

CLOVER ROOT CURCULIO RESISTANCE

Test accepted: March, 1991

Pest: *Sitona hispidulus* (F.)

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THIS TEST IS IN THE DEVELOPMENTAL STAGE AND SHOULD BE USED CAUTIOUSLY

PLANT CULTURE

Greenhouse (adult defoliation)

Container Flats (6 x 47 x 32 cm or similar size)

Media Commercial soil mix

Temp/Light 22 to 25°C; 16 hour daylength

No. of Plants 20 to 30 plants per replication in rows 2.5 cm apart; 16 rows per flat

No. of Reps 5 replications minimum

Other Plant border rows of susceptible standard around perimeter of flat; remove border plants and discard before rating entries

Field (larval root feeding)

Land Prep Prepare a firm seedbed in well-drained area

No. of Plants 50 seeds per 1.5 m row; rows 0.6 m apart

No. of Reps 5 minimum

Other Alleys and borders should be planted to white clover. Have alfalfa in vigorous vegetative growth in autumn at time of adult curculio flight.

INSECT CULTURE

Greenhouse

Source Collect adult weevils by sweeping infested fields of white clover, red clover, or alfalfa

Storage Refrigerate adults with plant foliage or on artificial diet⁽⁵⁾ for up to 3 months

Temperature 7°C

Field

Source Adults will infest plot area during autumn flight. Sweep net collections may be used to supplement natural infestation.

INFESTATION PROCEDURE

Greenhouse

Age of Plants 12 to 14 days after emergence, at first trifoliolate

Type Adults, unsexed

Rate One per plant

Method Plexiglass cage with plastic screen mesh top is pushed into soil in a flat; adults are introduced through an opening in plastic screen

Length 6 to 7 days, susceptible standards show 50%+defoliation

Field

Age of Plants 3 to 6 months; spring planting is the normal procedure, but late summer (early August) may also be suitable

Type Natural adult populations from the autumn flight; sweep net collections (1000 per rep) can be used as a supplement

Length 18 to 20 months (summer)

RATING FOR TOLERANCE

Greenhouse

1 Resistant No feeding on any leaves

2 Resistant Up to 25% of first trifoliolate is consumed

3 Susceptible 25 to 50% of trifoliolate consumed

4 Susceptible 50 to 75% of trifoliolate consumed

5 Susceptible 100% of trifoliolate consumed

Field (% of plants with damage)

1 Resistant Roots clean and white, no lesions, 0% damaged

3 Resistant Lesions small, roots still white, 0 to 5% damaged

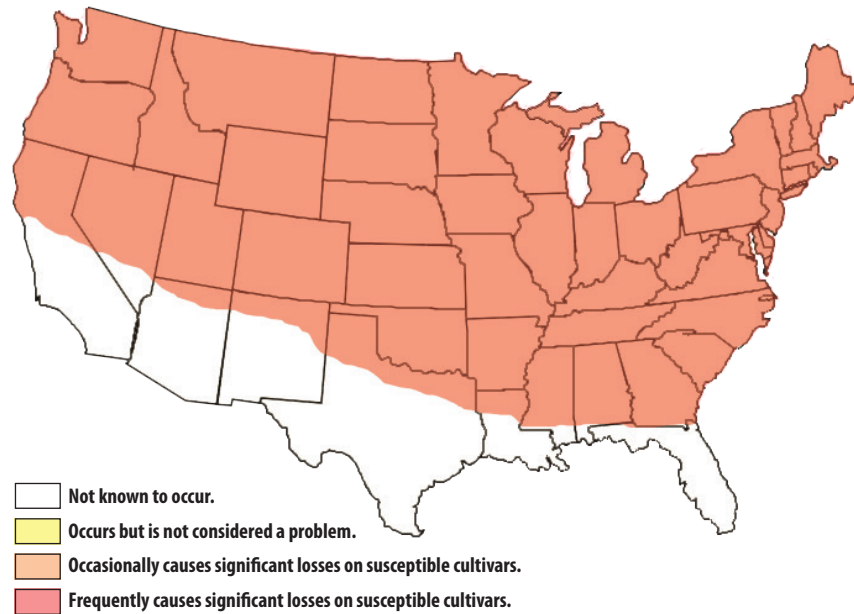
5 Susceptible Lesions brown, irregularly shaped grooves; severe feeding on 50% or more plants; may be associated with root rot; undamaged tap root white to tan, 6 to 100% damaged

CHECK CULTIVARS

	Approximate Expected Resistance (%)	
Susceptible		
Saranac AR	6-100	Root damage
WL316	6-100	Root damage

No resistant check available.

DISTRIBUTION AND SEVERITY OF CLOVER ROOT CURCULIO



Clover Root Curculio, *Sitona hispidulus* (F.)
(Click on the map above for a larger version.)

CULTURE OPTIONS AND RANGE CONDITIONS

Insects can be reared on slant-boards⁽¹⁾ or in pots⁽⁵⁾ but the yield is low.

PLANT GROWTH OPTIONS AND RANGE OF CONDITIONS

Best results in the greenhouse have been with first trifoliolate leaves. Although the adults feed on cotyledons and unifoliolate leaves, feeding is much greater on trifoliolates. Best results have been achieved in the field 2 years after planting. Although roots sustain damage the first summer following infestation, there are many escapes and the level of damage is low, ranging from 5 to 25%. Plants have been evaluated for resistance to larvae using the slantboard culture method for white clover⁽⁴⁾. This method has been tried for alfalfa but only tolerance to feeding has been observed. The growth pattern of the roots in this system produces many secondary roots and smaller tap roots and may be unsuitable to locate resistance in alfalfa.⁽²⁾

HELPFUL INFORMATION

Greenhouse

Adults should be used as soon as possible after field collection. Although adults can be stored and reused, they usually feed less the second time and mortality from diseases increases. Wet soil conditions in the flats enhances mortality of adults and reduces feeding. Adults for greenhouse evaluations are collected by sweeping fields of clover and alfalfa. White clover usually has the most adults. Beetles are aspirated from samples spread out on cafeteria trays. Collections are best made on sunny afternoons in fall and spring. Collections before frost in autumn usually yield few adults because they haven't emerged from aestivation. Several other *Sitona* sp. can be separated from *S. hispidulus* by examining under the stereomicroscope in the lab. *S. hispidulus* is the only *Sitona* sp. with hairs on the elytra and thorax. Others such as *S. cylindricollis* and *S. flavescens* are smooth.

Field

Plants are usually dug in July, 2 years after planting. This allows for larval attack during two springs. Roots are cut about 15 to 25 cm below the soil surface, washed and evaluated in the field. Potentially resistant plants are planted in the greenhouse for further testing.

REFERENCES

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4. Newton, R.C. 1958. Rearing *Sitona hispidula* larvae for various research uses. J. Econ. Entomol. 51:917-918.
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