

Introduction

Hydroponic cannabis growers that recirculate irrigation solution may accumulate NaCl over time; however, the effect of NaCl on cannabis yield (inflorescence) and potency (total THC concentration) is unknown. Furthermore, the effect of solution type (aquaponic [i.e., aquaculture effluent] vs. hydroponic) on NaCl stress has never been investigated.

NaCl can limit growth and yield by:

- 1) creating a drought stress, reducing water uptake and photosynthesis^{1,2};
- 2) reducing the uptake of monovalent nutrients such as K⁺;¹ and
- 3) causing oxidative stress within the plant².

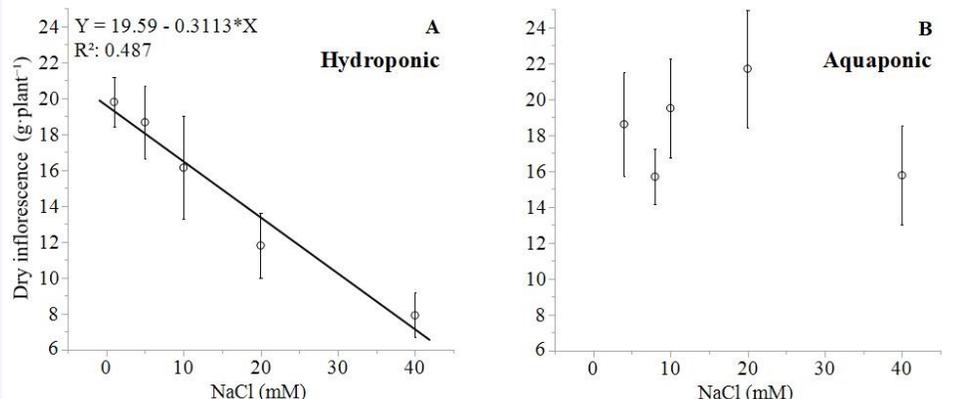
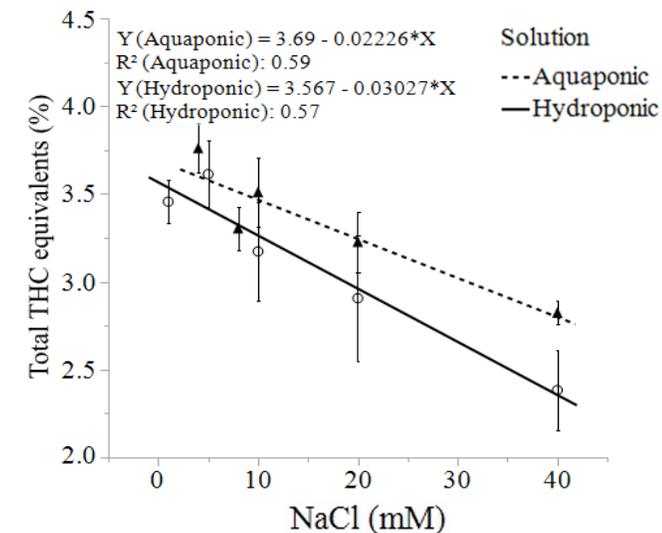
Objective: determine the effects of NaCl and solution on the yield and potency of cannabis

Method - Factorial Design

- Solution (N:P:K [mM]) - Aquaponic (9:2:2) - Hydroponic (13:3:5)
- NaCl (mM): 1, 5, 10, 20, 40 - Hydroponic
4, 8, 10, 20, 40 - Aquaponic

In an indoor environment, during flowering, each combination of solution and NaCl was replicated 5 times as a 'Nordle' plant grown in an oxygenated 8 L deep water culture bucket.

Results



Conclusion

- Potency (THC) decreased linearly with increasing NaCl in plants grown in both aquaponic and hydroponic solutions
- Yield decreased linearly with increasing NaCl concentration in plants grown in hydroponic solution
- Plants grown in aquaponic solution demonstrated tolerance to NaCl in terms of physiology and yield

References

- 1 Shaheen, S., Naseer, S., Ashraf, M., and Akram, N.A. (2013). Salt stress affects water relations, photosynthesis, and oxidative defense mechanisms in *Solanum melongena* L. *J. Plant Interact.* 8, 85–96. doi: 10.1080/17429145.2012.718376
- 2 Isayenkov, S. V., and Maathuis, F. J. M. (2019). Plant salinity stress: Many unanswered questions remain. *Front. Plant Sci.* 10, 1–11. doi: 10.3389/fpls.2019.00080