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# Role of Lime In Turfgrass Management

Turfgrasses can tolerate a wide range of soil acidity and alkalinity. The degree of soil acidity and alkalinity is expressed as pH. Soil acidity increases as pH decreases. A pH value of 7.0 is neutral. Values lower than pH 7.0 are acid and those above 7.0 are alkaline.

Turfgrasses respond differently to varying acidity or pH ranges. Bentgrasses grow normally on soils with pH values as low as 4.0, provided that calcium as a nutrient is not deficient. Bluegrasses will not tolerate such acidity. They can grow normally on soils with pH values as high as 8.0.

Lime is rarely needed in eastern Washington except in special cases. It is occasionally necessary to apply lime to soils in western Washington. Although bluegrasses are not well adapted in western Washington and are short-lived at best, the addition of lime to maintain pH at approximately 6.0 to 6.5 may increase the life of the stand.

## FUNCTIONS OF LIME IN THE SOIL

1. Lime is a soil amendment and is most often used to reduce soil acidity (increase pH). It also supplies calcium, a plant nutrient. Although calcium is required by turfgrasses, the requirement is less than certain other plant nutrients.

2. Lime will increase the rate of organic matter decomposition by microorganisms, thus increasing the rate of conversion of organic nitrogen, phosphorus, and sulphur to more readily available inorganic forms.

3. Lime will decrease solubility of certain toxic elements.

4. Lime improves soil particle aggregation. Calcium has a tendency to increase aggregation and improve soil structure over a period of many years.

5. Lime aids release of soil phosphorus. When soil acidity is reduced, so is solubility of iron and aluminum. Both iron and aluminum react with phosphorus to form insoluble compounds. This tie-up is known as phosphorus fixation. With reduced solubility of these two elements, phosphorus becomes more available.

## APPLICATION OF LIME TO TURFGRASS AREAS

When laboratory soil tests indicate a need for lime, follow these procedures:

1. *New Lawns*—It may be necessary to incorporate into the soil as much as 200 pounds of agricultural limestone per 1000 square feet. Mix lime thoroughly with soil 6 inches deep before planting.

2. *Established Lawns*—To correct low pH (high acidity) on established turf, it is not practical to apply the total required amount in a single application. Do not apply lime at rates above 50 pounds per 1000 square feet per application. Grass serves as a filter and causes lime to form layers. Lime layers can cause several nutritional problems, including iron chlorosis. Iron chlorosis appears as a general yellowing of grass leaves and occurs when excessive calcium raises pH excessively and renders iron insoluble and unavailable in the soil. High calcium levels in plant tissue can also cause iron to precipitate along the leaf veins and not reach the plant cells.

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**Dolomitic Limestone.** Dolomitic limestone supplies calcium, raises the pH, and supplies magnesium, another necessary plant nutrient. Dolomitic limestone is usually more expensive and reacts slower than agricultural limestone. Use only when soil tests indicate magnesium needs in addition to calcium.

**When To Apply Lime.** When soil tests indicate a need, the best time to apply lime is during the winter or early spring. Winter rains help dissolve lime and make calcium available for plant growth or correct soil acidity. The finer the lime particle size, the quicker it will react with the soil. Limestone ground to 100 mesh particle size or finer is most desirable.

Lime is not a cure-all for many common problems of lawns. The most important role of lime is to maintain pH between 5.5 and 7.0, which is the most favorable range for bacterial breakdown of organic residues and the availability of other plant nutrients. Lime will not control lawn moss and most other weeds in the Pacific Northwest. Its greatest function is to provide adequate calcium which, in turn, will increase turfgrass density and vigor provided no other nutrients are deficient.

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