Latina, 28/06/2023

Archive Code:

Test Report:

CUSTOMER INFORMATION

Customer	
Address	
Postal Code	
Location	
Province	

IRRIGATION WATER

Culture	
Substrate	
Cultivation	

SAMPLING IDENTIFICATION PROVIDED BY THE PICKER

Identification	
Sampling point	
Body of water	
Treatment	
Sample appearance	

SAMPLING INFORMATION PROVIDED BY THE SAMPLER

Sampler	
Sampling date	
Sampling hour	
Temperature (°C)	
Sampling rates	

RECEPTION INFORMATION

Check-in date	
Time of arrival	
Temperature (°C)	

ANALYTICAL TEST

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

L'Analista
Lorenzo Sbaraglia

Il Direttore del Laboratorio
Mauro Sbaraglia

Notes

- This test report refers to the sample delivered to the laboratory.
- This report may not be reproduced, even in part, unless approved in writing by the Laboratory.
- Records 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° 1739 L

Archive Code: Test Report:

CHEMICAL PARAMETERS

PARAMETER		UM	VALUE	*	UM	VALUE	TEST METHOD
Suspended solids		mg/l	0	*			APAT CNR IRSA 2090 Man 29 2003
Hydrogen concentration		pH	7,30				APAT CNR IRSA 2060 Man 29 2003
Electrical conductivity at 25°C		mS/cm	0,227				APAT CNR IRSA 2030 Man 29 2003
Dissolved salts		mg/l	145	*			Metodo interno PAMI L007
Calcium (Ca)	(Ca)	mg/l	36		mmoli/l	0,90	UNI EN ISO 11885:2009
Magnesium (Mg)	(Mg)	mg/l	3		mmoli/l	0,12	UNI EN ISO 11885:2009
Sodium (Na)	(Na)	mg/l	5		mmoli/l	0,22	UNI EN ISO 11885:2009
Potassium (K)	(K)	mg/l	2		mmoli/l	0,05	UNI EN ISO 11885:2009
Carbonates (CO3)	(CO3)	mg/l	0	*	mmoli/l	0,00	APAT CNR IRSA 2010 B Man 29/2003
Bicarbonates (HCO3)	(HCO3)	mg/l	116	*	mmoli/l	1,90	APAT CNR IRSA 2010 B Man 29/2003
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 B Man 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 11885:2009
Manganese (Mn)	(Mn)	mg/l	< 0,01		µmoli/l	< 0,18	UNI EN ISO 11885:2009
Copper (Cu)	(Cu)	mg/l	< 0,01		µmoli/l	< 0,16	UNI EN ISO 11885:2009
Zinc (Zn)	(Zn)	mg/l	< 0,01		µmoli/l	< 0,15	UNI EN ISO 11885:2009
Boron (B)	(B)	mg/l	0,01	*	µmoli/l	0,93	UNI EN ISO 11885:2009
Molybdenum (Mb)	(Mo)	mg/l	< 0,010	*	µmoli/l	< 0,10	UNI EN ISO 11885:2009

Notes
- U.M.: Unit of Measurement.
* : Non-accredited test

ACCREDIA
LAB N° 1739 L

---------- test report end----------

Archive Code:

Comment to the Test Report:

OPEN FIELD IRRIGATION WATER INTERPRETATION GUIDELINES

PARAMETER	UM	VALUE	EVALUATION
Reaction pH	pH	7,30	*Normal*
Electrical Cond. at 25°C	mS/cm	0,227	*Normal*
Sodium	mmoli/l	0,22	*Normal*
Chlorine	mmoli/l	0,17	*Normal*
Boron	mg/l	0,01	*Low*
RSC		-0,1	*Negative*
SAR		0,2	*Normal*

Reaction pH The pH reaction of the water is normal.

Electrical Cond. at 25°C The water has normal salinity.

Sodium Sodium levels are normal. No phytotoxic effects on the crop are likely.

Chlorine Chlorine levels are normal. No phytotoxic effects on the crop are likely.

Boron Boron level is low. The water can also be used for very sensitive crops.

RSC RSC values ??are negative.

SAR The SAR value is normal. No accumulation of sodium in the soil is likely.

Archive Code:

Comment to the Test Report:

WATER WATERING POTTED PLANTS
INTERPRETATION GUIDELINES

PARAMETER	UM	VALUE	EVALUATION
Reaction pH	pH	7,30	*Normal*
Electrical Cond. at 25°C	mS/cm	0,227	*Low*
Sodium	mmoli/l	0,22	*Normal*
Chlorine	mmoli/l	0,17	*Normal*
Boron	mg/l	0,01	*Low*
Hardness	F°	10,2	*Normal*

Reaction pH The pH reaction of the water is normal.

Electrical Cond. at 25°C The water in question has a low salinity; excellent for watering very sensitive plants such as Orchids, Azaleas, Asparagus plumoneus, ferns.

Sodium Sodium level is normal. No phytotoxic effects on the crop are likely.

Chlorine The chlorine level is normal. No phytotoxic effects on the crop are likely.

Boron Boron level is low. The water can also be used for crops that are very sensitive to the element.

Hardness Sensible variations in the pH reaction of the substrate due to the progressive neutralization of the acid functional groups are not probable.

Archive Code:

Comment to the Test Report:

WATER FOR FERTIGATION
INTERPRETATION GUIDELINES

PARAMETER	UM	VALUE	EVALUATION
Reaction pH	pH	7,30	*Normal*
Electrical conductivity at 25°C	mS/cm	0,227	*Normal*
Sodium	mmoli/l	0,22	*Normal*
Chlorine	mmoli/l	0,17	*Normal*
Boron	mg/l	0,01	*Low*
Carbonates	mmoli/l	0,00	*Absent*
Bicarbonates	mmoli/l	1,90	*Normal*

Reaction pH The pH reaction of the water is normal.

Electrical conductivity at 2 Water with low saline content, of excellent quality. Suitable for all crops.

Sodium Sodium level is normal. No phytotoxic effects on the crop are likely.

Chlorine The chlorine level is normal. No phytotoxic effects on the crop are likely.

Boron Boron level is low. The water can also be used for crops that are very sensitive to the element.

Carbonates Carbonates are absent

Bicarbonates The level of bicarbonates in the water is normal. The water has an adequate buffer capacity which requires a normal supply of acids to control the pH reaction.

Archive Code:

Comment to the Test Report:

ASSESSMENT OF THE RISKS OF OCCLUSION IN IRRIGATED WATER
INTERPRETATION GUIDELINES

PARAMETER	UM	VALUE	EVALUATION
Suspended solids	mg/l	0	*Low risk*
Reaction pH	pH	7,30	*Low risk*
Saturation index	IdS	-0,60	*No risk*
Dissolved salts	mg/l	145	*Low risk*
Iron	mg/l	0,08	*Low risk*
Manganese	mg/l	0,01	*Low risk*

Suspended solids The level of suspended solids is low and generally does not give rise to the risk of clogging. If they occur, they are due to incorrect sizing of the nozzles.

Reaction pH Precipitation phenomena of calcium and magnesium carbonates are unlikely. The risk must in any case be evaluated according to the saturation index.

Saturation index The saturation index is negative. Occlusion phenomena due to carbonate precipitation are not probable.

Dissolved salts The level of dissolved salts is normal. The risks of clogging are negligible.

Iron The level of dissolved iron is low. Risks of clogging are unlikely.

Manganese The level of dissolved manganese is low. Risks of clogging are unlikely.

OPEN FIELD IRRIGATION WATER

OBSERVATIONS

For a better evaluation of the analyses, the meaning of some derived parameters is given below:

SAR(Sodium Adsorption Ratio): relates the negative action of sodium on the structure of the soil with the positive effects of calcium and magnesium.

RSC(Residual Sodium Carbonate): For waters containing a high concentration of bicarbonates there is a tendency for calcium and magnesium to precipitate as carbonates in the soil solution. This induces more or less significant modifications of the SAR of the solution with enrichment of carbonates/bicarbonates of sodium and potassium with probable accumulation of sodium and rise of the pH reaction of the soil.

WATER FOR IRRIGATION OF POTTED PLANTS

OBSERVATIONS

For crops in pots, the hardness of the water assumes particular importance since the presence of calcium and magnesium induces the neutralization of the acid functional groups of the substrate (carboxylic and phenolic groups) with an increase in the pH reaction.

Acidophilous species, following the increase in the pH reaction, can show problems of chlorosis, even in the presence of sensitive quantities of nutrients (see iron), as the absorption mechanisms of the plant are not compatible with the pH of the cultivation medium .

When working with hard water it is essential to keep the pH reaction of the substrate under control and to intervene with acidifying means when the same rises beyond the range considered optimal.

WATER FOR FERTIGATION

OBSERVATIONS

In the event that the water is used for the preparation of nutrient solutions and acids are used, remember that salinity is of two types:

Temporary salinity: due to the presence of bicarbonates which can be replaced by nutrients such as NO3 and PO4 without increasing salinity. In other words, when acids are used, it is possible to replace the bicarbonates with nutritive elements without appreciable changes in the electrical conductivity of the water.

Fixed salinity: due to all the other salts present which cannot be removed or replaced by the use of acids.

Therefore, when the water has marginal or unsuitable salinity values, it is not convenient to use exclusively complex water-soluble fertilizers since, since they do not have a suitable acidifying capacity, the added quantities add up to the salinity of the water, giving rise to nutrient solutions of higher salinity than that obtainable with the use of simple acids and salts or water-soluble fertilizers.

EVALUATION OF OCCLUSION RISKS

OBSERVATIONS

The assessment of the risks of occlusion of the irrigation system, when it is performed before the design of the same, allows for the correct dimensioning of the system in order to minimize the risks.

When the risks are high, chemical-physical interventions are sometimes necessary to correct the water, as in the case of a significant presence of dissolved iron or manganese, or in the case of water with a positive saturation index. the limiting element is the suspended solids, filtration is necessary.

REACTION CORRECTION ELEMENTS pH

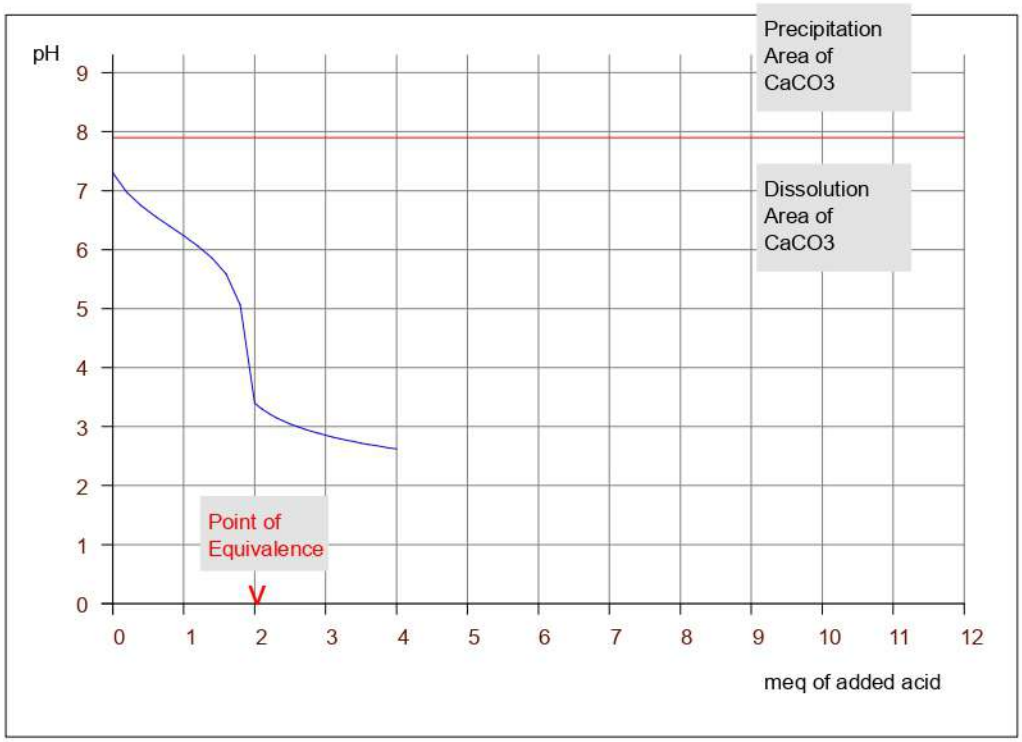
OBSERVATIONS

The pH reaction of the water is mainly regulated by the bicarbonates and carbonates present. Their neutralization with acids leads to a lowering of the reaction of the water.

Referring to the bicarbonate titration curve, the quantities of acid to be added and the quantities of nutrients added are given.

Remember how the neutralization of bicarbonates can also be done by mixing more acids. This is particularly useful when you don't want to add too much nitrogen. For example, the neutralizing power of 6 meq of nitric acid is the same that is obtained by mixing 2 meq of sulfuric acid, 2 meq of phosphoric acid, 2 meq of nitric acid.

TITRATION CURVE



CORRECTION WITH NITRIC ACID 65,0 %

meq of added acid	ml of acid per mc	NITROGEN CONTRIBUTED PER				
		1 mc (N gr)	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

CORRECTION WITH PHOSPHORIC ACID 85,0 %

meq of added acid	ml of acid per mc	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 mc	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