GLOBAL SYMPOSIUM ON
SALT-AFFECTED
SOILS

20 - 22
October, 2021
Virtual meeting

Introducing salt tolerant okra as a summer crop to coastal Lebanese area

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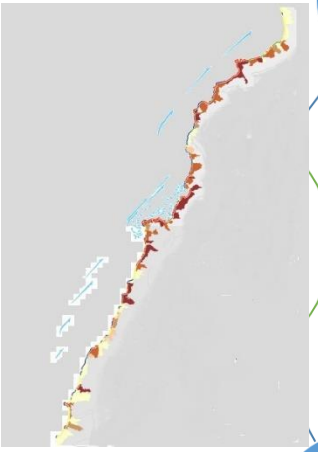
I. Introduction

- Human pressure on the Lebanese Mediterranean coast → seawater intrusion into coastal aquifer.
- Sensitive to salinity crops.
- Reduction of crop diversification
  ↓ Farmer's income
- ECw>7 dS/m → Land is fallowed.
- Food security, SDGs → recycling brackish water and use of saline water in irrigation of vegetable crops.



hasten resilience to CC

Reduce the loss of income

Salt tolerant summer crop

recover farmer's livelihood

Okra

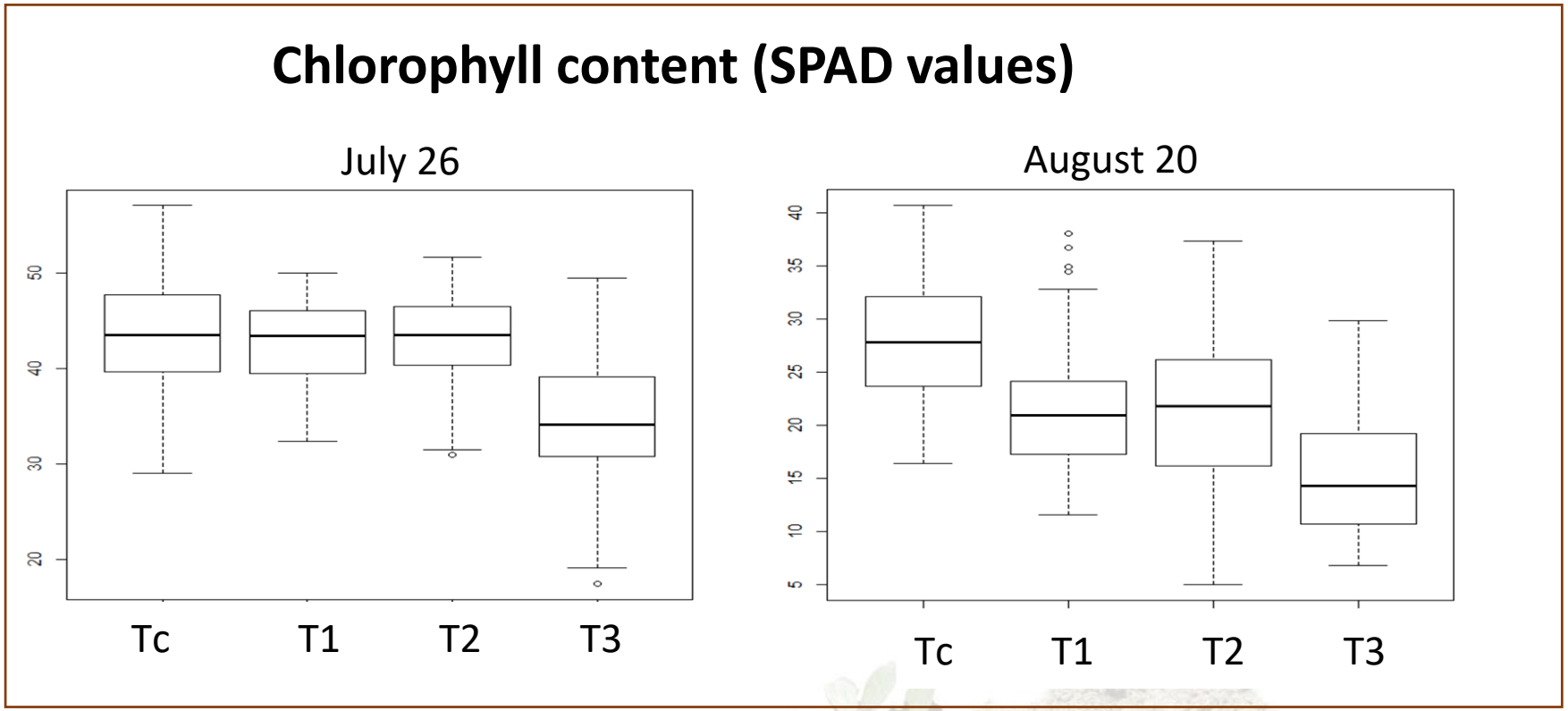
- **Cash crop**
- **Phytoremediation of salt affected soils**

II. Methodology

- Study area → coastal Jieh, 23 km south of Beirut.
- Experiment in open field on loamy soil Summer season of 2019 May → September.
- Four water salinity treatments ECw: Tc = 6 ds/m → projected 9 for T1, 12 for T2 and 15 dS/m for T3.
- 15 effective plants per treatment were selected for measurements.
- Crop performance of okra (PI 534521 received from ICBA): chlorophyll contents, canopy temperature and biomass production.

III. Results

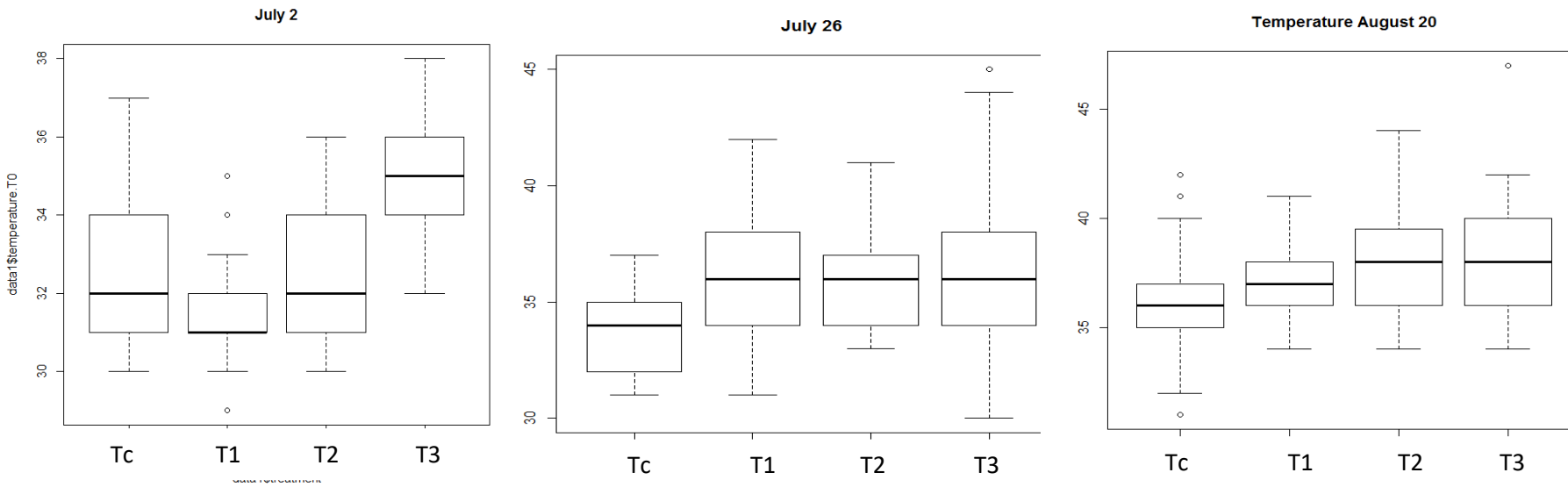
- **With induced salinity rise to 15 dS/m, chlorophyll content significantly decreased compared to Tc, T1 and T2 treatments.**



III. Results cont.

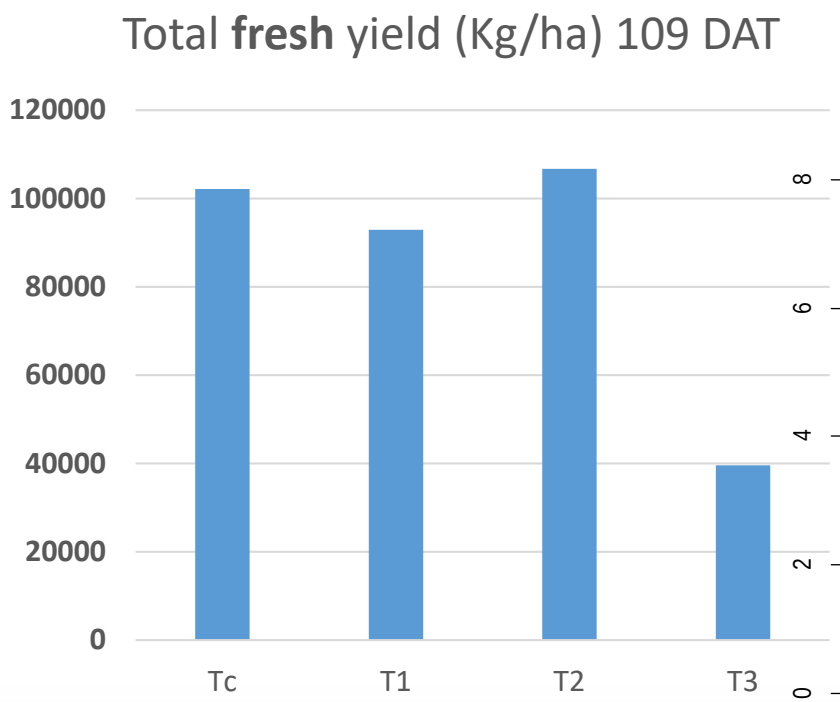
- **Okra canopy temperature increased over time.**
- **At the beginning, canopy temperature was significantly different between all the treatments.**
- **At full harvesting, temperature in T2-Tc, T3-Tc, and T3-T1 was significantly different.**

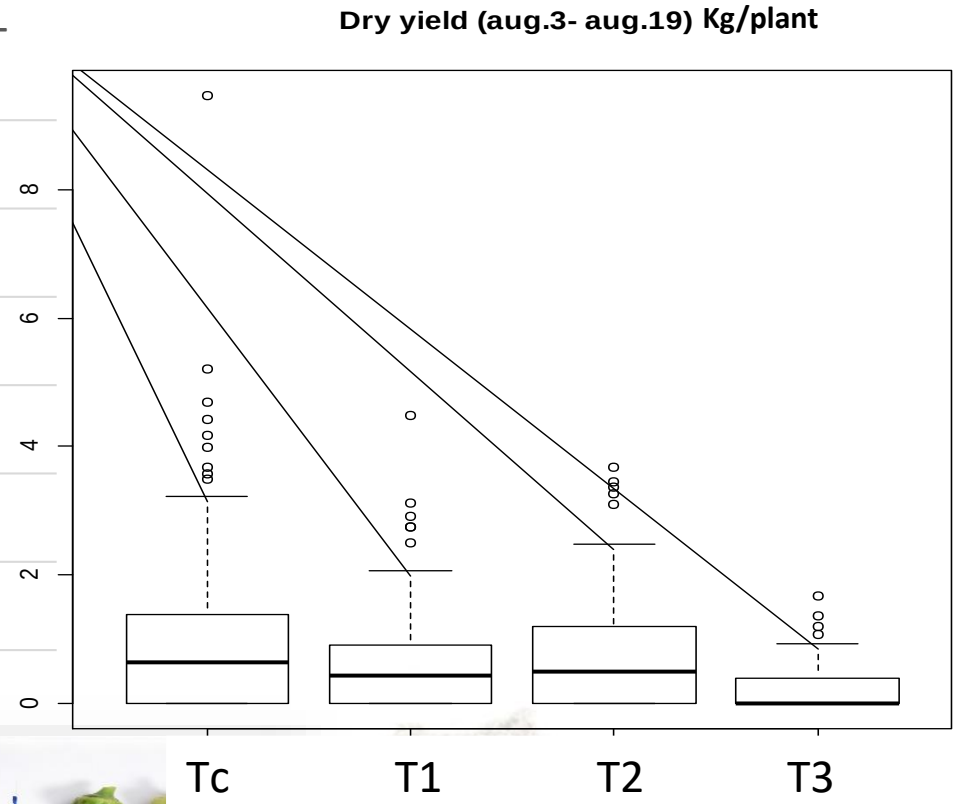
Canopy temperature (°C)



III. Results cont.

- **Treatments T_c, T_1, and T_2 had maximum yield, significantly different from T3 ($p>0.05$).**
- **T_3 fresh yield decreased by 60%.**
- **Pods were similar to local commercial quality (size and color).**
- **Pods in T3 smaller in size and pale green color: Negative impact of salinity above 12 ds/m on their market value.**





IV. Discussion and Conclusion

Discussion

- Chlorophyll content was affected by the highest salinity level (15 dS/m), beyond the threshold this okra variety can withstand.
- Salinity tolerance in okra varieties can be detected in a short time, 3 weeks after the onset of salt exposure.
- This study suggests that yield of okra subject to increased water salinity did not differ from the control up to 12 dS/m, twice the average value currently recorded in the wells in coastal Jieh area.
- Beyond this level, okra yield was significantly affected by higher salinity.
- Pods are similar to local varieties, will readily find access to the market and satisfy the consumers' choice.

Conclusions

- Salt tolerant okra can be grown on the Lebanese coastal area witnessing higher salinity of irrigation water.
- ECw for this okra genotype should not exceed 12 dS/m. Moderate salinity did not affect okra pod quality nor yield.
- Adapting new salt tolerant varieties provides opportunity to support farmer's income and encourage crop diversity and resilience on farmer's fields.
- For the first time, genotypes of salinity tolerant food crops were propagated and tested for salinity tolerance on the Lebanese coastal area and directly on farmer's fields.

Acknowledgements
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Thank You

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