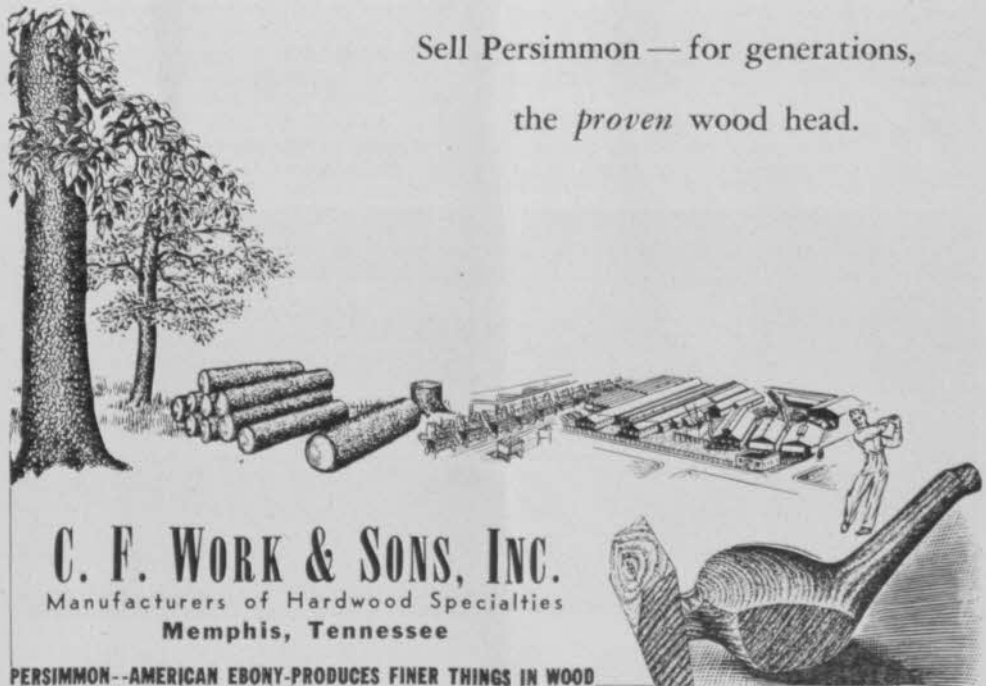


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Members of Southern Turf Association attend demonstration meeting at Cherokee CC, Memphis.



Aerifier is used on portion of ninth green in fertilizing and topdressing demonstration.

Southern Turf Association Meets at Cherokee GC

On September 1 the Southern Turf Association held a fall meeting at Cherokee GC in Memphis, Tenn., with "Bill" Perry as host. The date was chosen to coincide with the National Amateur Championship at the Memphis Country Club.

The morning was devoted to demonstrations and inspection of the course. Bill Perry demonstrated deep spiking on the 9th green. The West Point Aerifier was used on part of the green and a homemade deep spiker made by Bill was used also. Then the surface was mowed to remove debris, the green was fertilized and topdressed. The routine method employed on the course was used.

Those present toured the course and saw the experimental work on the approaches to the greens. Bill had applied

Milarsenite at 700 pounds per acre in a single dose. The treatment had eliminated almost all the crabgrass (kill estimated at 90 to 95 per cent by those present) and had produced an excellent stand of Bermuda grass. The contrast between the treated approaches and the adjoining untreated areas was most striking. Those present complimented Bill on the excellent condition of the course.

The balance of the morning was devoted to demonstration of mowers and other equipment by representatives of Jacobsen, Worthington, and Toro.

During the afternoon some played golf at Cherokee and the others went to Memphis Country Club to watch play there.

At 7:30 that evening the group assembled in the club house at Cherokee for dinner. Besides officials of the club and the officers of the Southern Turf Association, there were members from Knox-



Upside-down view of Bill Perry's homemade Deep Spiker shows construction and wheel attachment.



Perry measures depth of forking by Deep Spiker in demonstration before Southern Turf group.



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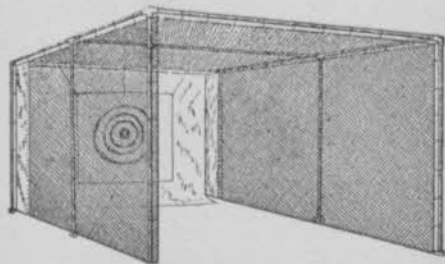
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ville, Nashville, Jackson, Miss., Paducah, Ky., and Arkansas. Mr. Elmer Michaels from Oak Hill CC, Rochester, N.Y., was present. The National Amateur is to be held at his club next year.

The evening meeting was devoted to a discussion of turf problems on southern courses with O. J. Noer as leader. At the start many nice things were said about the excellent turf on the fairways and greens at Memphis Country Club, and J. E. Hamner was praised highly for the excellent job he did in conditioning the course. Fertilization prior to seeding rye grass for winter play came in for much discussion. Those present agreed that phosphate and potash should be used generously before seeding, but that fertilization with nitrogen should wait until two to three weeks after the rye grass appeared above ground.

Charlie Danner, Secretary of the organization, reported that over \$125.00 of the \$200.00 yearly contribution for the turf experimental work at Tifton, Georgia, had been collected and that the balance would be obtained.

The meeting was an enthusiastic one and evidence of the increasing interest in turf development throughout the South. Until recently there was no concerted effort to solve maintenance problems in that section of the country. The next decade is sure to see vastly improved turf and better golf courses.

TURF ROUND-UP

(Continued from page 70)

They fail to see the entire picture. It is our conception that support of the Green Section is more essential than ever before.

Advances in 1948

We invite the attention of our readers to GOLFDOM's "Turf Roundup of 1947" for a thorough discussion of "new" things in turf maintenance. The basic principles discussed there are still good. We can, however, point to some advances and some results during 1948.

We are learning that bentgrass requires MUCH LESS irrigation than we had ever believed before. The regrettable tendency is to overwater bentgrasses on both greens and fairways. This is particularly true in the arid regions where water is critical. We need to learn a lot more about how to irrigate turf.

There is still a marked tendency to mow putting greens too high. The best greens in the country are mowed at 3/16-inch every day. Some bent fairways are in danger of being ruined by cutting too high. Bentgrasses grown at Beltsville without

artificial irrigation were better at 1/4-inch than at 1/2-inch. One must see this to believe it. The same can be said of Bermuda grass fairways and tees.

Bluegrass is being used less and less on golf courses except where it grows naturally in the roughs. Some courses are able to grow good bluegrass turf by cutting 1 1/4 to 1 1/2-inches high but golfers do not want to play out of that kind of turf. The trend on northern fairways definitely is toward bentgrass.

Bentgrass

Confusion is the rule, rather than the exception, where bentgrasses are concerned. Three types are available commercially as seed:

1. Seaside creeping bent. This grass is most useful in arid and semi-arid regions for putting greens. It is susceptible to snowmold but with careful treatment and close frequent mowing, it produces excellent turf. At the higher cuts it produces an undesirable matted fluffy turf.

2. Astoria Colonial bent. This grass is upright in growth and is most useful on fairways and tees and for lawns that are cut closely.

3. Highland Colonial bent. This grass is similar in many respects to Astoria Colonial bent but has a more bluish cast. It blends well with other grasses.

For closely-clipped turf (1/2 to 3/4-inch) a blend of the three bentgrasses has given better results than any one alone. It is outstanding that throughout the country, bentgrass thrives under the closest cutting it is possible to give it, whether it is on greens, tees or fairways. It is doubtful that bent requires any more irrigation than do many other turf grasses. It has been extremely disappointing to see much good bent turf ruined by overwatering.

Among the vegetated creeping bents, for which no seed is available, these strains continue to be outstanding wherever they are grown and are properly managed:

Arlington (C-1)
Congressional (C-19)
Washington
Old Orchard
Toronto (C-15)
Cohansey (C-7)
Collins (C-27)

The combination of Arlington and Congressional mixed in equal parts when the vegetative planting is made is one of the top combinations in the country. Another is Arlington, Congressional and Collins mixed together, one-third of each. The others named usually are grown alone and each has individual characteristics. Of these strains Arlington continues to be the most resistant to disease and to drought.

Cohansey is a heat-tolerant grass but requires careful management because of its susceptibility to disease. Toronto is very susceptible to dollarspot but when this disease is kept under control Toronto produces a beautiful turf. Old Orchard has not received the recognition it merits. It is a sturdy grass which takes a lot of punishment and recovers well.

New bentgrasses are in the offing in development from the breeding and testing programs at Pennsylvania, Rhode Island, Beltsville, and Purdue. One of the aims of the plant breeders is to produce a grass that will have high resistance to disease, drought and insects; will produce a tight desirable turf under a wide variety of conditions; and can be planted from seed.

Bentgrasses are being more widely used on tees than ever before, primarily because they have the power of rapid recovery and are the only important northern turf grasses that can stand close clipping.

Bluegrasses

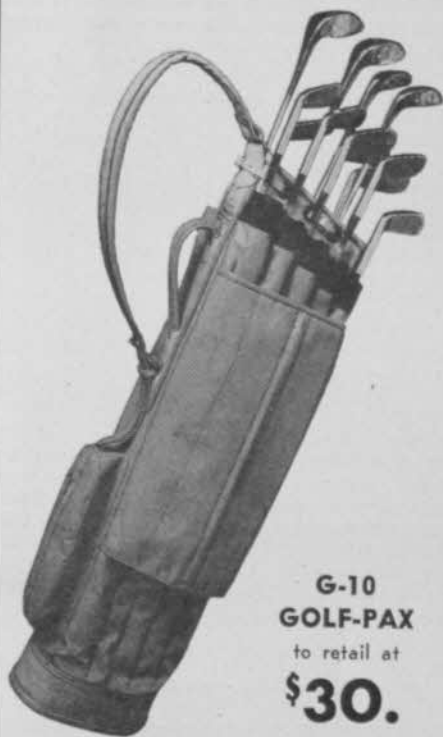
Last year we named B-27 bluegrass as the one receiving top honors in this field. The situation has not changed. Wide-scale tests with experiment stations and golf courses are in progress. Commercial production of B-27 bluegrass seed is increasing. It is entirely possible that within two years seed can be purchased on the market. This will represent a period of 14 years from the selection of the grass on a tee at the Merion GC, Ardmore, Pa., until the public can begin to realize the benefits of a new grass. Other bluegrasses are being tested which some day may prove to be superior to B-27. No possibility is being overlooked.

It appears to us, particularly in the Mid-Atlantic area, that bluegrass will find its greatest use in combination with a warm-season grass like Bermuda or Zoysia. The Bermudas and the Zoysias will be selected on the basis of their ability to allow cool-season grasses to grow with them uninterrupted. The demand for a green turf in fall, winter and spring is so great that it is useless to consider growing any warm-season grass by itself. To date it appears that B-27 bluegrass is much better than common bluegrass in this respect. The fact that it will stand closer clipping than commercial bluegrass is very much in its favor.

Fescues

The fescue testing program still is incomplete but a more complete report can be given at this time than last year. Tests at Beltsville indicate that Illahee creeping red fescue and Penn State Chewings fescue were the two at the top in our trials in 1948. At Purdue the creeping red fescue from Oregon, which now tentatively is being called "Prince Georges" (at one time

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the name "Trinity" was attached to the grass but because "Trinity" is a trade name it cannot be used as a strain name) and Penn State Chewings fescue have given the best performance over a period of several years. Both Illahee and the Oregon red creeper ("Prince Georges") are in large-scale commercial production. This phase of the program is just getting under way with Penn State Chewings.

Records are incomplete but it appears that the value of these fescues lies in the fact that they are more disease-resistant and that they withstand close clipping better than do others. For the greater part of the summer, the fescue plots at Beltsville were maintained under $\frac{1}{2}$ -inch cutting (the mowers were set at $\frac{1}{2}$ -inch on a smooth surface). In the tests at Purdue the fescues were subjected to three heights of cut— $\frac{1}{2}$ ", 1" and $1\frac{1}{2}$ ".

Alta fescue continues to command attention because of its sturdiness, its ability to start growth quickly (it germinates in the same length of time as ryegrass), its drought-tolerance, its ability to stay green during a drought when bluegrass and fescue are brown, its ability to withstand close clipping when soil conditions are good, and its companionability with other turf grasses such as bents, bluegrasses and the red fescues.

Since the Turf Committee of the American Society of Agronomy has recommended that ryegrass be eliminated from all mixtures of perennial turf grasses and since redtop is short in supply and out of sight in price, Alta fescue assumes new importance as a so-called "nurse", "companion", or "filler grass" in mixtures. In spite of its apparent coarse texture it blends well with all other turf grasses under good management. It is considerably more tolerant of poor soil conditions than many other grasses.

During the past two summers Alta fescue turf has been attacked by rhizoctonia (brownpatch) and by some other diseases which for a time damaged the appearance of the turf. Except in a few instances the damage has been neither severe nor permanent. Apparently this weakness is most evident in the first year of growth.

Bermuda Grasses

U-3 Bermuda grass continues to win new friends in the northern part of the Bermuda region and the southern fringe of the bluegrass-bent-fescue region, where crabgrass is the prevailing turf grass. Indifferent management of U-3 Bermuda grass usually results in disappointment. With good management, frequent close cutting, and heavy nitrogen fertilization (particularly during the summer) this grass is able to produce a dense, firm, green turf with the very minimum of irrigation (at Belts-

ville no irrigation at all) on soils so compact that only knotweed and goosegrass normally will grow.

U-3 Bermuda grass appears to be combining satisfactorily with B-27 bluegrass and with a mixture of Seaside, Highland, and Astoria bents. The bent-Bermuda plot and the B-27 bluegrass-Bermuda plot have been the freest of crabgrass, and have provided more delightful year-round green color than any other combination tried to date.

Leo Bauman and Al Linkogel, of St. Louis, reported that at the end of the baseball season in that city the square yard of U-3 Bermuda sod placed on the infield remained green and thriving when all other grasses in the infield had been ground to dust. Telecasts of the games caused people at the television sets to wonder what that spot was in the infield.

Where U-3 Bermuda has been placed on sunny one-shot tees (where play is extremely heavy) the results have been more than anybody dared hope for. Most greenkeepers and superintendents hesitate to plant U-3 Bermuda grass on the approaches to their greens for fear that the invasion into their bentgrass greens will be more than they can handle. At Beltsville we have deliberately planted U-3 Bermuda in a path between the two ranges of bentgrass being tested for putting green and fairway use. Invasion and control is being studied seriously at Oklahoma as well as at Beltsville. Many greenkeepers report that Bermuda grass invasion is one of their least serious worries on the course.

New selections of Bermuda grass developed at Tifton, Ga., appear to bid fair to revolutionize Bermuda greens throughout the southern part of the United States. In a cold-blooded "mass-murder" program of $\frac{3}{16}$ -inch daily mowing with the minimum of irrigation, little fertilizing, and no topdressing, two or three of the new strains at Tifton were outstanding. Common "cottonpatch" Bermuda or Bermuda grass developed from seed failed almost completely. The new selections were dense, green and thriving.

Centipede Grass

Considerable hope lies ahead for those turf areas where management and fertilization are insufficient to meet the rigid demands of Bermuda grass. No grass goes downhill so quickly as does Bermuda grass under a program of neglect. Centipede grass thrives remarkably well under a program where Bermuda grass fails. Seed supplies are not yet available but great strides have been taken in the past year to insure commercial stocks of seed. For drought-tolerance, insect and disease resistance; ability to stand close cutting; and

to develop a desirable turf for many purposes, Centipede grass has no equal.

Since the initiation of a full-scale breeding and testing program by the USGA Green Section and the Division of Forage Crops and Diseases cooperating, much has been learned about Zoysia grasses. *Zoysia japonica* continues to claim our attention because of its potentialities for producing commercial supplies of seed. None as yet has been developed and it will be several years before this is possible. For the present, then, our efforts in developing and spreading *Zoysia japonica* will be from the standpoint of seed production.

Already information is available on how and when to plant *Zoysia* seed and at what rate per acre for best results. No serious effort will be made to encourage vegetative plantings of *Zoysia japonica* because U-3 Bermuda grass apparently has roughly the same climate adaptations as has *Zoysia japonica* and it can be established much more easily and will spread and heal much more rapidly than *Zoysia japonica* vegetatively planted.

Our principal efforts with the *Zoysia* grasses are in the direction of determining their companionability with the cool-season grasses (bents, bluegrasses and fescues). It has been demonstrated to our satisfaction that the very coarsest type of *Zoysia japonica* will produce a completely acceptable turf which will stand the closest cutting necessary to produce a good fairway. It is unlikely therefore that a great deal of effort will be expended in the direction of finding finer-bladed types because the combination of *Zoysia japonica* with bluegrass, with bent, and in some cases with *Alta fescue*, is so outstandingly good with the common coarse material that companionability stands out as the chief requirement.

Poa Annua

Much remains to be learned about the most desirable management and fertilization of combinations of *Zoysia* with cool-season grasses. Progress is limited by our inability to establish large areas of *Zoysia* turf for further study. It has been outstanding, however, that *Zoysia* turf at Beltsville apparently has not been affected by the heavy population of Japanese beetle grubs which has nearly completely ruined many other types of turf. Similarly, *Zoysia* turf alone and in combination with cool-season grass has maintained perfect playing surfaces at Beltsville without any supplemental irrigation. Moreover, *Zoysia* turf has fought crabgrass on its own terms and crabgrass has lost in every case. Our *Zoysia* turf remains crabgrass-free without special treatments.

Poa annua is prevalent on many turf areas where overwatering and compacted

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soil discourage the growth of other cool-season grasses. Where *Poa annua* normally "melts" out in the summer it is predicted that Bermuda grass or *Zoysia* grasses will thrive and eventually will become the dominant summer turf in these areas. When this occurs *Poa annua* will be blessed where formerly it was reviled.

Zoysia tees in Louisville, Ky., and Bermuda greens in Atlanta, Ga. and other places are thoroughly dominated by *Poa annua* throughout the fall, winter and spring, providing a dense, compact turf which is highly desirable for playing surfaces. With the advent of summer's heat and drought (or heavy rains) the *Poa annua* disappears as the strong summer-growing grasses come into active growth.

Unfortunately *Poa annua* turf is found in many areas where water is critically short in supply. By thoroughly cultivating the soil and by reducing the quantities of water applied we are confident that *Poa annua* turf can be replaced by more permanent species. Detailed studies on this subject are being pursued under the USGA Green Section fellowship at the Pennsylvania State College.

Clover in Greens

Clover has ceased to be troublesome on putting greens on well-managed golf courses. The "secret" appears to be better physical soil conditions, less overwatering, and better feeding practices. In some cases stronger grasses are indicated but the physical soil conditions seem to be the dominant factor.

Weeds in General

There are more weed-free golf courses today than ever before in history. 2, 4-D has done an outstanding job in ridding turf of the broadleaf weeds. Today there is little excuse for dandelions, plantains and buckhorn on any golf course.

The solution to Dallis grass control throughout the South has not been found. Certain preliminary trials indicate that perhaps a mechanical method may be found to be the answer.

Weeds in Bermuda greens can be ascribed to the same causes as clover in bent greens; that is, compacted soil; overwatering; weak, thin stands of grasses; and under-fertilization. I have seen so-called Bermuda greens which contained not more than 10% of Bermuda grass by the most generous evaluation.

Stinkworm or Tropical Earthworm

So far the tropical earthworm or so-called stinkworm is the unsolved problem on putting greens from Florida to Maine. Insecticides which adequately control all other turf insects have been unavailing

against the stinkworm. A coordinated attack on this pest is being made, spearheaded by the New York-Connecticut Turf Improvement Assn. in cooperation with the appropriate research departments of the Connecticut Experiment Station and the New Jersey Experiment Station, the USGA Green Section cooperating. Contributed funds are being accepted by Warren E. Lafkin, chairman of the research committee. It is planned to establish a research fellowship to study practical methods of control of this highly undesirable pest.

Insects in General

With the advance in knowledge of the use of the newer insecticides there appears to be little immediate danger of any widespread damage to turf where the insect is recognized in time to prevent the rapid destruction of turf. It is highly important that proper identification of the insect causing the damage be ascertained at the outset. State entomologists have been extremely helpful to superintendents all over the country in assisting them with their insect problems.

Diseases

The newer fungicides are providing a measure of protection against turf diseases heretofore unknown. New fungicides rigidly are examined for their possible toxicity to grasses. A complaint in 1948 has been that the cadmium fungicides seemingly are not always effective under certain conditions. In most cases this apparent ineffectiveness can be traced to a lack of mercury in the soil.

Where mercury applications have been discontinued for a period of two years or more these newer fungicides seem to be somewhat less effective than where inorganic mercuries are applied in the early spring and late fall, when toxicity to grass is minimized. In many cases small amounts of inorganic mercury are applied simultaneously with Tersan and with the cadmium fungicides, with excellent results. These statements may not be substantiated by carefully-controlled experiments and data but the observations of many of the leading superintendents indicate the soundness of this explanation.

Personnel

The Mascaro team of West Point, Pennsylvania, (Tom, Althea and Tony) are nominated for outstanding service in the field of turf. Their machine, the Aerifier, has opened a new chapter in the history of turf management and through its use many turf ills are being corrected on large scale at low cost. Their "West Pointers" have induced many a chuckle in an otherwise serious business. They believe in fun

in addition to hard work. The turf world will have cause to long remember them for their contributions.

New Book on Turf Management for Golf Courses

The USGA has approved the preparation of a book on Turf Management for Golf Courses and copy is being prepared by H. B. Musser, Pennsylvania State College, Editor. In this volume it is intended to bring up-to-date greenkeeping practices and developments in turf management since Piper and Oakley published their book "Turf for Golf Courses" in 1923.

This book may well serve as a textbook for college work.

Summary

More "self help" and "help-one-another" programs.

Green Section staff undermanned to handle individual service calls in addition to Beltsville research and administrative duties in cooperative decentralized program.

Putting green soils to get more sand, less clay, for proper drainage and aeration.

Poor turf no excuse for rebuilding green if architecture is good.

Topdressing putting greens on way out.

Crabgrass still worst turf weed but its doom is sealed with better grasses on the way.

Only one-fifth of nation's golf courses assisting in turf research work.

List of workers in turf research growing steadily.

Bent grasses thrive under closer cutting and less irrigation than most people think possible.

U-3 Bermuda grass promising for "north-meets-south" belt where crabgrass, knotweed, and goosegrass prevail on compacted soils.

Better Bermuda grass for southern putting greens on the way.

Centipede grass seed production being pushed.

Zoysia research in full swing.

Poa annua may prove to be a blessing.

Tropical earthworm in danger of extinction.

USGA's new book on Turf Management in preparation.

Brains still the best ingredient in any management program.



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Galleti Accorded Recognition For 40 Years of Service



Louis Galleti, greenkeeper at Claremont CC, Berkeley, Calif., is congratulated by Marvin Ferguson, USGA Green Section, for a job well done during 40 years of continuous service with the club. He rebuilt No. 1 green when he started to work at Claremont March 12, 1908 and it has been in continuous play ever since—a fitting background for the scene above.

HIGHLIGHTS OF TURF

(Continued from page 57)

weeds, especially dandelion, buckhorn, and plantain. It kills knotweed in the seedling stage, but is less effective afterwards. Clover has been checked but seldom killed completely. The results with chickweed have been disappointing. Indications are that some other chemical, such as sodium arsenite, will have to be used to kill the common type on watered fairways. When 2, 4-D has been used enough times to kill the chickweed, it has damaged the bent grass seriously.

The trend seems to be toward using 2, 4-D in the early fall rather than in spring for dandelion. By waiting until then the spring crop of seedlings is killed as well as the old plants. Crabgrass is less apt to become troublesome also.

Some clubs obtained such miraculous results with 2, 4-D that they thought it alone was the answer to good fairways. Those who did that and failed to use fertilizer where it was definitely needed, have gone from broadleaf weeds to clover. Golfers seem to gripe more now than they did before.

Fairways continue to be a big problem, but they are becoming better in most places. Clubs with watered fairways, which have changed fertilizer programs and are fertilizing in fall, then in late spring and again during summer at light rates, invariably report better results than the old method of fall only, or spring and

fall. Turf does not need nitrogen in early spring, but benefits from a slight lift with this growth-producing element during the summer.

The use of some Colonial bent on unwatered fairways is receiving attention, notably in the Cincinnati area. Three of the courses in that city have Astoria bent and bluegrass in the fairways. The bent has done well for more than ten years without water. There is less crabgrass in the bent-blue grass turf and players obtain better lies.

Grubs were bad in parts of the Middle West. Results with DDT and Chlordane on the phyllophaga grub of the three-year cycle grub of the May or June beetle were disappointing. One club used 50 per cent DDT at 50 pounds and 50 per cent Chlordane at 28 pounds per acre without obtaining practical control of the grubs. Yet DDT gave excellent control of the annual June beetle grub in southern Ohio and Kentucky. Apparently it is important to know the species of grub.

In the southwest, Southern Hills CC at Tulsa pioneered turf improvement on fairways several years ago and pointed the way to good turf on watered fairways in that section. Before that, their watered fairways were mostly crabgrass and clover. Now they are a velvet-like carpet of Bermuda grass. They used sodium arsenite to kill the crabgrass and clover. Then they fertilized generously to obtain a solid mat of Bermuda grass. The Memphis CC did the same thing last year, and had exceptional fairways for the National Amateur in September. Their Bermuda greens were exceedingly good also.

PROS TELL HOW

(Continued from page 51)

charts, plus ideas that fit our particular course.

"The boys are permitted to play all day Monday and Friday morning during school vacation. They may also play after school on Monday and Friday and any other time I see fit to let them play. (This makes for better attendance.)

"A Caddy-Lady Event plus lunch is sponsored by our lady golfers each year.

"We held five caddy tournaments this season.

"Prizes went to boys showing most improvement, also there were prizes for playing ability.

"Golf instruction to caddies is given by me.

"I encourage the boys to play as often as