



Effect on linseed cultivars (*Linum usitatissimum* L. cv. Padmini)

The net impact of individual and combined stress on plant growth

Crop: Linseed (*Linum usitatissimum* L. cv. Padmini, T-397)
 Stress 1: UV-B (7.2 kJ m⁻²)
 Stress 2: Ozone (10 ppb)
 Stage of plant: At sowing

The table shows the impact of UV-B irradiance and ozone alone and in combination on growth and biochemical components in linseed cultivars.

		Plant response to stress (reduction over control %)					
		Type A parameters*					
	Treatment	Number of capsule	Number of seeds plant ⁻¹	Test weight	Seed weight	Number of seeds capsule ⁻¹	Harvest Index
Padmini	UV-B (7.2 kJ m ⁻²)	12.2↓	34.0↓	40.7↓	61.1↓	32.8↓	34.6↓
	Ozone (ambient +10 ppb)	21.0↓	20.0↓	24.8↓	44.4↓	24.1↓	26.9↓
	UV-B (7.2 kJ m ⁻²) + Ozone (ambient + 10 ppb) Simultaneous stress	10.9↓	10.7↓	7.1↓	27.8↓	15.5↓	11.5↓
T-397	UV-B (7.2 kJ m ⁻²)	25.3↓	44.2↓	25.9↓	43.8↓	28.8↓	25.0↓
	Ozone (ambient +10 ppb)	29.1↓	36.7↓	14.8↓	25.0↓	23.1↓	25.0↓
	UV-B (7.2 kJ m ⁻²) + Ozone (ambient + 10 ppb) Simultaneous stress	7.2↓	11.5↓	5.6↓	6.3↓	11.5↓	16.7↓

		Plant response to stress (reduction over control %) Type C parameters*					
	Treatment	Total sugar	Protein	Phosphorus	Calcium	Magnesium	Zinc
Padmini	UV-B (7.2 kJ m-2)	42.6↓	33.1↓	17.2↓	26.2↓	18.4↓	12.9↓
	Ozone (ambient +10 ppb)	29.8↓	43.6↓	22.1↓	37.6↓	27.6↓	21.1↓
	UV-B (7.2 kJ m-2) + Ozone (ambient + 10 ppb) Simultaneous stress	48.9↓	14.0↓	36.9↓	56.2↓	44.0↓	29.7↓
T-397	UV-B (7.2 kJ m-2)	39.6↓	32.3↓	13.8↓	26.9↓	21.9↓	20.6↓
	Ozone (ambient +10 ppb)	27.1↓	52.4↓	23.2↓	42.5↓	35.0↓	28.1↓
	UV-B (7.2 kJ m-2) + Ozone (ambient + 10 ppb) Simultaneous stress	47.9↓	19.0↓	30.8↓	60.6↓	44.7↓	38.6↓

Reference - Tripathi R, Agrawal SB (2012) Interactive effect of supplemental ultraviolet B and elevated ozone on seed yield and oil quality of two cultivars of linseed (*Linum usitatissimum* L.) carried out in open top chambers. J Sci Food Agric. 93(5):1016-1025.

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

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

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

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

Inference From the study: Tripathi and Agrawal studied the interaction of UV-B irradiation and ozone in linseed cultivars Padmini and T-397. Stress was given singly and simultaneously. The number of capsule, number of seeds/plant, test weight, seed weight, number of seeds/capsule

and harvest index and protein level was not reduced synergistically under combined stress treatment. However, sugar levels, phosphorus, calcium, magnesium, and zinc levels were reduced additively under combined stress conditions in both cultivars. Thus, this stress combination is not detrimental to linseed growth and yield but reduces the nutritional value of its seeds in both cultivars.