



Effect on rice cultivars (*Oryza sativa* cv. CG14, IDSA6)

The net impact of individual and combined stress on plant growth

Crop: Rice (*Oryza sativa* cv. CG14)
 Stress 1: Drought
 Stress 2: *Heterodera sacchari* (10 cysts/pot)
 Stage of plant: Sowing

The table shows the effect of nematode and drought alone and in combination on the growth and physiology of rice cultivars.

	Treatment	Plant response to stress (reduction over control %)			
		Type A parameters*			
		Specific leaf area	Leaf dry weight	Root dry weight	Root:shoot
CG14	<i>Heterodera sacchari</i> (10 cysts/pot)	-6.5 ↑	37.7 ↓	20.0 ↓	-29.0 ↑
	Drought	-2.8 ↑	16.6 ↓	-6.5 ↑	-29.0 ↑
	<i>Heterodera sacchari</i> (10 cysts/pot)+ Drought (60 days later) (Sequential stress)	4.3 ↓	48.5 ↓	38.1 ↓	-22.6 ↑
IDSA6	<i>Heterodera sacchari</i> (10 cysts/pot)	-5.3 ↑	18.9 ↓	14.9 ↓	-3.6 ↑
	Drought	5.3 ↓	37.2 ↓	19.7 ↓	-27.3 ↑
	<i>Heterodera sacchari</i> (10 cysts/pot)+ Drought (60 days later) (Sequential stress)	-8.2 ↑	39.8 ↓	26.1 ↓	-21.8 ↑
	Treatment	Plant response to stress (reduction over control %)			
		Type B parameters*			
		Leaf water potential	Stomatal conductance	Leaf chlorophyll content	

CG14	<i>Heterodera sacchari</i> (10 cysts/pot)	-34.6↑	51.2↓	-16.9↑
	Drought	-115.4↑	127.4↓	-33.9↑
	<i>Heterodera sacchari</i> (10 cysts/pot)+ Drought (60 days later) (Sequential stress)	-247.4↑	79.8↓	-61.1↑
IDSA6	<i>Heterodera sacchari</i> (10 cysts/pot)	-37.7↑	40.7↓	-7.0↑
	Drought	-59.7↑	57.0↓	-8.0↑
	<i>Heterodera sacchari</i> (10 cysts/pot)+ Drought (60 days later) (Sequential stress)	-93.5↑	66.3↓	1.8↓

Reference - Audebert A, Coyne DL, Dingkuhn M, Plowright RA (2000) The influence of cyst nematodes (*Heterodera sacchari*) and drought on water relations and growth of upland rice in Cote d Ivoire. Plant and Soil 220: 235–242.

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 parameter classification, please refer to the 'methodology' tab.

Inference from the study: Audebert et.al. 2000 studied the interaction of nematode and drought in two rice cultivars; CG14 and IDSA6. Plants were subjected to single and sequential stress. Specific leaf area, leaf dry weight and root dry weight reduced synergistically under combined stress conditions. Root:shoot ratio, leaf water potential and leaf chlorophyll content increase under stress conditions. Stomatal conductance is reduced synergistically under combined stress only for cultivar IDSA6. **Thus, this stress combination is detrimental to rice cultivars.**