

Effect on sugarcane (*Saccharum officinarum*) genotypes

The net impact of individual and combined stress on plant growth

The table shows the effect of individual and combined drought and freezing stress on the physiology of sugarcane genotypes

Plant: Sugarcane (*Saccharum officinarum*) genotypes IACSP94-2094 and IACSP97-7065
Stress 1: Withholding water for 11d
Stress 2: 15°C
Stage of the plant: 109 d old plants

Genotypes	Stress treatments	Plant response to stress				
		Type B parameters *				
		Pre-dawn leaf water potential (MPa)	Fv/Fm	Leaf CO ₂ assimilation (μmol/m ² /s)	Stomatal conductance (mol/m ² /s)	Lipid peroxidation (ηmol TBA-MDA/gFW)
IACSP94-2094	Control	-0.31	0.78	17.8	0.1	53.9
	Cold	-0.29	0.76	13.9	0.07	81.1
	Drought	-1.04	0.74	3	0.02	56.7
	Drought+ Cold	-1.5	0.69	4.4	0.01	83.3
IACSP97-7065	Control	-0.31	0.75	15.2	0.08	61.1
	Cold	-0.46	0.74	13.9	0.02	71.1
	Drought	-0.29	0.7	1.8	0.08	75.5
	Drought+ Cold	-0.81	0.69	2.3	0.02	108.9

For raw data – Click here (.xlsx file)

Reference- Sales CR, Ribeiro RV, Silveira JA, Machado EC, Martins MO, Lagoa AM (2013). Superoxide dismutase and ascorbate peroxidase improve the recovery of photosynthesis in sugarcane plants subjected to water deficit and low substrate temperature. *Plant Physiology Biochemistry* 73: 326-336.

Note: Values are presented as it is from the source article without subjecting to the calculation and the data was recorded 11d after stress treatment.

‘*’ - For more information on parameters classification, please refer to ‘methodology’ tab.

The inference from the study: Sales et al., 2013 reported that the leaf gas exchange and photochemical activity was negatively affected by drought stress and combined drought and cold stress to similar extent. The reductions in the drought-resistant genotype IACSP94-2094 were less as compared to the drought sensitive genotype IACSP97-7065. IACSP94-2094 also exhibited a high antioxidant capacity as compared to the sensitive genotype. **Thus, it can be concluded that combined drought and cold stress was equally damaging to the growth and physiology of plants as drought stress alone.**