



Effect on wheat cultivars (*Triticum aestivum* L. var. *MvEmese*, *Nadro*)

1. The net impact of individual and combined stress on plant growth

Crop: Wheat (*Triticum aestivum* L. var. *MvEmese*, *Nadro*)
 Stress 1: Low temperature (-12 °C)
 Stress 2: High light (500 $\mu\text{mol photons m}^{-2} \text{s}^{-1}$)
 Stage of plant: 10 day old Seedling

The table shows the impact of freezing stress and high light in combination on percent survival, putrescine level, spermidine level, glutathione S-transferase activity, spermine level, cadaverine level in wheat plants.

	Treatment	Plant response to stress**	Plant response to stress (reduction over control %)				
		Type A parameters*	Type C parameters*				
		Survival %	Putrescine level	Spermidine level	Glutathione S-transferase activity	Spermine level	Cadaverine level
<i>MvEmese</i>	FS (-12°C) + HL (500 $\mu\text{mol m}^{-2} \text{s}^{-1}$) 1 day later (Sequential stress)	73.5	3.1 ↓	28.9 ↓	-60.0 ↑	-8.1 ↑	-38.1 ↑
<i>Nadro</i>	FS (-12°C) + HL (500 $\mu\text{mol m}^{-2} \text{s}^{-1}$) 1 day later (Sequential stress)	17.4	-7.0 ↑	34.7 ↓	-74.4 ↑	-12.5 ↑	-45.2 ↑

FS-Freezing stress; HL- High light

Note: Values presented in the table were calculated using the formula described below.

$$\text{Reduction over control (\%)} = \frac{(\text{Value}_{\text{Control}} - \text{Value}_{\text{Stress}})}{\text{Value}_{\text{Control}}} \times 100$$

1) '↓' - indicates plant parameters affected by stress that lead to high susceptibility (higher the value more the damage).

2) '↑' - indicates plant parameters less/not affected by stress leading to improved resistance (higher the value lesser the damage).

‘*’ - *For more information on parameter classification, please refer to the ‘methodology’ tab.*
‘**’ - *Values are presented as it is from the source article without subjecting to the calculation.*

For raw data – [Click here](#) (.xlsx file)

Reference - Szalai G, Pap M, Janda T (2009) Light-induced frost tolerance differs in winter and spring wheat plants. *Journal of Plant Physiology* 166 :1826—1831

Inference from the study: Szalai G (2009) studied the interaction of low temperature and high light in two wheat cultivars MvEmese and Nadro. Stress treatment was given sequentially and concentration level of various polyamines such as putrescine, spermidine, spermine, cadaverine and glutathione S-transferase activity was analysed. Putrescine and spermidine levels were reduced under combined stress whereas Glutathione S transferase activity, spermine and cadaverine levels increased. However, plant survival percentage was low for cultivar Nadro compared to MvEmese. **Thus, inconclusion, this stress combination changes various polyamine levels in wheat plants resulting in lesser plant survival percentage in cultivar Nadro.**