



Effect on maize genotypes (*Zea mays* L. cv. C123Ht, B68Ht)

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

Crop: Maize (*Zea mays* L. cv. C123Ht, B68Ht)
 Stress 1: *Helminthosporium pedicellatum*
 Stress 2: *Pratylenchus scribneri*
 Stage of plant: Seedling

The table shows the net impact of nematode and fungus alone and in combination on dry shoot weight, dry root weight and stem circumference of maize genotypes.

Treatment	Maize lines	Plant response to stress (reduction over control %)		
		Type A* parameters		
		Dry shoot weight (% change)	Dry Root weight (% change)	Stem circumference (% change)
<i>P. scribneri</i> (1500/15cm Pot)	C123Ht	11.7 ↓	21.8 ↓	19.0 ↓
	B68Ht	0.6 ↓	-25.7 ↑	17.2 ↓
<i>Helminthosporium pedicellatum</i> (inoculum:soil ratio of 1:80)	C123Ht	22.2 ↓	39.7 ↓	8.6 ↓
	B68Ht	-0.1 ↑	15.0 ↓	17.2 ↓
<i>Helminthosporium pedicellatum</i> (inoculum:soil ratio of 1:10)	C123Ht	29.9 ↓	3.1	12.1
	B68Ht	36.9 ↓	-27.7 ↑	10.3 ↓
<i>Pratylenchus scribneri</i> (1,500/15cm Pot) + <i>Helminthosporium pedicellatum</i> (inoculum:soil ratio of 1:80) simultaneous stress	C123Ht	-54.6 ↑	7.0 ↓	1.7 ↓
	B68Ht	11.6 ↓	-25.2 ↑	8.6 ↓
<i>Pratylenchus scribneri</i> (1,500/15cm Pot) + <i>Helminthosporium pedicellatum</i> (inoculum:soil ratio of 1:10) simultaneous stress	C123Ht	34.8 ↓	36.7 ↓	22.4 ↓
	B68Ht	-16.1 ↑	-107.3 ↑	10.3 ↓

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).

2) '↑'- indicates plant parameters less/not affected by stress leading to improved resistance (higher the value lesser the 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-induced root-rot and effect of nematode on fungus population under combined stress treatment.

Treatment	Maize lines	Response to combined stress**	
		Type B parameters*	
		<i>P. scribneri</i> /g in the dry root	Root rot index
<i>Control</i>	C123Ht	0	0
	B68Ht	0	0
<i>P. scribneri</i> (1500/15cm Pot)	C123Ht	144	13
	B68Ht	5	0
<i>Helminthosporium pedicellatum</i> (inoculum:soil ratio of 1:80)	C123Ht	<1	19
	B68Ht	0	0
<i>Helminthosporium pedicellatum</i> (inoculum:soil ratio of 1:10)	C123Ht	<1	5
	B68Ht	0	10
<i>Pratylenchus scribneri</i> (1,500/15cm Pot) + <i>Helminthosporium pedicellatum</i> (inoculum:soil ratio of 1:80) simultaneous stress	C123Ht	20	36
	B68Ht	16	18

<i>Pratylenchus scribneri</i> (1,500/15cm Pot) + <i>Helminthosporium pedicellatum</i> (inoculum:soil ratio of 1:10) simultaneous stress	C123Ht	3	78
	B68Ht	5	43

For raw data – Click here (.xlsx file)

Reference– Egunjobi OA , Norton DC, Martinson C (1986) Interaction of *Pratylenchus scribneri* and *Helminthosporium pedicellatum* in the etiology of corn root rot. *Phytoparasitica* 14(4):287-295

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: Egunjobi et.al. 1986 studied the interaction of *H. pedicellatum* and *P.scribneri* on two maize inbred lines C123Ht and B68Ht. Seeds were grown in the presence of *H. pedicellatum* (two different concentrations) and *P.scribneri* alone and in combination. *H. pedicellatum* and *P.scribneri*, in combination, showed a higher reduction in shoot weight, root weight, and stem circumference. Root rot disease rating was also high in simultaneous inoculation, indicating a synergistic association of the two pathogens. It is also observed that B68Ht line displayed a lesser root rot index compared to C123Ht. B68Ht also shows an increase in dry shoot and root weight in contrast to C123Ht, which shows a reduction in the same parameters. **Thus, it can be concluded that *H. pedicellatum* and *P.scribneri* together form a severe disease complex in C123Ht but not in B68Ht . B68Ht is nematode tolerant**