

Effects of potassium fertiliser on physiological responses of field-grown sweetpotato under salinity

Jane Cypriyana Pedinedi Jerald¹, Johanna Volk¹, Dhruv Patel¹, Maria Isabel Andrade², Folkard Asch¹

¹University of Hohenheim, Inst. for Agricultural Sciences in the Tropics (Hans-Ruthenberg-Institute), Germany

²International Potato Center, Flagship 2- Adapted Productive Varieties and Quality Seed, Mozambique

Introduction

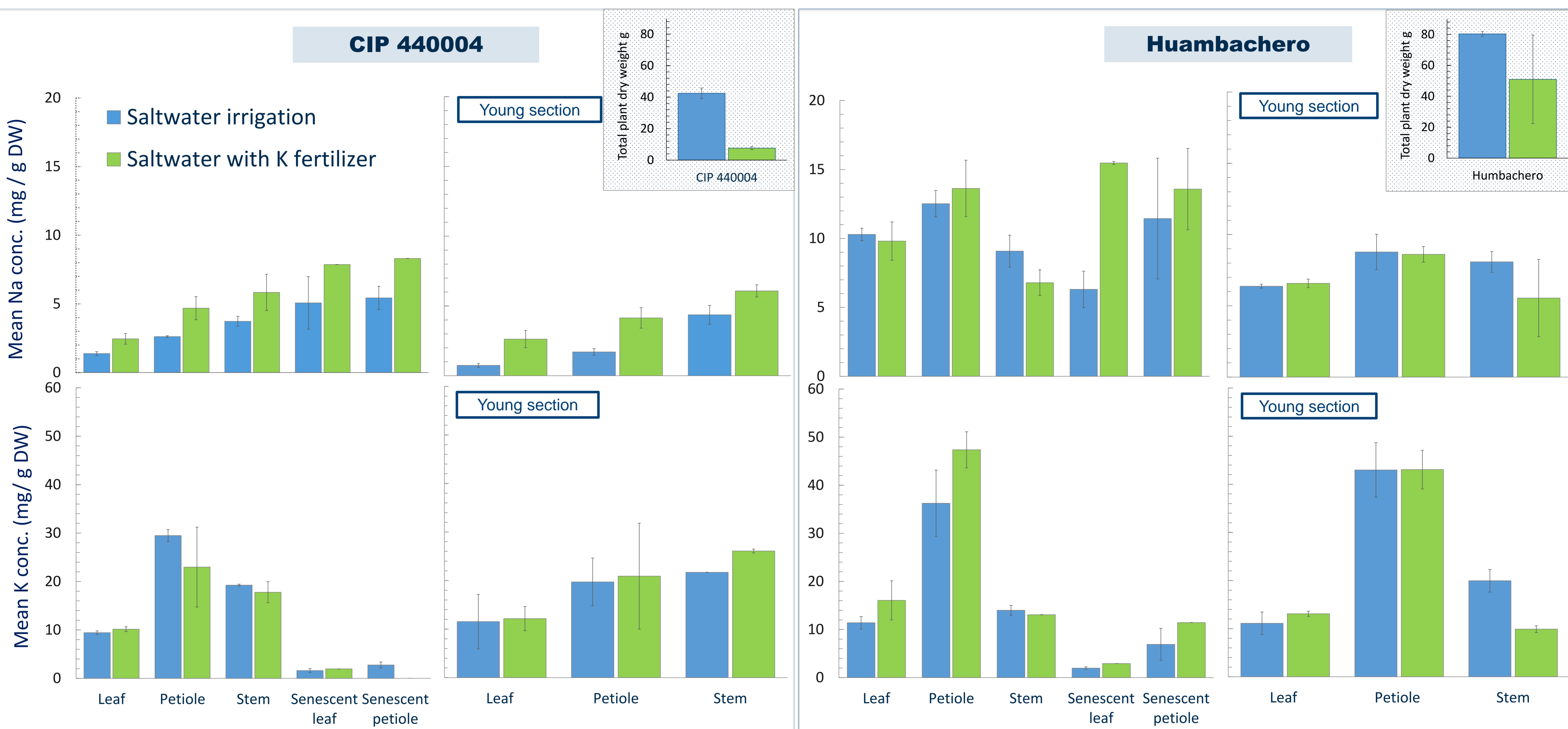
- Sweetpotato is a nutritious food security crop exposed to saline soils.
- A favorable tissue K^+/Na^+ ratio has been shown to reduce salt stress.
- Addition of potassium is a potential salt stress management strategy.
- Information on effects of potassium application in sweetpotato grown under saline conditions are limited.



Conclusions

- Potassium application decreased dry weight.
- Relative better growth of one variety linked to a higher K^+/Na^+ ratio in the leaves.
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- Higher K^+/Na^+ ratio due to lower Na^+ and higher K^+ concentration.
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- Lower K^+/Na^+ ratio only due to higher Na^+ concentration.
- Open questions on dry weight decrease.

Results and Discussion



K application decreased the dry weight in both varieties, stronger decrease in CIP 440004

- Higher Na^+ concentration in all parts with K addition (particularly in the young section)
- Unchanged K^+ concentrations
- generally lower K^+/Na^+ ratio

- Lower Na^+ concentrations in stems and leaves and higher concentration in petioles and senescent parts with K addition
- increased K^+ concentrations in leaves and petioles
- K^+/Na^+ ratio higher in leaves, lower in stems

Materials and Methods:

A field trial was conducted in Maputo, Mozambique in 2023 where two sweetpotato (*Ipomoea batatas* [L.] Lam) varieties (CIP 440004 and Huambachero) were subjected to two treatments: salt water irrigation (75mM NaCl) and saltwater irrigation with potassium sulfate (66 kg/ha). Saline irrigation onset was 25 days after transplanting, the potassium was applied to the soil at 59 days after transplanting. The soil EC before treatment onset was 1.8 dS/m (EC_e) which is classified as non-saline. Plants were harvested 84 days after transplanting and divided into sections (old – middle – young) where the youngest section grew newly from the sampling before. Each section was separated into leaves, stems and petioles. Samples were oven-dried for 48 hours at 60 °C for dry weight determination. The plant parts were measured for Na^+ and K^+ using a flame photometer. The bars in the graphs depict the standard error, n=3.