MAIZE CHLOROPHYLL-A FLUORESCENCE ANALYSIS UNDER WATER DEFICIT WITH APPLICATION OF TREHALOSE DERIVATES MIXTURE

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The water deficit is one of the main causes for global crop production decline. Thus, it can cause adverse effects on local economies. Maize has always been a crucial crop in Brazil, and in order to cope with both populational and industrial demand, planting in drought soils was needed. Trehalose is a key disaccharide for plant stress-tolerance, including water deficit. In this regard, this work analyses the influence of mixtures of trehalose derivates over the fluorescence of chlorophyll-α of the hybrid BRS 1030 maize under hydric stress (55% field capacity). Treatments were hydric deficit, hydric deficit with trehalose pulverization, hydric deficit with mixture of trehalose derivates and irrigated (70% field capacity). Analyzed parameters were electron transport rate, photosystem II maximum efficiency, photochemical quenching, light-adapted photochemical quantic production and non-photochemical quenching. Analyses were performed 24 hours after stress induction, after the period of hydric stress (12 days) and 12 hours after rehydration. For the most part, the pulverization with derivates mixture treatment averages were superior to the no pulverization and pulverization with trehalose treatments. These disaccharides carry out osmotic regulation in plants and no previous works measured the effects of these molecules over the fluorescence of chlorophyll-α. Hence, trehalose derivates mixture are effective in the induction of plant drought-tolerance and this mixture can consequently aid in hybrid maize BRS 1030 production in water deficient soils.

Keywords: drought, photosystem, disaccharide, ,