The effect of drought on nutrient acquisition in two contrasting cowpea accession

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Introduction

- Drought is an environmental stress having an adverse impact in constraining productivity of staple crops and thus increasing the rate of food insecurity and malnutrition. (Golldack *et al*., 2010).
- The adverse effect of drought stress occurs through a reduction of nutrient acquisition capacity which may consequently decreases plant growth as well as productivity.
- However, some leguminous crops are suggested to possess enhanced nutrient acquisition under drought , although in cowpea remains poorly understood .

Aim :

- The aim of the study is to evaluate nutrient acquisition in cowpea under drought .

Methods & Materials

- Two cowpea genotypes were grown in 1:3 Promix: soil mixture under well-watered and water deprived conditions in the greenhouse.
- Differences in plant growth, relative water content, chlorophyll content and foliar nutrient concentration in the two cowpea accession were measured.

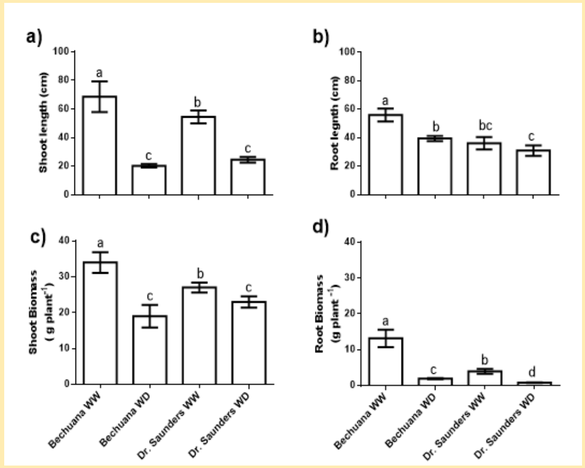

Figure1 Variation in shoot length, root length and root biomass of *Vigna unguiculata* genotypes (Bechuana White and Dr Saunders) grown in well-watered and water deprived.

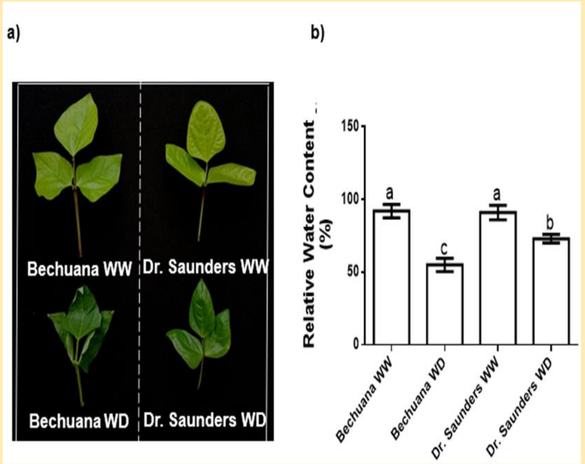

Figure 2 The effects of drought stress on relative water content of Bechuana and Dr. Saunders plants.

Table 1 Chlorophyll content (i.e. A, B and A + B) of Bechuana White and Dr. Saunders plants grown either under well-watered or water-deprived conditions

Treatments	Chlorophyll a	Chlorophyll b	Total chlorophyll (a+b)
Bechuana WW	11.47 ± 0.15 a	23.63± 0.32 a	35.11 ± 0.47 a
Bechuana WD	10.29 ± 0.07 b	21.20 ± 0.15 b	31.50 ± 0.22 b
Dr. Saunders WW	4.20 ± 0.10 d	8.65± 0.20 d	12.48 ± 0.30 d
Dr. Saunders WD	6.84 ± 0.23 c	14.09 ± 0.48 c	20.93 ± 0.71 c

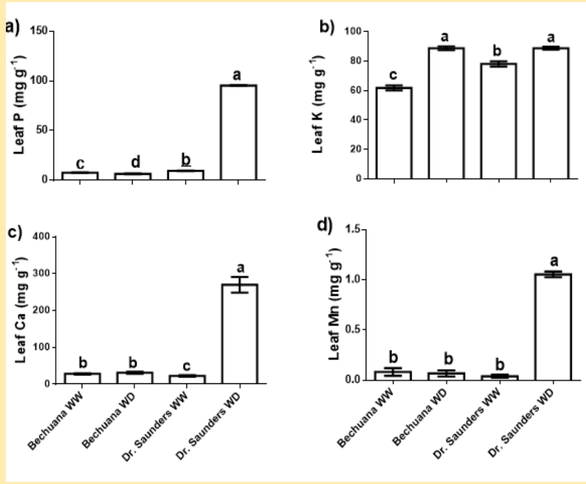

Figure 3 (a) Leaf phosphorus, b) leaf potassium c) leaf calcium and d) leaf manganese of water-deprived or well-watered Bechuana White and Dr. Saunders plants.

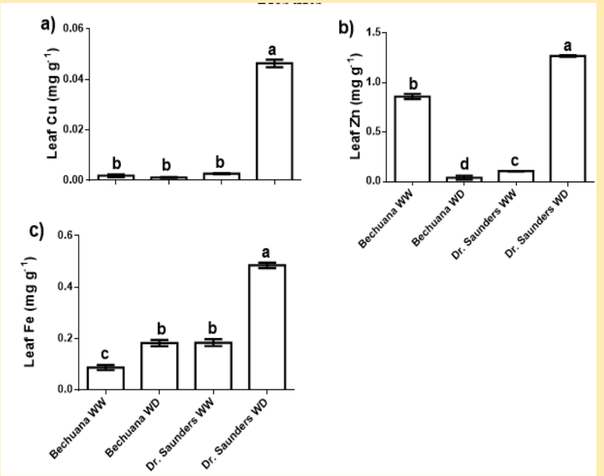

Figure 4 (a) Leaf cooper, b) leaf zinc, c) leaf Iron of water-deprived or well-watered Bechuana White and Dr. Saunders plants.

Conclusion

- Contrasting response trends were exhibited in cowpea genotype in response to water deficit in the soil.
- The BW genotype exhibited the incapacity to elevate soil nutrient acquisition under drought.
- In contrast, the Dr. S genotype enhanced nutrient acquisition in response to drought.

References

1. Golldack, D., Lüking, I. and Süthoff, U., 2010. Adaptation to a Changing Environment: T13. Gunes, A., Cicek, N., Inal, A., Alpaslan, M., Eraslan, F.
2. , Guneri, E. and Guzelordu, T., 2006. Genotypic response of chickpea (Cicer arietinum L.) cultivars to drought stress implemented at pre-and post-anthesis stages and its relations with nutrient uptake and efficiency. Plant Soil and Environment, 52(8), p.368he Regulatory Role of Small RNAs. In *Progress in Botany 71* (pp. 135-155). Springer, Berlin, Heidelberg..