

## Michigan State Study

# Threshold levels of anthracnose spores identified

A recent Michigan State University study established the relationship between periods of leaf wetness, temperature, and spore concentration as they relate to the expression of anthracnose disease symptoms. The study confirmed the close relationship between leaf wetness periods and optimum spore growth temperatures as well as established the concentration of conidia required to produce maximum disease symptoms.

The growth temperature range for *Colletotrichum graminicola* monitoring by this experiment was 68 F (20 C) to 86 F (30 C) with the optimum growth occurring at 77 F (25 C) to 86 F (30 C). The table below lists the spore concentration, the temperature, the length of time of leaf wetness, and the percent of leaves infected by *Colletotrichum graminicola*.

*TGT's view: The Michigan State data show a strong relationship between conidia concentration, moderate to heavy, extended periods of leaf wetness, 24 to 48 hours, consistent temperatures, 77 F (25 C) to 86 F (30 C), with very high levels of plant infection, 60% to 100%.*

*Anthracnose Colletotrichum graminicola should not be a major problem on Poa annua stands that do not have*

*a history of infection. However, stands with a moderate or previous history of infection should be closely examined when periods of leaf wetness exceed 48 hours at consistent temperatures above 77 F (25 C). Stands with chronic infections should be closely monitored any time leaf wetness periods exceed 24 hours at constant temperatures of 77 F (25 C) or greater.*

*At warm temperatures with forecast wet spells, turfgrass managers should attempt to lessen periods of extended leaf wetness on vulnerable annual bluegrass stands by spraying foliage with wetting agents, accelerating leaf drying by the use of fans or blowers or any combination of these actions. Shutting down stand sprinkler heads for 24 to 48 hours after rainfalls may lessen the canopy humidity levels enough to avoid exacerbating an existing problem.*

*This study clearly illustrates the relationship between inoculum levels, leaf wetness periods, and temperatures on infection of annual bluegrass. It is an excellent example of the disease triangle (host, pathogen, and environment) and how changes in pathogen levels, temperature variations and changing stand cultivars can dramatically effect the symptom expression of any disease. -CS*

## Percent infection of annual bluegrass by Anthracnose

| Concentration | Temp.(C) | Wetness(hrs.) | % Infected | Concentration | Temp.(C) | Wetness(hrs.) | % Infected |
|---------------|----------|---------------|------------|---------------|----------|---------------|------------|
| 10,000/ml.    | 20       | 12            | 0          | 100,000/ml.   | 25       | 48            | 70         |
| " "           | "        | 24            | 10         | " "           | "        | 72            | 100        |
| " "           | "        | 48            | 10         | " "           | 30       | 12            | 10         |
| " "           | "        | 72            | 10         | " "           | "        | 24            | 60         |
| " "           | 25       | 12            | 0          | " "           | "        | 48            | 80         |
| " "           | "        | 24            | 10         | " "           | "        | 72            | 100        |
| " "           | "        | 48            | 15         | 1,000,000/ml. | 20       | 12            | 0          |
| " "           | "        | 72            | 20         | " "           | "        | 24            | 20         |
| " "           | 30       | 12            | 0          | " "           | "        | 48            | 80         |
| " "           | "        | 24            | 20         | " "           | "        | 72            | 100        |
| " "           | "        | 48            | 20         | " "           | 25       | 12            | 10         |
| " "           | "        | 72            | 20         | " "           | "        | 24            | 60         |
| 100,000/ml.   | 20       | 12            | 0          | " "           | "        | 48            | 100        |
| " "           | "        | 24            | 20         | " "           | "        | 72            | 100        |
| " "           | "        | 48            | 40         | " "           | 30       | 12            | 20         |
| " "           | "        | 72            | 70         | " "           | "        | 24            | 80         |
| " "           | 25       | 12            | 5          | " "           | "        | 48            | 100        |
| " "           | "        | 24            | 40         | " "           | "        | 72            | 100        |