

Why soil analysis should be in your plan this autumn

Wednesday, 14 September 2016 10:29

innovationforagriculture.org.uk/index.php/innovation/commercial-innovations/services/item/5261-why-soil-analysis-should-be-in-y

Tue 6 Sep 2016

By: Philip Cosgrave

It has been a difficult year on many farms but now is the time to review last season and start planning for next season.



The first thing we need to look at is soil fertility and structure and now is the time to take a soil sample before the main cereal planting gets underway. Soil analysis gives you a basis for planning the fertilizer programme for the season ahead but also for the correction of low pH soils through the application of agricultural lime.

Your soil analysis results often give strong clues to the previous year's crop performance and of surprise on how indices may have dropped. This may well be the case this year following a very good 2015 harvest where last season's fertilizer applications were not sufficient to replace those nutrients removed in 2015. A yearly soil analysis is not a luxury but a necessity for planning the year ahead, it may not reduce your fertilizer costs but it enables you to target application to areas of higher yield potential.

Has poor soil structure and/or biology affected the previous year's yield? Investigating the physical aspects requires time but is rewarding as we can see with our own eyes at what depth compaction and compression is present at but also the frequency at which earthworms and other soil fauna can be found. If soil conditions are dry then now is the time to tackle compaction mechanically however improving biological activity might start with the addition of organic matter.

Soil and Leaf Analysis Services

With nearly 40 years' experience in research and commercial analytical services, Yara Analytical Services continues to focus on improving value and service for the customer.

Why Use Soil and Leaf Analysis?

Acquiring and utilizing accurate information in the form of analytical data is fundamental to many decisions made in the agricultural, horticultural, environmental and amenity sectors.

For plant and crop production, it enables planning a fertilizer program that is accurate, timely and -- increasingly important -- environmentally responsible. Furthermore, promptly identifying potential problems in materials or areas shows the correct course of action to be taken to prevent the need for expensive remedial action later.



In short, soil and leaf testing provides the critical information required to ensure all crop nutrition decisions are accurate, efficient, cost-effective and responsible.

Experience

Our laboratory has nearly 40 years of experience producing independent analytical data from many different materials. We specialize in servicing the agricultural, horticultural, environmental and amenity sectors. Regularly, we receive a wide range of sample types including soil, plant tissue, water, fruit, manures, slurries and fertilizers.

We currently perform over two million separate analyses every year on samples received from the UK and over 50 countries worldwide. Our customer base ranges from individual growers to independent agronomic consultants to multi-national companies, including research stations, academic bodies and government organizations.

Increasingly, our flexibility and capacity allows us to carry out contracted analysis for other laboratories, either on a short-term basis or as a cost-effective alternative to equipping or extending their own facilities.

This background gives us a unique competence in providing a complete range of accurate analytical data as well as the information required to interpret and utilize this data effectively for any given situation.

Service

Our key goal is to provide a rapid, accurate, cost-effective and understandable analytical testing service. At all stages, a knowledgeable back-up team fully supports this. They're capable of delivering technical guidance and advice in a professional and courteous manner.

Turnaround

We understand the importance of timely advice. Therefore, we're equipped and staffed to process samples quickly and efficiently. Most soil- and leaf-testing requests are completed within three working days from sample receipt to the emailed return of results.

Sample delivery is made as straightforward as possible, with postage-paid sample bags and a courier collection service available within the UK. We also have been granted the necessary authority to receive all types of samples from outside the UK.

Quality

Quality assurance is central to all we do at Yara Analytical Services. A robust internal quality system is in place to ensure that all data produced is consistently reliable and accurate. In addition, the laboratory holds both BS-EN-ISO 9001:2008 and ISO/IEC 17025:2005 levels of accreditation and, as a condition for maintaining these accreditations, we regularly participate in internationally recognized proficiency-testing schemes.

View or download a list of accredited analytical methods as a PDF from the UKAS website.

Furthermore, our commitment to the very best and latest analytical instrumentation, operated by our team of experienced and qualified staff, guarantees we can satisfy almost any analytical request.

Understandable

Analytical data on its own is meaningless if the information it holds is not understandable. Our experienced advisory team is fully aware of this and makes every effort to present the data in a straightforward manner. Full integration with the Megalab software, which utilizes established nutrient guidelines, is key to this. The software also uses cropping information to convert analytical data into comprehensive and easily understandable reports. This enables product recommendations to be made with complete confidence.

Accessible

Reports are released by email as soon as they become available from the laboratory. All results can be supplied in a variety of formats to ensure compatibility with other agronomic software packages. Paper copies can also be supplied by post upon request. In addition, direct access to all previous reports and further interpretation details is available at any time via the Internet.

However, we always remember the value of personal contact. Our advisory team is only a phone call away. We welcome direct contact to discuss all aspects of the services we provide.

What are the analyses we can offer?

Soil & Compost

A comprehensive list of parameters including nutrients, pH, electrical conductivity and particle size. Producing an invaluable guide to lime, fertilizer and nutrient inputs. Land assessment and categorization are also included in this section.

Grass and Fodder

Full mineral, trace element and feed value assessment in relation to the health and productivity of livestock.

Leaf and Petiole Analysis

To be used as a monitoring or diagnostic aid for an accurate assessment of the nutritional status of any crop at the time of sampling.

Water and Nutrient Solution

A special service for hydroponic growers, irrigated crops and water quality assessment. Covers minerals, pH, electrical conductivity and other related parameters.

Environment

Analysis of heavy metals and organic contaminants for assessing potentially contaminated areas. Also mechanical and nutrient assessment of topsoil to be used in landscaped sites to BS3882.

Other Services

Fruitlet and Fruit analysis for apple storage. Potato Cyst Nematode and Speciation. Pesticide Residues. Bacterial assessments. Fertilizer analysis. Nutrient analysis of manures and other organic waste products.

Mapping and GPS Sampling

This service is rapidly increasing and, as well as the basic analysis, many customers now request that an amalgamation of samples be made up for each field or part thereof for comprehensive nutrient.

Additional individual analyses and specialist services are available

The 'Just-in-Time' Concept

Soil and tissue analysis can help to identify timely the nutritional status of a crop in different stages of growth. When it comes to application of products, the 'Just-in-Time' concept expresses Yara's belief that applying the right amount

of the correct product, at the time needed by the developing crop, brings the best results for growers and profits to our customers. Whenever the 'Just-in-Time' approach is applied, sustainability and profitability will be always linked together.

"Just-in-time" application of fertilizers means:

Providing the required nutrients

- at the time of crop demand
- in an adequate ratio
- in a highly plant available form
- Employing the best available delivery system
- solid or foliar application, fertigation
- Using tools to determine the current nutrient requirement, by considering
- nutrient supply by the soil
- crop development stage

Advantages

- to allow a better fine tuning in terms of crop requirement
- to achieve a high nutrient efficiency
- to make the most of the crop's potential in terms of yield and quality

How to take samples for analysis

The importance of careful sampling

The reliability of the results and recommendations of analysis depends, ultimately, on the accuracy of the very first step: sampling. Sampling can be considered in terms of three simple stages:-

- Taking a representative sample of soil or leaves.
- Supplying all necessary field and background information (particularly for problem areas).
- Correct packing and immediate dispatch to the laboratory.
- Do's and Don'ts
- DO NOT sample immediately after lime or fertiliser application. The best time for soil analysis is after harvesting of the previous crop.
- DO NOT allow soil contamination of leaves and shoots when sampling.
- DO NOT despatch fresh plant material so that it will be in transit during a weekend or public holiday.
- DO clean tools and equipment before sampling a new area.
- DO provide the maximum amount of background information on problem fields. Keep samples in a cool dark place, and send to the lab immediately.
- Above all, DO make sure samples are clearly labelled.
- Sample packaging available from the laboratory
- 1st class postage paid jiffy bags (2 sizes) - Medium A5 size - for single soil or tissue samples, large A4 size - for 2-3 soil samples or bulky tissue samples e.g. Hay, Silage

- Polythene sample bags - Soil samples are placed directly in this bag and they are designed to hold the correct amount required by the laboratory (approx 500g). For tissue samples use this bag for the order form to keep it clean and dry.
- Order forms - These enable all the customer and sample details to be sent with the sample and provide a unique number for each sample. This number is essential to quote during subsequent enquiries. Each order form has 3 copies please ensure the top white is sent with the sample.
- Soil Sampling Augers - Stainless steel construction available.

Please note

For multiple samples of any type i.e. more than 10, contact the laboratory to arrange courier collection. Potato Cyst Nematode Samples due to their bulk cannot be posted in the pre-paid jiffy bags. Self-delivery or special arrangements are required. Please contact the laboratory for details.

Sampling soil for analysis

Soil analysis is an essential tool for the prediction of available nutrient levels for optimum plant growth and crop production.

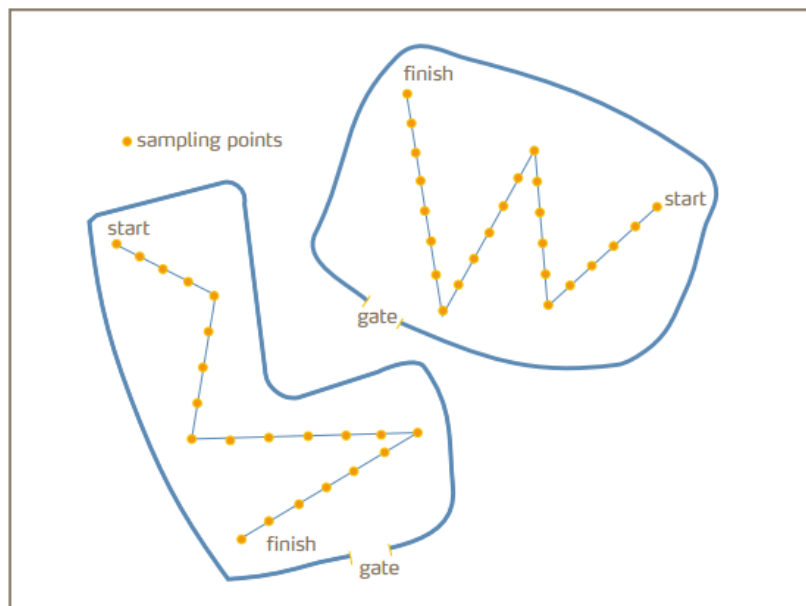
The available levels of the following nutrients can be accurately analysed Phosphorus, Potassium, Magnesium, pH, Calcium, Sulphur, Sodium, Iron, Manganese, Copper, Zinc, Boron, Molybdenum (Cobalt, Iodine for Grassland) and it is recommended that a testing regime of this type is carried out once every 4 years.

As a general rule, fields up to 10 Ha (25 Acres) in area can be sampled as one unit, providing each field is uniform e.g. with regard to soil type, past cropping, lime and fertiliser usage. Fields created by hedge removal are unlikely to be uniform.

Large fields, and fields which are not uniform, should be subdivided and each part sampled separately. Use a clean auger, hand trowel or spade (preferably chromium plated or of stainless steel). Carry a plastic bucket.

Sampling paths

Individual samples, whether of soil, leaves or fruit, should be taken along a carefully well planned route across the field. The 'W-pattern' sampling path is adaptable to most shapes of field (see diagrams).



Start away from the gate, and avoid all areas which are not representative of the field as a whole such as head-lands, hedges, ditches, footpaths, fences, telegraph poles, sites of bonfires, fertiliser, lime or manure dumps.

We recommend at least 20 samples, taken at regular intervals along the sampling path. Do not skimp on this number. Twenty samples are required even from small fields or areas.

At each of the 20 sampling sites, remove the top 5 cm (2") of soil and discard. Take a sample to a depth of 15 cm (6") for arable or 7.5 cm (3") for grass, and place in a bucket. Thoroughly mix all samples, avoiding spillage. Fill the polythene bag with soil from the bucket, and seal securely. Label. As a guide, enclose about 0.5 kg (3/4lb) of soil. Remember that bulking of samples will not allow identification of problems associated with patches, e.g. acid patches. Sample these areas separately, if necessary.

Sampling Tissue from Arable Crops and Grassland

Leaf samples from arable crops

Leaf analysis should not be used for prediction of seasonal nutrient requirements, as nutrient levels within leaves vary according to season, growth stage, and prevailing growing conditions.

Leaf analysis on arable crops is only of use in diagnosing nutrient levels at a particular moment in time. Soil analysis is the most reliable method for predicting nutrient availability throughout the season.

Select a sampling path as described previously. At each sampling site take several leaves at the same stage of development* preferably the first fully-expanded leaves working away from the growing point. Take leaves only, not stems or roots. Avoid bruising or tearing the leaves, and do not include leaves showing pest, disease or other damage. Avoid dusty or soil contaminated plants. Mix the leaves thoroughly, and take sufficient to fill the jiffy bag.

If the leaves are wet, blot them dry with clean absorbent material. The order form can then be placed in a plastic bag to keep it dry. Please don't forget to enclose it with the sample.

Sample problem areas separately and try to take plants which are starting to exhibit symptoms rather than those that are very badly stunted or nearly dead.

Grassland herbage

Select a sampling path as described previously. At each sampling site, use scissors or shears to cut the herbage 2.5-5 cm (1-2") above the ground. Only sample grass of the same height, and be careful to avoid contamination of the herbage with weeds, soil or animal droppings. Mix the herbage thoroughly, and take sufficient to fill a jiffy bag. If the herbage is wet, blot it dry with clean absorbent material. Label.

Hay, other fodder in bulk, silage

Hay can vary considerably within the bulk, therefore the following procedure is recommended.

Avoiding outer bales, select 4-6 bales at random from the stack, open and take a sample from the centre of each. Mix thoroughly, and take sufficient to fill a jiffy bag. Label.

Silage clamps are best sampled with a suitably designed corer, along a diagonal sampling path from front to back. If no corer is available, remove the top layer, and dig as deep as possible at each sampling point. Mix thoroughly, and take sufficient to fill a polythene bag. Seal securely. Label.

Sampling leaf and fruit from orchards

Leaf samples

Select 20 trees or bushes of the same variety along the sampling path. Exclude pollinators and diseased or otherwise abnormal trees. Take one leaf per shoot from shoots on the north, south, east and west sides to give a total of 4 leaves per tree or bush. Young, fully expanded leaves should be chosen, from the current year's extension growth. Mix the leaves thoroughly, and take sufficient to fill a jiffy bag. If the leaves are wet, blot them dry with clean, absorbent material. Label.

Fruitlet and fruit analysis

These services are for apples, in relation to storage potential and the need for calcium and phosphorus orchard sprays. Special arrangements exist for collection. Please telephone early in the season to book in and obtain details.

Fruitlet samples

Sampling time is important. Send fruitlets as early as possible, but not so early as to be too small. Fruitlets should ideally be between 30-50g in weight, though this will vary with variety. Select 20 trees along the sampling path, as for leaf analysis. Take one fruitlet from each of the north, south, east and west sides, to give 4 fruitlets per tree. Mix the fruitlets thoroughly, and take a sub-sample of 30-50 at random. Label.

Fruit samples

Samples should be taken within a fortnight before harvest. Parts of orchards which are known to produce fruit of different storage quality should be sampled separately. Select 20 trees along the sampling path. Take one undamaged average-sized apple from each tree. If the first apple is taken from the north side, take one from the next tree on the east, then from the south and so on. Send all 20 apples. Label.

Sampling for potato cyst nematode (PCN)

Because nematodes are seldom evenly distributed across a field the sampling procedure for PCN needs to be more thorough. At least 50 cores must be taken evenly from an area of no more than 7.5 acres (4 hectares). All the cores & approximately 1-2kg of soil are then sent to the laboratory.

Sampling potato petioles for analysis

Choose the youngest fully expanded leaf (usually 4th) at a stage no earlier than 10% flowering. For each complete leaf, separate the leaflets from the petiole, and discard the leaflets as soon as possible after sampling. Keep samples in a cool dark place, and send to the lab immediately.

Draw from at least 20 different locations in the field. At each location take one leaf branch from each of 3-4 plants (minimum of 60-80 branches in total). Do not sample fields within 3-5 days after being sprayed with pesticides or foliar nutrients.

Optimum plant part and timing for leaf analysis

Important: As a general rule please ensure approximately 200 grams (about 2 hand fulls) of fresh plant material is sent to the laboratory.

Important: If the plant you are sampling is not shown below, sample the youngest fully expanded leaves available.

Cereals - All the above ground portion clipped at 5-8 cm height.

Maize - Fully developed leaves from 40 cm high.

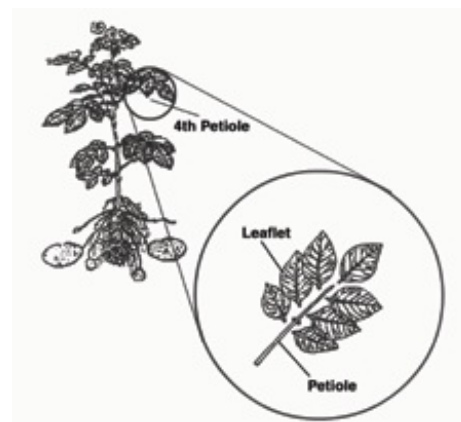
Sugar Beet - Fully developed and matured leaves during June/July or 50 days after germination.

Potato - Most recent fully developed leaves from 1 week after 100% emergence.

Oilseed Rape - Most recent fully developed leaves from 20 cm high to early bloom.

Legumes - Uppermost fully developed leaves prior to blossom formation. (peas, beans)

Grass - All the above ground portion clipped at 5 cm height. For turf grasses this is lower or take a sample from any recent mowing.



Fruit Trees - Middle leaves from current year's growth June - August.

Soft Fruit - Youngest fully developed mature leaves. Early to mid-season.

Trees/Shrubs - Fully developed leaves from current year's growth.