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**EXTENSION
SERVICE**

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TURF GRASS (Oregon)

Grasses require adequate fertilization to provide color, promote good root development, and to stimulate new leaf and crown formation. Nutrients removed by clippings and leaching must be replaced. Fertilizer requirements are modified by temperature, moisture, grass variety, use being made of turf, clipping disposal, and the general level of maintenance.

NITROGEN (N)

Grasses require large amounts of N for desirable growth. This element is leached by rainfall and is often difficult to store in the soil.

Soluble N fertilizers may cause grass burning if used at rates above 1 lb N/M (1,000 sq. ft.). Rates as high as 2 lb N/M may be used on dormant turf or during cooler periods. Applications should be made to dry turf and grass should be immediately irrigated to prevent foliar damage from the higher rates of soluble fertilizers.

Changes in color of the grass from blue green to yellow green can be the best guide for timing of N applications. Intensively managed areas may require applications as frequent as once every 30 days or even more frequently during the peak growing season. Avoid heavy applications prior to anticipated heavy traffic on athletic areas. Turf receiving only minimal care may require only one late summer and one spring application.

Nitrate-containing fertilizers such as calcium nitrate or ammonium nitrate give the fastest response when soils are cold.

Organic fertilizers release N more slowly and provide more uniform grass growth. They are also useful for summer applications because of less likelihood of burning damage during high temperature compared to chemical fertilizers. They should be used at rates of 2 to 4 lb N/M. Their response during cold weather is very poor because their conversion to readily available N is slow at low temperatures.

Urea formaldehyde or Isobutylidene Diurea (IBDU) fertilizers will release N over a 6 month period, but because of slow N release, these fertilizers must be applied at higher rates to provide an adequate amount of available N. Initial rates of 6 lb N/M followed by twice yearly rates of 4 lb N/M are required for effective long-lasting response.

PHOSPHORUS (P)

P is important for root growth and is especially important for young turf. Annual applications of 2 lb P_2O_5 /M are sufficient. The relationship between P_2O_5 and P is explained under the section on "New Plantings". P moves very slowly in soil and should be applied before heavy rains or irrigations for maximum response. P is not readily leached from soils. No response on established turf is expected on sites having OSU soil test values above 45 ppm P in Western Oregon or 30 ppm in Eastern Oregon. For suppression of annual bluegrass, P_2O_5 application should not exceed 1 lb/M.

POTASSIUM (K)

Turf grasses require large amounts of K, especially when clippings are removed. K fertilizer is similar to N fertilizer with respect to danger of foliage burning. It is also adsorbed on clay and organic matter and thus not readily leached from soils containing these constituents. One lb of K_2O /M is the maximum single application. The relationship between K_2O and K is explained under the section on "New Plantings". The total of N plus K_2O should not exceed 2 lb/M for any one application. No response to K on established turf is expected on sites having OSU soil test values above 250 ppm K.

SULFUR (S)

Small amounts of S are required by turf. Exact requirements are not known. Many mixed fertilizers provide ample S. One lb S/M per year should be sufficient. Annual bluegrass can be suppressed with a total annual application of 3 lb S/M.

IRON (Fe)

Fe deficiency may develop during high temperatures. The symptoms are pale yellow leaf discoloration which cannot be corrected by N applications. Foliar applications of chelated Fe or ferrous ammonium sulfate applied according to manufacturers' directions are the best sources of Fe. Some turf fertilizer mixtures contain trace amounts of Fe.

LIME

Grasses grow over a wide range of soil pH. Adjustments in pH often improve availability of other nutrients, alter grass reaction to disease, and reduce the development of thatch. Elemental S, iron sulfate, and aluminum sulfate can be used to lower alkalinity in soils.

Liming of soils with pH lower than 5.8 may be desirable. For bluegrass turf, lime should be applied to soils with pH below 6.3.

The desirable range of calcium:magnesium ratio by OSU soil test is from 2:1 to 12:1. Dolomitic limestone should be applied when there is more than 12 times as much calcium than magnesium. In all other cases, ground limestone should be used to increase the soil pH.

Lime is most effective when incorporated into the soil prior to seeding. The rate of application of lime will depend on the type of soil and the extent to which the pH is to be increased.

MIXED FERTILIZERS

Many types and grades of fertilizers are available for turf grass purposes. Requirements of the grass are often most nearly met by formulations supplying annual N-P₂O₅-K₂O ratios of 5-1-2, 4-1-2, 3-1-2 or multiples thereof.

APPLICATION TECHNIQUES

Uniform application is absolutely necessary to avoid foliar or tissue burn from the high rates suggested. Hand spreading is usually unsatisfactory. Small spreaders should be adjusted so that two or three coverages are required to spread the material over the area. By going in different directions with each coverage, skips and overlaps will not be apparent.

Always make sure the spreader is moving when any fertilizer is falling from it. Rotary spreaders are best adapted to odd shaped turf areas but may throw material onto adjacent walks and flower beds. Apply fertilizer only when turf is dry.

When using higher rates of soluble nitrogen and potassium, foliar burn can be alleviated by immediate watering of the turf. Soluble materials can be applied through the irrigation system to minimize burning. The fertilizer response will follow the pattern of water dispersal.

NEW PLANTINGS

Obtain an OSU soil test through the County Extension Office. Incorporate the following materials to a depth of 2 to 6 inches during seedbed preparation prior to seeding.

If OSU soil test reads: Apply this amount
lb/M (1,000 sq. ft.)

pH	above 7.8	S	10 ¹
	7.2 to 7.8		5 ¹
	6.3 to 7.2		none
	5.8 to 6.3	Lime	100 ²
	5.3 to 5.8		150
	below 5.3		200
K (ppm)	200 to 300	K ₂ O	1
	150 to 200		2
	below 150		3

P (ppm):

For Western Oregon

below 45 P₂O₅ 1

P (ppm):

For Eastern Oregon

below 30 P₂O₅ 1

Note: The P content of fertilizer is expressed as the oxide (P₂O₅) on fertilizer labels. Multiply P₂O₅ by 0.44 to convert to P.

Note: The K content of fertilizer is expressed as the oxide (K₂O) on fertilizer labels. Multiply K₂O by 0.83 to convert to K.

¹Not required for blue grass.

²For blue grass only.

1 to 2 lb N/M should be incorporated with the above materials. Additional broadcast applications of N at 1 lb/M should be made as shown by poor grass color.

Where S is not applied in the above treatments, 1 lb S/M should be applied.

CONVERSION TO METRIC UNITS

In this FG, rates of fertilizer application are expressed in pounds per 1000 square feet (lb/M). In order to convert lb/M to kilograms per 100 square meters (kg/100 m²), multiply lb/M by 0.5. Thus 2 lb/M = 1 kg/100 m².

The P, K, Mg, B, and lime recommendations are based on soil test values from the Soil Testing Laboratory, OSU, Corvallis, Oregon.

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