

COLUMBIA ROOT-KNOT NEMATODE RESISTANCE

Test accepted: June 1999

Pathogen: *Meloidogyne chitwoodi* (race 2)

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PLANT CULTURE

Greenhouse

Container Pot or Cone (4 cm diameter X 21 cm long)

Media Steam-sterilized sandy loam soil mixture

Seed Prep Scarify, surface sterilize or treat with fungicide

Temp/Light 20 to 25°C, 16 hr photoperiod, w/ supplemental light during winter

No. of Plants 100 plants minimum. 10 plants/pot or 2 plants/cone (5 cones per replication)

No. of Reps 10+

Other Promote good growth. Use proper insect control.

INOCULUM SOURCE

Source Greenhouse cultured winter wheat; eggs obtained by NaOCl method.⁽²⁾

Storage Egg in sterile or deionized water at 0 to 5°C, maximum 10 days.

INOCULATION PROCEDURE

Plant Age 3-4 weeks.

Method Apply egg suspension in 3 holes 2 cm deep next to seedling; cover; water.

INCUBATION

Location Greenhouse bench.

Duration 55 days.

RATING

Rating (RF) is on a per-plant basis from root extractions by the NaOCl method.⁽²⁾ One ml aliquots of the sample egg suspensions are counted using a stereoscope.

Reproductive Factor where $RF = \text{final egg count } (P_f) / \text{initial inoculum } (P_i, 500) \text{ per plant}$

Non-host $RF < 0.1$

Poor host $0.1 < RF < 1$

Good host $RF \geq 1$

CHECK VARIETIES

	Approximate Expected Reaction (%)	Acceptable Range of Reaction (%)
Poor host		
Nev. Syn XX	$RF \leq 1$	$RF = 0-1$
Good host		
Lahontan	$RF > 20$	$RF \geq 10$

DISTRIBUTION OF *MELOIDOGYNE CHITWOODI* (RACE 2)



Columbia root-knot nematode, *Meloidogyne chitwoodi* (race 2)
(Click on the map above for a larger version.)

RACES

M. chitwoodi consists of race 1, which does *not* parasitize alfalfa, and race 2 that do. The latter is composed of two pathotypes with different RF values on *Solanum bulbocastarum* that carries the resistant R_{cm1} gene.

HELPFUL INFORMATION

M. chitwoodi race 2 may not cause galls on alfalfa, and therefore gall count may not reveal the host-parasite relationship. Also, egg mass count is less desirable, because some nematodes may reach maturity on a resistant plant, but produce a gelatinous matrix with very few eggs deposited. Thus, the Reproductive Factor (RF) value is the most reliable measure to evaluate the host status of alfalfa cultivars and breeding lines. Wheat as an increase host is preferred over tomato which is a host for *M. hapla*, Northern root-knot nematode that occasionally contaminates tomato cultures.

REFERENCES

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