Effect on maize cultivars (*Zea mays L.* cv. DK-6142, FH-1231, FH-949, MALKA-2016)

The net impact of individual and combined stress on plant growth

> Crop: Maize (*Zea mays L.* cv. DK-6142, FH-1231, FH-949, MALKA-2016)
> Stress 1: Salinity (10 dSm-1)
> Stress 2: Flooding (3cm)
> Stage of plant : 15 days after germination

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

		Plant response to stress (reduction over control %)					
		Type A parameters*				Type B parameters*	Type C parameters*
	Treatment	Root length	Shoot length	Fresh root weight	Fresh shoot weight	Chlorophyll content	H2O2
DK-6142	Salinity (10 dSm-1)	31.0⬇	23.0⬇	37.0⬇	30.3⬇	27.3⬇	-26.2⬆
	Flooding (3 cm)	14.8⬇	14.7⬇	21.8⬇	18.5⬇	4.5⬇	-18.5⬆
	Salinity (10 dSm-1) + Flooding (3 cm) (Simultaneous stress)	31.9⬇	31.9⬇	44.5⬇	42.1⬇	36.4⬇	-41.8⬆
FH-1231	Salinity (10 dSm-1)	34.5⬇	26.7⬇	20.8⬇	30.7⬇	25.0⬇	-34.3⬆
	Flooding (3 cm)	8.2⬇	16.9⬇	2.1⬇	20.0⬇	20.0⬇	-24.3⬆
	Salinity (10 dSm-1) + Flooding (3 cm) (Simultaneous stress)	41.4⬇	41.3⬇	29.2⬇	44.3⬇	35.0⬇	-59.5⬆
FH-949	Salinity (10 dSm-1)	47.6⬇	31.8⬇	23.5⬇	36.1⬇	21.1⬇	-29.6⬆
	Flooding (3 cm)	14.8⬇	20.9⬇	2.0⬇	27.1⬇	15.8⬇	-30.1⬆

	Salinity (10 dSm-1) + Flooding (3 cm) (Simultaneous stress)	49.8⬇	36.3⬇	32.7⬇	45.8⬇	36.8⬇	-52.0⬆
MALKA-2016	Salinity (10 dSm-1)	25.0⬇	21.8⬇	41.5⬇	36.6⬇	27.3⬇	-24.0⬆
	Flooding (3 cm)	16.5⬇	9.4⬇	15.3⬇	15.7⬇	18.2⬇	-17.4⬆
	Salinity (10 dSm-1) + Flooding (3 cm) (Simultaneous stress)	36.0⬇	31.8⬇	37.3⬇	44.4⬇	31.8⬇	-44.9⬆

For raw data – Click here (.xlsx file)

Reference – Mahmood U, Hussain S, Hussain S, Ali B, Ashraf U, Zamir S, Al-Robai SA, Alzahrani FO, Hano C, El-Esawi MA (2021) Morpho-Physio-Biochemical and Molecular Responses of Maize Hybrids to Salinity and Waterlogging during Stress and Recovery Phase. Plants 10:1345-1364.

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

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

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).

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

Inference from the study: Mahmood et.al. 2021, studied the interaction of flooding and salinity in four maize cultivars, DK-6142, FH-1231, FH-949, MALKA-2016. Plants were subjected to single and simultaneous salt and flooding stress treatments. Root length, shoot length, fresh root weight, fresh shoot weight, and chlorophyll content were reduced synergistically under combined stress conditions for all four cultivars. H2O2 levels were more under combined stress. **Thus, this stress combination is detrimental to the growth and physiology of maize cultivars.**