

## THE ROLE OF LIME IN TURF MANAGEMENT

### *Soil pH Shows When Lime Is Needed:*

Soil reaction, expressed as pH, is the best yardstick for judging the probable need for lime. Soils which are more than moderately acid, that is below pH 5.7, definitely need lime and its use is justified without regard to any other factor.

Lime may be beneficial when the soil is slightly acid, in the range of pH 5.7 to 6.2, particularly when Kentucky Blue Grass predominates. But the large scale use of lime can await the outcome of trial applications on test strips, particularly when the soil is not more than slightly acid. Strips across a fairway or lawn measuring 10 x 100 feet are a convenient size and contain 1,000 square feet. Rates of 25, 50 and 100 pounds are equivalent to ½, 1, and 2 tons per acre. For similar tests on greens the first two rates can be used on areas of 1,000 square feet.

### *Acidity Reduces Vigor Of Turf So It Is Less Able To Cope With Drought Or Withstand The Shock Of Chemical Treatments:*

Acidity reduces vigor of the grass plant, and adversely affects its ability to withstand adversity. The grass on moderate to strongly acid soil is the first to turn brown and suffer from drought. An application of lime keeps the turf green for a longer time, and the grass on the limed area is the first to recover following a good rain.

Turf on acid soil is more sensitive to chemical injury. Acidity intensifies the damage caused by chemicals used to control diseases, insect pests, and weeds. Severe damage by bordeaux mixture was activated by the continuous use of ammonium sulphate. Lead arsenate and sodium arsenite also produce more shock to the grass when used on acid than on non-acid soil. Sulphate induced acidity may affect corrosive sublimate and other chemicals in a similar manner.

### *Lime Counteracts Turf Diseases:*

The prevalence of diseases such as dollar spot, snow mold, and brown patch may be due in part to insufficient lime. This was demonstrated very strikingly on a turf nursery of Washington Strain of Creeping Bent at Merion in Philadelphia more than fifteen years ago. Lime was applied to a portion of the turf nursery as an experiment. Three weeks later the unlimed part was

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severely damaged by Dollar spot. The limed turf was not touched and looked like it had received a preventative treatment of fungicide. Snow mold did little damage to a limed green on a course in the province of Quebec, but all the others fared badly. The unlimed greens were strongly acid, about pH 4.5.

*When Turf Does Not Respond To Ammonium Sulphate Need For Lime Is Indicated:*

The failure of bent turf on putting greens to respond following an application of ammonium sulphate is strong evidence of need for lime, provided temperature and all conditions other than nitrogen supply are favorable for growth. Sulphate applied on an acid soil increases the intensity of soluble acids and makes the medium unfavorable for growth. Such greens should be limed and a nitrate fertilizer which reduces acidity, or an organic fertilizer such as milorganite, should be the principal source of nitrogen until soil reaction reaches the range of slight to very slight acidity.

*Ground Limestone:*


There are two type of limestone. One is called "Calcite" or simply limestone because it is mostly calcium carbonate. The other is known as dolomite and is a variable mixture of calcium and magnesium carbonates.

Ground limestone is usually sold on a basis of its chemical composition and degree of fineness. The chemical guarantee may be expressed as the actual percentages of calcium and magnesium, either as the oxides or as the carbonates or both. When the separate percentages of calcium and magnesium carbonates are given, the closer the sum of the two approaches 100 the better the quality of the lime. The combined carbonates should never be below 90. Pulverized limestones vary in size of particle and in hardness. It is desirable to know something about the degree of fineness because solubility is a function of particle. The finer the state of division the more rapid is the rate of solution. Most mid-western manufacturers aim to make a product with a large percentage of fine particles for immediate action, but with enough of the coarser grades to insure lasting qualities. A fineness guarantee is desirable when comparing the probable effects of different limestones.

*When To Lime Fairways And Lawns:*

Late Fall, Winter, and Early Spring are the most convenient times to apply lime. Late Fall is especially good because Fall and Spring rains carry the lime into the soil. Ground limestone can be applied at any time. But it is unwise to use hydrated lime in excess of 1,000 pounds per acre during the summer. More than that may scorch the grass. Mention has been made of the fact that hydrated lime should never be applied im-

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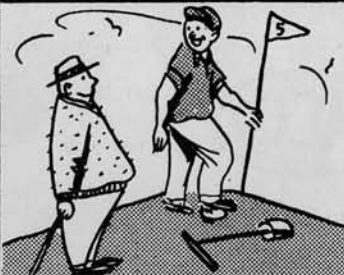
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mediately before or after using a fertilizer containing compounds of ammonia.

Reprinted from "The Role of Lime in Turf Management" by Turf Ser-Bureau, Sewerage Commission, Milwaukee, Wisconsin.

*Soil Texture And Kind Of Grass Affect Rate Of Application On Fairways And Lawns:*

The rate for applying lime is affected by the kind of soil and grass. Less lime is needed on a sandy soil than on a loam or clay to produce the same change in pH. Kentucky Blue Grass requires more lime than Fescue or Bent Grass. These factors, beside pH, are taken into account in the following table for the use of lime on fairways:

**RATES FOR APPLYING GROUND LIMESTONE TO FAIRWAYS AND LAWNS**

7	Neutral	0	0	0	0
6.3 to 7.0	Very Slight	0	0	0	0
5.8 to 6.2	Slight	1000	1500	0	0
5.3 to 5.7	Medium	2000	3000	1000	1500
4.8 to 5.2	Strong	3000	4000	2000	3000
4.0 to 4.7	Very Strong	4000	6000	3000	4000

**RATES FOR APPLYING FINELY GROUND LIMESTONE TO GREENS**

Soil Reaction	Limestone Rates Pounds per 1000 sq. ft.
6.6 to 7.0 pH	0
6.1 to 6.5	0-10 pounds
5.6 to 6.0	10-20 pounds
5.1 to 5.5	20-40 pounds
4.6 to 5.0	40-60 pounds
4.0 to 4.5	60-80 pounds

*Scalded Greens Need Hydrated Lime:*

Scad is a term applied to summertime injury caused by excessive rains, or overwatering, during periods of hot humid weather. The grass collapses on large areas and the spots become covered with a green scum of algae. Scalded greens need a little hydrated lime irrespective of soil pH. The hydrate is used to kill the algate, and counteract toxic organic compounds formed by anaerobic soil organisms in the waterlogged soil, rather than to change soil reaction. The rate of application varies from 2 to 5 pounds per 1000 sq. ft. When the bad spell of weather lasts for several weeks, greens are benefited by receiving a little hydrate every week. About 10 pounds per green is usually used. It can be mixed with sand, applied dry and watered-in, or it can be applied with a power sprayer.

**CLIPPINGS —**

Mr. and Mrs. Chuck Daurity are the proud parents of a 7½ lb. baby boy. We understand Grandpa "B" is still poppin' buttons.

Congratulations to the Wisconsin Association for a fine day spent by the Midwest group on the perfectly groomed Blue Mound Country Club course where Superintendent Frank Musbach presides. It will be a day long remembered. Charlie "Mill" Wilson was the speaker for the evening and did his usual fine job.

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