

Hillsides, slopes, uneven ground — the Fairway mower handles them easily. This 7-gang unit is working with the rugged, powerful Worthington Chief tractor, developed especially for fast, efficient hauling of gang mower units.

THE FAIRWAY BECOMES THE SMOOTHWAY WHEN IT'S WORTHINGTON-MOWED

The Worthington Fairway gang mower cuts fairways—and costs—in big swaths—does an outstanding job on both. A Worthington multi-gang unit hitched to truck or tractor cuts as much as 88 acres per day. Such high speed mowing means big labor-cost savings especially over a period of time.

Worthington Fairway mowers are available in 3, 5 and 7-gang sizes. Worthington convertible frame feature permits quick, easy changeover from a 7-gang to a 5-gang or 3-gang mower in a few minutes without tools.

Cutting units are so joined that each one conforms to surface irregularities. Of special importance is the Worthington patented spring. It holds the roller down to the ground—eliminates the bobbing or jumping that causes uneven cutting during fast mowing. This means a smoother cut plus reduced wear, as the spring gives a yielding pressure, not a dead weight pressure.

Your Worthington dealer will be glad to give you complete details on the application of Worthington equipment to mowing problems on your course. See him or write us direct.

WORTHINGTON MOWER COMPANY
STROUDSBURG, PENNSYLVANIA

SUBSIDIARY OF JACOBSEN MANUFACTURING COMPANY, RACINE, WISCONSIN

Spring opened the greens for play in June. The greens got through the Summer with a minimum amount of trouble. The work I have described in the preceding paragraphs constitutes the extent of the changes in construction I made on the four courses I have mentioned.

Texas Greens Construction

Texas golf courses are built on flat land and natural green sites are the exception rather than the rule. Most greens are elevated and have mounds constructed around them and the sand traps (surface) are slashed into the mounds. This is for the sake of appearance as well as inexpensive maintenance, since the long slopes of greens and mounds permit the use of power mowers.

The base of the green is constructed of the soil available near the site of the green. It is graded and compacted. The clay drain tile or fibre pipe is installed in this base so the top of the tile is 12 inches below the putting surface. Coarse rock is filled around the tile.

A mixture of limestone pea gravel and porous top soil five to six inches deep is spread over the hard pan, graded and

firmed with a light roller. Then six inches of loamy top soil, sharp sand and cultivated peat are spread over the entire putting surface and apron. This is graded, firmed with a light roller and then fine graded again.

The materials are proportioned as to the type of soil used, heavier soils requiring the use of more sharp sand. The peat is kept near the surface, in the top three inches.

The mixing can be done through a compost machine or in place with a disc harrow and rototiller. As a caution against layers, a thorough mixture is a "must".

Between the top seed bed and the gravel mixture, apply arsenate of lead to stop earthworms. Use about 50 to 60 pounds for the average green.

Potash, super-phosphate and Milorganite are stirred into the seed bed in correct amounts prior to seeding.

Three pounds of Seaside bent seed is recommended for each thousand square feet. This is raked in lightly and followed with hand watering. Continuance of hand watering is necessary until the grass is well established.

Calibration Table for Distribution of Lime or Fertilizer

Yardage to be Traveled by Distributing Machines of Various Hopper Widths to Discharge 200 Pounds Material at Various Rates Per Acre.

Width of Hopper In Feet	Rates In Pounds Per Acre									
	100	200	300	400	500	600	700	800	900	1000
5	5808	2904	1936	1452	1162	968	830	726	645	580
6	4840	2420	1613	1210	968	807	691	605	537	484
7	4148	2074	1383	1037	830	778	593	518	461	415
8	3630	1815	1210	907	726	605	519	453	403	363
9	3226	1613	1075	807	645	537	461	404	358	323
10	2904	1452	968	726	580	484	415	363	322	290
11	2640	1320	880	660	528	440	377	339	293	264
12	2416	1208	805	604	484	403	345	302	268	242

INSTRUCTIONS

- Put 200 pounds material in hopper.
- Set distribution controls at estimated position for desired rate.
- Select yardage under desired rate per acre.
- Operate spreader for the designated distance at normal speed.
- If 200 pounds is discharged before traveling entire distance, reduce the feeding rate.
- If 200 pounds is not discharged in designated distance, increase the rate of feed.
- Repeat operations until 200 pounds material is discharged in the designated distance for the desired rate per acre. Always start each trial with exactly 200 pounds material in the hopper.

EXAMPLE

Width of hopper _____ 8 feet
 Desired rate of application _____ 600 pounds per acre
 Amount of material in hopper _____ 200 pounds
 Distance to travel to discharge 600 pounds _____ 1815 yards
 Distance to travel to discharge 200 pounds _____ 605 yards
 The above method may be used for the whirlwind type spreader by using width of spread as width of hopper.

Credit on the Pro's Books Assures Buying at Club

BY HAROLD SARGENT
Professional, East Lake CC, Atlanta, Ga.

At East Lake for 15 years we've used a golf ball credit system that has been attractive to members and has worked out very well for the pro department.

We run a blind bogey every Saturday and a ball sweepstake, which we call a "dogfite," every Sunday. Winners of these events are paid off in golf balls.

If a member has a run of good luck and skill he will accumulate more than his current requirements of golf balls. Instead of requiring him to take the balls as he wins them, the winner has the option of having his winnings recorded in our ball ledger. He then can draw out balls as he desires from shop stock.

The member who has balls to his credit on the ball ledger is not going to buy balls downtown. When he comes into the shop to get his balls he may see something else that he wants. Inasmuch as he's not paying cash at the moment for the balls he gets he's in a mood favorable to the other purchase.

We also encourage members to use the ball credit for other merchandise. Although the margin on clubs, bags, apparel and accessories is less than it is on balls, the use of the ball credit in buying other items helps build the shop volume and gets the member fixed in the habit of buying all his golf equipment and apparel needs from the pro.

The ball credit is a highly effective method of protecting the pro against downtown competition on all golf merchandise and a very satisfactory idea as far as the member is concerned inasmuch as his pre-payment for the merchandise rather makes him feel as though he's getting it for nothing. He is inclined to forget his entry fee in the event that brought him a prize.

When a member's ball credit becomes high we do not hesitate to call the amount to his attention and suggest that he apply it to the purchase of some other merchan-



Harold Sargent

dise. We always try to suggest something that the member should have.

The regular events at clubs with the ball prizes handled on the golf ball ledger basis have another good feature for the member and the pro in keeping before the pro the names of the winners. When he notices that members who regularly enter the events aren't getting prizes it's a reminder to him that these members might be able to use a few friendly tips on their games to improve their scoring.

Cotton's Story in "This Game of Golf."

Henry Cotton's new book, "This Game of Golf," published by Charles Scribner's Sons, 597 Fifth Ave., NYC, 17, at \$10, presents an interesting combination of autobiography, comment and instruction. Cotton is a determined and intelligent fellow whose frank observations make as good reading in this country as they do in his homeland.

He relates numerous instances of the influence of Armour, Hagen and other American golfers on his successful career. He remarks that the larger American ball has been an important factor in the development of high American standard of play. Cotton's insides on his golf in Britain, on the continent and in the United States, reveal one of the most persistent and patient personalities in the game. He stubbornly and smartly worked on his game until he became a champion. Although he never has burned up any American courses with his scoring he isn't through yet. Those of his critics who haven't found him one of the world's ace buddy chums will be enlightened by Henry's book. He confesses that he went into golf to become a great player; not Britain's or America's sweetheart. Cotton's done right well for himself and again does well in supplying his readers with an entertaining book.

N. Y. Turf Conference at Cornell, March 1 - 4

The New York State Turf Advisory Committee has set dates for the 1949 Turf Conference, March 1 - 4 at the State College of Agriculture, Cornell University, Ithaca. Anyone wishing to be on the mailing list for copies of the program and similar material should send request to J. F. Cornmann at the college.

NOW the inside ISOTRŌPIC* prin construction

No fanfare or advertising marked the introduction to professionals late last fall of the new Wilson Top Notch ball. In the past, the appearance of a revolutionary Wilson product has been heralded by large space advertising announcements to the public.

Wilson knew then—as you have learned in the months since you first played and sold it—that this new ball had everything any golfer could want in a golf ball. It *has made good*—in a big way—with club professionals all over the country—on the PGA tournament circuit (in the recent L. A. Open it was used by 1st and 2nd place winners and many others)—and with thousands of club members. However, the '48 golf season was about over and it was decided to withhold advertising releases about the ball's remarkable new features until the start of the '49 season, when professionals would receive the fullest measure of benefit.

Now, the inside story of its new ISOTRŌPIC methods of construction and its exceptional playing qualities is about to be released to the public.

WILSON SPORTING GOODS CO., CHICAGO (A subsidiary of Wilson & Co., Inc.)
Branch offices in New York, San Francisco and other principal cities

*Pronounced ICE-O-TROPE-İK

story of the ple of golf ball can be told

ISOTRÖPIC golf ball construction—the culmination of 20 years of research—is the most important golf news since the advent of wound golf balls. Starting off at the beginning of the golf season with a smashing double page spread in colors in the Saturday Evening Post, the story will be told in an advertising campaign which will surpass *by a wide margin* any advertising campaign ever devoted to golf balls. It will include Life, Saturday Evening Post, Collier's, Golfing and many other widely read publications.

So that you'll be fully informed and ready for the increased demand this advertising is bound to create for Top Notch balls, a copy of the first big Saturday Evening Post ad will be sent to you in advance of publication. In the meantime it will pay you to be prepared with an adequate stock of Wilson Top Notch balls.

**TOP NOTCH GOLF BALLS ARE
SOLD THROUGH PRO SHOPS ONLY**



Winter Injury by Snow Mold Prevented by Fungicide

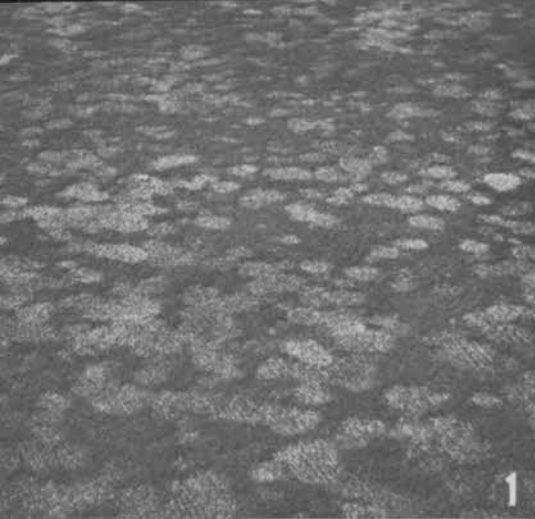
O. J. Noer

There are three principal types of winter injury on bent grass putting greens, snow mold, wind burn, and water damage. Injury usually comes in the spring when the snow melts, but may happen during mid or late winter thaws.

Snow mold is caused by a fungus which flourishes at low temperatures. Snow furnishes the moisture required by all fungi for growth. In that respect the name is a misnomer. Heavy rains in winter or early spring bring snow mold when conditions otherwise are favorable for growth of the causal organism. Wind burn and water damage will be described and illustrated next month.

Grasses differ in their susceptibility to snow mold. Seaside is very susceptible, but Colonial, Washington, and some of the other vegetative strains are more resistant. Many Canadian clubs use New Zealand bent or brown top, which is a Colonial type, for that reason.

Anything which keeps the green excessively wet, such as poor surface drainage, protective coverings of straw, manure, etc., and excessive amounts of peat or other types of humus in the surface soil accentuate snow mold by keeping the turf wet. Likewise, late fall fertilization with soluble nitrogen, or excessive amounts of nitrogen in the fall aggravate snow mold. The deadline for fall fertilization should fall between September First and Fifteenth. The effects of nitrogen should be spent before winter starts so the turf hardens-off in late fall. Snow mold is sure to be bad, and hard to control when the grass is green, leaf blades are lush, and turf is in active growth when covered with the permanent winter blanket of snow. There is evidence to support the contention that excessive soil acidity promotes snow mold. The effect is probably indirect. Strong acidity makes the grass less vigorous. Weak-



1. A heavy infestation of snow mold on Seaside Bent green. Spots typical and moderate in size. 2. Severe example of snow mold on mixed bent green in Winnipeg. The large spots have been spiked to help recovery by breaking surface scum. 3. Calomel-corrosive mixture applied in late fall at 4 ounces per 1,000 square feet prevented disease on this Seaside bent green in Ottawa, Canada. Picture taken to show line where treatment stopped. 4. The four PK (phosphate-potash) plots got no nitrogen. Calomel-corrosive mixture (Calo-Clor) applied at 1, 2, 4 ounces per 1,000 square feet. No snow mold on treated plots, or

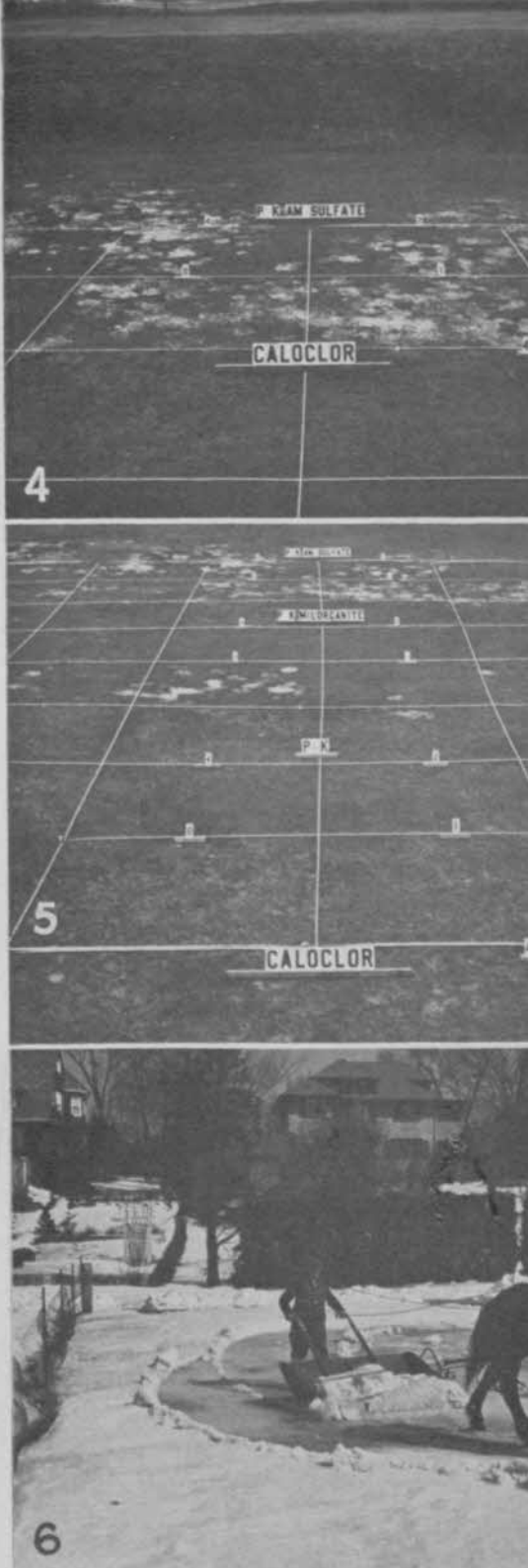
ened turf is less able to withstand attack by the disease producing organism. Greens should be limed in fall when soil reaction is below pH 6.0.

Snow mold can be prevented by late fall applications of fungicide, provided the conditions mentioned above have been met. To date the mercurial materials have been most effective. The cadmium complexes have not performed as well. Most clubs use a two-to-one mixture of calomel and corrosive sublimate, but some apply semesan and have had good results. Calomel-corrosive mixture or semesan are applied in late fall, after the last heavy rain, and before the greens are permanently covered with snow. Selecting the time is not an easy matter. Water systems have been drained by that time, so dry sand, compost, etc. are used to provide the bulk needed to insure uniform distribution. Another treatment, but at half rate is made should snow disappear during a midwinter thaw, or when it melts in the spring. Slopes and banks that drain onto the putting green are treated as well as the putting surface proper. Even though the fungicide does not always prevent the disease, it usually reduces its severity so the injury is superficial. Then recovery occurs quickly after growth starts in the spring.

Some clubs remove snow in spring at the time it disappears normally by melting. This is good practice, especially when the snow covering is deep. Otherwise the water from the melting snow washes the fungicide away and keeps the grass wet for a week or more. Then snow mold damage occurs.

There were two reasons why snow mold was bad in 1947-1948. Summer weather continued right up to the first snow in mid-November. Grass was green and in active growth when snow came and stayed all winter. As a result few clubs applied any fungicide. The greenkeeper at one club made treatments on top of the snow right after the first snowfall. His greens came through the winter exceptionally well.

on the untreated check. Turf got no nitrogen all season. 5. Fungicide failed to prevent snow mold on the PK-ammonium sulphate plots. Fertilizer consisted of phosphate and potash spring and fall, and ammonium sulphate at 5 pounds per 1,000 square feet each month. Treatments stopped in late September. Even 4 ounce rate of calomel-corrosive did not prevent snow mold. 6. Snow removal in early spring from a green in New England. Removal is customary practice at this club, although it makes no difference some years. Benefits in odd years more than offset labor cost in other years.





Three popular Toro turf-maintenance tractors designed for dependable low cost operation. Left, Toro Bullet with Sickle bar, a lightweight favorite, exceptionally maneuverable and easy to operate. Center, Toro Master tractor with gangs underslung to cut ahead of rear drive wheels. Right, Toro General all-purpose tractor with dump box.

Toro leads the way to lower mowing costs

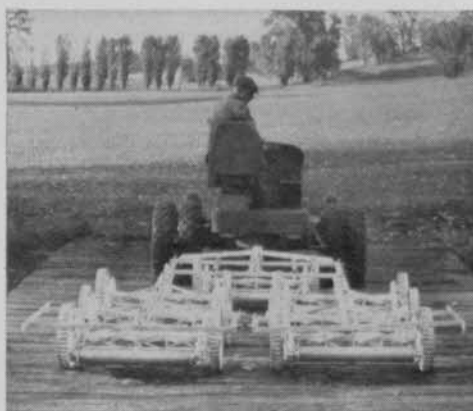
With labor costs rocketing, and with the public demanding improved playing conditions...grounds superintendents are faced with a double headache this season.

How can you stay within your budget ...and still please the players with smoothly trimmed fairways and well kept roughs and bunkers?

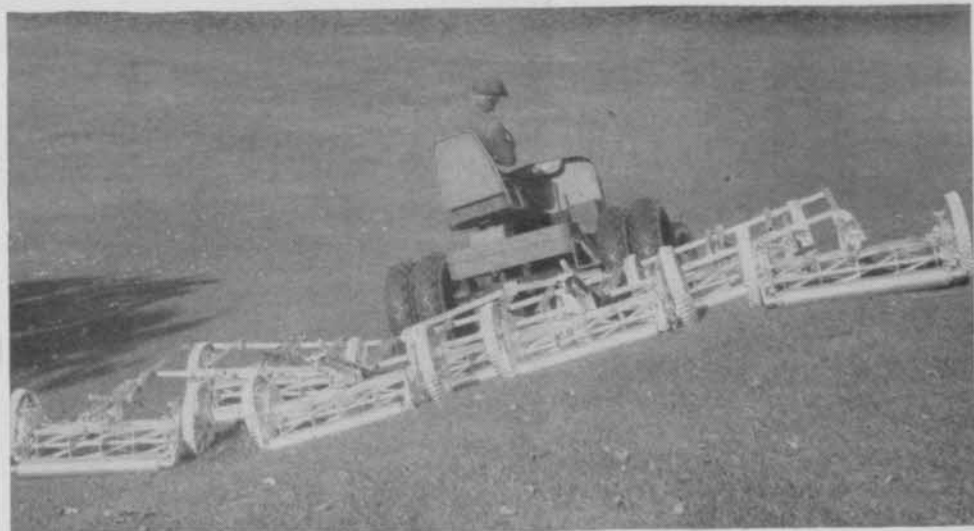
Toro shows you the answer again, with proved labor-saving tractors and gang



Toro Master Tractor with underslung hitch. Gives you a finer, smoother mowing job with no ridges or uncut strips because two mowers cut in front of the rear drive wheels. The Master Frame handles 3, 5, or 7 gangs of mowers and cuts a fine, even swath up to 17'2" wide.



Universal Hitch in trailing position is only seven feet wide. You can change to the trailing position quickly and without tools for trailing across bridges and through congested areas. A simple hand lever raises the rollers off the ground for easy transporting.



7-Gang Universal Frame with Spartan Gang Mowers. This sturdy frame fits all Toro Tractors . . . is built of square tubular steel for light weight, great strength and durability. The Spartan Gang Mowers are precision built, with case-hardened gears, reversible bed knives, hardened alloy steel blades. Exceptionally durable, simple in design, fitted with permanently lubricated roller bearings.

mowers, designed from the ground up to give you better mowing at a lower cost.

Every Toro machine you see on these pages is engineered to save on costly manpower. Their strong, simple construction means faster maintenance . . . fewer wearing parts . . . less time lost in breakdowns. Their design is the result of over 25 years of continuous testing and improving . . . your guarantee of efficient

and thoroughly dependable performance.

All Toro equipment is backed by Toro's unequalled service system, an organization which assures you of quick help, expert advice and readily available accessories and parts.

Count on Toro to do a better job for you at less cost. You'll see why Toro's the choice of championship courses everywhere!



Toro Roughmaster takes the worry out of rough cutting . . . follows irregular contours and banks . . . handles heavy growth . . . mows a swath from 7' to over 22' wide. The square tubular steel frame holds 3, 5, 7 or 9 gangs and is hinged for flexibility.



Specialists in manufacturing fine mowing equipment for over 25 years . . . Toro is a favorite on championship golf courses, parks, cemeteries and playgrounds. Nation-wide service facilities located near you. For information write Toro Mfg. Corp., Dept. G2, Minneapolis 6, Minn.

Tenn. Conference Examines Southern Turf Problems

By FRED V. GRAU

Third annual turf conference, sponsored by Southern Turf Assn., and held at University of Tennessee, Knoxville, Jan., was attended by 75, mainly course supts. of southern clubs. Various conference addresses also were heard by university students who must have acquired some idea of the problems and work being handled by southern greenkeepers and taken at least some of this information out with them to do a public relations job for the golf turf men.

Prof. James G. Walls, a geologist and vp, Holston Hills CC, was general chairman. Dr. N. D. Peacock, vice-dean of the University of Tennessee, College of Agriculture, gave the welcome address. He has become more cordial to this specialized group each year.

Fred V. Grau gave a 30-minute talk on "Soil-Grass Relationships in Turf Production." He cited some of the difficulties encountered in growing turf of various kinds, and explained the relationship between physical soil conditions and healthy normal plant growth and stressed the need for providing the very best of physical soil conditions in order to provide for good plant growth under highly artificial and unnatural conditions of management to suit a specific use.

He cited instances of mechanical analyses of putting green soils which had been made by the Saratoga Laboratories, pointing out that in many cases the high percentages of silt and clay in the soil impeded drainage and aeration and increased opportunities for compaction which results in weak turf. As remedies for these conditions so that the turf may remain in use, he stressed the value of soil cultivation with the Aerifier and similar equipment, the addition of materials which would tend to produce a more granular, well-aerated soil, minimizing the frequency and quantity of water applied, improving lateral drainage by the use of the mole drain.

He stressed water conservation in all phases and the development of measurements and practices which would provide

more uniform playing surfaces in all categories.

Prof. Lawrence S. Dickinson, Amherst, Mass., spoke on managerial factors in turf production. He stressed limits of tolerance and cited a number of categories such as the limits in using sulfate of ammonia, in the use of water, and in the use of arsenicals. He expressed his opinion that golf courses have plowed up their fairways because of the unwise use of arsenicals. He went further into the subject of mowing, selective weedicides, and aeration, stating that he was afraid that the aeration and cultivation of soils under turf would be carried in many instances beyond the limits of tolerance. Other items included cultural costs, hidden costs, labor hours, ribbing of fairways, and examples of poor management resulting from the improper use of fertilizer.

Dr. Eric Winters, Head of the Agronomy Department, University of Tennessee, spoke of a fertilization program of turf in Tennessee soils. He has appeared on each of the three programs and this was by far the best presentation. Much of his data was drawn from pasture studies but was extremely applicable to many turf areas, the main difference being that quantities applied were much lower than would be used on turf. As a guide to fertilization for the establishment of turf he indicated that 150 pounds of P_2O_5 and 50 to 100 pounds of K_2O were ample in most cases to satisfy the deficiencies in most Tennessee soils for seedling establishment.

Sixty pounds of nitrogen to the acre was mentioned for airport seedings. This would be equivalent to 1 ton to the acre of a 3-9-6 or a 3-10-5 fertilizer, neither of which are available in Tennessee. He offered the soil testing service of the University to turf people, stating that the cost would be 50c a sample for pH, calcium, phosphorus and potash determinations. He said there is no use in testing for nitrogen.

O. J. Noer, agronomist, Milwaukee Sewerage Commission, spoke on "Southern