SOIL ANALYSIS AND SAMPLING

GUIDE FOR TURF

Why test soil?

The primary objectives of soil testing are:

- To determine the nutritional status of soils
- To indicate clearly the existence of any deficiency, excess or imbalance of major nutrients
- To form a basis for assessing fertiliser and lime requirements of turf

In achieving efficient use of available fertiliser, soil testing provides vital information to assist in the formulation or modification of a fertiliser programme. A regular testing programme can be used to monitor soil fertility trends over a period of time and will enable fine-tuning to ensure that an optimum soil pH and adequate nutrient levels are always maintained.

The benefits

Maintenance of optimum soil pH and adequate nutrient levels will assist management of high quality grass surfaces that:

- Are vigorous and able to withstand heavy usage
- Recover quickly from damage due to wear
- Improve resistance to pest and disease outbreaks
- Improve tolerance to drought or frost
- Minimise weed invasion of turf areas

Turf soil sampling guide

For laboratory work and subsequent interpretation to be effective, it is essential that care be exercised in ensuring the samples collected truly reflect the area under consideration.

The following guide-lines are provided to assist in the selection and submission of samples that are representative of the area being sampled.

1. Establish that the area to be sampled has received similar fertiliser treatments and management eg. Cricket wickets and outfield areas should be sampled separately.
2. Soil samples from turf should be taken to a depth of 7.5 cm or 3 inches.
3. The most effective sampling tool is a soil auger. In its absence, a spade or trowel may be used to simulate the use of an auger.
4. Select cores in a random fashion from the areas under consideration. To form a representative sample combine at least twenty cores (approximately 500 g) from uniform areas that will receive a common fertiliser application.
5. Take care to avoid contamination of samples, especially with fertilizers. Use clean sampling equipment and new plastic bags.
6. Send samples to the laboratory as quickly as possible. Do not allow samples to sit in moist or hot conditions prior to submission.
7. Soils from turf areas should be analysed annually at the same time of year. This enables the trends in soil nutrient status to be monitored so that any deficiencies, excess or imbalance of nutrients can be anticipated.
8. A Basic Soil (BS) Profile is recommended.

Interpretation

The fertility (pH and nutrient status) of turf is usually monitored using soil tests. Analysis of clippings may be used to investigate nitrogen and trace element status if required, although soil contamination of the herbage sample is very difficult to eliminate. As such, tissue testing can be very difficult to interpret with any certainty.

It is important to note that adequate soil test ranges differ for different turf-grass species and the growing medium. Hill Laboratories has information available for a variety of turf species, additional to those shown in the table below. Interpretive ranges are based on the best information available and relate specifically to the sampling instructions given.

Soil codes & test levels	Browntop (S79)	Ryegrass (S77)	Fescue (S81)	Cotula (S78)	General Park (S8)	General, Sand (S96)
pH	5.0 – 5.7	5.5 – 6.5	5.0 – 7.2	5.8 – 6.5	5.5 – 6.5	5.5 - 6.5
Olsen P	5 – 15	20 – 30	8 - 20	20 – 30	20 -30	20 -30
Potassium (%BS)	2 – 6	3 – 6	2 – 6	3 – 6	3 - 6	5 -10
Calcium (%BS)	20 – 50	35 – 75	20 -75	45 – 75	35 – 75	50 -75
Magnesium (%BS)	4 -15	5 -15	4 -15	5 -15	5 -15	5 -15
Sodium (%BS)	0.0 – 5.0	0.0 – 5.0	0.0 – 5.0	0.0 – 5.0	0.0 – 5.0	0.0 - 0.5
CEC	12 – 25	12 – 25	12 - 25	12 – 25	12 - 25	3 - 6
Total BS %	25 – 60	35 – 80	25 - 95	40 – 80	35 - 80	55 - 85

Comments

The cation exchange capacity (CEC) of a soil is the measurement of its ability to hold exchangeable cations, or positively charged ions. Cation results for potassium, calcium, magnesium and sodium are reported graphically as base saturation percentages that show the *proportion* of that cation to the CEC. Alternative units (me/100g and MAF units) are also reported to show the measured *amounts* of plant-available nutrients. The Total Base Saturation (BS%) is the sum of these 'basic' cations reported as a percentage of the CEC.

The base saturation approach is useful for sand-based turf soils with low organic matter levels that have a low cation exchange capacity (CEC). While the actual amount of cation present is likely to be low, the ratio of cations may be adequate for the particular turf-grass species grown. These soils require frequent small fertiliser applications, as cations such as potassium and magnesium are depleted due to plant growth (in addition to the requirement for nitrogen).

Optimising fertility is important for reasons other than management of dry matter production. Wear tolerance, weed invasion, disease control and the persistence of desired turf grass species are all factors influenced by fertility.

For your quality assurance this laboratory is registered by International Accreditation New Zealand (IANZ).

Contact Details

For further information please contact an Agriculture Client Service Manager.