

# Spring Blackstem and Leafspot Resistance

*Phoma medicaginis* (Malbr. & Roum.) var. *medicaginis* Boerema  
 RoseMary Salter and Kenneth Leath

## 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

Storage ..... Culture on PDA on sealed slants or plates for 6 months in refrigerator (4°C) or on silica gel (4°C) for longer term  
 Incubation ..... On plates of PDA in incubator for 10 to 28 days to produce inoculum, light not critical  
 Temperature ..... 20 to 22°C

### INOCULATION PROCEDURE

Age of Plant ..... 4 to 6 weeks (4 to 6 trifoliates), or on regrowth  
 Plant Counts ..... Just prior to inoculation  
 Type of Inoc ..... Conidial suspension with 50 ppm Tween 20 or 1 very small drop per liter  
 Concentration .....  $1 \times 10^6$  to  $4 \times 10^6$  spores per mL  
 Method ..... Foliar spray until runoff

### INCUBATION

Location ..... Moist chamber for 48 hr; greenhouse next 8-10 days  
 Temperature ..... 18 to 24°C  
 Lighting ..... Darkness is satisfactory for the initial 48 hours, then 16 hr daylength  
 Humidity ..... 100% R.H. for first 48 hr  
 Age at rating ..... 5 to 8 weeks (about 10 days after inoculation)

### RATING

Class descriptions are subjective and may be adjusted. Percent resistance is a total of classes 1 and 2.

- 1 Resistant ..... Healthy, symptom-free top growth
- 2 Resistant ..... Small (<2mm), brown or black lesions or flecks; no defoliation
- 3 Susceptible ..... Larger (2 to 3mm), discrete lesions; lesions may be on leaves and petioles; usually no chlorosis or defoliation
- 4 Susceptible ..... Large (>3mm) lesions; no defoliation; petiole lesions

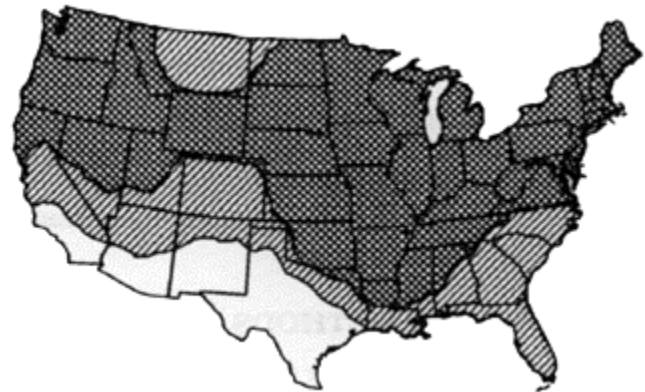
5 Susceptible ..... Lesions >3mm, fruiting; dead leaves or defoliation

### CHECK CULTIVARS

	Approximate Expected Resistance (%)	Acceptable Range of Reaction (%)
<b>Moderately Resistant</b>		
PL-PhR*	25	20-25
Ramsey	25	20-25
<b>Susceptible</b>		
Ranger	3	0-5
Lahontan	3	0-5

\*Seed can be obtained from K. Leath.

### DISTRIBUTION AND SEVERITY OF SPRING BLACKSTEM AND LEAFSPOT



Spring Blackstem and Leafspot; *Phoma medicaginis* Malbr. & Roum. var. *medicaginis* Boerema

(Click on the map above for a larger version. See also the [key](#).)

### SOURCE OF INOCULUM AND EXPERTISE

Name .....K.T. Leath  
 Address...USDA-ARS  
 U.S. Regional Pasture Res. Lab.  
 University Park, PA 16802  
 Phone.....814-863-0945

### CORRELATION TO FIELD REACTION

Not tested, but no problems have been observed.

## RACES

No races are known to exist.

## CULTURE OPTIONS AND RANGE OF CONDITIONS

Keep refrigerated for storage. Store 6 months or less on PDA; silica gel for longer periods.

## 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

Temperatures of 18 to 24°C have been found favorable for symptom development. 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. If used in a sequential inoculation with other pathogens, inoculate with *Phoma* last as it can cause death.

## ALTERNATIVE METHODS

Selection may be possible under field conditions.

## REFERENCES

1. Hijano, E.H., and F.I. Frosheiser. 1980. Effect of spring blackstem on alfalfa forage yield in the greenhouse and possible selection methodology. Proc. 27th N. Am. Alfalfa Imp. Conf. p.37.
2. Hill, R.R., Jr., K.T. Leath, and D.E. Rowe. 1989. Registration of PL-PhR alfalfa germplasm. Crop Sci. 29: 1577.
3. Hill, R.R., Jr., K.T. Leath, and K.E. Zeiders. 1972. Combining ability among four-clone alfalfa synthetics. Crop Sci. 12:627-630.