

Getting to the Roots of Watering Problems

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THIRTY YEARS AGO, in the sulphate of ammonia era, our acid greens took on water-resistant qualities which we tried to counteract with spikers, discs and digging forks. The fact that the dense velvet bent as well as some thatched areas in our mixed bent greens resisted water less than many thinner species of bent and the observation that many localized dry spots were often less compacted and had better roots than some less troublesome areas, led us to believe that our trouble was of chemical rather than mechanical origin.

After consultation with the best soil and turf experts of that period, we found that the bulk of our trouble could be cured by proper liming. However, localized dry spots remained which eventually led to the development of our modern aeration tools. These have helped greatly but have not completely solved our problems.

There are fungi which live in the soil (fairy ring and other mushroom types,) which interfere with capillarity and/or interfere with root action causing grass to wilt. Research is needed in the control of these fungi.

Some varieties of bent in old mixed greens wilt easily in spite of any treatment which has been tried yet.

In our attempt to increase the efficiency of our sprinklers through the use of mechanical tools such as aerifiers, we find new angles which must be considered.

Aerating tools slow down surface drainage or runoff on steep slopes, thus preventing water from running to low areas where it can damage turf. They also open up the soil allowing water-logged areas to dry out. Aerifying is valuable in accomplishing both of these purposes but it can also work in reverse. It can dry out turf, making more watering necessary, and it can slow surface drainage on poorly drained areas making it easier to over-water some greens.

Many superintendents whose greens were originally built of clay, try to get the same double action results with sandy top-dressing despite risk of layering. They do get a definite improvement but also find

that excessive rain can saturate their top-dressing and sometimes eliminate their turf.

Watering to Proper Balance

It is obvious that even though penetration of water is necessary to turfed areas, this penetration should be accomplished by capillarity, (which works down as well as up) rather than by gravity.

Penetration must never exceed sub-drainage on turfed areas. Runoff plus sub-drainage must equal rainfall plus watering; otherwise no turf!

How does all this apply in practice? I try to carry out the following program:

1. Lime to maintain P.H. of 5.5 to 6.
2. Water often enough to keep surface from drying. (Dry surfaces increase runoff.) Two to five times weekly plus extra hand watering daily if necessary.
3. Apply enough to keep soil moist but not soggy. Time for running sprinklers on my course varies from 30 minutes to several hours depending on water pressure, drainage, and several other conditions peculiar to the individual greens.
4. Aerate when and if necessary. Twice each year plus one or more extra treatments on some parts of many greens. Perfect soil conditions might make aeration not only unnecessary but undesirable.
5. Remove troublesome varieties of bent if possible. Replace with new sod.
6. Topdress with material similar to that which was used in the construction of the greens. I try to avoid sand, peats, mucks, etc., which might interfere with capillarity root growth and penetration or in any way produce unnatural or layered greens.

I think we should also avoid soils in which mushrooms have been grown commercially. If we do so, we are adding material which is obviously ideal for mushrooms and fungus growth. Possibly spraying of this material with the proper fungicide would

eliminate fungus which might prove troublesome years later.

The quantity and frequency of topdressing depends on local conditions. Some turf can be badly damaged by heavy topdressing, rather than by too frequent topdressing.

All of our practices are of course de-

pendent on our budgets, our natural conditions and other factors such as the skill of the men we are able to hire.

It pays to maintain a sod nursery and to train a man or several men in the art of patching greens. After all, we superintendents are not miracle men. Anyone can lose turf, even the finest doctors have the undertakers to cover up for them.

GOLF COURSES IN THE UNITED STATES

	Private	Semi-Private	Muny	Total	9-Hole	18-Hole and Larger
1900				982		
1923				1903		
1929				5648		
1930				5856		
1931				5691		
1934	4155	1006	566	5727	3368	2359
1937				5196		
1939	3405	1199	699	5303	3264	2039
1941	3288	1210	711	5209	3202	2007
1945				4809		
1946	3018	1076	723	4817	2930	1887
1947	3073	1061	736	4870	2952	1918
1948	3090	1076	735	4901	2967	1934
1949	3068	1108	750	4926	2973	1953
1950	3049	1141	741	4931	2972	1959
1951	2996	1214	760	4970	2956	2014
1952	3029	1246	751	5026	2974	2052
1953	2970	1321	765	5056	2977	2079

U. S. Courses Five-Fold Growth Shown by Years Since 1899

Rebound and Solid Growth Since Panic and War Years — South Dakota Leads in Courses on Population Basis —

THERE'S a golf course per 31,052 of U. S. population, National Golf Foundation figures show as an over-all picture. When population figures are broken down into age classifications and other factors affecting golf playing potentiality the showing of golf, of course, is considerably improved but far short of demand and practical possibilities for increasing the number of courses.

There are approximately 32,000,000 under 13 years of age in the U. S. and around 12,000,000 65 and over.

South Dakota leads in providing golf courses with one course for 9,849. Vermont is second with one course per 9,890 of population. North Dakota is third with a course per 9,967 and New Hampshire is fourth with 1 to 9,998. Louisiana is lowest in ranking with a course to 60,614. Percentage of non-white population is a factor

in keeping population per course high in the south. The best showing of southern states is made by Florida with its winter resort courses and a course per 23,650 population.

Delaware is the nearest average state with a course per 31,661.

Despite the recent pronounced growth of California courses the state which has a course per 49,953 population lags behind large eastern states: New York with one to 37,789, Pennsylvania with one to 36,582, Illinois with one to 28,196, Ohio with one to 28,727, Indiana with one to 24,661, Michigan with one to 24,837 and Massachusetts with one to 25,349.

A copy of the complete breakdown may be secured without cost from Rex McMorris, Director, National Golf Foundation, 407 S. Dearborn st., Chicago 5, Ill.