



Effect on tobacco cultivars (*Nicotiana tabacum* L. cv. Dixie Bright 101, Coker 316, NC95)

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

Crop: Tobacco (*Nicotiana tabacum* L. cv. Dixie Bright 101, Coker 316, NC95)
 Stress 1: *Meloidogyne incognita*
 Stress 2: *Rhizoctonia solani*
 Stage of plant: 4 week old Seedling

The table shows the impact of nematode and fungus alone and in combination on the fresh top weight of tobacco plants.

	Treatment	Plant response to stress**
		Type A parameters*
		Fresh top weight (g)
Dixie Bright 101	<i>Rhizoctonia solani</i> (20ml mycelial suspension)	113.0
	<i>Meloidogyne incognita</i> (12 eggmasses)	122.0
	<i>Rhizoctonia solani</i> (20ml mycelial suspension) + <i>Meloidogyne incognita</i> (12 eggmasses) (Simultaneous stress)	109.0
	<i>Meloidogyne incognita</i> (12 eggmasses)+ <i>Rhizoctonia solani</i> 10 days later (Sequential stress)	89.0
	<i>Meloidogyne incognita</i> + <i>Rhizoctonia solani</i> (20ml mycelial suspension) 21 days later (Sequential stress)	96.0
Coker316	<i>Rhizoctonia solani</i> (20ml mycelial suspension)	111.0
	<i>Meloidogyne incognita</i> (12 eggmasses)	126.0
	<i>Rhizoctonia solani</i> (20ml mycelial suspension) + <i>Meloidogyne incognita</i> (12 eggmasses) (Simultaneous stress)	114.0
	<i>Meloidogyne incognita</i> (12 eggmasses)+ <i>Rhizoctonia solani</i> 10 days later (Sequential stress)	97.0
	<i>Meloidogyne incognita</i> + <i>Rhizoctonia solani</i> (20ml mycelial suspension) 21 days later (Sequential stress)	74.0

NC95	<i>Rhizoctonia solani</i> (20ml mycelial suspension)	99.0
	<i>Meloidogyne incognita</i> (12 eggmasses)	109.0
	<i>Rhizoctonia solani</i> (20ml mycelial suspension) + <i>Meloidogyne incognita</i> (12 eggmasses) (Simultaneous stress)	117.0
	<i>Meloidogyne incognita</i> (12 eggmasses)+ <i>Rhizoctonia solani</i> 10 days later (Sequential stress)	120.0
	<i>Meloidogyne incognita</i> + <i>Rhizoctonia solani</i> (20ml mycelial suspension) 21 days later (Sequential stress)	115.0

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.

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

The table shows the effect of nematode on fungus induced root necrosis under combined stress treatment

	Treatment	Response to combined stress**
		Type B parameters*
		Root Necrosis
Dixie Bright 101	<i>Rhizoctonia solani</i> (20ml mycelial suspension)	1
	<i>Meloidogyne incognita</i> (12 eggmasses)	2.5
	<i>Rhizoctonia solani</i> (20ml mycelial suspension) + <i>Meloidogyne incognita</i> (12 eggmasses) (Simultaneous stress)	2.1
	<i>Meloidogyne incognita</i> (12 eggmasses)+ <i>Rhizoctonia solani</i> 10 days later (Sequential stress)	3.8
	<i>Meloidogyne incognita</i> + <i>Rhizoctonia solani</i> (20ml mycelial suspension) 21 days later (Sequential stress)	3.6

Coker316	<i>Rhizoctonia solani</i> (20ml mycelial suspension)	0.9
	<i>Meloidogyne incognita</i> (12 eggmasses)	1.9
	<i>Rhizoctonia solani</i> (20ml mycelial suspension) + <i>Meloidogyne incognita</i> (12 eggmasses) (Simultaneous stress)	2.2
	<i>Meloidogyne incognita</i> (12 eggmasses)+ <i>Rhizoctonia solani</i> 10 days later (Sequential stress)	3.8
	<i>Meloidogyne incognita</i> + <i>Rhizoctonia solani</i> (20ml mycelial suspension) 21 days later (Sequential stress)	4.6
NC95	<i>Rhizoctonia solani</i> (20ml mycelial suspension)	0.8
	<i>Meloidogyne incognita</i> (12 eggmasses)	0.3
	<i>Rhizoctonia solani</i> (20ml mycelial suspension) + <i>Meloidogyne incognita</i> (12 eggmasses) (Simultaneous stress)	1.3
	<i>Meloidogyne incognita</i> (12 eggmasses)+ <i>Rhizoctonia solani</i> 10 days later (Sequential stress)	0.8
	<i>Meloidogyne incognita</i> + <i>Rhizoctonia solani</i> (20ml mycelial suspension) 21 days later (Sequential stress)	0.8

For raw data – Click here (.xlsx file)

Reference - Batten CK, Powell NT(1971) The *Rhizoctonia*-*Meloidogyne* Disease Complex in Flue-cured Tobacco. *Journal of Nematology* 3(2):164-169.

Note:

‘***’ - Values are presented as it is from the source article without subjecting to the calculation.

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Inference From the study: Batten CK and Powell NT 1971 studied the interaction of *Meloidogyne incognita* and *Rhizoctonia solani* in three tobacco cultivars Dixie Bright 101, Coker 316 and NC95. Pathogens were inoculated singly, sequentially, and simultaneously. Plants were then analyzed for their fresh weight. An additive reduction under combined stress treatment was observed, but this reduction was maximum under sequential stress when nematode was inoculated before fungus. Cultivar Coker 316 showed maximum reduction in fresh weight,

whereas the least reduction was showed by cultivar NC95. Root necrosis was also observed, which was maximum under sequential stress compared to single and simultaneous inoculation. Root necrosis was also maximum in cultivar Coker 316 and least in cultivar NC95. Cultivar Coker is susceptible, whereas cultivar NC95 is resistant to this pathogen combination. **Thus, this pathogen combination works synergistically to form a severe disease complex in cultivar Coker 316 of tobacco.**