TECH CENTER

Fall fertilization:
going beyond N, P and K

Provide a solid base for next year's fertility program by giving attention to elements related to soil structure, not just turfgrass growth.

by Dave Wilber

■ Fall is the time to examine, evaluate and, if necessary, make changes to your turf fertilization program.

Fall fertility regimens are different in that they do not always have to do with the common fertilizers we may use to stimulate plant growth during the growing season. Late season fertilization means that we are in a position to feed and work on the soil.

As the summer heat winds down, turfgrass managers naturally take a breather from the dog days that have had them cornered during the past few months. Turf recovery is evident, and in most cases, the problems of the summer can disappear as the cooler nights set in.

Fall is the time to test and evaluate. Take a soil test of areas that were good and areas that were poor during the season, perhaps in addition to your regular testing program. The analysis is important as a first look at the balance of the soil after the past season's fertilization and irrigation.

The favorite test during this time looks at exchangeable rather than extractable nutrients. The difference is in the testing methods, but it leads to a more long term look at the soil profile. Exchangeable testing (reporting the standard soil test numbers, focuses on plant food nutrients called cations. The positive charged cations we are most concerned with are:

- calcium
- magnesium
- potassium
- sodium.

Hydrogen and dome other base elements in small quantity also figure into calculation of base saturation.

The importance of balance—Base saturation is by far the most informative reporting standard. As testing and reporting evolved there was work done to support the concept of nutrient balance. It was easy to see that when a soil was in balance it is able to support plant life to the greatest extent that nature will allow.

Potassium, rarely found in excess, can be overlooked during fall applications.

In the early 1950's, Dr. William A. Albrecht, a soil science professor from the University of Missouri, announced that a balance of the following nutrients was the optimum formula, based on his extensive work on the subject:

- calcium—65%
- magnesium—12%
- potassium—5%
- sodium—1%
- hydrogen—10%

The remaining 7 percent is found in other base soil elements.

The fall soil test may and probably will show a difference in soil cations, other than what is listed above.

Fall is the perfect time to adjust these numbers. Adjustment is based on the cation exchange capacity of the soil (CEC). A low CEC soil needs fewer actual pounds of soil fertilization than a high CEC. Over application may hurt, and under application may not be sufficient. A soil with a CEC of 4 may hold only 1600 lb./a of calcium as opposed to the 20 CEC soil that holds 8000 pounds of the same calcium.

Always ask if the recommendations are leading toward balanced soils. If they ar not, then ask what the goal may be. A good program will move toward improvement.

The importance of lime— A soil low in calcium should be limed. Lime is misunderstood, and should be viewed as more than just a pH adjuster.

The pH of a soil can be raised by applying any positively-charged material. Lime was used in the early days of agriculture to raise the pH of soils sufficient in calcium.

Dolimitic lime supplies both calcium *and* magnesium. Simply using pH as a guide to soil amendments is not enough, and fails in most cases to bring a soil to balance. In his work, Dr. Albrecht found that a balanced soil also had a pH of 6.2 to 6.8, regardless of where it came from.

Excessive sodium can lead to a high pH. If calcium is low, lime and gypsum can be used to remove sodium from the exchange sites. In this case, we lime the high pH soil to balance the soil.

Potassium is rarely found in excess and can be one of the most overlooked materials available for fall application. During the season, most fertilization has a goal of an equal amount of potassium and nitrogen applied. This may not offset a deficient condition and require additional potassium. The resulting cold and heat tolerance are well worth the money spent.

Late-season fertilization should be focused on the development of a solid base to support the efforts of fertilization during the following season. This may mean looking at fertilizer elements that are related to soil structure and not just turfgrass growth. There should be no guesswork with good soil testing.

Examine the soil carefully. The time spent will pay off in the early days of spring and the hot days of next summer.

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