

The background features a stylized illustration of a kiwifruit. The top half is a solid green gradient, while the bottom half is a light blue gradient. A large white circle is centered on the green background, containing the event title. Faint, semi-transparent outlines of a kiwifruit and its cross-section are visible behind the white circle.

**1<sup>st</sup> Symposium of kiwi  
growing**  
**Cavo Olympo, 20/03/2024**

**For a fruit full  
business,  
follow our lead!**



## Today's topics

**The importance of sampling in kiwi analysis**

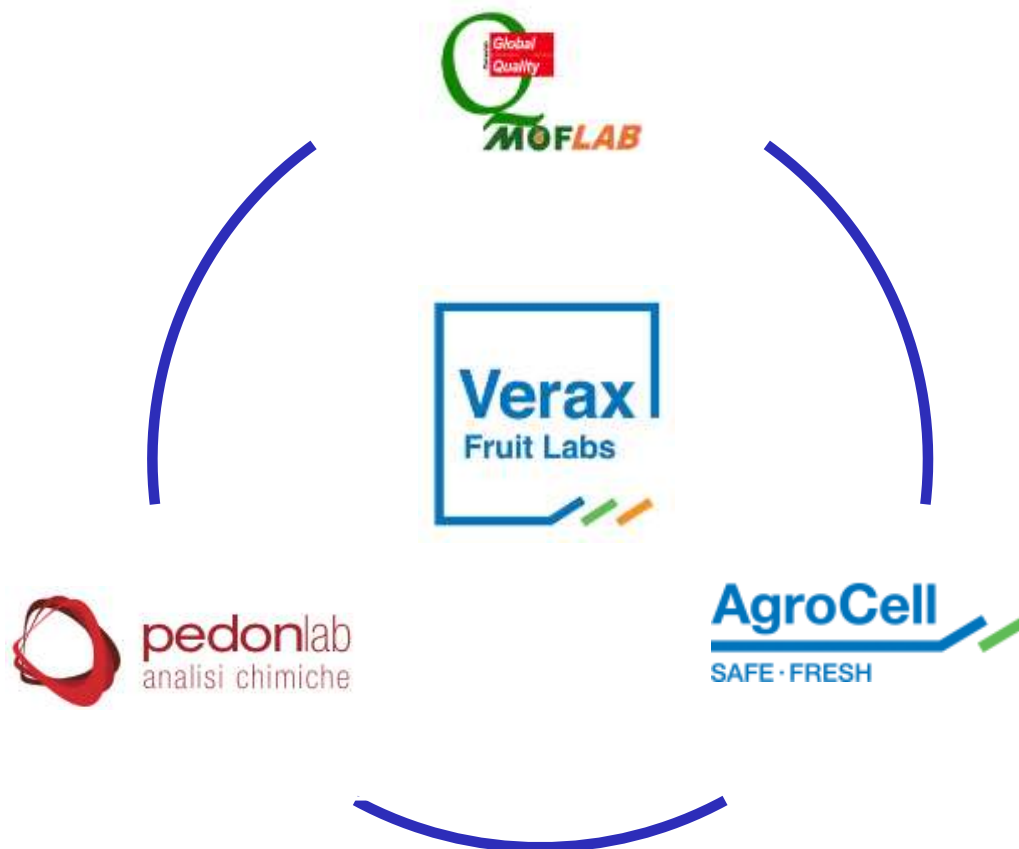
**Seeds count & evaluation of pollination**

**Pollination of kiwi plants and fruit quality**

**Kiwi “Moria” research in Italy and how to prevent the problem**

**Agronomic analysis & correct development of fertilization and irrigation plans**

## Our Network



## Our labs expertise:



Coordinator



Multiresidue analysis



D.M., Colour, Brix, Firmness, Seeds, Pollen



Soil, Leaf, Irrigation water

## Our Offerings



→ **Leaf nutritional analysis**

→ **Residue analysis**

→ **Merceological analysis (D.M., Brix, Colour, Firmness & weight)**

↓ **Evaluation of Irrigation water**

↘ **Phytopathological analysis (fungi, bacteria, nematodes and virus)**

↘ **Water retention curve**

↘ **Chemical-physical analysis of soil**

## Importance of sampling

# Method of Sampling for Merceological Analysis of KiwiFruit (60 Fruits)

For all ripening areas, one sample must be taken for harvest authorisation, except for those with a large area where the collection of two or more samples is recommended. Generally, one sample every 2 ha is suggested.

In the case of large areas and homogeneity of the orchard, the area can be extended to 4 ha. Select fruit from 30 randomised plants.( 90 fruit)

The selection of the plants should be based on a grid model to provide a good representation of the ripening area and the different blocks constituting it.

All blocks within the ripening area must be sampled. The selected fruit should be of class I quality and size standards. Fruit should not be picked from stressed, diseased or abnormal plants or from young plants replaced in the planting.

Sampling should only be carried out by personnel trained by the laboratory

## Importance of sampling

# Method of Sampling for Merceological Analysis of KiwiFruit (60 Fruits)

Sampling of kiwi fruit should be made according to the following scheme. The sampler should go along the rows and select a certain number of plants and take a fruit near the trunk, one in the middle of the shoot and one at the end of shoot. That means 20 plants for each sample.





## Importance of sampling

# Method of Sampling for Merceological Analysis of KiwiFruit (60 Fruits)



1° fruit

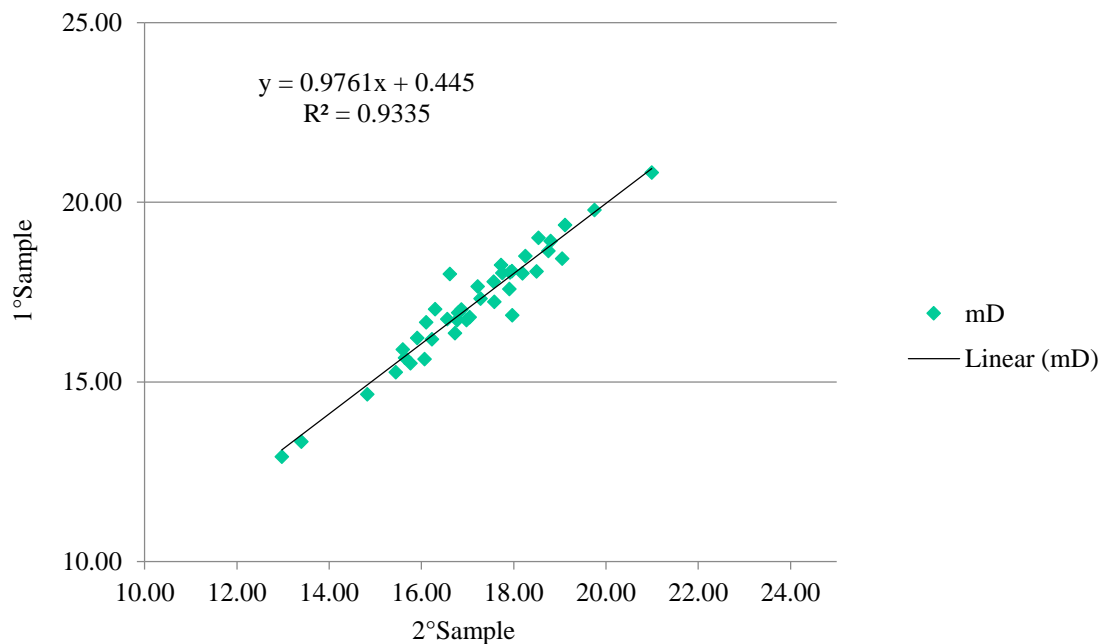
2° fruit

3° fruit

## Importance of sampling

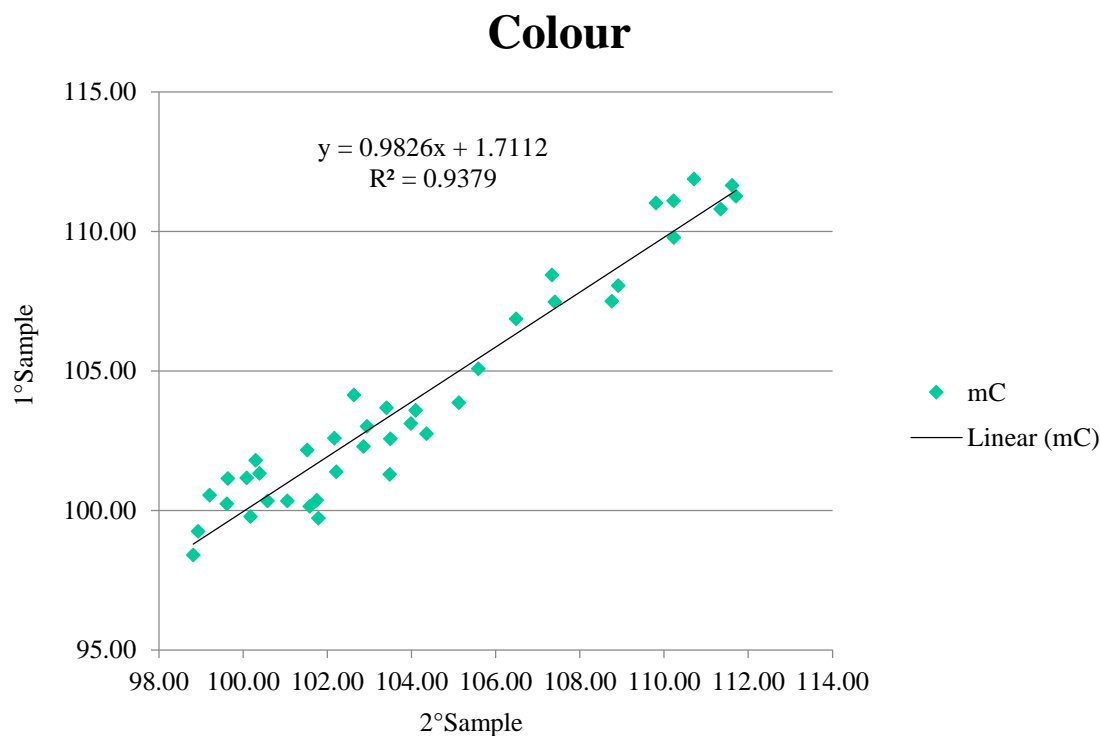
# Method of Sampling for Merceological Analysis of KiwiFruit (60 Fruits)

### Dry matter



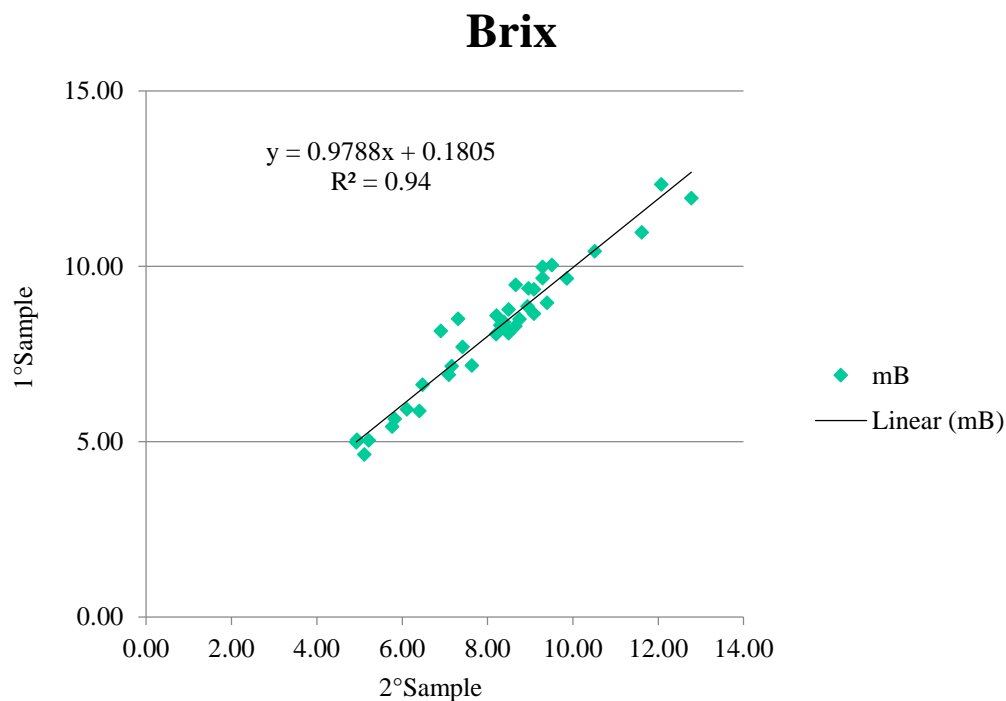
## Importance of sampling

# Method of Sampling for Merceological Analysis of KiwiFruit (60 Fruits)



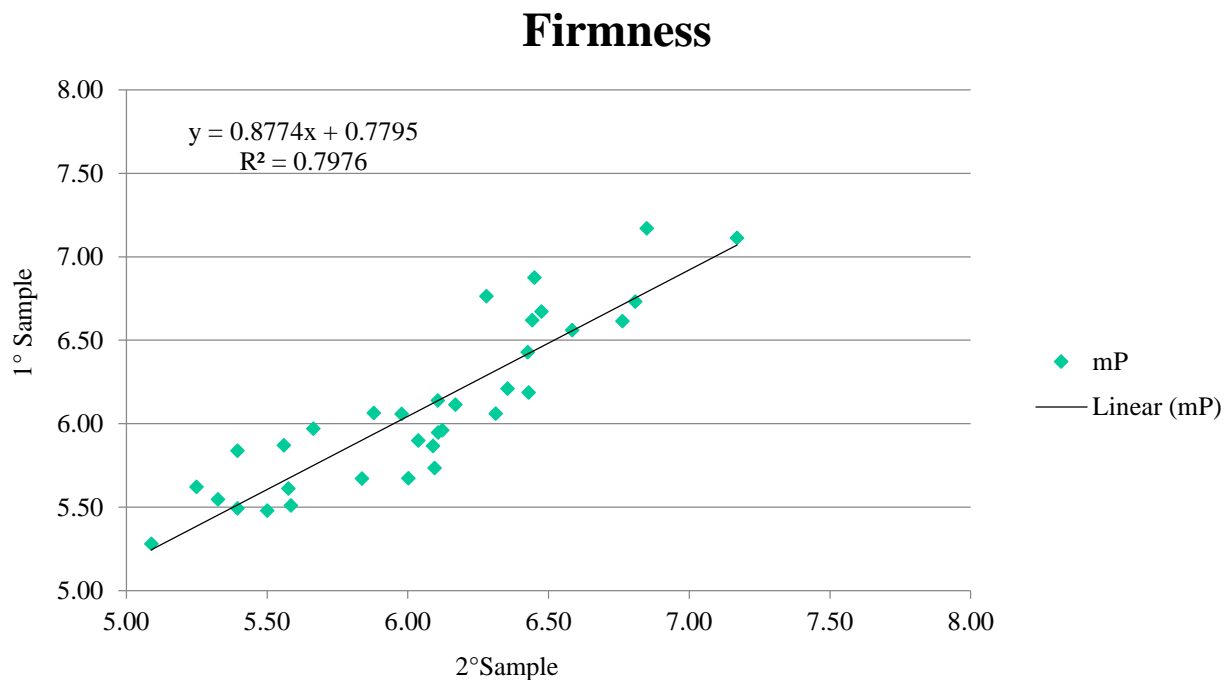
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# Method of Sampling for Merceological Analysis of KiwiFruit (60 Fruits)



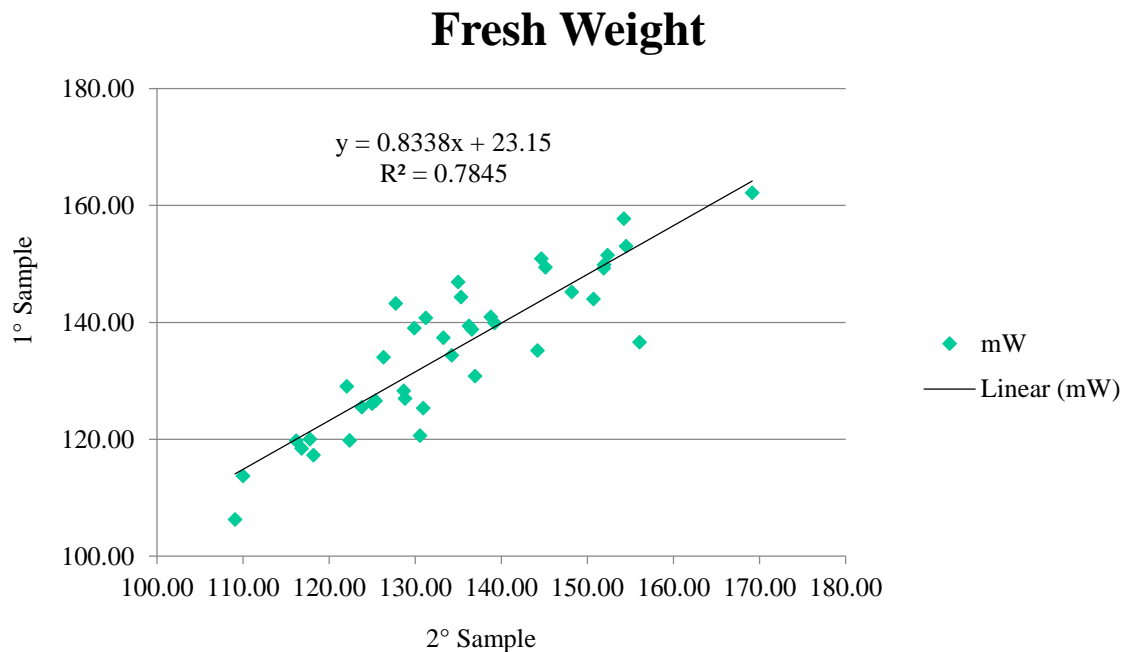
## Importance of sampling

# Method of Sampling for Merceological Analysis of KiwiFruit (60 Fruits)



## Importance of sampling

# Method of Sampling for Merceological Analysis of KiwiFruit (60 Fruits)



## Importance of sampling

# Method of Sampling for Pesticide Analysis of Kiwi Fruit (30 Fruits)



## Importance of sampling

# Method of Sampling for Merceological Analysis of KiwiFruit

The Laboratory's experience in this field has enabled it to develop a standardized sampling and analysis system for destructive testing of kiwifruit.

Based on this knowledge, our facility has an important database with which to compare the analytical data collected.

The analysis supports producers and technicians in verifying dry matter, brix, firmness and colour, as some of these parameters are considered as evaluation indexes for the final price of the product. In addition, the information obtained makes it possible to assess the correct timing for harvesting the final product.

The laboratory guarantees robust and accurate analysis methods and highly specialized staff for sampling.



## Importance of sampling

# Method of sampling for Multiresidual analysis of Kiwi Fruit (30 Fruits)

In general, the sampling methods for the analysis of pesticides must guarantee their safety representativeness of the sample. The procedures adopted by the Laboratory are described below.

One of the problems relating to sampling for pesticide analysis due to the edge effect when other crops are adjacent. In this case the edges and one or two internal diagonal must be drawn

The elementary samples will then be combined into the global sample.

The pieces must be placed in a clean container that ensures adequate protection during storage transport.

The overall sample can be reduced, to obtain a final sample, with the reduction method quarters (dividing the sample into quarters, discarding two opposite quarters and taking the remaining ones).

The final sample, if not too large, will coincide with the laboratory one and must consist of a minimum of 15 to a maximum of 30 pieces (1-3 kg).

Sampling should only be carried out by personnel trained by the laboratory

## Importance of sampling

# The importance of Multiresidual Analysis of kiwifruit or other fruit & vegetable

Multi-residue analysis is a complex analysis for the simple reason that the number of analytes (i.e. pesticide...) is very high.

This is because the origin of the samples to be analysed are not always the same: countries of origin and reference markets are extremely variable. All this determines the need to have a very high screening of p.a. , including molecules that are no longer registered for use.

Such extensive screening serves to check for fraudulent use of active ingredients that are no longer authorised and to include in the analysis also products registered or used outside Europe.

The ability of the laboratory not only to apply the method (extraction by the QuEChERS method and determination in GC-MS/MS & LC-MS/MS), but also to obtain the results in the shortest possible time, providing the best answers from both a qualitative (recognition of the active ingredients present) and a quantitative point of view, is crucial.

## Seed count

# The importance of seeds count Analysis of kiwifruit and evaluation of pollination

Through the specific analysis that involves counting the seeds of the fruit, it is possible to assess the quality of pollination.

The more seeds inside the fruit, the more effective pollination is.



## Pollen Germinability

### Pollination of kiwifruit and fruit quality

The pollination methods of Actinidia are different.

Pollination can take place either with dry pollen or with wet pollen.

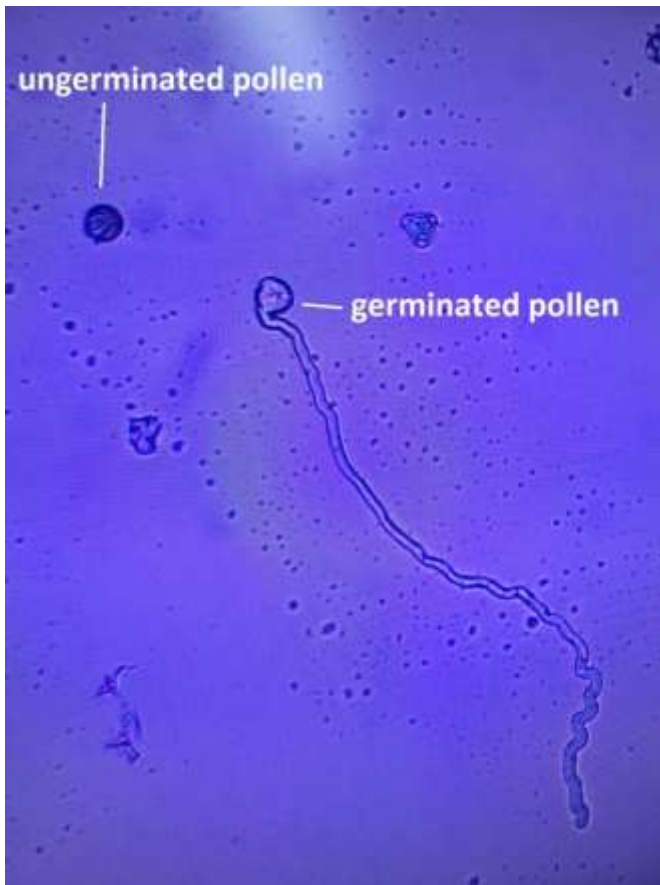
In both cases, it is essential to know the quality of the pollen before use by carrying out a germinability analysis of pollen at 4h, 8h and 24h. Pollination can be carried out either by industrial mechanical means (fans and vaporisers) or by hand with tools that allow more targeted pollination.

In the second case, pollination can lead to better results; in fact, the better the pollination, the better the organoleptic and merceological qualities of the fruit (weight, dry matter, brix degree, colour, pressure)



## Pollen Germinability

### Pollination of kiwifruit and fruit quality



## **Moria**

# **Our research experience in Italy 2019 - 2023**

**2019 Reporting the first cases of Moria (KVDS Kiwi Vine Decline Symptoms) in Lazio**

**Bibliographic research and start of Pedonlab trials**

**2020 preliminary agronomic and phytopathological analysis, first tests of pathogenicity**

**2021 field trials on different rootstocks and data collection**

**2022 treatment and prevention strategies Publication of the article “Investigations into Kiwi Moria in Lazio”**

**2023 extend the protocol to other companies and other products. Moving from theses to experimental fields. Testing new rootstock types**

## CHARACTERISATION OF ORCHARDS

- ✓ **Phytopathological analyses**
  - ✓ **Soil analyses**
- ✓ **Water retention curve analysis**
  - ✓ **Irrigation water analysis**
- ✓ **Leaves analysis Multi-residual analysis**
  - ✓ **Merceological analysis**

### **Evaluation of post-harvest root system:**

- ✓ **presence/absence of pathogens**
- ✓ **development of root capillitium**
- ✓ **yield of kiwifruits in kg for thesis**

## **Multi Factor Approach**

- ✓ **Biofertility Study of Soil**
- ✓ **Correct Water Management**
- ✓ **Correct Plant Nutrition**
- ✓ **Correct agronomical practices**
- ✓ **Climate change**



## Moria

### **2020 - First year of experimentation**

- ✓ **The trial began in the year 2020 with the phyto pathological study of 20 orchards in the Lazio region.**
- ✓ **Ten plants for orchards were sampled.**
- ✓ **Fungal colonization in the root system was investigated**
- ✓ **200 symptomatic root samples analyzed at the Pedonlab laboratory**

## Moria

### Symptomatology

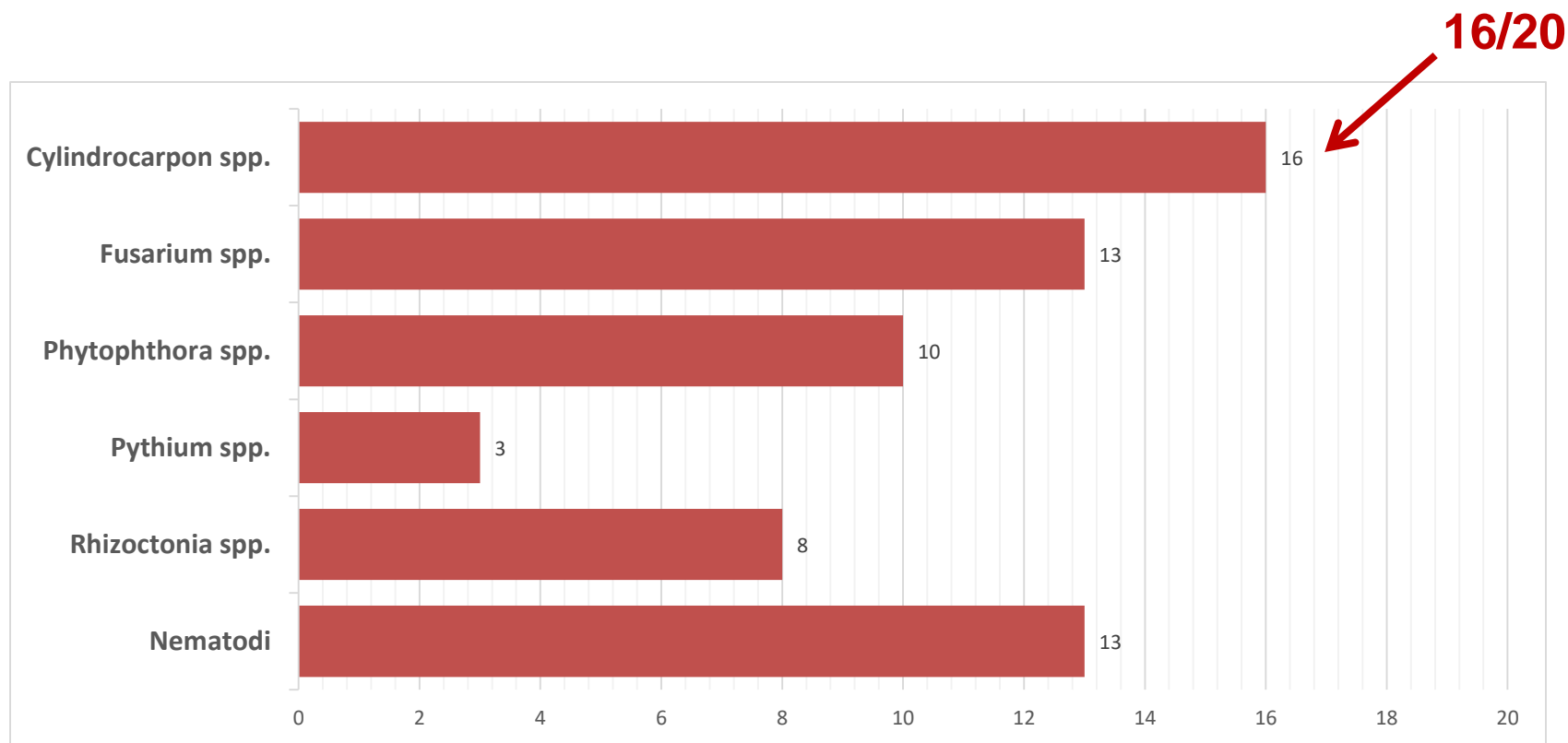
The most characteristic symptoms affect the root system, which presents:

- Bruising and necrosis of the xylem
- Progressive loss of the root capillitium hypertrophy and reddening of the cortical layer of the root branches
- Rot and detachment of the xylem cylinder



## Moria

# RESULTS OF PHYTOPATHOLOGICAL INVESTIGATIONS



## COMMENTS

The above tab. shows that:

**CYLINDROCARPON LIRIODENDRI is present in 80% of cases. Known pathogenicity on KIWI (Turkey) and VINE (Portugal and Italy)**

**The Laboratory has therefore decided to further investigate the presence of this pathogen while continuing its previous research into other pathogens that may contribute to the “KVDS”, without forgetting the importance of correct plant nutrition, correct agronomic practices to be implemented and the climatic changes taking place.**

## PATHOGENICITY TESTING



***CYLINDROCARPON LIRIODENDRI* is pathogenic to Kiwi fruit (certified by the CREA research group in Rome, Dr Scortichini, Dr Pilotti and Dr Lumia)**

**The pathogenicity of the fungus has been tested and confirmed in greenhouse trials**

***CYLINDROCARPON LIRIODENDRI* was isolated in Lazio in association with Kiwi plants affected by Moria**

**Replanting on infected soil is not recommended**

## 2021 SECOND YEAR

**The HAYWARD rootstock is susceptible to *CYLINDROCARPON LIRIODENDRI***

**the BOUNTY 71 rootstock is susceptible to the same pathogen, although it presents a different symptomatology**

**In view of the lack of tolerant plant material, the laboratory has planned an experiment for the year 2022/2023 to implement a treatment and prevention strategy for the problem of KDVS'.**

Moria

## 2022 THIRD YEAR

**20 products with different active ingredients were tested in vitro with 2D and 19 *CYLINDROCARPON LIRIODENDRI* isolates.**



**From the experimental evidence obtained from the in vitro tests, we moved on to the field intervention to evaluate the plants' response.**

## Moria

### 2022 THIRD YEAR: TRIAL ON FIELD

- **Thesis 1** chemical fungicide application\* (dose 125 ml per 100 liters)  
\* not authorised on kiwi fruit
- **Thesis 2** chemical fungicide application\* (dose 250 ml per 100 liters)  
\*not authorized on kiwifruit
- **Thesis 3** application of chestnut tannin product (dose 5 L per 100 liters)
- Thesis 4** control untreated  
*volume applied per plant: 10 liters*  
*volume applied per hectare: 5000 liters*



## 2022 THIRD YEAR: TRIAL ON FIELD

Application of treatments by means of an injector pole adjusting the pressure to 10 bar, the quantities injected are 10 L per plant for an application depth of 30 cm

period of application

1) first dose March - April


2) second dose early May

-appropriate agronomic management of the plant:

**correct drainage, correct irrigation, adequate fertilization, treatments and fruit thinning**

Moria


## 2022 THIRD YEAR: TRIAL ON FIELD



Palo iniettore utilizzato per l'applicazione



applicazione effettuata intorno alla pianta con 4 fori ad una distanza di circa 30-40 cm



profondità di applicazione 30 cm

Moria

## 2022 THIRD YEAR: TRIAL ON FIELD

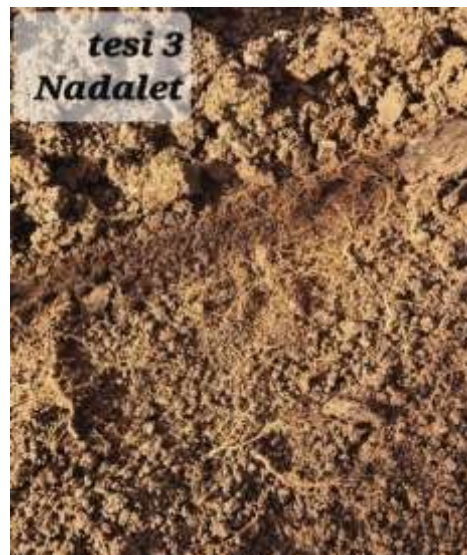


CONTROL



Moria

## 2022 THIRD YEAR: TRIAL ON FIELD



## Moria

# 2022/2023 THIRD YEAR: TRIAL ON FIELD

**AT THE END OF THE TWO-YEAR TRIAL PERIOD, THE RESULTS OBTAINED AND CONFIRMED BY THE EXPERIMENTAL EVIDENCE AND ANALYSES CARRIED OUT ARE:**

- ✓ **REDUCTION OF FUNGAL LOAD AFTER PRODUCT APPLICATION (AS PROTOCOL)**
- ✓ **RESTORATION OF THE ROOT SYSTEM, PARTICULARLY IF NEW CAPILLARIES ARE FORMED**
- ✓ **THE PLANTS IMPROVE THEIR VEGETATIVE PHASE WITHOUT EXPERIENCING PHYTOTOXICITY PROBLEMS**
- ✓ **INCREASED FRUIT PRODUCTION FOR PLANT (YIELD)**

## Moria

# 2022/2023 THIRD YEAR: TRIAL ON FIELD

FARMER	IDENTIFICATION	KIWI HORCHARD	NUMBER OF PLANTS	PRODUCTION Kg/plant TREATED	PRODUCTION Kg/plant CONTROL	DIFFERENCE PLANT kg	DIFFERENCE Kg/ha	STATISTICAL SIGNIFICANCE
Antonetti_	parcellone	GREEN	20	68	41	27	13700	OK
Lepidio D	doganella	GREEN	19	38	31	7	3300	OK
Nadalet_	settore 4	YELLOW	16	94	83	10	5200	OK
Bartoli_	Cisterna	YELLOW	24	42	28	14	6900	OK
Lesti_	cisterna	GREEN	19	45	34	11	5300	OK
Corbi_	Sermoneta	GREEN	21	67	57	11	5300	OK
Ricotta_	Campo verde	GREEN	17	57	28	29	14300	OK
Lepidio A_	via guardabassi	GREEN	15	61	32	29	14400	OK
Teresi_	tenuta retarola	GREEN	20	86	82	4	2100	NO
Parcesepe	cisterna	GREEN	20	91	86	5	2500	NO

## Soil Sampling

# Soil Sampling Methods PED/EAQ

Exclude areas from the plot to be sampled that are abnormal in appearance (color, texture, skeleton, etc.) and agronomic history (crop diversity, treatments, fertilization, etc.) Exclude plot edges near ditches and from headlands.

It is essential that the sample consists of at least 20 elementary samples (sub-samples) taken at different points and carefully mixed.

**Sampling points should be chosen by following a random path through the entire field.**  
**Always remove the grass before sampling (0-5 cm).**

For herbaceous crops, a soil layer between 5 and 30 cm should be taken.

For tree crops, it is preferable to take two samples, one between 5 and 30 cm and the other between 30 and 60 cm, both to be sent to the laboratory.

In case of homogeneous soil, one soil sample should be taken for every 4 ha. In case of inhomogeneous soil, the area should be reduced depending on the degree of in homogeneity

Test report  
Archive code

Latina,  
Client code

# Soil Sampling

## Soil Sampling Methods PED/EAQ

### SOIL TEST REPORT

#### CUSTOMER INFORMATION

Customer  
Address  
Postal Code  
Location  
Province

#### PICK-UP IDENTIFICATION PROVIDED BY THE PICKER

Identification field of actinidia  
Crop Impianto actinidia  
Ecological area Non specificata  
Soil type Non specificato

#### SAMPLING INFORMATION PROVIDED BY THE SAMPLER

Sampler Cliente  
Sampling date 11/03/2024

#### RECEPTION INFORMATION

Arrival date 14/03/2024

#### ANALYTICAL TEST

Analysis start date 14/03/2024  
Analysis end date 18/03/2024

Il Chimico Analista  
Dott. Lorenzo Sbraglia




Il Direttore del Laboratorio  
Dott. Mauro Sbraglia




#### NOTE

- This test report refers to the sample delivered to the laboratory.
- This test report may not be reproduced, even partially, without the written approval of the Laboratory.
- Records are available to the customer at the Laboratory for 4 years, test reports for 10 years.
- The sample is stored in the laboratory for at least 15 days after the test report has been issued.
- The sampling is not certified by ACCREDIA.
- This test report contains no attachments.
- The sampling date is provided by the picker. The Laboratory is not responsible for sampling if performed by a third party. In this case, the results refer to the sample as received.



LAB N° 1730 L





# Soil Sampling

## Soil Sampling Methods PED/EAQ

OPINIONS AND INTERPRETATIONS NOT SUBJECT TO ACCREDITATION BY ACCREDIA

Latina, 18/03/2024

<b>Attached to RdP n.</b>	<b>Farmer</b>	PEDONLAB	<b>Sample Id.</b>	new orchard of actinidia
<b>2402032</b>	<b>Address</b>	:	<b>Sampling</b>	11/03/2024
	<b>C.A.P.</b>	02600	<b>Crop</b>	Impianto actinidia
<b>Soil report</b>	<b>Locality</b>	BELGIO	<b>Area</b>	Non specificata
<b>ARC00304</b>	<b>Province</b>	ESTERO	<b>Soil</b>	Non specificato

### PHYSICAL CHEMICAL PROPERTIES

Parameter	Value	Evaluation	Parameter	Value	Evaluation
Gravel		SEN <i>sensitive</i>	Reaction (1:2.5)	pH 8,3	<i>med. alkaline</i>
sand (2.0-0.02 %)	54		El. Conduct. (1:2.0) mS/cm	0,451	<i>normal</i>
Silt (0.020-0 %)	16		Total Carbonate %	7,8	<i>leg. calcareous</i>
Clay (<0.002 %)	30		Active calcium carb %	2,3	<i>medium</i>
TEXTURE		FAS <i>loam clay sandy</i>	Organic matter %	1,47	<i>low</i>

### NUTRIENTS STATUS

Parameter	Value	Evaluation	Parameter	Value	Evaluation
Total Nitrogen (N) %	0,093	<i>Low</i>	BORO sol. (B) ppm	0,46	<i>Low</i>
Avail. Phosphorus (P) ppm	50	<i>v. high</i>	Exch. Calcium (Ca) ppm	3700	<i>v. high</i>
IRON ass. (Fe) ppm	15,6	<i>medium</i>	Exch. Magnesium (Mg) ppm	360	<i>v. high</i>
MANGANESE ass. (Mn) ppm	9,2	<i>medium</i>	Exch. Potassium (K) ppm	340	<i>v. high</i>
COPPER ass. (Cu) ppm	2,4	<i>medium</i>	Exch. Sodium (Na) ppm	41	<i>normal</i>
ZINC ass. (Zn) ppm	1,8	<i>medium</i>			

### CATION EXCHANGE CAPACITY

Parameter	Value x100gr	Saturation %	Evaluation
C.E.C.	meq 22,55		<i>high</i>
CALCIUM	meq 18,50	82,0	<i>high</i>
MAGNESIUM	meq 3,00	13,3	<i>high</i>
POTASSIUM	meq 0,87	3,9	<i>average</i>
SODIUM	meq 0,18	0,8	<i>normal</i>
SATURATION BASIC		100,0	<i>high</i>
Mg/K	3,45		<i>medium</i>

**Analista**  
Dott. Lorenzo Sbraglia

**Laboratory Director**  
Dott. Mauro Sbraglia

## Soil Sampling

# Soil Sampling Methods PED/EAQ

OPINIONS AND INTERPRETATIONS NOT SUBJECT TO ACCREDITATION BY ACCREDIA

Latina, 18/03/2024

<i>Note to the report</i> <b>2402032</b>	<b>Farmer</b> : PEDONLAB	<b>Sample Id.</b> : new orchard of actinidia
<i>Soil test report</i> <b>ARC00304</b>	<b>Address</b> :	<b>Sampling</b> : 11/03/2024
	<b>C.A.P.</b> : 02600	<b>Crop</b> : Impianto actinidia
	<b>Locality</b> : BELGIO	<b>Area</b> : Non specificata
	<b>Province</b> : ESTERO	<b>Soil</b> : Non specificato

### AGRONOMICAL REPORT

<b>TEXTURE</b>	The soil has a sandy clay loam texture with a significant presence of skeleton; the hydrogeological characteristics deducible from the texture (moderate permeability and good water retention capacity), are significantly high
<b>Reaction</b>	The soil has a medium alkaline pH reaction, unsatisfactory for the culture.
<b>COND. elettrica</b>	The soil salinity level is normal.
<b>Total Carbonate</b>	The soil is slightly calcareous.
<b>Active calcium</b>	The level of active limestone is medium; the choice of the rootstock is a limiting element, which must be done in a critical way.
<b>Organic matter</b>	The organic fraction of the soil is low; the microbial activity, the physical-structural characteristics and the chemical fertility are negatively affected. The contribution of organic matter is recommended.
<b>Total Nitrogen</b>	Total nitrogen is low; its contribution to the nitrogenous nutrition of the crop is modest.
<b>Avail.</b>	The level of phosphorus is very high; the response to the element is highly unlikely. Phosphorus is not needed.
<b>IRON</b>	The assimilable iron level is normal.
<b>MANGANESE</b>	The level of assimilable manganese is normal.

OPINIONS AND INTERPRETATIONS NOT SUBJECT TO ACCREDITATION BY ACCREDIA

Latina, 18/03/2024

<i>Note to the report</i> <b>2402032</b>	<b>Farmer</b> : PEDONLAB	<b>Sample Id.</b> : new orchard of actinidia
<i>Soil test report</i> <b>ARC00304</b>	<b>Daddress</b> :	<b>Sampling</b> : 11/03/2024
	<b>C.A.P.</b> : 02600	<b>Crop</b> : Impianto actinidia
	<b>Locality</b> : BELGIO	<b>Area</b> : Non specificata
	<b>Province</b> : ESTERO	<b>Soil</b> : Non specificato

## Soil Sampling

# Soil Sampling Methods PED/EAQ

### AGRONOMICAL REPORT

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## Soil Sampling

# Soil Sampling Methods PED/EAQ

OPINIONS AND INTERPRETATIONS NOT SUBJECT TO ACCREDITATION BY ACCREDIA

Latina, 18/03/2024

<i>Note to the report</i> 2402032	<b>Farmer</b> : PEDONLAB	<b>Sample Id.</b> : new orchard of actinidia
<i>Soil test report</i> ARC00304	<b>Daddress</b> :	<b>Sampling</b> : 11/03/2024
	<b>C.A.P.</b> : 02600	<b>Crop</b> : Impianto actinidia
	<b>Locality</b> : BELGIO	<b>Area</b> : Non specificata
	<b>Province</b> : ESTERO	<b>Soil</b> : Non specificato

<b>COPPER</b>	The assimilable copper level is normal.
<b>ZINC</b>	The level of assimilable zinc is normal.
<b>BORO</b>	Assimilable boron level is low; element response may be probable. Boron intake is recommended.
<b>Exch.</b>	The calcium level is high both in absolute value and in relation to the CSC. The response to the element is not probable.
<b>Exch.</b>	The level of magnesium is high both in absolute value and in relation to the CSC; the response to the item is not probable. Magnesium is not needed.
<b>Exch.</b>	The potassium level is very high in absolute value but appears to be average in relation to the CSC; the response to the element is highly unlikely. Potassium is not needed.
<b>Exch.</b>	The sodium level is normal both in absolute value and in relation to the CSC. Negative effects on the culture are completely unlikely.
<b>C.E.C.</b>	The cation exchange capacity is high; the amount of nutrients retained in cationic form is high.

## Water Sampling

# Methods of Sampling for Irrigation Water Analysis (chemical and microbiological analysis) ASCC/PMM

### Material

1. Sterile 500 ml plastic bottle (with thiosulfate in case of chlorinator implantation) PMM
2. Chemical analysis bottle (plastic) ASCC
3. Portable refrigerator .

### Sampling method microbiological analysis

4. remove rubber hoses and plastic filters
5. run water for 5 minutes if used often
6. run the water for about 15 minutes if it has not been used for a long time close the tap
7. sterilize the tap with a flame (use gas lantern or cotton ball soaked in alcohol) and reopen the tap. Let the water run for another 2 minutes . Take the sample with the sterile bottle taking care to open and close it as quickly as possible

### Sampling method chemical analysis

8. draw water for chemical analysis(ASCC), after rinsing the container with the same water to be analyzed

# Water Sampling

## Methods of Sampling for Irrigation Water Analysis

Archive Code:

Latina, 28/06/2023

Test Report:

### CUSTOMER INFORMATION

Customer  
Address  
Postal Code  
Location  
Province

### IRRIGATION WATER

Culture Not specified  
Substrate Not specified  
Cultivation Not specified

### SAMPLING IDENTIFICATION PROVIDED BY THE PICKER

Identification IRRIGATION WATER  
Sampling point EARL FKJ  
Body of water Not specified  
Treatment Not specified  
Sample appearance

### SAMPLING INFORMATION PROVIDED BY THE SAMPLER

Sampler Client  
Sampling date 26/06/2023  
Sampling hour  
Temperature (°C)  
Sampling rates 01

### RECEPTION INFORMATION

Check-in date 28/06/2023  
Time of arrival  
Temperature (°C)

### ANALYTICAL TEST

Analysis start date 28/06/2023  
Analysis end date 28/06/2023

L'Analista  
Lorenzo Sbrangia



Il Direttore del Laboratorio  
Maura Sbrangia



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- This report may not be reproduced, even in part, unless approved in writing by the Laboratory.
- Results are available to the client at the Laboratory for 4 years, test reports for 10 years.
- The sample is kept at the Laboratory for at least 15 days after the test report is issued.
- The sampling is not accredited by ACCREDIA.
- Sampling data are provided by the sampler. The Laboratory is not responsible for the sampling if performed by a third party. In that case, the results refer to the sample as received.



LAB N° 2730 L

## Water Sampling

# Methods of Sampling for Irrigation Water Analysis

Archive Code:

Test Report:

### CHEMICAL PARAMETERS

PARAMETER	UM	VALUE	*	UM	VALUE	TEST METHOD
Suspended solids	mg/l	0	*			APAT CNR IRSA 2000 Mar 29 2003
Hydrogen concentration	pH	7,30				APAT CNR IRSA 2000 Mar 29 2003
Electrical conductivity at 25°C	mS/cm	0,227				APAT CNR IRSA 2000 Mar 29 2003
Dissolved salts	mg/l	145	*			Metodi Interni PAM L007
Calcium (Ca)	(Ca) mg/l	36		mmoli/l	0,90	UNI EN ISO 15885:2009
Magnesium (Mg)	(Mg) mg/l	3		mmoli/l	0,12	UNI EN ISO 15885:2009
Sodium (Na)	(Na) mg/l	5		mmoli/l	0,22	UNI EN ISO 15885:2009
Potassium (K)	(K) mg/l	2		mmoli/l	0,05	UNI EN ISO 15885:2009
Carbonates (CO3)	(CO3) mg/l	0	*	mmoli/l	0,00	APAT CNR IRSA 2010 8 Mar 26/2003
Bicarbonates (HCO3)	(HCO3) mg/l	116	*	mmoli/l	1,90	APAT CNR IRSA 2010 8 Mar 26/2003
Chlorides (Cl)	(Cl) mg/l	6		mmoli/l	0,17	UNI EN ISO 10304-1:2009
Sulfates (S/SO4)	(S/SO4) mg/l	4		mmoli/l	0,12	UNI EN ISO 10304-1:2009
Ammoniacal Nitrogen (N/NH4)	(N/NH4) mg/l	< 0,5	*	mmoli/l	< 0,04	APAT CNR IRSA 4030 8 Mar 29 2003
Nitric Nitrogen (N/NO3)	(N/NO3) mg/l	1		mmoli/l	0,07	UNI EN ISO 10304-1:2009
Nitrous Nitrogen (N/NO2)	(N/NO2) mg/l	< 0,1		mmoli/l	< 0,01	UNI EN ISO 10304-1:2009
Phosphorus (P/H2PO4)	(P/H2PO4) mg/l	< 0,2		mmoli/l	< 0,01	UNI EN ISO 10304-1:2009
Iron (Fe)	(Fe) mg/l	0,08		µmoli/l	1,43	UNI EN ISO 15885:2009
Manganese (Mn)	(Mn) mg/l	< 0,01		µmoli/l	< 0,18	UNI EN ISO 15885:2009
Copper (Cu)	(Cu) mg/l	< 0,01		µmoli/l	< 0,16	UNI EN ISO 15885:2009
Zinc (Zn)	(Zn) mg/l	< 0,01		µmoli/l	< 0,15	UNI EN ISO 15885:2009
Boron (B)	(B) mg/l	0,01	*	µmoli/l	0,93	UNI EN ISO 15885:2009
Molybdenum (Mb)	(Mo) mg/l	< 0,010	*	µmoli/l	< 0,10	UNI EN ISO 15885:2009

#### Notes

- U.M. Unit of Measurement  
\* - Non accredited test



LAB N° 1239/L

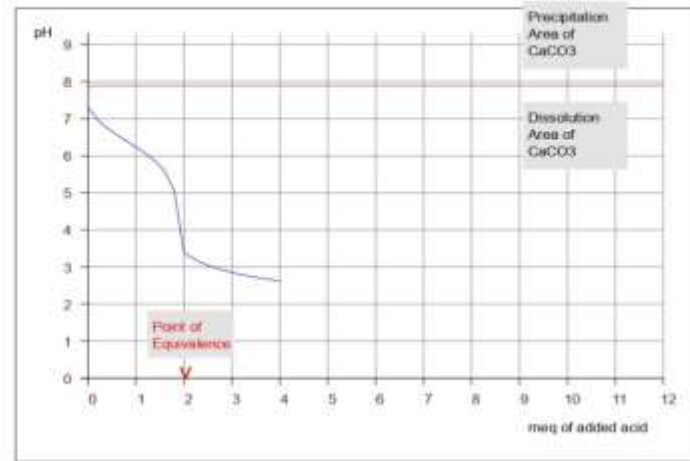
\*\*----- test report end -----\*\*



## Water Sampling

# Methods of Sampling for Irrigation Water Analysis

TITRATION CURVE



CORRECTION WITH NITRIC ACID 65,0 %

meq of added acid	ml of acid per mc	NITROGEN CONTRIBUTED PER				
		1 mc (N/g)	100 mc (N/Kg)	1000 mc (N/Kg)	2500 mc (N/Kg)	5000 mc (N/Kg)
1	70	14	1,4	14,0	35,0	70,0
2	140	28	2,8	28,0	70,0	140,0
3	210	42	4,2	42,0	105,0	210,0
4	280	56	5,6	56,0	140,0	280,0

## Water Sampling

# Methods of Sampling for Irrigation Water Analysis

CORRECTION WITH PHOSPHORIC ACID 85,0 %

meq of added acid	ml of acid per ml	PHOSPHORUS CONTRIBUTED PER				
		1 mc (P gr)	100 mc (P Kg)	1000 mc (P Kg)	2500 mc (P Kg)	5000 mc (P Kg)
1	68	31	3,1	31,0	77,5	155,0
2	136	62	6,2	62,0	155,0	310,0
3	204	93	9,3	93,0	232,5	465,0
4	272	124	12,4	124,0	310,0	620,0

CORRECTION WITH SULFUR ACID 95,0 %

meq of added acid	ml of acid per ml	SULFUR CONTRIBUTED PER				
		1 mc (S gr)	100 mc (S Kg)	1000 mc (S Kg)	2500 mc (S Kg)	5000 mc (S Kg)
1	28	16	1,6	16,0	40,0	80,0
2	56	32	3,2	32,0	80,0	160,0
3	84	48	4,8	48,0	120,0	240,0
4	112	64	6,4	64,0	160,0	320,0

## Leaf Sampling

# Sampling for Leaves Nutritional Analysis - FCC

1. take a sample for each type of kiwifruit  
example G3 - Hayward - Soreli, you cannot make a single analysis on different varieties, each variety represents a sample to be analyzed in the laboratory.
2. identify the plot of interest. you can also do one sample per plot if it is not larger than two hectares, otherwise it is advisable to divide the plot in two and do a double analysis
3. once the variety and plot to be analyzed have been identified, sampling is done diagonally across the rows, avoiding taking leaves on the perimeter plants. The choice of leaves to be analyzed should fall on mature young leaves taken at mid-shoot (therefore, apical leaves or those close to the trunk should be avoided)
4. the sample to be sent to the laboratory should consist of a minimum of 30 leaves (if the leaves are large) to a maximum of 50 leaves (if the leaves are small)

## Leaf Sampling

# Sampling for Leaves Nutritional Analysis-FCC

Archive code :

Test report:

### CUSTOMER INFORMATION

*Farmer*  
*Address*  
*C.A.P.*  
*Location*  
*Province*

### LEAF ANALYSIS

*Sample* SCEA JAPIENOU BD  
*Crop* Actinidia Gold  
*Phenological phase* Month September  
*Plant organ* Leaf Blade

### INFORMATION ON SAMPLING

*Sampler* Client  
*Sampling date* 12/10/2023

### ANALITICAL TEST

*Start analysis date* 12/10/2023  
*End analysis date* 16/10/2023

*Analyst*  
Dot. Lorenzo Sbaraglia



The Laboratory director  
Dot. Mauro Sbaraglia



#### Note

- This test report refers to the sample delivered to the laboratory.
- This report may not be reproduced, even partially, without the written approval of the laboratory.
- The recordings are available to the customer in the laboratory for 2 years, the test reports for 10 years.
- The sample is kept in the laboratory for at least 7 days after the issue of the test report.

## Leaf Sampling

# Sampling for Leaves Nutritional Analysis-FCC

Archive code :

Test report:

### PARAMETERS

PARAMETER	U.M.	VALUES	OPTIMAL RANGE	AGRONOMICAL EVALUATION
Nitrogen	(N) %	1,60	1,31 - 1,80	Medium
Phosphorus	(P) %	0,12	0,16 - 0,25	Low
Potassium	(K) %	0,95	1,01 - 1,50	Low
Calcium	(Ca) %	4,73	2,51 - 4,00	High
Magnesium	(Mg) %	0,61	0,31 - 0,50	High
Sodium	(Na) %	0,02	0,02 - 0,04	Medium
Iron	(Fe) ppm	54	51 - 110	Medium
Manganese	(Mn) ppm	39	51 - 150	Low
Copper	(Cu) ppm	10	9 - 13	Medium
Zinc	(Zn) ppm	15	21 - 30	Low
Boron	(B) ppm	21	31 - 45	Low

\*\*----- End of test report -----\*\*

**Note**

U.M.: unit of measurement

**Test methods**

- Nitrogen: determination according to Kjeldahl
- Chlorine: acidification, extraction in boiling water, determination by D
- Other elements: Acid mineralization and determination by ICP OES

## Plant Sampling

### **Method of sampling plant material (for phytopathological analysis) - FITO**

The sampler should preferably take those plants showing the symptoms deemed abnormal at an early stage; the sample should contain both healthy and diseased parts.

It is very important to accompany the samples with all information regarding: - cultivar - rootstock - age and origin of the plant - occurrence and extent of symptoms - crops previously present - distribution of diseased plants in the field (isolated episodes, in patches, in rows, at the edges, etc.).

In all those cases where sample delivery cannot be done on the same day, it is of paramount importance to store it in a refrigerator at 4-5 °C.

Storage should not exceed 2-4 days. Never store in the freezer. Use closed plastic bags for storage; avoid wrapping samples with paper or cloth.

Contact the laboratory before delivering samples.

## Soil Analysis

# The importance of agronomic soil analysis

The objective of agronomic soil analysis is to provide the technician/client with the basic knowledge for a correct understanding of the fundamental chemical-physical parameters of soils and the elaboration of fertilization plans

Our analytical report guarantees a clear and direct approach to the problems inherent in soil fertilization, focusing interest on the most suitable lines of action, transferring to the technician the necessary basis for operating incisively and safely

### **When to do the analysis:**

**before a new crop planting to assess the most suitable crop or the best rootstock**

**before drawing up a proper fertilization plan**

## Irrigation Water Analysis

# The importance of irrigation water analysis

**Evaluation of the most important chemical parameters according to the agronomic technique adopted (potted crops, open field irrigation, hydroponic crops) :**

- evaluation of the risks of occlusion in irrigation systems
- the bicarbonate titration curve
- the correct processing of nutrient solutions (for calculating nutrient solutions and their corrections during the growing cycle)

Our report provides the technician/customer with the necessary information to be able to optimally manage the water resource

When to do the analysis: Always !!! At least once a year...



## Leaf Analysis

# The importance of leaves analysis

**Evaluation of the nutritional status of crops by analyzing leaf macro-meso-micro nutrients :**

**Our analytical report provides technicians/clients, regardless of individual specific knowledge, with the necessary information for a critical assessment of agronomic problems such as deficiencies or phytotoxicity and their overcoming.**

**The guidelines for the interpretation of analyses are a simple and practical support for the agronomic evaluation of the analytical certificate**

**When to do the analysis:**

- 1.the manifestation of specific problems such as deficiencies or phytotoxicity**
- 2. during the growing cycle before harvesting for proper agronomic management of the plant**

## Phytopathological Analysis

# The importance of Phytopathological Analysis

**Phytopathology, or Plant Pathology, is the science that studies plant diseases (or phytopathologies). More specifically, it deals with how they occur, their causes, the favourable or unfavourable conditions for their development, the means by which they propagate and the ways to eradicate or prevent them.**

**In Phytopathology, the fundamental concepts are those of disease, symptom and pathogen. Specifically, disease is a “condition of persistent suffering, resulting from an alteration of the plant's normal physiological processes” (Belli, 2014) and is manifested through symptoms, which negatively affect the plant's development and productivity. These diseases are determined by pathogens, disease-causing agents (viruses, bacteria, fungi, phytoplasmas), which infect the tissues of a host plant and manifest themselves externally through symptoms.**

**Obviously, measures to combat and control these diseases are also analyzed in this field, as well as preventive methods**

**For a fruit full  
business,  
follow our lead!**

