STEMPHYLIUM LEAF SPOT RESISTANCE (WARM TEMPERATURE – EASTERN BIOTYPE)

Test accepted: March 1991
Pathogen: *Stemphylium botryosum* Wallr. **Test authors:** Rosemary Salter and Kenneth Leath

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

PLANT CULTURE

Greenhouse

Container ..... Flats or moveable carts
Medium ..... Greenhouse planting mix
Temp/Light ..... 21 to 30°C; 16+ hour daylength
No. of Plants ..... 30 to 40 per rep; 1 to 2 rows of plants per entry per flat
No. of Reps ..... 3 minimum
Other ..... Promote good growth

INOCULUM CULTURE

Source ..... Infected leaf tissue
Storage ..... Sealed cultures for several months or silica gel crystals for longer periods
Temp/Light ..... Culture 21±1°C, 12 hour daylength; storage 4°C
Storage life ..... At least 4 years
Incubation ..... Cultured on V-8 plates under cool white fluorescent lights at $20 Mm^{-2}sec^{-1}$ for approximately 10 days

INOCULATION PROCEDURE

Age of Plant ..... 4 to 6 weeks (4 to 6 trifoliates); or on regrowth
Plant Counts ..... Prior to inoculation
Type of Inoc. ..... Conidial suspension with 50 to 100 ppm Tween 20 or 1 small drop per liter
Concentration .... $1x10^4$ to $5X10^4$ spores per mL
Method ..... Foliar spray until runoff

INCUBATION

Location ..... Moist chamber for 48 hours
Temperature ..... 20 to 23°C
Lighting ..... Darkness is satisfactory for the initial 48 hours, then 16 hr daylength
Humidity ..... 100% R.H. for initial 48 hours
Age at Rating ..... 5 to 8 weeks (about 10 days after inoculation)

RATING

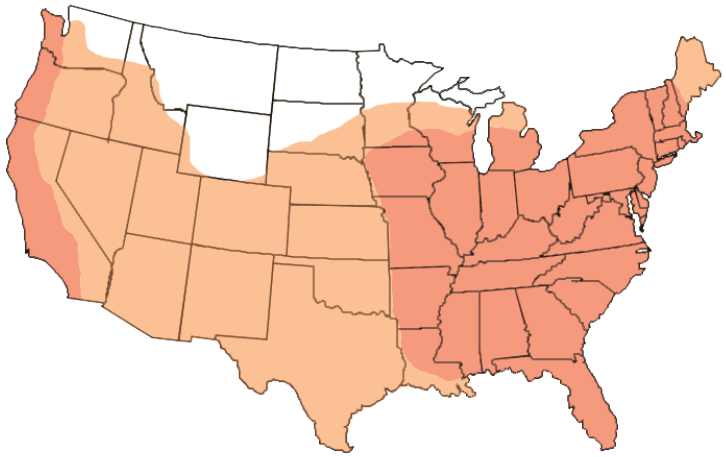
Class descriptions are subjective and may be adjusted. Fewer classes may be used and still meet the objectives of many experiments.

1 Resistant ..... Healthy, symptom-free top growth
2 Resistant ..... Small (<1mm) brown or black lesions or pepper spots; no defoliation
3 Susceptible ..... Larger (1 to 3mm), discreet lesions with necrotic centers; usually no chlorosis or defoliation
4 Susceptible ..... Large (>3mm), target-type lesions or necrotic areas; may have petiole lesions
5 Susceptible ..... Lesions >3mm, chlorosis, defoliation

CHECK CULTIVARS

No checks are available for the Eastern (warm-temperature) biotype. However, Apalachee has been reported to have some resistance.[3]

DISTRIBUTION AND SEVERITY OF STEMPHYLIUM LEAF SPOT



Not known to occur.
Occurs but is not considered a problem.
Occasionally causes significant losses on susceptible cultivars.
Frequently causes significant losses on susceptible cultivars.

Stemphylium leaf spot; *Stemphylium botryosum* Wallr.
(Click map to the left for a larger version.)

SOURCE OF INOCULUM AND EXPERTISE

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CORRELATION TO FIELD REACTION

Greenhouse and field test results have been similar.

RACES

No races are known to exist, but two biotypes of S. *botryosum* have been reported; the warm-temperature (Eastern) biotype, and the cooltemperature (California) biotype.

CULTURE OPTIONS AND RANGE OF CONDITIONS

Stemphylium can appear variable in culture. Keep refrigerated for storage. The cool temperature biotype has shown variability for virulence among single spore subcultures.

PLANT GROWTH OPTIONS AND RANGE OF CONDITIONS

Plants may be started in the greenhouse or growth room. Four-week old regrowth has been inoculated successfully.

INOCULATION AND INCUBATION CONDITIONS

After inoculation, keep plants moist for a full 48 hours. Incubation can range from 1 to 2 weeks after inoculation.

HELPFUL INFORMATION

Dry plants slowly after humidity treatment. Air-dry away from direct sunlight. Selections may be reinoculated to test for escapes.

ALTERNATIVE METHODS

Selection may be possible under field conditions. Field inoculations have been done.

REFERENCES

1. Cowling, W.A., D.G. Gilchrist, and J.H. Graham. 1981. Biotypes of *Stemphylium botryosum* on alfalfa in North America. Phytopathology 71:679-684.
2. Hill, R.R., Jr., K.T. Leath, and K.E. Zeiders. 1972. Combining ability among four-clone alfalfa synthetics. Crop Sci. 12:627-630.
3. Lucas, L.T., T.H. Busbice, and D.S. Chamblee. 1973. Resistance to Stemphylium leafspot in new alfalfa variety. Plant Dis. Rep. 57 (11):946-948