

60 Days of Trouble with *Pythium* Blight

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The severity of *Pythium* blight on both bentgrass and bermudagrass golf greens in the Piedmont area of the South from June 26 through August 26, 1968, will be remembered for many years. Many courses, especially those with bentgrass greens, will not be fully recovered until late spring or early summer of this year in spite of the best efforts of fully capable superintendents.

Pythium blight, sometimes called cottony blight or greasy spot, can be caused by any one of three species of *Pythium* (2, 9, 10, 11, 12):

Pythium aphanidermatum (Edson) Fitzpatrick

Pythium ultimum Trow

Pythium myriotylum Dreschler

All three species are most active during warm, humid weather, but much needs to be learned regarding specific factors which result in the situation so prevalent during the summer of 1968 (3, 4, 8, 13). It is also obvious that contemporary fungicides are not fully adequate once the disease becomes established; a change in weather conditions is often the only way the disease is stopped. A preventive fungicide pro-

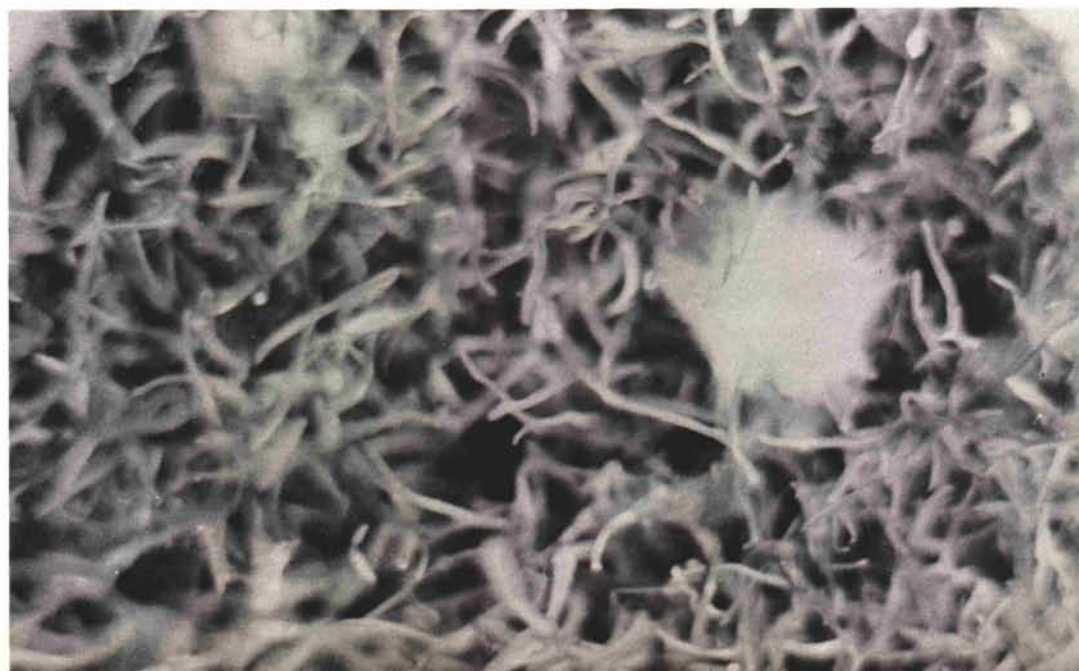
gram (spraying at weekly or bi-weekly intervals) is generally very good, but even this was not completely effective last year (5, 6).

The bentgrass research green at Clemson University, Clemson, S. C., was divided into two parts during construction. Following the necessary soil analysis, half of this was built according to the USGA Green Section Specifications with tile, sand, and gravel for adequate drainage. The other half of the green was constructed without any provisions for drainage except surface runoff. Each half was then divided into two parts with Penncross planted on one section and Cohansey on the other, thereby dividing the green into four distinct sections.

This green was observed closely during June 26 to August 26 period while *Pythium aphanidermatum* was extremely active and destructive.

The first outbreak of *Pythium* blight was noted early in the morning of June 26, and the fungus remained active for the next 60 days (through August 26). Initially, the disease occurred on the undrained Cohansey bentgrass fringe ($\frac{1}{2}$ inch height). Within three days the putting surface ($\frac{1}{4}$ inch height) on the undrained Cohansey and Penncross sections and

The cottony mycelium stands out on the turf blades in early morning.





Pythium spreading in a new seedbed.

the drained Cohansey section was infested. During these same three days the entire green, including six feet of the fringe, was sprayed daily with fungicides. Subsequent fungicide applications did not prevent the fungus from spreading over the entire putting surface, and before the first week elapsed approximately 20 per cent of the 5,000-square-foot green was dead. On August 26 an accurate rating disclosed that 60 per cent of the grass on the entire green was dead and that another 10 to 15 per cent was considerably weakened.

During the 60 days it was noted that the disease was most pronounced (as measured by mycelial activity and rate of enlargement of individual diseased spots) when the minimum night temperature stayed above 66 degrees F. This was enhanced if relative humidity (at 7 a.m.) was over 90 per cent and/or if dewfall was heavy. These findings tend to substantiate the findings of other researchers (2, 4, 8, 10, 13). It was also interesting to note that dewfall (measured at a point $\frac{1}{4}$ inch above the turf surface) exceeded five inches during the period June 24-August 31; this could be an important factor in the spread of the fungus from leaf blade to leaf blade (2).

Thirty fungicidal applications were made during the 60 days of the outbreak, yet the fungus continued to kill the turf. From the economic viewpoint (chemicals only) the cost to spray this one green of 5,000 square feet plus the six feet of fringe for control of **Pythium** blight

was approximately \$154. Add to this the cost of labor, water, equipment, usage and depreciation, plus player inconvenience and it can be seen why a disease of this nature is to be feared.

Turf management procedures found to be helpful in fighting this disease problem included:

1. Soil aspect
 - A. Keep the green as dry as possible.
 - B. Avoid the use of excessive nitrogen.
 - C. Do not permit water to stand on green after rainfall or irrigation; if necessary aerify or spike to "open up" soil surface.
 - D. Check on calcium nutrition; plants are more susceptible to **Pythium** blight if soil is low in calcium.
2. Above-ground factors
 - A. Remove dew and/or guttation by polishing, mowing, or blowing **early** in morning. The fungus strands (mycelia) of **Pythium** will spread from plant to plant very quickly in these liquids.
 - B. Vertical mow (lightly) or use a brush or comb on the greensmower to help break up the mycelia and to thin the grass so it will dry out faster. This technique appeared to be effective

during periods of increased fungus activity on the research green.

- C. Apply hydrated lime at two to three pounds per 1,000 square feet during periods of high humidity; but do not water in. This tends to keep the surface of the green drier. **(Do not apply too often).**
- D. Drop the height of cut as much as possible without risking serious injury to the grass. This will also help provide faster drying conditions.
- E. Be sure to mow daily—tall grass holds water on the blades longer.

Finally, keep your eyes and ears open with respect to new developments in the fungicide field. Several chemical companies have been working on fungicides which provide excellent prevention and/or control of *Pythium* blight.

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