

# Past, Present and Future of Turf Maintenance

By O. J. NOER

O. J. Noer, in this review, gives credit to many for their work in improving standards of golf course turf, but he takes none himself.

So, in behalf of a host of superintendents, and club and course maintenance association officials and for ourselves, we'll bow low to "Red" Noer as one of the most helpful individuals in improving golf course turf practices.

A bright and sound young agronomist whose work at the University of Wisconsin plainly indicated a great career in research, Noer went to work as a sales engineer with the Milwaukee

Sewerage Commission when it was beginning to make Milorganite. His field work, his practical advice, his good judgment and amazing industry and his great number of illustrated informative lectures have helped golf clubs, superintendents, his employers and other fertilizer manufacturers and dealers to a tremendous extent.

He spends more time making the rounds of golf courses all over the country than any other man in golf. Mrs. Noer deserves a crown for putting up with that, without complaining.

To the two of them; golf's gratitude.

Turf quality has improved and maintenance practices have changed during the past quarter of a century. Viewed on a year to year basis, both may seem inconsequential, but the overall picture emphasizes the fact that today golf course turf is better than ever before.

At one time poor turf on greens in mid-summer was commonplace. Extensive loss of grass at that time of year was accepted as inevitable. Today such an occurrence is a major disaster. The golfer has come to expect perfect putting greens irrespective of weather. Those charged with maintenance have met the challenge. Wholesale loss of turf is confined to spells of impossible weather.

Golf started in the United States as a rich man's game. The early teachers were imported from Great Britain. Those colorful Scotch and English professionals laid the groundwork for the tremendous expansion by popularizing the game with the middle classes and the workingman. Although essentially golfers, these Britishers influenced turf maintenance practices. Quite naturally they favored methods used in Britain. Some practices were sound over there but were not suited to most parts of America with its continental type of climate, typified by extreme changes in summer and winter.

Quick loss of grass on the greens at Columbia CC, Washington, D.C., at the time of a USGA National Open Tournament marked the end of a haphazard approach to golf turf maintenance.

The sudden loss of grass baffled everybody and sparked the formation of the

Green Section. Dr. Harbin of Columbia and members of the Executive Committee, USGA enlisted the help of Drs. Piper and Oakley of the Forage Crops Division, USDA.

That was the start of a research and extension program which has been carried on ever since, and has been expanded to include many of the state agricultural experiment stations. Oscar Pitts, now at Columbia, and George Cunningham were among the early pioneer workers. The early work on turf diseases was done by Dr. John Monteith, Jr., who became the second Director of the Green Section. He continued and expanded the grass selection and development project started by Dr. Piper.

Leach solved the grub problem when it looked as though the Japanese beetle was about to ruin all the turf on the courses in the Philadelphia area.

## Grau Extended Research

After World War II Dr. Fred Grau assumed the directorship and has put new life into turf research. He has decentralized the work and has been instrumental in starting projects in all parts of the country. Studies are under way at Tifton, Ga., in Florida, Texas, Oklahoma, California, Washington, Kansas, Iowa, Purdue, Michigan, Cornell, Massachusetts, Rhode Island, Rutgers, (N. J.); Maryland, and Pennsylvania. Among the older workers, Musser at Pennsylvania; Sprague, Evaul and Longnecker at New Jersey, DeFrance at Rhode Island, Tyson at Michigan, Stoutemeyer in California, and Dickinson at Massachusetts merit high mention. The

ten-week winter school at Massachusetts has trained many turf men, and is nearing a quarter century of service.

GOLFDOM has played a very important part in the turf improvement program. Authoritative factual articles have presented research findings to the practical men in simple, concise language. Research is of little practical value unless the information is placed before the people who can put the findings to use.

Through the years the National Green-keeping Superintendents Assn. and the local state and district organizations have enabled the practical men to become self-educated in all the diverse phases of turf maintenance. All of their meetings are of an educational nature, with but one purpose—to provide trustworthy information about the maintenance of turf—and so these organizations have been important factors in producing qualified superintendents, and in turn better golf courses.

### Grass Choices Change

Twenty-five years ago creeping red (mostly Chewings) fescue and South German mixed bent were the favored grasses for golf courses. Fescue was preferred over blue grass for fairways, and many clubs seeded the roughs to sheep fescue rather than blue grass because of its slow growth rate. With this grass roughs were seldom cut more than once a season. This was important in the days of extremely slow cutting behind horses.

Most greens were seeded with a mixture of fescue and South German mixed bent. The fescue persisted alone or in the mixture until the mower manufacturers developed the modern hand putting green mower, which was capable of close cutting. After that, fescue disappeared within several years after seeding and turf consisted of mixed German bent. The greens looked like a patch quilt, due to the patches of velvet bent and the creeping bents, which differ markedly in color and habit of growth.

The importation of bent seed decreased when World War I started in 1914, and stopped when the United States declared war. When the war ended scarcity prompted the Green Section to study vegetative planting with stolons of creeping bent. Selections were made from old mixed German bent greens, and the strains were tested in the turf garden at Arlington, Va. The most promising strains were given names, based on the place of origin. Washington and Metropolitan were the best ones at first. Metropolitan soon lost favor, but Washington is still preferred by some. There are many greens of it as good today as they were 25 years ago. The poorer selections included Virginia, Columbia, Vermont, In-

verness, etc. Through a mix-up in identification a large quantity of Virginia bent was sold and used as Washington. At first Washington got a bad name, because Virginia is a coarse strain which develops grain and is very susceptible to leaf spot.

In recent years newer selections, such as Old Orchard, Arlington, Congressional, Collins, Toronto, etc. have gained favor. The mixture of Arlington, Congressional, and Collins is performing well and the individual grasses do not separate into distinct patches.

The chaotic conditions in Europe after World War I and the rapid expansion in golf interest led this country to seek a domestic source of bent seed. Rhode Island harvested and sold some seed as Rhode Island Colonial bent. Since the quantity was inadequate, the USDA assigned the task of locating additional sources to Lyman Carrier. He found the best source in the Pacific Northwest where there were meadows of creeping bent alongside the Pacific Ocean. Seed production started first in the area around Coos Bay near Coquille, Ore. Seed was sold under the designation of "Seaside Bent". Congress was induced to place a duty on imported seed to help the infant industry. Grass seed production has become big business in the Pacific Northwest.

Besides Seaside, which is a creeping bent, colonial types are harvested and sold as Astoria and Highland bent. Some New Zealand brown top is being grown and sold as Oregon Colonial.

More recently grass seed production has been started in Eastern Oregon, where the grass is grown in rows as a cultivated crop. This method simplifies roguing and insures seed which is truer as to type than meadow grown grass.

### Breeding New Bents

A further advance in bent seed production is in prospect as a result of breeding by Prof. H. B. Musser. Superior strains are used as parent stock and grown in alternate rows. Some of the poly cross bent plots at Penn State College look extremely good. The turf is as tight as any of the vegetative strains and there is no evidence of any grain. A limited amount of seed is available for testing under use conditions.

When coverage is uniform creeping red fescue provides a perfect fairway lie. The original fescue fairways were the delight of golfers. Turf degeneration started with the advent of gang mower cutting with tractors, under player urge for more frequent and close cutting. The same thing happened to blue grass fairways. Close mowing did least damage where some bent seed was included in the original

seed mixture. Fairway watering made a bad matter worse, especially after the development of high pressure systems capable of applying 500 gal. per minute or more.

Courses with some bent in the fairways before watering started and where water has been used judiciously in conjunction with an adequate quantity of fertilizer have good fairways which are pleasing to the members. But where water was considered the only answer to good turf, coverage in fall and spring becomes poa annua. In summer, clover, knotweed, and crab grass are bad, and the turf is unfit for play. Renovation involving the use of sodium arsenite and reseeded has been the answer at some clubs. But the problem of better fairway turf is still with us.

Top-dressing practices accounted for some of the troubles on greens in the past. The use of straight materials such as sand, peat, and clay, produced layers. They caused wilting in hot weather because grass roots did not grow through them at such times. Dressing with sand was imported from Britain. Much damage resulted from its use here before it was realized that the practice was a bad one. Manure compost was considered a must for top-dressing mixtures until manure supplies vanished. Until recent years greens were top-dressed every four or five weeks. The mixture changed and finally consisted of approximately one part good loam, two parts sharp sand, and one part humus. Modern practice is to top-dress once or twice a year at the most. It is prompted by material scarcity and high cost of labor.

### Fertilizing Revolutionized

Fertilizer practices have been revolutionized during the past quarter century. Originally greens were top-dressed with a mixture containing manure compost. They received an occasional dressing of bone meal. This provided some of all the elements needed but did not furnish an adequate amount of nitrogen. During the acid era, which died with the grass in 1928, the use of lime was frowned upon and sulfate of ammonia was the only fertilizer used outside of top-dressing. The aim was to make the soil acid and control clover and weeds that way.

Modern practice is to use lime and not let the soil become more than very slightly acid. Enough phosphate and potash is applied to replenish the amounts removed in clippings and then enough nitrogen is used as needed to maintain a uniform and continuous growth.

### Fungicide Progress

Dollar spot, brown patch, and snow mold were the original turf diseases. Dr. John Monteith identified the casual organisms and showed that fungicides con-

taining mercury would prevent them. The mixture of two-thirds calomel and one-third corrosive sublimate was developed as a result of his research. Organic fungicides containing mercury were developed and marketed by duPont and Bayer under the trade names of "Semesan" and "Uspalun".

Pythium and leaf spot were recognized and described at about the same time. Up to now no good fungicide has been developed for them. Pink patch and copper spot are diseases of more recent identification. Some of the newer fungicides are said to control them as well as the other diseases. Tersan, formerly called "Thio-san" is a favorite with some for brown patch because it does not harm the grass like corrosive sublimate. In trials at Milwaukee it controlled snow mold when applied at rates which furnished four ounces per 1000 square feet of actual active ingredient. The other newer fungicides include phenyl mercury acetate, cadminate, 531, and Crag. Others are in the process of testing. A number of greenkeepers resort to light dusting with hydrated lime when brown patch is severe. They use it also for algae. The contention that dollar spot is aggravated by too little as well as too much nitrogen seems to be conceded.

Lead arsenate remained the only control for grubs and worms for many years after the findings of Leach. Now DDT, Chlordane, etc. are replacing it. Quick kill of grubs is one thing in their favor, and they appear to persist for three to four years at least. The answer to the stink worm was found by John Schread of the Connecticut Station. He worked out a satisfactory control with Chlordane.

Fairway turf is still the big problem in many parts of the country. Some have found the solution with bent, others think Merion blue grass the answer, and still others favor a mixture of warm and cool season grasses. The problem is an important one and deserving of serious consideration. Besides the matter of grass, there is the problem of poa annua, clover, chickweed, and knotweed infestation. They are probably incidental and will disappear as such when the right kind of turf is developed. It must satisfy the golfer and not be too exacting from the standpoint of maintenance.

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For fifth year John Samuel Clapper memorial fund contribution of \$500 transmitted by USGA Green Section to University of Rhode Island for turf research at R. I. Experimental station. Fund was established by Orville Clapper as a memorial to his father, widely-known pioneer in golf maintenance equipment manufacture.