

OCTOBER • 1950

Turf Round-up of 1950

By FRED V. GRAU

Director, USGA Green Section

The season just ending has been kind to most turf superintendents. Abnormally cool weather with persistent fogs in some coastal areas, has marked 1950 as an unusual season in contrast to the near-tropical weather of the last two years (which also was unusual). There were fewer complaints, but more letters, in the Green Section office than in any previous year within our recollection. The spirit which seemed to pervade the areas of turf and those who are responsible for them was one of OPTIMISM! Nearly everyone felt "At last we're getting somewhere." As this piece is being written the fall of Communist Korea is an actuality and the Reds are on the run. This news has generated great optimism for all things in spite of the sacrifices that we know lie ahead of us. No sacrifice is too great when Freedom is at stake.

Learn To Tighten Belts

Before we analyze the events in 1950 let each of us solemnly pledge to practice utmost economy in all things relating to Turf Management. Few are so naive to believe that we can continue to enjoy unrestricted use of materials important to an all-out effort. Perhaps that all-out effort may not be required but, to be forewarned and forearmed can hardly be considered a crime. Let us, therefore, practice economy voluntarily before it is required of us. But let us learn to distinguish between real and false economy. Here are a few pertinent suggestions:

1. See that maintenance equipment is in good order; get new equipment if it is needed. This is sound economy. Most important items are tractors, trucks, mowers, aerating tools.

2. Build a generous nursery of the best improved grasses which are adapted to your area, and which are tops in drought tolerance and disease resistance. Water and fungicides may be at a terrific premium within our time.

3. Learn how to control weeds economically. Avoid as you would the plague the over-priced herbicides. Remember that

there are low-cost methods and materials backed by authentic research.

4. Learn how to fertilize economically. When controls come, the superintendent who has lost the knack of using ordinary grades of dry fertilizer may be "over a barrel." Fertilizers in solution seem to be "over-priced" out of proportion to their value.

5. Above everything else learn how to save all the rainfall you can! In Peace or War nothing is so precious as WATER!! Most golf courses are on sloping land. Runoff is heavy when soils are compact and turf is thin. A porous soil, made so by cultivating turf below the surface, is the perfect sponge. It is our belief that steel for machines that cultivate turf soils for saving water should be put on a par with steel for farm machinery that is designed for the same purpose on pastures and other grasslands. Saving water and reducing erosion does not stop at the fence line between a corn field and a golf course. The benefits of such a steel allocation program would mean little to the total steel demands but would mean much to turf and to the national economy.

6. Saving labor already has been forced upon us. Golf courses that had lots of hand labor built into them are in a bad way. The 18-hole public courses with no sand traps that can operate with two men and a boy are smiling contentedly. It seems that we learn slowly!

7. Learn to grow good greens without adding top-dressing! Some greenkeepers have done this for 10 to 15 years. Their greens are excellent by every standard. Some 18-hole courses top-dress 6 to 8 times a season at \$400 to \$500 per. Some superintendents top-dress with material in the green which is left on the surface after aerifying. There is no standard — it is up to each individual to do the best he can.

8. Learn to produce good turf with less seed! A cemetery man in Cincinnati produced good Merion bluegrass turf in one year on subsoil with 100 pounds of seed

on 14 acres. Less seed is possible if it is good seed. It takes more than bushel weight or mechanical purity to be good seed! It takes genetic background and a record of performance. Avoid prepared seed mixtures which contain redbot, ryegrass, timothy. All experiments show that these three bandit grasses are detrimental to the good seed in the mixture. Let us hope that no true seedsmen ever will profane the superior turf grasses by mixing them with these thugs!

9. Learn how and when to make "foolproof" plantings of the truly superior vegetative grasses so that they require no labor to "baby them" while they get started. The 2-inch plugs seems to be most economical and nearly foolproof. They have been used successfully to returf a one-shot tee while it was in constant use.

WANTED

A sturdy inexpensive machine which can be used for the rapid, economical lifting and introduction of 2-inch plugs of superior creeping grasses into established turf without taking the area out of play and with virtually no inconvenience to the players.

LIBERAL REWARD

The reward will be the satisfaction of having contributed to the further development and the more economical maintenance of Better Turf.

10. Last but not least, in this admittedly incomplete list of suggestions is this: "Get on someone's research team and help those scientific men who serve you to test their findings in a practical manner." It makes little difference whose team you are on. Learn to release those "Secrets" for the benefit of mankind. Secrets in greenkeeping are about as useful as Communism in a free America. Learn, also, to tell about your experiences, your special machines and devices; take pictures and write about them. Others need to know some of the things you have learned. The splendid thing about knowledge is that "the more you give the more you have."

Turf Research in the U.S.

The USGA Green Section's TURF REVIEW, published in September 1950, is an up-to-date compilation of research projects, research workers, available publications, financial support and other pertinent data from 18 cooperating experiment stations. This booklet fulfills a long-felt need in helping to coordinate research work in turf and to introduce turf work-

ers to one another—at least on paper. It was financed by the USGA and free copies were mailed to all 48 experiment stations regardless of their activity in turf work, to all golf associations, to all greenkeeping superintendent associations, to all USGA committee members, to foreign co-operators and to those firms, who to our knowledge, are contributing financially to cooperative turf research. The few remaining copies will be sold at \$1.00 each, postage free, on a first-come, first served basis, to help defray publishing costs and to insure a revision for 1951.

Needless to say, cooperative turf research in the United States reached an all-time high in 1950. The expended post-war turf research fellowship program launched by the Green Section and several state experiment stations in 1945 has borne rich fruit. These men have received degrees in some phase of agronomic research which has benefited turf directly:

Dr. James R. Watson, Jr., Penn State, now engaged in teaching and turf research at College Station, Texas. Dr. Ethan Holt, Purdue, now engaged in pasture work at College Station, Texas. Ed Roach, Masters degree from University of California, Los Angeles, now greenkeeping superintendent at Rio Hondo. Dr. Willis Skrdla, Purdue, now in pasture and turf work at Middleburg, Virginia, for V.P.I. Dr. William Daniel, Michigan State, now directing turf research and extension at Purdue for M.R.T.F. Dr. Marvin H. Ferguson, University of Maryland, now Agronomist in Charge of Research for USGA Green Section. Don Likes, Masters degree from Purdue, now on a golf course at Lincoln, Nebraska. Dr. Richard Davis, Purdue, now at Ohio State where he is engaged in Turf and pasture research. Ian Forbes, Jr., Masters degree from University of Maryland, now working on his Ph. D. with the USDA. Alva Niles, Masters degree from Oklahoma A & M.

Shortly after this piece has been published, Penn State will have turned out another Ph. D., L. Neal Wright of Oklahoma. Another Ph. D. "soon-to-be" is B. P. Robinson, who is working under Dr. G. W. Burton at Tifton, Georgia.

The effect of these men and their splendid training on turf work over the United States is tremendous. As they step into positions of trust and responsibility the continued impartial search for truth will be assured. We are proud to have had a part in this program of Better Turf for America and can only hope that support (moral and financial) for these fellowships will continue to grow. At this writing one seed grower in Oregon is considering establishing the second \$6,000

grant for a second turf research fellowship at Penn State so that you can have better turf grasses from seed. This is the kind of support that produces results of the kind that all of you have been asking for.

Turf Extension Work

When Charles K. Hallowell, County Agent of Philadelphia County, received an appointment to serve as visiting professor at University of California, Los Angeles, in 1950, you may be sure that extension work in turf got a new lift. The ability to make friends (and keep them), and to make people like you, are terrific assets in this turf work. Charles has all of them together with an uncanny sense of being able to say the right thing at the right time and to engender confidence. The fact that he knows what he is talking about is common knowledge. This, then, is the essence of extension teaching; to wander among your fellow men, to seek no favors, to dispense accurate information impartially, to encourage the backward, to encourage and to utilize the hidden talents of natural leaders, to subdue without offending those who "push-to-the-front" overbearingly, to assist when help is needed and, above all, to seek no credit but to enjoy quietly the fruits of one's work by

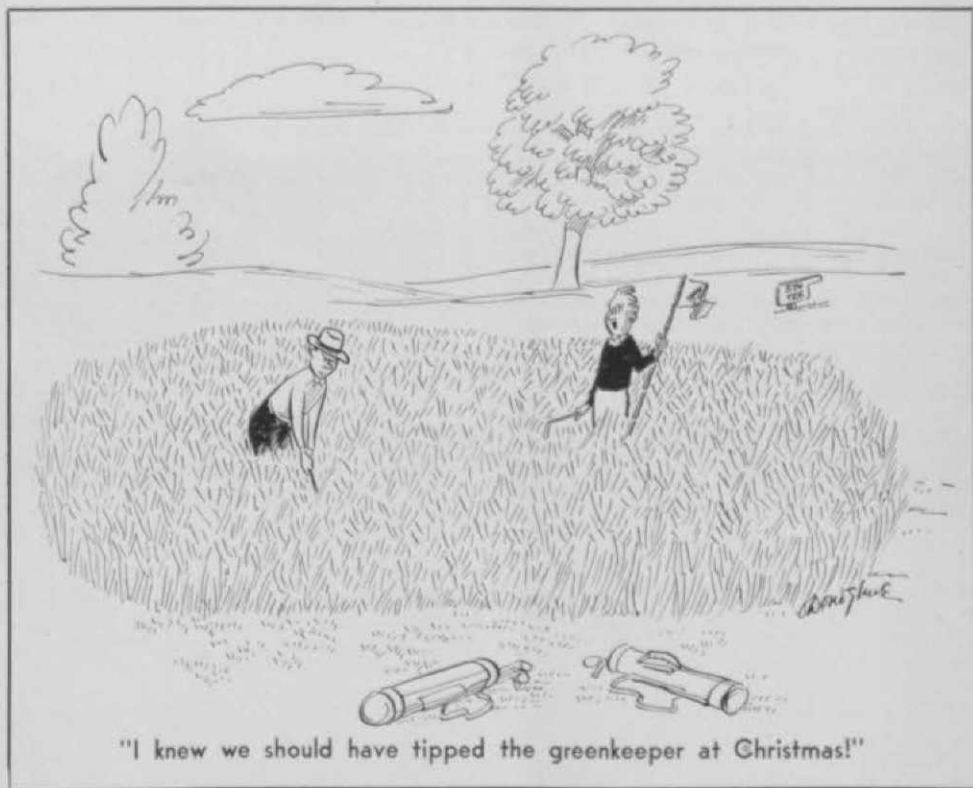
helping others to get the credit they deserve.

We need more good extension workers in turf to help protect the gullible American public from themselves and from the "hi-jackers" who sell inferior products at outrageous prices. We need more unselfish men and women who will dispense information to all who seek it without thought of reward. Among all the States in the Union only two have provided sufficient funds to provide a full-time extension man in Turf—Pennsylvania (1935) and Indiana (1950). Considering the value of turf and of the products sold and labor hired which go to maintain turf, this is rather a dim record, especially when one considers that "nearly every taxpayer is a lover of good turf."

Let us say then, that we are not happy over the development of turf extension work. Now, more than ever before, we need strong young men and women to tell the story of better turf—more economical turf—less wasteful turf—with the backing of accurate facts from the strong national research program.

Resident Teaching in Turf

Most of our recent Ph. D.'s in Turf were handicapped at the start because their undergraduate work had no relationship



to special turf problems. A strong effort is being made at two schools—Penn State and Purdue—to rectify this situation. Four year curricula are provided for students of selected backgrounds so that regular college courses with full credits can be taken and studied as they apply to turf management. For instance, a course in soils will be vastly more helpful to the student if he also studies the soil as it occurs on the golf course or on the athletic field. Disease of tobacco or cabbage are of little importance to the turf student when there are diseases of grasses to study. The very same diseases attack pastures, too. The whole idea is to teach the same fundamental courses in science but to let the turf students study that science as it relates to turf!

The plan had to wait several long years while the G. I. overcrowding of classrooms diminished. We hate to see it because many G. I.'s wanted to study turf but it wasn't in the cards. The plan is sound and receives our heartiest commendations and assistance. Some of the "top-dog" graduates will go on to take post-graduate work for advanced degrees in some special turf problem. These men will be our future leaders in Research Extension and Teaching. Yes, Turf has come of age!

Short courses in turf (6-8 or 10 weeks) and some 2-year courses, are being offered at New Jersey and Massachusetts. These fill a need among greenkeepers, park superintendents, and others who feel the need of a "refresher" course, to be brought up-to-date. Those who "graduate" have no academic standing but they achieve an enhanced position of importance among their fellow men and become more valuable to their employers. There always will be a demand for the short course because many will not be able to afford a four-year college course.

In all fairness, it should be pointed out that there is a steadily-increasing demand for college graduates to fill positions as turf superintendents at golf courses, parks, cemeteries, and college turf systems. Unfortunately, there is a serious lag in making the positions sufficiently attractive financially so that a young fellow can afford to spend four years in college. The ball is now in the hands of those who do the hiring—will it be a short kick (to the rear) or a long forward pass—or or a lousy fumble?

Orchids

First it was the Aerifier gang, then it was O. J. Noer. Should it go this year to the best crabgrass killer (heaven forbid) or to the best control for goosegrass (heavens, no). After long debate with ourselves we came to the unanimous decision that it should be ORCHIDS to

those who have done the most for cooperative Turf Research in a financial way. No arguments should arise over this popular decision—the record speaks for itself.

The golf associations include: Southern, Southern California, Detroit District, Georgia State, Indiana, Indianapolis District, Oklahoma, Western Pennsylvania, Women's of Augusta, Minnesota (Public), New England, Philadelphia, Pennsylvania, Maryland State, Texas, St. Louis District, Professional Golfers, and USGA, of course.

The turf associations include: Southern, Texas, Pocono, New York State, Oklahoma.

The golf clubs include: Atlanta Athletic Club, Capital City Club, Augusta National, and many many more who were not able to kick in \$1000 each.

The commercial firms include: American Cyanamid, R. R. Bond, Mock Seed Company, H. L. Wagner & Sons, Ed. Geary & Sons, West Point Lawn Products and our 170 Green Section Service Subscribers who pay \$35 a year for Green Section Service, most of which goes to support cooperative research.

The individuals include: O. O. Clapper—The John Samuel Clapper Memorial Grant.

The greenkeeper's associations include: Central Pennsylvania, Mississippi Valley Golf Supt.

Others include: Forest Park Cemetery, Houston, Texas, Municipal Sports Fund, City of Los Angeles, Tulsa, Oklahoma, Golfers' Fund for War Wounded, Inc.

Let us not forget the tireless efforts of those who have directed the research—Musser, Burton, Stoutemyer, Mott, DeFrance and all the rest who did the real work. Their orchids have that special fragrance of "forget-me-not." (If we missed someone tell us—not your neighbor. We're sorry!)

Conference and Field Days

Never before in history have there been so many gatherings and such intense interest on the part of the record-breaking attendances. There were some "Firsts" in 1950. Northern California got going at Berkeley in May. The Northern Intermountain region had their first at Billings in June. The Central Plains Turf Foundation was organized and has scheduled its first annual conference for October 25, 26 and 27 at Manhattan, Kansas. There seems to be a fierce desire to learn the "now" things and to be among the first to put them into practice. The pioneer spirit still is strong! The quality of the gatherings steadily improves with experience—and mistakes.

Poor preparation often dims the pleasure of a talk or a feature on the plots. A room not darkened spoils daytime Kodachromes. A faulty P. A. system can be a nuisance. Speakers who run overtime by 30 minutes should be checked by the Chairman. Many other faults could be listed.

Complete transcriptions of nearly all talks at Turf Conferences have been made available through the courtesy of the West Point Lawn Products. The records of the talks represent a valuable file of information for those fortunate enough to get them. A permanent record on what was said is needed by many who can not absorb all that is said (and that means most of us).

Nearly all dates for turf events cleared with the Green Section office first. Many conflicts were avoided and economy in travel was effected. Better spacing of conferences and Field Days is occurring.

Turf Publications

A splendid sturdy crop of Turf Newsletters has developed which are serving a very useful purpose. A partial list is given here: Heart of America, Oklahoma Turf News, Turf Maintenance Tips (R. I.), Bull Sheet (Midwest), New York-Connecticut, Tropical Turf Tips (Fla.), Turf Topics (Pa.), Pocono Golf Turf Association, Newsletter for Greenkeepers (Ia.), Mid-Atlantic, Midwest Turf News & Research (MRTF), New York State Turf Association, Turf News of Texas, Mississippi Valley Golf Supts. Association, University of California, Los Angeles, is getting ready to publish one and so is Southern Turf Foundation.

These local organs have a very important function. They cover the important things while they are happening. They are personal whereas Golfdom, Greenkeepers Reporter, and USGA Journal have to be more impersonal and factual. Congratulations to all those who serve on the staffs of these delightful adjuncts to keeping informed on local turf matters.

Turf Grasses and Seed Mixtures

In 1949 nearly 50 million pounds of common pasture bluegrass seed were stripped, processed, cleaned and sold. Now stop to think, "When and where was it I last saw a good bluegrass lawn?" Does it occur to you that most of the common bluegrass seed sold for turf fails to produce acceptable turf? In many cases the people who bought fancy, re-cleaned, 28-pound bluegrass seed might as well have bought crabgrass seed because that is what they ended up with. Seeding rates of 150 to 250 (or more) pounds of common bluegrass seed to the acre helps only the seedsman who sold seed. The Turf that

develops is just susceptible to leafspot disease (and others) and to crabgrass and other weeds as though only 50 pounds to the acre had been sown. It seems illogical to sell an inferior grass and then sell a high-priced "crabgrass control" for the crabgrass that is bound to follow.

In 1950 some 20,000 pounds of Merion (B-27) bluegrass seed were produced. The seed sold in 1-pound, 5-pound, and 25-pound lots at \$3.50 to \$4.00 a pound—and it was worth it as compared to common bluegrass seed at 80c. From 5 to 20 pounds to the acre of Merion bluegrass has resulted in perfect stands of turf in one year.

200x\$.80	=	\$160.00
20x\$4.00	=	80.00

\$ 80.00 saving per acre by planting Merion. Good seed (genetically good) always will be higher per pound but cheaper by the thousand (square feet) because less seed will be required and it won't have to be treated with hormones and other things. "Treated Seeds" as yet have not been proven. They make good sales talk but it's hard to prove their value.

In 1950 nearly 50,000 pounds of Penn State Chewings fescue were produced. The fact that it isn't certified doesn't change the fact that it is the best Chewings fescue available, especially from Washington, D. C. and into the Midwest where the going gets tough in summer. It stands diseases and close mowing better than other sources of Chewings tested at Beltsville.

The great new creeping red fescue, Penn State F-74, produced over a ton of seed in 1950. A piddling quantity, to be sure, but it is a start. This creeping red fescue actually creeps, is very resistant to disease and drought, and has been excellent for three years at ¼-inch mowing (putting greens). All of the other so-called creeping red fescues will have to bow to the newcomer (which will probably be a blend with several sister selections), especially in the "rougher-tougher" turf areas like Washington, Cincinnati, St. Louis, etc.

New top-crossed bents show promise but it is too early to say much on this point. Beware of so-called "hybrid" fescues or other grasses carrying a mysterious "X" designation. Where a "new" grass is "discovered" you owe it to yourself to report it at once to the Green Section or to your experiment station.

Virtually complete agreement has been reached on this point: Ryegrass, Redtop, and Timothy have no place in a seed mixture containing valuable perennial species. These three grasses detract from the value of any good mixture which contains

(Continued on page 86)

highway commission, Topeka. Dr. H. E. Meyers, K-State; Raymond V. Olson, K-State; F. W. Smith, K-State.

October 26 speakers are to be Fred V. Grau, USGA; F. D. Keim, agronomist, Nebraska Univ.; H. L. Lantz, Iowa State college, Ames; G. Brinkworth, Minneapolis, Minn.; P. Carson, Stroudsburg, Pa.; J. W. Funk, K-State; O. J. Noer, Milwaukee Sewage Commission and R. A. Keen, K-State.

The conference is to close at noon October 27. Speakers that morning are to be H. R. Bryson and J. W. Zahnley of K-State and G. L. McCall of the DuPont Company.

TURF ROUND-UP FOR 1950

(Continued from page 35)

bluegrass, fescue and bent. Either Astoria or Highland bent (or a mixture of the two) is more satisfactory as a nurse crop and "quick-greening" is obtained to satisfy the "in-a-hurry" customer. Meadow fescue, up to 15%, is popular on the West Coast and in the northern part of the Midwest.

Manilagrass (*Zoysia matrella*) slowly is gaining headway in the deep South but its occasional failure as far north as Washington, D. C. limits it. Its very slowness to establish is against it.

The Z-52 strain of zoysia is gaining new friends and admirers rapidly. It is nearly as fine as manilagrass but completely winter-hardy and spreads much faster to form a crabgrass-resistant turf. Z-52 seems to blend well with the better cool-season grasses to form nearly the "foolproof" year-round turf. A fairway of Z-52 with Merion bluegrass would be so perfect that golfers wouldn't believe it. Seed can be produced in club nurseries after two years in solid turf. Turf from the seed looks good, too!

Near-perfect fairway (and lawn) turf has been maintained for three years at the Beltsville Turf under the Green Section's maintenance, using the coarse common *Zoysia japonica* as the base grass overseeded with cool-season grasses. The best combination turf with the fewest weeds under a system of no water and very little fertilizer and $\frac{1}{2}$ -inch to $\frac{3}{4}$ -inch mowing are the plots where Merion bluegrass has been overseeded (3 years ago). The bluegrass-fescue-bent mixture isn't far behind. From this "hunch" five years ago we have come to regard a zoysia-cool-season mixture as nearly the ultimate in fairway and lawn turf wherever crabgrass is a serious pest. It may be the future athletic field turf, too, except that bermuda will stand more punishment.

The new C-115 bent still shows no evidence of turf diseases after four years

with no fungicides. It is being tested at various places for performance under a wide range of conditions. Plots with a mixture of C-1, C-19, C-115 show promise but it is too soon to tell how it will work out. Our meager stock at Beltsville is under increase but don't call on us now for stolons—see your own experiment station first. Our Jap-bettle quarantine makes it very expensive to ship vegetative material.

U-3 bermuda slowed down in 1950 because of low temperatures. Even so, it provided the very best in tee-and-fairway-playing quality. Cool-season grasses are doing well in U-3 this fall. Some of the skeptics are saying, "See, I told you it wouldn't work," but it is still in the picture for those who want the toughest in tee turf or athletic turf. We wouldn't trade our U-3 lawn in College Park for any bluegrass lawn I've seen—it suits our family perfectly. But it never should be planted on a lazy man's lawn because it responds only to good treatment and close, frequent mowing.

Southern California has welcomed the Green Section's U-3 bermuda as the bermuda grass they would most like to have. It stays green long after common strains are brown. To be convinced read C. K. Hallowell's report on his visit to Southern California. They also seem to like the improved strains of creeping bent (C-1, C-19, C-52, C-15) which are out-performing turf from Seaside seed month in and month out. Merion bluegrass got a fine reception in California, outranking common pasture bluegrass on every count.

The Southeastern States gingerly are trying Tifton 57 bermuda for their putting greens but they can't seem to believe that it is so good that it will crowd out the common cotton-patch bermuda. It does, though! But, after they have a Tifton 57 green they still have bermuda which doesn't putt like bent. We have to face the fact squarely—soon all the important golf courses in the South will be required to have bent-like putting surfaces. The pros and the players—all are mentioning it. Players in the USGA's Golden Anniversary Open at Merion and the Amateur at Minneapolis Golf Club remarked on the "perfect putting surfaces" and on what a contrast (shock) it was when they got back to their bermuda greens. Please not that we do not advocate bent for the South—we are reporting demands that are being heard for greens that putt like bent which is the highest standard known to golf.

Few will question today the value of a mixture of grasses, provided the grasses selected are suitable performers. Here are some top-grade mixtures which have stood the test for 10 years:

1. Arlington (C-1) with Congressional (C-19). Bill Glover at Fairfax, Virginia, suggests that you use 60% C-1 and 40% C-19 because C-19 is a faster starter.

2. No. 1 (above) with Collins (C-27) added. Collins can't be obtained easily so that it often is omitted from the mixture.

3. The No. 1 mixture with Toronto (C-115) added. Toronto is susceptible to dollarspot but produces a splendid putting surface.

4. Zoysia with Merion bluegrass for fairways and lawns.

5. U-3 bermuda with Arlington bent for the hardest wear on the toughest tees. Several experimental putting greens have been planted to this unorthodox mixture of N-S grasses. So far it looks good, but don't take our word for it—try some yourself.

Insecticides

Since Chlodane, DDT, Aldrin, and Dieldrin arrived there have been virtually no requests for assistance on insect problems. This can be explained principally on the basis that state experiment stations are doing a better job of advising on insect control in turf as well as in raspberries and currants. The new insecticides are so very effective that it would seem that again a major milestone has been passed. Even the tropical earthworm has been quiet in 950 (too cool, perhaps). The terribly dangerous Parathion largely

has been avoided on turf projects in favor of safer Chlordane and DDT.

Remember that an insect control program is basic to a weed control program, and to the whole turf program. There is no use controlling weeds if you allow the bugs to eat the grass.

Fungicides

The American Phytopathological Society has assumed responsibility for testing turf fungicides on a national coordinated basis and a number of reports of the 1949 tests have been published. The data is incomplete but important conclusions have been reached. Since recommendations may be different in various climatic regions we suggest that you consult your own state pathologist first. It must be noted with interest that one of the most successful golf course superintendents in the Washington-Virginia area always adds calomel at $\frac{1}{2}$ -ounce to 1,000 square feet with each treatment of Cadmium fungicides or with Tersan. There seems to be, as yet unexplained, an effect of "activation."

While we are writing about fungicides it is proper to report that Arlington (C-1) bent untreated with fungicides for 10 years at Rhode Island still is virtually perfect putting turf with no disease scars and no mat formation. This record has been approached at other places over the country. It is our prediction that, within

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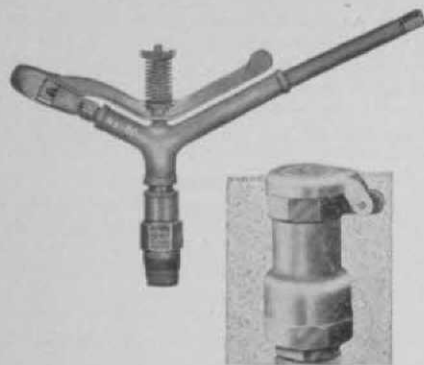
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our time, we will learn how to maintain good putting greens without resorting to weekly dosing with mercury, chromium, cadmium, tetramethylthiuram disulfide, and other strong chemicals. We have tended to lose sight of the fundamentals of plant growth, starting with disease-resistant grasses. In a squeeze we will be glad to accept any grass which will give us turf without chemical treatments.

Water Use and Abuse

Since we wrote the Turf Roundup of 1949 two top-grade students have attained their Ph. D. degrees on problems relating to the irrigation of golf (and other) turf. The USGA Journal has carried abstracts of these research studies. It has been shown conclusively that the abuse of water is far more prevalent than the proper use of it. It is odd, but true, that both studies (in Pennsylvania and in Michigan) were conducted on porous, well-drained soils that are difficult to mismanage. Even so, the use of more water than was needed resulted in deterioration of fairway turf. Best turf was that which was watered as needed—that is, when a soil-moisture gauge and appearances showed that the turf was beginning to suffer. We will hear much more on this subject in the winter conferences ahead. More research projects are being set up to study this important subject.

It is significant that none of the turf under investigation at Beltsville receives artificial irrigation or sprinkling—only natural rainfall! It has proven beyond a doubt that acceptable putting greens can be developed with far less water than most courses normally use.

One of the great factors in the better use of water has been the cultivation of the soil below the turfed surface on greens, tees, fairways, athletic fields, lawns, playgrounds, etc. In most cases water usage had to be cut in half to keep from over-watering severely. The answer lies in quicker and better absorption and deepening of the root systems. The curved "spoon" type of aerating tool (exemplified by the West Point Aerifier) actually loosens and shatters the soil below the surface, leaving a loose-walled cavity which is highly absorptive. It remains to be seen if the hollowtine machines (as exemplified by Nite-Crawler, Soilaire, Otis Airator), which produce a straight-in straight-out action will be as effective in increasing the infiltration rate of compacted soils. By the time we have had the broad experience with these newer machines that we have had with the Aerifier we can answer that question more directly.

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modern turf management for the control of many broadleaf weeds. It has become a much more useful tool since we have learned that it is no good for some weeds. There is no sense in trying to claim that a certain chemical is a "cure" for something that it isn't!

Mechanical crabgrass control slowly is catching on, especially for fairways. Where the flexible combs have been used on the fairway units all season, crabgrass virtually has been prevented from seeding. The crabgrass plants have been confined to tiny rosettes which actually serve to help a thin turf from the standpoint of the lie of the ball. Flexible combs for fairway units should be installed at the start of the crabgrass season and should be left on the mowers all season. Proper depth adjustment will prevent scar damage during hot weather when cool-season grasses are weakest and crabgrass is strongest. My first recollection of seeing crabgrass rakes on fairway mowers was at Merion. Congratulations again, Joe!

Crabgrass in some areas was the sickest weed that we have seen in many a year. Leafspot disease damaged this weed very severely in Washington, Cincinnati, and other "hot-spots." A good gen-

erous application of complete inorganic fertilizer (400 pounds on 15,000 square feet) killed crabgrass in September on a lawn in Washington and failed to damage the good turf grasses.

Biggest news in the crabgrass control field is that sodium arsenite (the old reliable) sprayed at one to two pounds to the acre with a wetting agent at a material cost of about 25c an acre did a job superior to some highly-advertised materials which cost 1,000 times that figure.

Best and cheapest crabgrass control anywhere in the United States has been achieved with adapted blends of superior turf grasses adequately managed. The highest ranking blend in the Washington-Cincinnati-Louisville areas has been zoysia (preferably Z-52) with bluegrass (preferably Merion when you can get it). Other mixtures are nearly equal. This is the most fruitful field for research in the entire turf picture. Chemical crabgrass control has received such a severe setback in 1950 that it may recover only for the purpose of using only the most economical materials to reduce crabgrass competition so that the superior turf grasses can become established. Today nearly everyone can get a small start of the highly desirable turf grasses which literally can

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choke the crabgrass to death. These grasses can do it without the help of chemicals but, with the right chemical, they will do it quicker and easier.

Phenyl mercuriacetate preparations continue to do a good job when applied in proper dilution and particularly when treating seedling plants. Mature crabgrass is controlled to better advantage with potassium cyanate preparations which also is excellent for chickweed control during the cool months. Mixtures of potassium cyanate, 2,4-D, and sodium arsenite are receiving attention for low-cost, across-the-board weed control. Economy of maintenance will guide the destinies of the crabgrass killers as well as many other things.

Maleic Hydrazide for growth control of turf has been over popularized and overpublicized. We know very little about its effect on our better turf grasses. Tests at Beltsville clearly indicate caution!! The non-scientific writers of popular articles often do great harm to the reputation of a material that may be of great value if it is thoroughly tested first. Our evaluation is that this growth regulator could do untold damage if used as suggested in some recent articles.

Fertilizers

Fertilizers still are one of the most important features of a weed control program. This is especially true of the high-fertility grasses such as bermuda, bluegrass, bent. Too many clubs still try to use water in place of fertilizer. Then they spend their money for herbicides and they still don't have enough to buy the fertilizer they should have had in the first place.

Natural organics are still preferred fertilizers for turf, supplemented with P and K and inorganic N where needed. The new Ureaform nitrogen fertilizer still is not available but it looks hopeful. Tests on turf still are going on so that we can give accurate information when the material becomes available.

Liquid fertilizers may have a hard time when economy-minded superintendents and chairmen begin to examine the costs of plant food applied. A 6-10-4 fertilizer contains 400 pounds of actual plant food in a ton which costs—we'll say \$80—for easy figuring. In some liquid fertilizers 400 pounds of actual plant food may cost over \$1,000. We can not subscribe to the thesis that this added cost for material is balanced by the saving in labor.

The Chairman—Greenkeeper Team

Did you ever have a favorite team of horses that got better as the years went by—the kind of team where the off-horse instinctively followed the lead of the near horse—sometimes even anticipated the action? Some chairman-greenkeeper teams

are like that—through the years. By contrast, consider the team where the off-horse is changed every spring just at planting time. Who could drive a straight row with a green horse? It puts most of the strain on the old lead horse and even then the old-timer gets the blame for the antics of the newcomer. We are trying to say in a new way that it is easier for us to work with a club on a turf-improvement program where the chairman-superintendent team is constant over a period of years—and it is much easier on the superintendent—and the chairman—and the club—and us.

USGA's New Book "Turf Management"

McGraw-Hill Book Company of New York has announced the price of \$6.00 for the USGA-financed book entitled "Turf Management," by H. B. Musser. Fresh off the press, parts of the book even now need to be revised in the light of new facts from research. This first authentic book on Turf since 1923 should find wide appeal to a wide range of turf lovers.

USGA's New Policy on Visits

As announced in the June 1950 issue of the USGA Journal, special visits on any turf problem will be made by Green Section agronomists on the basis of all traveling and living expenses plus a service fee of \$50 a day to member clubs and to Green Section Service Subscribers. For all non-member golf clubs and non-subscribers it is all expenses plus \$100 a day.

It is the stated policy of the USGA to assist local and regional groups in every way possible to develop their own integrated program, including advisory service. This policy has been exemplified in the developments in every major turf center in the United States.

Many clubs are requesting two visits a year regularly from the Green Section just like the slogan suggests—"See your d-n-t twice a year." A periodic checkup in many cases is welcomed by chairmen and superintendent alike.

In Summary

Always it is an inspiration to write *Golfdom's* "Turf Roundup." It is par-

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ticularly pleasing in 1950, the Golden Anniversary of the playing of the USGA's Open, Amateur and Women's Amateur, to realize that we have covered some mighty important milestones in Turf History. The future lies ahead but if the next five years adds to our stature as the last five have, the future is bright indeed!

Financial support of cooperative turf research has exceeded all expectations—but we need much more to do the job properly.

The crying need now is to extend Extension Teaching in Turf Management to get results of turf research into practical use and to expand private knowledge for the benefit of others.

Golf clubs that want college graduates to head their turf programs well could offer a scholarship to the student of their choice in his senior year with a guarantee figure on graduation. Commercial firms already are doing this.

The study of greater Economy in Turf Management is a universal problem. Only unselfish coordinated effort will do the job.

More clubs need better nurseries of superior grasses which fit into the economy scheme.

Ryegrass, Redtop, and Timothy virtually outlived in seed mixtures which contain valuable perennial species.

There never was a better time to learn how to do more with less; especially less oppressing; less water; less labor.

Best weed control is good turf—some chemicals help.

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