

PHYTOPHTHORA ROOT ROT – SEEDLING RESISTANCE

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Pathogen: *Phytophthora medicaginis* (Hansen & Maxwell)

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PLANT CULTURE

Container Seedling cavities within a water reservoir or a deep flat or tub with a single drainage hole which is capable of being plugged

Media Coarse vermiculite or a porous soil mix (eg., 3:2 sphagnum-based soilless mix: perlite); provide a coarse drainage layer (eg., gravel); pure sand medium **is not** desirable

Temp/Light 20-24°C; 12-16 hr daylength

No. of Plants 50-70 per replication

No. of Reps 3 minimum

INOCULUM CULTURE

Source Seedlings grown on infested soil

Storage Corn meal or V-8 juice agar

Temperature 4-12°C

Storage Life 6 months if hydrated

INOCULATION PROCEDURE

Age of Plant 10-12 days (when first trifoliolate begins expansion)

Type of Inoc. Zoospore suspension or comminuted mycelium

Production Zoospores are produced as per;⁽²⁾ or 9-day-old V-8 agar cultures of mycelium may be chopped in a blender for 10 seconds

Concentration Approximately 50 zoospores⁽³⁾ or 1 ml chopped mycelium per seedling; mycelium prepared as: 1 culture (9 cm diameter) in 1 L water

Concentration For zoospores: Presaturate the soil mix and drench inoculum over the seedlings;⁽⁴⁾ For mycelium: drench inoculum into shallow trench and then saturate the soil with water⁽¹⁾

INCUBATION

Location Moderate greenhouse or growth chamber

Plant Counts Count at full emergence (7-8 days after seeding)

Culture Maintain flooded conditions for 2 days; keep moist until rated

Age at Rating Rate when nearly all Saranac plants are stunted and dying, i.e. for zoospores: 10-12 days after inoculation, for mycelium: 14 days after inoculation

RATING

Resistant Vigorously growing plants with only slight to no necrosis of tap and secondary roots; hypocotyl area sound with slight to no chlorosis of cotyledons

Susceptible Stunted or dead plants with moderate to severe necrosis of roots, hypocotyls and cotyledons

CHECK CULTIVARS

	Approximate Expected Resistance (%)	Acceptable Range of Reaction (%)
Highly Resistant		
WAPH-1*	55	50-60
Resistant		
MNP-D1 ^b	46	38-54
Agate*	33	25-40
Susceptible		
Saranac	1	0-5

*WAPH-1 and/or Agate must be included for varieties with fall dormancy rating 1-5.

^bMNP-D1 must be included for varieties with fall dormancy rating 6-9.

REFERENCES

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4. Nygaard, S. L. and Grau, C. R. 1991. Aphanomyces Root Rot Resistance. page D-2. Ln: Standard Tests to Characterize Alfalfa Cultivars (Third Edition). North American Alfalfa Improvement Conference.