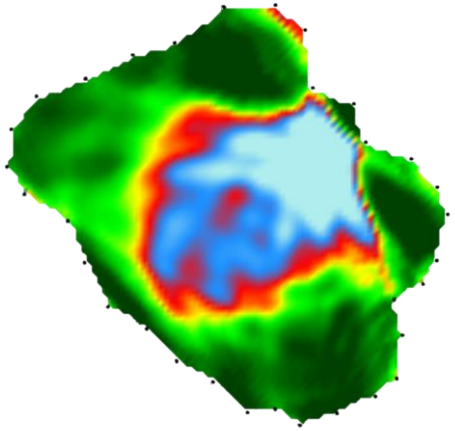
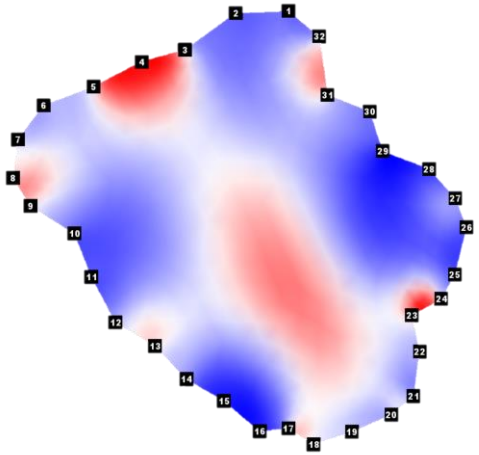
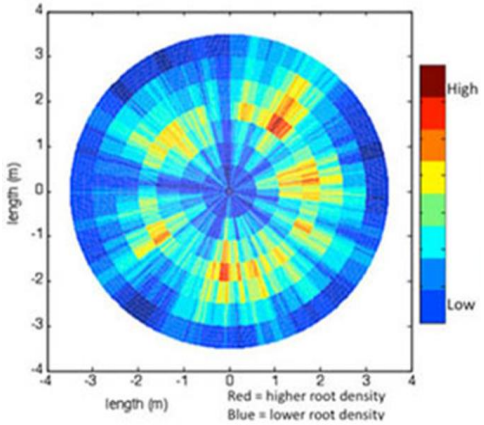
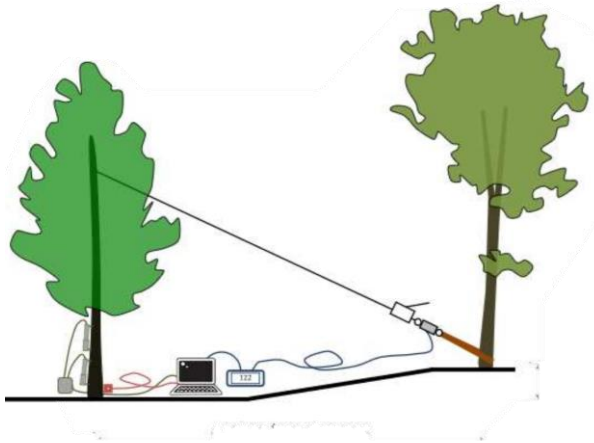
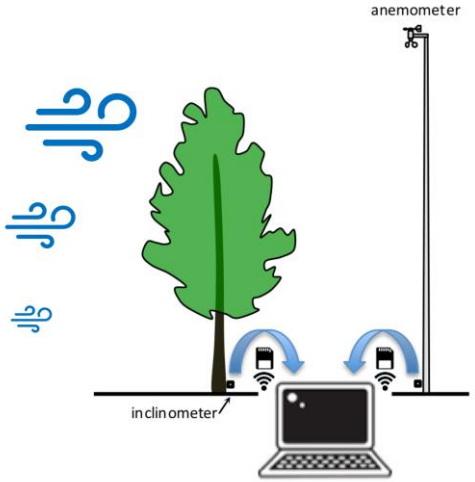
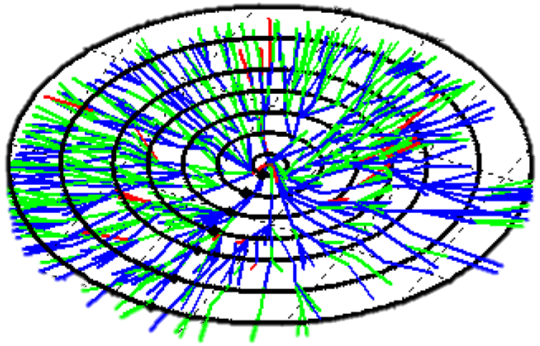












Tree Diagnostics®

ARBORICULTURAL FURTHER INVESTIGATIONS SALES & SERVICES

CONTENTS

Tree Diagnostics

Tree Investigations – What test equipment should I use?

Type of Assessment	Decay Detection						Tree Stability			Rootzone			Tree Canopy			
Area of Concern / Investigation Methods	Sonic Tomography	Microsecond Timer	Stem Radar	Electrical Resistance Tomography	Resistograph	Thermal Imagery	Static Tree Pull	DynaRoot	DynaTree	Ground Penetrating Radar	Root Detector	Air Excavation	Drone Survey	Chlorophyll Fluorescence	Aerial Inspection	Leaf Analysis
Premature Leaf Fall/Damage						✓							✓	✓	✓	✓
Canopy Dieback				✓		✓							✓	✓		✓
Canopy Cavities & Hollows	✓	✓	✓	✓	✓	✓									✓	
Canopy Fire Damage				✓		✓							✓	✓	✓	
Pest and Disease Monitoring													✓	✓	✓	✓
Stem Cavities and Faults	✓	✓	✓	✓	✓	✓	✓		✓						✓	
Heartwood Decay Fungi	✓	✓	✓	✓	✓	✓	✓		✓						✓	
Stem Damage	✓	✓	✓	✓		✓	✓		✓							
Stem Surface Decay	✓		✓	✓	✓	✓	✓		✓							
Stem Fire Damage				✓		✓	✓		✓					✓		
Stem Vessel Damage			✓	✓		✓								✓		
Root Damage				✓		✓	✓	✓	✓	✓		✓		✓		
Root Decay Fungi				✓	✓	✓	✓	✓	✓	✓		✓		✓		
Root Excavation Damage				✓		✓	✓	✓	✓	✓	✓	✓		✓		
Root Mapping										✓	✓					
Ground Compaction										✓		✓		✓		✓
Ground Contamination										✓				✓		✓
Leaning Tree and Stability	✓		✓				✓	✓	✓							

Save time, money and make the right decision, based on evidence. Lets find the right test.

INTRODUCTION

Hello and welcome to Tree Diagnostics, we offer a comprehensive range of tree assessments and investigation equipment.

We provide a wide range of equipment from simple one-shot sonic devices, through to a range of 2D & 3D sonic and electrical tomography systems. In addition, we can offer a range Static and Dynamic tree stability testing to understand tree safety and stability.

We provide full training in the use of these systems as well as interpretation and presentation of results. We want to be sure that you can start using these systems and generating reports the very next day.

In addition to this we can if required undertake these assessments and other tests such as Root mapping using TreeRADAR for you on a subcontract basis as either a data/image only or full appraisal and management report.

WE ARE HERE TO HELP

Whether you are about to purchase your first pieces of investigation equipment or request your first tomograph, we can help guide you through the maze, of options and help you find the appropriate assessment for a particular concern.

We provide, unbiased advice with both you and trees in mind. To this end we aim to restrict our assessment to none injurious testing and assessment to help ensure tests can be repeated and localised damage is avoided.

Only in extreme cases will we drill as a final check before a recommendation to remove is confirmed.

Decay, Defects & Stability of Trees

We specialise in helping you understand your trees and offer a wide range of assessment methods focused on answering that simple but often uncomfortable question.....

"Is That tree Safe?"

We have a wide range of systems to assess your trees in detail and understand the implications of features or defects:

We can investigate the soil and below hard surfaces to map where roots are located;

We can map and show the extent of decayed wood and assess where decay is likely to be in the future.

We can even test the stability of the whole tree and understand whether the tree offers a risk of failure through the collapse of the stem or failure of the roots.

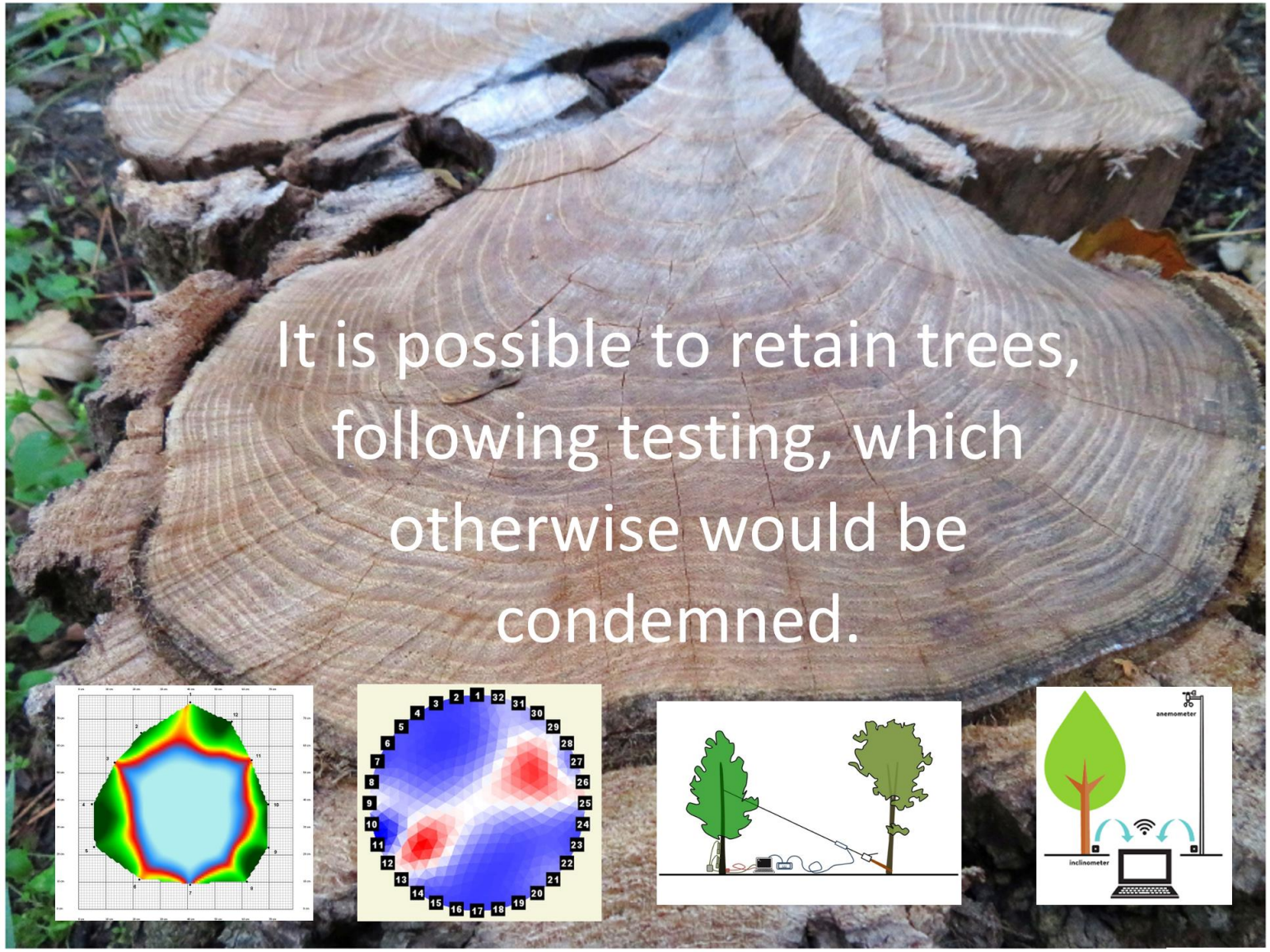
Please Contact - Tree Diagnostics for help

01423 322 371 - info@treediagnostics.co.uk

Tree Diagnostics®

We Can Offer You And Your Clients Detailed Assessments Of Suspected Decay & Defects, or Report on Safety & Stability.

Let’s Stop Guessing and Find Out if That Tree is Safe.



Types of Assessment

We can offer you or your client's various types of detailed assessment.

Please use the table opposite to find the most appropriate types of test.

Get better information to make better decisions on the impacts of Decay or Defects and to understand Safety & Stability of your trees.

Tree Investigations - What test equipment should I use?

Type of Assessment	Decay Detection						Tree Stability			Rootzone			Tree Canopy			
Area of Concern / Investigation Methods	Sonic Tomography	Microsecond Timer	Stem Radar	Electrical Resistance Tomography	Resistograph	Thermal Imagery	Static Tree Pull	DynaRoot	DynaTree	Ground Penetrating Radar	Root Detector	Air Excavation	Drone Survey	Chlorophyll Fluorescence	Aerial Inspection	Leaf Analysis
Premature Leaf Fall/Damage						✓							✓	✓	✓	✓
Canopy Dieback				✓		✓							✓	✓		✓
Canopy Cavities & Hollows	✓	✓	✓	✓	✓	✓									✓	
Canopy Fire Damage				✓		✓							✓	✓	✓	
Pest and Disease Monitoring													✓	✓	✓	✓
Stem Cavities and Faults	✓	✓	✓	✓	✓	✓	✓		✓						✓	
Heartwood Decay Fungi	✓	✓	✓	✓	✓	✓	✓		✓						✓	
Stem Damage	✓	✓	✓	✓		✓	✓		✓							
Stem Surface Decay	✓		✓	✓	✓	✓	✓		✓							
Stem Fire Damage				✓		✓	✓		✓					✓		
Stem Vessel Damage			✓	✓		✓								✓		
Root Damage				✓		✓	✓	✓	✓	✓		✓		✓		
Root Decay Fungi				✓	✓	✓	✓	✓	✓	✓		✓		✓		
Root Excavation Damage				✓		✓	✓	✓	✓	✓	✓	✓		✓		
Root Mapping										✓	✓					
Ground Compaction										✓		✓		✓		✓
Ground Contamination										✓				✓		✓
Leaning Tree and Stability	✓		✓				✓	✓	✓							

Save time, money and make the right decision, based on evidence. Lets find the right test.

Tree Diagnostics®

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Whatsapp: +44 7483 116044
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SCAN ME

Assessment Equipment

Microsecond Timer

ArborSonic Tomogram

ArborElectro Tomogram

Thermal Imaging

Chlorophyll Fluorescence

Static (Tree Pull) Test

Dynamic Tree Test

Root Detector

Root RADAR

Root Investigation

Drone Inspection

Other Assessment Services

Root Identification

Foliage Assessment

Soil Testing

Pest and Disease Identification

DNA Identification

Guide to Use

Not Harmful – This test can be repeated, or doesn't significantly harm the interior of the tree, typically attachments are in the outer (live) wood.

Sales – We sell and provide training for this equipment.

Service – We use this equipment as part of our Assessments.

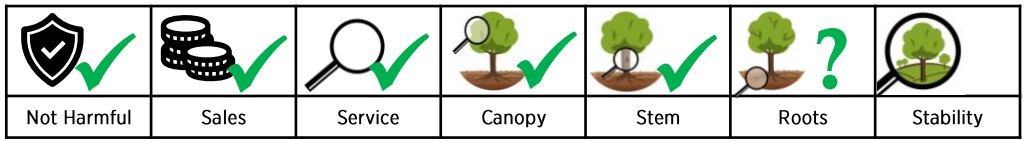
Canopy – Suited for use in the canopy, identify or document issues in the canopy.

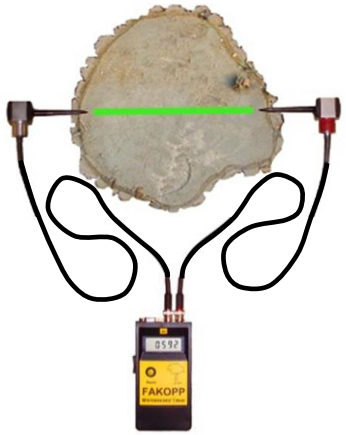
Stem – Suited for assessing, locating, identifying and documenting issues in main stems.

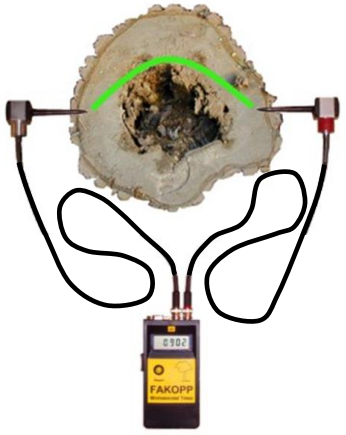
Roots – Equipment used to assess,or locate roots and rot systems or to identifying and document issues roost.

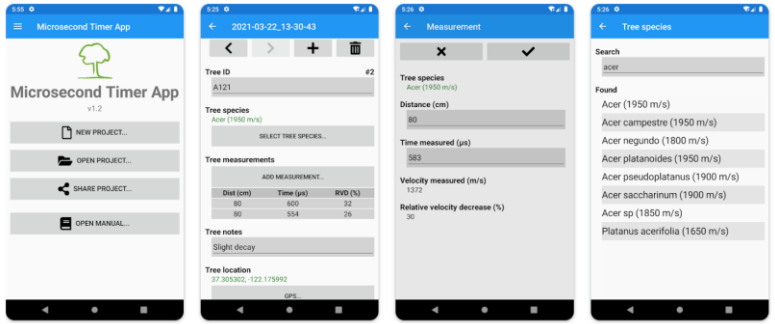
Stability – Equipment aimed at producing information on the loading of a tree and the trees resistance to failure or fracture.

Microsecond Timer









Microsecond Timer

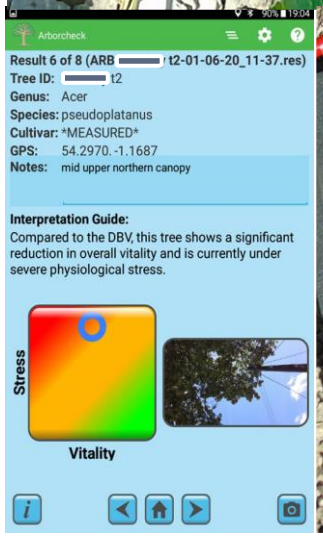
- This is a quick, non-injurious assessment tool for tree stems, branches and accessible roots. It can be used on structural timber such as play equipment, buildings or structures.
- It records the time taken for a sound wave to travel between two sensors and very simply a fast time equals good quality wood, whereas slow time equals poorer quality wood.
- Results can be stored on an App along with photographs and location information to be emailed back to the office immediately.
- This portable tool is small enough to sit in your bag while out on general surveys and risk assessments. It is perfect for climbing inspections and saves taking bulky complicated equipment into the tree.

Where to use

- Its great for locating decay or other defects such as cracking or shake.
- The results of the **Microsecond Timer** can often avoid the need for more complicated, costly assessments or enable these problem areas to be targeted more accurately.
- The Microsecond Timer is supplied with a bag, probes, hammer, extension cables, rechargeable batteries and charger. It comes with a serial port connection or can be supplied with a Bluetooth option for intensive use.
- The **Microsecond Timer** is a smaller, simple assessment tool designed to get targeted results quickly, without harming the tree. Its ready out of the box and provides detailed repeatable test results whether you are looking at a single cavity or needing to assess more than a hundred trees in a day.

Chlorophyll Fluorescence

Not Harmful	Sales	Service	Canopy	Stem	Roots	Stability



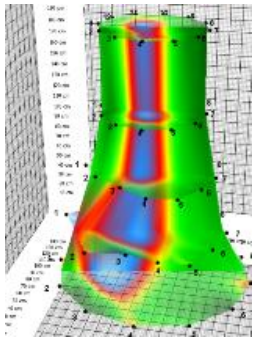
Tree Vitality Testing

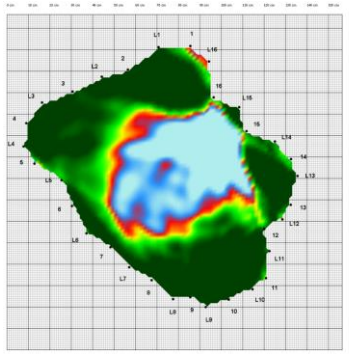
- This non-invasive, non-destructive measurement of leaf chlorophyll fluorescence and chlorophyll content uses methods of detecting physiological damage caused by biotic or abiotic stress factors.
- Data from the leaf fluorescence and chlorophyll content measurements is presented for both overall tree vitality and current stress levels. Vitality is calculated from 2 parameters; photosynthetic efficiency and chlorophyll content with stress calculated from 4 additional stress indicator (Si) parameters taken from the leaf chlorophyll fluorescence measurements.
- All we need to do is prepare 10 leaf samples either on the tree or collected on the ground by applying clips to provide a period of shade.
- Once the leaf is ready the assessment is undertaken and results are transferred to the App. Results can be stored on an App along with photographs and location information to be emailed back to the office immediately.
- Results are displayed both as a graphical summary of vitality and stress and also as a more detailed presentation of the standard deviation from the DBV for each of the individual parameters.

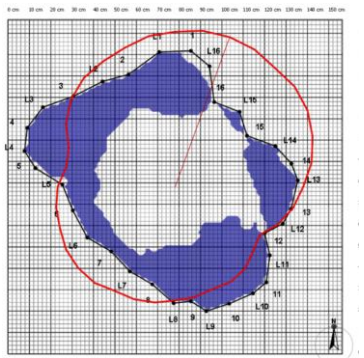
Where to use

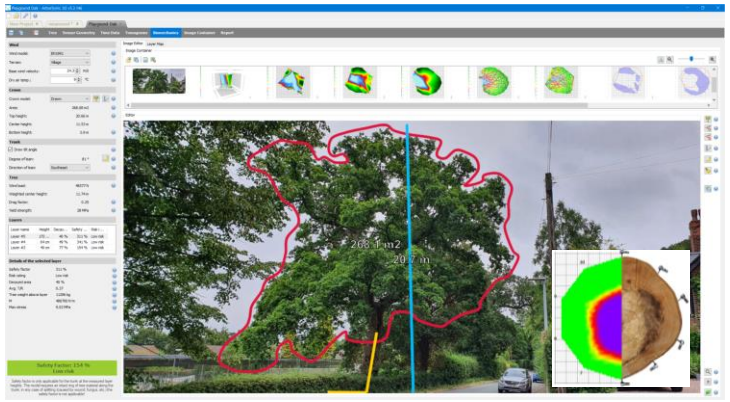
- This system is ideal to understand the underlaying condition of trees and shrubs and is able to see internal changes well before changes are visible to the Human eye.
- The system can identify sudden and subtle changes brought on by site changes, environmental or health changes.
- This is a good method to assess the viability or retainability of trees on sites prior to change or large investments of time on funds. By identifying tree conditions which otherwise may not manifest until after the construction work is completed.
- We regularly use this for routine testing of trees on development sites or in development/construction sites that have alleged damaged physically.
- This is also useful on sites which are suspected of damage by chemicals either by accident or alleged intentional sabotage.
- The system is also be good at identifying the quality planting stock and helps avoid using material of low vitality and can help prevent costly remediation and/or replanting work that can arise where trees in a poor physiological state are planted or supplied.
- The British Standard “BS8545 Trees: from nursery to independence in the landscape – Recommendations” describes the use of chlorophyll fluorescence and chlorophyll content measurements as tests that “should be carried out wherever practicable”.
- The system can help to highlight abnormal decline in tree vitality post-planting so that remedial work may be carried out before the tree becomes a costly re-planting exercise.

ArborSonic 3D Sonic Tomograph









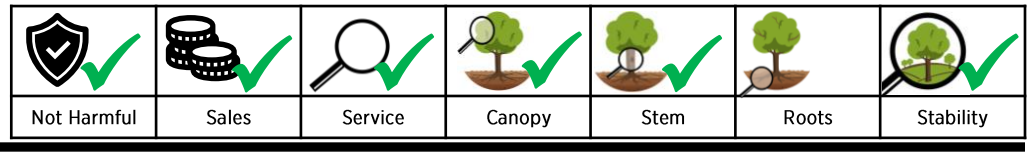
ArborSonic

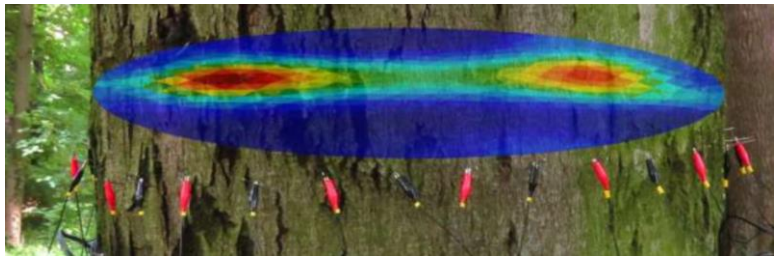
- This non-injurious assessment tool can be used on tree stems, large branches and accessible roots. It can also used for structural timber such as buildings or timbers structures.
- The ArborSonic 3D Acoustic Tomograph can us up to 64 measuring points to provide very detailed assessment on the physical condition and the quality of a cross-section. It can detect the size and location of decayed or hollow regions within the live trees with minimal damage.
- It works by measuring the time of flight of a sound wave between sensors around the trunk. The basic measurement principle is that good quality wood has a higher density and higher speeds. Whereas decay and defects typically reduce the speed.
- Scans can be joined to produce 3D representations of the volumes of affected wood. Data can be combined with biomechanical information, dimensional data and site conditions to generate safety information. The system calculates a safety factor for the assessed defects to shown resistance to fracture.
- Results, reinforce management decisions by moving away from visual assessment based upon the extent of decay versus the extent of sound wood.

Where to use

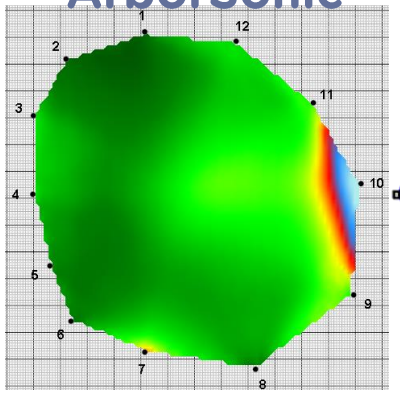
- The Arborsonic locates decay or other defects such as cracking or shake in branches, lateral branches on main stems and the uses of increased sensor numbers allows closer representation of a trees form and improve the level of detail for safety calculations.
- The results of the **ArborSonic** can often avoid the need for more costly or harsh Tree Works assessing problem areas more accurately and provided recovery time for trees to adapt.
- The ArborSonic is supplied as a full kit within a Pelican Case and includes everything you needs from, sensors, hammer, extension cables, batteries, charger there even a tape measure. You just need to supply Laptop, Tablet or Phone to run the license free software, which can be installed on as many devices that you want including clients.
- The ArborSonic 3D sonic Tomograph is designed to get targeted results quickly, without harming the tree and to a level of detail to that allows the retention or removal of trees with confidence.
- It proves detailed repeatable test results to allow progression of decay or adaption and recovery to be measured, whether you are looking at a single small cavity or extensive decay on thin shell trees.

ArborElectro Impedance Tomograph

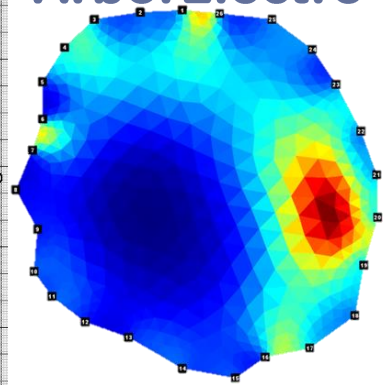




ArborSonic



ArborElectro



ArborElectro

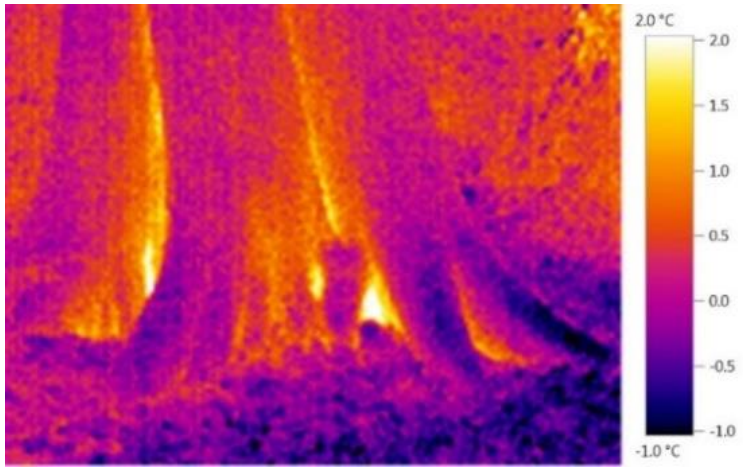
- The ArborElectro, Electrical Impendence Tomography, is a great addition to Sonic tomography and provides improved levels of detail. It helps locate fungal activity and areas of future decay by informing upon wood quality, moisture distribution and wood chemistry.
- The ArborElectro can us up to 32 measuring points to provide a detailed assessment on the physical condition and the quality of a cross-section. It can detect the size and location of decayed or hollow regions within the live trees with minimal damage.
- This system can detect the size and location of active fungi that attack regions in the trunk non-destructively, including incipient decay
- It works by measuring electric resistivity measurements between multiple sensors around the trunk. The basic measurement principle is that resistivity increases/decreases if there is a change in the concentration of ions between two sensors.
- Fungi attack even in very early stages can be determined and well before decay can be seen within the tree and is the perfect complement to the Arborsonic, to understand where the decay is developing and likely affect next.

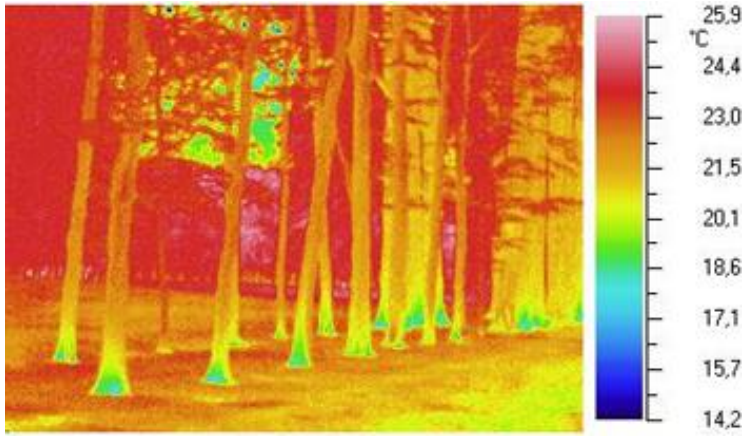
Where to use

- The ArborElecto can be used on woody parts of the tree as a further level of information or as a compliment to other assessment methods and will detects chemical changes that sonic systems just can not see.
- Its also ideally placed to help identify changes in vascular activity and can show the subtle changes associates with root damage, fires damage or vascular dysfunction resulting from colonization by fungi.
- Results, reinforce management decisions particularly in combination with other systems such as the Arborsonic by shown where decay is today and where it likely to be tomorrow. This can provide valuable time to help a tree to adapt or avoid wasteful attempts to retain trees which high levels of dysfunction.
- The ArborElectro is supplied as a full kit within a case and includes everything you needs from, sensors, hammers, extension cables, batteries, charger there even a tape measure. You just need to supply Laptop, Tablet to run the license free software, which can be installed on as many devices that you want including clients.
- The ArborElctro is designed to help you better understand both where the decay and defects are now and where fungi are going to be in the future.
- It provides targeted results quickly, without harming the tree and to a level of detail to that allows either the retention or removal of trees with confidence.

Thermal Imaging

Not Harmful	Sales	Service	Canopy	Stem	Roots	Stability





Thermal Imaging

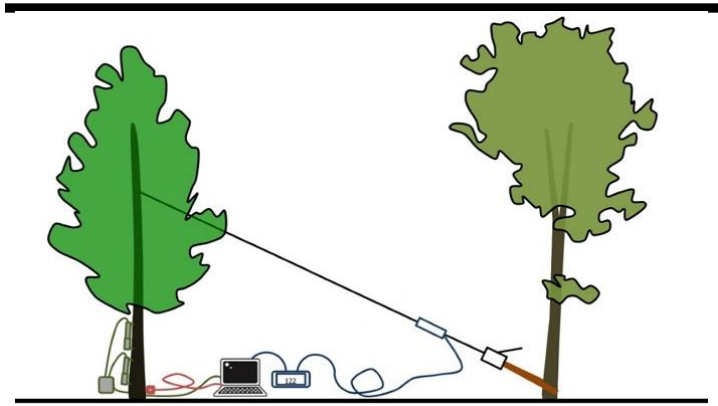
- Produce images based on the amount of infrared energy emitted, transmitted, and reflected by an object.
- A thermal imaging camera will show subtle temperature changes when the tissues of the wood or bark are altered or destroyed by physical actions or pathogens in addition to identifying areas of restricted vascular activity or destroyed tissues below the surface.
- Images obtained with an infrared camera allow the early detection of various kinds of alteration in trees, including bark necrosis, decay and the onset of adaptive growth in response to damage or mechanical stress.
- This method is total non-invasiveness, rapid to use, and provides 'real-time' information and has the ability to work at distance from the tree.
- In order to assess trees, however, the surfaces must be out of direct sunlight, free from running water and be unobscured.
- The technique does not allow a truly quantitative assessment of the relative extent of decayed and sound wood but is accurate enough to identify trees which merit either remedial action or more detailed assessment.

Where to use

- This type of assessment can be undertaken quickly and is useful for rapid assessment of groups of trees or detailed assessment of particular defects.
- The system is particularly good for assessing trees with high levels biological activity which elevate the temperature of the tree relative to the surrounding or nearby trees. This is particularly useful in assessing groups of trees where outwardly all the trees can look similar but when using Thermal Imaging one or two trees can be significantly warm due to localized internal decay.
- Additional uses of this system are the ability of the camera to see areas of active growth which I turn help show or confirm vascular activity or adaptive tissue develops in response to issues detected by the tree.
- This system is also valuable in providing general health information on the vitality and transpiration rates of trees canopy and can be used to identify stressed or trees with low vitality within groups. This aspect is particularly useful in estate surveys for identifying low vitality trees when Thermal Imaging is combined with the improved visibility provided by our drones – please see out separate section.

Static (Tree Pull) Test

Not Harmful	Sales	Service	Canopy	Stem	Roots	Stability



Static (Tree Pull) Test

- Tree Pulling at present, is the most accepted method for evaluating the safety and stability of trees, none destructively.
- This methods involves applying a measured load using a Forcemeter into the tree via a cable attached to the tree. Then using very accurate devices to measure the trees response to the applied load and comparing the response of the tree to a high number of previous tests.
- The Pull Test can be undertaken in three different configurations to test different parts of the tree:
    1. Assessing a trees resistance to uprooting and overturning by measuring the tilt of the using inclinometer at the buttress or root collar, known as an 'Inclino' test.
    2. Assessing the resistance of the trunk to fracture or breakage by measuring the bending stresses in the outer shell using elastometers attached to the trunk, this is known as an 'Elasto' test.
    3. A full 'Tree Pull' Test or combined 'Inclino and Elasto' which tests both the roots and the stem simultaneously.

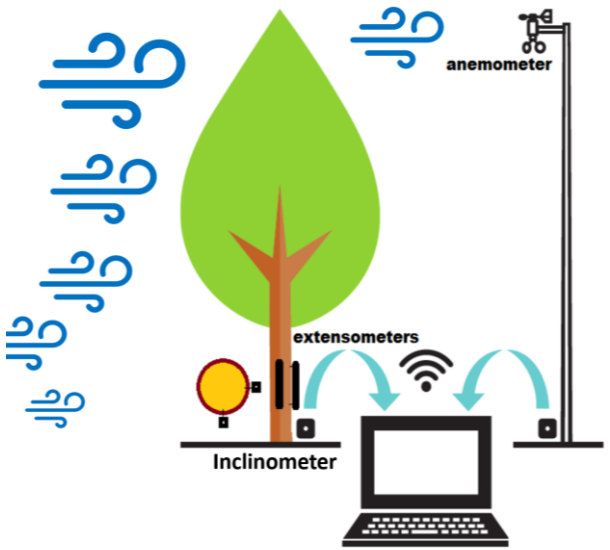
Where to use

- Specialist software records the results and warns when the limits are approached to avoid causing lasting damage to the test tree.
- The test results are combined with tree, site and local weather information to provide an assessment of the trees safety in likely loading and enables us to comment upon the impact of known and suspected defects with confidence.
- The results are presented in a report that allows us show trees safety in response to the test, which is summed up as a safety factor for each particular element of the tree, which has been tested.
- This is shown as a number or percentage showing the ratio between load bearing capability and the loads as shown below:

  SF = (load bearing capacity) / (loads)

- The system is particularly useful as an aid to manage trees with suspected root decay or trees which have undergone site changes or damage such as trenching or soil level changes.
- Its is also useful for confirming the actual state of the stem where suspected weaknesses have been identified by visual or investigation methods.

DynaTree & DynaRoot Testing



Dynamic Stability Test

- Although Tree Pulling is the most accepted method for evaluating the safety and stability of trees, none destructively, there can e difficulties in undertaking assessments, particularly on busy sites or highways.
- In Dynamic assessment, the collection of similar test information is possible using the power of the wind to replace the need of a Winch and Forcemeter.
- Dynamic testing can be undertaken in two different configurations to test different parts of the tree:

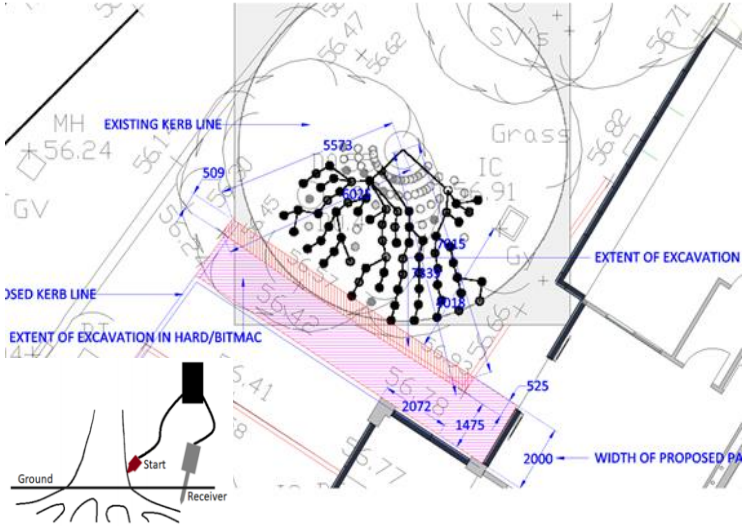
1. DynaRoot is used to assess a trees resistance to uprooting and overturning by measuring the tilt of the using inclinometer at the buttress or root collar and can be used in place of an 'Inclino' Pull test.
2. DynaTree is used to replace a traditional 'Tree Pull' Test or combined 'Inclino and Elasto' which tests both the roots and the stem simultaneously. This assessment assess the resistance of the trunk to fracture or breakage by measuring the bending stresses in the outer shell using elastometers attached to the trunk and assess a trees resistance to overturning by measuring the tilt of the buttress or root collar.

Where to use

- Specialist software records the results and warns when the limits are approached to avoid causing lasting damage to the test tree.
- The test results are combined with tree and local weather information to provide an assessment of the trees safety in likely wind loading and enables us to comment upon the impact of known and suspected defects with confidence.
- The DynnaRoot & DynaTree system should be used on days with at least 25 km/h (15 mph) wind gust velocities and wind date is recorded simultaneously and compared with the results of the test tree.
- The results are presented in a report that allows us to show trees safety in response to the test, which is summed up as a safety factor for each particular element of the tree, which has been tested.
- The system is particularly useful as an aid to managing trees with suspected root decay or trees which have undergone site changes or damage such as trenching or soil level changes and trees which are found in difficult to access areas.
- Its is also useful for confirming the actual state of the stem where suspected weaknesses have been identified by visual or previous investigation methods.

Sonic Root Detector

Not Harmful	Sales	Service	Canopy	Stem	Roots	Stability



Root Mapping

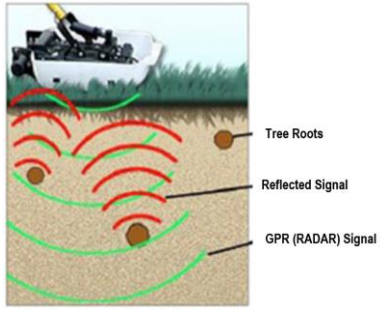
- This non-injurious assessment tool can be used to find the principal roots within the soil without having to excavate.
- And can be supplied as standalone system or as an addition to the Arborsonic 3D tomograph.
- The system detects sound moving from the trees buttress through the roots and into the soil close to the roots.
- The sound wave travels faster in the woody than it does in the soil as the signal can be buffered by the soil.
- The system works by recording the speed of sound between the start sensor attached to the tree and the receiver sensors which is located in the soil at a preferred location / position or the testing is repeated radially around the stem roots enabling the pattern of roots to be identified by the strength of the sonic connections.
- The software displays fast time results in darker colours which shows the location of the principal roots so in principle the faster the sound signal the closer the sensor is to the root.

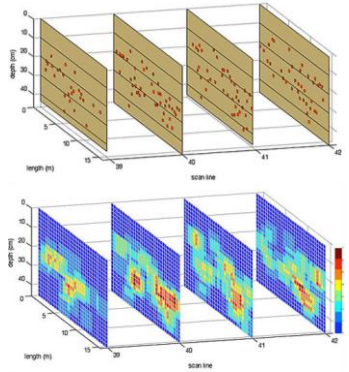
Where to use

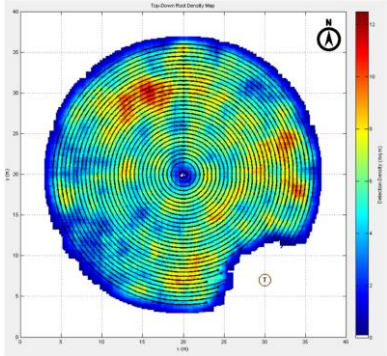
- The the system is great for identifying rooting patterns associated with trees, when testing is repeated in increase radius circle from the tree. these test can be used to show an entire circular area or limited to a particular quadrant of interest.
- Rooting areas that are disconnected from the tree, this can be particularly useful in tree that have been suspected of excavation damage or in tree which are suspected of being affected by subterranean decay or pathogens.
- This system is help full in identifying which tree or which roots are associated with damage to structures, such as being able to demonstrate the source of rooting associated with deflection damage of paving or hard surfacing
- The system is also particularly useful in identifying areas of soil free of rooting, which is particularly important during excavation close to trees such as the installation of Fencing, Pilling or Trenching during the installation of utilities.
-

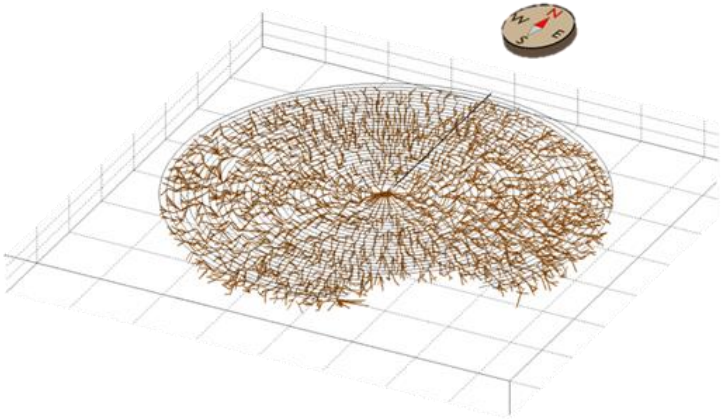
Root RADAR

Not Harmful	Sales	Service	Canopy	Stem	Roots	Stability









Root Mapping

- Ground Penetrating Radar also known as GPR has historically been known to be used successfully within the field of archaeology and the construction industry for the last 30 years to locate and plot subterranean structures and utilities.
- Tree Radar Unit is a non-invasive method to enable the location of structural roots. The Tree Radar uses RADAR (RAdio Detecting And Ranging) offers a non-invasive method for roots inspection.
- We can use a 900Mhz and a 400MHz antenna which sends an electromagnetic wave (similar to Wi-Fi) every 1cm down to a depth prescribed by the operator. An inbuilt receiver picks up and records any reflected signals and records them within the onboard computer.
- The results show the location and depth of live tree roots >10mm along scan lines either around a tree or across a site on the sallow stetting. Deeper scans, assess tree rooting to a depth down to 3m to 4m and can identify tree roots down to 20mm diameter.
- The information can be presented in a series of 'top down' and 'virtual trench' views to help map the location of roots; additionally, the results can then be imported into a Computer Aided Design (CAD) if required to help inform site design.

Where to use

- The system detects the reflection off live roots which contain moisture, though ignores dead or dry roots. Data can be processed and viewed on site and displayed within the software package or exported as an image.
- The outputted images are typically, either a:
- 2D Planar Image of each line scanned showing Root Location and Depth – "A Virtual Trench" (middle left)
- 2D Top Down Image showing Root Density "Root Density Plan" (middle right)
- 3D Root Morphology Plan which can be exported in CAD. (bottom image)
- GPR is non-invasive and uses a lightweight grass friendly rubber wheeled transportation system to carry out investigations.
- GPR does not harm the tree or its roots so repeated scans over a long period can be safely deployed to monitor root development.
- GPR can penetrate hard surfaces such as tarmac, concrete, brick and can be used inside buildings.

Root Inspection / Improvement

Not Harmful	Sales	Service	Canopy	Stem	Roots	Stability

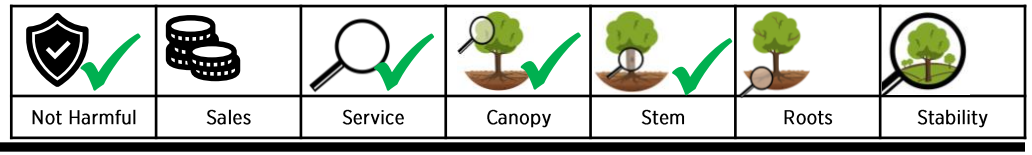
Root Inspection

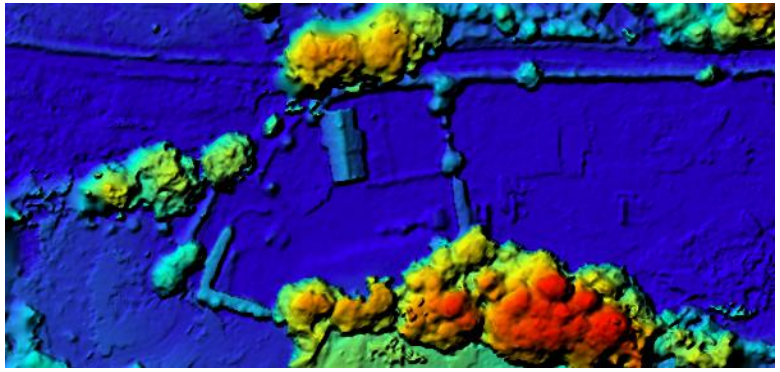
- This non-injurious assessment tool can be used to expose and inspect the principal tree roots within the soil.
- This method allow close physical inspection of the root without long lasting harm with all but the finest roots remaining viable.
- This process uses high pressure air to de-compact via a tool called and Arb-Ex, which moves soil from around roots. This process can be greatly improved when used in combination with a soil vacuum and is perfect for the confirmation of or to show presence or location of roots.
- This process is quite loud and can be messy however tidying up after comes as part of the service.
- Whether excavation or decompaction is required within the rootzone of a tree the condition and wellbeing of the roots must take top priority.
- Soil compaction is one of the main contributing factors that leads to low vitality levels and the onset of decline in trees.

Where to use

- The the system is great for identifying the precise location and pattern associated with trees.
- And its ideal for locating and mapping tree roots, assessing the conditions and density of rooting prior to site changes such as construction.
- It is also very useful for creating low impact service runs where the soil; below roots can be removed and service ducts fed in at a lower level below rooting pattern.
- This method can also be used for assessing the underside of tree roots which although present and viable may be compromised by decay fungi for example.
- Although, this system is used primarily for root inspection, it can be used to improve and rejuvenate tree rooting zones of trees that are in decline through issues such soil compaction through livestock or pedestrians.
- This system is particularly useful to help rejuvenate soil which have undergone sudden changes such as soil level changes or have undergone recent site changes during site changes such as temporary storage of materials or tracking across exposed soils.

Drone (UAS) Inspection





Drone inspections

- Drones are professionally known as Unmanned Aerial Systems (UAS), and have been used to great success in many industries including the construction industry.
- We have Civil Aviation (CAA) Operational Authorization (OA) to fly commercially. This authorization has required our staff members to undergo intense training and pass both theory and practical flying tests, a little like a driving test.
- We have a range of drones which we have affectionately named including *'Midgey'* which is a sub 250g small drone, perfect for getting between the canopy, *'Aphid'* which is a slightly larger drone for everyday use, and the infamous *'Donald'* which is a much larger 6 rotor drone used for 3D mapping and thermal imagery.
- All the drones have 4K cameras and Geo locate to produce high quality images/3D models as well as being able to fit our Multi spectral cameras for vitality monitoring.
- The drones can become a very cost-effective solution for clients while we are out on site as we may not need to put our harness on to inspect a canopy feature if the drone access the inspection area.

Where to use

- The drones cannot be deployed in restricted airspace, this is a check we complete prior to coming to site.
- The drones can provide a simple yet effective service of taking 4K aerial images/videos of sites to gain a 'birds eye view' of the relationship between trees and the site. These images can 'speak a thousand words' in some cases.
- Up to date 2D site photos can be produced for us to use as a base for tree surveys if Google imagery is poor or outdated.
- 3D site modelling can be produced to give the client an interactive model of the site and trees. These can be converted to .dxf/.dwg formats for CAD.
- Thermal imagery from the air can identify areas of the tree which are likely to be hosting fungal activity as a well as identifying cultural issues around the tree.
- Multi Spectral cameras can detect vitality levels emitted from tree canopies, perfect for group and woodland surveys.

Other Testing

Specific Testing

- Sometimes a simple test can provide a real insight into the health and vitality of the tree and help us identify wider issues such as underlying health problems, issues with the soil or wider site problems and help inform management decisions.
- The use of a broad spectrum leaf test gives the nutrient levels for all twelve plant nutrients and ensures deficiency can be spotted, compared to benchmark levels and gives recommendations to correct the deficiency. The nutrients included in this analysis normally are: N, P, K, Ca, Mg, S, B, Cu, Fe, Mn, Mo, Zn.
- Understanding soils can be critical to proposed construction or the stability or your home. Alternatively you may have cracking in a building and need to understand the particular characteristics of the soil which it is built and is this or another factor responsible for the damage.
- Certain insects and fungi can be pests and can offer a serious risk to the tree, and its well-being and some even pose a direct risk to the health of the tree and in turn us. So early identification and management problems is the best way to help keep your trees safe and healthy.
- Trying to find out exactly what fungi is affecting your favourite tree or shrub can be problem and is it important to its ongoing health to understand what it is in a timely manner.
- Other times you may find a root in a drain or close to building and you need to know what it is and where did it come from before you can get on with repairs.
- Please feel free to contact us if you see anything your not sure about of or have any questions or concerns about the health of your trees their health and issues they may be suffering from.
- We can help with:

Root Identification

Foliage Assessment

Soil Testing

Pest and Disease Identification

DNA Identification