



Effect on alfalfa genotypes (*Medicago sativa* L. cv. Ranger, Lahontan, Moapa69)

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

Crop: Alfalfa (*Medicago sativa* L. cv. Ranger, Lahontan, Moapa69)
 Stress 1: *Ditylenchus dipsaci*
 Stress 2: *Fusarium oxysporum*
 Stage of plant: At sowing

The table shows the impact of nematode and fungus alone and in combination on shoot weight, root weight and survival of alfalfa genotypes

Cultivar	Treatment	Plant response to stress (reduction over control %)		
		Type A parameters*		
		Shoot weight	Root weight	Survival
Lahontan	<i>Ditylenchus dipsaci</i> (100 nema/plant)	25.8 ↓	-3.7 ↑	96 ↓
	<i>Fusarium oxysporum</i> (12X10 ⁷ microconidia/plant)	13.7 ↓	22.2 ↓	82 ↓
	<i>Ditylenchus dipsaci</i> (100 nema/ plant) + <i>Fusarium oxysporum</i> (12X10 ⁷ microconidia/plant)(simultaneous)	36.3 ↓	23.1 ↓	74 ↓
	<i>Ditylenchus dipsaci</i> (100 nema/plant) + <i>Fusarium oxysporum</i> (12X10 ⁷ microconidia/plant)(28 days later) sequential stress	35.5 ↓	19.4 ↓	72 ↓
Moapa 69	<i>Ditylenchus dipsaci</i> (100 nema/plant)	49.6 ↓	18.6 ↓	81 ↓
	<i>Fusarium oxysporum</i> (12X10 ⁷ microconidia/plant)	5.3 ↓	3.1 ↓	90 ↓
	<i>Ditylenchus dipsaci</i> (100 nema/ plant) + <i>Fusarium oxysporum</i> (12X10 ⁷ microconidia/plant)(simultaneous)	55.6 ↓	29.9 ↓	68 ↓

	<i>Ditylenchus dipsaci</i> (100 nema/plant) + <i>Fusarium oxysporum</i> (12X10 ⁷ microconidia/plant)(28 days later) sequential stress	60.9 ↓	34.0 ↓	70 ↓
Range r	<i>Ditylenchus dipsaci</i> (100 nema/plant)	47.9 ↓	23.7 ↓	85 ↓
	<i>Fusarium oxysporum</i> (12X10 ⁷ microconidia/plant)	15.7 ↓	17.5 ↓	84 ↓
	<i>Ditylenchus dipsaci</i> (100 nema/ plant) + <i>Fusarium oxysporum</i> (12X10 ⁷ microconidia/plant)(simultaneous)	74.4 ↓	40.2 ↓	54 ↓
	<i>Ditylenchus dipsaci</i> (100 nema/plant) + <i>Fusarium oxysporum</i> (12X10 ⁷ microconidia/plant)(28 days later) sequential stress	71.9 ↓	44.3 ↓	51 ↓

For raw data – Click here (.xlsx file)

Reference- Griffin GD (1990) Pathological Relationship of *Ditylenchus dipsaci* and *Fusarium oxysporum* f. sp. *medicaginis* on alfalfa Journal of Nematology 22: 333-336

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

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

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.

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

Inference From the study: Griffin GD 1990 studied the interaction of *Fusarium oxysporum* and *Ditylenchus dipsaci* on alfalfa cultivars. Simultaneous and sequential inoculation of both pathogens resulted in reduced shoot and root weight compared to single pathogen inoculation in cultivar Ranger and Moapa, but in Lahontan this reduction was less significant. The plant survival rate also reduced additively under combined stress treatment for the two pathogens in all

three cultivars. **To summarize, this stress combination additively reduce growth of alfalfa in cultivar more effectively in cultivar Ranger and Moapa69 compared to Lahontan.**