PLANT SYSTEMS BIOLOGY: INTEGRATING SCALES AND TIMES

FAST CLASSIFICATION SYSTEM FOR DROUGHT TOLERANCE IN PEANUT AND SOYBEAN

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INTRODUCTION

Drought is one of the major limitations for agriculture.

The direct selection of tolerant genotypes on the fields is time-consuming due to the unpredictability of the environmental conditions.

Our group use a physiological approach to classify the genotypes under controlled drought at vegetative stage.

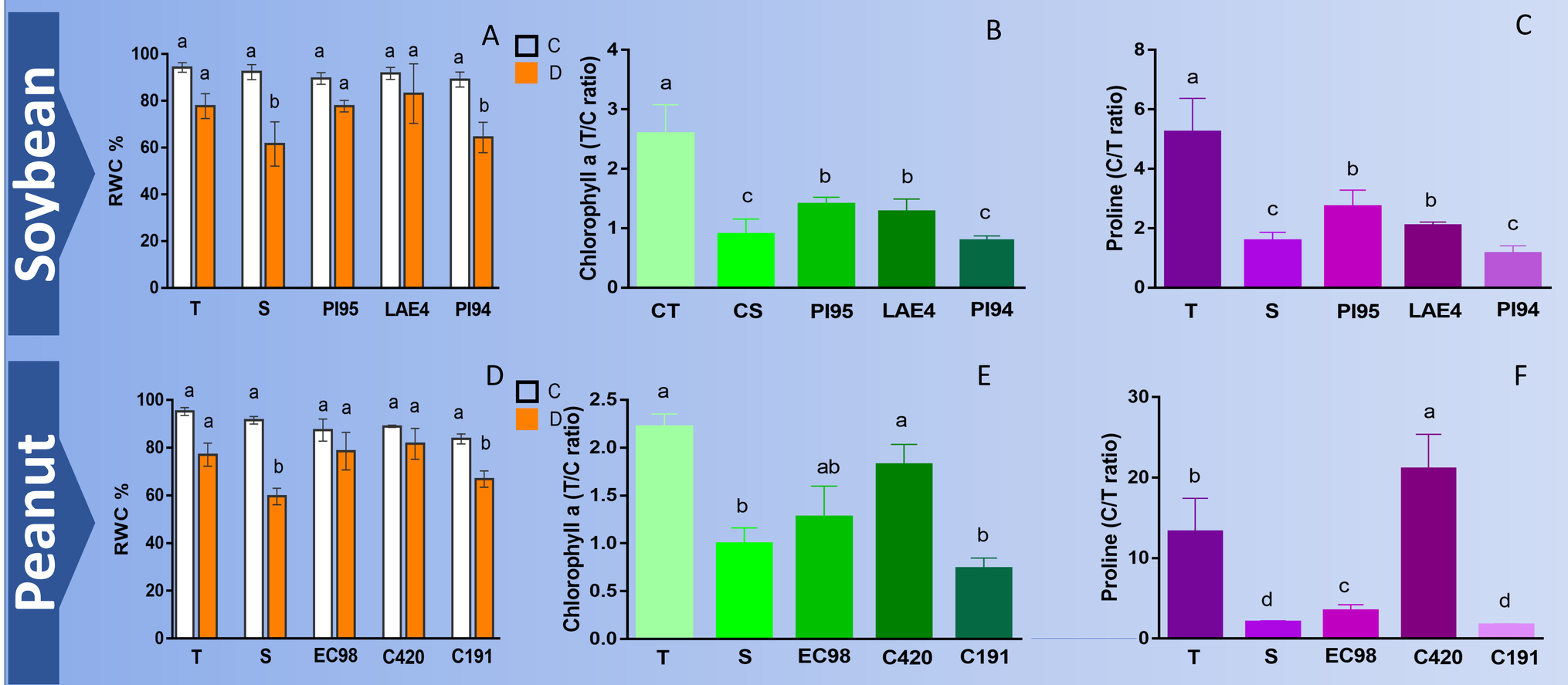
We analyze several biochemical and physiological traits to classify the genotypes under stress, such as leaf relative water content (RWC), chlorophylls, and proline.

The aims are to develop strategies to reduce breeding times for legumes and to identify soybean and peanut drought tolerant candidates for breeding.

CONCLUSION

- Overall, tolerant materials showed higher, chlorophylls, and/or proline accumulation.
- Those responses may contribute to the water balance maintenance under stress in the tolerant materials (e.g. proline in peanut C420).
- In addition, the higher increase of chlorophylls (peanut C420 and soybean LAE4 and PI95) suggest a better performance on recovery stages.
- The use of these traits could contribute to reduce breeding times for both crops.

RESULTS AND DISCUSSION



We define tolerant genotypes relative to the tolerant and sensitive checks. Overall, tolerant materials show less reduced RWC, higher chlorophyll content, and higher proline accumulation. Best performance was observed in PI95 soybean and C420 peanut materials.

Figure 1. Biochemical traits under drought stress in soybean (A, B, C) and peanut (D, E, F). Relative water content (RWC) (A, D). Chlorophyll a (B, E), and proline contents (C, F). T, tolerant check. S, sensitive check. Shared letters indicates non-significant differences (Tukey, $p<0.05$).

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