The Advantages of Late-Season Fertilization

by Susan E. Young

Turf under high traffic stress is hungry throughout the year. It must be aggressive at all times during the season without being lush. Fertilizer timing is critical and fall applications are more critical than others.

Why is fall fertilization so important? If you think it's a way to help the turf survive the winter, you're right. Late-season fertilization not only improves turf density and color, it enhances spring green-up and makes turf maintenance more effective the following year.

Timing – For cool-season grasses, fertilizer is best applied as late in the season as possible, anytime from late September to early November. Timing should coincide with the natural slowdown of turfgrass growth which depends upon the area of the country and the weather pattern. This is about the time of the last regular mowing.

Although it's called "late fall," the application should not be made when the ground is frozen, or too close to the time when it will freeze. Fertilizer applied to frozen ground is less likely to be available to the plant in sufficient quantities.

In the South, a late fall application should be made before the first frost. That's when bermudagrass usually stops growing and goes dormant, remaining so until soil temperature again reaches 60 degrees F. It's important to remember that bermudagrass roots remain active for roughly 30 days after topgrowth ceases. The idea is to provide enough nutrients for winter storage without encouraging the bermuda to start growing again.

Difficulties may arise when bermudagrass is overseeded with perennial ryegrass or other cool-season turf. In general, fertilizer rates of one half pound of nitrogen per 1,000 square feet and 1.5 pounds of potassium will maintain optimum turf quality and enhance winter hardiness.

In the southernmost regions of the country, Florida especially, a nitrogen rate between 0.9 and one pound of nitrogen per 1,000 square feet is desirable to maintain healthy turf. This feeding should include an equivalent amount of potassium.

Timing of fertilization is critical to turf under high traffic stress.

Understanding the Process – After vegetative growth (leaf production) has slowed down in the fall, the plant begins to increase food production (carbohydrates and proteins) for storage in the crown and root system. These carbohydrates and proteins are used as energy sources throughout the fall and winter. The buildup of nutrition in the plant's roots and rhizomes is perhaps the most significant benefit of fall fertilization and leads to improved green-up and vigor the following spring.

Major Nutrients – Research supports the use of a complete fertilizer – one containing nitrogen, phosphorus, and potassium – for fall feeding. Nitrogen encourages root growth, provides good winter/early spring color, increases turf density, protects the plant against damage from cold and drought, and helps the plant recover from stresses.

Fertilizers with a high analysis, controlled-release nitrogen source are ideal for encouraging root system development without excessive topgrowth. Be careful not to apply too much nitrogen in late fall. Excessive nitrogen can divert the energy meant to enhance root growth to the production of lush top growth. It makes plants more susceptible to turf diseases and freezing damage to the crown. Fertilizers with controlled-release nitrogen sources applied at moderate amounts (about one pound of nitrogen per 1,000 square feet) can eliminate such problems. In general, the benefits of late fall fertilization far outweigh any negative effects.

Phosphorus plays an important role in the transfer of energy in the grass plant, a vital part of plant growth. Root growth in the fall and winter provides more active sites for nutrient uptake.

Phosphorus is less mobile in cooler soils (below 50 degrees F.) and tends to be fixed readily. This is particularly evident if the soil analysis of a given area shows less than 15 parts per million (ppm) of phosphorus. If routine applications during the season have supplied 0.6 to one pound per 1,000 square feet, a high analysis feeding of phosphorus is generally not needed.

A late fall feeding of phosphorus supplies small, readily available amounts to meet plant needs. By being available, it enhances shoot density, increases tillering, improves establishment of seedlings, and encourages growth of shoots, roots, and rhizomes.

Potassium aids in conditioning or hardening off the turf plant to lessen chances of winter injury. It plays an important part in plant metabolism and protein synthesis and regulates water absorption and retention in the plant. Furthermore, potassium acts as a deterrent to a number of important turf diseases and aids in the recovery of others, such as leaf spot.

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Apply potassium if analysis reveals your soil contains less than 75 ppm of exchangeable potassium, particularly on sandy soils. Nitrogen-to-potassium ratios in the 3:1 to 2:1 range are recommended under these conditions. Generally, it is best to apply potassium when the turf is actively growing for maximum uptake.

Secondary & Micro-Nutrients – Just as each of the major nutrients play a specific role in the turf growth, so do the secondary elements and micronutrients. It's important to understand their roles in order to determine whether or not they should be applied during the fall.

* Calcium: A vital component of cell walls which is critical for growth and essential for good root development.

* Magnesium: Aids in translocation of phosphorus. As an integral part of chlorophyll, magnesium is essential for photosynthesis.

* Sulfur: Together with nitrogen, sulfur makes protoplasm for plant cells. It is an integral part of certain amino acids and proteins.

* Boron: Essential to carbohydrate metabolism and sugar movement with the plant.

* Copper: Contributes to plant metabolism by activating various enzyme components vital to protein synthesis and formation of chlorophyll.

* Iron: Directly involved with plant respiration. Improves chlorophyll synthesis and turf color.

* Manganese: Activates numerous enzymes involved in chlorophyll synthesis and photosynthesis.

* Molybdenum: Activates enzyme system that controls high concentrations of nitrates in grass plant.

* Zinc: Regulates sugar consumption and chlorophyll production.

Importance of pH – Nutrient availability and exchange is greatly influenced by the pH of the soil. The optimum range is between 5.6 to 6.6. Bentgrass, red fescue, centipedegrass, and carpetgrass prefer the lower, more acid part of the range. Kentucky bluegrass, perennial ryegrass, tall fescue, annual bluegrass, bermudagrass, zoysia, bahia, and St. Augustine perform best on the high end.

Utilization of nutrients can be increased by changing the soil pH. Sulfur or acid-forming fertilizers decrease the pH while lime increases it.

Fall is an excellent time to amend soils to correct pH problems. Nutrient storage is directly related to availability and uptake. Since much of this storage takes place in the fall, soil nutrient deficiencies at this time can greatly hamper the health of the turf the following season.

Fertilizing in the fall gives managers of high-traffic turf a leg up in the spring, especially if their turf will be used early in the season. With the demand for golf and sports increasing steadily, turf is put into play earlier each spring and remains in play longer each fall.

Turfgrasses have survived cold stress and other weather phenomena for eons without any help from fertilizers. However, it is very doubtful whether they could survive the demand placed on them today without a carefully planned program of fertilization. That program should clearly include nutrient applications in the fall.

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