

(Patch Diseases cont'd.)

The development of Rhizoctonia yellow patch is favored by cool wet weather. The primary temperature range in which the disease is most active is 40 to 60 degrees F. When the leaf symptoms are in the early chlorosis stage of development, if the air temperatures drop below 40 degrees F. or go above 75 degrees F., these symptoms will disappear. However, if the temperatures stay within the 40-60 degree range, the disease will progress to foliar blighting.

Since many of the field symptoms of Rhizoctonia yellow patch and necrotic ring spot overlap, and both diseases can occur in the same location and at the same time of the year, confirmation of the diagnosis by laboratory examination of crowns and roots of diseased plants for the presence of the characteristic Rhizoctonia mycelium is advisable.

Attempts to control Rhizoctonia yellow patch with applications of fungicide have met with little success. Research at Ohio State University has shown that 'Adelphi', 'Cheri', and 'Touchdown', Kentucky bluegrass are highly resistant to this disease.

Summer Patch Diseases

Fusarium Blight

Many species of Fusaria are found in association with stands of turfgrass. Only three of these, however, have been shown by research procedures to be pathogenic to turfgrass plants. These are (i) **Fusarium nivale**, the incitant of the winter disease, Fusarium patch, and (ii) **Fusarium culmorum** and **Fusarium poae**, the incitants of the warm weather patch disease, Fusarium blight. All of the other Fusarium species that are commonly isolated from turfgrass have been shown to be either non-pathogenic or at best very weakly pathogenic. This means that they can not function as primary parasites of either leaves, crowns or roots. In order for a warm weather patch disease to be diagnosed as Fusarium blight, then, either **Fusarium culmorum** or **Fusarium poae** must be present in the diseased tissue. If one of these two species is not present, then the disease in question is not Fusarium blight.

Fusarium blight is a major disease of Kentucky bluegrass, bentgrass, tall fescue, red fescue and ryegrass. The total pathology of the disease consists of two phases: (i) a direct blighting of the leaves, and (ii) a crown and root rot. All turfgrass species are vulnerable to the crown and root phase of Fusarium blight, but the impact of this aspect of the disease is more pronounced on ryegrass and tall fescue. One of the economic impacts of Fusarium blight in tall fescue sod production is the reduction in the size of the root systems to the extent that even though the plants may not be showing foliar symptoms, the sod shatters when lifted.

The better known foliar symptom for Fusarium blight is the so-called "frog-eye" pattern. In field diagnosis, however, it is important to keep in mind that this symptom pattern is not always present. Also, at least two other warm weather patch diseases, Pythium blight and Rhizoctonia blight (brown patch) can develop very pronounced "frog-eye" patterns — particularly under fairway and tees cutting heights.

Fusarium blight can be very destructive to bentgrass under putting green management. On putting greens, the disease first appears as tan to light brown, irregularly-shaped areas 2-3 inches in diameter. Under favorable weather conditions, these patches will develop into irregularly shaped areas of blighted grass

(cont'd. page 14)

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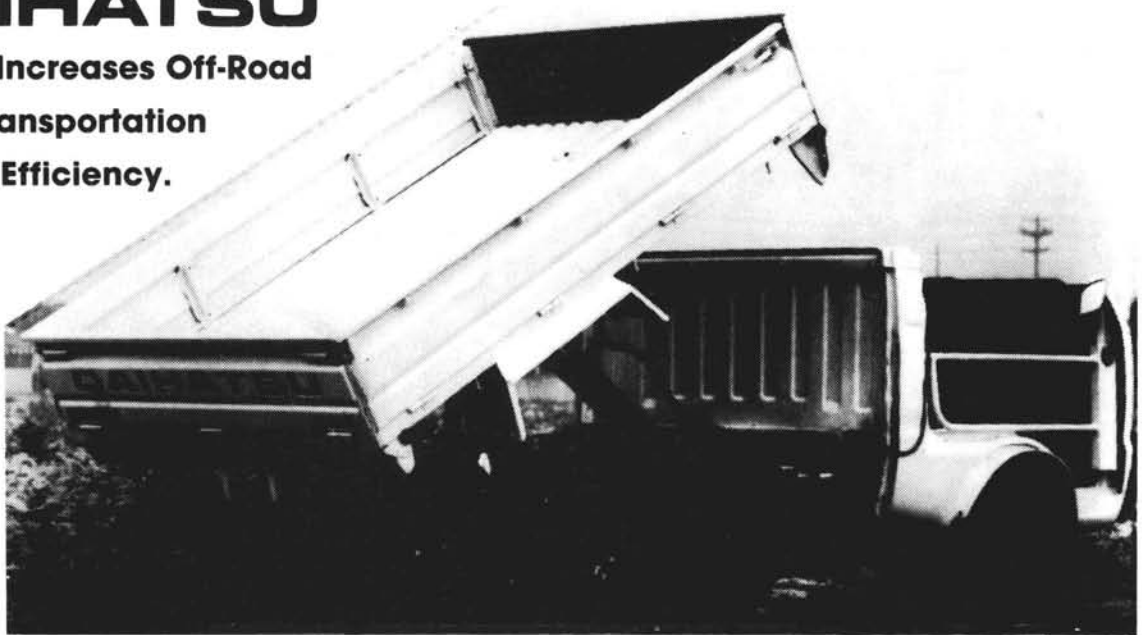
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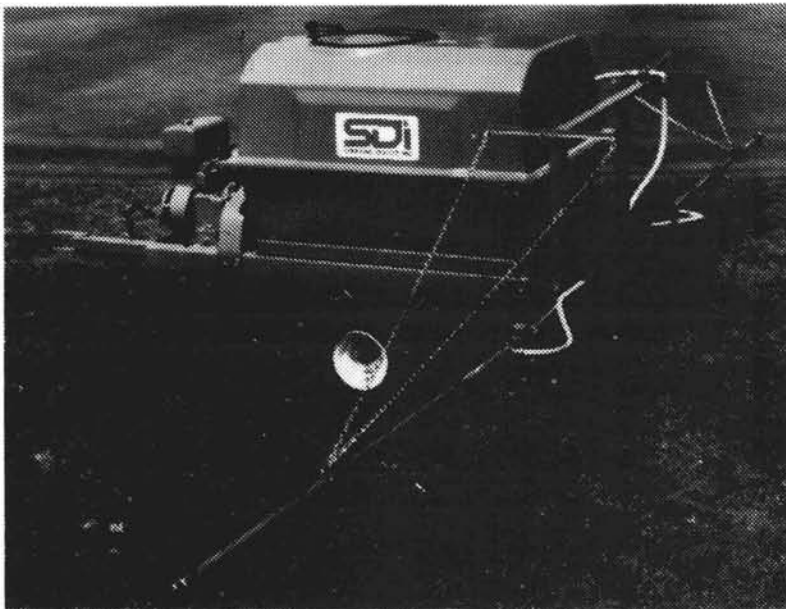
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Midwest Breezes



The deepest sympathy of the members of the Midwest Association of Golf Course Superintendents is extended to the Grotti and Rack families due to the death of Charles Rack in late May and Dominic Grotti in early June.

Upcoming Events — Mark Your Calendar

July 8th — MAGCS Monthly Meeting at Deer Path G.C. in Lake Forest

July 17th — University of Illinois Field Day at Urbana Turf Plots

August 7th — Illinois Landscape Contractors Association Summer Field Day at Kishwaukee College, Malta, IL (6 miles west of Dekalb). This is the site of the "All American Vaughn Trial Gardens"

August 12th — Change of date ... MAGCS Meeting at Briar Ridge C.C., Dyer, IN

September 9th — MAGCS monthly meeting at Aurora C.C. (tentative)

September 19-24 — GCSAA Mid-Year Turfgrass Conference & Show, Indianapolis

November 10-12 — Penn State Turf Conference, State College, PA

November 12th — Midwest Clinic at Medinah C.C.

“July”

Fire Cracker time once more,
Summer's closing Springtime's Door.
Heat and Humidity will reign supreme,
Revealing the perils of Summer's scheme.
With Disease and Insects in carefree folly,
Let's Pray we weather the Storm by golly.
Our Quest, to conquer Summer's Treason,
For within lays the Golfing Season.

Kenneth R. Zanzig

Dominic Grotti January 3, 1909 — June 6, 1985

Born in Fanno, Italy, Dominic lived there till he was 8. During World War I, Dominic and his family came to the U.S. and settled in Pine Ridge, IN. In order to help his family, Dominic quit school after the 7th grade to take a job in the coal mines. In the early 30's Dom started his career working at Columbia C.C. in Wheeling (now Chevy Chase). In 1933 he took a job at Sunset Ridge C.C. for 45 cents an hour and quickly moved up the ladder till he became head greenskeeper in 1942. For the next 36 years Dominic maintained one of the finest golf courses on the North Shore. In 1978 he retired but lived on at the golf course until 1981 when he and his wife moved to Highwood.

Submitted by: Dennis Wilson

What a shame that Dominic didn't live to see all his old friends when they played Sunset Ridge on June 17th. Dennis Wilson had the course in "Dominic condition" with not a blade of grass out of place. There were 118 who played golf and 134 who came for a delicious dinner. It was a beautiful day on a beautifully conditioned golf course. The new 8th green which was just built this Spring was in great shape. What a pretty par 3 hole it is now.

“Thank You” from Herb Graffis

Dear Fred,

Thanks to all of you in the Midwest ancient and honorable and damned talented team for a birthday present that is a beautiful reason for celebrating. It is a philodendron nearly the size of a mighty oak and it shelters me in my study-library and/or office where I pen these lines, now that I no longer can see the typewriter keys.

Here my readers give me the score from **The Bull Sheet**, that family journal of the Midwest of so many years. From which pals of brother Joe and mine got many a fine valuable tip for "Golfdom" copy in the historic days when we all were growing up.

Now at 92, I can take oath in declaring that knowing the Midwest team and working with them and for them has been the best birthday present I ever could have had and again thanks to you all — and I'll now take a drink to all of you.

Blessings, Herb

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(Patch Diseases cont'd.)

up to 3 feet wide. If it is suspected that *Fusarium* blight might be present, a laboratory examination of the diseased grass for presence of *Fusarium culmorum* or *Fusarium poae* should always be made.

The new sterol inhibiting fungicides Bayleton and Rubigan are very effective in *Fusarium* blight control. The benzimidazole fungicides Tersan 1991, Fungo 50 and Cleary 3336 are also labeled for control of the disease. In areas with recurring *Fusarium* blight, for maximum effectiveness of control, the fungicide application should be made immediately after the first occurrence of night temperature that do not drop below 70 degrees F.

Summer Patch

To date, a hot weather dying-out condition of Kentucky bluegrass referred to as "summer patch" has been reported in New York. It has also been suggested that the disease may occur in other northeastern and in certain midwestern and north central states. Outbreaks of what is being referred to as summer patch develop during July and August during prolonged periods of hot, dry weather.

The symptoms reported for this disorder are irregular patches of dull tan to brown grass. The individual areas may be more or less circular in outline and extend up to several feet in diameter. Within the diseased stand of grass, there may be patches that show the basic "frog-eye" pattern of blighted grass with center tufts of apparently healthy plants.

Recent research at Cornell University indicates that summer patch might be brought on by periods of high air temperature stress and then the colonization of the weakened plants by the fungus *Phialophora graminicola*. This fungus species is commonly found in association with the root systems of grasses. It's potential for affecting the health of plants has been the subject of considerable research by plant pathologists in England.

The research in England has shown that *Phialophora graminicola* is a very weak pathogen. In fact when it is placed in the soil, it actually protects the turfgrass plants from take all patch (*Ophiobolus* patch). Also, when the soil is infested with *Phialophoa graminicola*, the growth rates of fescue and bentgrass are increased. This is thought to be due the fact that the fungus enhances nutrient uptake by the root system.

The laboratory and field research procedures described by the workers at Cornell University to bring about the death of Kentucky bluegrass by *Phialophoa graminicola* have been of the type that place severe stress on the plants. For example, in one series of pathogenicity experiments, the tests were conducted on Kentucky bluegrass field-grown sod cut at a depth of $\frac{3}{4}$ inch and then placed over a $\frac{3}{8}$ inch layer of soil in plastic containers. These plants were then held in growth chambers under a continuous day-night air temperature of 85 degrees F. for 15 weeks. During this time, the leaves were maintained at a $\frac{1}{2}$ inch cutting height. In view of the extreme stress placed on the growth systems of the plants in these tests, it is not surprising that *Phialophoa graminicola* switched from its normal role as a beneficial soil-inhabiting fungus to an active Kentucky bluegrass root colonizer.

The findings at Cornell University place summer patch in the category of turfgrass diseases known as Senescence Syndromes. The diseases in this grouping are caused by the combination of acute plant stress followed by colonization of the weakened

tissue by various microorganisms. In assessing what can be done to control these diseases, the first question that must be answered is whether or not the invading fungi or bacteria are actually compounding the acute stress-induced problem by introducing an added measure of tissue degradation, or if the initial environmental pressure was severe enough in itself to lead to the ultimate death of the affected leaf, crown or root system.

In view of (i) the research reports from England that show *Phialophora graminicola* to be beneficial to the growth and development of turfgrass and (ii), the work at Cornell that shows

an extreme stress must be placed on the Kentucky bluegrass plants in order to weaken them to such an extent that a major form of colonization by this organism can take place, it would seem reasonable to assume that summer patch is a product of environmental stress rather than the result of infection and colonization of the plants by either *Phialophora graminicola* or any other microorganism.

Professor of Plant Pathology, Department of Plant Pathology, Physiology and Weed Science, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061.

Table 1. Patch Diseases of Turfgrasses

Disease and Season of Occurrence	Susceptible Grasses	Incitant
<i>I. Winter</i>		
Spring Dead Spot	Bermudagrass	<i>Leptosphaeria korrae</i> in certain areas
Typhula Blight	annual bluegrass, Kentucky bluegrass, perennial ryegrass, red fescue, tall fescue	<i>Typhula incarnata</i> and <i>T. ishikariensis</i>
Fusarium Patch	annual bluegrass, bentgrasses, Bermudagrass, Kentucky bluegrass, red fescue, ryegrasses, tall fescue	<i>Fusarium nivale</i>
Sclerotinia Patch	Kentucky bluegrass, red fescue,	<i>Myriosclerotia borealis</i> perennial ryegrass
Winter Crown Rot	creeping bentgrass, Kentucky bluegrass, red fescue, tall fescue	<i>Coprinus psychromorbidus</i>
Frost Scorch	Kentucky bluegrass	<i>Sclerotium rhizodes</i>
<i>II. Spring and Fall</i>		
Necrotic Ring Spot	bentgrasses, Kentucky bluegrass, tall fescue, red fescue, chewing fescue, ryegrasses	<i>Leptosphaeria korrae</i>
Take-all Patch (<i>Ophiobolus</i> Patch)	bentgrasses, Kentucky bluegrass, red fescue, ryegrasses, tall fescue	<i>Gaeumannomyces graminis</i> var. <i>avenae</i>
Rhizoctonia Yellow Patch	creeping bentgrass, Bermudagrass, Kentucky bluegrass, tall fescue, zoysia	<i>Rhizoctonia cerealis</i>
Corticium Red Thread	bentgrasses, Bermudagrass, Kentucky bluegrass, red fescue perennial ryegrass	<i>Laetisaria fuciformis</i>
Liminomyces Pink Patch	Red fescue, perennial ryegrass	<i>Liminomyces roseipellis</i>
<i>III. Summer</i>		
Fusarium Blight	bentgrasses, Bermudagrass, centipedegrass, Kentucky bluegrass, red fescue, ryegrasses, tall fescue	<i>Fusarium culmorum</i> and <i>F. poae</i>
Sclerotium Blight	creeping bentgrass, Bermudagrass, Kentucky bluegrass	<i>Sclerotium rolfsii</i>
Pythium Blight	bentgrasses, Bermudagrass, Kentucky bluegrass, red fescue, ryegrasses, tall fescue	<i>Pythium ultimum</i> and <i>P. aphanidermatum</i>
Rhizoctonia Blight (Brown Patch)	annual bluegrass, bentgrasses, Bermudagrass, Kentucky bluegrass, red fescue, ryegrasses, St. Augustine- grass, tall fescue, zoysia	<i>Rhizoctonia solani</i>
Melanotus White Patch Summer Patch	tall fescue Kentucky bluegrass	<i>Melanotus phillipsii</i> A senescing plant syndrome

Concepts in Golf Course Design

by Dr. Michael J. Hurdzan, President
American Society of Golf Course Architects

Every talk on golf course design should begin with a reading of the following passage:

GOLF

Golf is a science, the study of a lifetime, in which you may exhaust yourself but never your subject. It is a contest, a duel, or a melee, calling for courage, skill, strategy and self-control. It is a test of temper, a trial of honour, a revealer of character. It affords a chance to play the man and act the gentleman. It means going into God's out-of-doors, getting close to nature, fresh air, exercise, a sweeping away of mental cobwebs, genuine recreation of tired tissues. It is a cure for care, and antidote to worry. It includes companionship with friends, social intercourse, opportunities for courtesy, kindness and generosity to an opponent. It promotes not only physical health but moral force.

D. R. Forgan

Notice that this was written by D. R. Forgan of the Forgan family who were famous club makers in Scotland since the middle 1800's. In fact this passage on "Golf" was written about the turn of the century - 80 or 90 years ago. Much has changed in golf since 1900 including golf equipment, the golf swing, the golf course, and certainly standards of maintenance; but Forgan's description of this great game is as valid today as it was when he wrote it. The point is that the **SPIRIT** of golf is the same, it has not changed, and under close inspection the spirit of golf course design has not really changed either. Some have tragically abused it, but this is more out of ignorance about the true concepts, then it is a premeditated maliciousness. So the purpose of this paper is to discuss golf course design concepts in the time parameters of yesterday, today, and tomorrow; and to give you some ideas that might apply to your golf course. But before I begin this discussion we should restate some obvious facts for they are important and should be kept in mind.

First it must be stressed that maintenance is more important to the golfer than is design. Given a choice between a well designed but poorly maintained golf course, or a poorly designed but well maintained one, the golfer will nearly always choose the best maintained. Secondly, it should be remembered that maintenance has a greater influence on the difficulty and speed of play of a course than does design. When greens are kept fast, fairways lush, roughs long, and sand bunkers soft, you can bet the golf course will play difficult and slow. And lastly it is the subtleties or nuances of a golf course, such as flowers, shrubs, selected tree plantings, tee accessories, etc., that make a golf course memorable and enjoyable. Then in summary this means that the golf course superintendent exercises far greater impact on the golf course and the golfer than does the designer. Hence he should be aware of his power and responsibility and likewise he should be given full credit for making a round of golf an enjoyable experience. (By the way, these influences of the golf course superintendent are also 100 or more years old for in researching old magazines for a history book on golf architecture I am writing, I continually find references made to the great condition of this or that course with only occasional mention of the design.)

The place to start to examine golf course design is perhaps

the oldest and, in my opinion, the greatest golf course in the world, the Old Course at St. Andrews, Scotland. This course is a product of 600 or 700 years of golfers trudging those sandy links, and so rather being designed, it evolved with the game itself and hence it is the touchstone for design principles. At the Old Course, the basic rule is that the hazards for the drive are on the right side of each hole, and the hazards at the green are on the left or middle left. This means that if you risk the hazards on a drive down the right side, then you are rewarded by an easier approach to the green than the left side driver. Although this may be a bit too simple, it does illustrate that what makes St. Andrews so great a challenge is a complex system of risks and rewards. This is the key element in all golf course design - a finely tuned balance of **RISKS AND REWARDS**. In addition the penalty should match the crime while always recognizing the average golfer's margin of error with each particular golf shot.

So the **spirit** of St. Andrews "Old" Course is a system of risks and rewards that demands strategic planning of your golf shots. You must think ahead and not just hit the ball down the middle all of the time.

"Well, how does all of this apply today?" you may ask. The answer is that the most enjoyable golf courses to play demand the golfer be able to apply a precise balance of **skill, strength, and strategy**. So all golf course design must provide the opportunities for this to occur by producing a system of hazards and safe areas that can be managed by all golfers.

This process begins by analyzing the green or green site, determining what are the margins of error permitted around this green, selecting a fair distance to approach the green then working backwards to determine where a fair approach shot must be played from, and then defend or improve it. In short it means laying a golf hole out from the green back to the tee, which was how the first golf course architects did it.

Since the golf green is the key element in this process, that is where this discussion should now focus. But here is where we must also remember those obvious facts I mentioned earlier, you remember -

- 1) conditioning is more important than design.
- 2) the superintendent controls conditions.
- 3) the superintendent should get the credit or blame.

Thus if condition is so important, the golf green must be designed with maintenance in mind, which means good surface and subsurface drainage, a compaction resisting soil mix, sufficient cupset space, enough collar area to accommodate maintenance equipment, maintainable slopes outside the green, and a design and placement of bunkers so they fairly protect the green but far enough away to reduce accumulations of blasted sand, confining of foot traffic, and eliminate drying out of putting surfaces through super-heated bunker faces.

Having been trained and worked as a golf course superintendent, we know these factors well and believe that a green can be designed which will meet all of these criteria. The general guidelines are as follows:

1. at least 4,200 sq. ft. of **usable** cupset area with a total green size of around 6,000 ft.²
2. a free-form design of the green with 75%-80% of it not seriously defended by hazards but 25%-30% of it is strongly defended.
3. surface drain the green in 3 or 4 different directions with interior slopes of 2%-4%.

(cont'd. page 18)

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4. tile drain entire putting surface on 15'-18' centers and build with a high infiltration rate material (at least 8"/hour).

5. mounds should "bleed" out into the putting surface and bunkers should be no closer than 12 feet to putting surface.

These are only general guidelines that can be occasionally modified. But where the skill of the golf course architect comes in is in knowing what is a fair target area within a green, how to defend it, and how to present it to all golfers of all skills. This topic can not be explained in a paper and some golf course designers work an entire lifetime without ever understanding it. It is not magic either, but rather it is a process that requires knowing how all golfers react to a given shot, knowing their probability of hitting various targets with various clubs under varying conditions, and then adjusting risks and rewards in an artistic framework. This ability rests more on experience than on intellect.

This does not mean that the golf course superintendent can ignore these intrinsic factors but rather it **requires** that the superintendent try to understand the design intent, and adjust maintenance to enhance it. This means understanding speed and slope relationships within the putting surface and keeping putting a skillful pursuit; instead of just mowing as short as possible and making it a test of luck. The same can be said of the width of fairway landing areas, the length of rough and collar grasses, and the softness of bunker sand, etc. The goal of maintenance should be to make the game more fun not more difficult.

In the future I believe that golfers will place more emphasis on having a total outdoor environment rather than just a place to play golf. They will expect to see mini-landscapes integrated into the golf course such as flower beds, rocks, waterfalls, wooden walls, ornamental trees and shrubs, etc. In America we have normalized the golf car and golf car paths, so much that the naturalness found in linksland would be foreign. This situation may be either good or bad depending on your point of view. It may be good in that it allows the superintendent to be artistically expressive through the location of these landscapes and the materials he uses. It will force us to learn more about all plant materials and not just turf and trees so we become more multi-dimensional professionals. On the negative side it requires more work, study, and money to meet these expectations. If you believe this trend is inevitable, as I do, you should begin now using and learning about these materials.

A basic rule that I follow is to use formal plants and devices in formal settings such as around tees, walks, signs, ball washers, structures or bridges, etc.; and informal plants out on the golf course proper. Formal plants and devices are such things as flower beds, steps, garden or hybrid flowers, landscape shrubs, and any kind of planting you commonly see around homes. Informal plants and devices refer to ornamental grasses, wildflowers, meadow grasses such as hard and sheep fescues, prairie grasses, such as blue gramma, buffalo grass, and wheat grasses. Properly used these items can make your golf course distinctive and easier to care for.

In summary I would emphasize:

1. condition is more important than design.
2. make the golf course fun not difficult.
3. be fair to all skill levels of golfers.
4. make the golf course a visual experience through landscape techniques.

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The Role of the Assistant Superintendent

by Peter V. Leuzinger, CGCS

St. Charles Country Club, St. Charles, IL

Everyday experiences are fun to share. I know a story or two involving Assistant Superintendents that some people in the golf business can relate to. The first is about the frustrations of dedication. Our young assistant was at home enjoying an outdoor barbecue with his family when he received a phone call early Sunday afternoon. "There is a serious problem with the irrigation system! We can't reach the Superintendent. Could you please come to the club? There is water leaking near the tennis courts."

Not overly concerned, the assistant excused himself from the party and drove to the club to find a four inch main spewing twelve hundred gallons per minute of water across the tennis courts, the parking lot, down the hill, and over the first fairway. It didn't take him long to shut the system down and isolate the main. He surveyed the damage and decided to return in the evening to make repairs so the irrigation schedule for the entire course could be met. The course was very dry and three holes would be without water with this section of the system out of commission.

He returned to the scene an hour before sundown that evening. Working conditions were poor, at best. The huge hole made by the main's rupture was still full of water. After sloshing around in the mud until two a.m. in the morning, with only dim headlights from the '66 Chevy Pickup, the young assistant crawled out of the hole, covered with mud, satisfied that the temporary repair would hold long enough to complete the irrigation on his three holes. He returned to the pump house to resume irrigation, but noticed the sun had disappeared behind some clouds.

Leary of the situation, (thunder to the west and a fresh repair that could let go), he waited in the office. By three a.m. a one and a half inch cloud burst sufficiently watered the rest of the golf course and the remaining irrigation program was cancelled! (Oh well, "at least the irrigation reservoir filled up again.")

The second story points out where blind ambition can get the assistant in his efforts to impress his Superintendent. They had been discussing a crowded work schedule and their inability to get the fairways fertilized this past week. (It so happened that this particular assistant was bucking for a raise. He loved his work, liked his boss, but that didn't put bread on the table.) Something extra had to be done for the fairways. They were not in top condition and the tournament was just around the corner. Everyone had gone home except the ambitious Assistant Superintendent. He would single-handedly fertilize the fairways and water them in. Some four hours later, three and a half tons of fertilizer had been applied to the fairways. It was perfect. He had come within a bag or two of proper calibration. Driving up to his last irrigation controller, he swelled with pride thinking no one else could have done it better. Having started up the last fairway irrigation controller, he popped his keys into his rear pocket only to look up and see his tractor roll down the hill and smack squarely into the sturdy Hickory tree guarding the lake.

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