

FUSARIUM WILT RESISTANCE - GREENHOUSE/CONTROLLED ENVIRONMENT

Test accepted: March 1995

Test updated: June 2024

Pathogen: *Fusarium oxysporum* Schlecht f. sp. *medicaginis* (Weimer) Snyder & Hans.

Test authors: J.E. Brummer and S.L. Nygaard

PLANT CULTURE

Greenhouse

Container Bench or tub with adequate depth for root development (6-8")

Media Soil Mix (1:2:1; Top soil: sand: sphagnum/perlite) adequate lime and fertilizer (0:24:24)

Temp/Light 24 to 30°C; 16+ hour daylength

No. of Plants 50-60 per replication

No. of Reps 4 replications

Other Inoculate with *Sinorhizobium meliloti*

INOCULUM CULTURE

Source Infected roots

Storage Silica gel crystals, inoculated sterile soil, or mycelial plugs in cryoprotectant and -80°C

Temperature 4 to 10°C

Storage Life 1 to 2 years

INOCULATION PROCEDURE

Age of Plant 8 weeks old

Type of Inoc. Microconidia in water suspension

Inoc. Culture Potato Dextrose Broth; inoculate sterile broth with PDA plugs and incubate on a shaker for 4 days at 20 to 24°C.

Concentration 1 X 10⁶ spores per ml

Method Clip and bare root soak

Time of Inoc. 20 min at 24°C or 12 hours at 16°C

INCUBATION

Location Greenhouse: transplanted into benches or tubs

Temp/Light 28 to 32°C; 16 hour daylength

Culture Provide an arid environment to facilitate symptoms. Clip top growth twice at 5 to 6 week intervals (at bud or bloom) maintain good growth and control insect pests; fertilize (0-24-24) after each clipping

Spacing 2.5 cm between plants and 6 cm between rows

Age at Rating 12 to 14 weeks after transplanting

RATING

Plants are removed from benches and cross sections of roots are rated

Resistant Symptomless root or discrete dark specks in the stele of the root

Susceptible Any dark discoloration in root with an arc or ring pattern; severe necrosis of entire root; dead plant

CHECK CULTIVARS

	Approximate Expected Resistance (%)	Acceptable Range (%)
Resistant		
Agate**	45	35-55
Moapa 69	70	60-80
Susceptible		
MNGN-1**	4	0-8

Controlled environment evaluations can be more severe than field evaluations (check varieties may have a lower resistance when compared to field results)

**Checks used by AOSCA Alfalfa and Miscellaneous Legumes Variety Review Board for variety certification.

SOURCE OF INOCULUM AND EXPERTISE

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REFERENCES

See Fusarium Wilt field protocol; In: Standard Tests to Characterize Alfalfa Cultivars.