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DESAFIOS PARA A FISIOLOGIA VEGETAL

PRODUÇÃO DE ALIMENTOS E SUSTENTABILIDADE

Responses of Setaria viridis plants to saline stress

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Responses of Setaria viridis plants to saline stress Ferreira TMM1,2, Lopes, CL3, Sousa CAF2, Souza Jr MT1,2 1Universidade Federal de lavras, Lavras, MG, Brazil 2Embrapa Agroenergia, Brasília, DF, Brazil 3Faculdade Anhanguera de Brasília, Brasília, DF, Brazil thalita.massaro@colaborador.embrapa.br Soil salinity is a major abiotic constraint affecting crop yield in at least 20% of the worlds soils. Because of that, much research has been conducted to develop plants with improved salinity tolerance. As a first step, the strategy seeking to understand the effects of saline stress in model plants has been largely adopted under laboratory scales. Setaria viridis (green foxtail) has arisen as a model for C4 photosynthesis in this type of study. Salinity stress affects many aspects of a plant's physiology. In this work, we dissect the plant's response into traits more responsive to saline stress, which are hypothesized to be involved in the overall tolerance of the plant to salinity. Thus, we submitted S. viridis plants in the vegetative growth stage to the doses of 0.0; 0.2; 0.4; 0.6; 0.8 and 1.0 g NaCl/100 g of substrate. We used techniques that measure the impact of salinity in the growing substrate and on several physiological traits. As expected, the addition of salt to the substrate led to a proportional dose-dependent increase in the electrical conductivity and a consequent reduction in the water potential of the saturation extract. The effects on plants were a proportional reduction in daily water consumption, chlorophyll, and carotenoid contents, but increased protection of the photochemical apparatus by means of the functioning of the xanthophyll cycle, as determined by photochemical reflectance index. Furthermore, the results show a linear decrease in the net CO2 assimilation rate, stomatal conductance, and transpiration. The internal CO2 concentration, in turn, decreased from the control to the lowest salt dose but increased as the salt doses increased, adjusting better to a quadratic dose-response equation. The sum of all effects on plants led to a linear fall in biomass. Keywords: green foxtail, salt tolerance, osmotic stresses. Acknowledgments: to CAPES for scholarship and FINEP (Grant 01.13.0315.03) for financial support.

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