



## Effect on pigeon pea genotype (*Cajanus cajan* L. cv. ICP8863, BDN1, ICP2376)

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

Crop: Pigeonpea (*Cajanus cajan* cv. ICP8863, BDN1, ICP2376)  
 Stress 1: *Heterodera cajani*  
 Stress 2: *Fusarium udum*  
 Stage of plant: At Sowing

The table shows the impact of nematode and fungus alone and in combination on fresh root weight, fresh shoot weight and dry shoot weight of pigeon pea genotypes.

	Treatment	Plant response to stress (reduction over control %)		
		Type A parameters*		
		Fresh root weight	Fresh shoot weight	Dry Shoot weight
BDN1	<i>Fusarium udum</i> (50g/pot)	31.0↓	-28.6↑	-20.0↑
	<i>Heterodera cajani</i> (1000J2/pot)	37.9↓	21.4↓	20.0↓
	<i>Fusarium udum</i> (50g/pot) + <i>Heterodera cajani</i> (1000J2/pot) simultaneous stress)	41.4↓	7.1↓	20.0↓
ICP2376	<i>Fusarium udum</i> (50g/pot)	N/A	N/A	N/A
	<i>Heterodera cajani</i> (1000J2/pot)	45.8↓	30.0↓	50.0↓
	<i>Fusarium udum</i> (50g/pot) + <i>Heterodera cajani</i> (1000J2/pot) simultaneous stress)	N/A↓	N/A	N/A
ICP 8863	<i>Fusarium udum</i> (50g/pot)	-65.5↑	-95.0↑	-62.5↑

	<i>Heterodera cajani</i> (1000J2/pot)	6.9↓	20.0↓	37.5↓
	<i>Fusarium udum</i> (50g/pot) + <i>Heterodera cajani</i> (1000J2/pot) <i>simultaneous stress</i> )	-44.8↑	-75.0↑	-25.0↑

**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 number of nodules under combined stress treatment

	Treatment	Response to combined stress**
		Type B parameters*
		No. of nodules
BDNI	<i>Control</i>	27.6
	<i>Fusarium udum</i> (50g/pot)	5.5
	<i>Heterodera cajani</i> (1000J2/pot)	20.5
	<i>Fusarium udum</i> (50g/pot) + <i>Heterodera cajani</i> (1000J2/pot) <i>simultaneous stress</i> )	7.8

ICP2376	<i>Control</i>	36.1
	<i>Fusarium udum</i> (50g/pot)	N/A
	<i>Heterodera cajani</i> (1000J2/pot)	14.5
	<i>Fusarium udum</i> (50g/pot) + <i>Heterodera cajani</i> (1000J2/pot) simultaneous stress)	N/A
ICP 8863	<i>Control</i>	36.6
	<i>Fusarium udum</i> (50g/pot)	14.5
	<i>Heterodera cajani</i> (1000J2/pot)	27.4
	<i>Fusarium udum</i> (50g/pot) + <i>Heterodera cajani</i> (1000J2/pot) simultaneous stress)	11.4

For raw data – Click here (.xlsx file)

Reference- Sharma SB, Nene YL (1989) Interrelationship between *Heterodera cajani* and *Fusarium udum* in pigeonpea. *Nematropica* 19:21-28

**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:** Sharma SB, Nene YL (1989) studied the relationship between *Heterodera cajani* and *Fusarium udum* in pigeonpea in three cultivars ICP8863 BDN1 and ICP2376. Plant root and shoot weight did not show the significant additive effect of combined pathogen stress in ICP8863, but BDN1 showed a less additive effect on root weight. Also, no. of nodules were low in combination stress treatment for all the cultivars. **Thus, this pathogen combination is not acting synergistically to cause a severe disease complex .**