

Effect on potato genotypes (*Solanum tuberosum* L. cv Diamont & Spunta)

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

The table shows the net impact of treatments of nematode and bacteria alone and in combination on the growth of two potato cultivars

Crop: Potato (*Solanum tuberosum* L.) cv Diamont
 Stress 1: *Meloidogyne incognita*
 Stress 2: *Ralstonia solanacearum*
 Stage: At sowing and 10 days afterwards

Stress	Treatment	Cultivars	Plant response to stress (reduction over control %) Type A parameters *	
			Fresh root weight	Fresh shoot weight
Nematode alone	3000 juveniles (J2) per plant	Diamont	10.34 ↓	13.64 ↓
		Spunta	24.24 ↓	28.21 ↓
Simultaneous inoculation	3000 juveniles (J2) per plant + 5 ml. bacteria suspension-10 ⁸ CFU/ mL	Diamont	31.03 ↓	38.64 ↓
		Spunta	51.52 ↓	43.59 ↓
Nematode first bacteria after 10 days (sequential stress)	3000 juveniles (J2) per plant= 5 ml. bacteria suspension-10 ⁸ CFU/ mL	Diamont	13.79 ↓	22.73 ↓
		Spunta	45.45 ↓	33.33 ↓
Bacteria first nematode after 10 days (sequential stress)	5 ml. bacteria suspension-10 ⁸ CFU/ mL+ 3000 j2 per plant	Diamont	37.93 ↓	45.45 ↓
		Spunta	63.64 ↓	53.85 ↓
Bacteria alone	5 ml. bacteria suspension-10 ⁸ CFU/ mL	Diamont	44.83 ↓	56.82 ↓
		Spunta	57.58 ↓	48.72 ↓

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

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

1) '↓' indicates plant parameters affected by stress that lead to high susceptibility (higher the value more the damage).

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



2. The interaction between nematode and bacteria treatment under combined stress at plant interface

The table shows the effect of bacteria on nematode population under combined stress

Stress	Treatments	Cultivars	Response to combined stress** Type B parameters *	
			No. of galls per root	Mean of Root Gall Index
Nematode alone	3000 juveniles (J2) per plant	Diamont	180	3.90
		Spunta	143	3.4
Simultaneous inoculation	3000 juveniles (J2) per plant + 5 ml. bacteria suspension- 10 ⁸ CFU/ mL	Diamont	220	3.60
		Spunta	146	2.8
Nematode first bacteria after 10 days (sequential stress)	3000 juveniles (J2) per plant= 5 ml. bacteria suspension- 10 ⁸ CFU/ mL	Diamont	175	3.80
		Spunta	163	3.2
Bacteria first nematode after 10 days (sequential stress)	5 ml. bacteria suspension- 10 ⁸ CFU/ mL+ 3000 j2 per plant	Diamont	160	2.60
		Spunta	127	2.1

NA- data not available

For raw data – Click here (.xlsx file)

For genotype study- click here (pdf file)

Reference- Bekhiet *et al.*, 2010

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

The inference from the study: The purpose of the study by Bekhiet *et al.*, 2010 was to test the considerable damage caused by *M. incognita* and *R. solanacearum* infection alone and in combination on potato plant growth and their interaction at the plant level. Results showed more reduction in root and shoot weight under *R. solanacearum* infection alone compared to *M. incognita* infection alone and also other combined stress treatments. The effect of *R. solanacearum* was reduced when both the pathogens inoculated simultaneously and nematode inoculated before inoculation of *R. solanacearum*. But the results were opposite when *R. solanacearum* inoculated before *M. incognita*. Both the cultivars showed a similar trend with respect to the treatments but spunta was more susceptible compared to dimont cultivar. Further galls number and gall index was reduced when *R. solanacearum* inoculated before *M. incognita*. Here also both cultivars showed similar trend but overall the gall number and index were less in spunta compared to dimont. **Overall study confirms that *M. incognita* inoculation before and simultaneous inoculation with *R. solanacearum* reduced the deleterious effects caused by *R. solanacearum* in potato.**