



Effect on sweet potato cultivars (*Ipomoea batatas* L. cv. Yongtsai, Taoyuan 1)

The net impact of individual and combined stress on plant growth

Crop: Sweet potato (*Ipomoea batatas* L. cv. Yongtsai, Taoyuan 1)
 Stress 1: High light ($1500 \mu\text{mole m}^{-2}\text{s}^{-1}$)
 Stress 2: Flooding/Waterlogging/Submergence (5 days)
 Stage of plant: 30 day old plant

The table shows the effect of waterlogging and high light alone and in combination on the chlorophyll content, superoxide dismutase, catalase activity and peroxidase activity of sweet potato cultivars

	Treatment	Plant response to stress**			
		Type B parameters*			
		% Change in chlorophyll content	Superoxide dismutase activity (% of control)	Catalase activity (% of control)	Peroxidase activity (% of control)
Yongtsai	High light ($1500 \mu\text{mole m}^{-2}\text{s}^{-1}$)	113.7	275.4	74.5	45.5
	High light ($1500 \mu\text{mole m}^{-2}\text{s}^{-1}$) + Waterlogging (5 days) (Simultaneous stress)	74.8	39.3	48.4	67.3
Taoyuan1	High light ($1500 \mu\text{mole m}^{-2}\text{s}^{-1}$)	110.0	284.1	122.7	80
	High light ($1500 \mu\text{mole m}^{-2}\text{s}^{-1}$) + Waterlogging (5 days) (Simultaneous stress)	95.6	123.2	129.7	69.7

Reference - Hwang SY, Lin HW, Chern RH, Lo HF, Li L (1999) Reduced susceptibility to waterlogging together with high-light stress is related to increases in superoxide dismutase and catalase activities in sweet potato. *Plant Growth Regulation* 27: 167–172.

Note:

‘’ - 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: Hwang et.al. 1999 studied the interaction of waterlogging and high light in two sweet potato cultivars Yongtsai and Taoyuan1. Plants were subjected to single and simultaneous waterlogging and high light treatment and analysed for various physiological parameters. Chlorophyll content, superoxide dismutase, catalase activity, and peroxidase activity increased upon stress treatment. However, this increase was more in single high light stress compared to combined stress. **Thus, this stress combination led to a change in redox state of sweet potato plants affecting its physiology in both cultivars.**