

Soil Test Report



Report name: **Orchard trees** Test Date: 02/02/21 Date saved: 02/29/24
 Next crop: Apples Last crop: Apples
 *Soil test type: Logan Labs Std M3 w/ extras
 Soil type: Clay loam This soil is calcareous: FALSE

Target cations and elements:	Ca other (%)	Mg 15%	K 6.0%	Na 1.0%	Elemental P (lbs/a) 250	S (lbs/ac) auto	Target pH 6.8	Show min Ca, Mg, K FALSE
enter other ->	63.5							

Logan Labs Std M3 w/ extras Test Report

Alerts

Sample Location	Orchard
Sample ID	trees
Lab Number	
* Sample Depth in Inches	6
* Total Exchange Capacity (M.E.)	18.91
* pH of Soil Sample	6.70
* Organic Matter (%)	4.44
* Sulfur: ppm	12
Mehlich III as (P ₂ O ₅)	
* Phosphorus lbs/acre	517
Calcium: Desired value	
* lbs/acre Value found	4690
Deficit	
Magnesium: Desired value	
* lbs/acre Value found	999
Deficit	
Potassium: Desired value	
* lbs/acre Value found	883
Deficit	
* Sodium: lbs/acre	69
* Calcium (60 to 70%)	62.01
* Magnesium (10 to 20%)	22.02
* Potassium (2 to 5%)	5.99
* Sodium (.5 to 3%)	0.79
Other Bases (Variable)	4.70
Exchangable Hydrogen (10 to 15%)	4.50
* Boron (ppm)	4.54
* Iron (ppm)	153
* Manganese (ppm)	31
* Copper (ppm)	2.51
* Zinc (ppm)	3.24
Aluminum (ppm)	490
Cobalt (ppm)	0.46
Molybdenum (ppm)	1.00
Ammonium (ppm)	1.10
Nitrate (ppm)	15.90
Selenium (ppm)	0.14
Silicon (ppm)	6
EC mmhos/cm	0.15

Click switch to override an error message, if present.	
FALSE	
[Nitrogen has moved to the next tab]	
[Select Area and Depth has moved to the next tab]	

(* = required entry)

Saturated Paste Test Report

Report name:

Test Date: 2/2/21

Report Date: 2/29/24

Sample Location: Orchard trees

Sample ID:

Water Used: Well

	Units	Value	Targets		Measurement % of	Comments
			Low	High	Target	
pH	none	6.60	6.2	6.8	100%	
Soluble salts	ppm	47	0	600	100%	
Chloride	ppm	14	0	90	100%	
Bicarbonate	ppm	46	0	120	100%	
Sulfur	ppm	1.80	3.0	5.0	60%	S is low in soil and paste
Phosphorus (as P)	ppm	0.15	0.3	0.6	50%	
Calcium	ppm	3.14	20	40	16%	
Calcium	meq/l	0.16	1.0	2.0		
Magnesium	ppm	2.06	4	8	52%	Mg is high in soil but low in paste
Magnesium	meq/l	0.17	0.33	0.67		
Potassium	ppm	4.18	10	12	42%	
Potassium	meq/l	0.11	0.26	0.31		
Sodium	ppm	6.68	0	5	134%	
Sodium	meq/l	0.29	0	0.22		
Calcium	%	21.59%	60%	60%	36%	
Magnesium	%	23.61%	20%	20%	118%	
Potassium	%	14.92%	12%	15%	100%	
Sodium	%	39.88%	0%	5%	798%	
Boron	ppm	0.03	0.05	0.1	60%	B is high in soil but low in paste
Iron	ppm	3.45	0.5	1.5	230%	Fe is high in soil and paste
Manganese	ppm	0.06	0.14	0.3	43%	Mn is low in soil and paste
Copper	ppm	0.01	0.05	0.08	20%	Cu is low in soil and paste
Zinc	ppm	0.01	0.07	0.15	14%	Zn is low in soil and paste
Aluminum	ppm	3.30	0	1.5	220%	

Date printed: 2/29/2024

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Enter Area To Be Amended and Select Units:

8000 sq feet
lbs/oz

Select Depth To Mix Amendments

Check all that apply. If all the boxes are unchecked we assume you will mix in the amendments to a depth of 6 inches (15 cm).

FALSE This soil is in a raised bed or is a potting mix.
inches Enter the depth of the raised bed.

We assume you will be able to dig the amendments in to the full depth of the bed, up to 12 in. (30 cm) unless you also check the "no till" box below.

FALSE This is no-till. The amendments cannot be dug in.

FALSE I want to enter the depth manually.
inches Enter the depth.

Choose Target Nitrogen Amount

other lbs/acre Independent of depth to mix amendments
N target -> 75 lbs/acre

Best fit compost / nitrogen source for this soil
will have an N - P205 - K2O ratio of 0.8 - 0 - 0

For advice on target nitrogen amounts, read the article linked below.

<https://growabundant.com/how-much-nitrogen-shall-i-add/>

TRUE Use the pre-selected nitrogen sources below

Choose up to 2 Compost/Nitrogen Sources

Source 1 Composted Chicken Manure (3 - 2 - 2)

Or enter your own compost or NPK fertilizer below

Name:

N

P

K

P as P2O5, K as K2O

Select C:N ratio:

-

or enter your own C/N ratio:

Source 2 Feather Meal (12-0-0)

Do these amendments supply the target NPK?

Nitrogen?	yes	100%	If P and K are not 100%, OrganiCalc may recommend P and/or K mineral amendments
Phosphorus?	no	0%	
Potassium?	no	0%	

FALSE Use additional compost or other organic carbon-based N-P-K amendments

Additional compost sources will be recommended before the standard sources above.

10 <> Alternatively, 3.7 lbs of (Blue) Copper Sulfate Pentahydrate, an organic fungicide, may be used.

20 <> Available silicon has been found to be beneficial to plants. Foliar feed potassium silicate as a mildew preventative (check with your certifier). Soil-applied basalt rock dust has also been shown to supply silicon in low pH, weathered soils.

21 <> In addition to the soil application, a foliar application of BioMin Manganese prior to flowering and whenever signs of deficiency are present is highly recommended. Check the label for application rates.

Where to source amendments

<https://growabundant.com/where-to-source-amendments/>

How to apply amendments

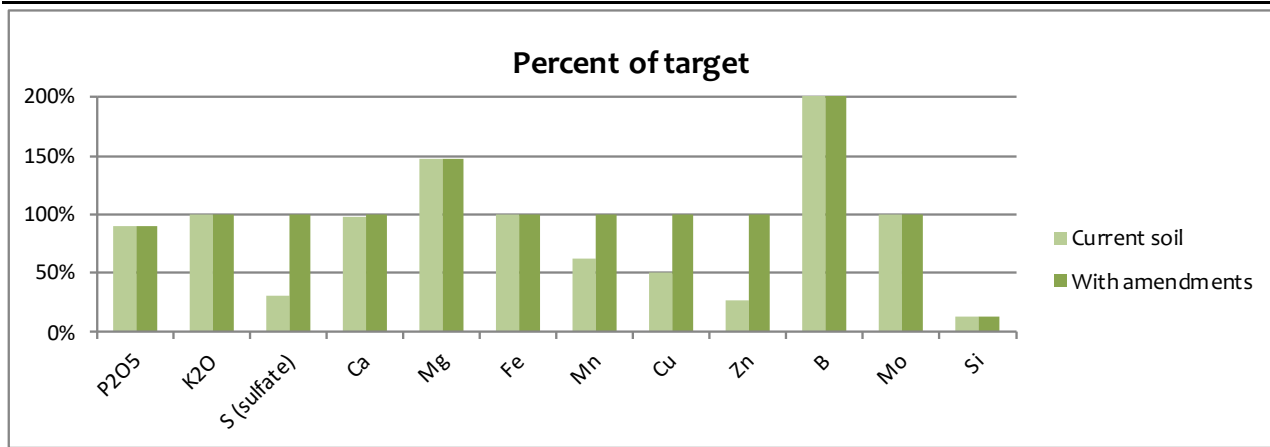
<https://growabundant.com/how-to-apply-amendments/>

****End of Amendment Report****

Test Date: 2-Feb-2021

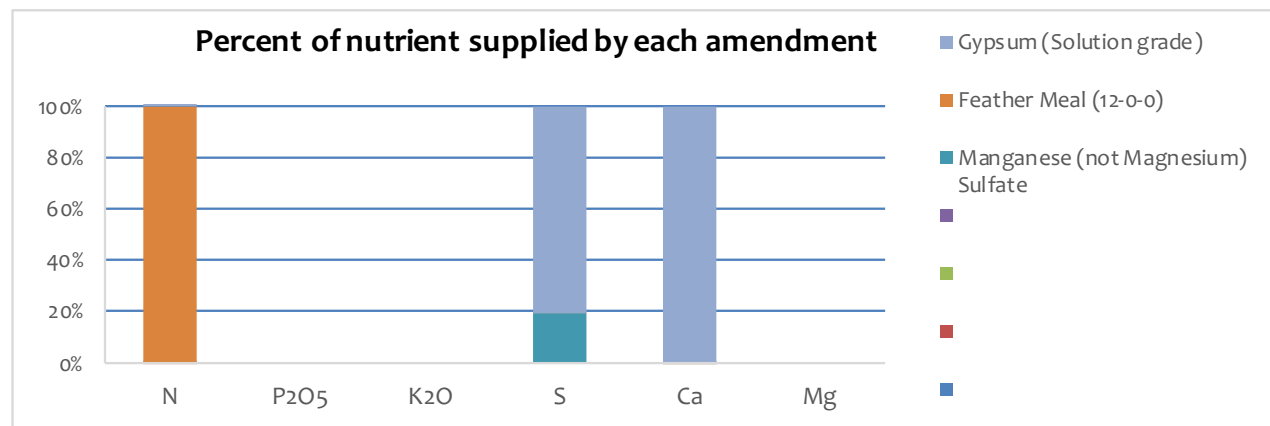
Analysis Details (6" furrow depth)

	Measured (lbs/ac)	Target %	Target (lbs/acre)	Measurement percent of target	Application limit (lbs/ac)	Amount needed (lbs/ac)	Amount to be applied (lbs/ac)	Measured plus amount to be applied (lbs/ac)	How'd we do? % of target this application
N	--		75			75	75		100%
P ₂ O ₅	517		572	90%	100000	0	0	517	90%
P	226		250	90%	100000	0	0	226	90%
K	883	6.0%	885	100%	100000	0	0	883	100%
K ₂ O	1064		1066	100%	100000	0	0	1064	100%
S (as sulfate)	24		80	30%	100000	56	125	149	187%
S (as elemental)	-		0	-	270	0	0	-	-
Ca	4690	64%	4803	98%	100000	113	113	4803	100%
Mg	999	15%	681	147%	613	0	0	999	147%
Fe	306		120	255%	100000	0	0	306	255%
Mn	62		100	62%	100000	38	38	100	100%
Cu	5.0		10	50%	100000	5.0	5.0	10.0	100%
Zn	6.5		25.0	26%	100000	18.5	18.5	25.0	100%
B	9.1		4	227%	100000	0.0	0.0	9.1	227%
Na	69	1.0%	87	79%	100000	18	0	69	
Co	0.92		0.7 to 4.0	100%	100000	0.0	0.0	0.9	100%
Mo	2.00		0.5 to 2.0	100%	100000	0.0	0.0	2.0	100%
Si	13		100	13%	100000	87	0	13	13%



Orchard trees

Note: P ranging between 100% and 200% target. has been set to 100% and has been divided in half above 200% target. Fe above 100% has been set to 100%. Sulfur between 100% and 400% target has been set to 100% and has been divided by 4 above 400%.



Soil - Paste - Water Summary

Report Name: Orchard trees

Analysis date: 2/29/2024



	Soil				Paste (Well Water)				Well Water			
Test date	2/2/21				2/2/21				1/29/21			
	Value (ppm)	Target (ppm)	% target	% target after amending	Value (ppm)	Target low (ppm)	Target high (ppm)	% target	Value (ppm)	Target low (ppm)	Target high (ppm)	% target
Total Exchange Capacity	18.91											
pH	6.7				6.60	6.2	6.8	100%	7.70	6.5	7.0	501%
Organic matter	4.44											
Soluble salts					47		600	100%				
Total alkalinity									323	120.0	180.0	High
Hardness									187			Hard
Sodium Adsorption Ratio									2.4			Significant
Chloride					14		90	100%	38			Safe
Carbonate									0			Safe
Bicarbonate					46		120	100%	394			Severe
Sulfur in Sulfate (SO4-S)	12	40	30%	187%	1.8	3	5	60%				
Total Sulfate (SO4)									90		90.0	Safe
Nitrate-N	15.90								0.2			
Ammonium-N	0.14											
Phosphorus (as P)	113	125	90%		0.15	0.3	0.6	50%	0.01	0.0	0.4	Safe
Calcium	2345	2402	98%	100%	3	20	40	16%	37	40	80	Low
Magnesium	500	340	147%		2	4	8	52%	23	30	50	Low
Potassium	442	442	100%		4	10	12	42%	1	2	10	Low
Sodium	35	43	79%		7		5	134%	76	0	50	High
Ca %	62.0%	64%	98%		22%	60%	60%	36%				
Mg %	22.0%	15%	147%		24%	20%	20%	118%				
K %	6.0%	6.0%	100%		15%	12%	15%	100%				
Na %	0.8%	1%	79%		40%		5%	798%				
Boron	4.54	2.0	227%		0.03	0.05	0.10	60%	0.32		0.5	Safe
Iron	153	60	255%		3.45	0.50	1.50	230%	0.1			
Manganese	31	50	62%	100%	0.06	0.14	0.30	43%				
Copper	2.51	5	50%	100%	0.01	0.05	0.08	20%				
Zinc	3.24	12.5	26%	100%	0.01	0.07	0.15	14%				
Aluminum	490				3.30		1.50	220%				
Cobalt	0.46	0.4 to 2.0	100%									
Molybdenum	1	0.3 to 1.0	100%									
Selenium	0.14											
Silicon	6.3	50	13%									
EC (mS/cm)	0.15			Safe	0.07			Safe	0.88			Concerning

Grow Abundant Gardens Soil-Paste-Water V3.0A

Irrigation Water Test Report



Report name:

Test Date: January 29, 2021

Sample Location: Well

Report Date: February 29, 2024

	Units	Value	Target Range		Warnings	Warning Levels	
pH	(no units)	7.7	6.5	7.0	High	Low, Safe, High	
Hardness	ppm	187	50	150	Hard	Soft, Moderate, Hard, Very Hard	
Hardness	grains/ gallon (calculated)	10.9					
Conductivity	mmhos/cm	0.88	0	0.75	Concerning	Safe, Concerning, High, Severe	
Sodium Adsorption Ratio	sqrt(mmole/L) (calculated)	2.41	See notes		Significant	Safe, Okay, Significant, High, Severe	
	Value (ppm)	Value (meq/l)	Value (lbs/ac-in)	Target Range (ppm)		Warnings	Warning Levels
Calcium Ca	36.7	1.83	8.3	40	80	Low	Low, Safe, High
Magnesium Mg	23.1	1.90	5.3	30	50	Low	Low, Safe, High
Potassium K	1	0.03	0.2	1.5	10	Low	Low, Safe, High
Sodium Na	75.7	3.29	17.2	0	50	High	Low, Safe, High
Iron Fe	0.1		0.0	0	0.1	Safe	Safe, High
Total cations (calculated)		7.05					
Total Alkalinity	323	6.46	73.4	120	180	High	Low, Safe, High
Carbonate	0.0	0.00	0.0	0	15	Safe	Safe, High
Bicarbonate	394	6.46	89.5	0	120	Severe	Safe, Moderate, Severe
Chloride	38	1.07	8.6	0	70	Safe	Safe, Low, Moderate, Severe
Sulfate	90	1.87	20.4	0	90	Safe	High, Good
Total anions (calculated)		9.40					
Salt Concentration	563.2	(calculated)	128.00	0	500	Low	Safe, Low, Moderate, Severe
Boron	0.32		0.07	0	0.5	Safe	Safe, Very Low, Low, Moderately Low, Moderately High, High, Severe
	Units	Value	Expected Range		Warnings	Warning Levels	
Cation/Anion Ratio (calculated)		0.75	0.8	1.2	Out of range	May be out of range if ion levels are low	
Nitrate	ppm	0.20	0	5	Safe	Safe, High	
P ppm	ppm	0.01	0	0.4	Safe	Safe, High	
pHc	(no units, not used)						
Adj. SAR	sqrt(mmole/L) (calculated)	2.79	See notes. (This will not match LL values due to differences in calculation methods.)		Safe	Safe, Okay, Significant, High, Severe	

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Irrigation Water Analysis Notes - Well - 1/29/2021

Salinity Concerns	See reference High salinity (a high quantity of dissolved minerals in the water) decreases the ability of plant roots to take up water. Plants may wilt even though the soil has plenty of moisture. Plant tolerance for salts varies by plant species.
Some - may have detrimental effect on sensitive crops.	
Alkalinity Concerns (Usually Due to Bicarbonates)	See reference High alkalinity has a detrimental effect on seedlings and other plants in pots. In the extreme, it is a problem for field crops, especially in light soil where bicarbonates can build up and raise soil pH.
Expect a detrimental impact to field crops if this irrigation water is the only source of water for the crop.	
Water Infiltration Problems Due to High Sodium Adsorption Ratio	See reference Irrigation water with high sodium adsorption ratio and low conductivity can lead to a buildup of sodium in the soil, causing the soil to lose porosity and form a hard layer at the surface that water cannot penetrate.
None.	Irrigation water with high sodium adsorption ratio and low conductivity can lead to a buildup of sodium in the soil, causing the soil to lose porosity and form a hard layer at the surface that water cannot penetrate.
None.	
Sodium Removal of Calcium and Magnesium	See reference High residual sodium carbonate (RSC) will tend to remove calcium and magnesium from the soil, increasing the percentage of sodium which in turn clogs air pores in clay soils. High RSC irrigation water should be treated with gypsum to supply additional calcium.
High. All or most Ca and Mg will be removed from irrigation water. Monitor water infiltration and soil pH; amendment with gypsum is necessary.	
Boron Toxicity Concerns	See reference Boron at high levels can be toxic to plants.
None.	
Chloride Toxicity Concerns	See reference Chloride at high levels can be toxic to plants.
None.	
Iron Toxicity Concerns	See reference Iron at high levels can be toxic to plants. At lower levels it may cause staining and emitter plugging.
None.	
Overhead Watering Concerns - Leaf Burns and Stains	See reference Overhead watering with water high in sodium or chlorine can cause leaf burn. Water high in iron can cause staining.
None.	
Overhead Watering Concerns - Hard Water Spots	See reference Hard water can cause white spots on foliage when overhead irrigation is used. White spots can be mitigated by irrigating at night or on cloudy days when evaporation is low.
Overhead irrigate at no more than 0.2 in/hr and only at night or on cloudy days	
Suitability for Foliar Spray Mixes	See reference The water used for foliar sprays should be quite pure and of slightly acid pH so as to not interfere with any of the spray active ingredients.
Excess sodium. Do not use this water for a foliar spray.	
Drip Irrigation Emitter Plugging Concerns	See reference Drip emitters can be plugged by lime deposits, excess iron and high alkalinity, as well as other causes not measured on an irrigation test such as particles and algae.
Due to: pH: Severe. Soluble salts: Moderate. Iron: None. Calcium: none Alkalinity: severe	
Corrosion Concerns	See reference Water with pH under 6.5 can corrode metal pipes and fittings.
None.	