Effect on cotton cutivars (*Gossypium hirusutum*)

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

Crop: Cotton (*Gossypium hirusutum* cv. SCRC17, 33B)
Stress 1: Salt (0.5% wt/wt based on dry soil)
Stress 2: Waterlogging (120% field capacity; 21 days)
Stage of plant : 8 days after planting

The table shows the effect of waterlogging and salt alone and in combination on total soluble protein and gossypol level of cotton plants.

		Plant response to stress (reduction over control %) Type C parameters*	
	Treatment	**Total soluble protein**	**Gossypol level**
SCRC17	Waterlogging (21 days)	53.4↓	-93.1↑
	Salt (150mM NaCl)	25.2↓	-58.5↑
	Salt (150mM NaCl) + Waterlogging (Simultaneous stress)	64.9↓	-80.2↑
33B	Waterlogging (21 days)	39.1↓	-52.4↑
	Salt (150mM NaCl)	9.2↓	-31.4↑
	Salt (150mM NaCl) + Waterlogging (Simultaneous stress)	66.8↓	-38.5↑

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

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

Value $_{Control}$

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.*

2. The interaction between waterlogging and salt under combined stress at plant interface

The table shows the effect of waterlogging and salt on percent mortality of bollworm larvae under combined stress treatment

	Treatment	Response to combined stress** Type B parameters*
		Mortality of bollworm larvae (%)
SCRC17	Waterlogging (21 days)	70.3
	Salt (150mM NaCl)	91.6
	Salt (150mM NaCl) + Waterlogging (Simultaneous stress)	46.9
33B	Waterlogging (21 days)	60.2
	Salt (150mM NaCl)	94.8
	Salt (150mM NaCl) + Waterlogging (Simultaneous stress)	52.2

For raw data – Click here (.xlsx file)
Reference – Luo Z, Dong H, Li W, Ming Z, Zhu Y (2008) Individual and combined effects of salinity and waterlogging on Cry1Ac expression and insecticidal efficacy of Bt cotton. Crop Protection 27:1485–1490.

Note:

'' - For more information on parameters classification, please refer to 'methodology' tab.*

*‘**’ - Values are presented as it is from the source article without subjecting to the calculation.*

Inference from the study: Luo et.al. 2008, studied the interaction of waterlogging and salinity in two cultivars of Bt cotton, SCRC17, and 33B. Plants were subjected to simultaneous salt and waterlogging stress treatments. Gossypol levels were high under stress conditions. However, total soluble proteins were reduced synergistically under combined stress conditions in both cultivars. Bollworm mortality was also checked on these plants, which shows that under combined stress conditions larval mortality was reduced. **Thus, this stress combination is detrimental to the growth and resistance of cotton plants against bollworm infestation.**