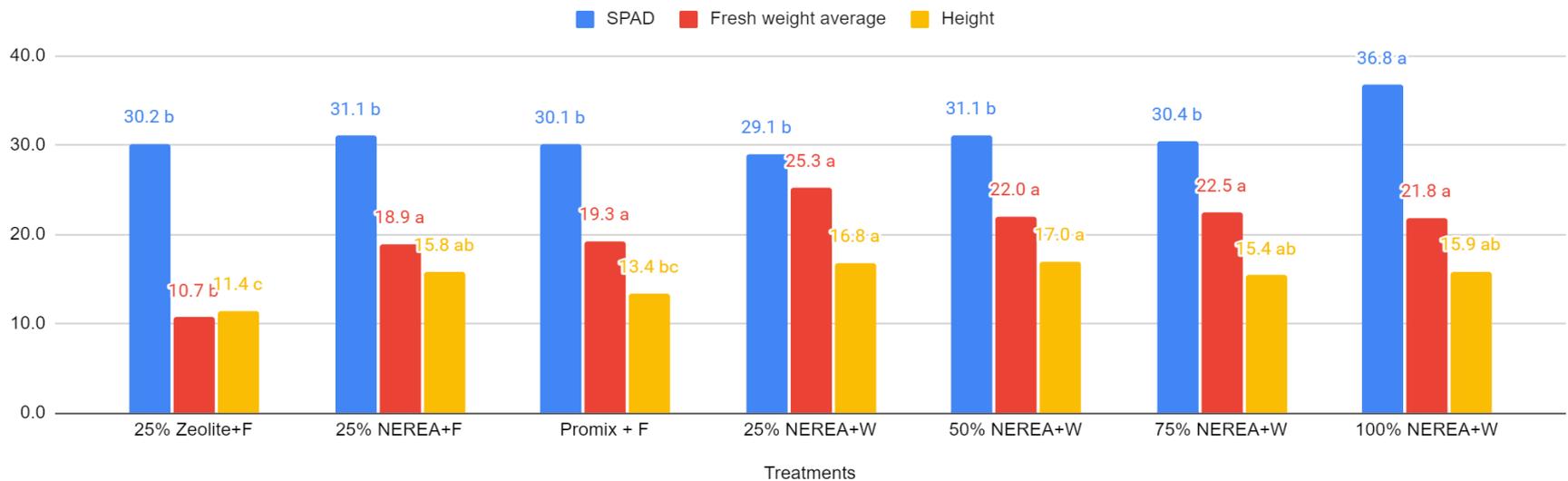


Basil trial



Basil trial

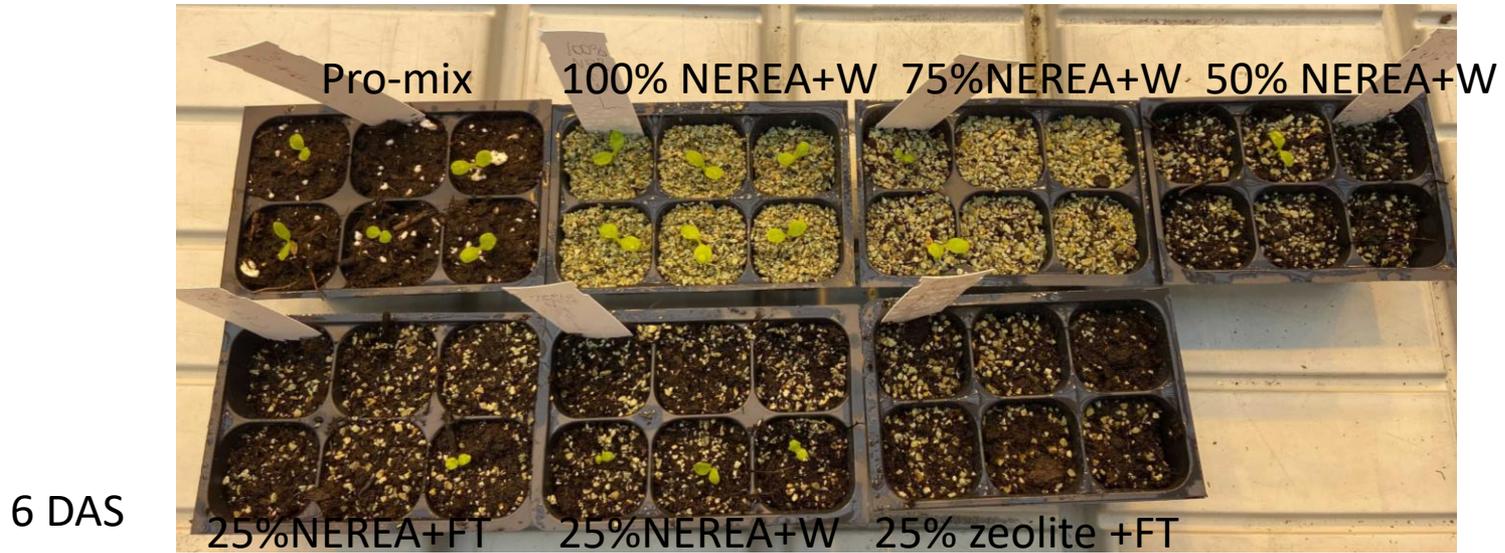
SPAD, Fresh weight and height of basil



Highest fresh weight (yield) under 25% NEREA with fresh water



Lettuce trial



Lettuce trial



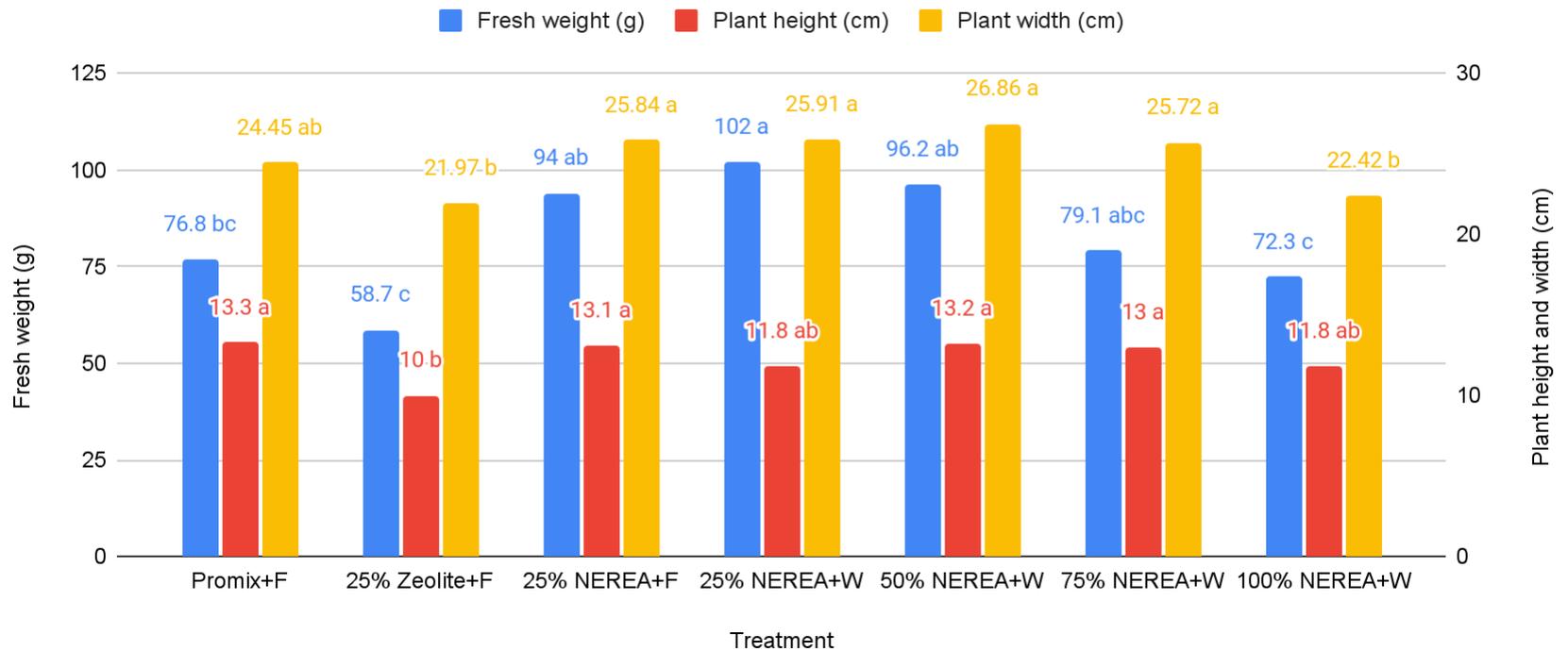
- Low germination rate potentially associated with higher air temperature in the greenhouse
- Started a new crop cycle on Oct. 22nd
- Getting similar results for the second crop cycle
- Fertilizer did not improve plant growth with 25% NEREA

Lettuce trial

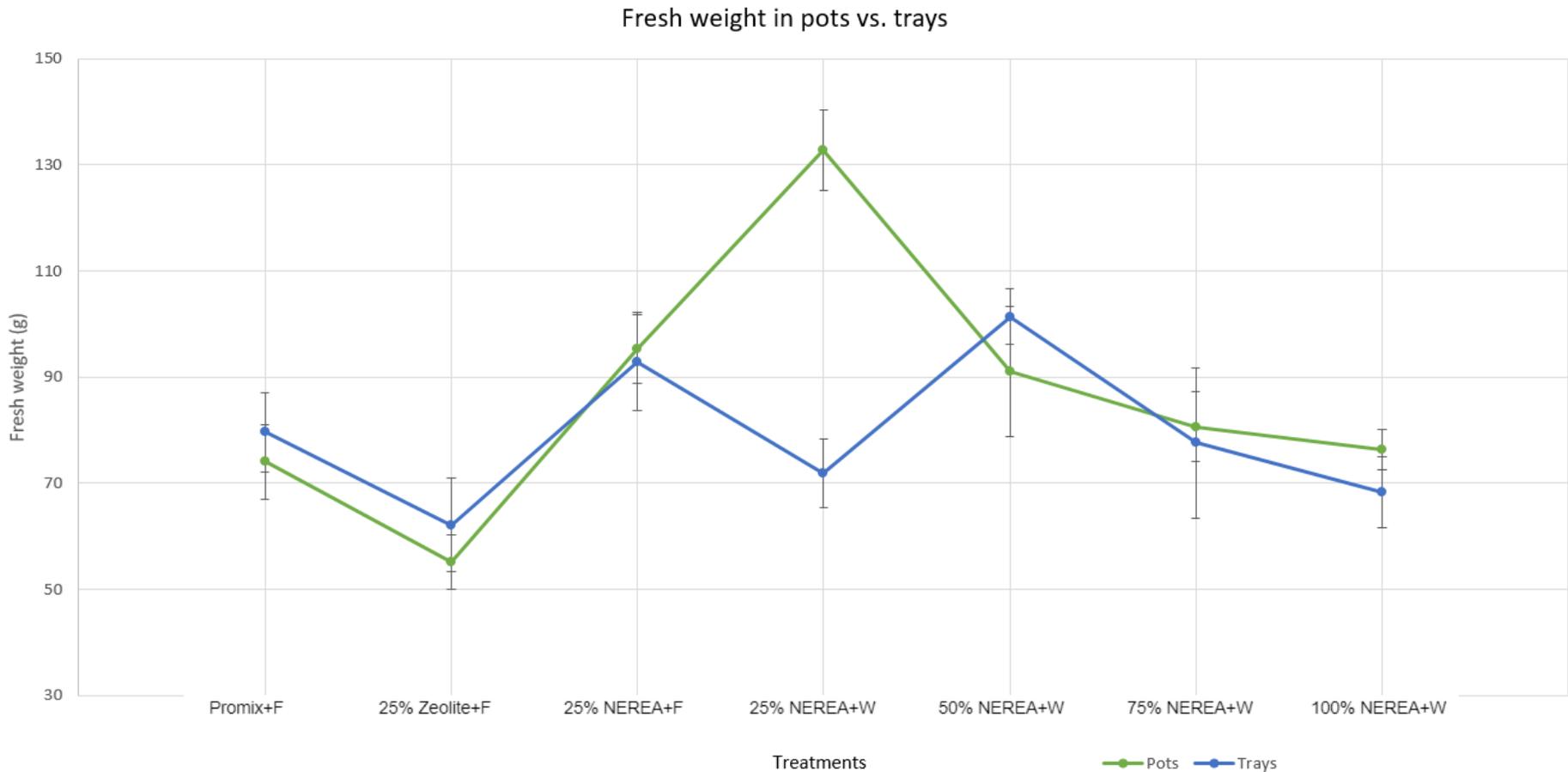


Lettuce trial

Lettuce fresh weight, height and width



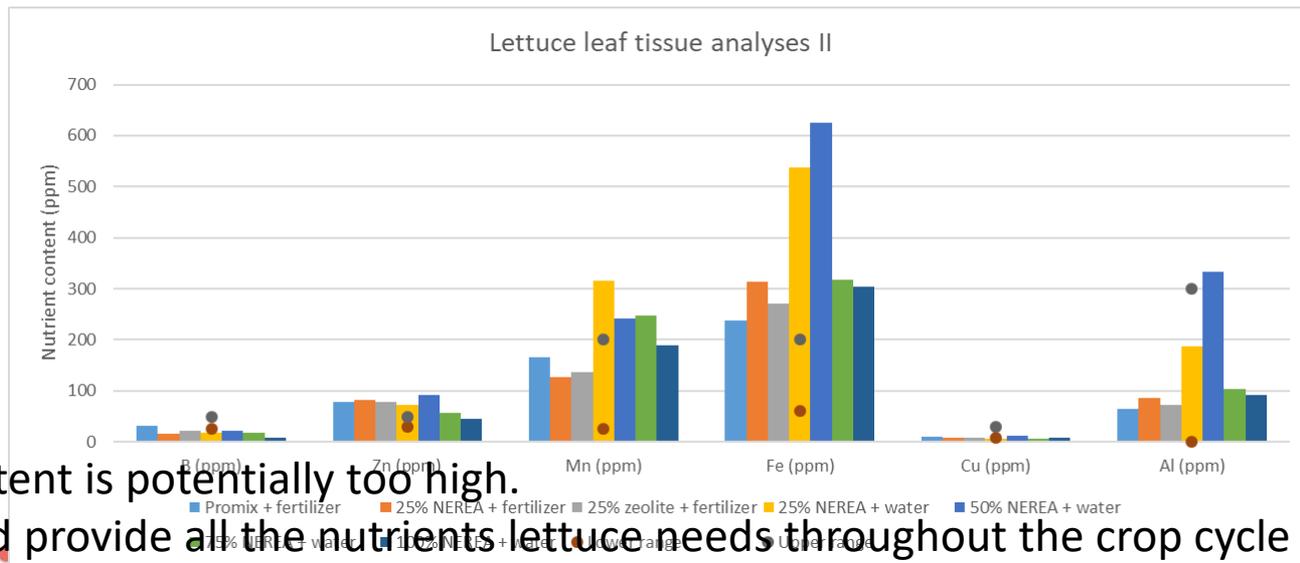
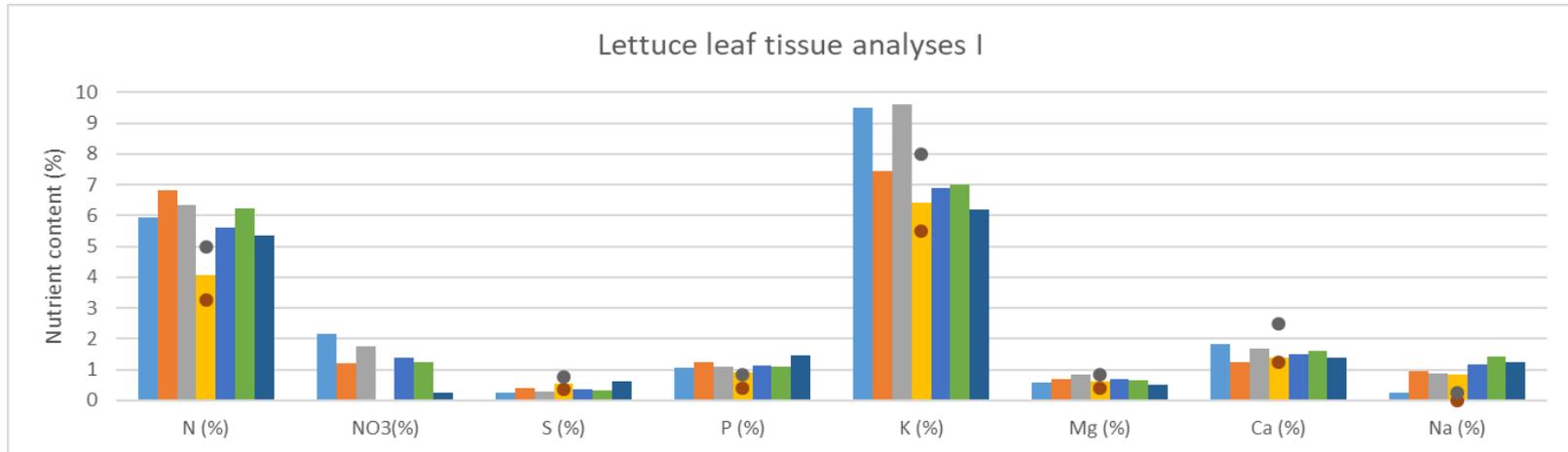
Lettuce trial



Using 25% NEREA, lettuce can be started directly in the pots with better yield, and potentially save labor cost.



Lettuce trial



Sodium content is potentially too high.

NEREA could provide all the nutrients lettuce needs throughout the crop cycle

Thank you



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