

This year do it RIGHT!

NORTHERN COURSES

KILL CRABGRASS

before it grows —

**Famous DI-MET P.C.C. Prevents Crabgrass
from Ruining Greens, Tees, Aprons, Fairways, Clubhouse Areas**

One application works for years

One Spring application of DI-MET P. C. C. (Pre-emergence Crabgrass Control) prevents Crabgrass from infesting your Course. Wide-spread testing shows up to 100% control.

Unlike products whose toxic ingredients may not last one full season, P.C.C. continues to work for years.

After the initial application, you'll need only a light "booster shot" each Spring — a 75% saving in materials! Won't interfere with Spring seeding. Seed safely 3 weeks after application.

DI-MET P.C.C. gives you these 3 Extras: Grubproofs, Kills Chickweed, Controls Poa annua. Don't accept substitutes. See your supplier today.

SOUTHERN COURSES

LINCK'S TAT-42

**Kills weeds before they grow
in Bermuda or St. Augustine turf**

This remarkable pre-emergence control destroys germinating seeds of weedy grasses and broadleaf weeds. Selective, can't harm turf. One application continues to work on greens or fairways for 3 months or more.

Whether your St. Augustine or Bermuda turf is established or newly sprigged, TAT-42 permits luxurious, thick-knit growth without weed competition for months. Easily applied by

sprayer.

Kills Crowsfoot (silver crab), Crabgrass, Dallis Grass, Pursley, Ragweed, Goosegrass, Notweed, Witchgrass, Chickweed, Spurge, emerged Poa annua, and many others. Speeds elimination of overseeded rye during transition period in Spring. Does not interfere with germination of newly seeded rye the following Fall.

See your wholesaler or write us immediately for full information.

O. E. LINCK CO., Inc.

Clifton, New Jersey

"If you give the impression that you need every dollar possible, you'll probably get it," Graffis said, "but if you present your budget request in a slipshod fashion, club officials probably will be so unimpressed that they will look for ways to cut back on you."

Resistance is Best Bet

Eliot Roberts, the scholarly Iowa State research agronomist, expressed the opinion that turf never will become immune to most of the diseases that attack it. "About the only hope," he said, "is for turf to build up strong resistance which, combined with the use of fungicides, will ward off many of the common diseases."

Golf course turf, Roberts commented, is especially susceptible to disease because it is kept so closely clipped. A great deal of its strength is lost in the clippings and what remains becomes a potential breeding place for fungi. Areas that are intensively watered also invite the invasion and spread of disease.

Alluding to resistance factors, Roberts said that beside fungicides, nitrogen, phosphorus and potassium, in proper balance, are the elements best suited to outgrow fungus; phosphorus promotes the manufacture of carbohydrates to counteract the enzymes produced by the various fungi; and potassium also adds to the resistance-growth process. Proper climatic, planting and growing conditions also enable turf to withstand disease.

Much of Roberts' lecture was given with the aid of slides in which it was shown how the structure of cell walls within a plant cause it to fall prey to or resist diseases.

Work Against Ourselves

Roberts' remarks about the deleterious effect of close turf clipping were substantiated by Victor Youngner, who described some of the heat and temperature experiments made in plant growing chambers at UCLA.

"By mowing close and making relatively heavy nitrogen feedings of cool season grasses in hot weather," said Youngner, "we are working against ourselves. Close clipping retards root growth and thus destroys the food storage capacity of plants. Heavy applications of nitrogen under this condition become wasteful because only a small amount of the element is being consumed. We should apply only enough nitrogen in warm weather to maintain a healthy color and supply the plant with the small amount of food it can use. Our tests have shown that it is unwise to apply chemicals other than fungicides in

Comes 6,000 Miles from Germany to Attend GCSA Convention

The distinction of having travelled farthest to attend the GCSA convention went to M/Sgt. John F. Petrie, who came 6,000 miles from Stuttgart (Germany) GC to absorb the turf learning offered in the four-day educational program. Petrie's expenses were partly paid by club members, who raised a special fund to send him to Houston, and by himself.

An Army veteran of 18 years, Petrie has spent the last nine as a course supt. From 1951 until 1954 he was stationed in Japan where he helped maintain or build courses in Yokohama and at Camp Zama. From 1954 until 1959, he was supt. of the Ft. McPherson (Ga.) CC.

Petrie was transferred to Stuttgart early last year. He maintains Kentucky Blue fairways and greens of Colonial bent and creeping red fescue. Greens are large there, averaging 8,000 sq. ft. German civilians and GIs work under Petrie's direction in maintaining the three year old Stuttgart GC. U. S. equipment is used on the course but fertilizers, seeds and chemicals are purchased locally.

The large club membership is made up of officers and enlisted personnel. Play is heavy from April through October, often touching 300 rounds a day on weekends.

hot weather, and watering should be controlled so that there is no likelihood of saturation."

Numerous interesting theories have come out of the growing chamber experiments made at the U of C agronomy station, Youngner said. At this point, agronomists there feel that the duration of daylight may have a much more important bearing on plant growth than temperature influences. Observations of two *Zoysia* strains, for example, showed that both grew three or four times as much when exposed to 16 daylight hours as compared to eight. Temperatures in both cases were a constant 70.

For both warm and cool season grasses, according to UCLA findings, temperatures for root growth can be slightly lower than for top growth. This has been confirmed by field as well as hothouse tests. In warm weather it has been found that top growth increases and root growth slows down. The process is reversed in cool weather. UCLA scientists also have observed that the range of growth temperatures are nar-

Your best buy
in

GOLF COURSE

MAINTENANCE EQUIPMENT

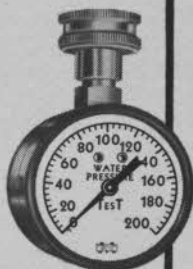


SUPERLITE RAKE

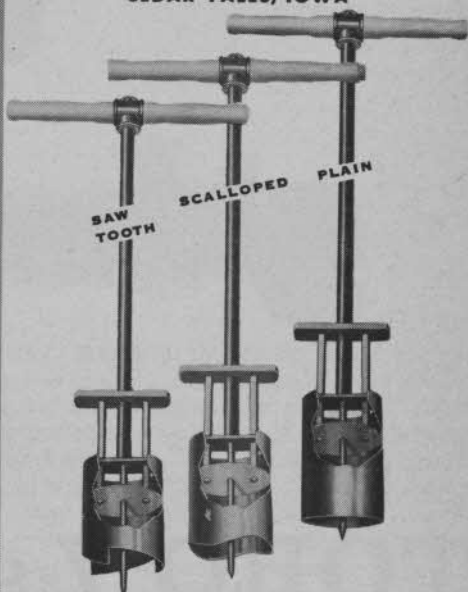


**CUP
SETTER**

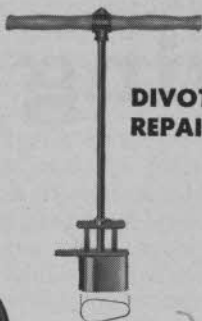
**WATER
PRESSURE
GAUGE**



MANUFACTURING COMPANY
CEDAR FALLS, IOWA



**"CUTS TRUE"
HOLE CUTTERS**

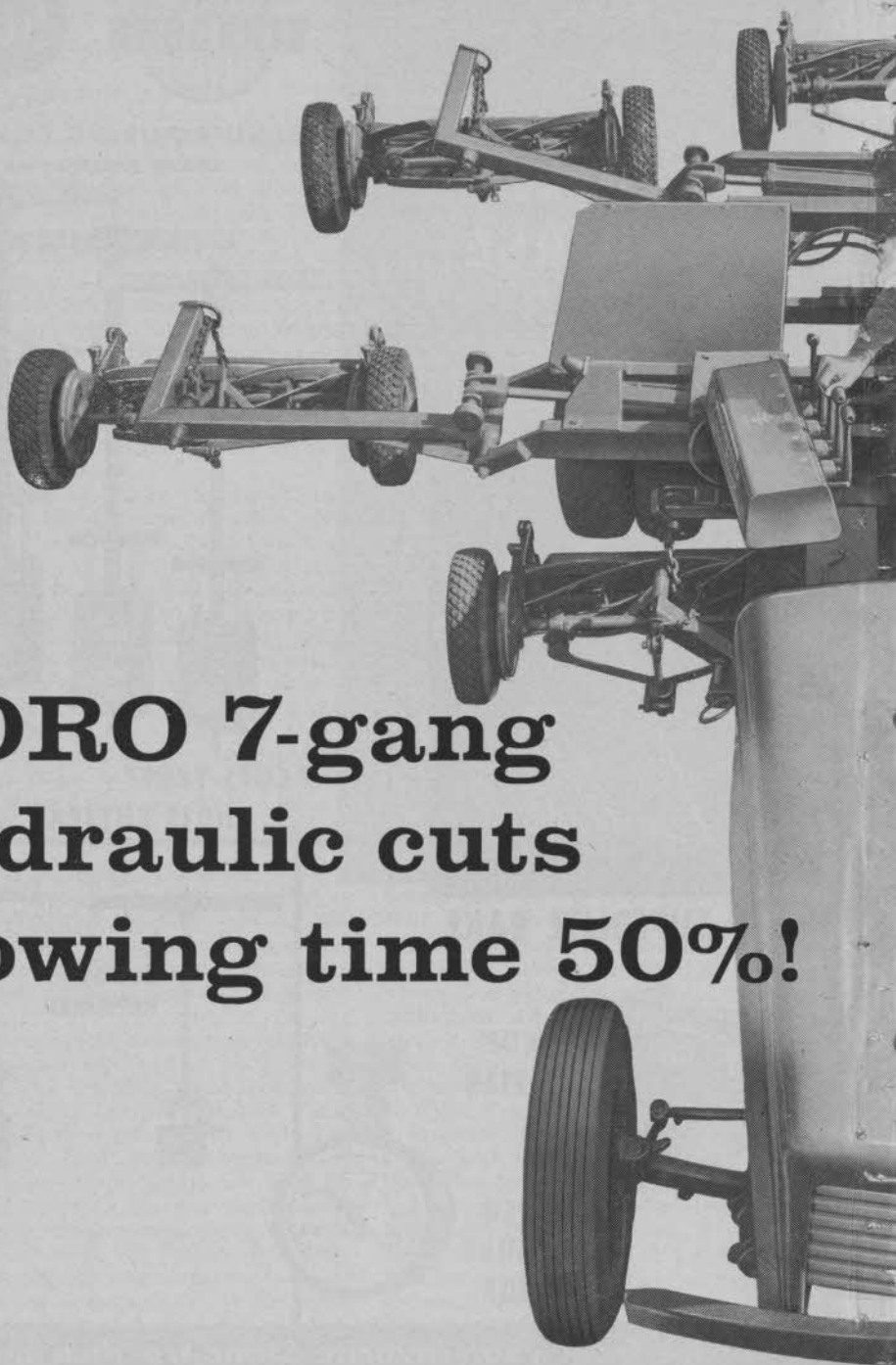


**DIVOT
REPAIRER**



**TURF
REPAIRER**

order from your favorite Standard distributor



**TORO 7-gang
hydraulic cuts
mowing time 50%!**



PULL DOWN the center lever on the control console that's right by your elbow; 3 gang units lower swiftly, gently into mowing position—two ahead of the rear wheels, one centered in back. Pull down controls 4, 5, 6 and 7. Each one instantly lowers another gang unit into place. And you lift or lower the units in any order to give any combination of gangs you need—3, 4, 5, 6 or 7 units at the flick of a lever. You never leave your seat!

Here is a 7-gang mower with speed and flexibility unlike any other combination on the market. It slims down to pass through narrow areas, fans out to mow up to a 15-ft. swath in seconds. You can mow on both sides of roadways using the wing units only—even mow boulevards or other strips with one or two wing units lowered to turf height. It's actually many mowers in one!

Look over the features of this rugged machine (it even climbs curbs!) Better yet, drop us a card and let your Toro distributor show you on your own grounds how the new Toro 7-unit hydraulic Golfmaster* can start saving you money today!

*A registered trademark of the Toro Mfg. Corp., U.S.A.

TORO

TORO MANUFACTURING CORP.

3014 SNELLING AVENUE • MINNEAPOLIS 6, MINN., U.S.A.

rower for warm than cool season grasses. Minimum temperature for the growth of common Bermuda is 50 degs., for Tifgreen it is slightly less than 50 and for Meyer Zoysia, 60.

Water Movement Film

The third session was concluded with the showing of a color film prepared by the Milwaukee Sewerage camera duo of O. J. Noer and Charles G. Wilson. It was largely devoted to maintenance methods with emphasis on the care and building of greens and traps and irrigation installations. New and easier ways of handling maintenance jobs, improved by supts. and persons working under them, also were featured.

Following this, a time-lapse motion picture of water moving through soil was shown. Painstakingly filmed, it proved to be a convincing argument for the school of turfmen who contend that topsoil has to be homogenous in texture to insure deep and healthy root growth. The film, which took about 20 minutes, showed the progress of water droplets through a layer of topsoil about 12-inches deep and how this progress was very visibly retarded when the droplets reached a layer of dissimilar material.

Fourth Session

Supts. Detect Some Shortcomings In Course Construction

Fred V. Grau of Nitroform Agricultural Chemicals was moderator of the Wednesday morning program which had as its theme, "Construction Concepts of a Course." He presented George Cobb, Greenville, S. C. architect; Warren Bidwell, supt. of Olympia Fields (Ill.) CC and Charles Danner, supt. of Richland CC, Nashville. A question and answer period, which followed the speeches by these men was, as it usually is, interrupted too soon by the bell. The morning's program was concluded with a film by the well travelled team of O. J. Noer and Charley Wilson which showed how Mel Warnecke built several greens at Atlanta's East Lake course last year.

Wants Supt. on Job

Architect George Cobb emphasized that he insists on two things when he designs

a course. One is that a supt. be on hand in at least the final construction phase so that he can oversee the building of greens. A second is that the contractor follow the design down to the last contour section on the blueprint.

The Greenville architect said that the secret of design is the adhering to the natural features of the site on which the course is to be constructed. The only departure from this time-tested method should come when it is seen that a succession of holes have so many similarities in appearance that they become monotonous, or when it is apparent that the layout of some holes will be decidedly unfair for the fellow who is classed as a struggling golfer.

As for built-in characteristics, Cobb stated that he is most conscious of good air circulation around greens and efficient water drainage. His fairways are built with a one per cent grade and herringbone style drainage systems are installed under all his greens, usually at a depth of about 10 inches.

Golf Jobs Are Fill-ins

"Too many courses are being built by general contractors who take on golf jobs to fill in during slack times," Warren Bidwell declared. "Perhaps this wouldn't be so bad," he added, "if the supt., who is to take over when the course is completed, were on hand to see what's going on during the time the course is being built. But usually this is not the case. As a result, numerous clubs are finding it necessary to spend important money to correct mistakes made in the original construction, or, if not, they are often disappointed with the mess they have on their hands after the course is completed.

"Perhaps," Bidwell continued, "we shouldn't be too sympathetic with them. As far as we supts. are concerned, they are being penny wise only with us."

Construction sins that are being committed every day, Bidwell said, are: building of greens that are too small; contouring so that cupping areas are too small; burying of debris such as tree stumps under tees and greens; and cutting out of trees or leveling of knolls and slopes that have strategic importance so far as playing conditions are concerned.

Bidwell's conclusion: If clubs want to get their money's worth, they should insist on having their courses built by contractors who know something about golf course construction and are not mere earth movers.

What do you get when you buy a Hand-Shovel Fed ROYER?

By STAN DAVIES

President, Royer Foundry & Machine Co.

Let's assume you've decided that better soil shredding, mixing, blending and aerating will be a major step forward in improving your operation. Now, what shredder shall you buy?

Here is what ROYER has to offer:

Efficiency. Soil or compost tumbles until it is completely shredded. Royer's exclusive belt shredding principle makes it impossible for large unbroken lumps to feed under the sweep fingers (1). Thousands of users testify to the superiority of Royerated materials.

Capacity. Royer manufactures a full line of shredders to meet any need. In Hand-Shovel Fed Models we offer a choice of 5, 8 or 12 cubic yards per hour. Too large a machine wastes power; too small a machine wastes time and labor.

Intelligent Design. Compare our: tubular steel frame, for rigidity without weight (2); ample size hopper, low enough for easy shoveling (3); large, semi-pneumatic tired wheels for portability (4); adjustable deflector for regu-



lating discharge (5); large sealed-for-life bearings for trouble free operation (6).

These are the highlights. For complete specifications on Royer Models 8, 10 and 12 Hand-Shovel Fed Shredders, write today for Bulletin NS-60. We'll include the name of your local Royer Dealer, who will be glad to demonstrate the exclusive Royer principle.

ROYER FOUNDRY & MACHINE CO.,
171 Pringle Street, Kingston, Pa.



Abandoned Herringbone Design

Charley Danner, the pioneer bent green custodian in the South, told of his dissatisfaction with the herringbone system of drainage used on the first six greens that were converted at Richland CC in 1952. Channelling excess water into a narrow area, such as is done with the herringbone arrangement, Danner said, caused sloppy conditions in front of the greens during rainy weather and made these areas potential disease breeding spots.

When the remaining 12 greens were converted to bent in 1953 and 1954, the Nashville supt. said, a square U tile arrangement was installed so that the drainage became diffused. This, combined with the fact that the last 12 greens were built with perhaps more attention to improved surface drainage, has resulted in these latter putting surfaces giving much less trouble to the Richland CC maintenance dept. than the six that were originally converted.

Suggestions for Improvements

Fred Grau prefaced the Question and Answer period by commenting on some of the things that he thinks should be done to improve both construction and maintenance. His observations: Newly built

Golfdom Holds Luncheon

The third annual luncheon for fathers, sons, and sons-in-law who are supts., sponsored by GOLFDOM, was held during the GCSA convention. About 70 persons attended the affair. Hosts were Joe Graffis, Sr., publisher of the magazine, and Herb Graffis, editor.

courses should be given more time to settle; Proper soil mix and depth of mix often are neglected; maintenance buildings, at a majority of clubs, are located in too inaccessible spots; course communication systems are behind the times; many times the interval between new seeding and watering is too long — it shouldn't exceed 48 hours; there probably is not enough use of fertilizers when tees and greens are overseeded.

The questions that followed were directed, for the most part, at architects and dealt entirely with the adoption of standardized building specifications by the men who design the country's courses. George Cobb, the only architect present, emphasized that he did not speak for the designers as a group, but only for himself. He maintained that he always has built tees,



James A. Reid



George Cobb

greens, traps, etc. to what generally are accepted as reliable agronomical and physical specifications, but he doubted if these can always lend themselves to an exact formula. If nothing else, he said, the wide variances in building budgets prevent this. Architects, he also conceded, have very definite likes and dislikes and these don't lend themselves to standardization.

"Green Construction at East Lake," the Milwaukee Sewerage Commission film that concluded the morning's program, traced the entire operation from the leveling of the site to soil sterilization and seeding. One of the interesting sidelights of the film was the showing of how soil is tested for texture qualities in the laboratory of Leon Howard of College Station, Tex.

Fifth Session

The Practical Side — From Wetting Agents to Mower Maintenance

James E. Reid, supt., Suburban CC, Baltimore, led off the Wednesday afternoon meeting with a talk on wetting agents. He was followed by James R. Watson, Jr., Toro agronomist, who spoke on water management. Morris E. Bloodworth of Texas A & M then discussed soil mixtures. After him came J. W. MacQueen, also of A & M, who pointed out some principles to be followed in landscaping. Purdy Carson of Jacobsen-Worthington, concluded the program with tips on equipment care.

The Answer to Your Crabgrass Problem...



CHIP-CAL

(LOW-LIME CALCIUM ARSENATE)

1. *Stops crabgrass before it grows*

Chip-Cal keeps tees, fairways and greens free of crabgrass . . . it kills the seedling plants.

2. *Low-cost treatment lasts for years*

Up to 5 years effectiveness reported . . . length of time depends on soil-type, rate of application, etc.

3. *Available in powder or granular form*

Chip-Cal **powder** may be applied dry or as a water-mixed spray. Chip-Cal **Granular** is easily applied with a fertilizer spreader.

4. *Treat spring, fall or winter*

Early spring treatment may be preferable, but fall or winter is equally effective to prevent crabgrass the following season.

5. *Widely used . . . proved highly effective*

Chip-Cal has had wide commercial use on golf courses and is backed by many years of research and testing.

6. *Also controls chickweed, Poa annua and certain turf insects*

Use CHIP-CAL this year!

Contact Your Supplier or Write:

CHIPMAN
CHEMICAL COMPANY
Dept. H, Bound Brook, N. J.

Explains Use of Wetting Agents

Jim Reid declared all his experiences with the use of wetting agents have turned out to be very favorable. In one instance, he applied 6 gals. of Aqua-Gro per acre to 10 acres at a 10 to 1 dilution rate and got exceptional results. Reid cautioned that the agent should be watered in immediately after application. If not, there is danger that the turf will be burnt. When the dilution is at a rate of 100 to 1 or 200 to 1, followup watering probably is not necessary.

As explained by Reid, wetting agents reduce surface tension and thus gives better water distribution through the soil. As a consequence, nutrients penetrate the root zone more readily. Tests have shown, he said, that where wetting agents are used, root penetration may go to 10 or 12 ins. as compared to 6 ins. without. With deeper rooted turf, resistance to disease and wilt is greatly increased. The Baltimore supt. concluded by saying that there is some evidence that watering can be reduced by from 50 to 60 per cent when wetting agents are regularly used.

Long and Short Range Watering

Jim Watson of Toro said that the more a person thinks about water management, the more he comes to the realization that it is a pretty scientific undertaking. "You just don't set out the sprinklers when you're in the mood and give the ground a good soaking," Watson declared. "That is, if you are interested in getting the most favorable watering results."

The 'how often, how much, how to apply' equation, Watson said, is determined by several long and short range considerations. For the long range program, the thinking man is looking to the kind of turf he must water, the condition of his drainage system, climatic environment, texture and structure of the soil and its condition in regard to compaction. Immediate watering needs are determined by capacity of the system, availability of help to apply water, amount of play, temperature, degree of windiness over a period of say two or three days and, possibly, intensity of sunlight during a similar period.

Soil Investigation Described

Soil investigation work carried on at Texas A & M was described by Morris E. Bloodworth. Many variations of the sand, clay, silt-organic mix have been tested there for permeability, infiltration, root penetration and absence of compaction and A & M agronomists have concluded that the best turf growing mixtures are found in approximately these proportions:



O. J. Noer Elmer Border

Among tributes to O. J., the GCSA Merit Award. Georgia Turf Association also gave Noer a plaque.

80 per cent sand (dia. of .5 to 1 mm); 10 per cent clay and 10 per cent organic (peat). Where 10 per cent silt has been used, compaction has been a problem. Topsoil depths should range from 12 to 16 ins.

Bloodworth also showed an interesting water penetration chart covering the soil range from loamy sand through sandy loam, loam, clay loam and clay. When three ins. of water is applied to each of these soils, loamy sand is penetrated to a depth of three ft., but there is a gradual decrease in the others (in the order listed) with penetration falling off to 16 or 17 ins. in clay. This chart was supplemented by another showing the degree of water flow through soils of various textures.

Bloodworth summed up his remarks by saying that putting mixtures as a rule, lose their structures much more quickly than agricultural soils. So far as the mixtures for greens are concerned, much research and practical work remain to be done in compounding soils that will not break down and will be resistant to a compaction.

Eight Landscaping Hints

If the supt. is called upon to double as a landscaper at his club, J. W. MacQueen recommended that he keep these points in mind:

1. Use trees and shrubs to enhance but not hide a building;
2. If the lines of a building are harsh and unpleasing to the eye, landscape to soften them;
3. Try to work out designs that frame