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“Lightning Can Strike Without Warning”

by Bruce R. Williams, Bob O’Link Golf Club

Of all the weather phenomena affecting the golf course manager today, lightning is the most often overlooked. We worry about the heat, cold, rain, wind, humidity, sunshine, clouds, etc. but we know so little about lightning and its effects. After reading several books and a number of articles on the subject - I will present a review of all of the information currently available.

WHAT IS LIGHTNING?

Simply stated lightning is nothing more than a very long spark which discharges a region of excess electrical charge developed in thunderclouds. It reaches a peak temperature of 50,000 degrees Fahrenheit which is five times greater than the surface temperature of the sun. Each cloud-to-ground lightning flash has a voltage of between 100 million and a billion volts and travels at a speed of between 20,000 and 60,000 miles per second.

Meteorological data shows that there are roughly 2000 thunderstorms in progress in the world at any given time. Each storm produces 1 to 3 lightning flashes each minute and collectively they may produce as many as 100 cloud-to-ground discharges each second or more than 8 million each day worldwide.

WHO IS AFFECTED BY LIGHTNING?

Data published by several life insurance companies and government agencies shows that from 200 to 600 deaths occur in the United States each year as a direct result of lightning. This is more than any other weather phenomena including tornadoes and hurricanes. The Lightning Protection Institute reports that at least 50% of the lightning related deaths or injuries happen to golfers. Golfers are prime targets for lightning strikes. They just happen to be in the wrong place at the wrong time. 70% of the accidents occur in the afternoon in outdoor areas. Golf courses with rolling hills and/or tall trees are more likely targets. Players are sitting ducks during a thunderstorm with a golf club in hand and metal golf spikes serving as a ground. Umbrellas often act as a conductor to attract the fatal blow.

A CASE HISTORY

In the 1975 Western Open, at Butler National Golf Club in Chicago, there occurred the most widely publicized lightning accident to a golfer in recent history. It was the second round of the tournament when an alarm was sounded and play dispensed. Lee Trevino and Jerry Heard were on the bank behind the 13th green. Bobby Nichols was on the 14th fairway and opted to finish the hole although the warning had been given. A bolt of lightning came down and struck Teel Lake on the golf course and offshoots of electrical energy hit each of the three players. All of them were hospitalized and only Jerry Heard returned to finish the final rounds of the tournament. Trevino and Nichols withdrew.

Oscar Miles, Superintendent of Butler National, stated that the Western Golf Association receives advance information from meteorologists. The meteorologists use a system of triangulation to track any potential storms. The Western Golf Association then uses this information and may choose to sound an alarm to dispense play if hazardous conditions exist.

WHAT CAN THE GOLF COURSE MANAGER DO
ABOUT LIGHTNING?

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(Lightning con't.d)

1. Read up on the subject and then pass this information along to your members in your club newsletter or post a warning statement in the clubhouse. Many injuries and deaths could be prevented if only the victims were aware of the danger lightning poses.

2. Inform the members of your staff about lightning. It should be written into your personnel policies that employees will stop work and seek shelter during a thunderstorm. Just as golfers are prime targets so are your crews on the golf course. Most machinery will attract lightning as well as uncovered utility vehicles. Designate those shelters which are properly protected by lightning rods.

3. Post instructional signs at rain shelters with safety procedures to follow if lightning should occur.

4. Be sure that your buildings and rain shelters have the required amount of lightning rods which are properly installed and grounded. Buildings which are used for equipment and chemical storage are rarely protected. While some irrigation controllers are protected in the field it is uncommon to see lightning rods on pumphouses. And once again it must be emphasized that a rain shelter or halfway house is not a safe place without adequate lightning rods.

5. If there are any irreplaceable trees on your golf course, lightning protection is a small price to pay to insure their existence. While there are no statistics on the actual number of trees struck by lightning each year the USDA Forest Service reports about 10,000 forest fires are ignited in the U.S. by lightning annually.

IS A LIGHTNING STRIKE ALWAYS FATAL?

About 2/3 of the people involved in lightning accidents make a complete recovery. Most are not victims of a direct hit but are in close proximity of a strike and receive a lesser shock. Many victims stop breathing and have no heartbeat. Through the use of CPR (cardio-pulmonary resuscitation) and mouth to mouth resuscitation many victims can be revived and stabilized until a physician or paramedic is on the scene. This is another good reason to have as many crew members as possible trained in First Aid and CPR.

WHAT TO DO IS NO PROTECTED SHELTERS ARE AVAILABLE DURING A THUNDERSTORM

1. Never stand under a tall tree. If you must use trees as a shelter than choose a small tree in a wooded area that is not on a hill.

2. Do not touch any metal objects such as rakes, golf clubs, ball washers, etc.

3. Stay away from fences, overground pipes, and metal railings.

4. Avoid standing water and do not lay on moist ground.

5. As a last resort find a ravine or valley and crouch down in that area.

In summary, the danger of lightning has been shown in several different ways. The statistics speak for themselves in regard to the threat posed to use on golf courses. Educate yourself about lightning and pass the information on to players and staff. Install lightning rods for the protection of human lives, buildings and fixtures, pumphouses, rain shelters, irrigation controllers, and irreplaceable trees on the golf course. The next time a thunderstorm threatens your area - be prepared.

Development and Management of Gaeumannomyces Patch

by J. M. Vargas, Jr., Principal Investigator

Supporting Investigators: MSU Turfgrass Faculty

Gaeumannomyces patch or take-all patch formerly known as *Ophiobolus* patch, occurs in many regions of the United States, but has typically been associated with the Pacific Northwest. Monteith and Dahl in 1932 implicated the fungus as an occasional turfgrass pathogen. However, it was not until 1960 that the disease was actually confirmed on creeping bentgrass in western Washington. More recently, the disease has been reported on creeping bentgrass turf in Rhode Island and in the Washington, D.C., Maryland area. We have made similar observations on newly seeded "Pennncross" greens in Michigan, although the disease has never been very serious.

Take-all patch has been reported to be most severe during wet years in poorly drained soil. In 1983, however, the Midwest had one of the warmest, driest summers on record. The disease is also most severe under conditions of high soil pH and low phosphorus levels. But many of the soils on which the disease occurred this summer has high phosphorus levels although the soil pH's were generally high which may have made the phosphorus unavailable. Sulfur has been reported to reduce the severity of take-all patch and is believed related to the effect of sulfur on the soil pH. The use of acidifying fertilizers, i.e. ammonium sulfate, has also reduced the severity of take-all patch, presumably by reducing the soil pH.

Symptoms: The symptoms initially appeared in patches of yellow turf. The grass in the center of these patches usually becomes bronze as it dies completely or becomes severely thinned. The bare or thin areas become filled with broadleaf weeds, creeping bentgrass or later on with annual bluegrass again. The initial spots may be 1 to 6 inches in diameter, but may grow to a diameter of several feet over a period of years. The plants in the disease patches had short and very poorly developed root systems. Examination of the roots under a dissecting microscope revealed dark cortical tissue inside the root and crowns from infection, and dark runner hyphae of a Gaeumannomyces-like fungus lengthwise on the exterior of the roots.

Recent Developments: In recent years, our laboratory has received occasional turf samples from midwestern states that were infected with Gaeumannomyces-like organisms. This August, numerous annual bluegrass samples were received from eastern, mid-central and midwestern states infected with this organism. Annual bluegrass is the major component of golf course fairways in the northern United States, whether it is desirable or not. A disease like "take-all patch" destroyed large areas on many annual bluegrass fairways this summer and since no known control was available many superintendents felt their jobs were in jeopardy. This research proposal is being submitted for funds to try and identify the organisms involved, predict the environmental conditions under which the disease occurs, and to find cultural or chemical means of managing it.

Proposal

Modeling: There is no real quantitative data concerning the environmental conditions leading to the development of "take-all patch". Does it start in the cool weather and remain a minor disease until the soil and/or air environment changes? Does it

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