MIDWEST BREEZES

Harold Frederickson, Supt. of Edgewood Valley C.C., is renovating the no. 3 fairway. The fairway was sliced in two directions, making it easy to peel back the sod to be picked up. The fairway is being recontoured and then seeded with an 80% rye grass blend and 20% penncross. Harold starts his construction projects early so that by October 1st he can start his vacation.

Elmhurst C.C. have played host to ABC Network Corp., Merchantile Exchange, and many other prestigious golfing groups. This is no different than any other year for golf Supt. Tom DiGuido in renovating fairways that again were flooded by the Salt Creek basin. Tom's new book, "The Use of an Ark on a Golf Course", will soon be ready for publication.

Howard Baerwald is Supt. at La Grange C.C. for 31 years. He will be meeting with the Greens Committee to prioritize capital improvement projects for the fall. Howard reminds us that every year is a learning experience. Mother Nature is unpredictable as ever and gives us vigor, simuli, fungi and ...

Congratulations to Marilyn and Phil Taylor on their newborn baby boy, 8 lb. 15 ozs. Joseph was born at 4:00 A.M. on July 15th. Phil is Director of Golf Operations at Sugar Creek Golf Club in Villa Park. Marilyn and baby are doing fine. Phil has not been to work since the delivery. Rumor has it, Phil is giving Joseph golf lessons so he will be ready for the Tour in 1995.

Dudley Smith and Dave Behrman made it the U. of I. Field Day, just in time to eat lunch and visit the collegiate pub. Dave at least picked up the educational material in order to have something to read on the way home. U. of I. is growing bentgrass taken from Dudley's putting greens. The bentgrass never looked so good. Dudley, it's Turf in the morning and Trees in the afternoon.

August meeting was at Ridge C.C., hosted by Sean Daley. There were 48 for golf and 71 for dinner. Roger Brown, representing The Andersons Company, provided the educational session with a presentation on sulfur coated urea products. Dr. Bill Daniels, Purdue University, spoke on What Good Will Come From This Season's Extreme Heat. "Maybe new jobs".

Annual Meeting of MAGCS will be October 24th, 1983 at the Cyprus Inn, Hinsdale, IL.

Our next meeting will take place at the St. Charles C.C. on September 12, 1983. A buffet lunch will be served at 11:30 A.M. with a shotgun start at 1:30 P.M. Cocktails and hors d'oeuvres will be served while the golf prizes are awarded. This event is limited to the first 128 golfers to register. Please no guests at this meeting. When making reservations, all names of foursome must be reserved at that time.

Jim Johns at Northmoor C.C. is looking for an old Toro Dump tractor with overhead valve motor. Doesn't have to run, but must have all the parts. Call him at 432-6730.

Plan now to attend the North Central Turfgrass Exposition starting November 1-2-3, 1983 at the Arlington Park Hilton, Arlington Heights, Illinois. Dr. Joe Duich will be the keynote speaker on November 1st. More details later.

Dr. Dave Wehner addresses crowd at the opening of the Illinois Turfgrass Foundation Field Day

I.T.F. GOLF DAY

The 1983 I.T.F. golf day will be held on September 19 at Turnberry Country Club in Crystal Lake. Donations for the day is $50.00. This includes: golf, cart, locker, prime rib dinner, raffle and door prizes. Tickets for dinner only are available for $25.00. All proceeds go to turf research in Illinois. This is a fun event for a worthwhile cause and we'd like to see a big turnout this year. Bring your friends, greens chairmen or just yourself and enjoy a nice day. Tickets can be purchased from Don Spier, John Lebedevs, Jim Reed, Greg Oltman, Jim Halloran or Mike Nass.

Mark October 3rd, 1983 on your calendar for the October meeting of MAGCS. Dan Murray, Kishwaukee C.C., DeKalb, IL will be our host. Dan has had trouble with flooding on his course (seems alot of us have had that problem) and after trying seeding with the normal bluegrasses, bents, and ryes with no success he planted bermuda. He is quite pleased with the catch he got in the flooded areas when everything else failed him. Maybe more of us should look into this in those special problem areas when we find it hard to get the normal grasses to germinate.

Congratulations to Bob Kronn, Supt. at Rolling Green C.C. for doing so well in the Illinois Open which was held at Elgin C.C. in July.

With the passing of Ray Gerber, Fred Opperman assumed the duties of Editor of **The Bull Sheet**. All correspondence should be directed and sent to Fred Opperman, 1022 Shady Lane, Glen Ellyn, Illinois, 60137. Phone calls should be made to (312) 469-3444 which is the new number for **The Bull Sheet**. Calls can be made anytime since there will be an answering device used to insure that all calls and messages are received.

Pete Leuzinger has informed me that we are tentatively set to sponsor another GCSAA Seminar at Pheasant Run in January on the 10th and 11th. The topic will be Turfgrass Diseases and will be taught by Dr. Couch and Dr. Larsen.

The deepest sympathy of the members of the Midwest Association of Golf Course Superintendents is extended to the Hopphan family due to the death of Carl's wife, Norma, who passed away on August 9th, 1983.

PESTICIDE USE — ENVIRONMENTALISTS GOVERN

The safe use of pesticides is an important tool for effective turfgrass management. Our industry depends on the availability of these materials as well as arborists and indoor pest control operations. The regulations associated with pesticide use, especially state certification, has made it harder for just anyone to apply pesticides, and hopefully the more responsible and trained personnel are licensed to apply them. These regulations we can live with.

Recently in Lake County, Illinois, an environmentalist group called the Lake County Defenders have been pushing against the use of pesticides. They are attending village meetings and "educating" people on the dangers of pesticide use. In the "News Sun" of Lake County, a local newspaper, the executive director of the Lake County Defenders was quoted as saying, "You know what Agent Orange is? It's the same stuff you can go into the store and buy right off the shelf, and it's called Ortho Weed-Be-Gone." The sad part is village board members are listening. In the Village of Wauconda, Lake County, Illinois, an ordinance was passed which affects all industries using pesticides. The Lake County Defenders' executive director played an important role in the approval of the ordinance. To summarize the articles which pertain to the Golf Course Superintendent:

Section I: 3) User of Pesticides who is the landlord or Tenant of a building to which the public is invited for the sale of goods or services, included but not limited to food dealers, liquor dealers, **exhibitors of athletic events**, carnivals, cinema, billiard and pool halls, bowling alleys, and public dances.

Section IV: A person not otherwise subject to the requirements of this ordinance who applies pesticides in the board definition as used by this ordinance, to an area less than 5,000 square feet but more than 1,000 square feet by spraying, fogging, dusting or dragging, shall be required to insert warning signs every 75 feet of frontage which warning signs must protrude 18 inches above the grass lines. The warning signs must be of a plastic, metallic or other material which will not decompose with rain and said warning sign must be rectangular and be at least 8 inches by 6 inches. The information on the sign must be as follows in black letter on a white field with a red border and shall be as follows:

A. The name of the company providing the pesticide or if no company the name of the person having done the spraying.
B. The name of the chemical, such as Two-Four-D or Dursban and diazinon or other chemical as the case may be (in red lettering).
C. The day and time of application.
D. Keep children and pets off this lawn until after the first rainfall, or 72 hours have elapsed.

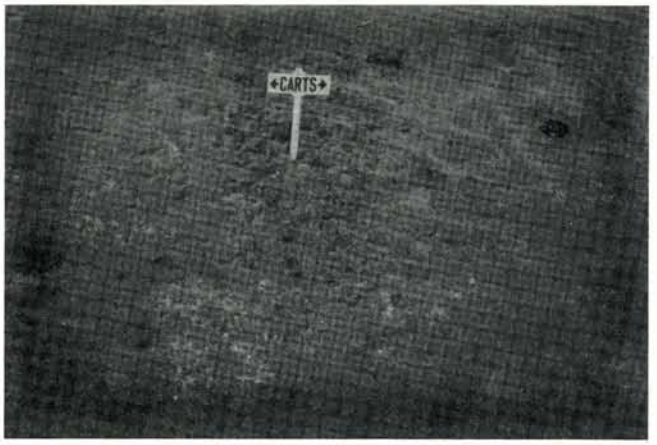
Said sign shall be inserted on the lawn no closer than 2 feet of the sidewalk or right of way and no further than 5 feet from the sidewalk or right of way.

I feel that enforcing this law will be difficult and if need be we could all comply. But will the next ordinance be a total ban on pesticide use in Wauconda? We as a group attended the village meeting the evening the ordinance was passed to comment on it. Unfortunately, they voted on the ordinance before they would hear comments and discussion. The board said all comments and discussion had taken place at the previous meetings. How are we to know when these meetings are discussing such subjects? Do we as an industry need to have a representative at every town meeting in every village

Continued

to protect against such local legislation?
A few new groups have been formed to protect our industry against anti-pesticide forces: the 2,4-D Coalition, headed by Dr. Robert Miller, Vice-President of Chemlawn Corporation, Columbus, Ohio, and the National Environment Law Foundation (NELF) headed by John Kenney, President, Turf Doctor Inc., Framingham, Massachusetts. Although the lawn care industry is directly affected by anti-pesticide lawns, and we are working to fight against them, we need your support in the golf course industry to help protect your needs and interests. You will be hearing more about the 2,4-D Coalition and NELF. Please join and support these organizations to help maintain reasonable pesticide policies.

Jim Mello, Agronomist
Nice'n Green Plant Foods, Romeoville, IL



The job of greenkeeping pictured above shows pythium and cart damage during the July and August stress. If it hasn't been wilt, it's wet wilt, if not that, it's been grubs, or a pump that went out, or pythium. This past summer it has been all of the above and more. But as you read this it will be all past history and all we will have to do is grow grass, and LOTS of it with this past season.

OAKS: OAK WILT

This disease appears during drought or other stressful conditions. Red and black oaks (the ones with sharp-pointed leaves) wilt, curl slightly, and drop leaves in large numbers starting in the upper crown of the tree. The leaves turn pale green, bronze, or tan, starting at the margins. Red and black oaks will wilt and die within several weeks. Brown to black streaks usually develop in the young sapwood of wilting branches. White and bur oak (the ones with rounded or lobed leaf edges) symptoms are brown, curling, and dying leaves that remain attached to the branches. Infection generally occurs in scattered branches of the crown. Infected trees may die in one year but usually die back slowly over a period of several years or more (becoming "stagheaded"). Sapwood discoloration, which is common in red and black oaks, is rare in white and bur oaks. CONTROL: There is no cure for oak wilt. All we can suggest is: (1) avoid pruning or otherwise wounding trees during the growing season when the sap is flowing; (2) promptly cover all wounds with a tree-wound dressing; (3) break root grafts by cutting the roots mechanically or by applying Stauffer's Vapam Soil Fumigant in a series of holes midway between the healthy trees and those that are actively wilting or are suspected of being diseased; (4) in forests and woodlands, poison all oak trees that are within 50 feet of trees infected with oak wilt.

Extension service, U. of I.

GROWTH AND DEVELOPMENT

In the last issue of the ITU, I began a series on basic concepts in turfgrass science. The first article in this series covered the germination of the seed and the early stage of seedling growth. In this issue, I will continue to describe the growth and development of the turfgrass plant.

For the purposes of this presentation, consider the newly emerged seedling to be made up of two parts, the root system and the shoot system. The root system shortly after germination is composed of the primary or seminal root system. This root system is active for only a few weeks and is composed of only a few roots. Approximately two weeks after germination, the seminal roots start to decay and the plant starts to develop what is called the adventitious root system. The adventitious root system is so named because it does not arise from root tissue but rather from stem tissue. The adventitious roots, located at the base of the shoot, serve the plants needs for the rest of the plant's life. This system is characterized by extensive branching and is very fibrous in nature. One researcher, who examined the root system of Kentucky bluegrass, found that in one cubic inch of soil there were 2,000 roots with 1,000,000 root hairs. The cominbed length of all the roots was 4,000 feet and the surface area of the roots amounted to 65 square inches.

Turfgrass species have either an annual or perennial root system. This means that some species regenerate almost their entire root system every year while others, with a perennial root system, retain a portion of their roots on a year-to-year basis. All roots have a limited life span; the perennial vs. annual designation refers to the time period over which the roots are regenerated. Perennial ryegrass has an annual root system while Kentucky bluegrass has a perennial root system. Research done in Texas has shown that bermudagrass has an annual root system and that when the plants are greening up in the spring, there are very few roots to support the new top growth. The tops actually start growing before there is an adequate root system.

As would be expected, there are many factors that affect the extent of rooting of a turfgrass plant. The environmental factors that affect rooting include the soil temperature and pH, the oxygen status of the soil, the fertility level of the soil and the presence of salts. Also important are the cultural practices that are imposed on the plants including mowing height and nitrogen fertilization. The root system is less extensive when turf is mowed very close or when high levels of nitrogen are applied.

There is a facility at Ohio State University to study the rooting of turfgrass plants. This facility, called a rhizotron, is composed of an underground room housing root observation boxes. The boxes are filled with sand and plants are seeded or sodded at the surface of the box which is flush with the surrounding area. Because the room is underground, the roots can be observed while they are exposed to natural growing conditions. The Ohio State research has shown that the major root growth period for perennial ryegrass, tall fescue, creeping bentgrass, and Kentucky bluegrass was during mid-March to the end of April. Interestingly, the root growth of annual bluegrass was severly reduced at the beginning of April. This reduction corresponded with the period of seedhead formation. The researchers suggested that the food supply normally going for root growth was diverted to produce the annual bluegrass seedhead. Comparison of several turfgrass species revealed that, on April 15, perennial ryegrass had the deepest root system at 13 inches followed by tall fescue at 10.6 inches, creeping bentgrass and Kentucky bluegrass and 6.3 inches, and annual bluegrass at 3.5 inches. As expected, the root growth rate declined during the summer and increased again in the fall. The growth rate in the fall was less than that for the spring.

The shoot system of a turfgrass plant is termed a compound shoot system since it is made up of a single repeating unit called the phytomer. The phytomer consists of the leaf blade and sheath and a bud at the base of the leaf sheath. Furthermore, the shoot of a grass plant does not have elongated internodes so that the phytomers are stacked on top of each other. By holding a turfgrass plant in your hand and peeling back the leaves one can get the concept of the phytomer and the compound shoot system. The leaves that are pulled off will consist of the blade and sheath, the bud located at the base of the sheath will either not be visible or will have developed into a tiller, rhizhome or stolon. A good way to understand the growth of the shoot system is to visualize a collapsable telescope that is made up of a series of concentric rings where the eyepiece is the innermost and smallest ring. The youngest leaf of a turfgrass plant can be compared to the eyepiece of the telescope. The oldest leaf of a turfgrass plant corresponds to the outermost section of the telescope. As a new leaf begins to grow, it emerges from the leaf sheath of the next oldest leaf. The growth of the leaf is due to meristems located at the base of the leaf blade and leaf sheath; these meristems are called intercalary meristems (a meristem is an area of the plant where new cells are produced by division of older cells, intercalary meristems are meristems located away from the apical meristem or pirmary growing point of the plant). The ability of a turfgrass plant to withstand mowing is because their apical meristem is removed during the mowing process. The leaf of a turfgrass plant cannot grow indefinitely, once it has reached full expansion, it will stop growing and will remain below the mowing height. The newest growth is always removed during mowing.

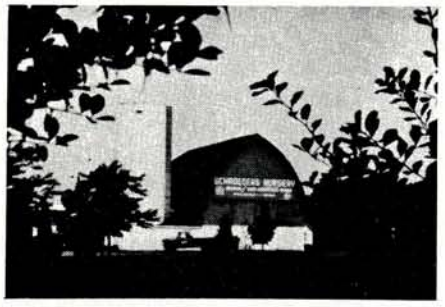
As was stated earlier, the phytomer or building block of the shoot is composed of the leaf blade and sheath and a bud at the base of the leaf sheath. This bud can either remain dormant or develop into a intravaginal or extravaginal tiller. The terms intravaginal or extravaginal refer to whether the new tiller remains inside the leaf sheath of the previous leaf (intravaginal, sometimes referred to bunch-type growth habit) or penetrates the leaf sheath and developes into a stolon or rhizome (extravaginal, sometimes referred to stoloniferous or rhizomatous growth habit). All turfgrass species have intravaginal tilling while some species have extravaginal tilling in addition. Perennial ryegrasses has only intravaginal tilling while Kentucky bluegrass has intravaginal tilling and extravaginal tilling in the form of rhizomes. Extravaginal tilling can sometimes be seen on plants that do not normally have this type of tilling in a turf situation. For example, I have seen rhizomes on tall fescue space-planted in a breeder's nursery.

Dr. Dave Wehner, U. of I.

JOB OPENING

Bartlett Hills C.C. 18 hole municipal course. Send resume to: Dick Warner, c/o Bartlett Hills C.C., 228 S. Main Street, Bartlett, IL 60103. Position to be filled by December 31, 1983.

Schroeder's Nursery, Inc.



TREES - EVERGREENS - SHRUBS

Specializing in large Caliper shade trees and Ornamentals.
We also offer complete installation service.

TELEPHONE: (312) 546-9444

Richard A. Schroeder
Don Virgens
Carl Dravis

GRAYSLAKE, ILLINOIS
23379W Route 60
Nursery on Rt. 60 between Rtes. 12 (Volo) and 83 (Ivanhoe)

Nels J. Johnson, Tree Experts, Inc.

SINCE 1930

Nels J. Johnson, Sr.
Nels J. Johnson, Jr. - Karl G. Johnson
Complete, economical tree service for Private Estates, Parks, Municipalities, Golf Courses, Cemeteries, Schools, Industrial Areas.

All phases of Arboriculture, Diagnosing, Pruning, Treating, Transplanting, Fertilization, Hydraulic and Mist Spraying. Removals. Stump Routing. Municipal Forestry. Chemotherapy for elms, and other trees.

• *FULLY INSURED* •

Graduate -- Licensed Arborists

MAIN OFFICE - 912 Pitner Avenue, Evanston, Illinois 60202
Phones: GReenleaf 5-1877 - GR 5-5255
Hinsdale, Illinois - FA 5-0970

LABOR-SAVING GRASSES

GLADE KENTUCKY BLUEGRASS

- Does Great in Sun Or 60% Shade
- Excellent Disease Resistance to Powdery Mildew — Stripe Smut — Leafspot — Rust
- Quick Recovery — Fast Germinating

Adelphi KENTUCKY BLUEGRASS

- Low Growing — Tolerates Close Mowing
- Greens Up Earlier in Spring — Stays Green Longer In Fall
- Great Resistance To Disease

CITATION FINE LEAF PERENNIAL RYEGRASS

- Performs Great In Hot, Humid Areas
- Improved Mowing Qualities
- Blends Well Wtih All Other Grasses

FOR MORE DETAILED INFORMATION AND TEST RESULTS WRITE TO:
VAUGHAN'S
5300 Katrine Avenue, Downers Grove, Illinois 60515, (312) 969-6300
WAREHOUSES LOCATED IN:
Bound Brook, New Jersey • Landover, Maryland • Ovid and Grand Ledge, Michigan • Spokane, Washington

PAARLBERG CHEMICALS
featuring

- Par-Ex Fertilizer
- Vertagreen Fertilizer
- Du Pont Chemicals
- Chipco Chemicals
- Daconil - Dacthal
- Bean Sprayers
- All Major Turf Supplies

Quality • Value • Service

1840 E. 172nd St., So. Holland
312—474-3086 312—258-3485

The best in turf supplies -
LESCO 100% Sulfur-Coated Fertilizers,
golf course accessories, chemicals including

LESCOSAN

A highly effective pre-emergence
(800) crabgrass and poa annua control (800)
321-5325 362-7413
NATIONWIDE Available from: IN OHIO

LAKESHORE EQUIPMENT & SUPPLY CO.
"Home of LESCO Products"
300 South Abbe, Elyria, OH 44035

McGinty BROS., INC.

LAWN CARE
Weed, Crabgrass and Disease Control/Fertilizing

TREE CARE
Tree Spraying, Feeding, Surgery, Trimming, Removal

HYDROSEEDING

RT. 2, BOX 518, LONG GROVE ROAD
LONG GROVE, ILLINOIS 60047 /(312)438-5161

MIDWEST REGIONAL TURF FOUNDATION RESEARCH OBJECTIVES FOR 1983

There is a continued interest in the development of new products or the re-development of old products that have had some success as controls for **Poa annua**. We have two years of test data using many compounds on a **Poa annua** - bent fairway at Highland C.C., Indianapolis, Indiana. We have looked at growth regulators as well as various pre- and post-emergent controls on **Poa annua**.

One concept that continues to be of interest in the growth regulator control of **Poa annua** is a combination of two growth regulators, EL500 and Embark. We made two applications in 1982 and one in 83. Rates have ranged from 0.25 to 1.0 lbs. of EL500 plus 0.12 to 0.25 lbs. ai/A Embark. We have found that a range of rates of 0.25 to 0.5 EL500 plus 0.25 Embark gave a gradual change in population from that or predominantly **Poa annua** to predominant bent in one and one-half years.

Preemergent herbicides that we have looked at include Prograss, Ronstar, Balan, Dacthal, Devrinol, Machete, PreSan and Prowl. Though all have shown some moderate successes, none have met our objectives.

An old product, recently redeveloped, that looks very good is the TurfCal, tricalcium arsenate, in a flowable form. This has been quite successful in selectively eliminating **Poa annua** in our test plots. We have TurfCal on a pitching green, on bentgrass, at low cut maintenance at Highland C.C., on our Purdue experimental green, and the Elks C.C., Layfayette, IN, on bluegrass fairways and at several other sites in the Midwest. We have been able to eliminate the **Poa annua** from the bent without damage to the bentgrass. Fairway work with the TurfCal in Indianapolis and Lafayette has been most successful in the elimination of **Poa annua**. It is anticipated that this product will be available beginning in the fall of 1983. The Lafayette test site also includes the application of sulfur for **Poa annua** control as well as sulfur in combination with the TurfCal. The sulfur treatments were first applied in spring of 1982. We will continue to add sulfur to observe **Poa annua** responses.

Rubigan continues to be of interest as a selective control of **Poa annua**. We have observed treatments with this product at Highland C.C. for two years. Continued treatment, a 0.4 oz. of formulation/1,000 sq. ft. at 14 day intervals in 1982 has reduced **Poa annua** populations on the bentgrass green test site. Treatments at this rate are continuing in 1983.

Fertilizer application studies include the evaluation of late fall, spring and summer, summer and fall treatments. This program was initiated in the fall of 1982 and is expected to continue for some years. The test is in cooperation with six other Midwest universities who are using the same grasses and fertilizers. Our intent is to evaluate the density and turf performance.

The evaluation of new liquid sources of nitrogen as opposed to granular was begun in 1981. There are several liquid ureaformaldehydes as well as those with slow release potential that look promising. Among these are Nitro 26, an experimental with a 21-0-0 analysis, Fluf, Fluf plus urea, Formolene, a Georgia Pacific ureaformaldehyde, 30-0-0, Powder Blue plus urea, and flowable aldehyde nitrogen, 20-0-0.

Several other new experimental sources of nitrogen with potential for slow release are included in another test. We are also evaluating the potential for nitrification inhibition in turf. Several nitrification inhibitors look encouraging.

There is an extensive series of pre-emergent crabgrass controls including the old standards as well as new experimental compounds that have some potential. The future may bring other flowable or liquid forms of preemergent herbicides to supplement those already on the market.

We are evaluating bentgrass response to applications of oxidiazon, Ronstar, a preemergent control of annual grass to observe responses to this herbicide under putting green conditions.

Another series of tests that appears promising is that of pre- and post-emergent application for control of crabgrass. Tandem from Dow, and experimentals from Union Carbide and American Hoecht are good postemergents. The American Hoecht product has also given excellent control of goosegrass. We anticipate seeing this on the market soon for your use.

A good part of our effort is in the evaluation of growth regulators to reduce maintenance time costs. A new growth regulator from Monsanto was first made available in 1980. Since it is not restricted to foliar uptake, and has soil activity, it allows a broader time frame in which to make applications. It is also a good inhibitor of seedhead development. Currently evaluation of this growth regulator is extensive throughout the United States.

Other growth regulators that we are continuing to evaluate either alone or in combination include Embark, EL500 (Cutless) from Elanco, PP333 from ICI, Eptam, three experimental products from 3M, Glean, and ethrel. Combinations of Embark with either EL500 or PP333 have some potential. Both EL500 and PP333 are excellent growth regulators but neither has potential for seedhead inhibition, whereas the combination with low rates of Embark has given us good seedhead inhibition.

The fungicide program with Don Scott continues on our Penncross nursery here at Purdue. The test site has a good infestation of dollarspot so it serves as an excellent site to evaluate fungicides to control both Helminthosporium and Fusarium blight on bluegrasses in fairways on the Purdue South Course.

Purdue is participating in the National Bluegrass Test with 140 entries planted in 1980 and the National Ryegrass Test with 160 entries planted in 1982.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Midwest Field Day, Tuesday, September 27, 1983, dual program - golf and lawn care.

Turf & Ornamental Seminar, November 7-11, 1983.

Chemicals For Turf Use Seminar, January 16-20, 1984.

SUPPORT YOUR ADVERTISERS

HOW TO REPAIR A BALL MARK

The Trouble With Ball Marks

The ball landed with a thud. The green was soft, and as the ball bounced forward it left a deep little crater in the turf, exposing brown dirt at the back and grass blades pushed together at the front.

Ignoring this little crater, the golfer walked up to his ball, cleaned it, holed his putt, and gleamed with self-satisfaction.

Some hours later, after the exposed dirt in the ball mark had dried out, another golfer found the damaged area in his line of putt. He attempted repairs, but the result was not very satisfactory. An unflattened bit of turf twisted his putt of line.

Next morning an inexperienced greenkeeper mowed the putting surface without repairing the ball marks. The result was a putting surface pock-marked, untrue and covered with bare spots where the mower scalped the grass from the turf.

What Happens

What actually happens when a ball mark is not promptly and properly repaired?

1. Soil is exposed, and so the area immediately surrounding the ball dries up faster than it would if the ball marks were repaired, and thus a blemish is left on the green.

2. There is a chance that the raised turf by the ball will dry quickly and may die out.

3. The open soil invites weed invasion, such as crabgrass, silver crabgrass, POA ANNUA, dandelion, plantain, or Pearlwort ... seeds of which could be brought in on the shoes of golfers, caddies or workers or on mowing equipment.

4. The improperly repaired or neglected ball marks leave a bumpy spot in the green. If not corrected before cutting the next day, then the spot is scalped by the mower and the bruise mark will remain for several days.

William H. Bengeyfield, Western Director of Green Section, says: "From an agronomic viewpoint, a ball mark bruises a grass plant and severely damages or destroys the meristem or growing point. This means that the turf recovery must take place from the perimeter of the damaged area, and this takes considerable time. Rapid drying of the damaged area is a major factor in delaying recovery. Some soil compaction also results from the balls impact."

How to Make Repairs

There is a correct way to repair a ball mark and, simply stated, it is to stretch the turf back over the bruised area, then loosen the soil beneath so that the bruised turf is able to root again.

To loosen the soil, some sharp pointed instrument is required, such as a golf tee. The instrument must be sharp enough to penetrate the soil easily and strong enough to cut through soil laterally at a depth of one inch or less. In stretching the turf back over the ball mark area, try not to tear it loose. After the soil is loosened, the bruised and stretched turf must be firmed or pressed down to make contact with the soil again; otherwise it may dry and die.

If a divot is taken when the ball hits the green and skids, the divot must be carefully stretched and replaced.

From the United States Golf Assn.