

NUTURF TECHNICAL SERVICES

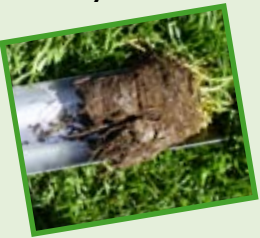


ANALYTICAL • DIAGNOSTIC • CONSULTANCY • SOIL TESTING

“Nuturf aims to provide an informative and efficient analytical and diagnostic package to the turf industry. This package has been developed to solve our customer’s problems whilst providing a greater understanding within the industry on a range of nutrition and plant protection issues.”


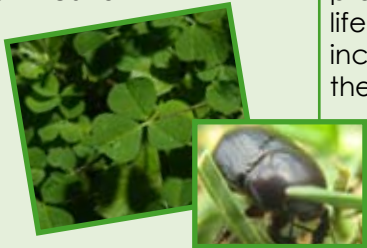
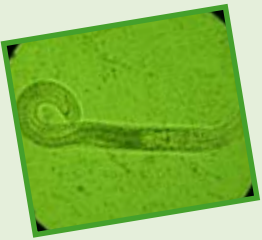



For more information please contact your local Nuturf Territory Manager on **1800 631 008** or visit **www.nuturf.com.au**

ANALYTICAL SERVICES

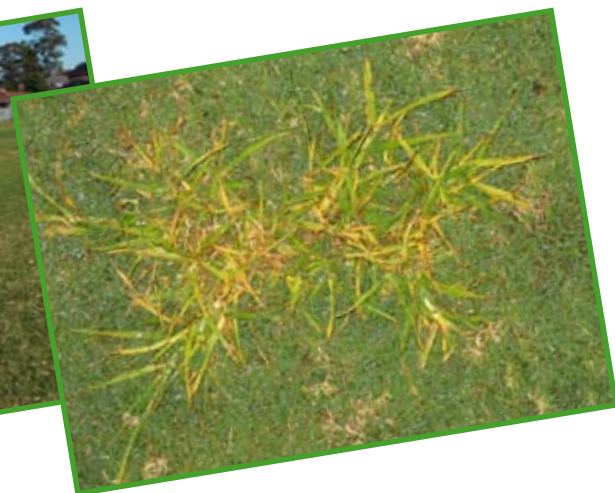
Analytical Services	Description of Test	How to Take Test
Soil Analysis 	Using the latest technology in nutrient extraction methods, the analytical package includes a comprehensive soil analysis, which quantifies the levels of all cations, phosphorus, essential minor nutrients and organic matter in the soil. In addition, recommendations for remedial actions are based on scientific calculations, which greatly assists in enhancing the performance of corrective programs.	Take a random sample of the area to be tested with a 1 inch plugger. Place in plastic bag and send to Nuturf. Minimum 200g soil required.
Saturated Soil Analysis 	A Saturated Soil Analysis determines what nutrients are present in soil solution. This is an important diagnostic tool to assess if the nutrients analyzed in the soil analysis are actually available in soil solution. Certain irrigation waters and soil types (calcareous) tie up essential soil nutrients, and it is important to determine that there are sufficient nutrient levels in soil solution to meet turf requirements in these situations.	Take a random sample of the area to be tested with a 1 inch plugger. Place in plastic bag. Minimum 200g soil required. Obtain a 500ml sample of the irrigation water. Ensure container is clean of any residues that may contaminate the analysis.
Irrigation Suitability Analysis 	The irrigation water suitability test provides the most comprehensive turf orientated chemical water analysis in Australia, measuring pH, Hardness, Conductivity, Sodium Absorption Ratio, Adjusted SAR, pHc, Cations (Calcium, Magnesium, Potassium, Sodium, Iron) Alkalinity, Anions (Carbonate, Bicarbonate, Hydroxide, Chloride, Sulfur) and Total Dissolved Salts. A key attribute of this test is the Tendency to Precipitate Calcium graph which indicates the solubility of this essential nutrient.	Take a 500ml sample from the irrigation source the customer wants tested. Ensure container is clean of any residues that may contaminate the analysis.
Basic Soil & Water Analysis	A basic water test measuring pH, EC and TDS can be undertaken for monitoring purposes. This is an efficient and cost effective service for diagnosing major water and soil quality issues.	Take a 250ml sample of soil or a 500ml of sample water and send to Nuturf Sydney Office.

DIAGNOSTIC SERVICES

Diagnostic Services	Description of Test	How to Take Test
<p>Disease Diagnosis</p> 	<p>This service is aimed at providing a more visual and comprehensive review of the disease activity within the plant, with photos and analysis of disease severity provided. In addition, a holistic approach will be used when discussing control, taking into account cultural, managerial and fungicidal options.</p>	<p>When taking disease samples please take 2 - 3 cores 5 - 10cm wide by 6cm deep. The cores should be taken from the edge of affected areas. Wrap soil samples in moist paper toweling and place inside a plastic bag. Complete 'Disease Identification Submission Form' and if possible email a photo of the affected area. Send samples Express Post to Nuturf. If not possible to send the day of taking sample, place in crisper of fridge until it can be sent.</p>
<p>Weed and Insect Identification</p> 	<p>The Weed and Insect identification service provides a comprehensive report detailing pest lifecycles and management strategies and includes pictures of the pests identified and how the identification was established.</p>	<p>WEEDS: Where possible, take sample of weed that is in flower. This makes it easier to ID. Wrap weed in moist paper towel. And place in Express Post bag. INSECTS: For soft bodied insects, place in bottle in methylated spirits. Fasten tightly and put tape around lid to prevent leakage. Send to Nuturf Sydney Office.</p>
<p>Nematode Diagnosis</p> 	<p>A nematode test quantifying Nematode counts per 200ml of soil. This test also provides a Hazard Index rating. The Hazard Index is a useful guide to whether nematodes are likely to be causing root damage in a given situation. In addition, photos of nematode damage on the roots are taken and a general root health assessment is provided.</p>	<p>Ideally, use a 1-2cm diameter sampling tube and collect about 20 cores to a depth of 5-10 cm (i.e. about 500 mL of soil). Collect cores from the margins of problem areas rather than from areas that are severely debilitated or dead. Place the samples in a plastic bag and pack them in a sturdy cardboard box, postal pack or insulated picnic cooler. Keep samples cool but do not refrigerate. Most importantly, do not expose samples to excessive heat (i.e. by leaving them in the sun or inside a closed vehicle).</p>
<p>Root Health Assessment</p> 	<p>Root health assessment quantifying and assessing important root health parameters such as nematode, disease levels, thatch depth and root length.</p>	<p>Please note; When taking Root health assessment samples 2 samples are required. Sample 1 - please take 2 deep cores approx. 10cm wide by 6cm deep. The core should be taken from the edge of affected areas if apparent. Wrap soil samples in moist paper toweling and place inside a plastic bag. Sample 2 - Use a 1 - 2 cm diameter sampling tube and collect about 20 cores to a depth of 5-10 cm (i.e. about 500 mL of soil). Collect cores from the margins of problem areas rather than from areas that are severely debilitated or dead. Place the samples in a plastic bag and pack them in a sturdy cardboard box, postal pack or insulated picnic cooler. Keep samples cool but do not refrigerate. Most importantly, do not expose samples to excessive heat (i.e. by leaving them in the sun or inside a closed vehicle). Send to Nuturf Sydney Office.</p>

CONSULTANCY SERVICES

Consultancy Services	Description of Test
<p>Sports field Assessments</p> 	<p>Nuturf conducts a quantitative audit of sports fields and recreational turf areas. The scope of parameters assessed can be tailored to client needs. The assessment studies compaction, surface levelness, soil nutrition levels, irrigation water suitability, turf root health, desirable and undesirable plant populations and insect, disease and nematode occurrences. From the information obtained above, a detailed 12 month maintenance program is produced to improve turf quality. The maintenance program includes a calculation of total monthly and yearly Nitrogen, Phosphorus, Potassium, Calcium, Magnesium and Trace Element output. In addition, soil amendment, weed and pest control, water management and mowing regime recommendations are provided. The assessment and maintenance recommendations are detailed in a comprehensive final report.</p>
<p>Irrigation Audits</p> 	<p>As the cost of water increases and its availability decreases the need to maximize water use efficiency becomes paramount. Nuturf can provide a Turfgrass Irrigation Audit that assesses the sprinkler system on a Turfgrass site to identify:</p> <ul style="list-style-type: none"> • Uniformity of water distribution • Working pressure of individual sprinklers • Inconsistency between nozzle size and required flow rate • Problems with operation and alignment • Potential hazards <p>The final report identifies the factors that are affecting optimum performance and recommendations are made on where improvements are required. The key benefits have been :</p> <ul style="list-style-type: none"> • Identification of problems that are not otherwise observed or measured • Possession of a detailed document that will provide the basis for future irrigation improvement planning and costing • Ability to prioritize improvement works • Ability to quantify increase in water use efficiency as improvements are made • Basis to maximize turf quality for minimal water input.
<p>Maintenance programming</p>	<p>Working in conjunction with Turf Managers, Nuturf can formulate annual maintenance programs that address:</p> <ul style="list-style-type: none"> • Nutrition programmes including annual elemental usage • Pesticide programmes • Wetting agent programmes.
<p>Contract product evaluation trial work</p>	<p>Assessment of products in detailed field trials for either demonstration or registration requirements. Replicated trials are designed to to be statistically analyzed and suitable for registration submission.</p>
<p>Training and Education</p>	<p>Programmes can be developed in association with the client to provide short, topic specific training programs for staff. These sessions typically run between 30 and 120 minutes. All areas surrounding turf grass management can be covered. Participants receive information booklets and programmes could be structured to qualify for AGCSA Accreditation points.</p>
<p>Racetrack Soil and Health Assessment</p>	<p>Detailed analytical, diagnostic and surface quality report provides detailed report on potential compaction, disease, root health and nutrient concerns. The report provides quantitative results and treatment recommendations.</p>





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Technical Agronomist - QLD



OTHER SERVICES

Service	Description of Test	Quantity Required
Particle Size Analysis	Particle size analysis using standard USGA sieves (8 fractions).	500g
Sand, Silt and Clay Analysis	Ideal for Cricket Wicket Samples.	200g
Hydraulic Conductivity	Hydraulic Conductivity / infiltration rates to determine surface drainage characteristics.	1kg
USGA Suitability Package	Full analysis for construction suitability on USGA guidelines.	3kg
Porosity Assessment	Total, Air filled, Capillary Porosity.	1kg
Bunker Sand Package	pH, salts, hydraulic conductivity (drainage), particle size analysis, angle of repose, particle shape, visible crusting, ball penetration, colour.	2kg
Biological Water Test	N,P,K - Biological Oxygen Demand, Ecoli, faecal coliform.	500ml <i>Note: Special sampling bottle and delivery procedures required.</i>
Cricket Wicket Package	Particle size analysis, Silt/clay determination, pH, salinity, shrinkage, cracking, crushing strength.	1kg
N drawdown Index	Determines drawdown index of organic materials and soils.	2kg
Particle Shape Assessment	Angularity and shape analysis.	200g