

Snow Mold and Its Control

Notes on a most excellent address

By MR. A. S. DAHL

"Disease Specialist," U. S. G. A. Green Section, entitled "Snow Mold" and delivered before a meeting of the Midwest Greenkeepers' Association, Dec. 5th, 1930

THE investigation of snow mold has been carried on by the United States Golf Association Green Section at the University of Wisconsin and the University of Minnesota. These two universities have cooperated to the extent of furnishing space and use of equipment and materials. Greenkeepers in various cities have also cooperated in a very satisfactory way.

As Dr. Monteith's duties in the Green Section increased to such an extent that he was unable to carry on the experimental work, the investigation of turf diseases fell on the shoulders of Mr. A. S. Dahl. Mr. Dahl's experience with snow mold covers a period of three years. He has carried on experimental work on golf courses at Detroit, Grand Rapids, Chicago, Milwaukee, Madison, St. Paul, Minneapolis and Duluth. At the same time laboratory work has been carried on at the two universities and correlated with the field work.

The following problems confronted Mr. Dahl. First to find the best control for the disease; second to study the conditions of its development; third to find the condition which encouraged its development.

Snow mold according to Mr. Dahl is most prevalent in the northern tier of states and in Canada. It is very important in Michigan, Wisconsin and Minnesota. When conditions are favorable it may occur even farther south. It causes most damage on putting greens but also occurs on fairways. In some cases it may kill out large areas on the putting greens which must be resodded or reseeded.

The disease although only recently observed in

this country is by no means a recent discovery. It has been recorded in literature since the middle of the 18th century. It was observed on a lawn in Vienna in 1763 in a winter when unusual and heavy snow fell in that city. This snow fell on unfrozen ground and as it melted large areas in the lawn were found to be killed out by snow mold. Almost the same time it was observed on winter grains in Northern Europe.

In 1820 the organism was isolated and its pathogenicity proved by artificial inoculation. Since that time much work has been done on the disease as it occurs on grain by European scientists. The organism attacks all of the winter grains but is most prevalent on rye.

Although the disease is widely distributed on golf courses in this country it is not found on our winter grains. The reason for this difference in occurrence in this country and Europe is that here the leaves of the grains are subjected to several heavy frosts and freezes before snowfall while in Europe the snow usually falls on unfrozen and green plants which are more succulent and more susceptible.

On golf courses here the grass is succulent and in about the same condition as the grain in Europe so that they are more susceptible. All of the commonly used grasses are subject to snow mold injury including creeping bent, red top, blue grass, fescue and Colonial bent.

SNOW MOLD OCCURS IN IRREGULAR PATCHES
SNOW mold occurs in irregularly circular patches of a few inches in diameter. These patches



MR. ARNOLD S. DAHL

We will again Report **The GREENKEEPERS' CONVENTION**

Following the gathering at Louisville last Spring we published in pamphlet form, an account of the proceedings. Several thousand copies were distributed. We heard from many sources that the service was appreciated. The Columbus Convention, which promises to outdo all previous, will be reported in full. A digest of all the addresses will be printed as will the discussions which follow. Greenkeepers may have this report without charge.

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may fuse together to cover large areas. The patches are usually a dirty white or gray color and may have a pinkish cast. Individual plants have a bleached appearance which is very characteristic. When wet the leaves have a slimy feel due to a soft rot of the leaf tissue.

The fungus attacks the leaves mainly, and at times the patch is covered by an aerial mycelium or cottony growth. Sometimes this aerial growth is so abundant that the leaves are matted together and form a thick layer over the affected area. When this occurs the stems are also injured and the sod must be replaced. Other patches may not have an abundant aerial growth and are not as severely injured so that the turf recovers and the patch disappears after the second or third cutting in the spring. In many cases the grass although not killed is weakened so that weeds, especially clover, are allowed to come in.

The disease has been found by Mr. Dahl to be caused by a fungus organism as is Brown Patch. However, it is not the same organism that causes Brown Patch. It is caused by *Fusarium nivoli*, which is closely related to the organisms which

cause cabbage yellows, seedling blights of grains, flox wilt and many other important diseases on agricultural crops. It is a common soil organism and is very widespread in its occurrence.

ORGANISM LIVES IN THE SOIL

THIS organism lives in the soil in a dormant state and when conditions become favorable it attacks the grass and causes the diseased patches in the turf. In the laboratory the organism has been isolated from diseased grass leaves. The organism has then been grown on artificial media and on sterile grass clippings in test tubes. Pots of grass have been inoculated with the fungus growing on the grass clippings. These pots are placed in moist chambers which are kept at a temperature between 32 degrees to 41 degrees Fahrenheit.

After a few days the mycelium of the fungus appears on the grass leaves and begins to enter them. Soon it spreads over the entire pot and the grass dies. Wheat, oats, barley, rye, creeping bent, red top, blue grass and fescue have been thus artificially inoculated in the greenhouse.

Mr. Dahl stated that the snow mold fungus also

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causes other diseases on grain. It attacks the grain at each stage of development. In the fall it causes a seedling blight, later it causes snow mold during the winter and early spring. In the early summer it attacks the stems at the crown of the plant, causing a disease known as foot rot; later in the summer it causes a head blight. Usually all of these diseases are most serious during wet seasons. On golf courses it remains in a dormant state during most of the year and attacks the grass only when conditions are favorable.

The fungus must have a temperature down near the freezing point, a supersaturated atmosphere, and is found on greens when the snow drifts and melts slowly in the spring. High organic matter in soils, tender grass and snow or unfrozen ground encourage the development of the disease.

CALOMEL USED FOR CONTROL

IN his work on control measures, Mr. Dahl has experimented with different rates of calomel (Hg_2Cl_2) and corrosive sublimate ($HgCl_2$). He has applied rates of 1, 2, and 3 oz. per 1000 sq. ft. These treatments were made on plots of 500 sq. ft. which were placed side by side on the same green

with areas between each plot which received no treatment. The treatments have been applied both in water solution and dry and no difference has been observed between the two methods.

The method recommended is to mix the chemical with a bucket of soil or sand per 100 sq. ft. and broadcast it over the area to be treated. The results showed that the 1 oz. treatments were not effective; the 2 oz. treatments lessened the injury considerably and the 3 oz. treatment gave a good control. In some cases there was some snow mold patches even on the 3 oz. treatments but these were few and the grass was not seriously injured. There was very little difference between the calomel and corrosive sublimate.

Mr. Dahl has also carried on experiments on the use of straw covering for greens and on fall fertilizers. He has found that straw covering encouraged the development of the disease and in some cases the injury was so great that the grass in those plots was entirely killed out. He stated that it was inadvisable to cover greens with straw especially where a susceptible grass was grown or where there as a large amount of organic matter

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Wendell P. Miller & Associates, Eastern engineering representatives for the Buckner Mfg. Co., may be called upon and will be glad to furnish data showing the clubs just what can be done in this respect. The Buckner Mfg. Co. has a world-wide reputation of guaranteeing their equipment in every respect.

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"Come Putts"—A New Idea

The past season has seen the introduction of an improvement to the hole on the putting green which is fast being adopted by well-known golf clubs, the country over, and in foreign countries as well. This newcomer is called "Come-Putts" and is designed to improve the hole on the green as well as make it more visible to the player.

"Come-Putts" are white, special composition rings, waterproofed, and made to regulation diameter for inserting in the hole above the metal cup. They support the earth around the edges and side-walls and keep the hole in better shape, so that the players are assured of even, clean-cut

holes and the greenkeeper is not required to cut new holes so frequently.

The white color makes the hole clearly visible as much as forty feet away, so that the caddy can pick up the flag pole and get out of the line of vision, leaving the player to putt into a hole which he can see with complete freedom from distracting influences. These "Come-Putts" are non-resilient and eliminate the tendency of the ball to bounce out from striking an irregular earth hole or the edge of the metal cup.

"Come-Putts" conform to the requirements of the U. S. G. A. and are rapidly making their appearance on many of the best-known courses. It is expected the coming season will see them adopted by golf clubs everywhere, especially since players who have putted into them often insist that "Come-Putts" be used wherever they play.

Toro Opens Sales and Service Station in Pittsburgh

On Thursday, December 11, 1930, Toro Manufacturing Company held a banquet and get-together in the William Penn Hotel for the purpose of introducing Mr. E. A. Griffith who will have charge of the Pittsburgh branch.

About twenty-five greenkeepers were present and a good time was had by all.

Mr. Griffith should make many friends in Pittsburgh and should find this a pleasing territory to work in. He has promised to give excellent service minus any high-powered stuff

and he will find the superintendents a bunch of fine fellows.

He has had quite a bit of experience in the factory and understands the full line of Toro equipment from any angle. A location has not yet been decided upon as he wishes to locate as centrally as possible to be able to serve all clubs to the best advantages of all concerned.

Mr. K. E. Goit, Sales Manager of Toro, accompanied Mr. Griffith and will help him get located.

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in the soil. Fertilizing late in the fall with organic fertilizers also encouraged the occurrence of the disease. The plots which were fertilized with organic fertilizer had twice as much disease as the unfertilized plots.

There is a wide difference in the susceptibility of the grasses used on putting greens. Creeping bents of the Columbia type are apparently very susceptible. Fescue and seaside are also quite susceptible. Washington and Metropolitan though not immune are rather resistant. Dr. Dahl stated that the control measures practiced by each greenkeeper would be determined by his locality, susceptibility of his grass, amount of organic matter in his soil and by his fertilizing program.

New Ideal Mower

The Ideal Power Lawn Mower Company have announced a new power putting green mower for 1931, the mower being something absolutely new and different in the way of power greens mowing equipment, a machine that will weigh less than 100 pounds and is going to retail f. o. b. Lansing at a price below \$200.00. This mower will be shown to the public for the first time at the Golf Show in Columbus in February.

Wytheville, Va.—Wytheville is to have a modern golf course and club house, the gift of a former resident of the town who declines to have his name disclosed. The improvements will cost \$30,000. Fifty acres of land, located on the Lee highway, one mile west of Wytheville has been purchased for the site of the golf course. The course and club house will be modern in every particular.



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