

S2.16. CHLOROPHYLL FLUORESCENCE AS AN INDEX FOR FREEZING TOLERANCE IN FALL SUGAR BEET (*BETA VULGARIS* L.) CULTIVARS

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Variation of chlorophyll fluorescence parameters is an important criterion for selection of tolerant crop cultivars against stressful conditions such as freezing stress. In order to study the possibility of using the chlorophyll fluorescence parameters to evaluate freezing tolerance of fall sugar beet cultivars, an experiment was conducted by using a factorial based on randomized complete block design with three replications. Seven fall sugar beet cultivars (Jolge, Giada, Monatunna, Sbsi1, Super Ma, and Pp8), were exposed to ten temperature levels (0 (control), -2, -4, -6, -8, -10, -12, -14, -16 and -18°C), and their yield of quantum efficiency (Fvs/Fms) at four levels of recovery period (2, 12, 24 and 72 hours) were recorded. Results indicated a strong correlation between yield of quantum efficiency and plant survival percentage ($R^2=0.90^{**}$). Monatunna variety showed the highest and Sbsi1 showed the lowest yield of quantum efficiency. There were no significant differences among sugar beet varieties on Fvs/Fms parameter until -14°C, but lower temperatures severely declined this parameter. There was a reduction of Fvs/Fms parameter in the first 24 hr duration of recovery, but after 72 hr recovery, this parameter increased up to the values monitored before the freezing conditions. Among the studied varieties, Monatunna cultivar showed the suitable recovery when exposed to the -16°C, but the yield of quantum efficiency on Sbsi1 cultivar was decreased dramatically at the same temperature.