

mat of grass acts the same way on greens. It impedes or prevents absorption of water. Localized dry spots and sometimes the entire green becomes dry. Forking or aerifying then becomes necessary before the soil can be re-wetted. Removal of the surplus grass is the permanent solution. This can be done by cross-raking followed by close cutting or with one of the machines made for that purpose. Turf should be kept tight after that by close cutting along with brushing if necessary.

Tree roots in greens are responsible for much bad turf. They deplete the soil of all its moisture to a depth of several feet. Greens become hard and the soil refuses to accept water. The surface becomes sopping wet after each watering. Grass thins and algae puts in an appearance. Trenching between the trees and the green to sever the tree roots, or root pruning with the Haines tree root pruner, is the best answer. In order to obtain and keep good grass, tree roots must be controlled.

How to water is always a debatable question. Some favor sprinklers, others hand-water, and still others use a combination of both methods. It is not easy to water severely contoured greens with sprinklers without overwatering the low areas. That is why some superintendents water one time with the sprinkler and the next time by hand during hot weather. The man who does the hand-watering is taught to direct the water to the high spots.

The necessity to keep the soil on the banks and slopes of the green moist seems obvious, yet is not appreciated by everybody. Dry banks will rob the green of moisture. Then wilting occurs around the edge of the green and the bruising effect of the driving drum on the power mower takes its toll.

The amount of water to apply at one time is important. That can be judged by pressing the soil between the thumb and forefinger. Whenever water can be squeezed from the soil several hours after sprinkling stops, the indication points to overwatering.

When to water is another popular question. When overwatering is practiced, time of watering does not matter. There is some evidence in favor of early morning as the best time when the proper amount of water is used. This applies to humid areas where grass is apt to be laden with dew in the early morning. Sprinkling destroys the drops of dew and dries the grass so disease is less severe. In areas of low hu-

midity, there is no difference between night and daytime watering because turf gathers no dew during the night.

Infrequent watering is the goal to strive for and is best practice when there is an extensive and deep root system. Yet the necessity for frequent watering in times of stress when root systems are shallow must be recognized and followed. The use of a little water during the daytime is inevitable when grass is in severe wilt and the day is hot and/or windy. This practice saves and does not kill the grass as some believe. Watering soon after heavy rains may seem ridiculous to some, but it may be the difference between saving and losing grass which is in an advanced stage of wilt. Metallic blue color and footprinting are unmistakable signs of wilt if you do not know it.

### **Duration of Insecticides in Soil Not Known**

By **WALTER E. FLEMING**

USDA, Agr. Research Service, Bureau of  
Entomology and Plant Quarantine

**B**EGINNING in 1943 experiments have been carried out at the Japanese Beetle Laboratory at Moorestown, N. J. to determine how long a single application of the newer chlorinated insecticides, including DDT, chlordane, toxaphene, aldrin, dieldrin, and heptachlor, would persist in different soils under various conditions, and how long each of them would be effective in controlling larvae of the beetle in established turf.

The treatments were applied at rates required to control the fully grown larvae. The residual insecticide in the experimental plots was determined periodically by chemical analysis and bioassay.

The investigation is still in progress but, so far as information is available, it appears that when the percentages of the insecticides remaining in the soil are plotted against the periods of weathering, the resulting curves were of the sigmoid (curved in two directions, like the letter S) type.

DDT has been under investigation for 9 years, chlordane and toxaphene for 6 years, aldrin and dieldrin for 4 years, heptachlor for 2 years, and treatments with isodrin were applied this year. During these periods the treatments have been effective in eliminating the annual broods of larvae that hatched in the treated soil. The duration of the effectiveness in controlling the larvae and the persistence of these compounds in soil have not been determined.



### EYES OF TEXAS SUPTS. ARE ON THEM

Society of Agronomy meeting at Dallas, Rivercrest CC invited some of the golf turf authorities over to Ft. Worth. Here's the line-up of guests and hosts: Front Row (L to R): A. G. Mitchell, Rivercrest pro; Tom Mascaro, West Point Products; Charlie Wilson, USGA Green Section; Frank Goldthwaite, Texas Toro Co.; Fred V. Grau, West Point Lawn Products; H. B. Musser, Pennsylvania State College. Back Row (L to R): Ralph Rowley, Texas Toro Co.; Clarence Waits, supt., Rivercrest CC; Howard Gregory, Texas Toro; Charles Gregor, Texas Toro; Bill Daniels, Purdue

### Columbia (Mo.) Teamwork Gets 9-hole Course for \$15,000

**H**OW DO YOU build an excellent 9-hole grass green golf course for \$15,000? Early this summer Central Missouri golfers will be teeing off on just such a course.

Columbia, Mo. is the site of this 9-hole bargain.

It took a lot of hard work by two Columbia civic groups in cooperation with the city's Parks & Recreation department to bring this course into reality.

The whole thing started several years ago when the City of Columbia tried to buy a tract of land adjoining its airport in order to make some runway improvements. The owner of the land was determined to sell all or nothing so the city found itself with 75 acres of rolling land for which it had no use.

The Cosmopolitan Club and the Junior Chamber of Commerce of Columbia both had park sites on either end of this tract. The two organizations soon put their heads together. With only one public golf course in a city of over 30,000 the area seemed a natural for the development of a municipal golf course. It had a lake which would provide a plentiful water supply and the soil composition and land contour were generally suitable.

The Columbia City Council agreed to

lease the land to the clubs for one dollar per year and construction of the course was begun. With the major problems of acquiring a suitable location and paying for it taken care of the two organizations, in cooperation with W. C. Harris, Columbia's Parks & Recreation director, began work in earnest.

After clearing of the area and roughing out of the greens and tees had begun Earl "Smiley" Bell, of Kansas City's Armour Fields CC was engaged as course architect for the 3485-yard layout.

To finance the work the two clubs each raised \$1500 which was supplemented by \$5000 given by the city thru the Parks & Recreation Department. Additional funds have been raised thru the sale of tickets to be used when the course is completed.

Expenses were cut by the use of labor donated by members of the Junior Chamber and the Cosmopolitan Club. The over two miles of trenching needed for the courses watering system were dug free and special discounts were received on many items. In addition city equipment and labor were used whenever available.

The course, expected to be ready for use by late May or early June, will be the only municipal links with grass greens in a 50-mile radius of Columbia and is expected to draw golfers from all over Central Missouri.

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# National Cash Register New Club Sets Top Standard

By HERB GRAFFIS

**M**AY 29 National Cash Register Co. employees formally opened their two 18-hole golf courses and clubhouse. The plant is by a substantial margin the largest golf construction job of recent years and perhaps the biggest investment yet made in a golf establishment. Its cost is approximately \$2,000,000. Industrially it is outstanding in many ways.

In company policy as well as in the character and cost of the courses, clubhouse and operating equipment the plant impressively exhibits the importance highly successful corporations put on golf as a valuable balance in an intensely industrialized civilization.

The personnel situation at NCR's huge Dayton plant is one of mutual respect and friendliness between those who might be termed the "enlisted men and women" and

the "officers." "Labor" and "management" are interchangeable labels at NCR. The non-executive workers say that nobody works harder than S. C. (Chick) Allyn, NCR's president, and his companion executives. Col. E. A. Deeds, 80-year-old chairman of the board; Allyn, R. S. Oelman, executive vp, and the rest of the top command take pride in the family spirit which prevails in the organization.

## Golf in NCR Community Service

Another factor reflected in the democracy of NCR operations is the range of the company's business from a little store buying the lowest priced item in the NCR line to gigantic corporations and governments whose purchases run into millions. Every customer is important to the NCR management and so is every worker on the National Cash Register team.







From the air you see, in the foreground, left to right, in a semi-circle around the clubhouse the 1st tee, 9th green, 18th green and 10th tee of the South course; and the 9th green, 10th tee, 18th green and 1st tee of the North course.

Golf figured early in the NCR community- and employee-relations picture. John H. Patterson, pioneer builder of the company, although not a golfer, gave the 36-hole Community CC to Dayton. Col. Deeds, also not a golfer, was a founder of the Moraine CC on which the 1945 PGA championship was played.

Allyn is the golfing driver of the NCR outfit. He shoots in the mid-80s. He has served as chairman of the Advisory committee of the PGA. Allyn is a star among the world's super-salesmen. He will return to Dayton after a trip of weeks abroad, catching his sleep on the fly, steam through accumulated desk and plant work, then on week-ends get out for golf to keep himself in condition for a brutally strenuous schedule.

NCR always has had an accent on employees' recreation. The Old River recreation park close to the main factory is a model operation. There are swimming, boating, picnic, golf practice, and other recreation facilities. Movies and other indoor diversion also feature the NCR Employee's Benefit Assn. program.

With the great growth of golf interest and play there hasn't been room enough for NCR's 13,000 employees and their families who are present or potential golfers, on Dayton's courses. There are 63 holes on

Dayton's three many courses, a semi-private 18 hole course, and five private clubs in the Dayton area; a total of 162 holes of golf. The population of Dayton's metropolitan area is about 340,000.

To provide NCR employees with golf facilities of the most completely satisfying character golf architect Dick Wilson was called in and given instructions to provide the best for NCR employees. To a 200 acre area secured from Col. Deeds another 270 acres adjoining was added. The entire tract has as an across-the-road neighbor the Moraine CC. On its borders are fine suburban residences and estates.

Scenically the site was superb. One 18, the South course, can provide a rigid test for the field in any major golf championship. It winds through wooded, undulating terrain. The other 18 (the North course) is on what was rather flat farmland. This has been transformed by the magic of modern earth-handling equipment and methods into exceedingly interesting rolling ground very much on the order of some of the Scotch seashore courses, although without their rugged trapping.

#### **Big Earth-Moving Job**

Construction work was begun May 1, 1952. In four months the courses were roughed in during what probably was the most extensive non-hydraulic earth mov-



NCR's interest in golf extends beyond its own family in Dayton. Company chiefs have brought the game's stars to Dayton for exhibitions. Here, prior to an exhibition at Moraine are (L to R): Babe Zaharias, Col. E. A. Deeds, chmn., NCR board and S. C. Allyn, pres.

ing job done in golf course building. The courses' sites, like that of the adjacent Moraine CC., was a glacial moraine and full of rocks and pebbles. Generally it takes years and an untold amount of money to get satisfactory golf turf on such ground. Here Wilson decided, and was given the green light by NCR, to save money and time by doing the job quickly at the start.

Wilson placed the earth-moving contract with Troup Contracting Co., Miami, Fla. The Troup organization has done 12 earth-moving jobs on Wilson-designed courses. On the NCR job approximately a million dollars' worth of equipment was used. At one time there were 50 operators, 50 laborers, two superintendents and five foremen on the job.

Some topsoil was hauled from as far as 2 miles away. Due to careful planning and speed the over-all economy of this work was remarkable. In one day 10,000 yds. of dirt was moved. Action was swift with the earth being unloaded and contoured quickly after the stakes were put into the ground.

There are no blind holes and course design has a very gradual rise to the clubhouse which is 75 feet above the lowest point of the course. Subgrading and top-

soiling was done with machine course maintenance clearly in mind. Especially interesting examples of fairway contouring to control shot placement, and in one case to steer play with complete safety on parallel fairways, are among features of the design taking fullest advantage of the earth-moving facilities.

#### Seeding Catch Good

All fairways, tees and slopes of greens were seeded in August 1952. Fairways were seeded to a combination of Astoria bent, Chewings fescue and bluegrass supplied by O. M. Scott & Sons Co. Tees also were seeded with this combination but with a heavier percentage of bent.

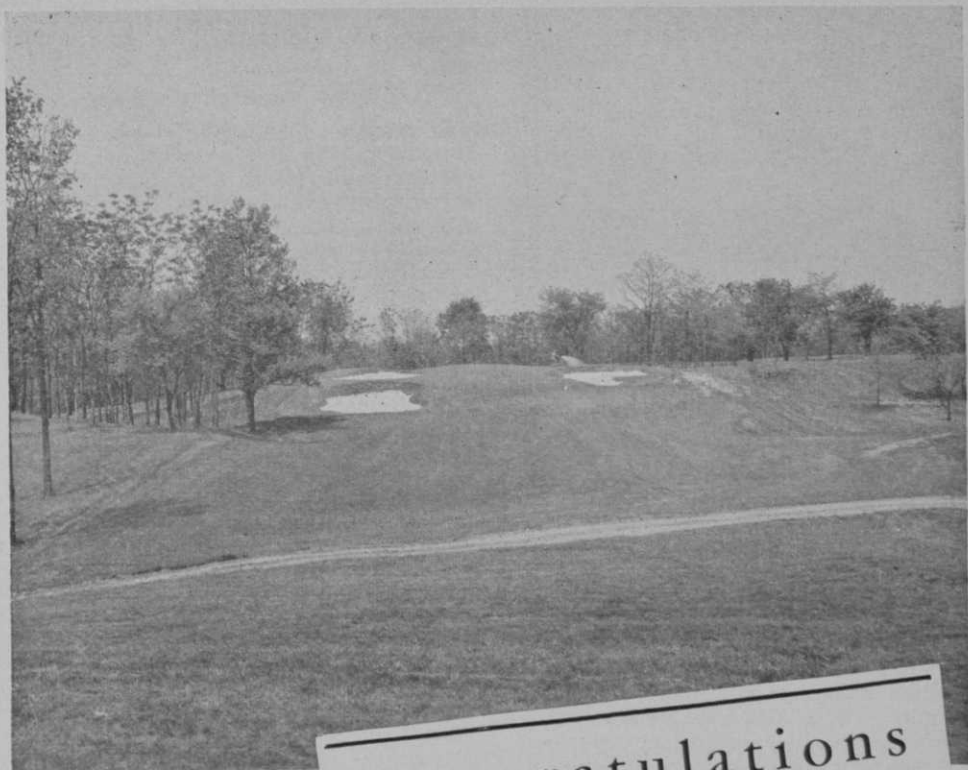
Despite adverse weather conditions seeding catch was excellent. A soil preparation program and fertilization involving use of Milorganite, 10-6-4 and 6-10-4 together with one of the most complete and modern watering systems accounted for saving years in turf development time and in cash economy beyond the realm of estimate.

#### Watering System Thorough

Clow-National mechanical joint castiron pipe in 3 in. thru 10 in. sizes and to the extent of 40,910 ft. was used. Durability, low maintenance cost and flexibility were performance and economy factors figured

Front of the NCR clubhouse partially shows parking space for 600 cars. Practice and instruction tees are to the left of this area.





## Congratulations

to all of you at the National Cash Register Company on the opening of your two magnificent golf courses.

We are proud to have the privilege of working with you on a golf course development that exhibits the highest standard in every detail.



In your two outstanding golf courses, as in many more of the finest golf irrigation installations, Clow-National Mechanical Joint Cast Iron Pipe assures enduring satisfaction.

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Landscaping was planted early on the road side of the equipment building to dress it up as fitting a fine residential district.

in determining the installation which was trenched by Southern Hills Pit, Inc., Dayton. Galvanized steel pipe (10,000 ft.) was used in lead-offs to sprinkler heads. Plastic pipe was used for drinking water lines.

Two Layne & Bowler 30 hp deep well pumps, each 300 gpm, were installed to supply a 700,000 gal. reservoir. Water level of reservoir automatically operates or cuts out pumps. Four American Well Works 300 gpm pumps supply water to course sprinklers via a 7500 gal. pressure tank.

Skinner sprinkler equipment was used on a carefully worked-out system of sprinklerhead distribution that provides uniform water coverage. Generally the heads are spaced 80 ft. apart. Water distribution includes rough areas within playing scope. The watering system is set up to operate 28 sprinklers simultaneously.

Considerable investigation of watering installation and practice was done among superintendents and golf turf scientists prior to designing the watering system.

The pumphouse is adjacent to the course equipment headquarters. Equipment headquarters and course service roads were thoughtfully located for efficiency and to

Men and machinery to maintain NCR courses form in "company front" before course operating headquarters. Supt. Hart heads the assembly.



avoid interference with play instead of being hit-or-miss placement as often is the case at golf courses.

### Early Work on Greens

Greens were planted to C-1 and C-19 in September, 1952. Then a spell of hot, humid weather came along. Availability of the watering system was a life-saver. In 1953, with some patching, greens were maintained toward the latter part of the season virtually on a playing basis. Fer Mel soluble fertilizer was effectively used in this program. Hand weeding was done on greens by a force of 47 men who also attended to such jobs as clearing away brush and woodlands bordering fairways. Tersan, Calo-Clor and Acti-Dione helped greatly in greens development and maintenance.

The clearing up operation was another example of getting the course completely prepared so attention could be concentrated on maintenance while the course is in play, instead of having to divide work between maintenance and completion of undone construction and clean-up work which usually makes the first couple of years of new course operation costly and unsatisfactory.

Due to a generally gravelly subsoil tiling wasn't needed as greens drainage. Greens were put into basic shape for planting by floats of 2 in. by 12 in. timbers held together by steel ropes with finishing contouring done with steel mats to soften the grades for mechanical maintenance and surface drainage prior to planting.

Particular attention was given to getting physically as well as chemically correct soil. On fairways and on greens and tees where design permitted Seaman pulverizers on big wheel tractors went over the ground, prior to plowing and discing.

The year's conditioning in 1953 showed remarkably little settling and tees are noticeably level for a new job that's been well weathered-in.

Because of accent on having everything finished at the opening greens weed elimination was more strenuous than is customary on new courses and comparatively few small spots required overseeding with a 50-50 mixture of seaside and redbot.

### Start Fully Equipped

Never before, so far as informed superintendents, equipment men and golfturf authorities know, has a golf establishment had the start for fully and efficiently mechanized operation the NCR courses have had. Allyn told Jack Hart, supt. of the courses, and Dick Wilson that he



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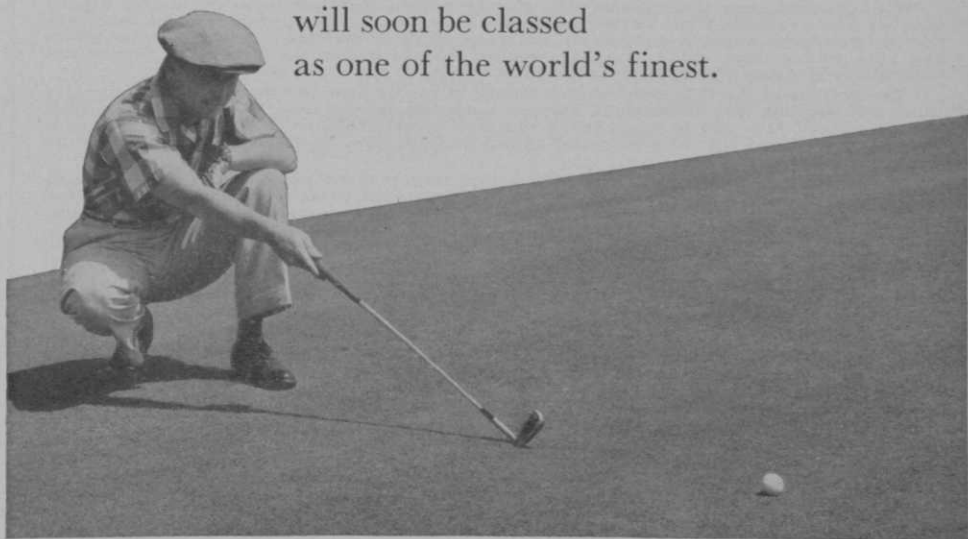
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# NATIONAL CASH REGISTER Golf Course at Dayton

Congratulations . . .  
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of NCR on this important achievement  
in employee relations and to  
Architect Dick Wilson for a superb  
job of design and construction.

We are confident this 36 hole layout  
will soon be classed  
as one of the world's finest.



wanted the same policy followed in course maintenance that prevails at the NCR plant and which the NCR president emphasizes in his selling — the best machinery you can get to do the job better and save men, money and time.

The layout started out with an equipment building and shop that looks like a fine clubhouse and which cost \$109,000. The dormer windows on the building are for show only as the building is in the neighborhood of fine homes and has to fit the picture.

Inside the building is about \$50,000 in maintenance equipment and a shop fully equipped to take care of almost every repair and adjustment job except those requiring welding.

Hart, who is 25, is one of the youngest superintendents on a big golf job in the country. He is a protege of Orville Young, supt. at Moraine. He has a degree in agriculture at Ohio university, a hitch in the

Marines and a year in charge of the Zanesville (O.) CC in addition to his work with Young at Moraine, in his record. He's got two very competent foremen (one for each course) as top staff officers, a mechanic and asst. mechanic and about 25 men as his permanent operating force for the two courses.

He's not scared about the size and importance of the job or backward about asking questions of older superintendents and other experts. He says the job is simplified and made efficient by the NCR policy of treating every fellow on the payroll as a high-class human and that has them working more and smarter than any boss could drive anybody.

The equipment building has a room of lockers, shower, washing and toilet facilities for the course workers, a businesslike office for Hart, a store-room containing a \$1200 inventory of spare parts, as well as

*(Continued on page 72)*

## **In the National Cash Register Family Spirit**

*(S. C. Allyn, NCR Co. president, comments on getting together at the new club.)*

The NCR Company has always given considerable attention to recreational facilities for employees and their families. We believe that the opportunity to get together in after-hour activities does much to foster the family spirit which has always marked this organization.

We have seen, for instance, how much our employees' recreation center, Old River, has meant to our people during the 15 years it has been in operation. With its swimming pool, picnic groves, boating lagoon, baseball diamonds and other attractions, Old River is enjoyed by thousands every summer.

The popularity of Old River emphasized the interest of employees in wholesome recreation. The 40-hour work week and full week ends have increased the amount of leisure time available and give families more opportunity than ever before to get out of doors and to participate in sports. Forty years ago when I joined the business, the normal work week was 54 hours.

In considering the expansion of existing facilities it was natural that golf should be given serious consideration.

Industrial golf courses are not new. There are a number throughout the country and quite a few have been established fairly recently.

We knew that many of our people were playing golf and that many more would play if better facilities were available. While Dayton is probably in as good a position as the average community from the standpoint of public and private golf clubs, all its courses are overtaxed. The congestion and long waiting times which frequently resulted, did not add to the pleasure of playing and undoubtedly kept many from taking up the game.

The facilities of the NCR Country Club consist of two 18 hole golf courses and an attractive clubhouse, complete with locker-rooms, lounges, snack bar and pro shop. The South Course winds through wooded hills and is considered a course of championship calibre. The North Course is much more level and will have a special appeal for those who are just starting to play and for women.

We believe these courses will satisfy the golfing interest of the many hundreds of our people who want to play the game. Our employee ranks include some of the community's best amateurs. On the other hand, hundreds who have signed up are just taking up the game. Over 600 are taking beginner's lessons and have been during the months the courses have been under construction. Among these are wives and children of employees. As of the opening date more than 3,000 employees and members of their families had taken golf memberships and another 2,000 social memberships. The cost of membership is extremely low.

A great deal of research and planning went into the construction of these courses and the clubhouse as well. We feel that the end result is something which will spell many happy hours for NCR people.

The Club will be operated as a separate non-profit corporation known as "The NCR Employees Benefit Association" with its own officers and operating committee. While the Club is for the use of NCR employees and will not be open to the public, it will benefit other golfers in the city by taking some of the pressure off of other courses.

As time goes on we expect to expand intra-plant leagues and help to promote local industrial league events. It is quite likely that we shall be associated with industrial events of even broader geographical significance in the years to come.

We believe that golf has already made an important place for itself in the industrial recreation picture and that it will make even greater progress in the future.