

Effect on potato (*Solanum tuberosum*) cultivars

The net impact of individual and combined stress on plant physiology

Crop: Potato (*Solanum tuberosum*) cv. Bintje and Bzura
Oomycete: *Phytophthora infestans* race 1.4
Stress 1: Cadmium treatment- Experiment Cd 1 -0.77 mg/kg of dry soil, Experiment Cd 2 -23 mg/kg of dry soil
Stress 2: 500 zoospores/ml of *P. infestans*
Stage of the plant: Seedling

The table shows the effect of individual and combined heavy metal and oomycete stress on the physiology of potato

Cultivars	Stress treatments	Plant response to stress	
		Type B parameter*	
		Electrolyte leakage (µSi/h/g fw)	K ⁺ Efflux (µmoles/h/g fw)
Bintje	Cd1	12	19
	Cd2	14	12
	<i>P. infestans</i> race 1.4 ^a	83	65
	Cd1 and <i>P. infestans</i> race 1.4 ^a	26	28
	Cd2 and <i>P. infestans</i> race 1.4 ^a	21	16
Bzura	Cd1	23	17.8
	Cd2	18	9.4
	<i>P. infestans</i> race 1.4 ^a	19	7.5
	Cd1 and <i>P. infestans</i> race 1.4 ^a	25	9.9
	Cd2 and <i>P. infestans</i> race 1.4 ^a	24	5

a- observation recorded for leaves with leaflet infection being less than 25%, Control for Electrolyte leakage-15(Bintje), 13 (Bzura), K⁺ efflux-52(Bintje), 4.5 (Bzura)

For raw data – Click here (.xlsx file)

For cultivar data- Click here (.pdf file)

Reference-

Stroinski A and Floryszak-Wieczorek J (1990). Effect of cadmium on the host-pathogen system. III. Influence of cadmium and *Phytophthora infestans* on membrane permeability of potato leaves. *Biochemie und Physiologie der Pflanzen* 186(5-6): 417-421.

Note: Values are presented as it is from the source article without subjecting to the calculation.

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

The inference from the study: Stroinski and Floryszak-Wieczorek, 1990 studied the effect of cadmium on oomycete *Phytophthora infestans* infection in resistant (Bzura) and susceptible (Bintje) cultivars of potato. The authors found that Cd stress increased membrane permeability of Bzura but decreased the permeability in Bintje. In case of Bintje, pathogen infection was found to cause a maximum increase in permeability in the susceptible cultivar causing maximum ion leakage whereas, in case of the resistant cultivar, the combined stressed plants exhibited maximum leakage.