ATRF 2008 – 5 (E)

factsheet

Fertility Management for Turfgrass Systems

Fig. 1. Close up view of grass and growing medium.

Fertility management can help turfgrass managers and producers optimize healthy plant growth. Understanding the quantity of each nutrient required is important. Maximizing growth and minimizing application rates reduces fertilizer costs and the chance of environmental pollution. It is important to keep in mind that excessive amounts of fertilizer can be just as detrimental as not enough.

Soil and tissue testing are two important factors in the fertility management of turfgrass. Combined, you have the knowledge to develop fertility management programs that maximize turfgrass growth.

Soil Sampling Techniques

On established turf, the soil should be tested every 2-3 years. For newly established systems, or on sand-based soils, tests should be completed every year. Keep track of any yearly changes in results. Proper sampling techniques should be followed so that the fertility management program accurately reflects the sample area. Remember, the thatch layer should be discarded. Proper techniques include:

- Using a soil sampling tube, shovel or cup changer
- Samples should be taken to 7.5 cm depth for greens and tees
- Samples should be taken to 15 cm depth for everywhere else
- For each sample, there should be at least 10-20 cores mixed in a clean bucket
- Problem areas should be sampled separately to avoid misleading results

Fig. 2. Soil plug taken for analysis.

Funding for the publication of this factsheet was provided through the Canada-Nova Scotia Water Supply Expansion Program (CNSWSEP), an initiative under the federal-provincial-territorial Agricultural Policy Framework.
For more information, please check our website at www.turfgrass.ca

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Nitrogen, Phosphorus, and Potassium

Nitrogen (N) is the most important primary nutrient required. Excessive levels can cause serious damage as it will stimulate the growth of leaves, decrease root development and reduce food reserves. Visual observation is most commonly used to assess the amount of N in the soil. A soil deficient in N will produce a thin stand with weed infestation. Colour is also a good indicator because it is a major component of chlorophyll and gives the plant its lush green colour. A lack of N will result in yellowish-green leaves.

Fig. 3. Yellowish-green turf indicates N deficiency.

Phosphorus (P) is required by all plant cells and is used for the conversion and transfer of energy and affects establishment, rooting, maturation, and reproduction. Symptoms of P deficiency include a darkening of green on the leaves, reduced tillering (side shoot growth), moisture retention on the leaves, and delayed maturity.

Potassium (K) plays a vital role in healthy turfgrass growth and is second to N in the amounts required for growth. It is involved in many physiological processes and aids in maintaining turgor. Leaves deficient in K become soft and droopy. Other problems include an increased susceptibility to drought, winter injury, and disease.

Interpretation of Results

pH and Lime Requirement: The soil pH measures the acidity or alkalinity of the soil solution and influences nutrient availability, microorganism populations, and thatch decomposition (decreases at pH <5.5). Each turfgrass species has a range where it is most vigorous and healthy.

Cation Exchange Capacity (CEC): Any element with a positive charge is called a cation. Included on a routine soil test are Ca, Mg, K, Na, H, and Al. The CEC describes the amount of these cations that the soil can hold. The larger this number, the more cations the soil can hold.

Results should be applied to the fertility program, minimizing excess applications that can lead to pollution and unnecessary fertilizer costs.

Fig. 4. Deep healthy root system.

By using fertility as a management tool, turf managers can develop the best possible playing surface, while limiting the impact on the environment.

Through understanding what nutrients are required for turfgrass to thrive, how they interact with one another, how they are acquired by the plant, and deficiencies that can occur, you can maximize growth and vigour within your management program.

By knowing these interactions and relationships, you can minimize excess fertilizer use and prevent potential non-point source pollution.