

Sulfur Use On Greens

By Dr. Norm Hummel, Cornell University

Soil reaction, or pH, is an important consideration in managing fine turfgrass areas. The pH is a measure of the hydrogen ion concentration in the soil solution. While most turfgrass species tolerate a wide range of soil pHs, optimum growing conditions exist in a pH range of 6.0 to 7.0. At excessively low pHs, the solubility of aluminum and manganese increase to a point where these elements can reach toxic levels in the soil. Excessive alkalinity, or very high pH, can result in deficiencies of several micronutrients.

Throughout much of New York State, calcareous sands are used to topdress golf course greens. Managing the pH on greens topdressed with these sands has been a major concern of superintendents. Applications of elemental sulfur are frequently used on an annual or biannual basis to reduce the pH of greens to an optimum range. Sulfur is an effective acidifying amendment thanks to the action of *Thiobacillus* bacteria that live in the soil. The bacteria obtain their energy from sulfur by oxidizing it into the sulfate form. A by-product of this oxidation process are hydrogen ions that reduce soil pH.

Recently, isolated reports of damage from sulfur applications have surfaced. The symptoms have varied from what looks like an incurable infestation of dollarspot to a general discoloration. Damage has resulted from granular, flowable, and wettable powder forms of sulfur. The dollarspot-

type damage caused by granular sulfur may not occur until several months after application.

While sulfur still remains a recommended acidifying material perhaps some caution should be exercised when using it. The following are suggested guidelines for using sulfur on bentgrass greens:

1. Do not use sulfur unless soil pH is above 7.5. Believe it or not, you can grow beautiful bentgrass greens on slightly alkaline soils. The use of micronutrients may be necessary as the pH rises much above 7.0. As an alternative to sulfur, acidifying nitrogen fertilizers such as ammonium sulfate may be used.
2. Apply no more than 2 pounds of sulfur per 1,000 square feet are application.
3. Only apply sulfur when temperatures are expected to be cool, preferably spring and fall.
4. Use a sulfur product the way it was intended to be used. For example, wettable powder should be sprayed, not broadcast and watered in. *Read the label.*
5. A wettable powder or flowable sulfur material can be applied more uniformly than granular sulfur.
6. If damage occurs, do not aerify. Aerification will increase microbial activity, including the oxidation of sulfur by *Thiobacillus* bacteria. Aerification may actually increase damage. ■

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