



Chemical & Microbiological Analyses

in Agriculture

QUALITY ASSURANCE & ACCREDITATION

HUMOLABS: Science in the Service of Quality

Who We Are

HUMOLABS laboratories constitute a model analytical laboratory focused on innovation and reliability. We provide comprehensive laboratory solutions covering a wide range of needs, from quality control to specialized research.

Our Philosophy

At **HUMOLABS**, we believe that accuracy is not just a goal, but the cornerstone of our work. We combine the high scientific expertise of our staff with cutting-edge technology to offer results that safeguard the quality of our partners' products and services.

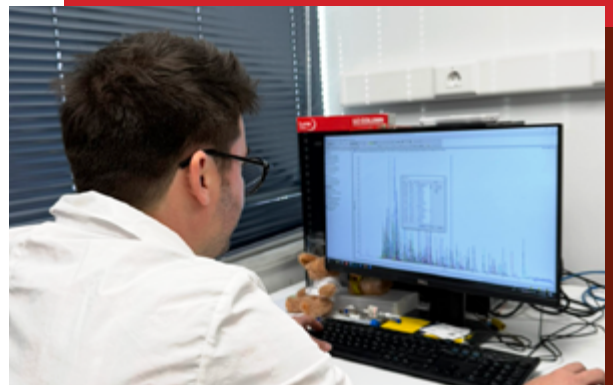
Why Choose Us?

- **Technical Competence:** We hold accreditation according to the international ISO/IEC 17025 standard by ESYD, guaranteeing the validity of every measurement.
- **Personalized Approach:** We don't just offer analyses, but consulting support tailored to the specific requirements of each industry.
- **Speed & Reliability:** We understand market needs and are committed to the timely and valid delivery of results.

Our Vision

To be the strategic partner of every business and organization that sets quality and safety as a top priority, actively contributing to the growth and extroversion of Greek products.

HUMOLABS laboratories operate in accordance with the international ISO/IEC 17025 standard and are accredited by the Hellenic Accreditation System (ESYD). This accreditation is the official recognition of our technical competence and the impartiality of our results.



HUMOLABS: SCIENTIFIC SUPPORT & INNOVATION

HUMOLABS laboratories were established in 2022 with the aim of providing chemical, microbiological, and molecular analyses essential for the control, certification, and improvement of products and materials across a wide range of human activities, such as:

- Agriculture
- Animal Husbandry
- Aquaculture
- Food Industry
- Chemical Industry
- Water Technologies (irrigation, hydroponics, swimming pools, etc.)
- Environmental Technologies (biological treatment, wastewater management, etc.)

The operation of **HUMOLABS** laboratories is based on the following values::

- ✓ **RELIABILITY**
- ✓ **PRESTIGE**
- ✓ **QUALITY**
- ✓ **UTILITY**
- ✓ **TRUST**
- ✓ **CUSTOMER SATISFACTION**

Our goal is to be your steady partner, offering reliable results and consulting services that help you:

- Improve your product
- Highlight your products' advantages over competitors
- Obtain the certifications you need
- Enter new markets
- Reduce your costs
- Demonstrate compliance with laws and regulations
- Confirm the superiority of your products
- Increase the efficiency of your production means
- Contribute to environmental sustainability



Agriculture

A large part of **HUMOLABs** laboratories is dedicated to providing comprehensive services concerning the agricultural sector. These include chemical, microbiological, and molecular analyses of

- ▶▶ Soil
- ▶▶ Plant tissues (leaves, stems, roots, seeds)
- ▶▶ Irrigation water
- ▶▶ Hydroponic aqueous solutions
- ▶▶ Fertilizers
- ▶▶ Plant protection product residues

These services are not limited to measuring physicochemical quantities but also include additional evaluation of results and advisory guidance, aimed at agricultural producers or anyone interested in:

- ✓ Reducing production costs
- ✓ Increasing the productivity of their farms
- ✓ Producing certified and safe products
- ✓ Improving and highlighting the quality characteristics of their products
- ✓ Reducing the environmental footprint of their activities



SOIL ANALYSIS

Soil analysis is a valuable tool for producers and agronomists because it provides the opportunity to optimize agricultural practices, so as to reduce production costs and increase farmers' income.

BENEFITS OF SOIL ANALYSIS

Rational management of nutrients

- ✓ Accurate assessment of nutrient levels in the soil
- ✓ Targeted application of fertilizers
- ✓ Optimal utilization of existing nutrients from the soil by crops
- ✓ Reduction of nutrient losses

Improvement of soil conditions

- ✓ Increase in fertility
- ✓ Reduction of irrigation and fertilization costs
- ✓ Improvement of crop yield

Targeted choice of crops:

- ✓ Maximum utilization of soil potential
- ✓ Resource saving
- ✓ Easy adjustment to the soil

Reduced environmental footprint

- ✓ Reduction of wasteful use of fertilizers
- ✓ Limitation of nutrient runoff into the environment

Sustainable management:

- ✓ Maintenance of soil fertility
- ✓ Preservation of agricultural land
- ✓ Precision agriculture

Experience **HUMOLABs**

Depending on the use of soil analysis, different analyses and measurements are required. **HUMOLABs** laboratories have created comprehensive service packages to make it easier for those interested to choose the package that best suits their needs.

1. Basic Soil Analysis

(mechanical composition, pH, electrical conductivity, total calcium carbonate, organic matter).

Addressed to: Producers planning to cultivate uncultivated land and wishing to select the appropriate crop, as well as those wishing to identify potential soil limitations in the case of an established crop.

** In cases where the pH is higher than 8.5, it is essential to measure the ESP and SAR indices.*

*** In the case of clay soils, or for the selection of grapevine rootstocks, the measurement of active calcium carbonate (active lime) is also significant.*

2. Soil Analysis for Basic N-P-K, Ca & Mg Fertilization Selection

(mechanical composition, pH, electrical conductivity, total calcium carbonate, organic matter, available nitrogen, available phosphorus, available potassium, available calcium, available magnesium).

Addressed to: Producers and agronomists who need to select the basic N-P-K, Ca & Mg fertilization for the crop they manage.

3. Complete Soil Analysis

(mechanical composition, pH, electrical conductivity, ESP, SAR, total calcium carbonate, active calcium carbonate, organic matter, cation exchange capacity, exchangeable calcium, exchangeable magnesium, exchangeable potassium, available phosphorus, available potassium, available calcium, available magnesium, iron, zinc, manganese, boron, copper).

This analysis is **addressed** to professionals (producers or agronomists) who wish to have a complete picture of the conditions prevailing in the soil, with the aim of improving them and formulating a complete fertilization program for the crop..

4. Analysis of Saline, Sodic, and Calcareous Soils.

(pH, electrical conductivity, total calcium carbonate, ESP, SAR).

This package is very useful for assessing potential problems in the crop due to serious soil limitations, such as high salinity, poor structure, contamination, etc., with the aim of improving it.

****Ανάλυση εδάφους για έλεγχο βαρέων μετάλλων (ολικών & ελεύθερων).*

5. Specialized Soil Analysis according to the Crop

These analyses offer the possibility of targeted fertilization consulting based on the specific needs of each crop.

Olive: (mechanical composition, pH, electrical conductivity, total calcium carbonate, organic matter, available nitrogen, available phosphorus, available potassium, available calcium, available magnesium, boron).

Vineyard: (mechanical composition, pH, electrical conductivity, ESP, SAR, total calcium carbonate, active calcium carbonate, organic matter, total nitrogen, nitrate nitrogen, available phosphorus, available potassium, available calcium, available magnesium, iron, zinc, boron).

Note: Capability to create specialized soil analysis for any type of crop.

6. Macronutrient NPK Analysis

(available nitrogen, available phosphorus, available potassium).

Determination of immediately available nutrients for the crop.

7. Micronutrient Analysis

(iron, zinc, magnesium, boron, copper, molybdenum).

Determination of micronutrient availability for the crop, identification of deficiencies.

8. Microbiological Control

(detection and identification of beneficial microorganisms and pathogenic fungi)

All the above packages can be accompanied by **CONSULTING SERVICES** so that the user has at their disposal a complete guide of good agricultural practice and rational fertilization for their farm.

PLANT TISSUE ANALYSIS

Plant tissue analysis includes all chemical, microbiological, and molecular analyses that can be performed on the following parts of a plant:

- ▶▶ Leaves
- ▶▶ Stem
- ▶▶ Root
- ▶▶ Genetic material (seeds)

More specifically, leaf and stem analysis examines physicochemical properties and measures the values of all chemical nutrients that determine a plant's physical condition. Additionally, microbiological analysis of leaves and roots can identify plant health problems caused by pathogenic fungi, bacteria, and viruses. The plant tissue analysis section concludes with microbiological and molecular seed analysis to detect infestation by pathogenic microorganisms. HUMOLABs laboratories offer all the above services to provide scientific documentation for all plant nutrition and protection issues.

BENEFITS OF PLANT TISSUE ANALYSIS

Evaluation of crop nutritional status:

- ✓ Accurate measurement of nutrient content in plants
- ✓ Evaluation of fertilization effectiveness
- ✓ Adjustment of nutrition programs
- ✓ Maximization of production

Correction of nutritional imbalances:

- ✓ Identification of nutrient deficiencies or excesses not visible in the field
- ✓ Accurate correction of plant fertilization
- ✓ Prevention of negative impacts on crop yield
- ✓ Improvement of harvest quality

Specialized fertilization programs – precision agriculture:

- ✓ Targeted interventions according to actual crop needs
- ✓ Minimization of fertilizer losses
- ✓ Cost savings – reduction of inputs
- ✓ Increased crop yield
- ✓ Maximization of profitability

Early diagnosis of diseases

- ✓ Targeted use of plant protection products
- ✓ Reduction of production losses
- ✓ Reduction of production costs
- ✓ Increase in yields
- ✓ Reduction of business risk

SERVICE PACKAGES

HUMOLABs laboratories provide specific plant tissue analysis service packages covering most of the needs of modern agriculture. **HUMOLABs'** list of services is constantly enriched with new analyses and measurements, primarily in the field of molecular identification of pathogenic microorganisms, opening new horizons in early diagnosis and prevention of plant diseases.

1. Plant Tissue Analysis (leaf diagnostics)

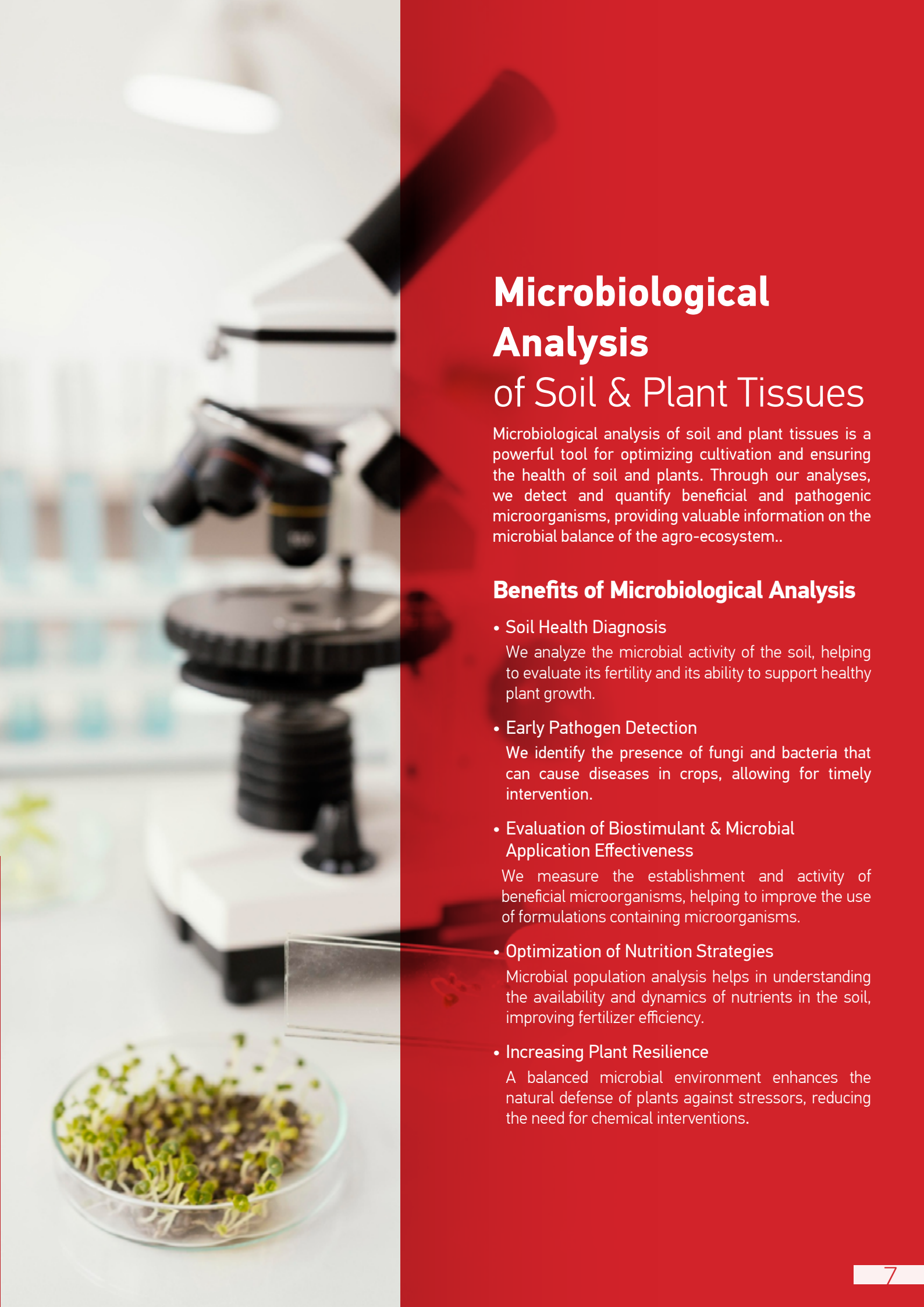
(Total Nitrogen, Phosphorus, Potassium, Calcium, Magnesium, Sodium, Chlorine, Boron, Iron, Zinc, Manganese, Copper, Molybdenum)

Alt is aimed at producers who wish to check the nutritional status of their crop, estimate the actual uptake of nutrients, evaluate fertilization programs and adjust them.

2. Ανάλυση Φυτικού Ιστού για Μεμονωμένα στοιχεία (Measurement of individual elements **according to the needs of the crop**)

3. Microbiological control

(Detection and identification of pathogens)



Microbiological Analysis of Soil & Plant Tissues

Microbiological analysis of soil and plant tissues is a powerful tool for optimizing cultivation and ensuring the health of soil and plants. Through our analyses, we detect and quantify beneficial and pathogenic microorganisms, providing valuable information on the microbial balance of the agro-ecosystem..

Benefits of Microbiological Analysis

- **Soil Health Diagnosis**
We analyze the microbial activity of the soil, helping to evaluate its fertility and its ability to support healthy plant growth.
- **Early Pathogen Detection**
We identify the presence of fungi and bacteria that can cause diseases in crops, allowing for timely intervention.
- **Evaluation of Biostimulant & Microbial Application Effectiveness**
We measure the establishment and activity of beneficial microorganisms, helping to improve the use of formulations containing microorganisms.
- **Optimization of Nutrition Strategies**
Microbial population analysis helps in understanding the availability and dynamics of nutrients in the soil, improving fertilizer efficiency.
- **Increasing Plant Resilience**
A balanced microbial environment enhances the natural defense of plants against stressors, reducing the need for chemical interventions.

IRRIGATION WATER ANALYSIS

Irrigation water analysis is very important as it provides useful information to the crop manager, helping them draw conclusions regarding

- ✓ The suitability of the water for crop irrigation.
- ✓ The determination of nutrients the crop receives through irrigation water.
- ✓ Contamination of irrigation water with heavy metals.

BENEFITS OF IRRIGATION WATER ANALYSIS

Certification of borehole water for use in crop irrigation

- ✓ Water use permit for irrigation

Identification of potential future problems in the crop

- ✓ Identification of physicochemical parameters affecting crop growth and soil fertility.
- ✓ Corrective actions to improve the problem.
- ✓ Prevention of negative impacts on crop yield.
- ✓ Yield improvement.

Prevention of damage to the irrigation system

- ✓ Targeted interventions to reduce the likelihood of problems and future destruction of the irrigation network.
- ✓ Cost savings – reduction of inputs.

Correct fertilization tailored to the real needs of the crop

- ✓ Correction of fertilization methods and application of appropriate fertilizer types.
- ✓ Reduction of production losses.
- ✓ Reduction of production costs.

Reduction of agricultural holding degradation

- ✓ Early detection of future problems due to water unsuitability.
- ✓ Reduction of the probability of losing harvest certification.
- ✓ Ensuring sustainability conditions.

SERVICE PACKAGES

1. Analysis for Irrigation Water Use Permit

pH, Conductivity, Total Hardness, Chlorides, Nitrites, Nitrates, Ammonia

2. Basic Analysis / Irrigation Water Classification

pH, Conductivity, Salinity, Alkalinity, Carbonates, Bicarbonates, Sulfates, Chlorides, Calcium, Magnesium, Sodium, Boron

3. Irrigation-Borehole Water Analysis / Quality Assessment

pH, Conductivity, TDS, Alkalinity, Total Hardness, Carbonates, Bicarbonates, Sulfates, Chlorine, Nitrates, Nitrites, Calcium, Magnesium, Sodium, Potassium, Ammonium, Iron, SAR (Sodium Adsorption Ratio), T. (Alkalization Degree), CEC (Cation Exchange Capacity), Langelier Saturation Index, Revelle Ratios.

HYDROPONIC NUTRIENT SOLUTION ANALYSIS

The cultivation of greenhouse vegetable crops on hydroponic substrates is steadily gaining ground. This method of cultivation requires multiple analyses of the solution that provides plants with water and nutrients, in order to maximize yield and reduce the risk of errors that could lead to production degradation



BENEFITS OF HYDROPONIC NUTRIENT SOLUTION ANALYSIS

Hydroponic water quality control

- ✓ Early detection of water-borne problems that degrade the crop
- ✓ Reduction of potential production loss
- ✓ Readjustment of nutrition programs
- ✓ Maximization of production

Composition of hydroponic nutrient solution

- ✓ Correct regulation of nutrients according to the growth stages of the crop
- ✓ Maximization of production capacity
- ✓ Improvement of yield

Readjustment of the nutrient solution composition when needed

- ✓ Timely and targeted intervention whenever required
- ✓ Reduction of production losses
- ✓ High harvest quality

Pathogen detection in the nutrient solution

- ✓ Timely and targeted application of plant protection products
- ✓ Increase in yields
- ✓ Increase in profitability

SERVICE PACKAGES

1. Full Nutrient Solution Analysis

(pH, Electrical Conductivity, Nitrates, Chlorides, Sulfates, Carbonates, Bicarbonates, Phosphorus, Potassium, Sodium, Calcium, Magnesium, Iron, Zinc, Manganese, Boron, Copper, Molybdenum)

2. Basic Nutrient Solution Analysis

(pH, Electrical Conductivity, Nitrates, Phosphorus, Potassium, Calcium, Magnesium)

3. Trace Element Analysis of Nutrient Solution

(pH, Electrical Conductivity, Iron, Zinc, Manganese, Boron, Copper, Molybdenum)

FERTILIZER ANALYSIS

The quality of fertilizers used in agriculture is crucial for crop success and is achieved through compositional control. Laboratory testing ensures that the correct amount of nutrients is available to plants throughout the growing season. Elemental analysis ensures adequate nutrient content, compliance with manufacturer specifications, and the absence of undesirable elements (e.g., heavy metals) that could harm the soil, agricultural production, or consumer health.

BENEFITS OF FERTILIZER ANALYSIS

Quality Control & Specifications

- ✓ Confirmation of macronutrient (N, P, K) and trace element content.
- ✓ Ensuring correct composition according to the product label.
- ✓ Solubility and stability testing of the formulation.

Nutrient Optimization

- ✓ Accurate calculation of fertilizer units applied to the field.
- ✓ Avoidance of excessive fertilization, which leads to unnecessary costs and environmental burden.
- ✓ Prevention of nutrient deficiencies through the use of appropriate and quality fertilizers.

Crop & Soil Protection

- ✓ Detection of heavy metals and toxic elements (Pb, Cd, As, Hg, Cr, Cr⁶⁺, Ni).
- ✓ Salinity and pH control to avoid plant "burns" or soil degradation.
- ✓ Certification of suitability for use in conventional or organic farming.

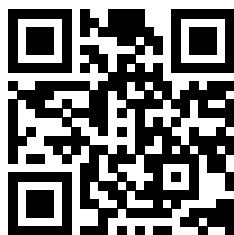
SERVICE PACKAGES

- 1. Analysis of Main Nutrients N-P-K**
(Total Nitrogen, Ammoniacal, Uric, Nitric, Organic, Total Phosphorus, Water-soluble Phosphorus, Total Potassium)
- 2. Secondary Nutrients Analysis**
(Total Calcium, Water-soluble Calcium, Total Magnesium, Water-soluble Magnesium, Total Sodium, Total Chlorine, Total Sulfur.)
- 3. Trace Elements Analysis**
(Total Iron, Zinc, Manganese, Boron, Copper, Molybdenum, Cobalt.)
- 4. Heavy Metals Analysis**
(Total Arsenic, Mercury, Lead, Total Chromium, Hexavalent Chromium, Nickel, Cadmium)
- 5. Physicochemical Properties**
(pH, Electrical Conductivity, Salinity, Specific Gravity, Viscosity, Water Solubility, Moisture, Granulometry)
- 6. Quality Analysis of Organic/Organo-mineral Fertilizers / Compost**
(Organic substance, C/N Index, Proteins, Silicon, Selenium)
- 7. Microbiological Fertilizer Analysis**
(Total microbial load, Number of bacterial colonies, Number of fungal colonies)



A close-up photograph of an olive branch with several green olives. The branch is in sharp focus, while the background is blurred. The olives are small, round, and have a slightly textured surface. The leaves are elongated and have a silvery-green color.

Partnering with you for more
productive and sustainable farm-
land



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