Effect on wheat cultivars (*Triticum aestivum* cv. cv. KRL35, KRL210, HD2009)

The net impact of individual and combined stress on plant growth

Crop: Wheat (*Triticum aestivum* cv. cv. KRL35, KRL210, HD2009)
Stress 1: Boron stress (50 ppm, 100 ppm)
Stress 2: Salinity stress (60 mM, 100 mM NaCl)
Stage of plant: 3 day old seedling

The table shows the impact of boron stress and salinity alone and in combination on growth of wheat cultivars.

		Plant response to stress (reduction over control %) Type A parameters*			
	Treatment	**Root length**	**Shoot length**	**Number of roots**	**Fresh weight of root**
KRL35	Boron stress (50 ppm) + Salinity (60 mM NaCl) (Simultaneous stress)	29.8↓	24.6↓	12.5↓	8.8↓
	Boron stress (100 ppm) + Salinity (60 mM NaCl) (Simultaneous stress)	79.7↓	39.4↓	12.5↓	85.4↓
	Boron stress (50 ppm) + Salinity (100 mM NaCl) (Simultaneous stress)	67.6↓	36.9↓	25.0↓	67.7↓
	Boron stress (100 ppm) + Salinity (100 mM NaCl) (Simultaneous stress)	81.0↓	56.1↓	25.0↓	88.0↓
KRL210	Boron stress (50 ppm) + Salinity (60 mM NaCl) (Simultaneous stress)	53.2↓	34.8↓	14.3↓	72.8↓
	Boron stress (100 ppm) + Salinity (60 mM NaCl) (Simultaneous stress)	81.4↓	47.7↓	28.6↓	92.5↓
	Boron stress (50 ppm) + Salinity (100 mM NaCl) (Simultaneous stress)	64.3↓	25.8↓	14.3↓	76.8↓
	Boron stress (100 ppm) + Salinity (100 mM NaCl) (Simultaneous stress)	85.4↓	56.6↓	42.9↓	94.9↓

HD2009	Boron stress (50 ppm) + Salinity (60 mM NaCl) (Simultaneous stress)	61.3↓	27.5↓	28.6↓	74.8↓
	Boron stress (100 ppm) + Salinity (60 mM NaCl) (Simultaneous stress)	84.7↓	69.4↓	28.6↓	95.3↓
	Boron stress (50 ppm) + Salinity (100 mM NaCl) (Simultaneous stress)	76.6↓	55.8↓	28.6↓	88.1↓
	Boron stress (100 ppm) + Salinity (100 mM NaCl) (Simultaneous stress)	91.8↓	75.1↓	42.9↓	98.0↓

	Treatment	**Plant response to stress (reduction over control %) Type A parameters***		
		Dry weight of root	**Fresh weight of shoot**	**Dry weight of shoot**
KRL35	Boron stress (50 ppm) + Salinity (60 mM NaCl) (Simultaneous stress)	-4.2↑	23.3↓	29.9↓
	Boron stress (100 ppm) + Salinity (60 mM NaCl) (Simultaneous stress)	72.1↓	61.6↓	54.9↓
	Boron stress (50 ppm) + Salinity (100 mM NaCl) (Simultaneous stress)	45.1↓	52.1↓	45.1↓
	Boron stress (100 ppm) + Salinity (100 mM NaCl) (Simultaneous stress)	78.7↓	68.1↓	61.3↓
KRL210	Boron stress (50 ppm) + Salinity (60 mM NaCl) (Simultaneous stress)	72.9↓	59.1↓	63.7↓
	Boron stress (100 ppm) + Salinity (60 mM NaCl) (Simultaneous stress)	89.2↓	80.2↓	71.2↓
	Boron stress (50 ppm) + Salinity (100 mM NaCl) (Simultaneous stress)	76.0↓	66.6↓	75.0↓

	Boron stress (100 ppm) + Salinity (100 mM NaCl) (Simultaneous stress)	90.8⬇	81.1⬇	84.1⬇
HD2009	Boron stress (50 ppm) + Salinity (60 mM NaCl) (Simultaneous stress)	69.9⬇	70.9⬇	54.1⬇
	Boron stress (100 ppm) + Salinity (60 mM NaCl) (Simultaneous stress)	84.9⬇	84.2⬇	71.5⬇
	Boron stress (50 ppm) + Salinity (100 mM NaCl) (Simultaneous stress)	77.8⬇	81.4⬇	58.5⬇
	Boron stress (100 ppm) + Salinity (100 mM NaCl) (Simultaneous stress)	94.4⬇	88.2⬇	75.3⬇

Reference – Lata C, Kumar A, Sharma SK, Singh J, Sheokand S, Pooja, Mann A, Rani B (2017) Tolerance to combined boron and salt stress in wheat varieties: Biochemical and molecular analyses. IJEB 55(5) :321-328.

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

$$\textit{Reduction over control (\%)} = \frac{(\textit{Value}_{\textit{Control}} - \textit{Value}_{\textit{Stress}})}{\textit{Value}_{\textit{Control}}} \; x100$$

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).

3) "0.0" value indicates plant parameter behaved similarly under control and stress condition (no 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.*

Inference from the study: Lata et.al. 2017 studied the interaction of boron stress and salinity interaction in three wheat cultivars KRL35. KRL210, HD2009. Plants were subjected to simultaneous boron stress and salinity. Two boron levels were tested with two salinity levels. Root length, shoot length, the number of roots, fresh weight of root, dry weight of root, fresh weight of shoot, and dry weight of shoot was reduced more with increasing salinity levels. At the same boron levels reduction was more under high salinity treatment, in all cultivars. **Thus, this stress combination is detrimental to wheat cultivars.**