



Effect on wheat cultivars (*Triticum aestivum* cv. Pirsabak, Inqlab-91, SARC-6, HD-2329)

The net impact of individual and combined stress on plant growth

Crop: Wheat (*Triticum aestivum* cv. Pirsabak,
Inqlab-91, SARC-6, HD-2329)
Stress 1: Salt (100mM NaCl)
Stress 2: Waterlogging
Stage of plant: 24 days after sowing

The table shows the effect of waterlogging and salt alone and in combination on growth and physiology of wheat cultivars.



	Treatment	Type A parameters			
		Grain dry weight/plant	Ear/plant	Grain/plant	1000 grain weight
Pirsabak	Waterlogging	-36.3 ↑	-66.7 ↑	-17.2 ↑	30.1 ↓
	Salt (100mM NaCl)	73.4 ↓	52.4 ↓	-10.6 ↑	49.3 ↓
	Salt (100mM NaCl) + Waterlogging (Simultaneous stress)	85.4 ↓	41.3 ↓	-5.6 ↑	75.4 ↓
Inqlab-91	Waterlogging	-12.8 ↑	-60.4 ↑	28.9 ↓	0.2 ↓
	Salt (100mM NaCl)	62.3 ↓	62.3 ↓	-14.9 ↑	12.8 ↓
	Salt (100mM NaCl) + Waterlogging (Simultaneous stress)	76.5 ↓	50.9 ↓	-5.4 ↑	53.9 ↓
SARC-6	Waterlogging	-58.1 ↑	0.0	-66.2 ↑	4.7 ↓
	Salt (100mM NaCl)	58.1 ↓	50.0 ↓	-13.4 ↑	25.0 ↓
	Salt (100mM NaCl) + Waterlogging (Simultaneous stress)	64.6 ↓	43.5 ↓	-22.3 ↑	48.6 ↓
HD-2329	Waterlogging	8.2 ↓	1.4 ↓	11.3 ↓	-5.3 ↑
	Salt (100mM NaCl)	47.6 ↓	60.3 ↓	11.3 ↓	-9.8 ↑

	Salt (100mM NaCl) + Waterlogging (Simultaneous stress)	67.2↓	57.5↓	-18.4↑	34.4↓
	Treatment	Plant response to stress (reduction over control %) Type B parameters*			
		Stomatal conductance	Chlorophyll content		
Pirsabak	Waterlogging	-5.2↑	0.0		
	Salt (100mM NaCl)	41.6↓	4.2↓		
	Salt (100mM NaCl) + Waterlogging (Simultaneous stress)	64.2↓	2.1↓		
Inqlab-91	Waterlogging	4.7↓	-2.2↑		
	Salt (100mM NaCl)	69.3↓	-2.2↑		
	Salt (100mM NaCl) + Waterlogging (Simultaneous stress)	80.9↓	13.3↓		
SARC-6	Waterlogging	-11.0↑	2.0↓		
	Salt (100mM NaCl)	65.6↓	0.0		
	Salt (100mM NaCl) + Waterlogging (Simultaneous stress)	61.0↓	7.8↓		
HD-2329	Waterlogging	-1.3↑	2.0↓		
	Salt (100mM NaCl)	30.7↓	0.0		
	Salt (100mM NaCl) + Waterlogging (Simultaneous stress)	71.9↓	6.1↓		

Reference - Ibrahim KM, Wright D, Mirbahar RB, Panhwar M (2007) Effects of salinity and waterlogging on ion uptake and growth of wheat varieties. Pak. J. Bot. 39(7): 2535-2540.

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

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

- 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.

Inference from the study: Ibrahim et.al. 2007, studied the interaction of waterlogging and salinity in four wheat Pirsabak, Inqlab-91, SARC-6, HD-2329. Plants were subjected to single and simultaneous salt and waterlogging stress treatment. Grain dry weight, ear per plant, 1000 grain weight, stomatal conductance, and chlorophyll content was reduced synergistically under combined stress in all cultivars. However, the number of grains per plant was increased under stress. **Thus, this stress combination is detrimental to the yield and physiology of wheat cultivars.**