Effect on potato cultivars (*Solanum tuberosum L. cv.* King Edward, Erika, Fontane, Kuras, Perlos, Rosagold*)*

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

Crop: Potato (*Solanum tuberosum* L. cv. King Edward, Erika, Fontane, Kuras, Perlos, Rosagold)
Stress 1: *Full nematode community Pratylenchus (47%) Tylenchorhynchus (7%) and Trichodoridae (0.2%)*
Stress 2: *Verticillium dahliae*
Stage of plant: at sowing

The table shows the impact of nematode and fungus alone and in combination on dry weight of stem, dry weight of tubers, no. of tubers and dry weight of roots of potato plants.

	Treatment	Plant response to stress (reduction over control %) Type A parameters*			
		Dry weight of stem	Dry weight of tubers	No. of tubers	Dry weight of roots
King Edward VII	*Verticillium dahliae (0.1g /pot)*	0	-12.1↑	27.6↓	-12.9↑
	Nematode Community (5000 nematodes/ pot)	-5.7↑	8.6↓	-20.7↑	-1.1↑
	Nematode Community (5000 nematodes/ pot) + Verticillium dahliae (0.1g /pot) Simultaneous stress	-2.9↑	19.0↓	34.5↓	4.3↓
Erika	*Verticillium dahliae (0.1g /pot)*	-18.8↑	8.5↓	-23.8↑	-11.6↑
	Nematode Community (5000 nematodes/ pot)	-12.5↑	2.1↓	-38.1↑	-4.7↑
	Nematode Community (5000 nematodes/ pot) + Verticillium dahliae (0.1g /pot) Simultaneous stress	-18.8↑	8.5↓	-66.7↑	-4.7↑
Fontane	*Verticillium dahliae (0.1g /pot)*	9.5↓	6.9↓	28.6↓	18.6↓
	Nematode Community (5000 nematodes/ pot)	23.8↓	18.8↓	28.6↓	32.2↓
	Nematode Community (5000 nematodes/ pot) + Verticillium dahliae (0.1g /pot) Simultaneous stress	14.3↓	22.8↓	21.4↓	33.9↓

Kuras	*Verticillium dahliae (0.1g /pot)*	11.1↓	-13.6↑	31.3↓	13.8↓
	Nematode Community (5000 nematodes/ pot)	29.6↓	31.8↓	-3.1↑	36.8↓
	Nematode Community (5000 nematodes/ pot) + Verticillium dahliae (0.1g /pot) Simultaneous stress	25.9↓	0	43.8↓	35.6↓
Perlo	*Verticillium dahliae (0.1g /pot)*	14.3↓	2.0↓	17.5↓	10.5↓
	Nematode Community (5000 nematodes/ pot)	21.4↓	25.5↓	33.3↓	31.4↓
	Nematode Community (5000 nematodes/ pot) + Verticillium dahliae (0.1g /pot) Simultaneous stress	3.6↓	-2.9↑	-19.3↑	-10.5↑
Rosagold	*Verticillium dahliae (0.1g /pot)*	-3.3↑	2.1↓	32.4↓	-2.7↑
	Nematode Community (5000 nematodes/ pot)	10.0↓	8.5↓	32.4↓	12.0↓
	Nematode Community (5000 nematodes/ pot) + Verticillium dahliae (0.1g /pot) Simultaneous stress	6.7↓	0	40.5↓	20.0↓

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

$$\textit{Reduction over control (\%)} = \frac{(Value_{Control} - Value_{Stress})}{Value_{Control}} \; x100$$

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 parameters classification, please refer to 'methodology' tab.*

2. The interaction between nematode and fungal pathogen under combined stress at plant interface

The table shows the effect of the fungal pathogen on nematode damage and nematode population in stem, tuber roots and sand and effect of the nematode on fungus induced stem canker, sclerotia, elephant hide and black scurf under combined stress treatment

	Treatment	Response to combined stress** Type B parameters*					
		% Stem damage			% Tuber damage		
		Stem canker	Sclerotia	Nematode damage	Elephant hide	Black scurf	Nematode damage
King Edward VII	*Verticillium dahliae (0.1g /pot)*	50	13	N/A	28	4	N/A
	Nematode Community (5000 nematodes/ pot)	N/A	N/A	43	N/A	N/A	3
	Nematode Community (5000 nematodes/ pot) + Verticillium dahliae (0.1g /pot) Simultaneous stress	44	0	67	17	0	0
Erika	*Verticillium dahliae (0.1g /pot)*	62	10	N/A	29	13	N/A
	Nematode Community (5000 nematodes/ pot)	N/A	N/A	76	N/A	N/A	0
	Nematode Community (5000 nematodes/ pot) + Verticillium dahliae (0.1g /pot) Simultaneous stress	62	0	62	14	14	0
Fontane	*Verticillium dahliae (0.1g /pot)*	50	40	N/A	22	22	N/A
	Nematode Community (5000 nematodes/ pot)	N/A	N/A	50	N/A	N/A	11

	Nematode Community (5000 nematodes/ pot) + Verticillium dahliae (0.1g /pot) Simultaneous stress	50	7	57	30	15	0
Kuras	*Verticillium dahliae (0.1g /pot)*	60	20	N/A	46	46	N/A
	Nematode Community (5000 nematodes/ pot)	N/A	N/A	90	N/A	N/A	0
	Nematode Community (5000 nematodes/ pot) + Verticillium dahliae (0.1g /pot) Simultaneous stress	56	11	78	27	18	0
Perlo	*Verticillium dahliae (0.1g /pot)*	81	0	N/A	14	68	N/A
	Nematode Community (5000 nematodes/ pot)	N/A	N/A	69	N/A	N/A	0
	Nematode Community (5000 nematodes/ pot) + Verticillium dahliae (0.1g /pot) Simultaneous stress	79	33	48	2	68	0
Rosagold	*Verticillium dahliae (0.1g /pot)*	50	40	N/A	20	27	N/A
	Nematode Community (5000 nematodes/ pot)	N/A	N/A	44	N/A	N/A	0
	Nematode Community (5000 nematodes/ pot) + Verticillium dahliae (0.1g /pot) Simultaneous stress	25	25	38	15	15	0

	Treatment	Response to combined stress** Type B parameters*							
		Nematode Population in stem		Nematode Population in tubers		Nematode Population in roots		Nematode Population in sand	
		Plant parasitic	Fungal feeding	Plant parasitic	Fungal feeding	Plant parasitic	Fungal feeding	Plant parasitic	Fungal feeding
King Edward VII	*Verticillium dahliae (0.1g /pot)*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Nematode Community (5000 nematodes/ pot)	47	0	0.16	0	367	0	0.01	0
	Nematode Community (5000 nematodes/ pot) + Verticillium dahliae (0.1g /pot) Simultaneous stress	16	0	0.83	0	393	6.9	0.03	0
Erika	*Verticillium dahliae (0.1g /pot)*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Nematode Community (5000 nematodes/ pot)	40	0	0.05	0	283	0	0.06	0.01
	Nematode Community (5000 nematodes/ pot) + Verticillium dahliae (0.1g /pot) Simultaneous stress	79	0	0	0	882	0	0.06	0
Fontane	*Verticillium dahliae (0.1g /pot)*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

	Nematode Community (5000 nematodes/ pot)	36	0	0.11	0	1322	0	0.14	0.03
	Nematode Community (5000 nematodes/ pot) + Verticillium dahliae (0.1g /pot) Simultaneous stress	32	0	0.29	0	931	0	0.15	0.01
Kuras	*Verticillium dahliae (0.1g /pot)*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Nematode Community (5000 nematodes/ pot)	70	0	0.19	0	581	0	0.07	0
	Nematode Community (5000 nematodes/ pot) + Verticillium dahliae (0.1g /pot) Simultaneous stress	18	0	1.06	0	580	0	0.03	0
Perlo	*Verticillium dahliae (0.1g /pot)*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Nematode Community (5000 nematodes/ pot)	27	0	0.05	0	418	0	0.08	0.1
	Nematode Community (5000 nematodes/ pot) + Verticillium dahliae (0.1g /pot) Simultaneous	11	6.7	0.87	0	179	10.9	0.04	0

	stress								
Rosagold	*Verticillium dahliae (0.1g /pot)*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Nematode Community (5000 nematodes/ pot)	53	0	0.09	0	341	0	0.02	0.04
	Nematode Community (5000 nematodes/ pot) + Verticillium dahliae (0.1g /pot) Simultaneous stress	44	0	0.67	0	243	0	0.02	0.03

For raw data – Click here (.xlsx file)
Reference - Viketoft M, Andersson A, Edin E (2017) Cultivar Effects on the Interaction between Free-Living Plant-Parasitic Nematodes and the Fungal Pathogen Rhizoctonia solani in Potato. American Journal of Potato Research 94: 314-322

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

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

Inference From the study: Viketoft M (2017) studied the interaction of *Verticillium dahliae* with Nematode community in six potato cultivars King Edward, Erika, Fontane, Kuras, Perlos, Rosagold. Pathogens were inoculated singly and simultaneously. Plants were then analysed for their dry weight of stem, dry weight of tubers, no. of tubers, and dry weight of roots. The number of tubers and dry weight of roots showed additive reduction under simultaneous inoculation in cultivars King Edward, Kuras, and rosagold. Nematode population in tubers and roots increased in simultaneous inoculation in King Edward, Kuras and rosagold. **Thus, pathogen combination synergistically to reduce plant growth.**