TIMELY TURF TOPICS

Issued By The

UNITED STATES GOLF ASSOCIATION GREEN SECTION

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WASHINGTON, D. C.

AGREEMENT ON TURF FERTILIZER: The members of the staffs of the Agricultural Experiment Stations of Michigan, Ohio, and Indiana, have come to a "gentlemen's agreement" with fertilizer manufacturers in those states to recommend a 10-6-4 grade of fertilizer for general turf purposes. The practical result of this agreement has been that 10-6-4 has been placed on the regular price list of standard fertilizers and is now available on the market in these states at a price at present in the neighborhood of $32.00 a ton. Formerly in these states it was sold as a special grade for golf course purposes at two to three times the price at which it is now available. Moreover, the consumer is no longer confused by getting recommendations for a different grade from each source of information he reaches.

NEW FAIRWAY FERTILIZER SERIES: Last fall a number of series of tests on Fairway Fertilizers were established in various sections of the country. Some 60 clubs in 15 different states have already cooperated with the Green Section by establishing one of a series of these plots on one of their fairways. In each district in which these plots are started it is planned to have at least three series on nearby areas so that they will serve as checks under different soil conditions.

Additional series are being established this spring. Most of them will be maintained under playing conditions on golf courses, but some will be on lawns in parks and elsewhere as well as on various types of recreational areas. It is also planned to include in this program tests on turf on road shoulders and landing fields.

Each series consists of twelve 10 by 30-foot plots on which different ratios of nitrogen, phosphoric acid, and potash are applied in both organic and inorganic forms, with and without lime. Results are to be followed over a period of years.

This probably is the most extensive series of fertilizer tests ever run on established turf. If you are interested in the program and do not have a series of plots in your neighborhood, we shall be glad to have you write the Green Section's office for further details.

REMOVE EXCESS STOLONS: Certain strains of creeping bent tend to produce an excess of stolons on the surface during the spring months when growth is particularly vigorous. When not removed or covered with topdressing, these stolons cause objectionable grain in the turf during the summer months. Perhaps the best way to remove them is to give the turf a severe raking or brushing followed by close mowing. This should be done not later than the middle of May while the grass is growing vigorously enough to cover up the scars quickly. Light brushings may be given throughout the summer months.

USEFULNESS OF EXPERIMENTAL GREENS: Injury from snowmold has already been reported as being unusually severe this year in some sections of the country. If the disease is prevalent in your neighborhood you may find it of interest to visit the Green Section Experimental Green in your district and observe which of the strains being tested there are particularly resistant to this disease.

April 1941

TURF IN THE SOUTH: In those regions in the South which experienced frosts this winter, it may be found that the Bermuda grass has been injured. The injury is likely to be most severe on areas where the turf is cut close, such as putting greens and tees. In such areas recovery may be hastened by light disking with the disks set as straight as possible, followed by dragging with a brush harrow or other smoothing device and then rolling. An early application of fertilizer will also be helpful in thickening the grass where injury was not sufficient to necessitate reseeding. Sulfate of ammonia will often stimulate a quick growth of Bermuda grass in spite of some cool weather. Where injury is severe, reseeding may be necessary.

Greenkeepers who have winter greens should watch their ryegrass for any signs of brownpatch. The prompt use of mercury fungicides will retain the winter grasses in good condition for a longer time, thereby giving the Bermuda grass a chance to produce a good new growth before the summer greens are opened for play.

LATE WINTER DROUGHTS: The Weather Bureau reports that scanty precipitation in recent months has resulted in rather serious dryness in the Ohio and lower Missouri River valleys. Some areas in the Ohio valley report the driest January, February and March-period on record. A dry period during this time of year may actually be of benefit to turf if it is followed by more rain later in the season. Spring root development is better in soils which are not saturated as they usually are during this season of the year. Because of this lack of precipitation, the surface soil may appear dry and the temptation may be to water early, but this should be postponed until it is actually necessary.

TRIPS OF GREEN SECTION STAFF: Dr. Monteith plans to be in New England early in May, when he is to represent the Green Section on the program of the May meeting of the Greenkeepers of New England. This meeting will be held at the Ponkapoag Golf Club in Canton, Massachusetts, on Monday, May 5, beginning at 10:00 A.M. Any clubs in that area which are planning to ask for visits from the Green Section staff would do well to plan for them at that time and correspond with Dr. Monteith as soon as possible to arrange for dates. Those who attend the meeting at Ponkapoag will no doubt be interested in observing and rating the twelve strains of grass on the experimental green which was established there two years ago in cooperation with the Green Section.

SOIL ACIDITY

The acidity of soil solution, as of any other watery solution is caused by what the chemist terms hydrogen (H) ions, and the alkalinity by hydroxyl (OH) ions. Chemically pure water contains an equal number of hydrogen and hydroxyl ions and therefore is neither acid nor alkaline but is referred to as being neutral. When any other chemical is present in solution even in exceedingly small quantities the ratio between the numbers of hydrogen and hydroxyl ions is changed. The product of the concentrations of these two ions remains the same, however, and therefore as the number of hydrogen ions is increased, the number of hydroxyl ions is decreased, and vice versa. When there is an excess of hydrogen ions, the solution is said to be acid and the greater the excess the greater the acidity. When the hydroxyl ions are in excess the solution is alkaline and the greater the excess of them the greater the alkalinity.

One liter (approximately one quart) of chemically pure water or any neutral solution contains 1/10,000,000 of a gram of hydrogen ions. Fractions with such large denominators make the expression of the actual concentration of hydrogen ions a cumbersome matter. Consequently, acidity and alkalinity are referred to in terms of small whole numbers which refer to the number of ciphers in the denominator of these fractions. These numbers are arranged on a scale which is known as the pH (pressure of hydrogen) scale.

On the pH scale the figures run from 0 to 14, with the midpoint 7 referring to 1/10,000,000 gram which is the weight of hydrogen ions in a neutral solution. The values pH 3, 5, and 9, for instance, refer to 1/1,000, 1/100,000, and 1/1,000,000,000 gram of hydrogen respectively. Thus the numbers less than 7 refer to acid solutions and the numbers greater than 7 to alkaline solutions. At pH 6, 5, and 4, the acidity or the concentration of hydrogen ions is 10, 100, and 1,000 times greater than at pH 7. On the other hand at pH 8, 9, and 10, the alkalinity or the concentration of hydroxyl ions is 10, 100, and 1,000 times greater respectively, or the concentration of hydrogen ions 1/10, 1/100, and 1/1,000 times as great respectively as at pH 7.

The pH values of arable soils normally fall between 4 and 9 but the great majority of surface soils under cultivation have pH values between 5.0 and 7.5. Plant life in general, including many of the fungi, appears to be stimulated by a moderate excess of hydrogen ions. Moreover, there is a wider tolerance of excessive acidity than of excessive alkalinity. In higher plants, this may be associated with the fact that the pH of the cell sap in the roots of most plants ranges between pH 4 and 6. It would seem, therefore, that soil acidity should be regulated rather than eliminated.

In a broad way, plants are able to adjust themselves to a considerable range of pH, although a few crop plants such as alfalfa, red clover, sugar beets, sorghum, tobacco, cabbage, and cauliflower are extremely sensitive to an acid condition, whereas other plants, such as cranberries, blueberries, coffee, pineapple, holly, rhododendrons, and azaleas prefer a distinctly acid condition, growing well in soils with an acidity of pH 4.0. The turf grasses, fortunately fall in the much larger group of plants which tolerates a wide range of acidity. In some of the Green Section's experiments in various sections of the country, good turf of both bluegrass and bent has been produced over a period of 5 years on soils which ranged from pH 4.7 to 7.5 when they were properly fertilized. (See TURF CULTURE, December, 1939.)

The acidity of the soil also affects the growth of soil fungi and bacteria. The fungi causing many plant diseases thrive in a rather limited range of pH. Some twelve years ago, for instance, it was demonstrated by the Green Section that the severity of dollarspot, brownpatch, and scald on bent turf growing on very acid soil was significantly reduced by the addition of lime. The nitrogen-fixing bacteria in alfalfa, on the other hand, do not thrive at a soil pH lower than 6.5. In too acid soils also, the bacterial decomposition of organic matter is retarded and consequently insufficient amounts of nitrogen are released for growth of higher plants.

There are numerous other indirect effects of the acidity of soil on its fertility. The physical characteristics of clay soils are unfavorably affected by an acid condition, the presence of calcium being necessary for the desirable crumb structure of soil. Also, the availability of nutrients such as phosphorus, iron, and others are decidedly influenced by the acidity of the soil solution.

The benefits derived from the use of lime, however, are not necessarily consistent with the pH values of soil. Lime may be present to such an extent as to supply plenty of active calcium, without greatly reducing the acidity and, on the other hand, soils may have a pH of between 6.5 and 7.0 and still not have enough active calcium for good growth of plants. For example, in the Green Section's fertilizer experiments mentioned above, the turf on the most acid soils did not necessarily respond better to applications of lime than did the less acid plots. The most beneficial results were produced on an almost neutral soil of pH 6.7, whereas, in another area with a soil pH of 6.7, the turf on the lime-treated soil was poorer than that on the untreated soil. The second best results from the application of lime were obtained on an acid soil of pH 4.7.

It is evident, therefore, that the simple determination of soil pH, although a useful guide, does not furnish sufficient information to form the basis for dependable recommendations for the application of lime or fertilizers. Small scale field tests based on the results of laboratory soil tests, should give more reliable information as to the treatment required.