Strawberry Nutrition

Mark Bolda

UC Cooperative Extension

ANALYTICAL CHEMISTS
and
BACTERIOLOGISTS
Approved by State of California

SOIL CONTROL LAB

42 HANGAR WAY
WATSONVILLE
CALIFORNIA
95076
USA

TEL: 831-724-5422
FAX: 831-724-3188

Work Order #: 2060799
Account #: 4004
Date Received: June 28, 2012
Date Reported: July 4, 2012

University of California - Mark Bolda
1432 Freedom Blvd
Watsonville, CA 95076-2741
Attn: Mark Bolda

Leaf Tissue Analysis

Date Received:	June 28, 2012
Project # / Name:	None / None
Sample Identification:	Castroville Strawberry Fld.
Crop:	Strawberry
Portion of plant analyzed:	Leaves
Lab Sample #:	2060799-1/1

	Your Results		Strawberry Optimum Range
Total Nitrogen (N)	2.0	%	2.50-4.00
Total Phosphorus (P)	0.59	%	0.25-1.0
Potassium (K)	0.90	%	1.30-3.0
Calcium (Ca)	2.9	%	1.00-2.50
Magnesium (Mg)	1.2	%	0.25-1.0
Water Soluble Sulfate Sulfur (S)	0.038	%	-
Total Sulfur (S)	0.23	%	-
	ppm (mg/Kg)		
Copper (Cu)	11		6-50
Zinc (Zn)	29		20-200
Iron (Fe)	410		50-200
Manganese (Mn)	440		50-200
Boron (B)	170		23-50
Molybdenum (Mo)	2.3		-
Aluminum (Al)	24		-
Sodium (Na)	1800		-
Chloride (Cl)	7500		-
Nitrate (NO_3-N)	550		-

Basic components of a plant.

- Hydrogen
- Oxygen
- Carbon

Total about 92% of the plant.

Next basic components of a plant.

- Nitrogen: 2- 4 % of the total
- Phosphorous : 0.5-0.9% of the total
- Potassium: 1.3-1.8% of the total

6% of the total mineral content of the plant.

98%

Next basic components

- Calcium: 0.6%- 1.3% of the total
- Magnesium: 0.28 %-0.42% of the total
- Sulfur: 0.15% - 0.21% of the total

Total of 1% of the mineral content of the plant.

99%

Micronutrients (very, very small percentage)

- Zinc (0.002%)
- Iron (0.01%)
- Boron (0.005%)
- Manganese (0.03%)
- Copper (0.0004%)

Less than 1% of the total.

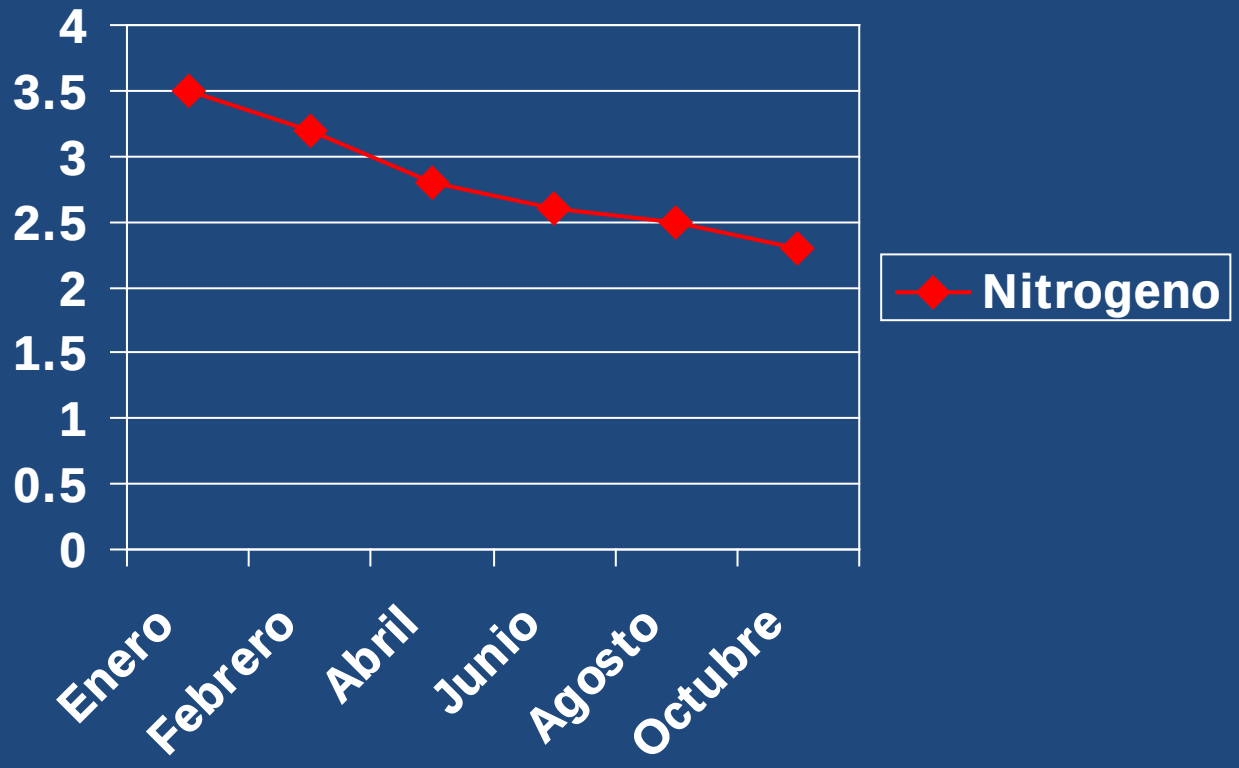
Analysis for Miracle Gro

- 24-8-16

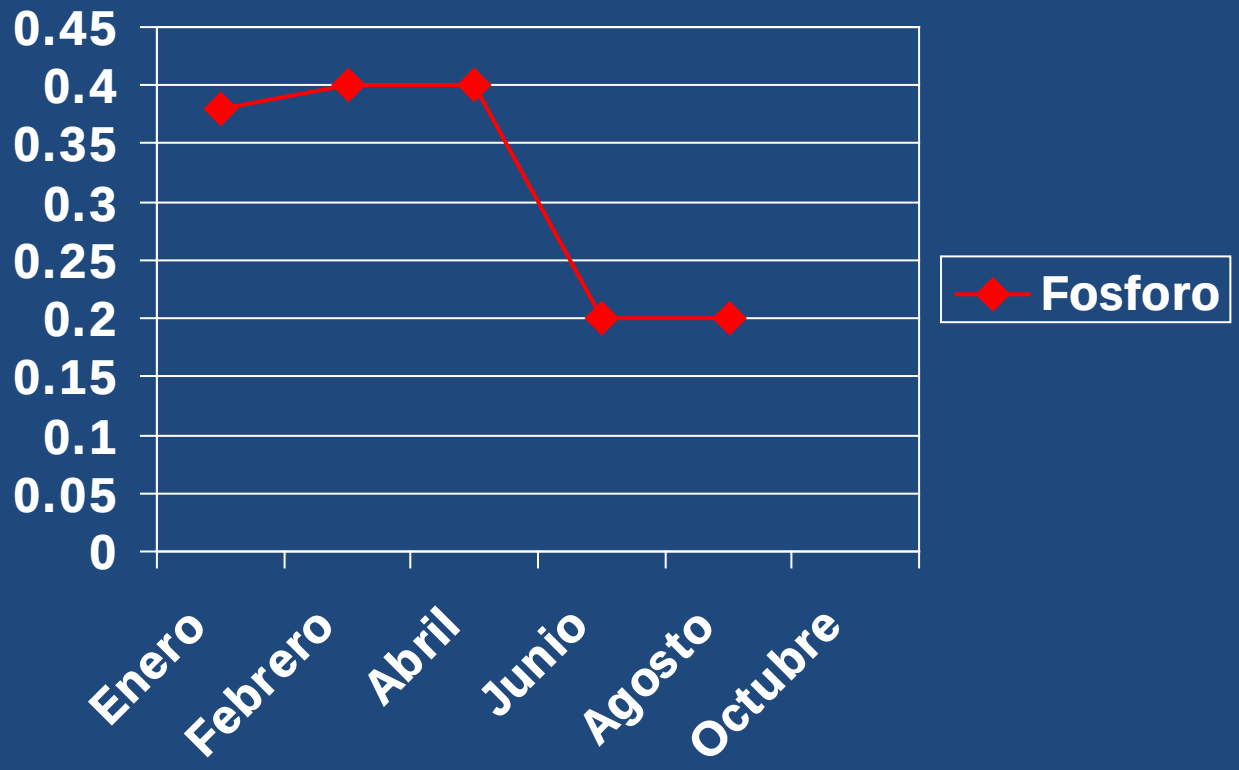
Leaf sufficiency in strawberry- pre-harvest

		Nutrient sufficiency ranges		
Growth stage	Nutrient	DRIS		
pre-harvest	% Nitrogen	3.1 - 3.8		
	% Phosphorus	0.50 - 0.90		
	% Potassium	1.8 - 2.2		
	% Calcium	0.6 - 1.3		
	% Magnesium	0.33 - 0.45		
	% Sulfur	0.19 - 0.23		
	PPM Boron	31 - 46		
	PPM Zinc	13 - 28		
	PPM Manganese	75 - 600		
	PPM Iron	70 - 140		
	PPM Copper	3.3 - 5.8		

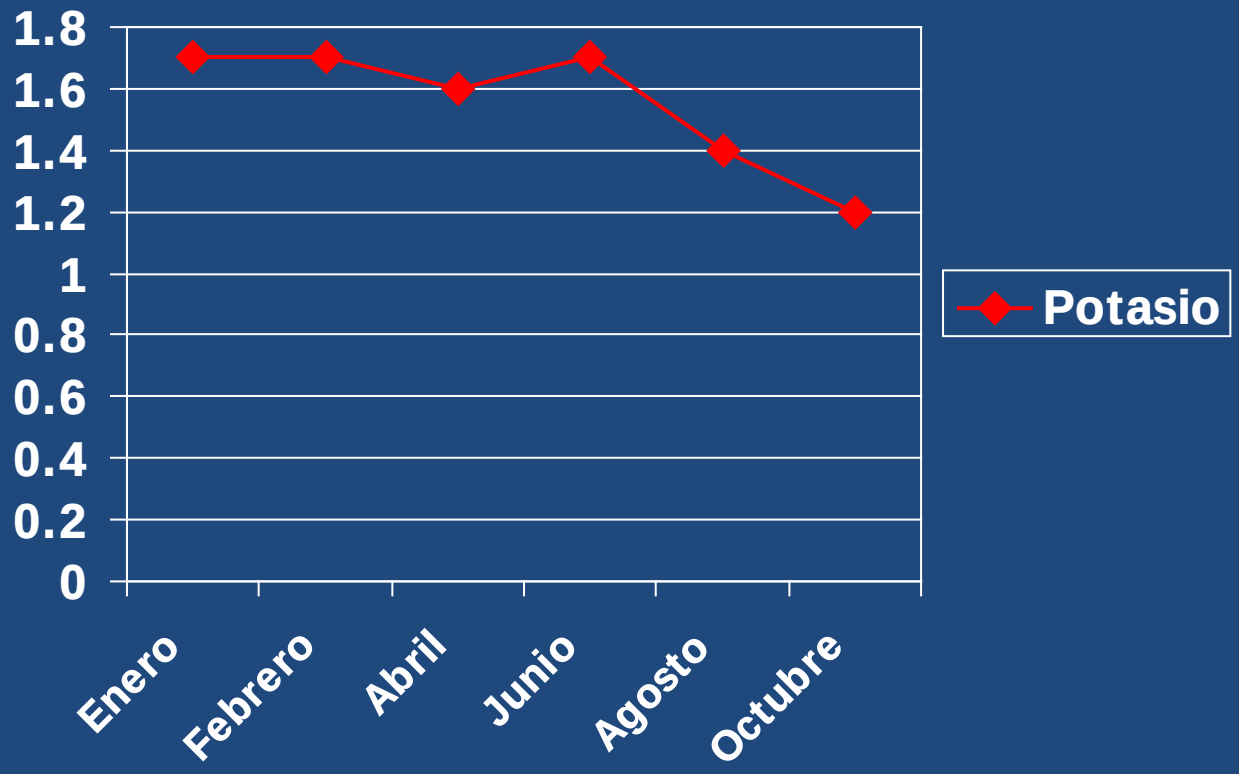
Level of nitrogen in the leaf



Level of phosphorous in the leaf

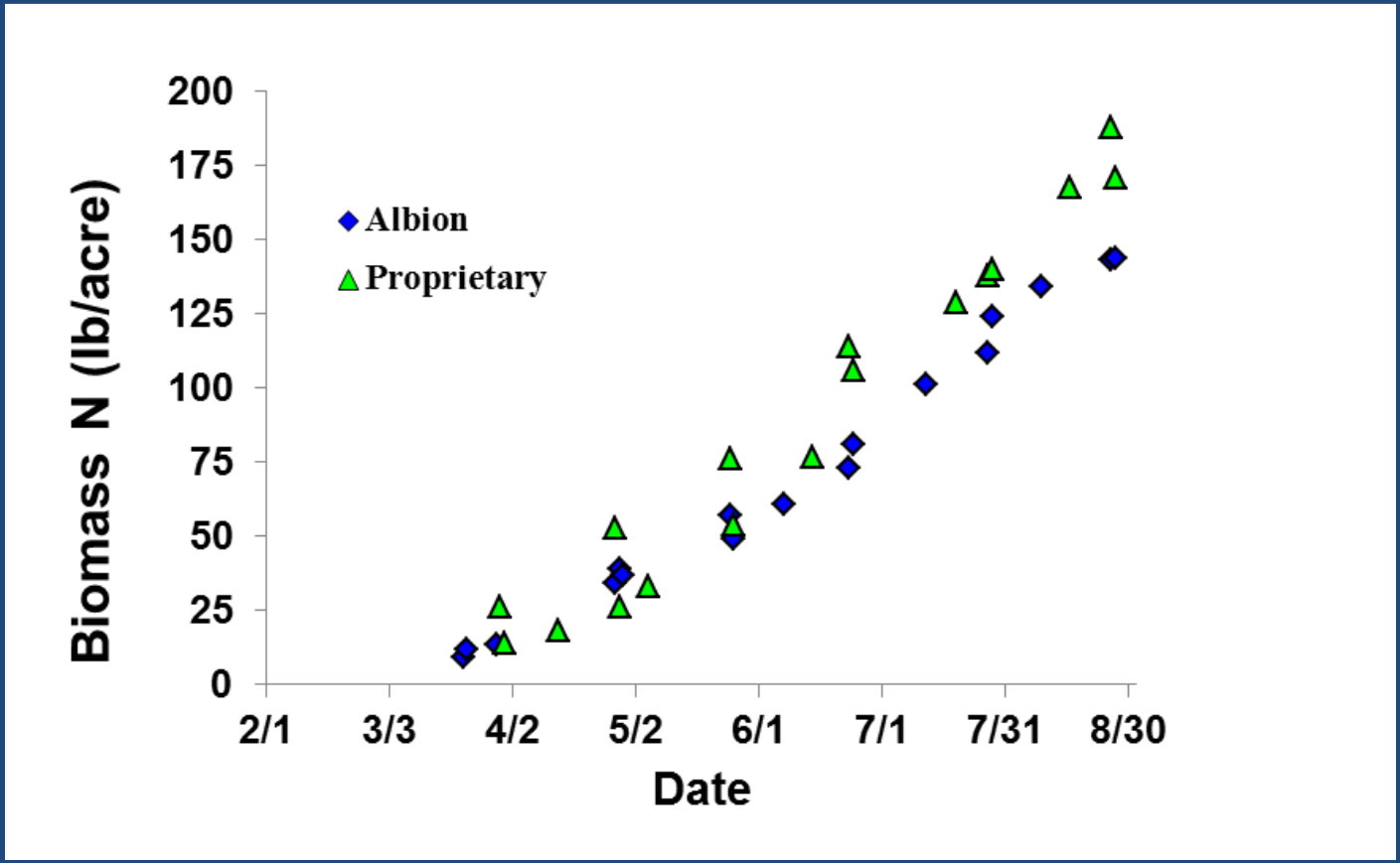


Level of potassium in the leaf



Nitrogen assimilation is constant:

Average from three fields per variety



- **Acerca de 20 lb N/acre asimilado desde plantar hasta marzo.**
- **Acerca1 lb N/acre/day por el resto de la estación.**

Leaf sufficiency in strawberry - harvest

main harvest				
	% Nitrogen	2.4 - 3.0		
	% Phosphorus	0.30 - 0.40		
	% Potassium	1.3 - 1.8		
	% Calcium	1.0 - 2.2		
	% Magnesium	0.28 - 0.42		
	% Sulfur	0.15 - 0.21		
	PPM Boron	40 - 70		
	PPM Zinc	11 - 20		
	PPM Manganese	65 - 320		
	PPM Iron	85 - 200		
	PPM Copper	2.6 - 4.9		

Excess of salt

Salt damage

Comparing watered fields

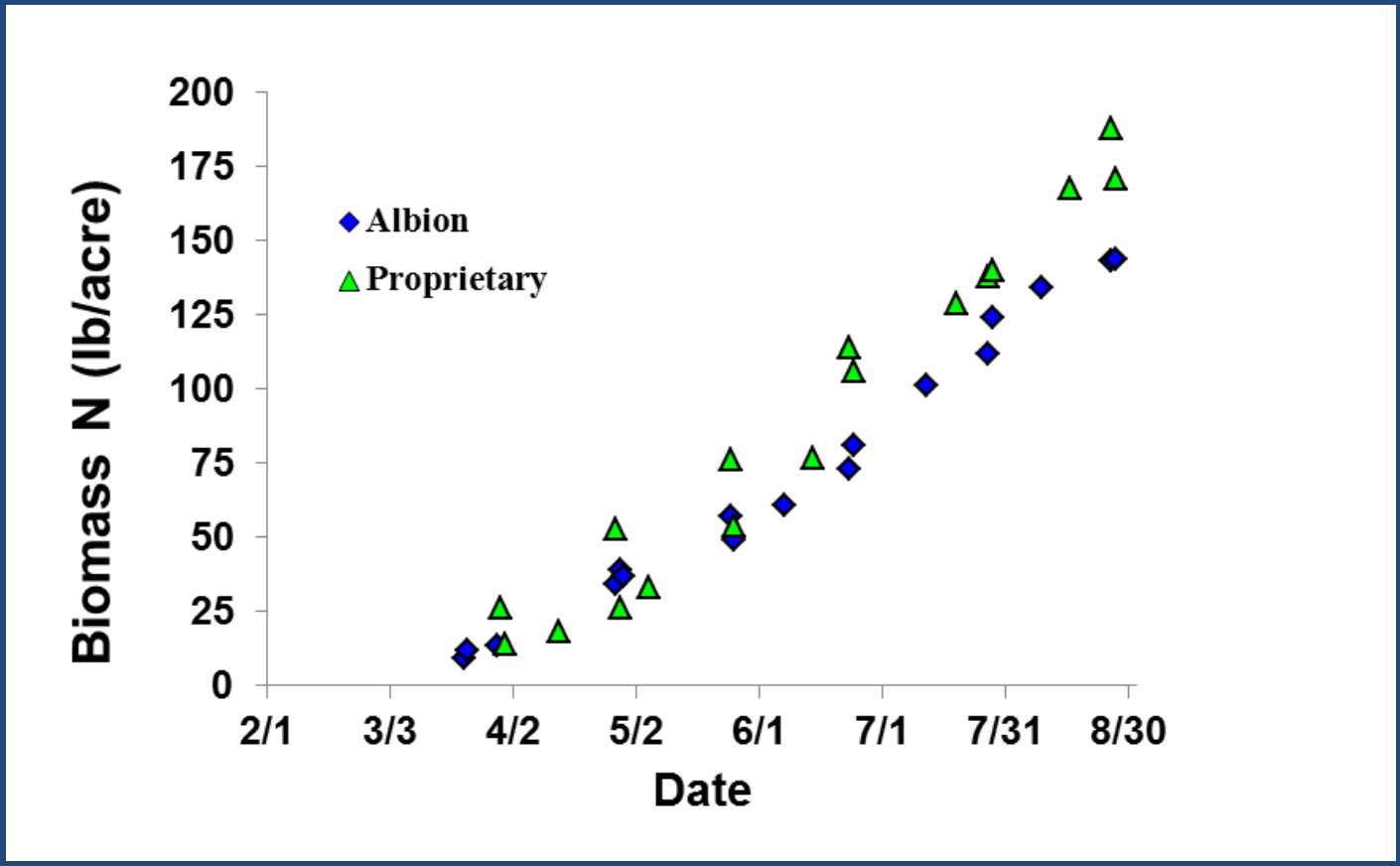
	Nitrate (ppm)	Ammonium (ppm)	EC (dS/m)
Sample 1 (not sprinkled):	58	4.8	2.8
Sample 2 (not sprinkled):	72	5.2	4.2
Sample 3 (not sprinkled):	69	4.8	3.8
Sample 4 (sprinkled):	24	5.1	2.2

Potassium and phosphorous:

- A higher proportion of phosphorous and potassium goes to the fruit,
- but assimilation is a little later than nitrogen.

- Supposing a good yield, the nutrient requirements of strawberry are as follows:

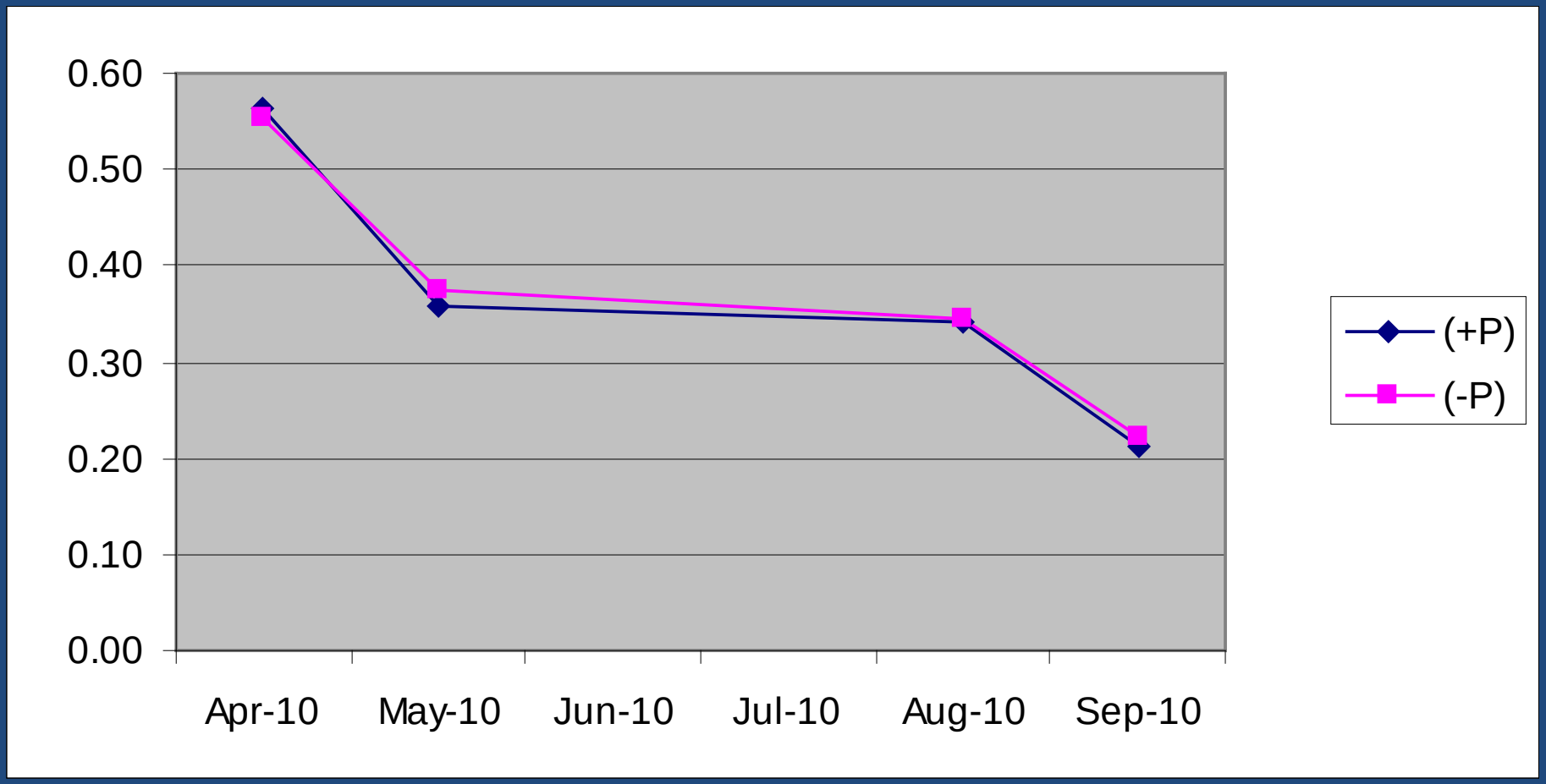
180 – 220 lb nitrogen
90 – 110 lb phosphorous
270 – 330 lb potassium


Biomass N (lb/acre)
200
175
150
125
100
75
50
25
0
Albion
Proprietary
2/1
3/3
4/2
5/2
6/1
7/1
7/31
8/30
Date

Comparison of using and not using phosphorous in a high P field.

	10/9/2009	9/8/2010
26 lbs P (+P)	85.5 Olsen P	79.6 Olsen P
0 lbs P (-P)	83.5 Olsen P	77.3 Olsen P

Phosphorous leaf concentrations



Fruit yield = same

Fruit quality = same

Potassium

- We do not often find potassium problems in our agricultural fields.
- Sufficiency should be between 200 and 300 ppm in the soil.

	Your Values (lbs/acre 6" deep)	Suggested Values	
Ammonia (NH_3-N)	11	10-50	OK
Nitrate (NO_3-N)	9.5	20-100	Low
Total Available N	21	75-150	Low
Phosphorous(P_2O_5)	450	100-300	High
Potassium (K_2O)	500	450-750	OK
Calcium (Ca)	4000	3233-4041	OK
Magnesium (Mg)	680	323-646	High
Sulfate (SO_4-S)	130	100-200	OK
Sodium (Na)	80	< 250	OK
Chloride (Cl)	22	1-100	OK
ECe (dS/m)	0.80	0.2-4	OK
Copper (Cu)	NA	1 +	
Zinc (Zn)	NA	3 +	
Iron (Fe)	NA	8 +	
Manganese (Mn)	NA	4 +	
Boron (B)	NA	1-4	
SAR	NA	0-6	
CEC (meq/100gms)	13	10-20	OK
ESP (%)	1.3	0-10	OK
pHs Value	6.8	6.5-7.5	OK
Organic Matter (%)	NA		

RECOMMENDATIONS
ALL VALUES lbs/acre 6" deep

125	Nitrogen (N)
0	Phosphorous (P_2O_5)
100	Potassium (K_2O)
0	Gypsum ($CaSO_4$)
2000	Lime ($CaCO_3$)
0	Dolomite ($CaCO_3$ & $MgCO_3$)
0	Sulfur

*Gypsum adds Ca and doesn't affect pH; Lime adds Ca and raises pH; Dolomite adds Ca & Mg & raises pH.

Lime Requirement:
Tons of 100% $CaCO_3$ Lime per Acre 6" deep needed to raise pH of soil to:

pH 6.0 needs	NA
pH 6.5 needs	NA
pH 7.0 needs	NA

Gypsum Requirement (needed for clay treatment)
NA tons per acre 6" deep
Gypsum helps the soil structure by "loosening" the soil

Data:			Method
NO_3-N	4.7	mg/Kg	KCl
NH_3-N	5.6	mg/Kg	KCl
P	100	mg/Kg	Olsen
SP	48	%	Sat
pHs	6.8	unit	Sat
ECe	0.80	dS/m	Sat
Ca	NA	meq/L	Sat
Mg	NA	meq/L	Sat
Na	NA	meq/L	Sat
K	NA	meq/L	Sat
Cl	0.64	meq/L	Sat
SO_4-S	4.3	meq/L	Sat
SAR	NA	ratio	Calc
B	NA	mg/Kg	CaCl2
Cu	NA	mg/Kg	DTPA
Zn	NA	mg/Kg	DTPA
Fe	NA	mg/Kg	DTPA
Mn	NA	mg/Kg	DTPA

Data:			Method
OrgMat	NA	%	WalkBk
Org-C	NA	%	WalkBk
SMP Bufffer pH	7.28	unit	SMP
GypReq	NA	meq/100g	GypSol
Ca	2000	mg/Kg	NH_4OAc
Mg	340	mg/Kg	NH_4OAc
Na	40	mg/Kg	NH_4OAc
K	210	mg/Kg	NH_4OAc

Cation Exchange Capacity (CEC) and Base Saturation Percentages

CEC	13	meq/100gm	Calc.
NH_3-N	0.3	% of CEC	Calc.
Ca	73.4	% of CEC	Calc.
Mg	21.1	% of CEC	Calc.
Na	1.3	% of CEC	Calc.
K	3.9	% of CEC	Calc.
H	0.0	% of CEC	Calc.

Lab Analyst:

Watsonville, CA 95076-2741 Sample ID: Xtremely Healthy

Attn: Mark Bolda

	Your Values (lbs/acre 6" deep)	Suggested Values	
Ammonia (NH_3-N)	23	10-50	OK
Nitrate (NO_3-N)	67	20-100	OK
Total Available N	90	75-150	OK
Phosphorous(P_2O_5)	540	100-300	High
Potassium (K_2O)	580	686-1144	Low
Calcium (Ca)	6500	5850-7312	OK
Magnesium (Mg)	1700	585-1170	High
Sulfate (SO_4-S)	310	100-200	High
Sodium (Na)	210	< 250	OK
Chloride (Cl)	130	1-100	High
ECe (dS/m)	1.7	0.2-4	OK
Copper (Cu)	NA	1 +	
Zinc (Zn)	NA	3 +	
Iron (Fe)	NA	8 +	
Manganese (Mn)	NA	4 +	
Boron (B)	NA	1-4	
SAR	NA	0-6	
CEC (meq/100gms)	24	10-20	OK
ESP (%)	1.8	0-10	OK
pHs Value	7.1	6.5-7.5	OK
Organic Matter (%)	NA		

RECOMMENDATIONS

ALL VALUES lbs/acre 6" deep

50	Nitrogen (N)
0	Phosphorous (P_2O_5)
300	Potassium (K_2O)
6000	Gypsum ($CaSO_4$)
0	Lime ($CaCO_3$)
0	Dolomite ($CaCO_3$ & $MgCO_3$)
0	Sulfur

*Gypsum adds Ca and doesn't affect pH; Lime adds Ca and raises pH; Dolomite adds Ca & Mg & raises pH.

Lime Requirement:
Tons of 100% $CaCO_3$ Lime per Acre 6" deep needed to raise pH of soil to:

pH 6.0 needs	NA
pH 6.5 needs	NA
pH 7.0 needs	NA

Gypsum Requirement (needed for clay treatment)
NA tons per acre 6" deep
Gypsum helps the soil structure by "loosening" the soil

Data:			Method
NO_3-N	33	mg/Kg	KCl
NH_3-N	12	mg/Kg	KCl
P	120	mg/Kg	Olsen
SP	57	%	Sat
pHs	7.1	unit	Sat
ECe	1.7	dS/m	Sat
Ca	NA	meq/L	Sat
Mg	NA	meq/L	Sat
Na	NA	meq/L	Sat
K	NA	meq/L	Sat
Cl	3.1	meq/L	Sat
SO_4-S	8.6	meq/L	Sat
SAR	NA	ratio	Calc
B	NA	mg/Kg	CaCl2
Cu	NA	mg/Kg	DTPA
Zn	NA	mg/Kg	DTPA
Fe	NA	mg/Kg	DTPA
Mn	NA	mg/Kg	DTPA

Data:			Method
OrgMat	NA	%	WalkBk
Org-C	NA	%	WalkBk
SMP Bufffer pH	7.26	unit	SMP
GypReq	NA	meq/100g	GypSol
Ca	3300	mg/Kg	NH_4OAc
Mg	840	mg/Kg	NH_4OAc
Na	100	mg/Kg	NH_4OAc
K	240	mg/Kg	NH_4OAc

Cation Exchange Capacity (CEC) and Base Saturation Percentages			
CEC	24	meq/100gm	Calc.
NH_3-N	0.3	% of CEC	Calc.
Ca	66.7	% of CEC	Calc.
Mg	28.6	% of CEC	Calc.
Na	1.8	% of CEC	Calc.
K	2.6	% of CEC	Calc.
H	0.0	% of CEC	Calc.

Lab Analyst:

Mike Galloway

Attn: Mark Bolda

	Your Values (lbs/acre 6" deep)	Suggested Values	
Ammonia (NH_3-N)	48	10-50	OK
Nitrate (NO_3-N)	32	20-100	OK
Total Available N	80	75-150	OK
Phosphorous(P_2O_5)	590	100-300	High
Potassium (K_2O)	830	527-879	OK
Calcium (Ca)	5400	4497-5622	OK
Magnesium (Mg)	800	449-899	OK
Sulfate (SO_4-S)	230	100-200	High
Sodium (Na)	110	< 250	OK
Chloride (Cl)	23	1-100	OK
ECe (dS/m)	1.3	0.2-4	OK
Copper (Cu)	NA	1 +	
Zinc (Zn)	NA	3 +	
Iron (Fe)	NA	8 +	
Manganese (Mn)	NA	4 +	
Boron (B)	NA	1-4	
SAR	NA	0-6	
CEC (meq/100gms)	19	10-20	OK
ESP (%)	1.2	0-10	OK
pHs Value	5.4	6.5-7.5	Low
Organic Matter (%)	NA		

RECOMMENDATIONS
ALL VALUES lbs/acre 6" deep

50	Nitrogen (N)
0	Phosphorous (P_2O_5)
0	Potassium (K_2O)
0	Gypsum ($CaSO_4$)
6000	Lime ($CaCO_3$)
0	Dolomite ($CaCO_3$ & $MgCO_3$)
0	Sulfur

*Gypsum adds Ca and doesn't affect pH; Lime adds Ca and raises pH; Dolomite adds Ca & Mg & raises pH.

Lime Requirement:
Tons of 100% $CaCO_3$ Lime per Acre 6" deep needed to raise pH of soil to:

pH 6.0 needs	NA
pH 6.5 needs	NA
pH 7.0 needs	NA

Gypsum Requirement (needed for clay treatment)
NA tons per acre 6" deep
Gypsum helps the soil structure by "loosening" the soil

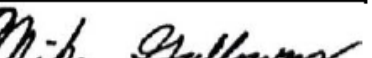
Data:			Method
NO_3-N	16	mg/Kg	KCl
NH_3-N	24	mg/Kg	KCl
P	130	mg/Kg	Olsen
SP	48	%	Sat
pHs	5.4	unit	Sat
ECe	1.3	dS/m	Sat
Ca	NA	meq/L	Sat
Mg	NA	meq/L	Sat
Na	NA	meq/L	Sat
K	NA	meq/L	Sat
Cl	0.67	meq/L	Sat
SO_4-S	7.5	meq/L	Sat
SAR	NA	ratio	Calc
B	NA	mg/Kg	CaCl2
Cu	NA	mg/Kg	DTPA
Zn	NA	mg/Kg	DTPA
Fe	NA	mg/Kg	DTPA
Mn	NA	mg/Kg	DTPA

Data:			Method
OrgMat	NA	%	WalkBk
Org-C	NA	%	WalkBk
SMP Bufffer pH	6.81	unit	SMP
GypReq	NA	meq/100g	GypSol
Ca	2700	mg/Kg	NH_4OAc
Mg	400	mg/Kg	NH_4OAc
Na	53	mg/Kg	NH_4OAc
K	340	mg/Kg	NH_4OAc

Cation Exchange Capacity (CEC) and Base Saturation Percentages

CEC	19	meq/100gm	Calc.
NH_3-N	0.9	% of CEC	Calc.
Ca	72.6	% of CEC	Calc.
Mg	17.9	% of CEC	Calc.
Na	1.2	% of CEC	Calc.
K	4.7	% of CEC	Calc.
H	2.6	% of CEC	Calc.

Lab Analyst:



Calcium

- Structural component of cell walls and cell tissues of plants.
- A deficiency of calcium in the plant leads to a general collapse of the structure of the tissue and the cell walls.

Burn of the leaf points of strawberry leaves.

Burning of the points of leaves owing to a deficiency of calcium.

Calcium

- A leaf tissue concentration of less than 0.9% means the plant is deficient.
- Calcium sufficiency is in the area of 1.5 % of dry leaf tissue.

Santa Maria Results
June 2007

Top 3 Symptomatic, Bottom 3 Healthy

N (Total) [SOP 525] %	P (Total) [SOP 590] %	K [SOP 550] %	S (Total) [SOP 590] ppm	B (Total) [SOP 590] ppm	Ca (Total) [SOP 590] %	Mg (Total) [SOP 590] %	Zn (Total) [SOP 590] ppm	Mn (Total) [SOP 590] ppm	Fe (Total) [SOP 590] ppm	Cu (Total) [SOP 590] ppm
2.15	0.33	1.65	1570	48	0.69	0.26	20	88	277	4.3
2.54	0.33	1.56	1710	73	0.74	0.29	19	118	296	4.8
2.55	0.32	1.48	1850	117	1.27	0.38	23	143	310	5.6
2.41	0.33	1.56	1710.00	79.33	0.90	0.31	20.67	116.33	294.33	4.90
2.59	0.28	1.24	1640	101	1.71	0.54	23	131	396	4.8
2.35	0.28	1.41	1650	72	1.25	0.40	17	108	405	3.6
2.60	0.27	1.42	1680	81	1.49	0.51	18	136	296	4.2
2.51	0.28	1.36	1656.67	84.67	1.48	0.48	19.33	125.00	365.67	4.20

Quantities of Calcium

- Total calcium and available calcium.
- Total tells us how much there is, while available is what the root encounters. Available normally between 4- 8 meq/l.

Calcium sufficiency

- Crop requirement between 100-300 lbs per acre.
- Every 1000 ppm represents 2000 lbs per acre.
- However, this is not all available and need to look at Ca in the soil solution, which is measured in meq/L.
- Hydroponic solutions are 4-8 meq/L.

	Your Values (lbs/acre 6" deep)	Suggested Values	
Ammonia (NH_3-N)	15	10-50	OK
Nitrate (NO_3-N)	120	20-100	High
Total Available N	130	75-150	OK
Phosphorous(P_2O_5)	130	100-300	OK
Potassium (K_2O)	360	450-750	Low
Calcium (Ca)	3300	3783-4729	Low
Magnesium (Mg)	1100	378-756	High
Sulfate (SO_4-S)	73	100-200	Low
Sodium (Na)	140	< 250	See SAR
Chloride (Cl)	39	1-100	OK
ECe (dS/m)	1.7	0.2-4	OK
Copper (Cu)	2.5	1 +	OK
Zinc (Zn)	2.0	3 +	Low
Iron (Fe)	110	8 +	OK
Manganese (Mn)	37	4 +	OK
Boron (B)	0.14	1-4	Low
SAR	1.1	0-6	OK
CEC (meq/100gms)	16	10-20	OK
ESP (%)	1.9	0-10	OK
pHs Value	4.4	6.5-7.5	Low
Organic Matter (%)	3.2		

RECOMMENDATIONS
ALL VALUES lbs/acre 6" deep

0	Nitrogen (N)
150	Phosphorous (P_2O_5)
200	Potassium (K_2O)
0	Gypsum ($CaSO_4$)
6000	Lime ($CaCO_3$)
0	Dolomite ($CaCO_3$ & $MgCO_3$)
0	Sulfur

*Gypsum adds Ca and doesn't affect pH; Lime adds Ca and raises pH; Dolomite adds Ca & Mg & raises pH.

Lime Requirement:
Tons of 100% $CaCO_3$ Lime per Acre 6" deep needed to raise pH of soil to:

pH 6.0 needs	2.2
pH 6.5 needs	2.7
pH 7.0 needs	3.2

Gypsum Requirement (needed for clay treatment)
1.3 tons per acre 6" deep
Gypsum helps the soil structure by "loosening" the soil

Data:			Method
NO_3-N	60	mg/Kg	KCl
NH_3-N	7.7	mg/Kg	KCl
P	29	mg/Kg	Olsen
SP	48	%	Sat
pHs	4.4	unit	Sat
ECe	1.7	dS/m	Sat
Ca	6.9	meq/L	Sat
Mg	5.0	meq/L	Sat
Na	2.6	meq/L	Sat
K	0.33	meq/L	Sat
Cl	1.2	meq/L	Sat
SO_4-S	2.4	meq/L	Sat
SAR	1.1	ratio	Calc
B	0.069	mg/Kg	CaCl2
Cu	1.3	mg/Kg	DTPA
Zn	0.98	mg/Kg	DTPA
Fe	55	mg/Kg	DTPA
Mn	18	mg/Kg	DTPA

Data:			Method
OrgMat	3.2	%	WalkBk
Org-C	1.8	%	WalkBk
SMP Bufffer pH	6.62	unit	SMP
GypReq	1.5	meq/100g	GypSol
Ca	1700	mg/Kg	NH_4OAc
Mg	540	mg/Kg	NH_4OAc
Na	71	mg/Kg	NH_4OAc
K	150	mg/Kg	NH_4OAc

Cation Exchange Capacity (CEC) and Base Saturation Percentages			
CEC	16	meq/100gm	Calc.
NH_3-N	0.3	% of CEC	Calc.
Ca	52.8	% of CEC	Calc.
Mg	28.4	% of CEC	Calc.
Na	1.9	% of CEC	Calc.
K	2.4	% of CEC	Calc.
H	14.1	% of CEC	Calc.

Lab Analyst:

SUMMARY REPORT OF ANALYTICAL RESULTS

Sample Number	% Organic Matter	Nitrate N ppm	Phosphorus ppm IF pH < 7.1	Phosphorus ppm IF pH > 7.1	Potassium ppm	Magnesium ppm	Calcium ppm	Sulfur ppm	Zinc ppm	Manganese ppm	Copper ppm	Iron ppm	Boron ppm
RBFRB	2.7	31.0	41	---	230	458	1710	54.0	3.8	2.7	0.9	9.3	0.5
RBRBN	3.0	51.0	34	---	226	514	1954	51.0	4.2	2.2	1.0	8.0	0.5
RBBKG	1.2	5.4	---	12	193	366	1767	33.0	2.4	1.7	1.1	6.1	0.7
RBKGN	1.6	4.3	---	20	222	448	2454	53.0	2.8	2.9	1.3	11.9	1.1
RBPC	1.0	3.7	---	14	151	282	1755	42.0	1.5	2.4	1.4	11.1	0.7
RBPCN	1.2	6.0	---	19	200	327	1300	26.0	2.1	1.5	1.1	8.2	0.7
Average	1.8	16.9	49	16	204	399	1823	43.2	2.8	2.2	1.1	9.1	0.7

SUMMARY OF ANALYTICAL RESULTS

Sample Number	Soil pH	Buffer Index	Excess Carbonate	Soluble Salts mmhos/cm	Sodium ppm	Bulk Density
RBFRB	6.4	7.2	VL	0.54	106	1.08
RBRBN	6.5	7.3	VL	0.63	113	1.06
RBBKG	8.3	---	M	0.34	93	1.32
RBKGN	8.3	---	L	0.46	117	1.31
RBPC	8.0	---	L	0.34	78	1.27
RBPCN	7.9	---	L	0.29	78	1.40

CATION EXCHANGE CAPACITY

ACTUAL % OF TOTAL CEC					
% K	% Mg	% Ca	% Na	% H	Total CEC
4.0	26.1	58.5	3.2	8.2	14.6
3.6	26.9	61.4	3.1	5.0	15.9
3.9	23.9	69.1	3.2	0.0	12.8
3.3	21.9	71.8	3.0	0.0	17.1
3.3	19.8	74.0	2.9	0.0	11.9
5.1	27.0	64.5	3.4	0.0	10.1

Additional Tests

Sample Number	RBFRB	RBRBN	RBBKG	RBKGN	RBPC	RBPCN
Ammonium ppm	1.2	0.5	0.2	0.2	0.2	0.5
Chloride	22.4	45.7	15.1	21.2	15.6	10.3
Salinity Ammonium Nitrogen ppm	5.6	4.2	5.6	5.6	4.2	4.2
Salinity Bicarbonate ppm	26.24	36.61	92.13	82.98	106.78	84.20
Salinity Boron ppm	0.24	0.23	0.17	0.18	0.19	0.18
Salinity Calcium meq/L	4.33	6.36	2.70	3.01	2.89	1.94
Salinity Chloride ppm	37.9	87.6	42.9	39.7	39.4	27.7
Salinity Copper ppm	0.1	0.1	0.1	0.1	0.1	0.1
Salinity ECE mmhos/cm	1.09	1.53	0.77	0.88	0.74	0.61
Salinity Iron ppm	2.4	1.7	12.1	2.9	14.8	5.8
Salinity Magnesium meq/L	3.82	5.71	2.21	2.22	2.14	1.53
Salinity Manganese ppm	0.1	0.1	0.2	0.1	0.3	0.1
Salinity Moisture %	82.93	66.67	34.92	50.00	55.17	52.83
Salinity Nitrate Nitrogen ppm	43.9	79.3	7.3	7.0	3.9	10.8
Salinity pH	6.4	6.4	8.0	8.0	8.0	7.8
Salinity PO4 ppm	2.58	1.75	1.75	1.54	2.37	2.78
Salinity Potassium meq/L	0.45	0.44	0.47	0.44	0.56	0.45

Relation between evapotranspiration and concentration of calcium in the tissues.

- Mature leaves evapotranspire more than young leaves, flowers and fruit, which means they tend to subsequently have less problems with calcium deficiency.
- We see more problems with calcium when there is little evapotranspiration.

A couple of plant problems.

Yellow plants and water

Magnesium deficiency?

Iron Deficiency?

Low nitrogen

Low nitrogen.

Nutrient Sampled	Average Concentration
Nitrogen (N)	1.7 %
Phosphorous (P)	0.3 %
Potassium (K)	1.4 %
Calcium (Ca)	1.5 %
Magnesium (Mg)	0.4 %
Sulfur (S)	0.1 %
Copper (Cu)	4 ppm
Zinc (Zn)	15 ppm
Iron (Fe)	213 ppm
Manganese (Mn)	805 ppm
Boron (B)	80 ppm