

Yuma Fall 2025 Romaine Trial

BalaSal – Salt Mitigation Trial

PI: Robert Masson

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Yuma County Cooperative Extension



THE UNIVERSITY OF ARIZONA

Cooperative Extension

Yuma County

Trial Summary

- Average plant weight and heart size was similar across treatments, but a higher number of marketable heads was seen with product application (low walkby percentages)
- Two salinity meters were used, but EC values were too closely related to soil moisture readings to be trusted.
- Significance differences seen in sodium levels in soil samples taken at the end of the trial. It appears salts were in a state of transition, moving through the soil horizon.
- Note: Temperatures were significantly hotter than normal, advancing harvest date a week ahead of initial forecast
- Note: Aphids encountered on plants but spray was applied multiple times to control them with very minimal damage.

Trial Details

- Product comparison trial
 - UTC
 - 1 Qt/AC x 4 apps
 - 1 Gal/AC at planting x 3 apps of 1 Qt/AC in-season
 - 0.5 Gal/AC at planting x 2 apps of 1 Qt/AC in-season
- Four treatment, six replication trial
- 3-line romaine of 42” beds
- Variety: Del Sol
- Planting Date: 11 Nov 2025
- Harvest Date: 16 Feb 2026 (98 DAP)

Product Applications

- App A: 11/10 (-1 DAP)
 - Trt1: NA
 - Trt2: 1 QT/AC
 - Trt3: 1 Gal/AC
 - Trt4: 0.5 Gal/AC
- App B: 11/25 (14 DAP)
 - Trt1: NA
 - Trt2: 1 QT/AC
 - Trt3: 1 QT/AC
 - Trt4: 1 QT/AC
- App B: 12/9 (29DAP)
 - Trt1: NA
 - Trt2: 1 QT/AC
 - Trt3: 1 QT/AC
 - Trt4: 1 QT/AC
- App C: 12/22 (42 DAP)
 - Trt1: NA
 - Trt2: 1 QT/AC
 - Trt3: 1 QT/AC
 - Trt4: NA

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T-7 BalaSal Rate Study. Apply different rates and timings under normal irrigation.

Trial ID: T-7 BalaSal Rate Romaine 2025
 Protocol ID: T-7 BalaSal Rate Romaine 2025 Location: Yuma Arizona Trial Year: 2025
 Project ID: T-7 BalaSal Rate Romaine 2025
 Study Director: Robert Masson Sponsor Contact:
 Investigator:

Reps: 6 Appl Code: A Plots: 3.5 by 30 feet
 Appl. Amount: 345 GAL/AC Mix Size: 4.99 GAL (total for 6 plots; minimum=4.99 GAL)

Trt No.	Treatment Name	Form Type	Rate	Appl Unit	Code	Amt Product to Measure	Rep					
							1	2	3	4	5	6
4	BalaSal	L	0.5 gal/a	A		27.37 mL/mx	1601	1902	1803	1704	1905	1706
3	BalaSal	L	1 gal/a	A		54.75 mL/mx	1701	1802	1603	1804	1605	1806
2	BalaSal	L	1 qt/a	ABCD		13.69 mL/mx	1801	1702	1903	1604	1705	1906

Reps: 6 Appl Code: B Plots: 3.5 by 30 feet
 Appl. Amount: 345 GAL/AC Mix Size: 4.99 GAL (total for 6 plots; minimum=4.99 GAL)

Trt No.	Treatment Name	Form Type	Rate	Appl Unit	Code	Amt Product to Measure	Rep					
							1	2	3	4	5	6
4	BalaSal	L	1 qt/a	BC		13.69 mL/mx	1601	1902	1803	1704	1905	1706
3	BalaSal	L	1 qt/a	BCD		13.69 mL/mx	1701	1802	1603	1804	1605	1806
2	BalaSal	L	1 qt/a	ABCD		13.69 mL/mx	1801	1702	1903	1604	1705	1906

Reps: 6 Appl Code: C Plots: 3.5 by 30 feet
 Appl. Amount: 345 GAL/AC Mix Size: 4.99 GAL (total for 6 plots; minimum=4.99 GAL)

Trt No.	Treatment Name	Form Type	Rate	Appl Unit	Code	Amt Product to Measure	Rep					
							1	2	3	4	5	6
4	BalaSal	L	1 qt/a	BC		13.69 mL/mx	1601	1902	1803	1704	1905	1706
3	BalaSal	L	1 qt/a	BCD		13.69 mL/mx	1701	1802	1603	1804	1605	1806
2	BalaSal	L	1 qt/a	ABCD		13.69 mL/mx	1801	1702	1903	1604	1705	1906

Reps: 6 Appl Code: D Plots: 3.5 by 30 feet
 Appl. Amount: 345 GAL/AC Mix Size: 4.99 GAL (total for 6 plots; minimum=4.99 GAL)

Trt No.	Treatment Name	Form Type	Rate	Appl Unit	Code	Amt Product to Measure	Rep					
							1	2	3	4	5	6
3	BalaSal	L	1 qt/a	BCD		13.69 mL/mx	1701	1802	1603	1804	1605	1806
2	BalaSal	L	1 qt/a	ABCD		13.69 mL/mx	1801	1702	1903	1604	1705	1906

Fertilization Plan

- Total # N/AC: 151
- 200# 11-52-0 MAP at preplant
- 12 GPA UAN 32 (43# N per application)
 - 12/8 (27 DAP)
 - 1/13 (63 DAP)
 - 2/2 (83 DAP)

Field Map

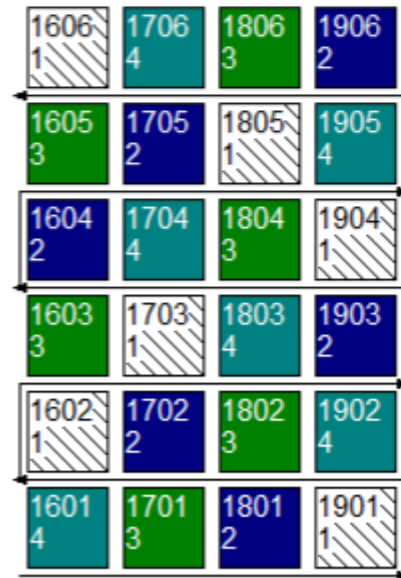
University of Arizona

T-7 BalaSal Rate Study. Apply different rates and timings under normal irrigation.

Trial ID: T-7 BalaSal Rate Romaine 2025
 Protocol ID: T-7 BalaSal Rate Romaine 2025 Location: Yuma Arizona Trial Year: 2025
 Project ID: T-7 BalaSal Rate Romaine 2025
 Study Director: Robert Masson Sponsor Contact:
 Investigator:

Trial Map Treatment Description

Trt	Code	Description
1	CHK	UTC
2		BalaSal 1 QT/A
3		BalaSal 1 GAL/A;BalaSal 1 QT/A
4		BalaSal .5 GAL/A;BalaSal 1 QT/A;BalaSal



Irrigation

Sprinkler rate: 0.1 IN/HR
 Drip rate: 0.186 Acre IN/HR

**Total Water Applied to full water
 treatment area 14.87 Acre IN**

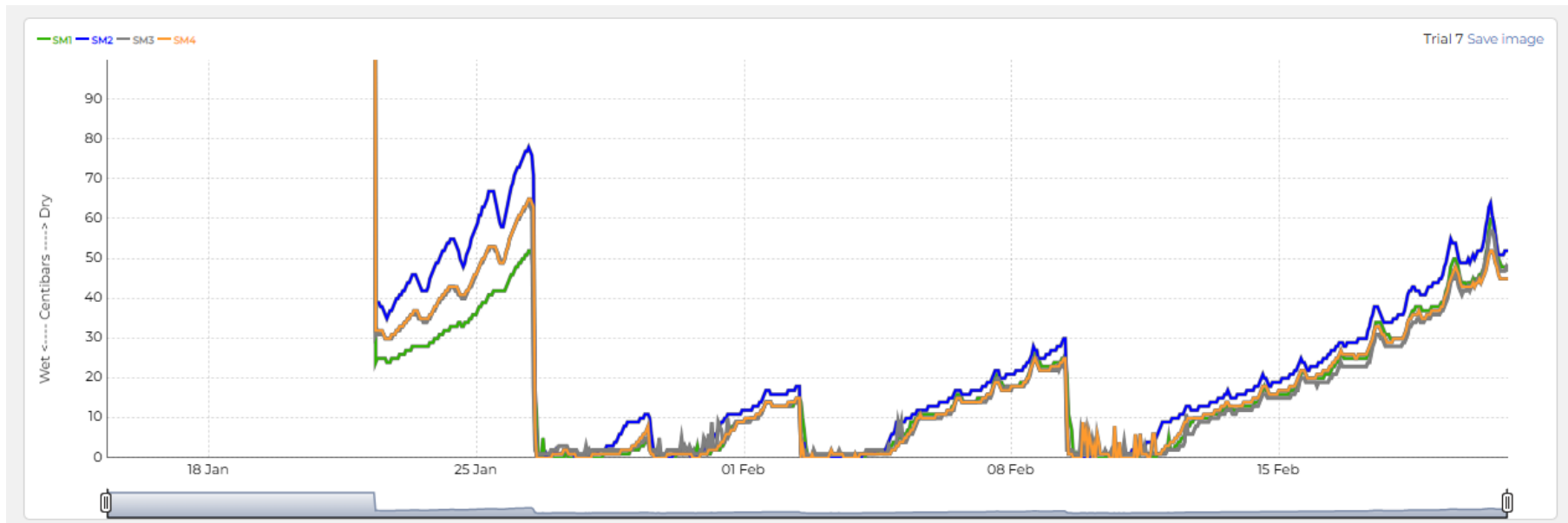
Irrigation Date	Type	Full Irr Treatment Irrigation Hours	Full Irr Water Used (AC IN)
11/10	Drip	4	0.744
11/11	Sprinkler	10	1.000
11/12	Sprinkler	10	1.000
11/13	Sprinkler	8	0.800
11/14	Sprinkler	8	0.800
11/19	Sprinkler	8	0.800
11/20	Sprinkler	8	0.800
11/25	Drip	4	0.744
12/8	Drip	6	1.116
12/9	Drip	3	0.558
12/22	Drip	4	0.744
1/7	Drip	4	0.744
1/13	Drip	5	0.930
1/29	Drip	2	0.372

Irrigation

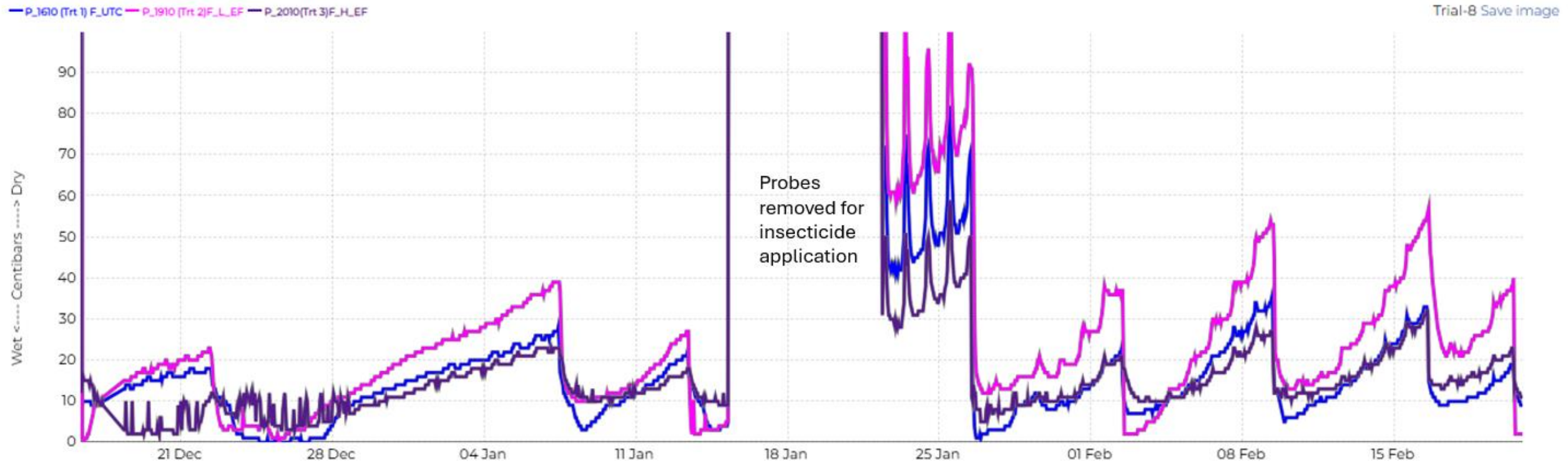
Sprinkler rate: 0.1 IN/HR
Drip rate: 0.186 Acre IN/HR

**Total Water Applied to full water
treatment area 14.87 Acre IN**

Irrigation Date	Type	Full Irr Irrigation Hours	Full Irr Water Used (AC IN)
2/2	Drip	5	0.930
2/5	Drip	2	0.372
2/9	Drip	5	0.930
2/16	Drip	4	0.744
2/21	Drip	4	0.744
Total			14.87



Irrigation (probes in nearby trial)



Pesticide

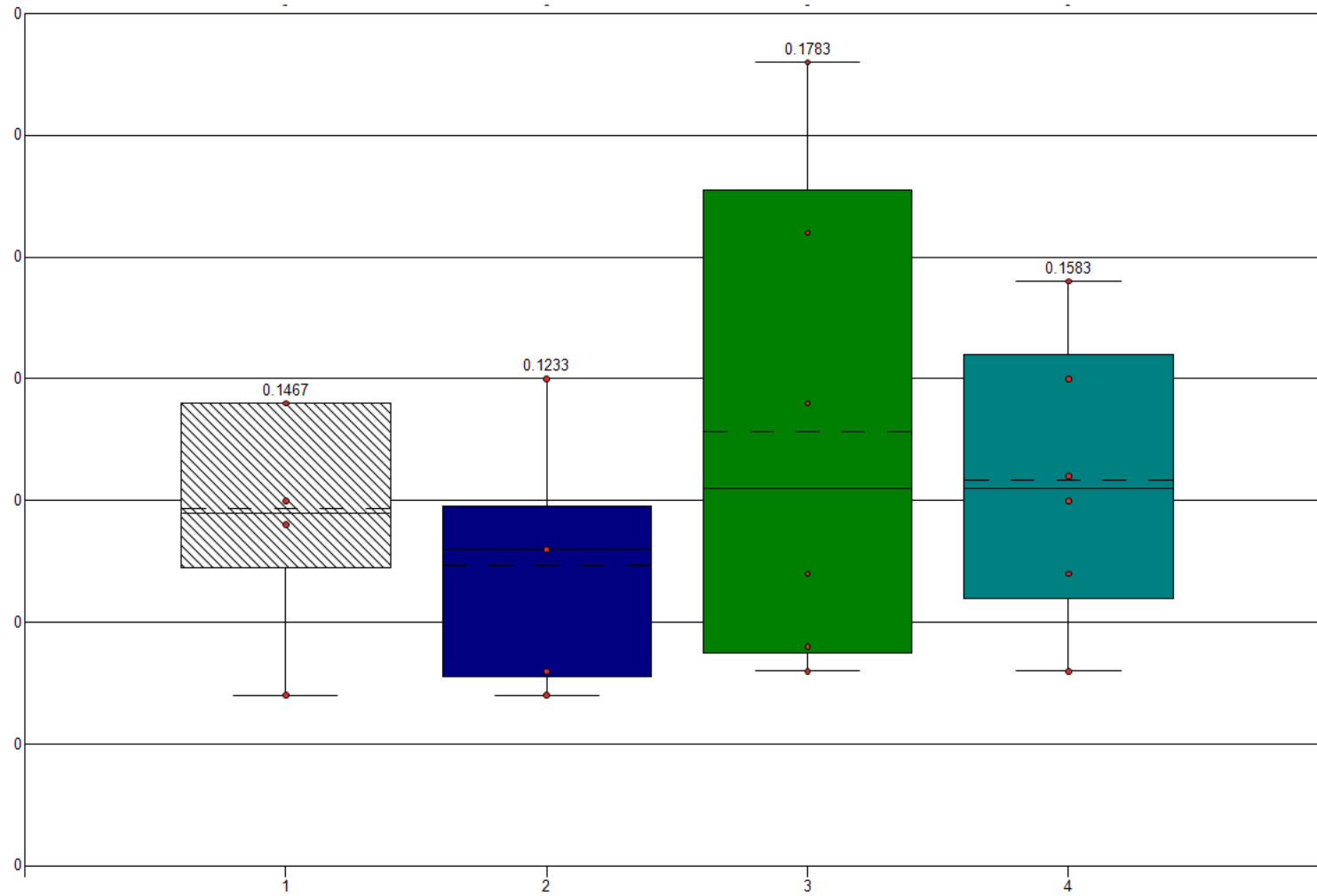
Date	Pesticide	Rate	Type	Method
11/13	Prefar	6.0 Q/A	Pre-emerge Herbicide	Sprinkler
1/15	Orondis Ultra	8.0 Oz/A	Fungicide	Spray
1/15	Quadris	12.0 Oz/A	Fungicide	Spray
1/15	Nu-Film	4.0 Oz/A	Adjuvant	Spray
1/25	Sequoia	4.0 Oz/A	Insecticide	Spray
2/4	Verimark	10.0 Oz/A	Insecticide	Spray
2/5	Verimark	10.0	Insecticide	Drip

In Season Measurements (Dr. Bhupinder Singh)

- Net photosynthesis
- Gas exchange traits
 - Transpiration rate
 - Stomatal conductance
 - Vapor pressure deficit
- Light uptake traits
 - Maximum quantum yield
 - FY/FM
 - Electron transport rate
 - Chlorophyll content
- Meteorological traits
 - Canopy temperature
 - Surface temperature

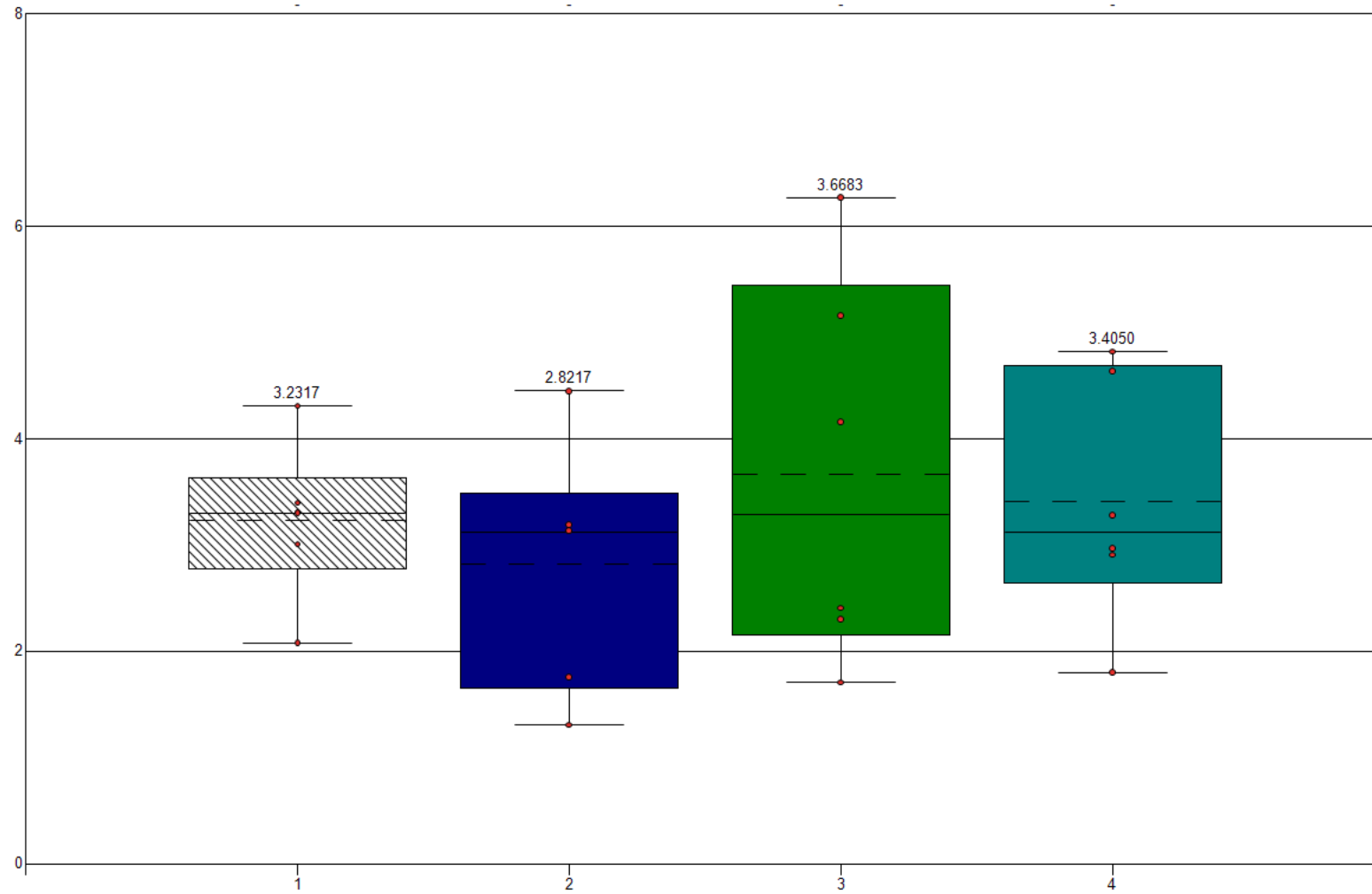


mol m⁻² Stomtal conductance



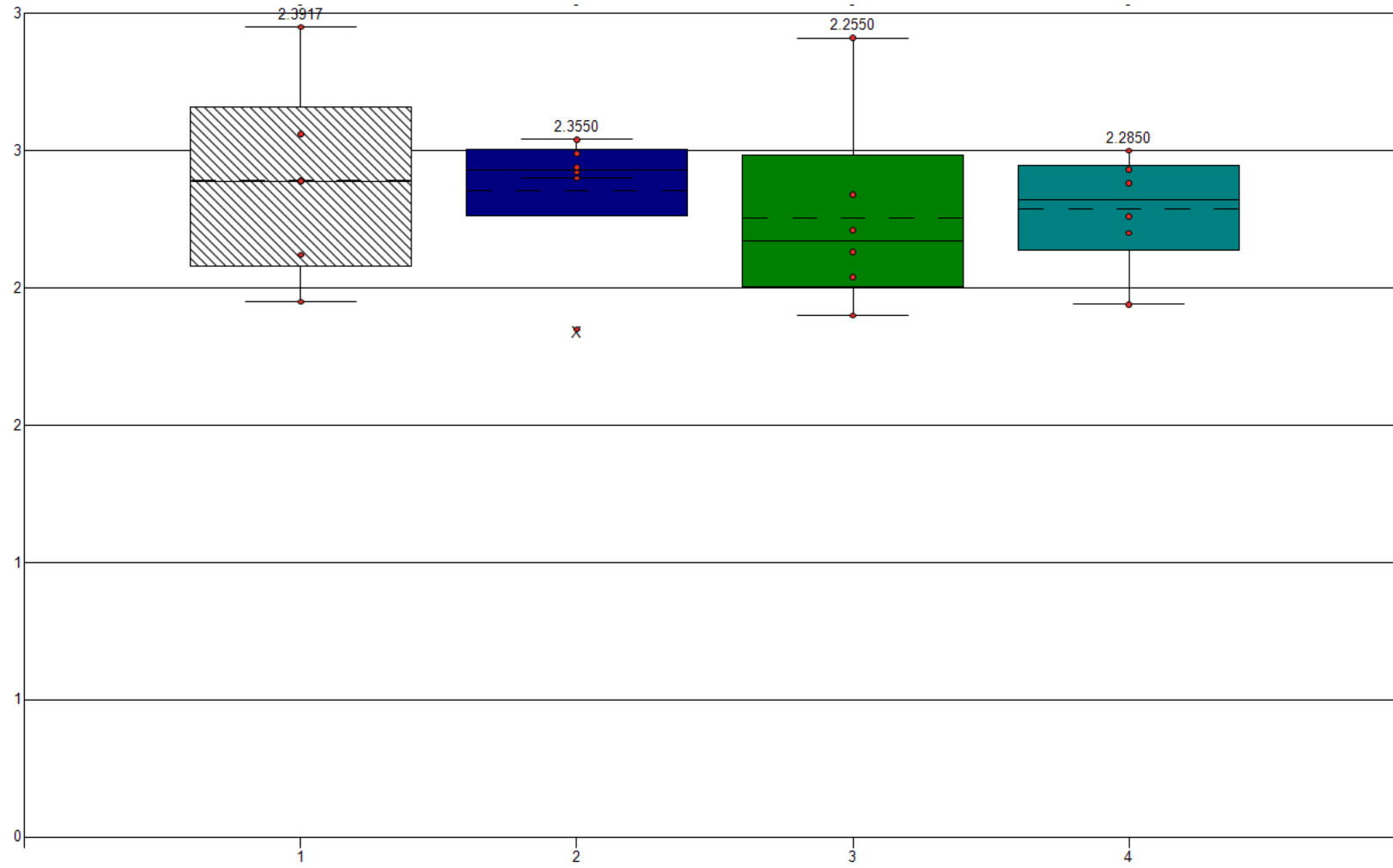
- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

mol m⁻² Transpiration



- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

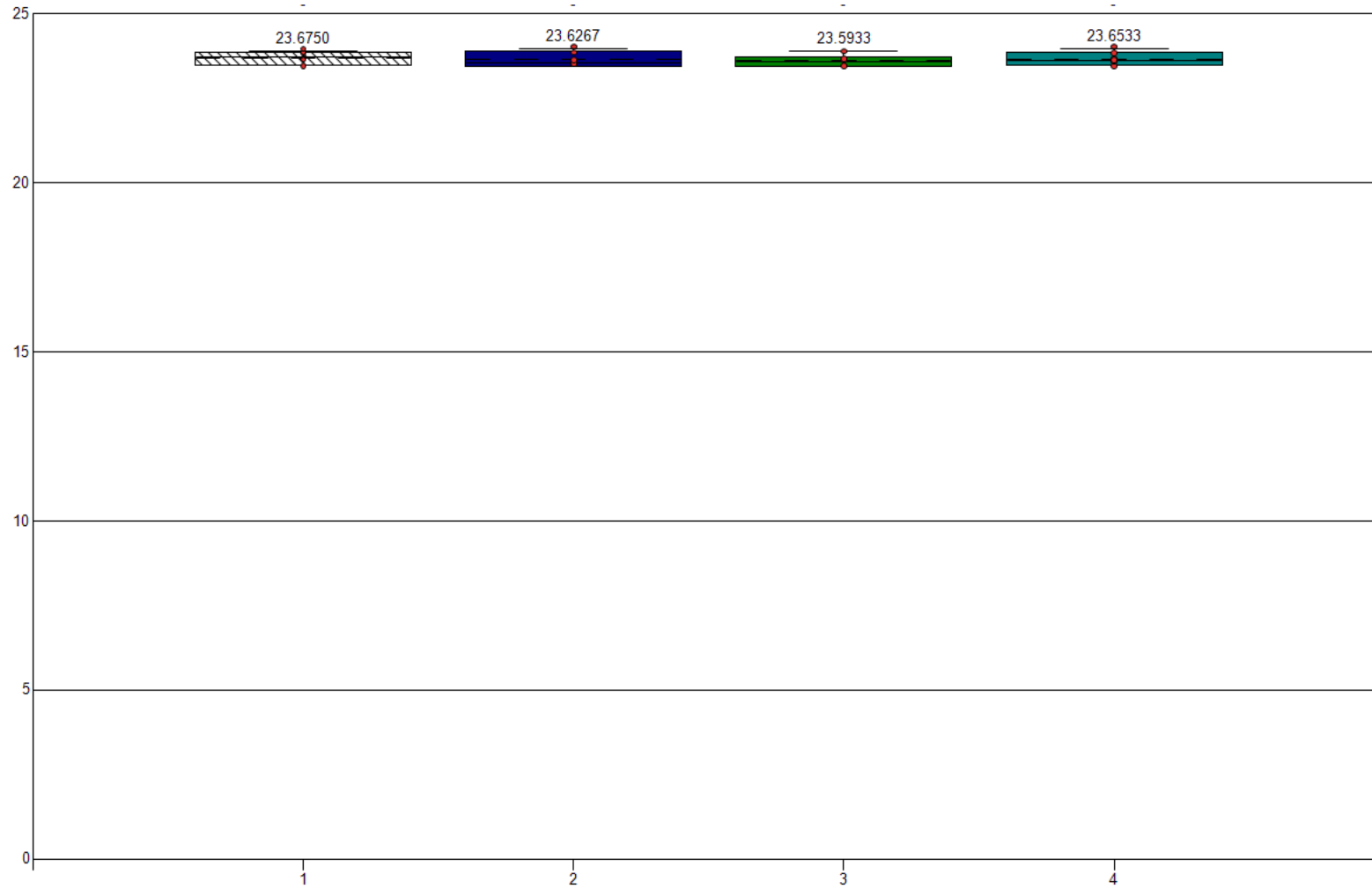
kPa VPDleaf



- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Yuma Romaine - BalaSal Trial - Fall 2025

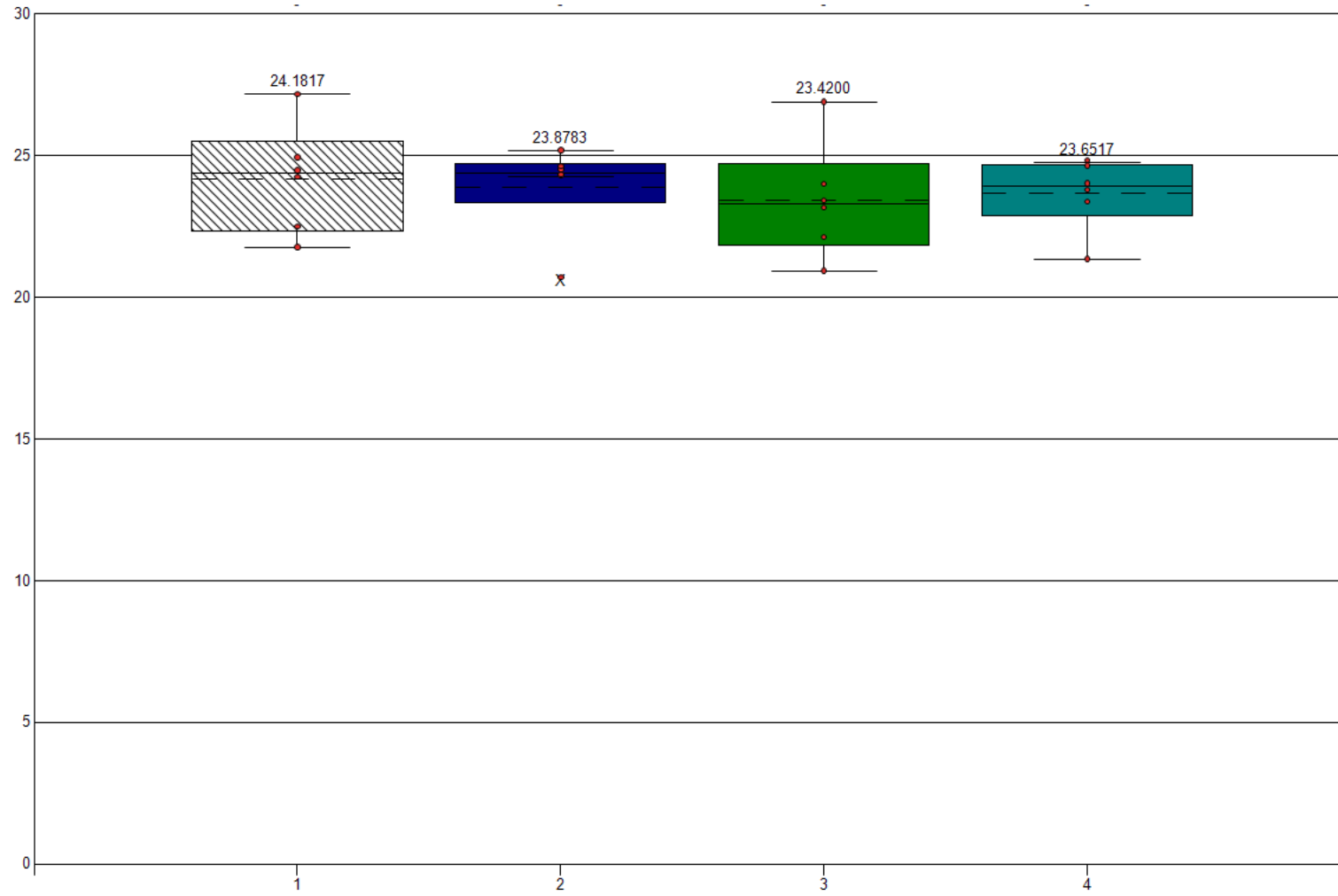
°C air temperature



- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Yuma Romaine - BalaSal Trial - Fall 2025

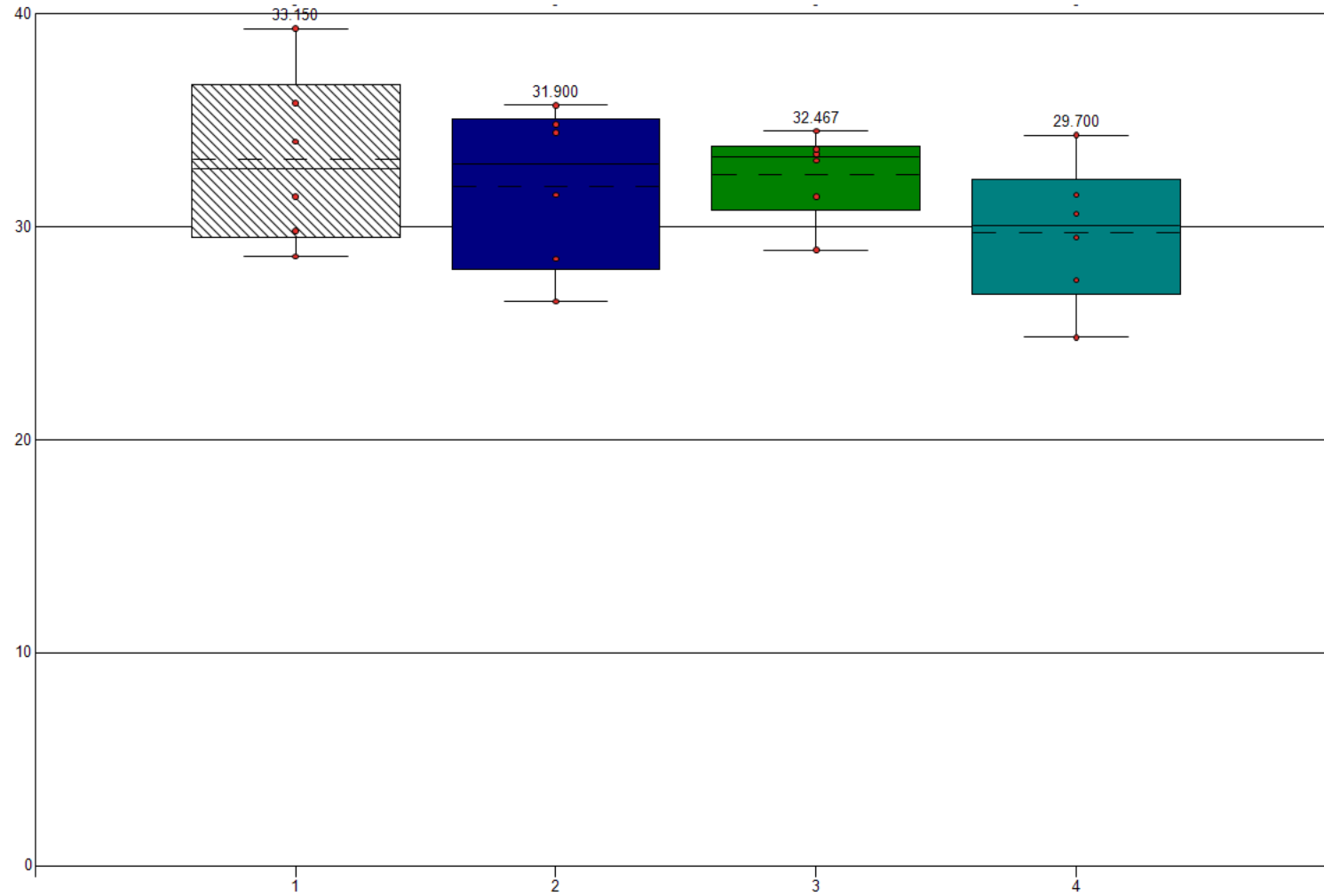
°C Canopy Temperature



- 1 UTC
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- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Yuma Romaine - BalaSal Trial - Fall 2025

µg m-2 Chlorophyll content



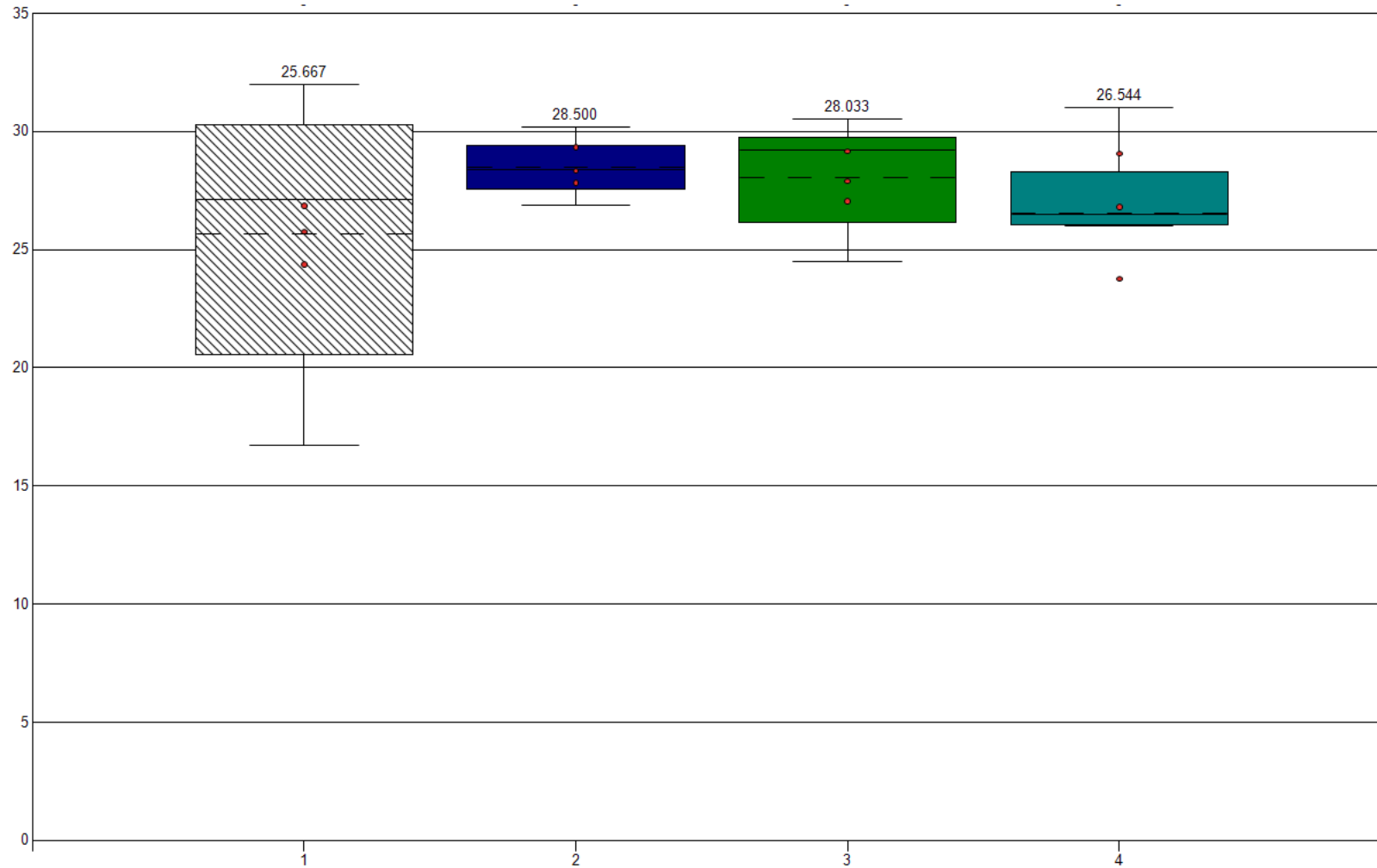
- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Salinity Meters

Evaluation of the Soil Cub and GrowBud DRO moisture and salinity meters

Soil Cub 12/16

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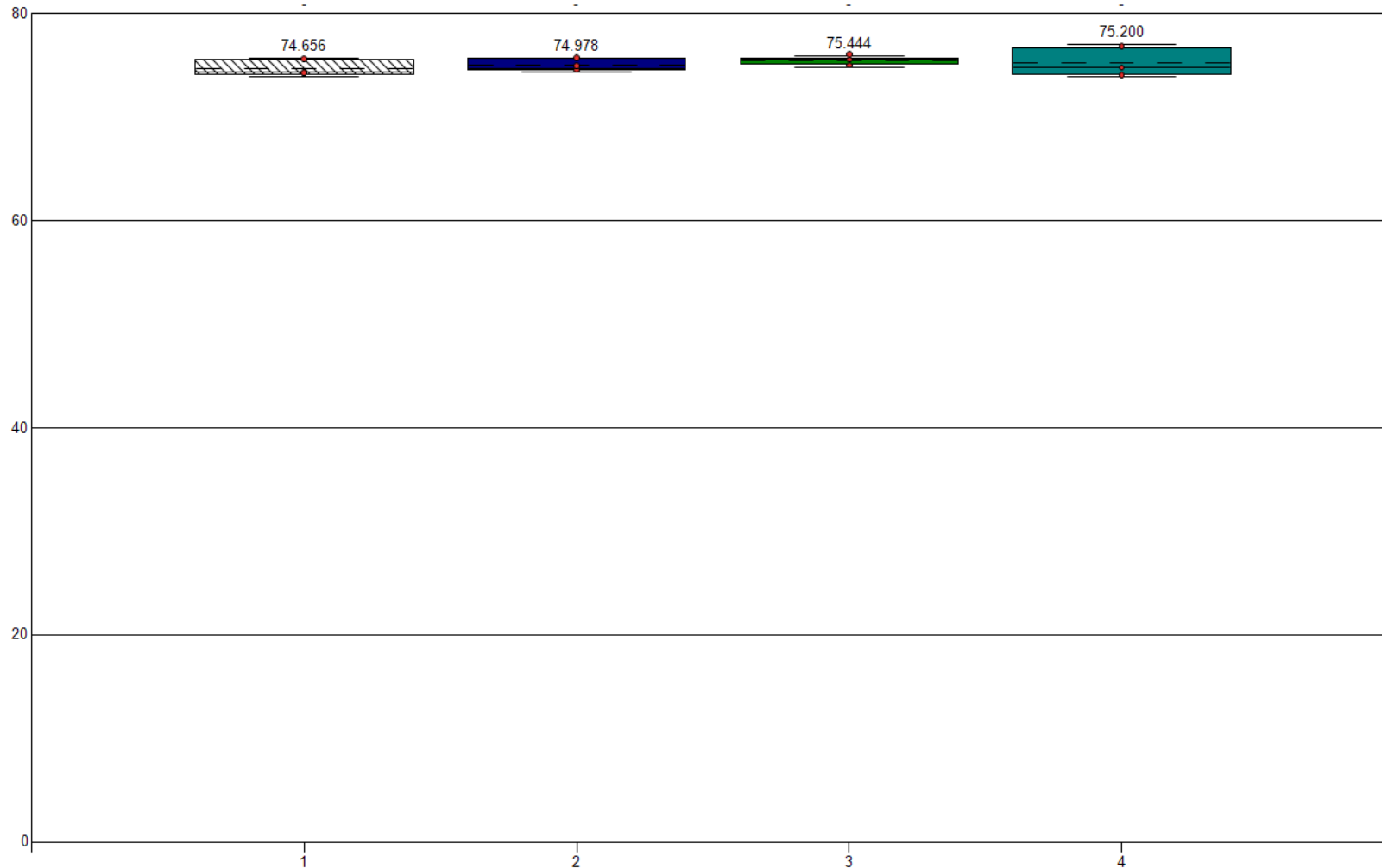
- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

*Soil VWC %

Soil Cub 12/16

Yuma Romaine - BalaSal Trial - Fall 2025

Soil Temp °F

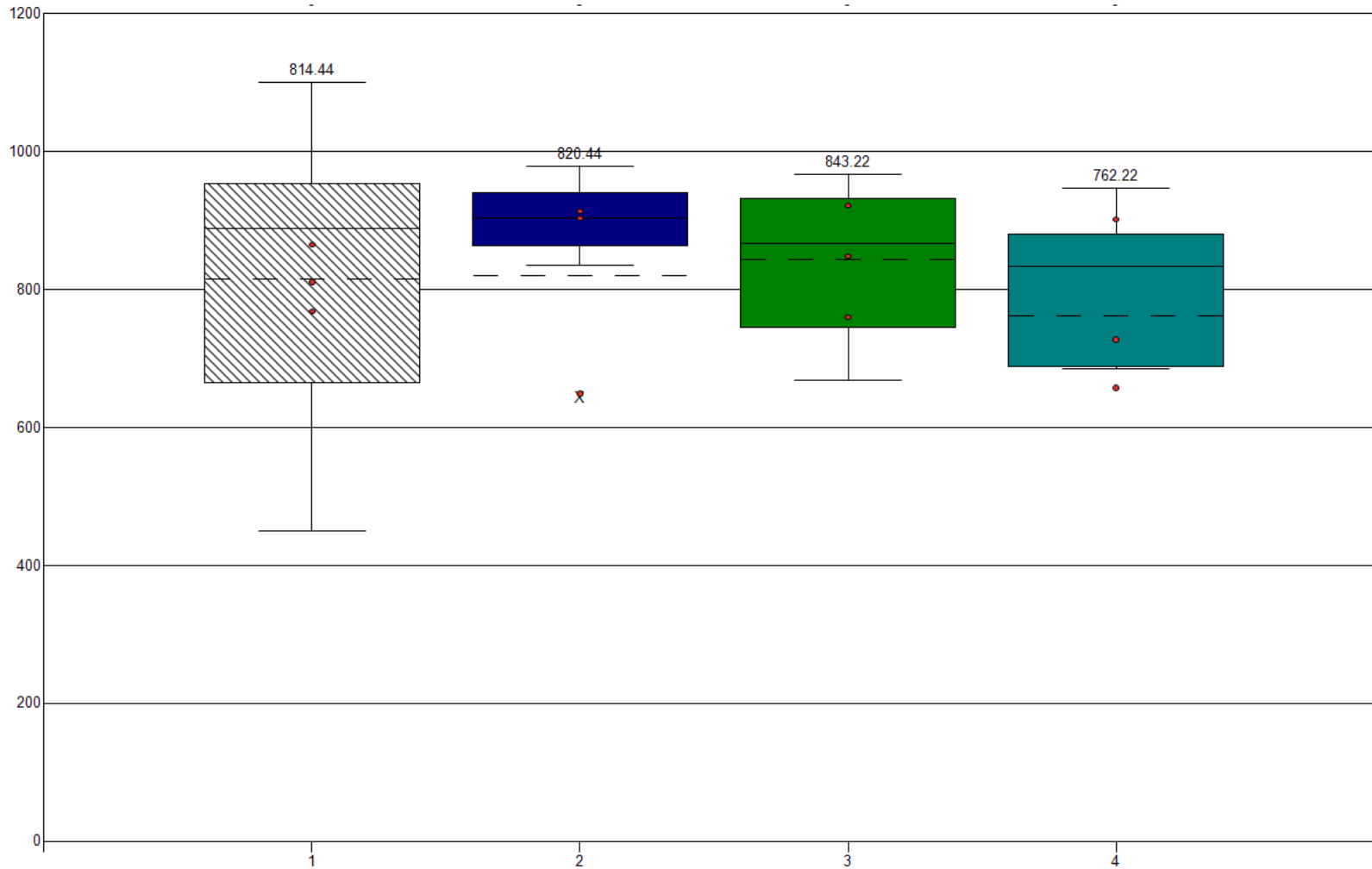


- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Soil Cub 12/16

Yuma Romaine - BalaSal Trial - Fall 2025

*Soil E.C uS/cm

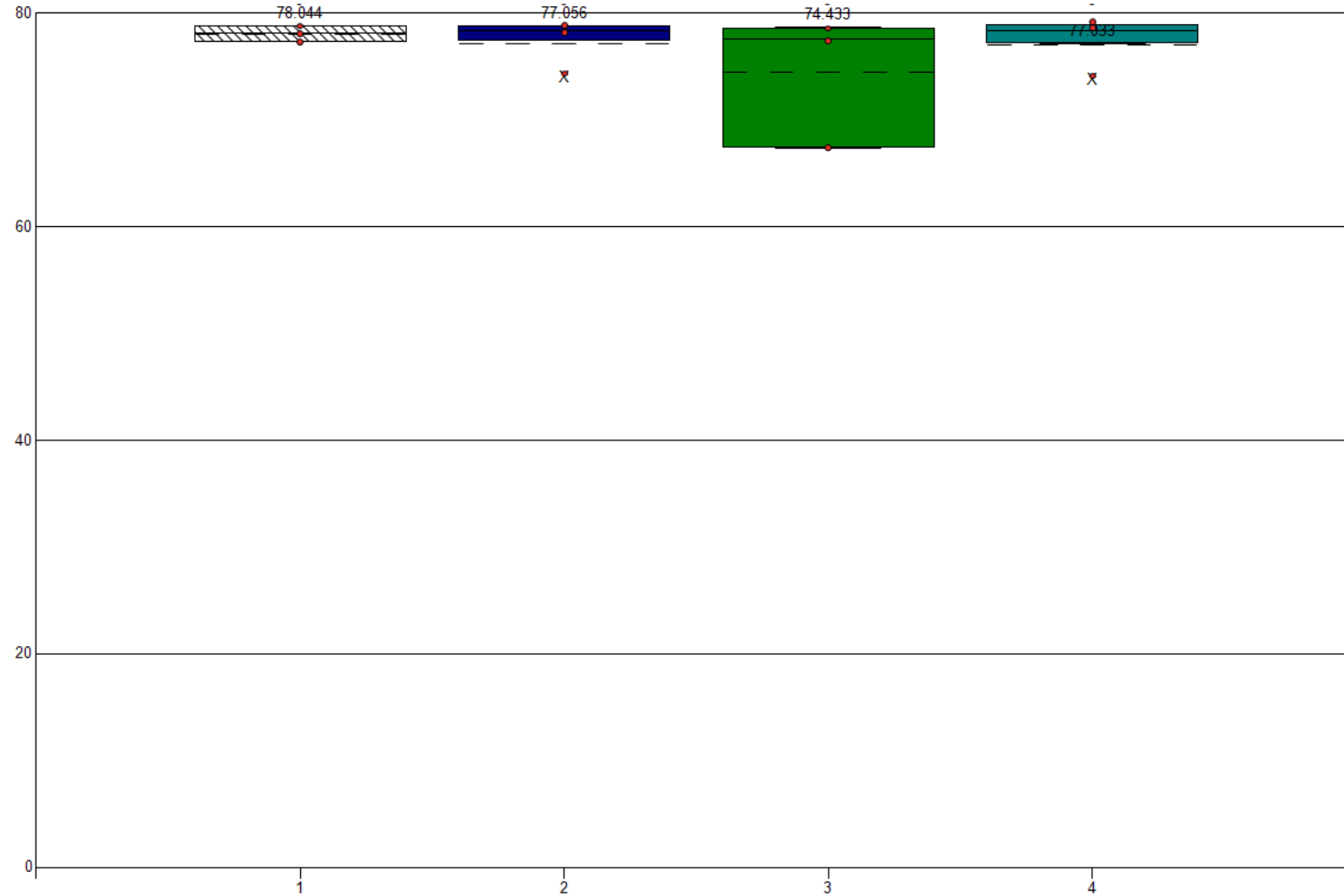


- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Soil Cub 12/16

Yuma Romaine - BalaSal Trial - Fall 2025

Ambient Temperature °F

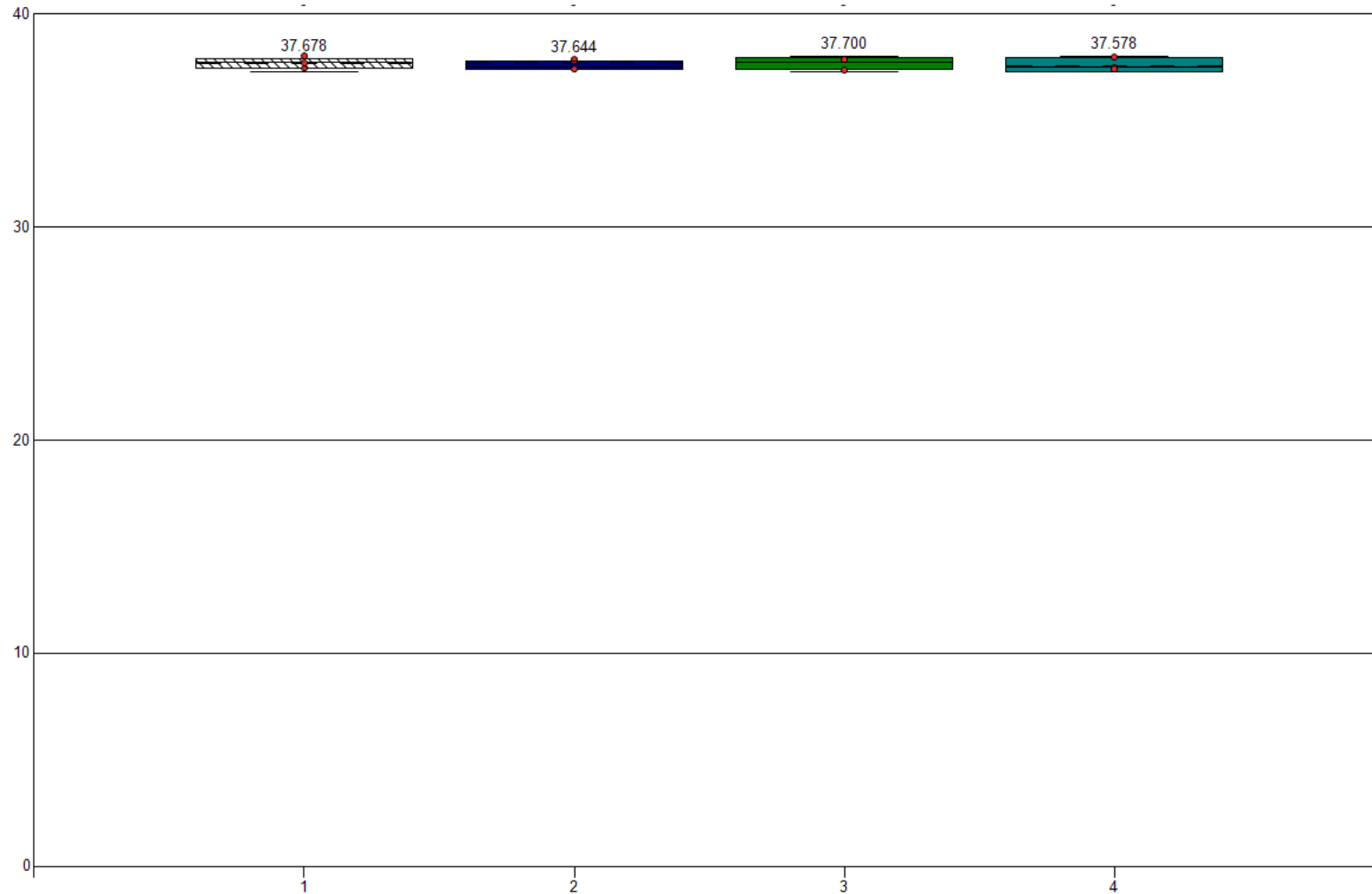


- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Soil Cub 12/16

Yuma Romaine - BalaSal Trial - Fall 2025

Relative Humidity %

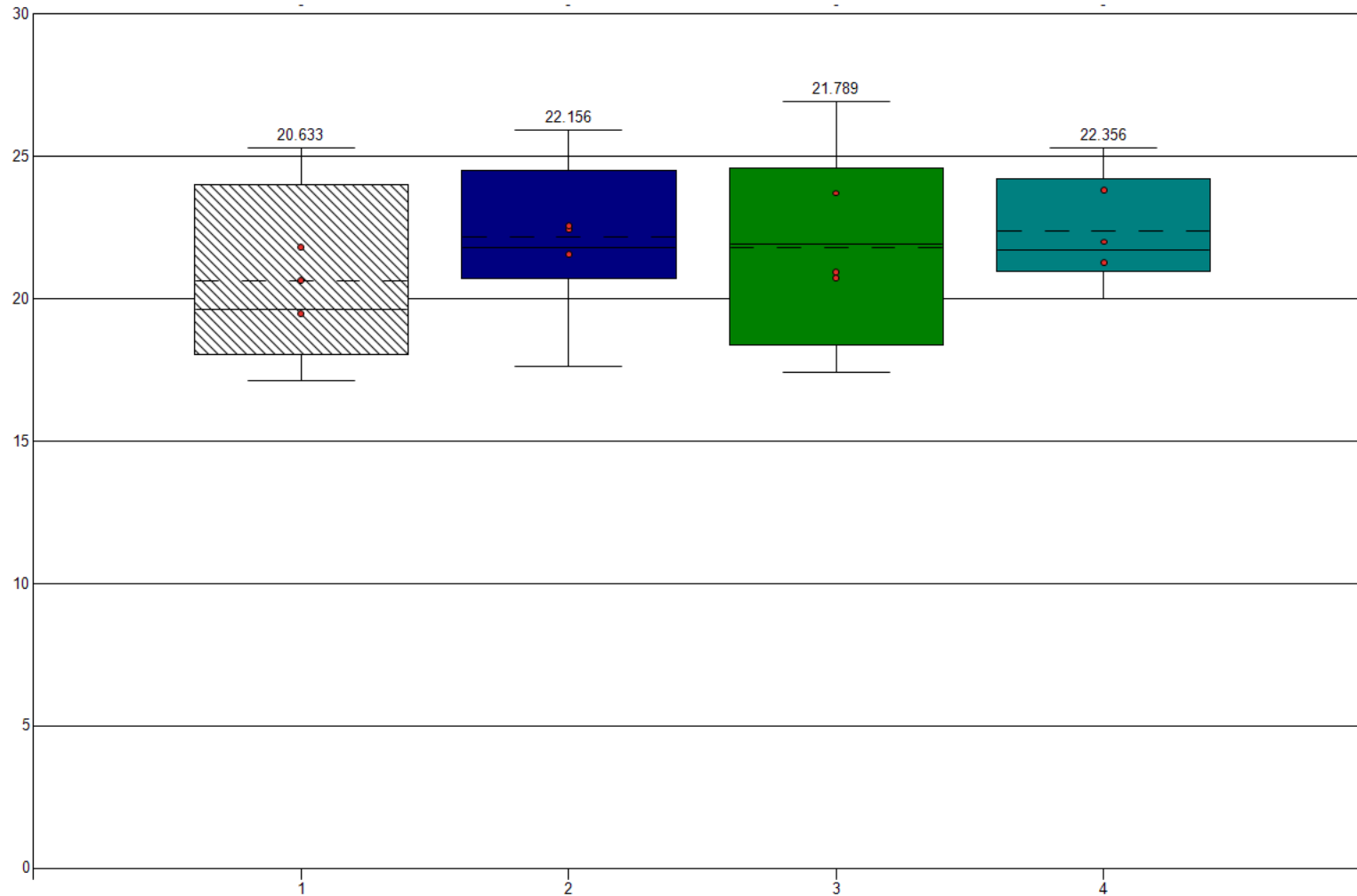


- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Soil Cub 1/22

Yuma Romaine - BalaSal Trial - Fall 2025

Soil Cub *Soil VWC %

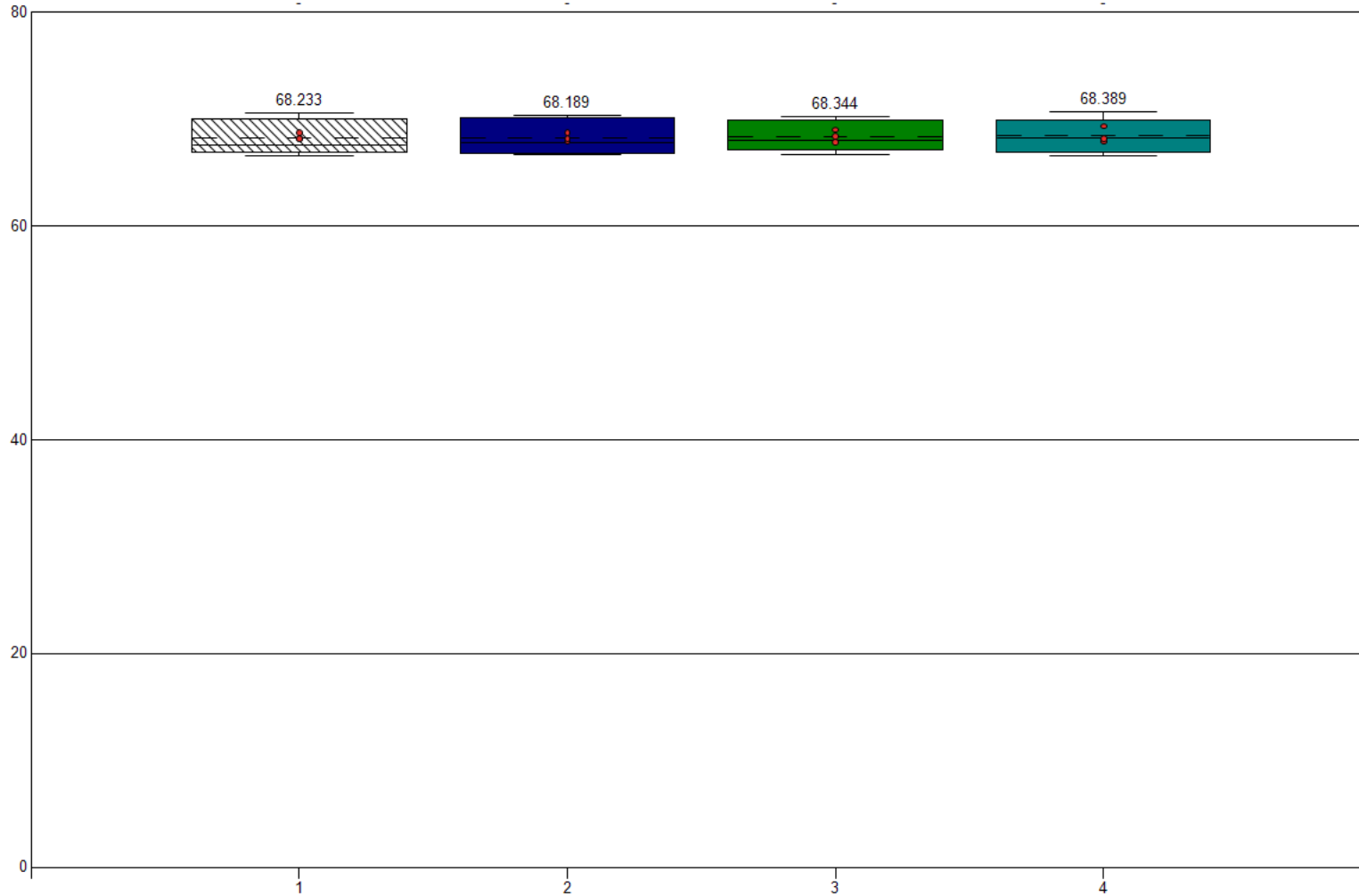


- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Soil Cub 1/22

Yuma Romaine - BalaSal Trial - Fall 2025

Soil Cub Soil Temp °F

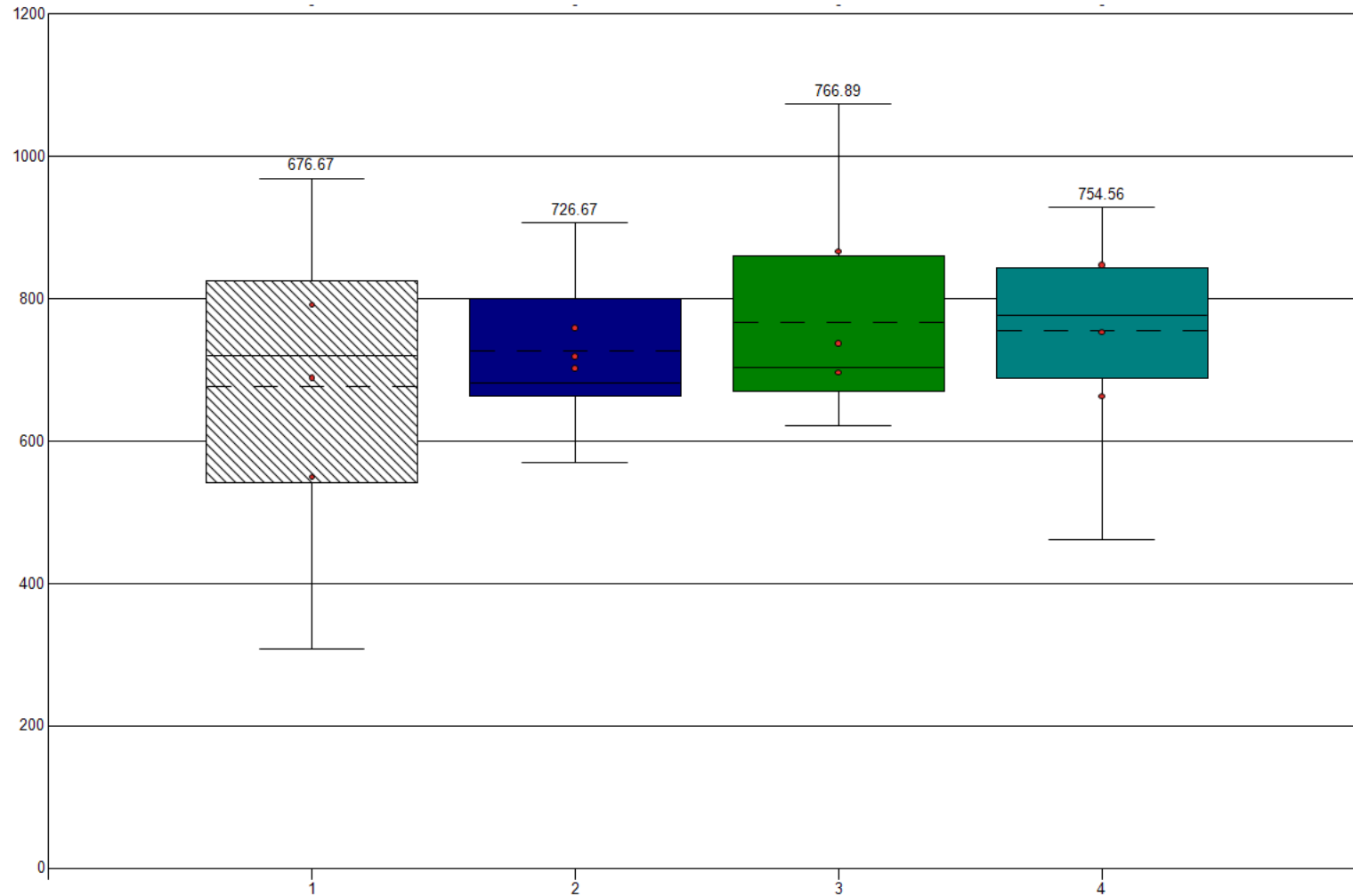


- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Soil Cub 1/22

Yuma Romaine - BalaSal Trial - Fall 2025

Soil Cub *Soil E.C uS/cm

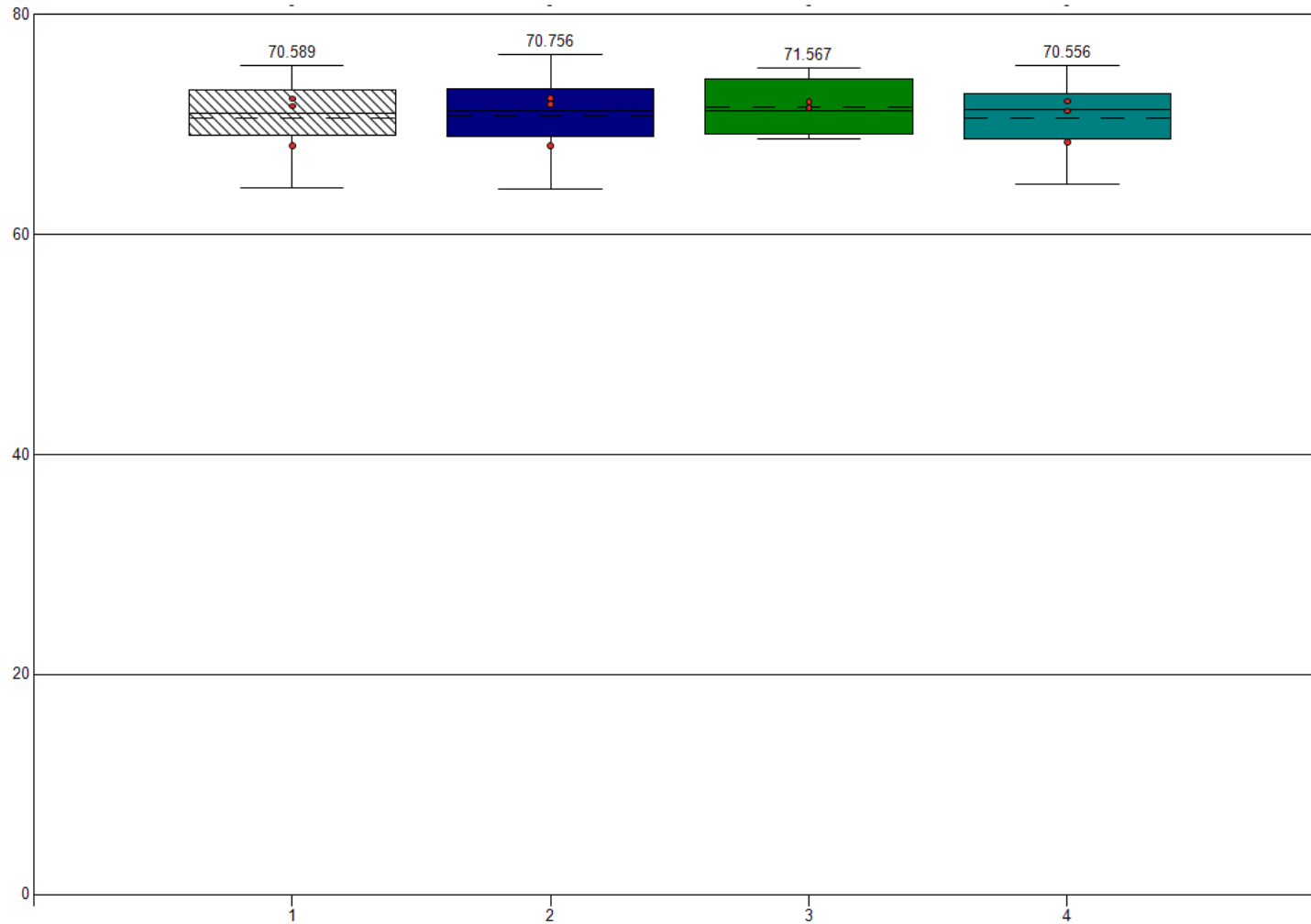


- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Soil Cub 1/22

Yuma Romaine - BalaSal Trial - Fall 2025

Soil Cub Ambient Temperature °F

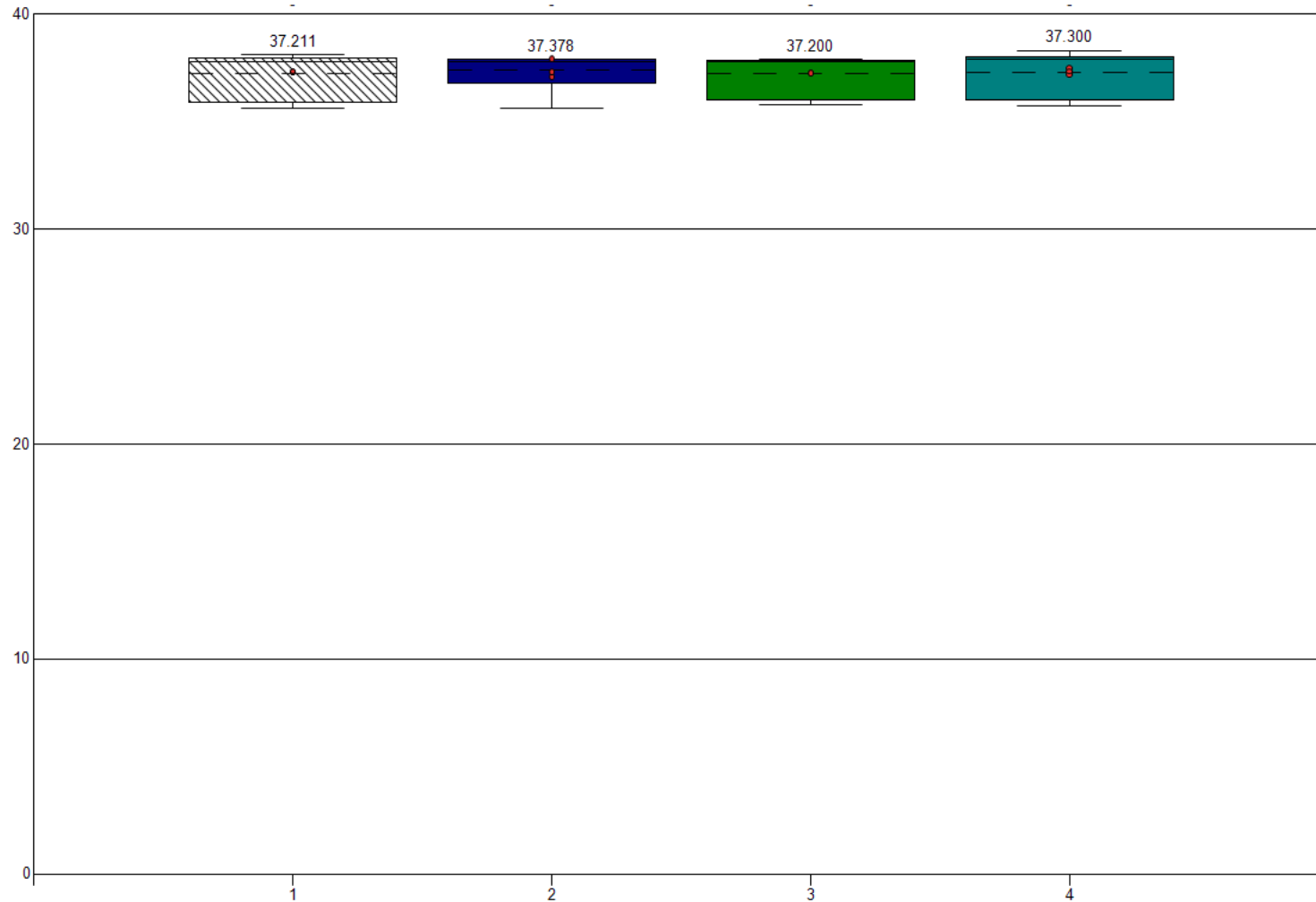


- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Soil Cub 1/22

Yuma Romaine - BalaSal Trial - Fall 2025

Soil Cub Relative Humidity %

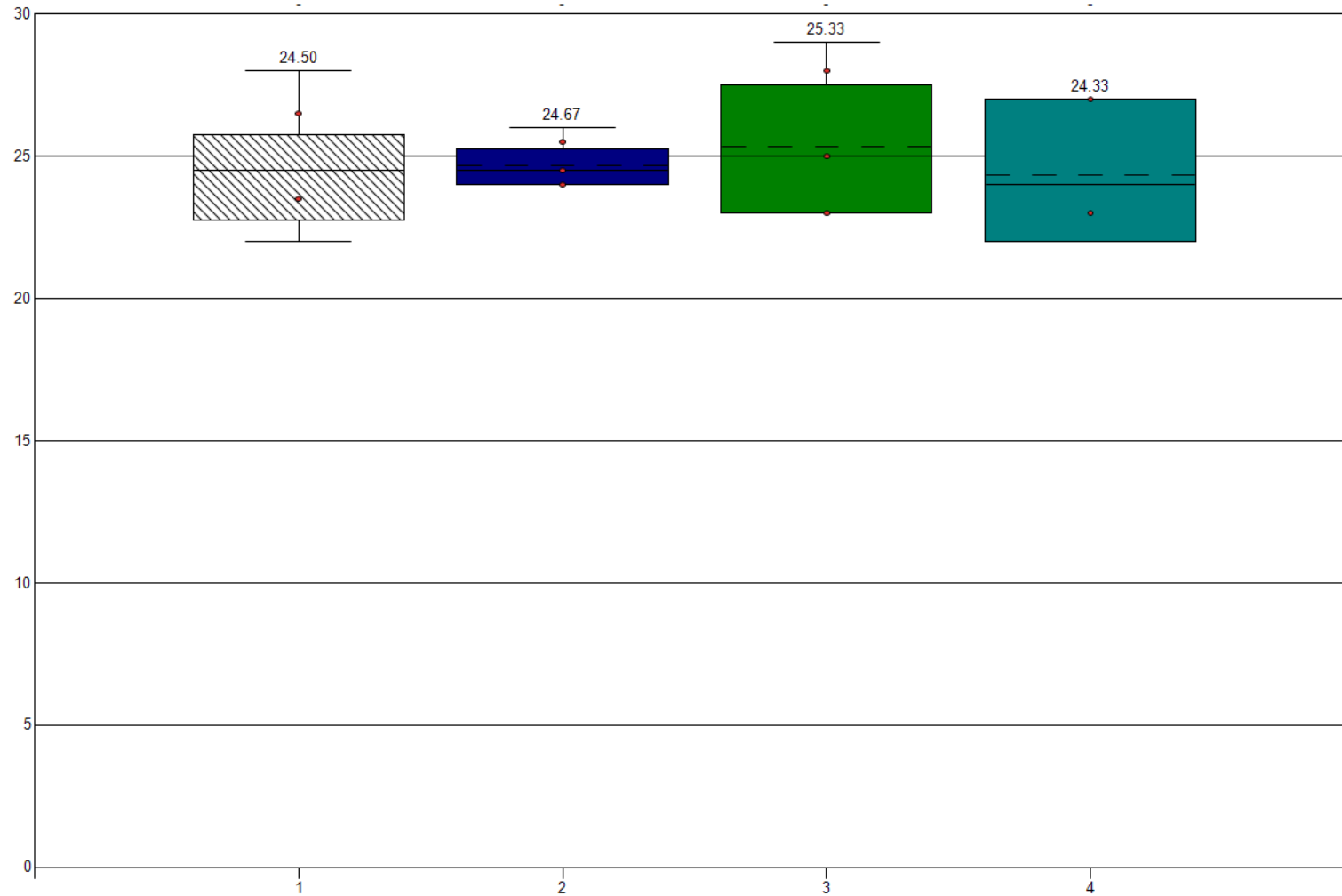


- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

GrowBud DRO 2/25

Yuma Romaine - BalaSal Trial - Fall 2025

GrowBud Water Content

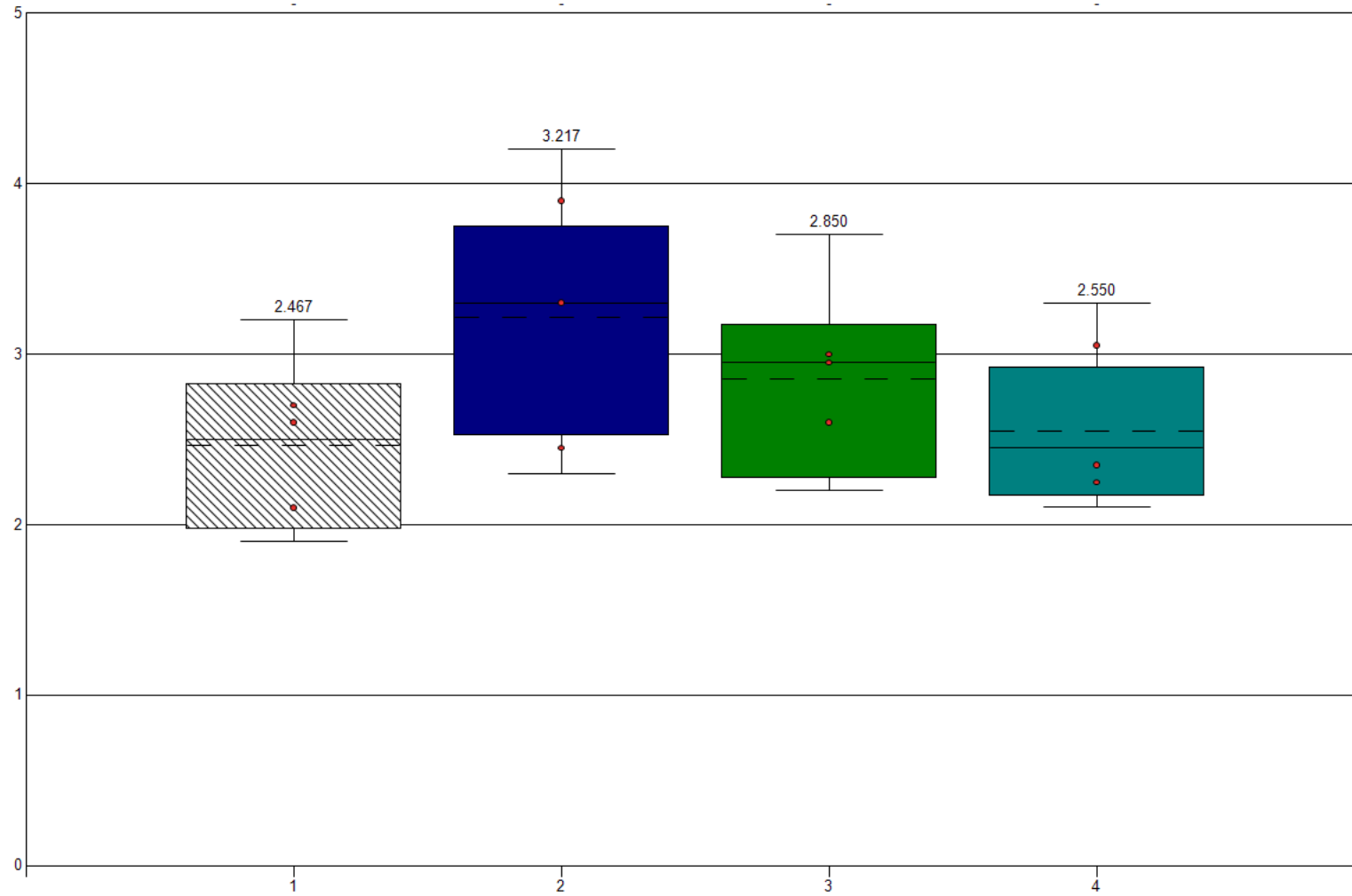


- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

GrowBud DRO 2/25

Yuma Romaine - BalaSal Trial - Fall 2025

GrowBud Pore Water EC

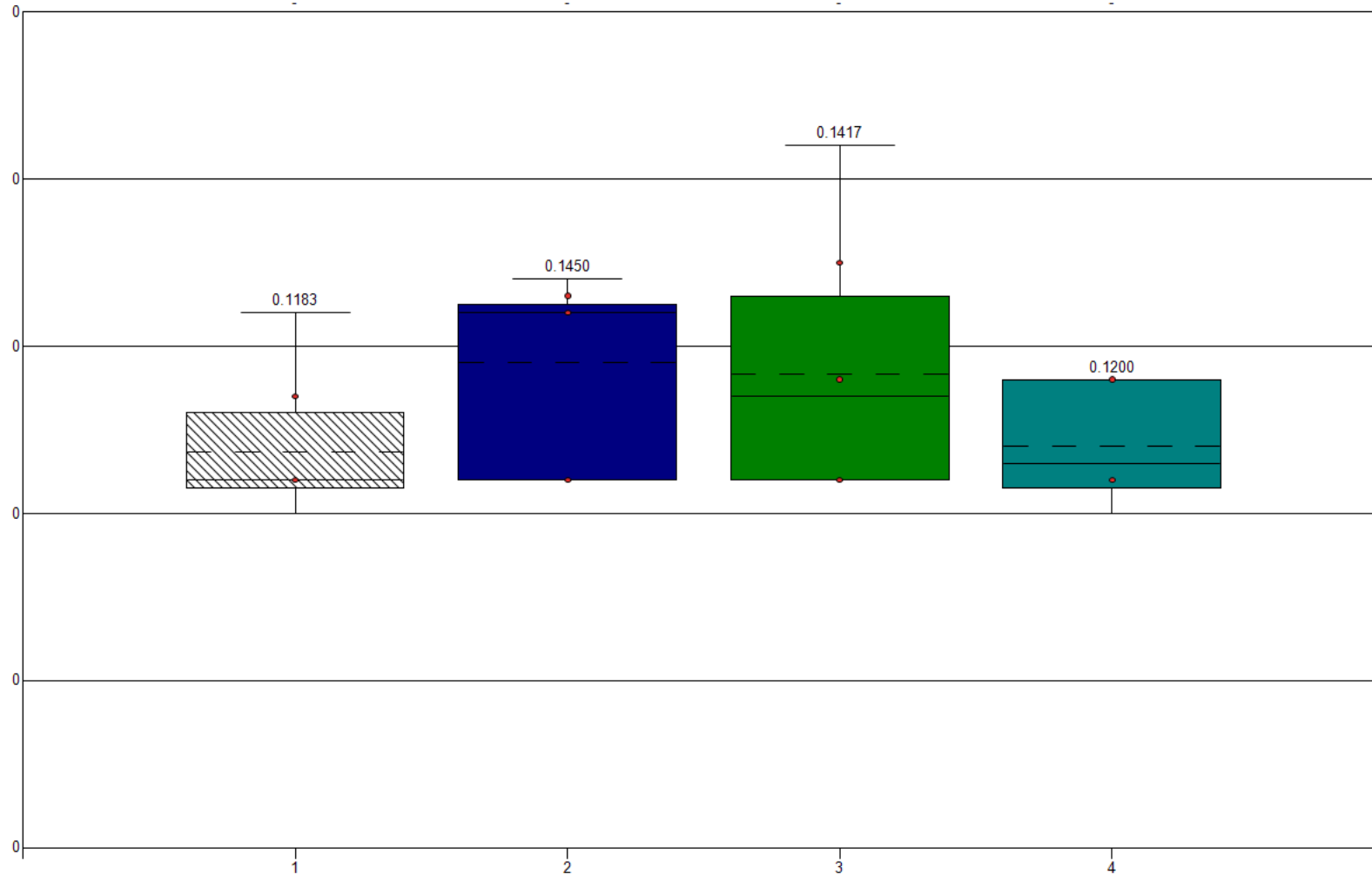


- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

GrowBud DRO 2/25

Yuma Romaine - BalaSal - Fall 2025

GrowBud Bulk EC

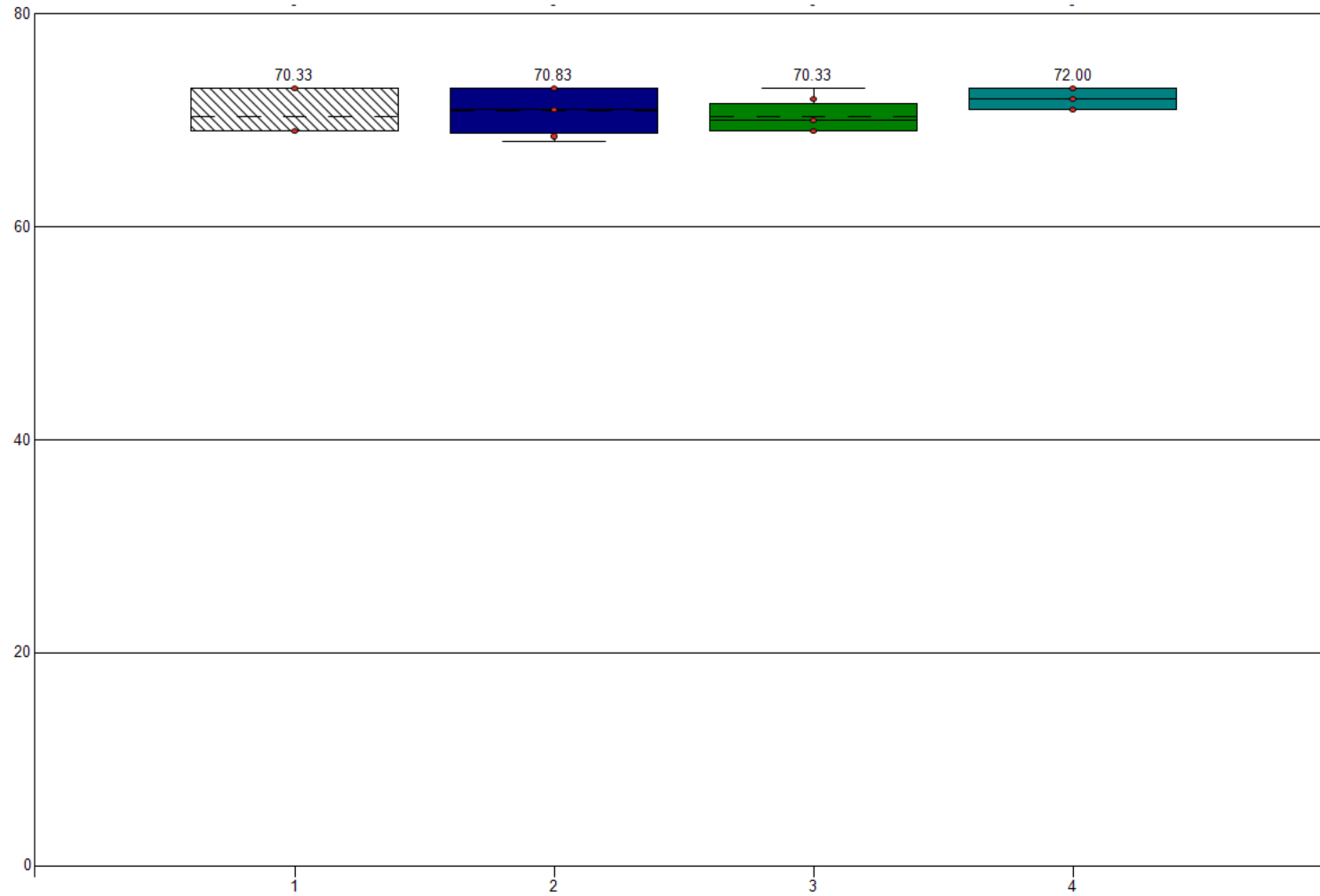


- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

GrowBud DRO 2/25

Yuma Romaine - BalaSal - Fall 2025

GrowBud Air Surface Temp

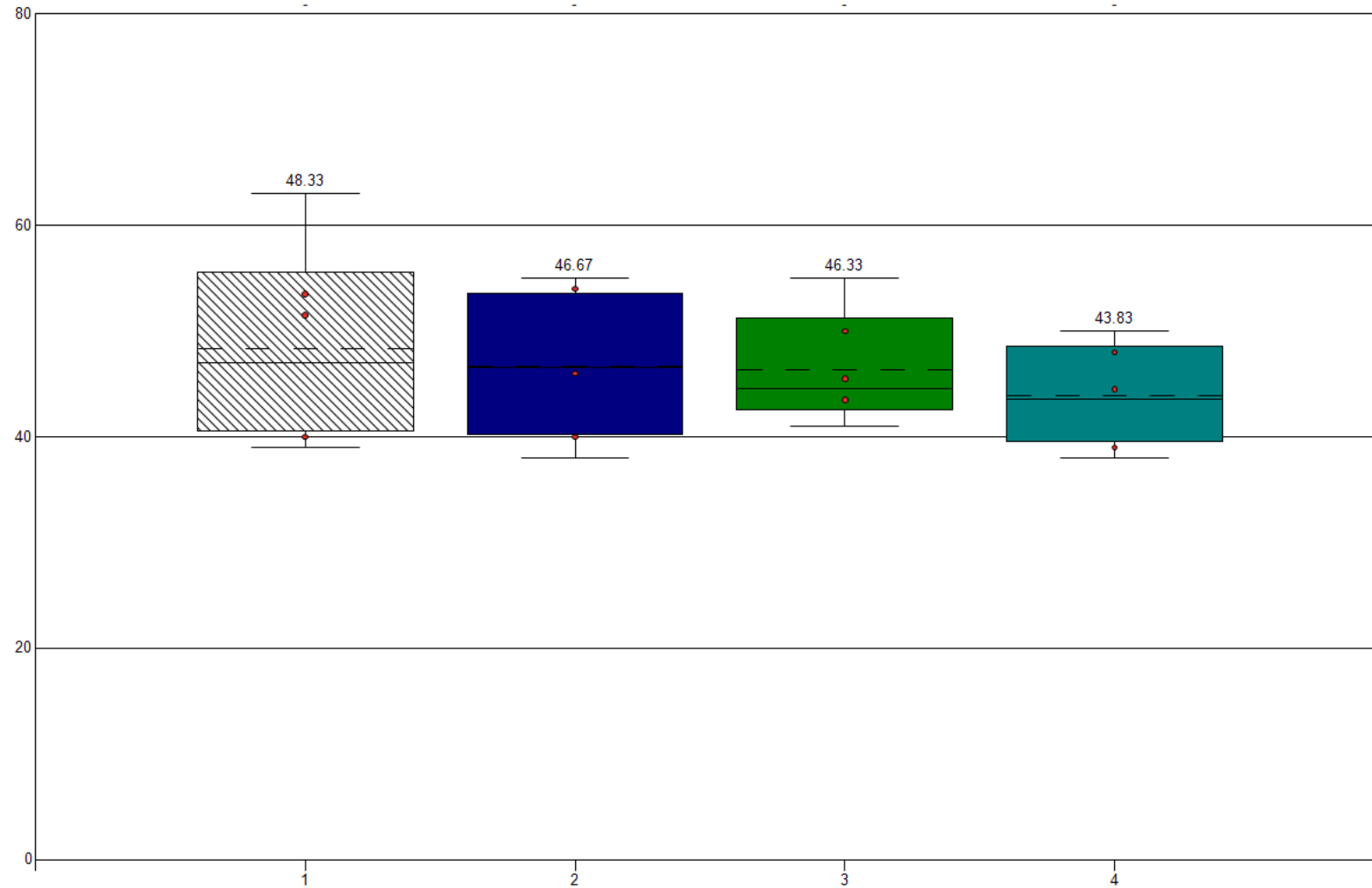


- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

GrowBud DRO 2/25

Yuma Romaine - BalaSal - Fall 2025

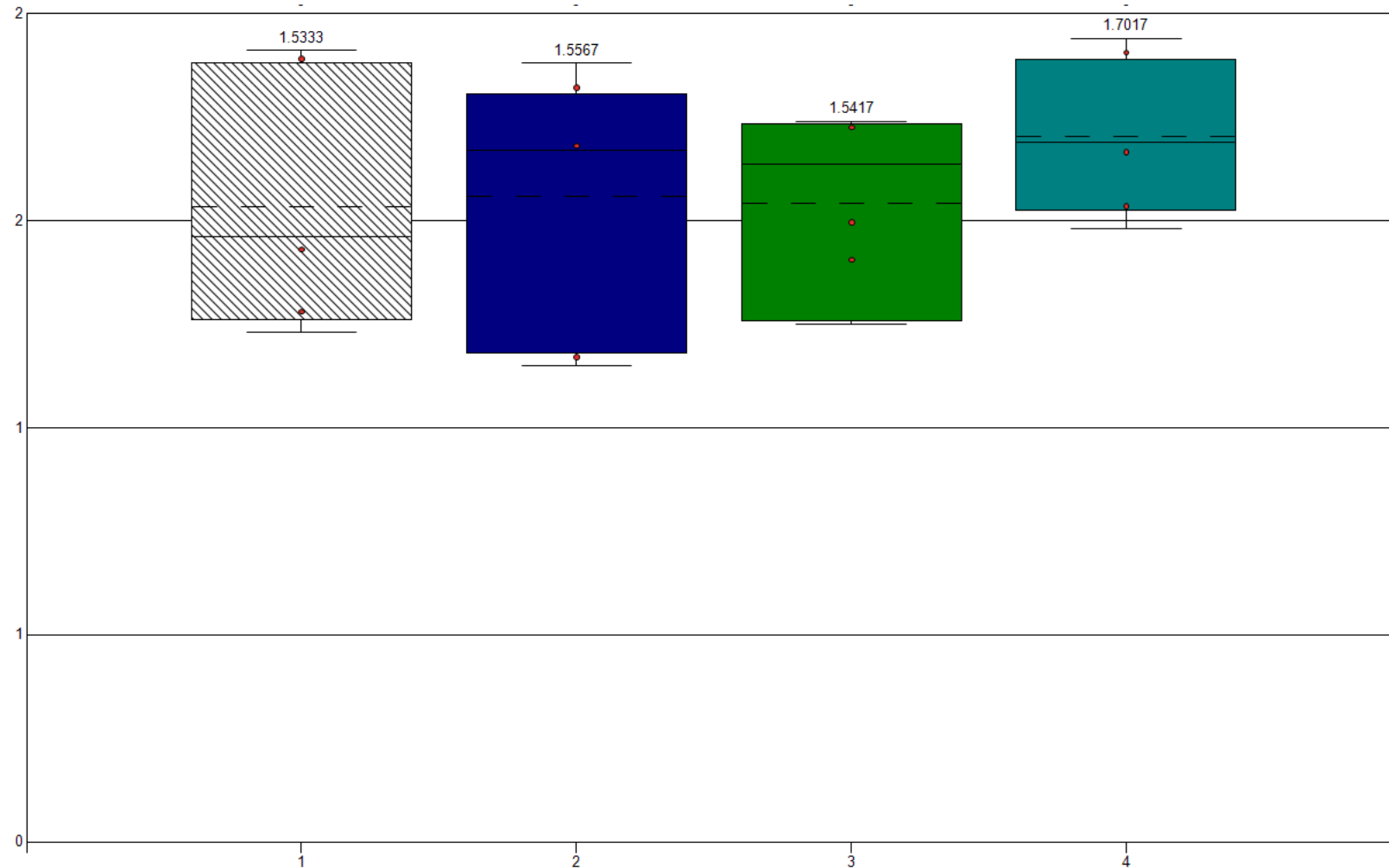
GrowBud Humidity



- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

GrowBud DRO 2/25

Yuma Romaine - BalaSal - Fall 2025



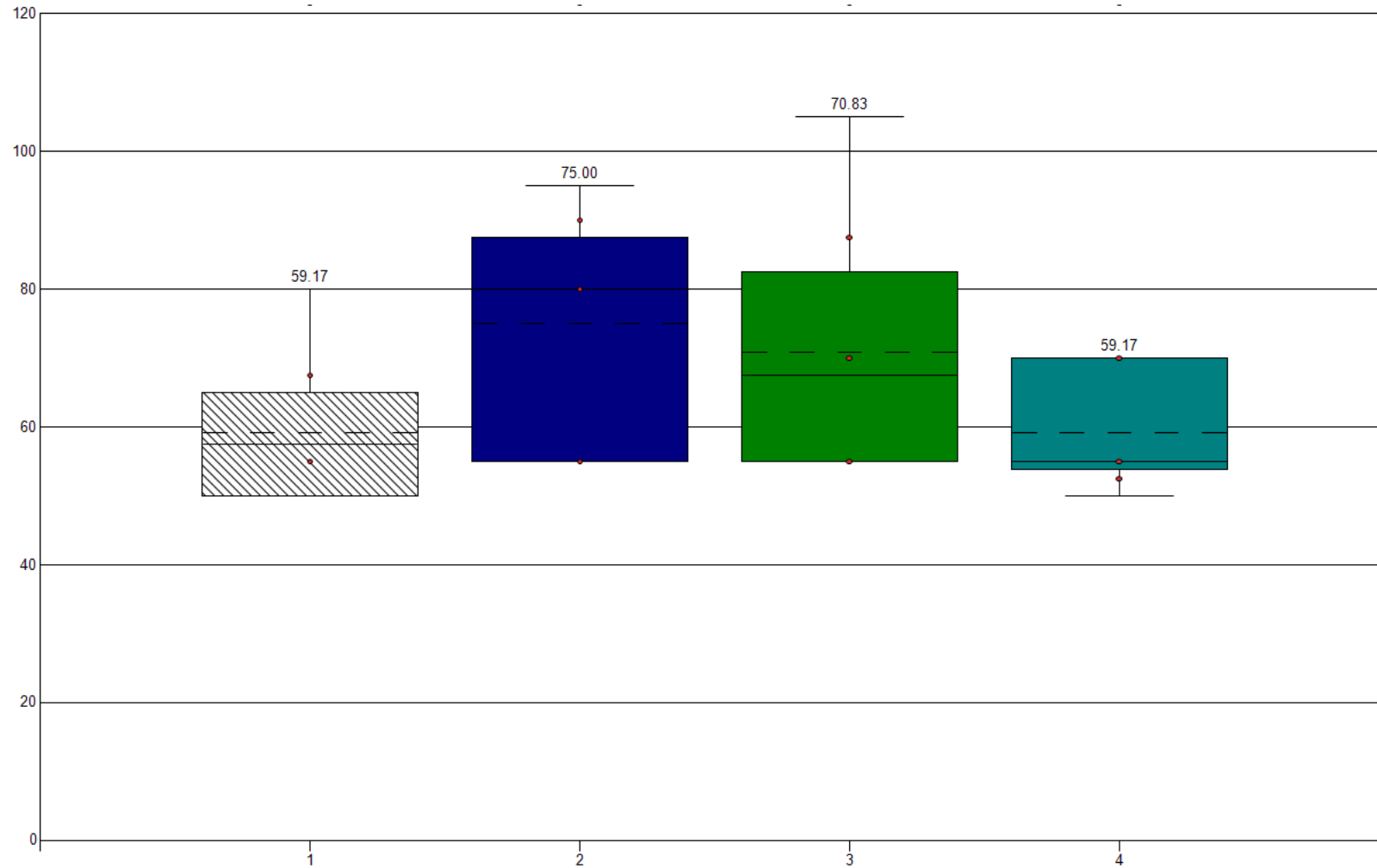
- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

GrowBud VPD

GrowBud DRO 2/25

Yuma Romaine - BalaSal - Fall 2025

GrowBud TDS



- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Harvest

- 26 Feb 2026
- Harvest a 10 foot section of each plot
- Each plant weighed for total above ground biomass
- Hearts were trimmed from the biomass and weighed individually
- Walkby percentage was calculated by counting the plants that did not make a marketable heart (lower values = more harvestable plants per plot)
- Heart circumference and length was recorded for each trimmed head

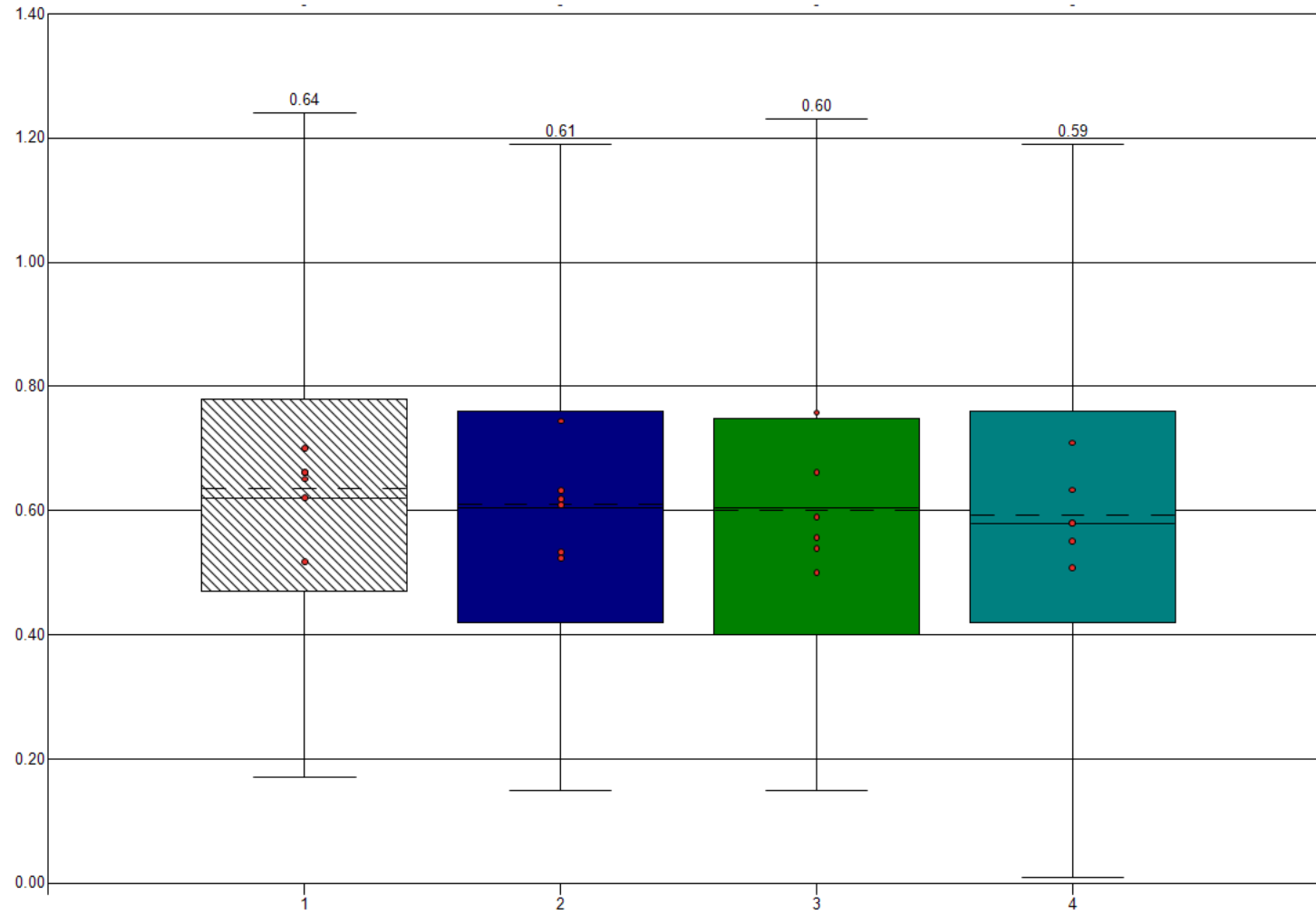








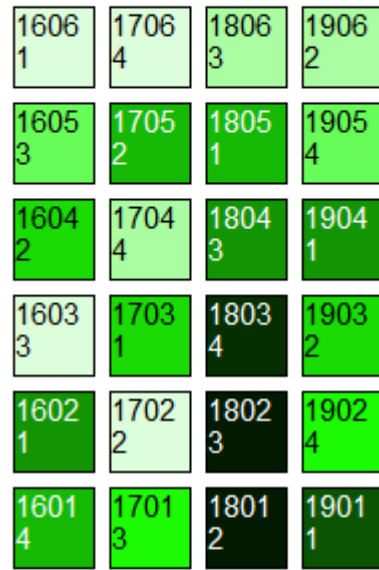
KG/Plant Above Ground Biomass



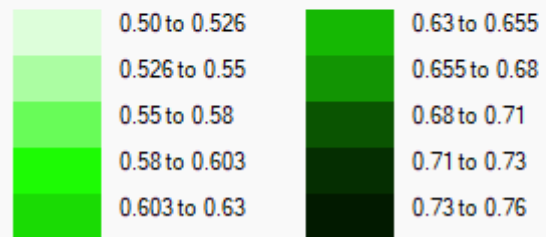
- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Assessment Map - Column 1 - KG/Plant Above Ground Biomass

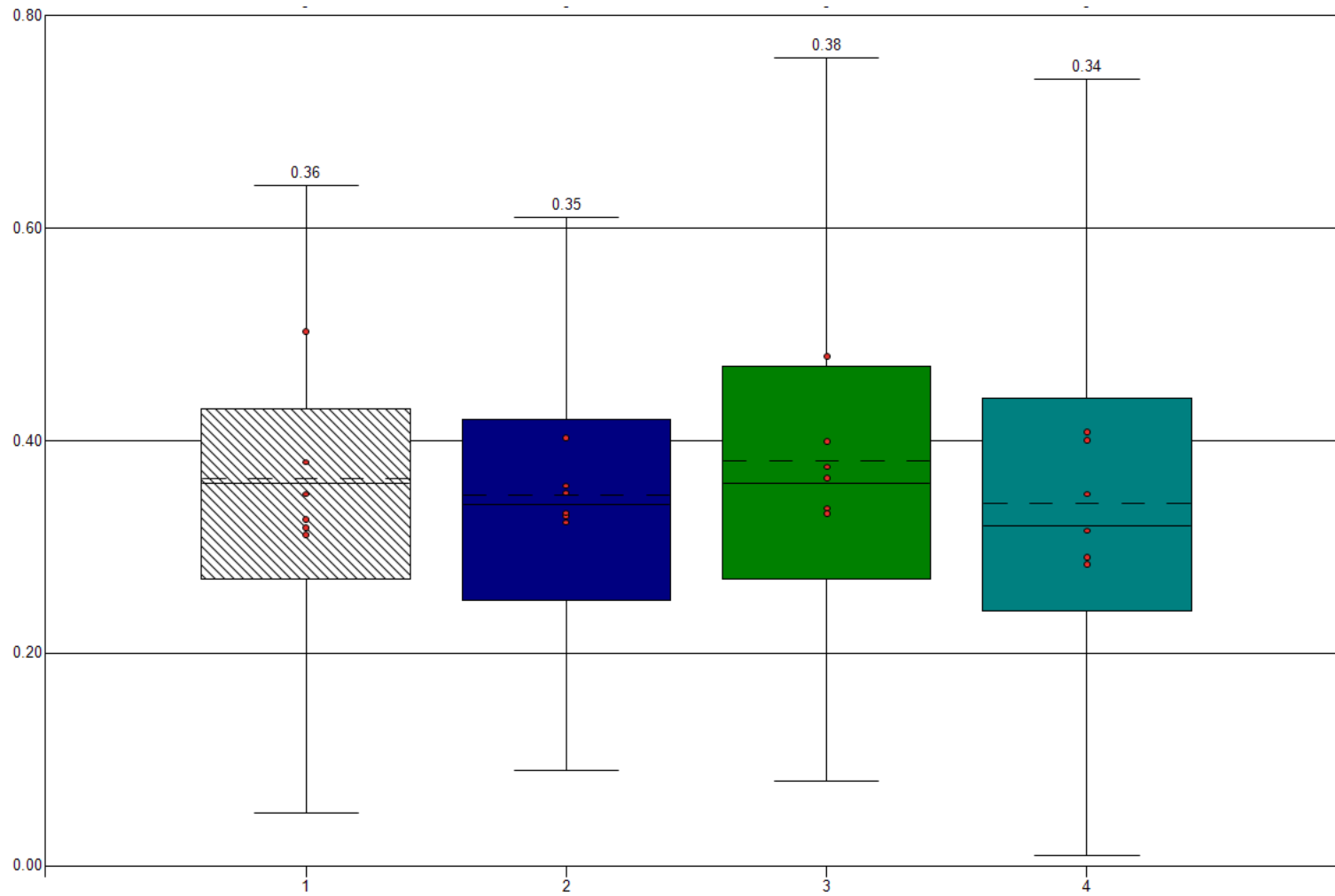
Navigation icons: zoom in, zoom out, pan, arrow, 100%, zoom in, zoom out, Always size to fit



Color Description Options Treatment Description Assessment Description



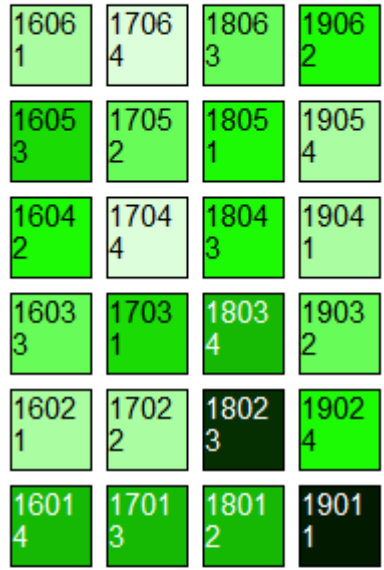
KG/Heart Trimmed Weight



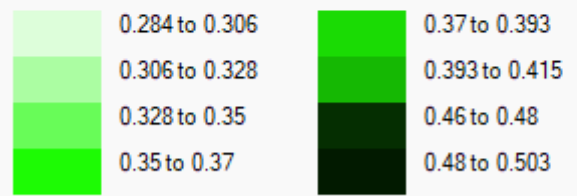
- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Assessment Map - Column 2 - KG/Heart Trimmed Weight

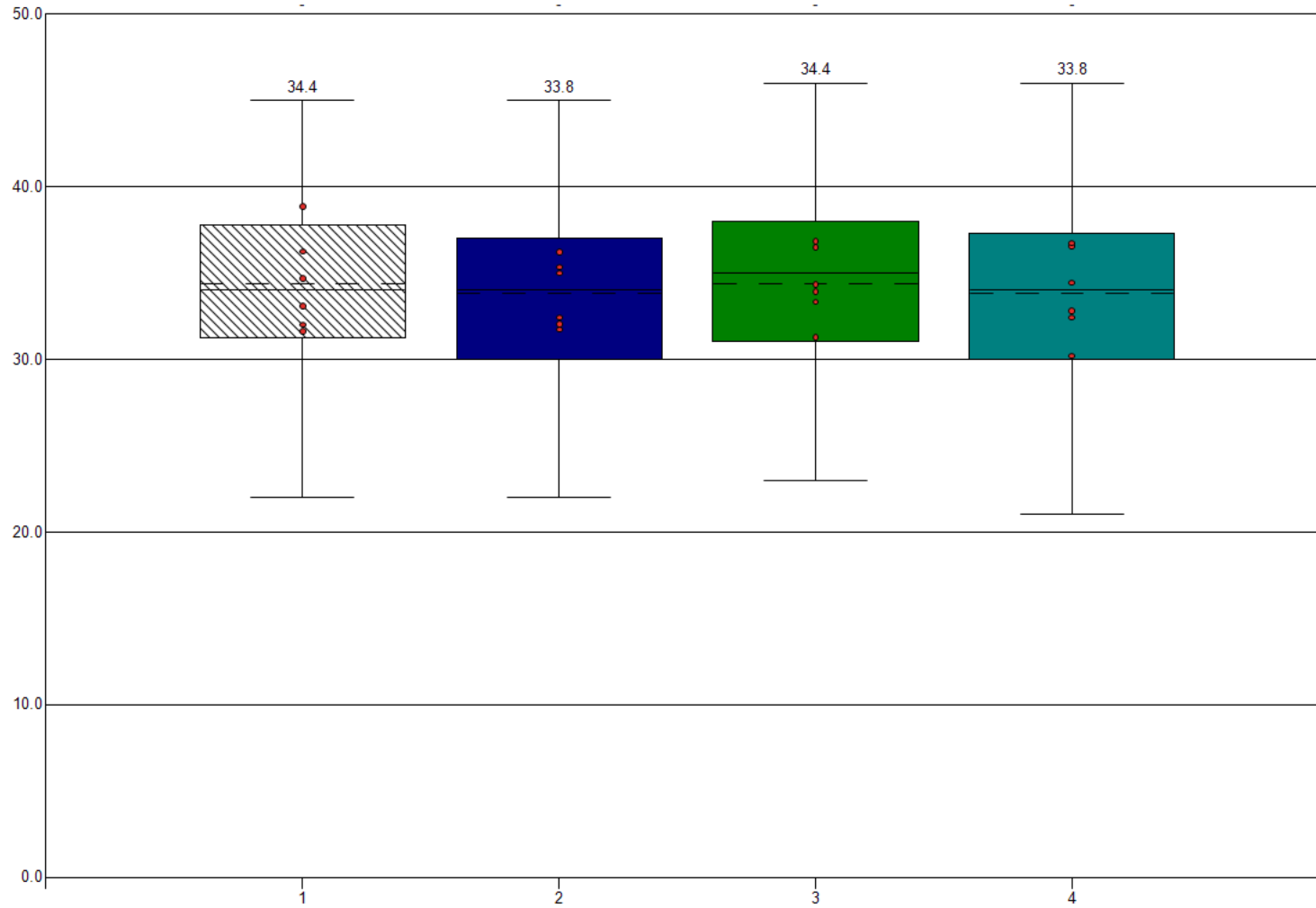
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Color Description Options Treatment Description Assessment Description



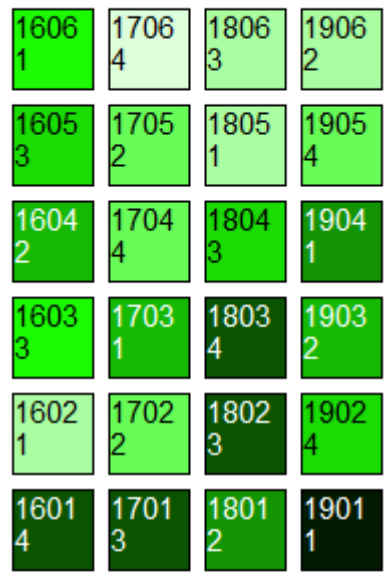
CM/Heart Heart Circumference)



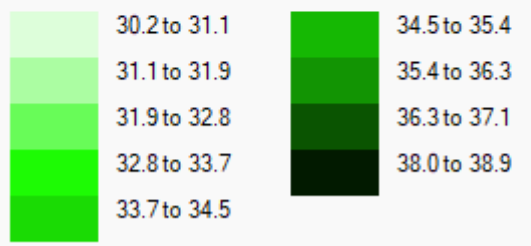
- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Assessment Map - Column 3 - CM/Heart Heart Circumference

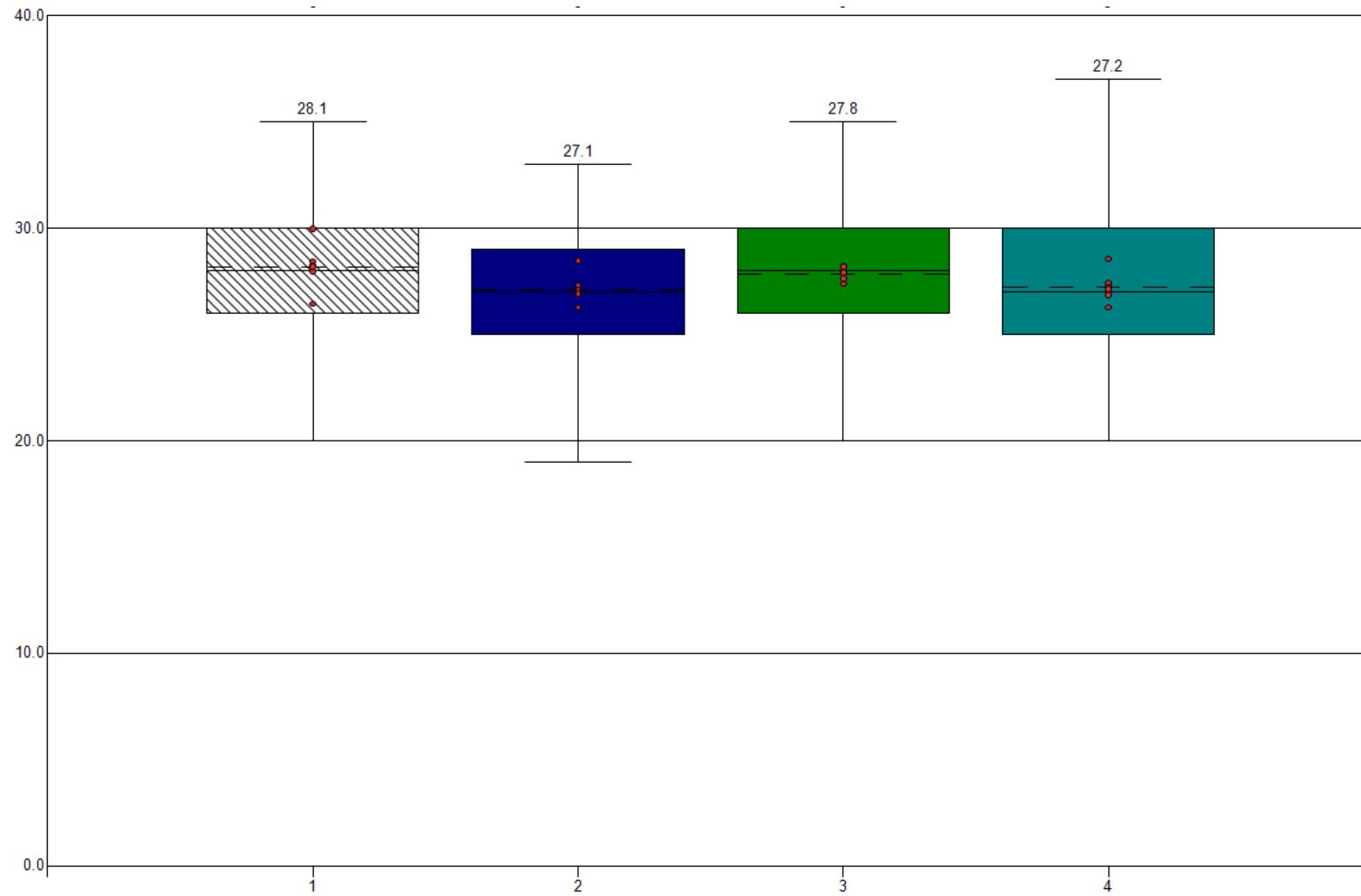
Navigation icons: zoom in, zoom out, pan, arrow, 100%, zoom in, Always size to fit (checked)



Color Description Options Treatment Description Assessment Description



CM/Heart Heart Length











- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Assessment Map - Column 4 - CM/Heart Heart Length

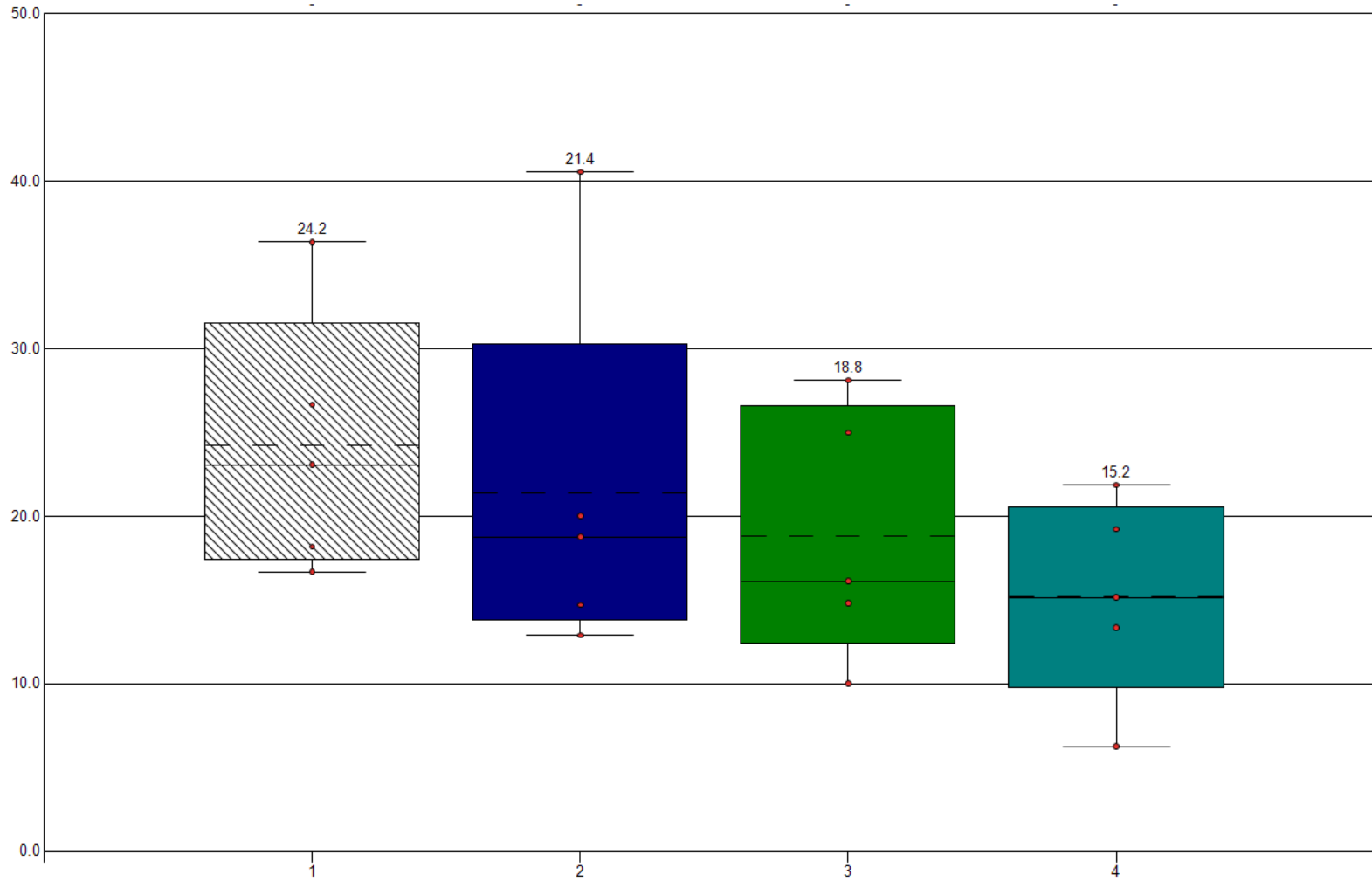
Navigation icons: zoom in, zoom out, hand, play, zoom in, 100%, zoom out, pan, Always size to fit

1606 1	1706 4	1806 3	1906 2
1605 3	1705 2	1805 1	1905 4
1604 2	1704 4	1804 3	1904 1
1603 3	1703 1	1803 4	1903 2
1602 1	1702 2	1802 3	1902 4
1601 4	1701 3	1801 2	1901 1

Color Description Options Treatment Description Assessment Description

	26.3 to 26.6		27.7 to 28.1
	26.6 to 27.0		28.1 to 28.5
	27.0 to 27.4		28.5 to 28.8
	27.4 to 27.7		29.6 to 30.0

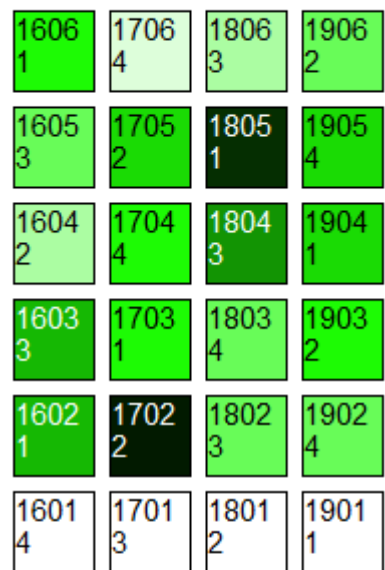
% Walkby Percent



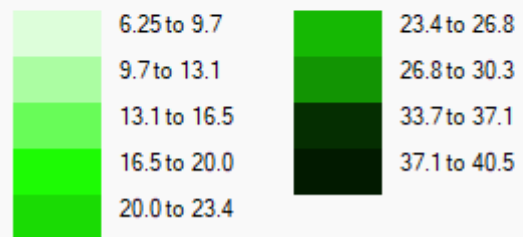
- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A, BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A, BalaSal 1 QT/A, BalaSal

Assessment Map - Column 5 - % Walkby Percent

Navigation icons: zoom in, zoom out, pan, play, 100%, zoom in, pan, Always size to fit



Color Description Options Treatment Description Assessment Description



University of Arizona

T-7 BalaSal Rate Study. Apply different rates and timings under normal irrigation.

Trial ID: T-7 BalaSal Rate Romaine 2025
 Protocol ID: T-7 BalaSal Rate Romaine 2025 Location: Yuma Arizona Trial Year: 2025
 Project ID: T-7 BalaSal Rate Romaine 2025
 Study Director: Robert Masson Sponsor Contact:
 Investigator:

Rating Date	1	2	3	4	6	8
SE Group No.						
Rating Type						
Rating Unit	KG/Plant	KG/Heart	CM/Heart	CM/Heart	%	mol m ⁻²
Rating Min/Max/Interval	0.01, 5, -	0.01, 3, -	1, 60, -	1, 30, -	0, 100, -	
Number of Subsamples	54	30	30	30	1	1
Pest Stage Majority/Min/Max						
Description	Above Ground Bi>	Trimmed Weight	Heart Circumfer>	Heart Length	Walkby Percent	Stomtal conduct>
Number of Decimals	2	2	1	1	1	
Data Entry Date	Feb-16-2026	Feb-16-2026	Feb-16-2026	Feb-16-2026	Feb-16-2026	Mar-4-2026
Trt Treatment Rate Appl No. Name Rate Unit Code	1*	2*	3*	4*	5*	6* dAA
1 UTC	0.64 -	0.36 -	34.4 -	28.1 -	24.2 -	0.143 -
2 BalaSal 1 qt/a ABCD	0.61 -	0.35 -	33.8 -	27.1 -	21.4 -	0.120 -
3 BalaSal 1 gal/a A BalaSal 1 qt/a BCD	0.60 -	0.38 -	34.4 -	27.8 -	18.8 -	0.167 -
4 BalaSal 0.5 gal/a A BalaSal 1 qt/a BC	0.59 -	0.34 -	33.8 -	27.2 -	15.2 -	0.154 -
LSD P=.05	0.088	0.056	1.97	0.96	10.92	0.0748 - 0.0838
Standard Deviation	0.071	0.046	1.60	0.78	7.92	0.4895t
CV	11.71	12.75	4.69	2.82	39.84	22.4t
Levene's F^	1.991	0.606	0.883	0.064	0.64	1.802
Levene's Prob(F)	0.148	0.619	0.467	0.978	0.60	0.179
Shapiro-Wilk^	0.9557	0.9421	0.9851	0.9252	0.954	0.9263
P(Shapiro-Wilk)^	0.3576	0.1814	0.9687	0.076	0.4322	0.0808
Skewness^	0.4352	0.7796	0.0847	0.7483	0.6544	-0.7168
P(Skewness)^	0.3664	0.1124	0.8593	0.1267	0.2167	0.1427
Kurtosis^	0.8432	0.4568	-0.4786	-0.0775	0.1277	-0.2168
P(Kurtosis)^	0.3678	0.6234	0.607	0.9335	0.899	0.8153
Replicate F	1.760	2.759	5.643	1.071	1.424	0.784
Replicate Prob(F)	0.1818	0.0582	0.0040	0.4150	0.2849	0.5771
Treatment F	0.395	0.886	0.247	2.390	1.173	0.575
Treatment Prob(F)	0.7585	0.4709	0.8623	0.1095	0.3608	0.6400

University of Arizona

T-7 BalaSal Rate Study. Apply different rates and timings under normal irrigation.								
Trial ID: T-7 BalaSal Rate Romaine 2025								
Protocol ID: T-7 BalaSal Rate Romaine 2025 Location: Yuma Arizona Trial Year: 2025								
Project ID: T-7 BalaSal Rate Romaine 2025								
Study Director: Robert Masson Sponsor Contact:								
Investigator:								
Rating Date	9	10	11	12	13	Dec-16-2025 14	Dec-16-2025 15	
SE Group No.								
Rating Type								
Rating Unit	mol m ⁻²	kPa	°C	°C	µg m ⁻²	Soil Cub	Soil Cub	
Rating Min/Max/Interval	0, 100, -							
Number of Subsamples	1	1	1	1	1	3	3	
Pest Stage Majority/Min/Max								
Description	Transpiration	VPDleaf	air temperature	Canopy Temperat>	Chlorophyll con>	*Soil VWC %	Soil Temp °F	
Number of Decimals								
Data Entry Date	Mar-4-2026	Mar-4-2026	Mar-4-2026	Mar-4-2026	Mar-4-2026	Mar-4-2026	Mar-4-2026	
Trt Treatment	7*	8*	9*	10*	11*	12*	13*	
Rate Appl								
No. Name								
Rate Unit Code								
1 UTC	3.232 -	2.392 -	23.675 -	24.182 -	33.15 -	25.67 -	74.66 -	
2 BalaSal 1 qt/a ABCD	2.822 -	2.355 -	23.627 -	23.878 -	31.90 -	28.50 -	74.98 -	
3 BalaSal 1 gal/a A BalaSal 1 qt/a BCD	3.668 -	2.255 -	23.593 -	23.420 -	32.47 -	28.03 -	75.44 -	
4 BalaSal 0.5 gal/a A BalaSal 1 qt/a BC	3.405 -	2.285 -	23.653 -	23.652 -	29.70 -	26.54 -	75.20 -	
LSD P= .05	1.6306	0.3605	0.2647	2.1602	3.881	2.143	1.072	
Standard Deviation	1.3251	0.2930	0.2151	1.7554	3.153	1.073	0.536	
CV	40.38	12.62	0.91	7.38	9.92	3.95	0.71	
Levene's F^	2.63	0.10	0.389	0.032	0.537	0.652	1.584	
Levene's P prob(F)	0.078	0.959	0.762	0.992	0.662	0.604	0.268	
Shapiro-Wilk^	0.953	0.9709	0.9307	0.9767	0.9763	0.9824	0.9053	
P(Shapiro-Wilk)^	0.3146	0.69	0.1012	0.8292	0.8197	0.9915	0.1856	
Skewness^	-0.6927	0.2791	0.1489	0.0158	-0.0606	0.0291	0.2541	
P(Skewness)^	0.156	0.5604	0.7554	0.9736	0.899	0.9644	0.6978	
Kurtosis^	0.2649	-0.3865	-1.3388	-0.6081	-0.4382	-0.3619	0.4145	
P(Kurtosis)^	0.7755	0.6776	0.1582	0.5142	0.6376	0.7745	0.7429	
Replicate F	0.646	1.123	0.109	0.882	1.525	6.017	8.630	
Replicate Prob(F)	0.6689	0.3899	0.9885	0.5170	0.2409	0.0368	0.0172	
Treatment F	0.431	0.275	0.161	0.206	1.345	4.488	1.173	
Treatment Prob(F)	0.7335	0.8425	0.9209	0.8908	0.2973	0.0561	0.3953	

University of Arizona

T-7 BalaSal Rate Study. Apply different rates and timings under normal irrigation.						
Trial ID: T-7 BalaSal Rate Romaine 2025						
Protocol ID: T-7 BalaSal Rate Romaine 2025 Location: Yuma Arizona Trial Year: 2025						
Project ID: T-7 BalaSal Rate Romaine 2025						
Study Director: Robert Masson Sponsor Contact: Investigator.						
Rating Date	Dec-16-2025	Dec-16-2025	Dec-16-2025	Jan-22-2026	Jan-22-2026	Jan-22-2026
SE Group No.	16	17	18	19	20	21
Rating Type	Soil Cub	Soil Cub	Soil Cub	Soil Cub	Soil Cub	Soil Cub
Rating Unit						
Rating Min/Max/Interval						
Number of Subsamples	3	3	3	3	3	3
Pest Stage Majority/Min/Max						
Description	*Soil E.C uS/cm	Ambient Tempera>	Relative Humidi>	*Soil WWC %	Soil Temp *F	*Soil E.C uS/cm
Number of Decimals						
Data Entry Date	Mar-4-2026	Mar-4-2026	Mar-4-2026	Mar-4-2026	Mar-4-2026	Mar-4-2026
Trt Treatment	14*	15*	16*	17*	18*	19*
No. Name						
Rate Appl						
Rate Unit						
Code						
1 UTC	814.4 -	78.04 -	37.68 -	20.63 -	68.23 -	676.7 -
2 BalaSal 1 qt/a ABCD	820.4 -	77.06 -	37.64 -	22.16 -	68.19 -	726.7 -
3 BalaSal 1 gal/a A	843.2 -	74.43 -	37.70 -	21.79 -	68.34 -	766.9 -
BalaSal 1 qt/a BCD						
4 BalaSal 0.5 gal/a A	762.2 -	77.03 -	37.58 -	22.36 -	68.39 -	754.6 -
BalaSal 1 qt/a BC						
LSD P=.05	166.94	4.554	0.247	2.731	0.509	198.64
Standard Deviation	83.56	2.280	0.124	1.367	0.255	99.42
CV	10.31	2.97	0.33	6.29	0.37	13.6
Levene's F^	0.632	0.59	0.664	0.566	0.708	0.815
Levene's Prob(F)	0.615	0.639	0.597	0.653	0.574	0.521
Shapiro-Wilk^	0.962	0.9603	0.9886	0.9088	0.979	0.9548
P(Shapiro-Wilk)^	0.8124	0.7888	0.9994	0.206	0.9794	0.7073
Ske wness^	-0.4435	-0.413	0.1058	0.6872	0.5166	0.4254
P(Ske wness)^	0.5009	0.5303	0.8712	0.304	0.4348	0.5182
Kurtosis^	-0.518	0.8692	-0.0744	-0.636	0.2426	-0.1939
P(Kurtosis)^	0.6823	0.4953	0.953	0.616	0.8475	0.8778
Replicate F	3.862	7.144	16.855	0.248	15.009	0.229
Replicate Prob(F)	0.0835	0.0259	0.0034	0.7879	0.0046	0.8021
Treatment F	0.503	1.380	0.558	0.952	0.404	0.487
Treatment Prob(F)	0.6938	0.3364	0.6621	0.4732	0.7557	0.7038

University of Arizona

T-7 BalaSal Rate Study. Apply different rates and timings under normal irrigation.						
Trial ID: T-7 BalaSal Rate Romaine 2025						
Protocol ID: T-7 BalaSal Rate Romaine 2025 Location: Yuma Arizona Trial Year: 2025						
Project ID: T-7 BalaSal Rate Romaine 2025						
Study Director: Robert Masson Sponsor Contact:						
Investigator:						
Rating Date	Jan-22-2026	Jan-22-2026	Feb-27-2026	Feb-27-2026	Feb-27-2026	Feb-27-2026
SE Group No.	22	23	24	25	26	27
Rating Type	Soil Cub	Soil Cub	GrowBud	GrowBud	GrowBud	GrowBud
Rating Unit						
Rating Min/Max/Interval						
Number of Subsamples	3	3	2	2	2	2
Pest Stage Majority/Min/Max					.01, .60, -	
Description	Ambient Tempera>	Relative Humidi>	Water Content	Pore Water EC	Bulk E C	Air Surface Temp
Number of Decimals						
Data Entry Date	Mar-4-2026	Mar-4-2026	Mar-4-2026	Mar-4-2026	Mar-4-2026	Mar-4-2026
Trt Treatment	20*	21*	22*	23*	24*	25*
No. Name						
Rate Appl						
Rate Unit						
Code						
1 UTC	70.59 -	37.21 -	24.5 -	2.47 -	0.118 -	70.3 -
2 BalaSal 1 qt/a ABCD	70.76 -	37.38 -	24.7 -	3.22 -	0.145 -	70.8 -
3 BalaSal 1 gal/a A BalaSal 1 qt/a BCD	71.57 -	37.20 -	25.3 -	2.85 -	0.142 -	70.3 -
4 BalaSal 0.5 gal/a A BalaSal 1 qt/a BC	70.56 -	37.30 -	24.3 -	2.55 -	0.120 -	72.0 -
LSD P=.05	3.313	0.420	4.05	0.731	0.0553	2.06
Standard Deviation	1.658	0.210	2.03	0.366	0.0277	1.03
CV	2.34	0.56	8.21	13.2	21.09	1.45
Levene's F^	0.361	0.425	0.129	0.774	0.461	0.286
Levene's Prob(F)	0.783	0.74	0.94	0.54	0.717	0.834
Shapiro-Wilk^	0.9565	0.9056	0.9031	0.9789	0.9823	0.9461
P(Shapiro-Wilk)^	0.7331	0.1873	0.1741	0.979	0.9912	0.5812
Skewness^	-0.3573	0.6827	0.4537	-0.098	-0.077	-0.0824
P(Skewness)^	0.5862	0.307	0.4914	0.8806	0.906	0.8994
Kurtosis^	-0.7834	0.8116	-1.3157	0.2767	-0.5465	-0.9255
P(Kurtosis)^	0.5379	0.5237	0.3085	0.8265	0.666	0.4684
Replicate F	2.274	2.307	0.703	3.514	0.253	9.941
Replicate Prob(F)	0.1840	0.1806	0.5317	0.0977	0.7844	0.0125
Treatment F	0.246	0.473	0.140	2.588	0.772	1.745
Treatment Prob(F)	0.8615	0.7123	0.9324	0.1484	0.5507	0.2570

University of Arizona

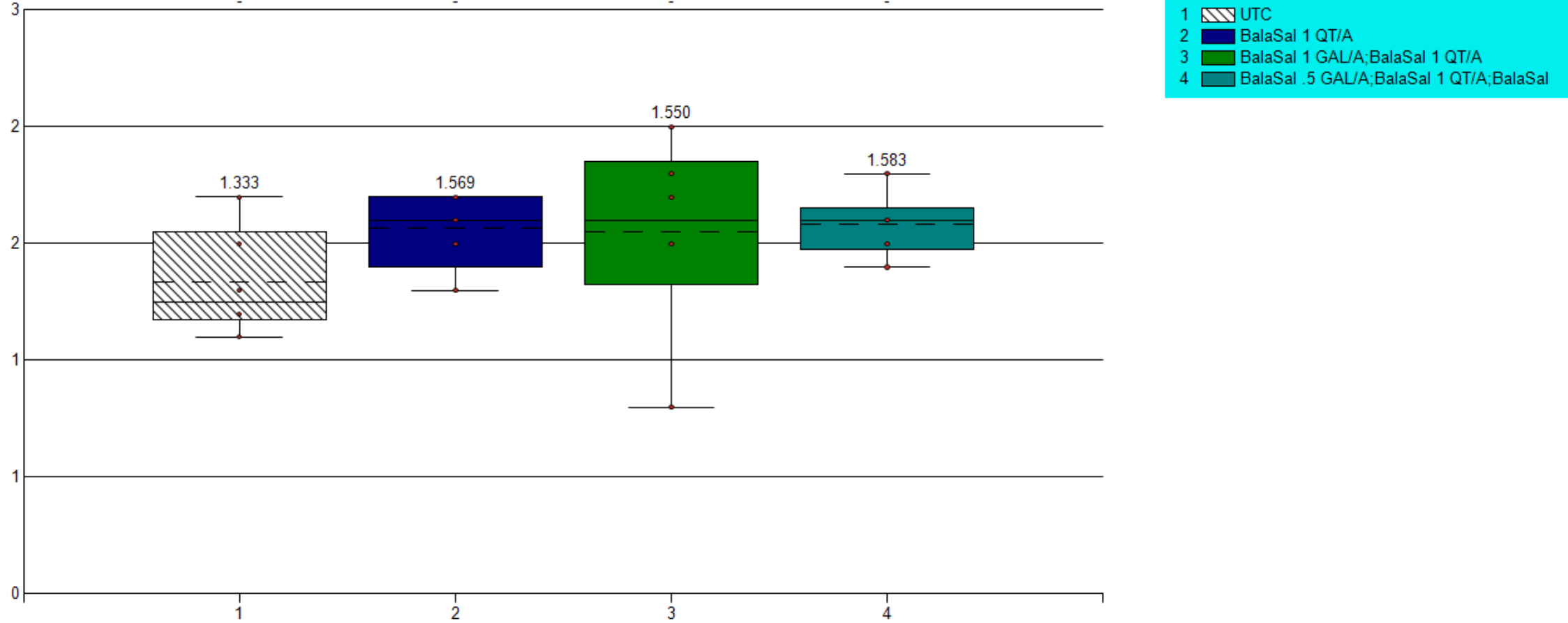
T-7 BalaSal Rate Study. Apply different rates and timings under normal irrigation.						
Trial ID: T-7 BalaSal Rate Romaine 2025						
Protocol ID: T-7 BalaSal Rate Romaine 2025 Location: Yuma Arizona Trial Year: 2025						
Project ID: T-7 BalaSal Rate Romaine 2025						
Study Director: Robert Masson Sponsor Contact:						
Investigator:						
Rating Date	Jan-22-2026	Jan-22-2026	Feb-27-2026	Feb-27-2026	Feb-27-2026	Feb-27-2026
SE Group No.	22	23	24	25	26	27
Rating Type	Soil Cub	Soil Cub	GrowBud	GrowBud	GrowBud	GrowBud
Rating Unit						
Rating Min/Max/Interval						
Number of Subsamples	3	3	2	2	2	2
Pest Stage Majority/Min/Max					.01, .60, -	
Description	Ambient Tempera>	Relative Humid>	Water Content	Pore Water EC	Bulk EC	Air Surface Temp
Number of Decimals						
Data Entry Date	Mar-4-2026	Mar-4-2026	Mar-4-2026	Mar-4-2026	Mar-4-2026	Mar-4-2026
Trt Treatment	20*	21*	22*	23*	24*	25*
No. Name Rate Unit Code						
1 UTC	70.59 -	37.21 -	24.5 -	2.47 -	0.118 -	70.3 -
2 BalaSal 1 qt/a ABCD	70.76 -	37.38 -	24.7 -	3.22 -	0.145 -	70.8 -
3 BalaSal 1 gal/a A BalaSal 1 qt/a BCD	71.57 -	37.20 -	25.3 -	2.85 -	0.142 -	70.3 -
4 BalaSal 0.5 gal/a A BalaSal 1 qt/a BC	70.56 -	37.30 -	24.3 -	2.55 -	0.120 -	72.0 -
LSD P=.05	3.313	0.420	4.05	0.731	0.0553	2.06
Standard Deviation	1.658	0.210	2.03	0.366	0.0277	1.03
CV	2.34	0.56	8.21	13.2	21.09	1.45
Levene's F^	0.361	0.425	0.129	0.774	0.461	0.286
Levene's Prob(F)	0.783	0.74	0.94	0.54	0.717	0.834
Shapiro-Wilk^	0.9565	0.9056	0.9031	0.9789	0.9823	0.9461
P(Shapiro-Wilk)^	0.7331	0.1873	0.1741	0.979	0.9912	0.5812
Skewness^	-0.3573	0.6827	0.4537	-0.098	-0.077	-0.0824
P(Skewness)^	0.5862	0.307	0.4914	0.8806	0.906	0.8994
Kurtosis^	-0.7834	0.8116	-1.3157	0.2767	-0.5465	-0.9255
P(Kurtosis)^	0.5379	0.5237	0.3085	0.8265	0.666	0.4684
Replicate F	2.274	2.307	0.703	3.514	0.253	9.941
Replicate Prob(F)	0.1840	0.1806	0.5317	0.0977	0.7844	0.0125
Treatment F	0.246	0.473	0.140	2.588	0.772	1.745
Treatment Prob(F)	0.8615	0.7123	0.9324	0.1484	0.5507	0.2570

Soil Samples: End of Trial

Nutrition and SAR

Yuma Romaine - BalaSal Trial - Fall 2025 - End of Trial Soil Samples

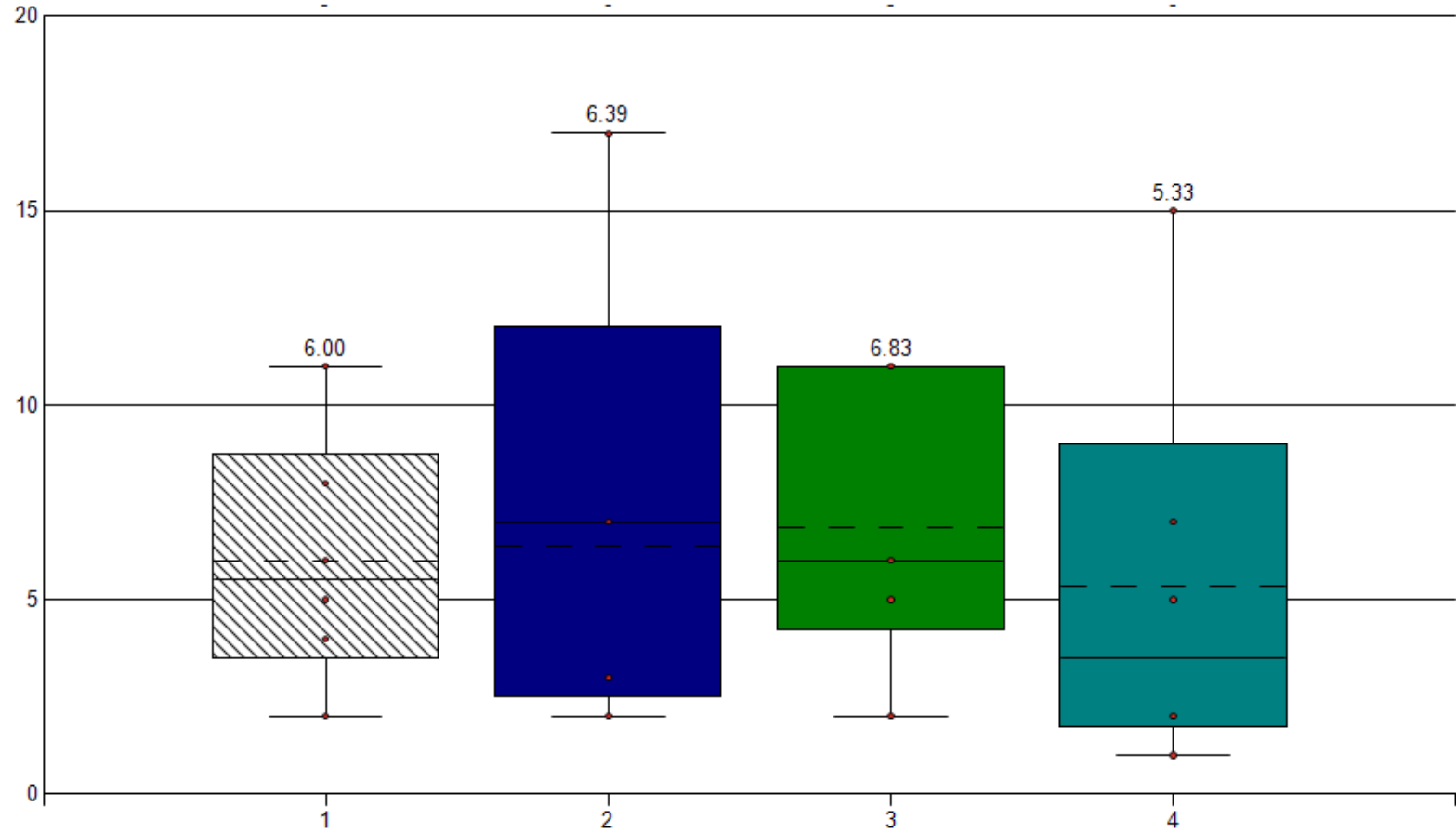
% OM



Trial ID: T-7_BalaSal_Rate_Romaine_2025

Yuma Romaine - BalaSal Trial - Fall 2025 - End of Trial Soil Samples

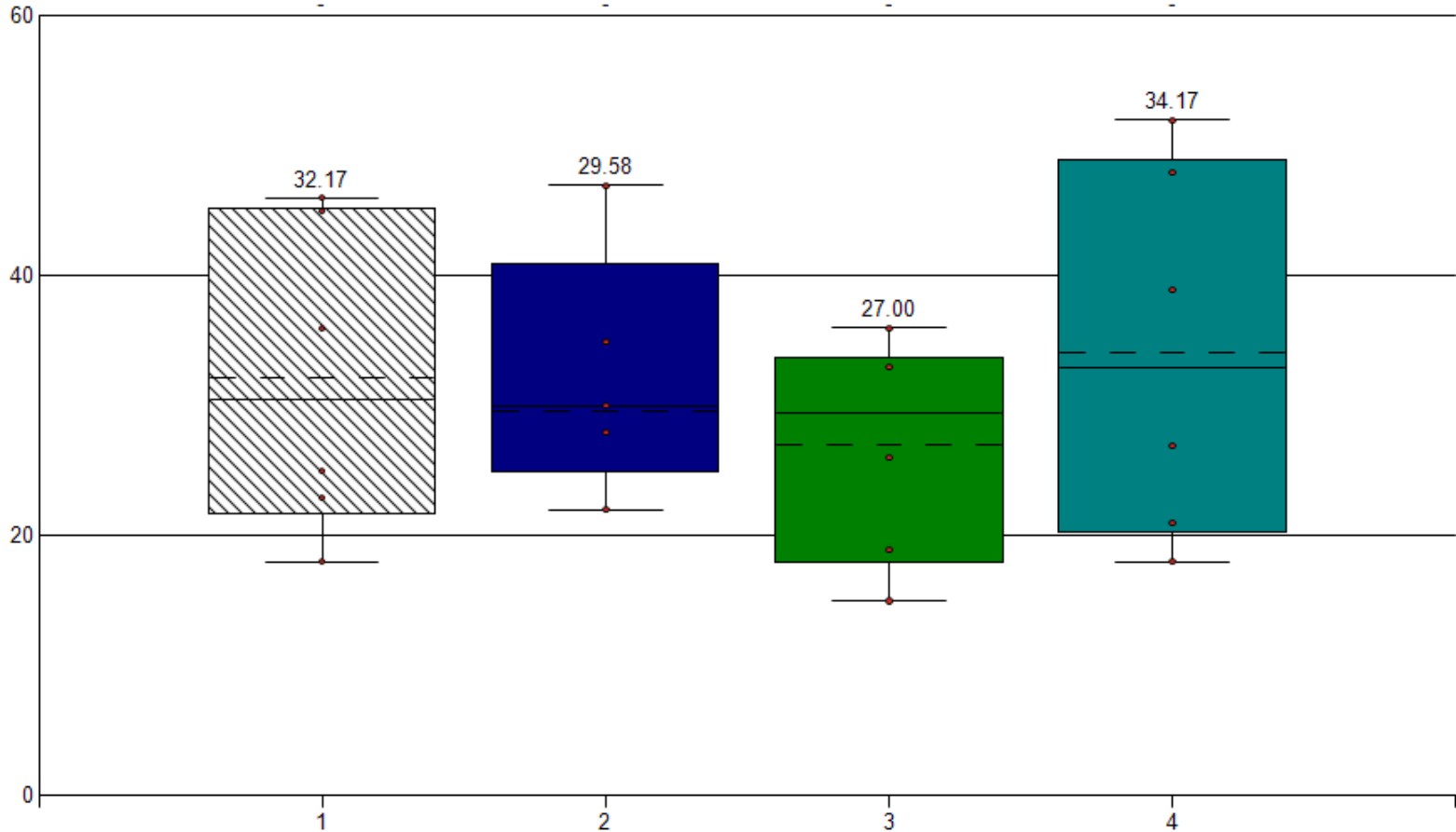
ppm P1



- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Yuma Romaine - BalaSal Trial - Fall 2025 - End of Trial Soil Samples

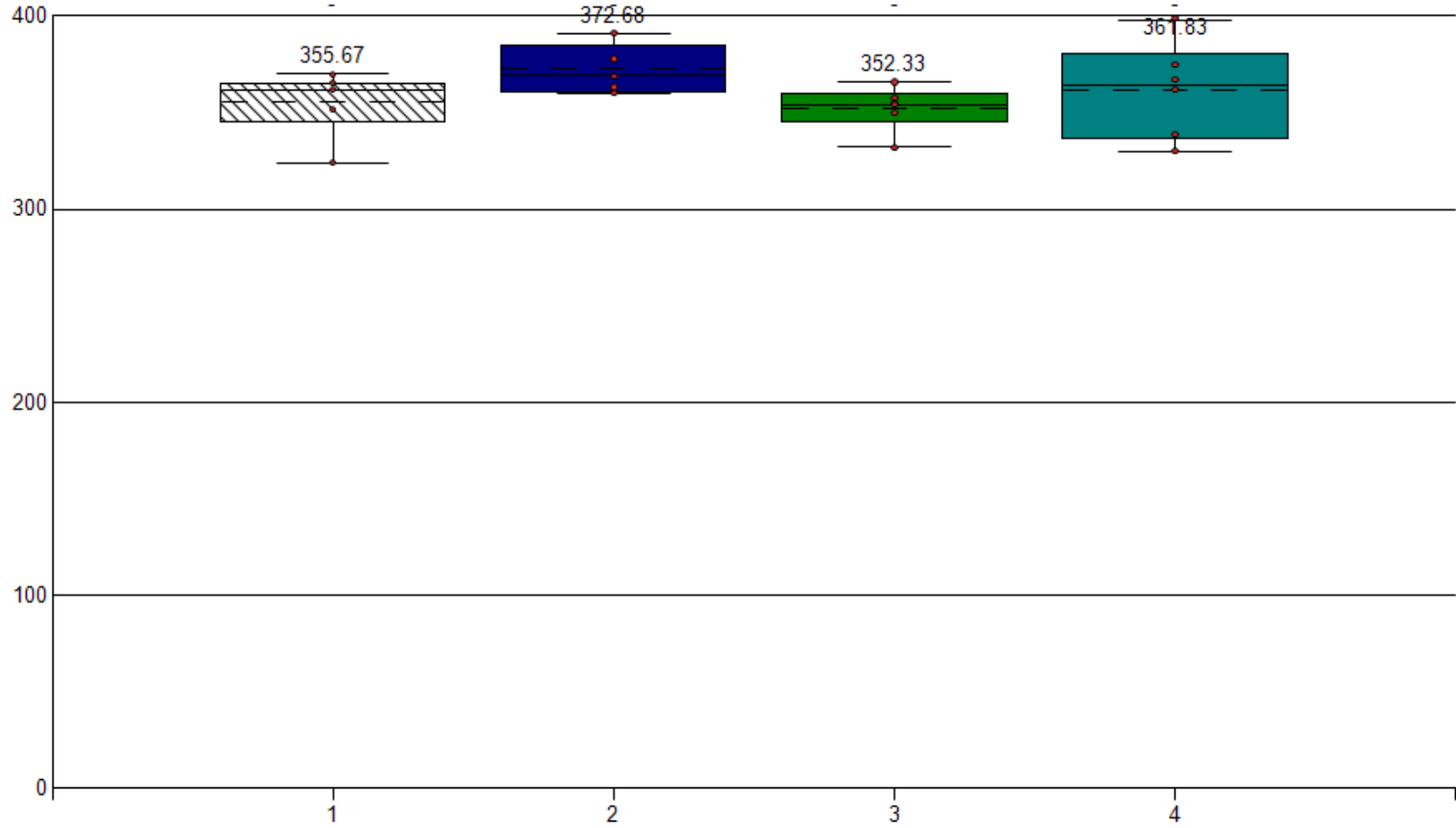
ppm Olsen



- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Yuma Romaine - BalaSal Trial - Fall 2025 - End of Trial Soil Samples

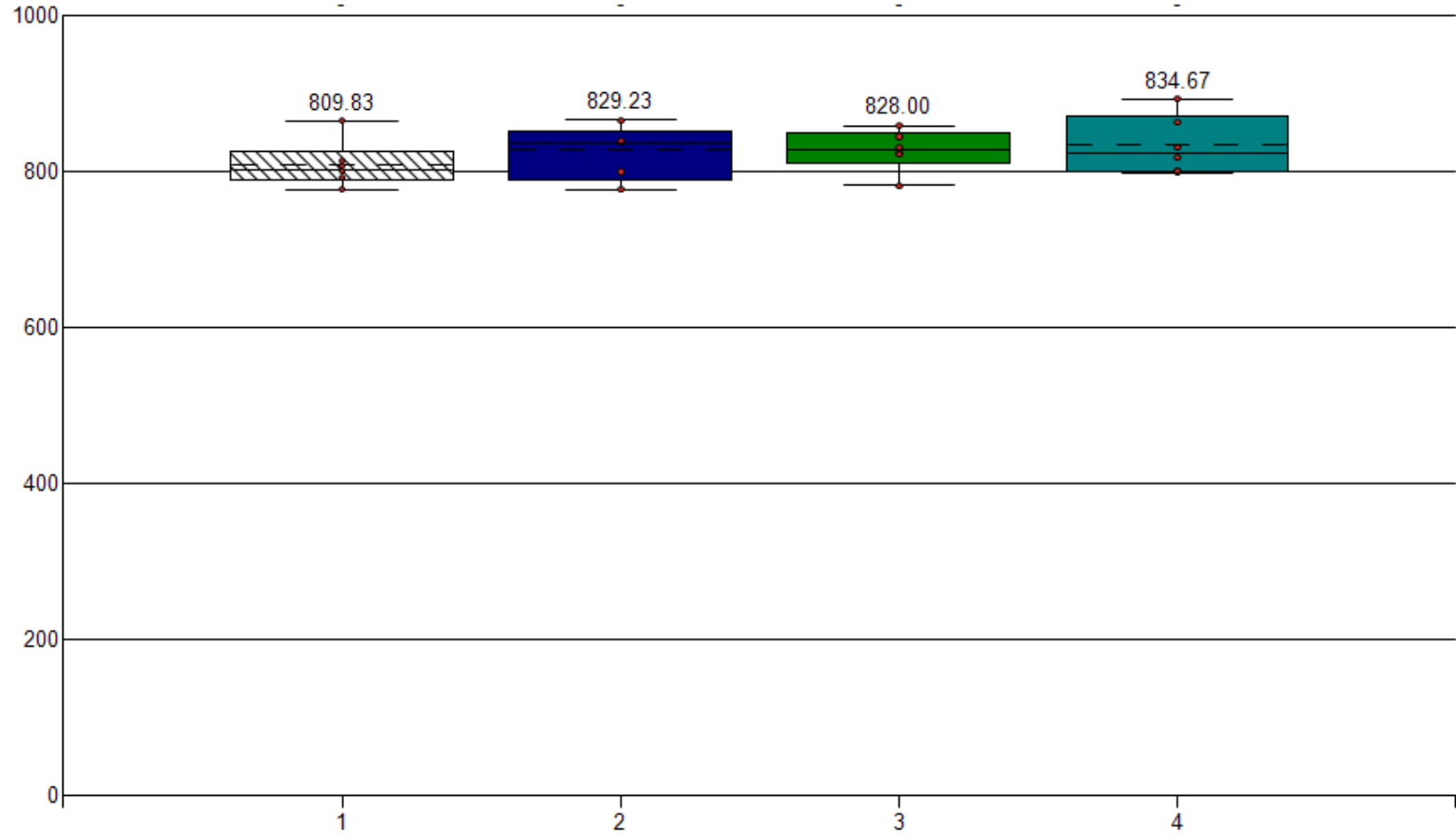
ppm K



- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Yuma Romaine - BalaSal Trial - Fall 2025 - End of Trial Soil Samples

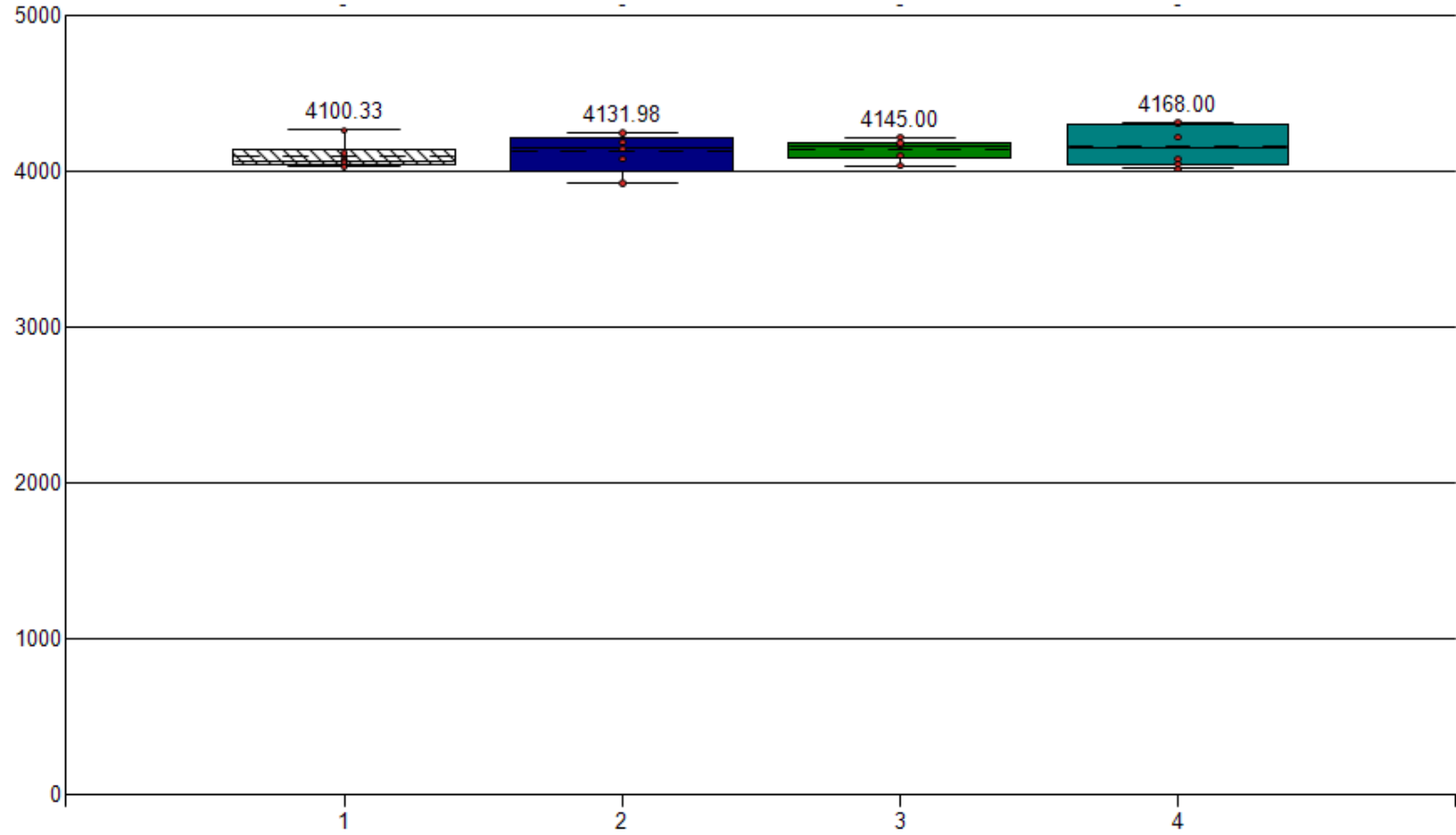
ppm Mg



- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Yuma Romaine - BalaSal Trial - Fall 2025 - End of Trial Soil Samples

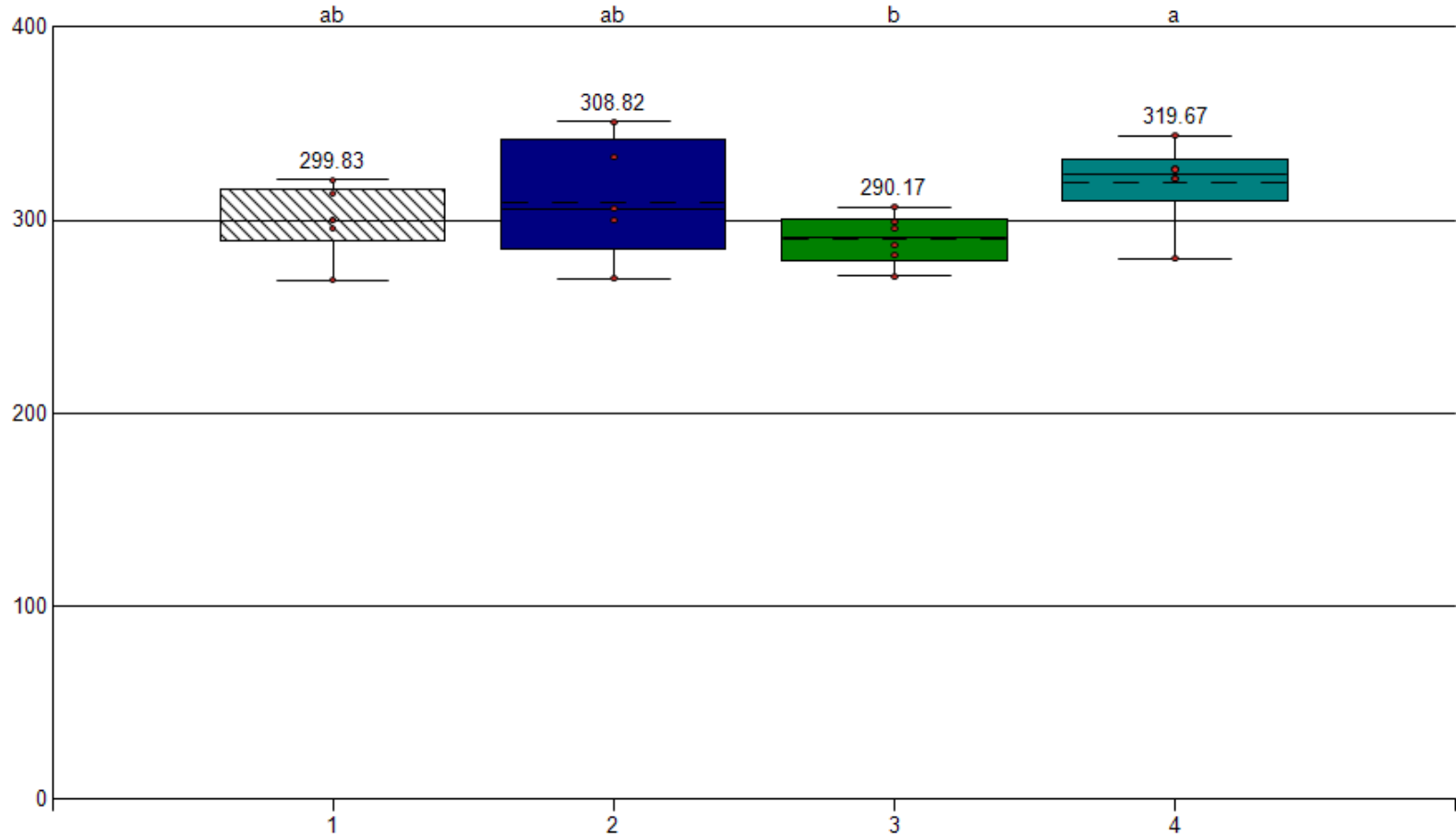
ppm Ca



- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Yuma Romaine - BalaSal Trial - Fall 2025 - End of Trial Soil Samples

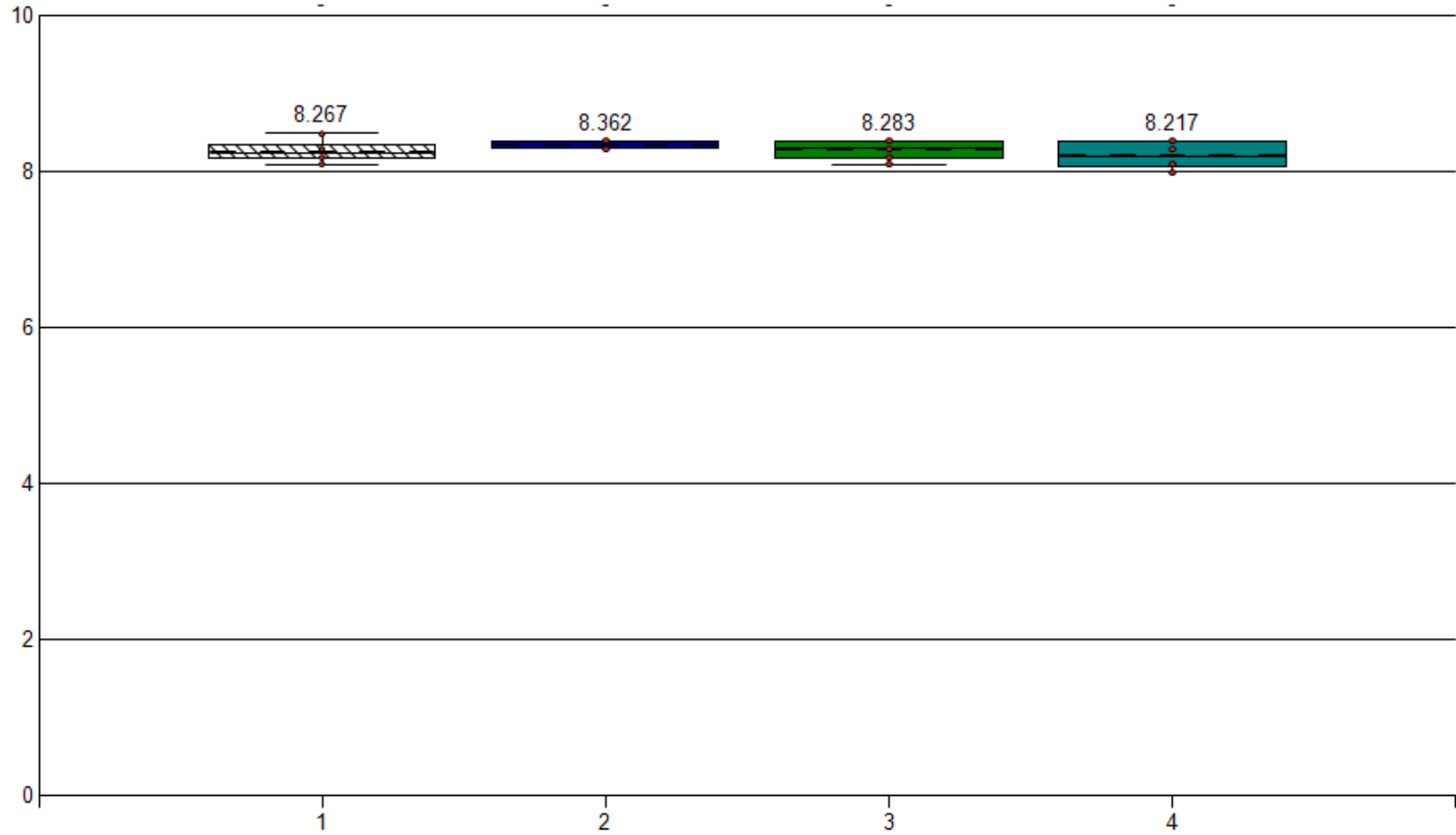
ppm Na



- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Yuma Romaine - BalaSal Trial - Fall 2025 - End of Trial Soil Samples

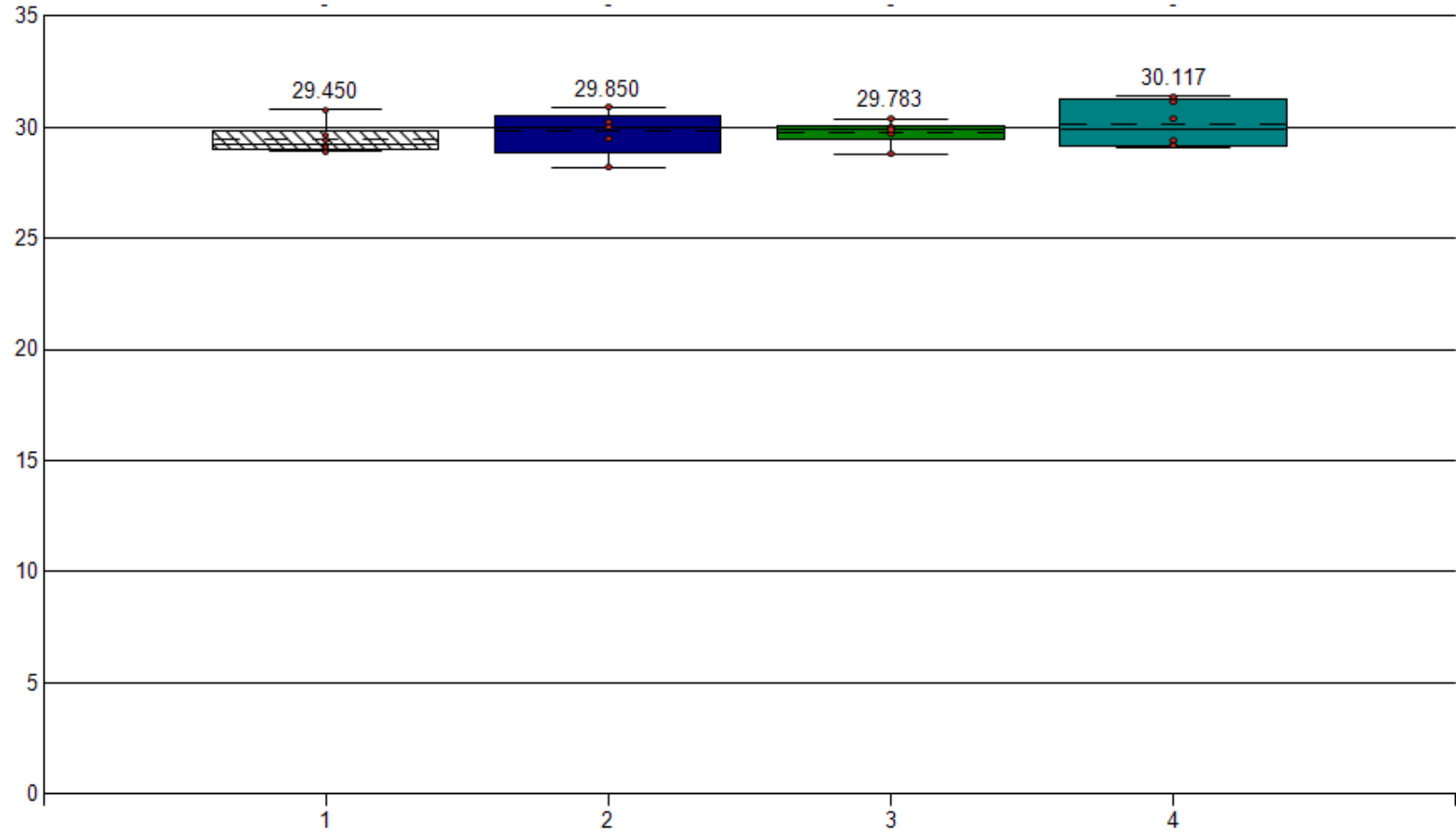
pH



- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Yuma Romaine - BalaSal Trial - Fall 2025 - End of Trial Soil Samples

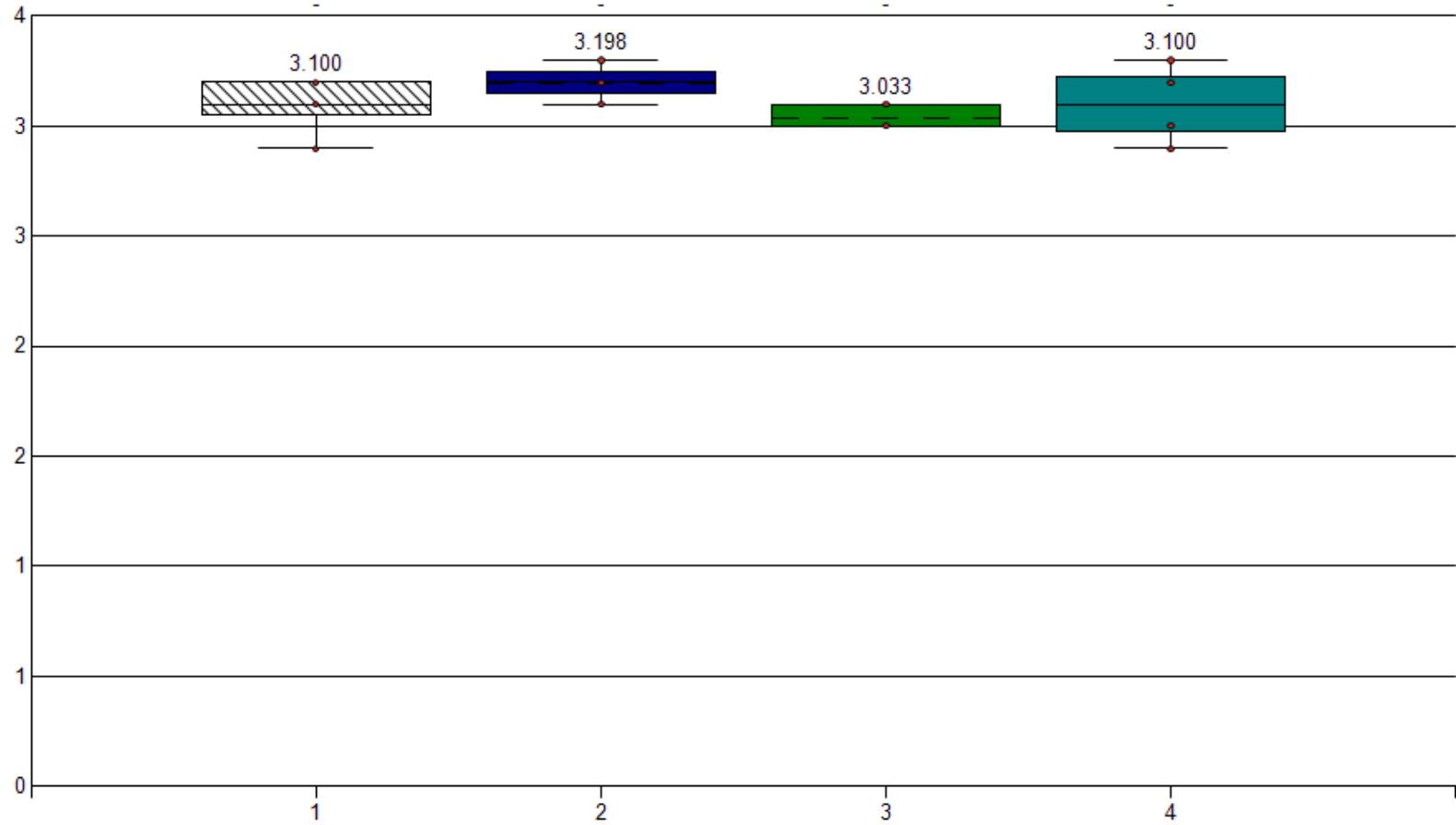
meq/100g CEC



- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Yuma Romaine - BalaSal Trial - Fall 2025 - End of Trial Soil Samples

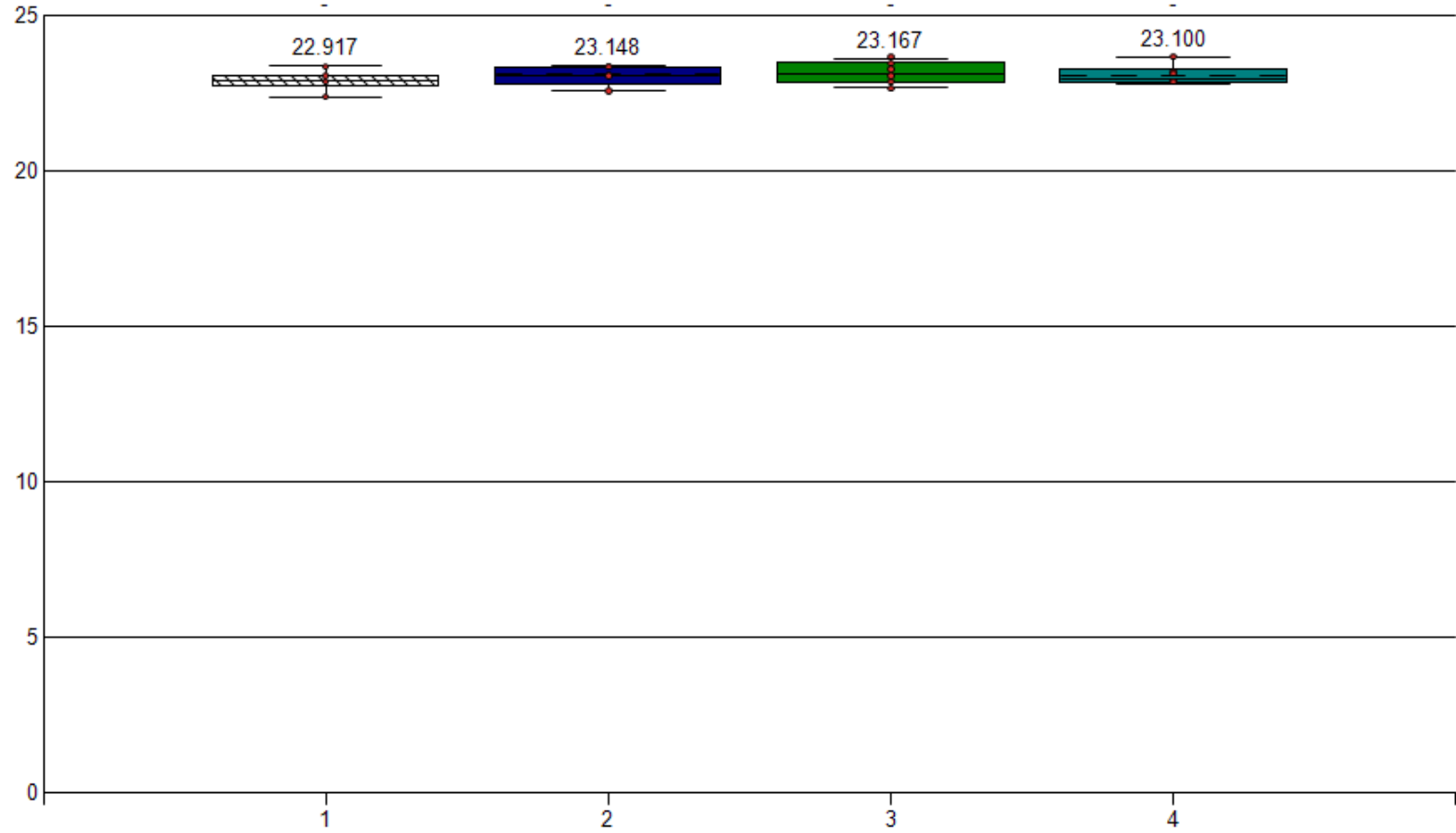
Percent K







- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Yuma Romaine - BalaSal Trial - Fall 2025 - End of Trial Soil Samples

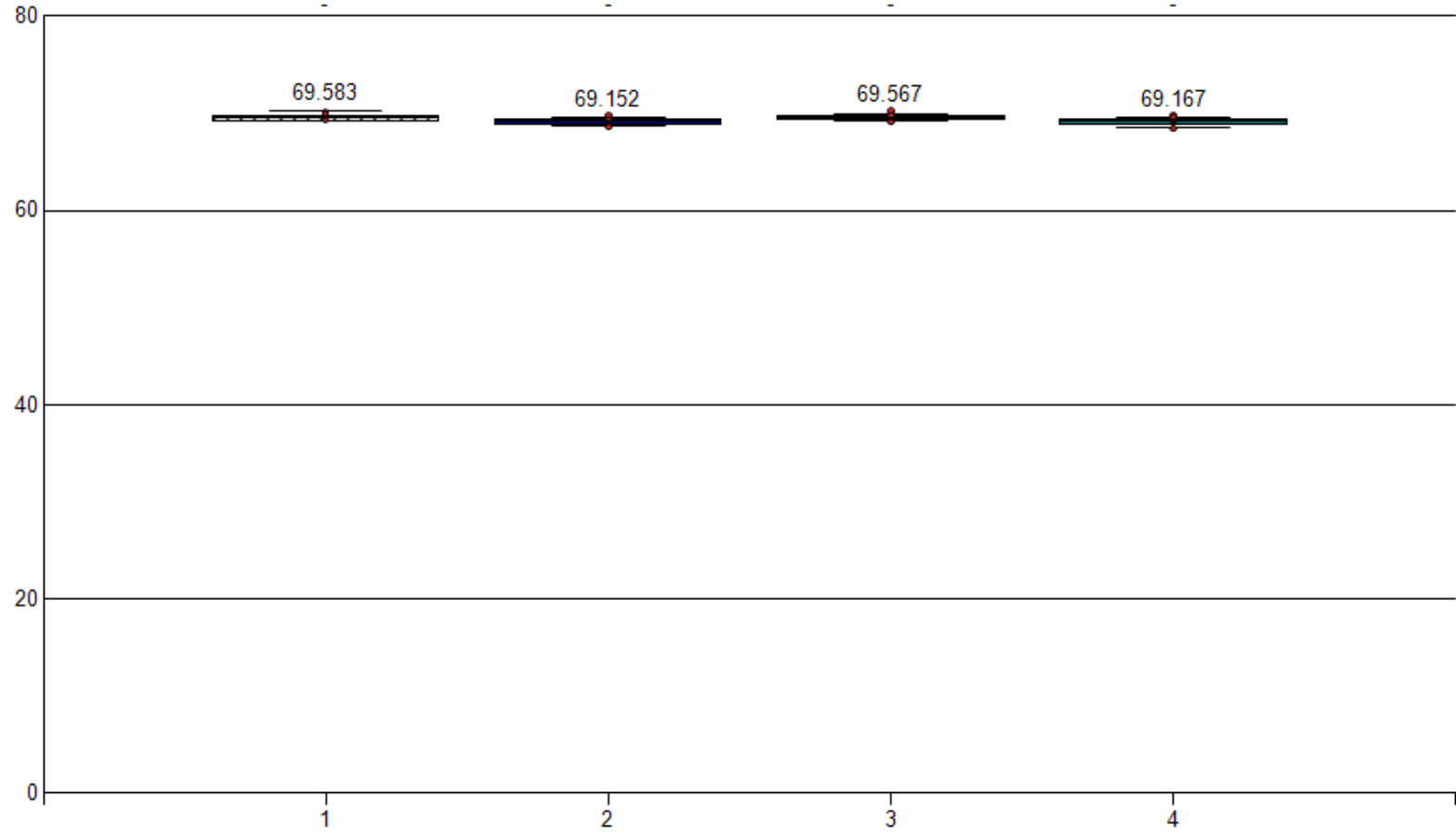
Percent Mg



- 1  UTC
- 2  BalaSal 1 QT/A
- 3  BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4  BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Yuma Romaine - BalaSal Trial - Fall 2025 - End of Trial Soil Samples

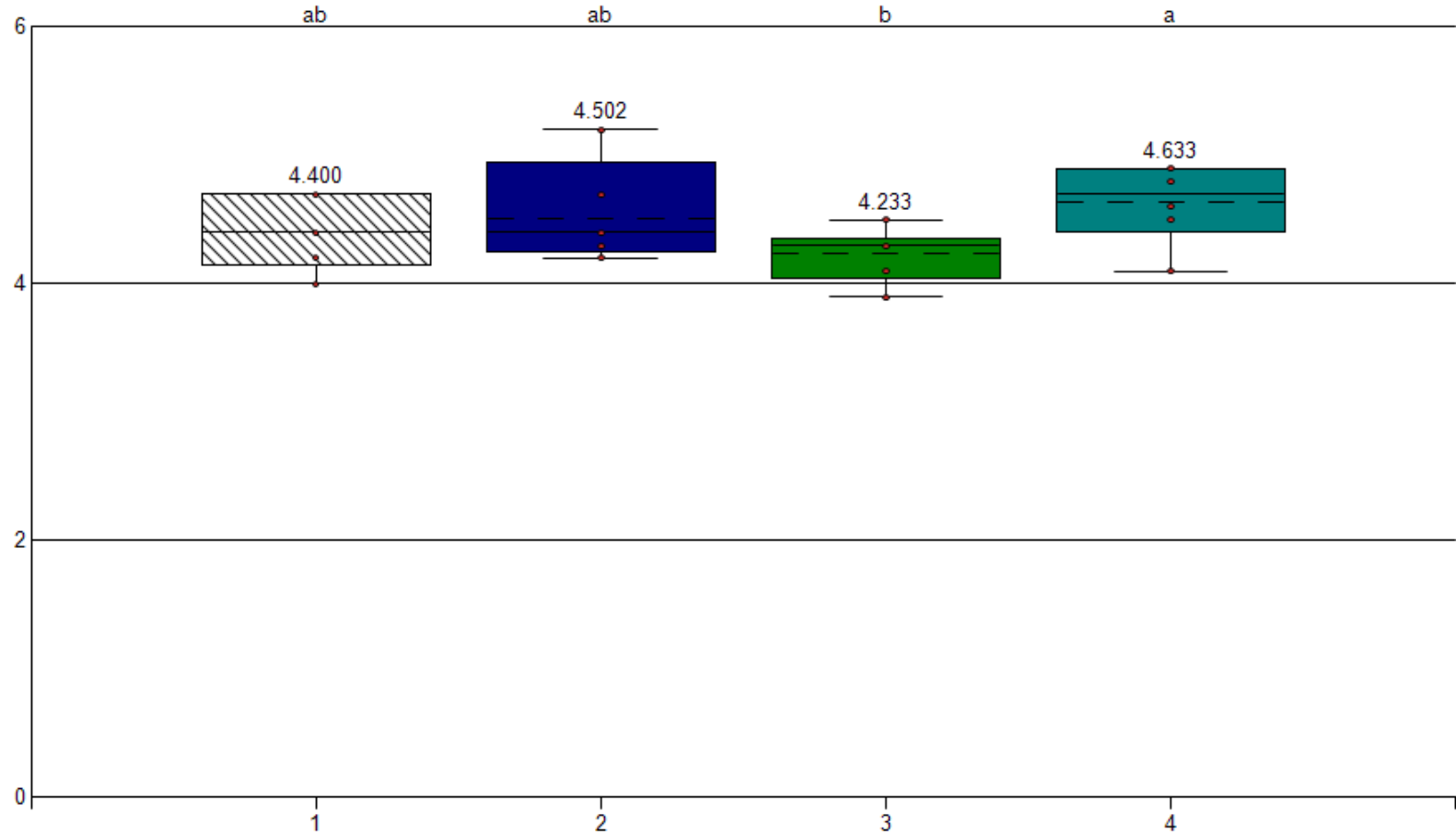
Percent Ca



- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Yuma Romaine - BalaSal Trial - Fall 2025 - End of Trial Soil Samples

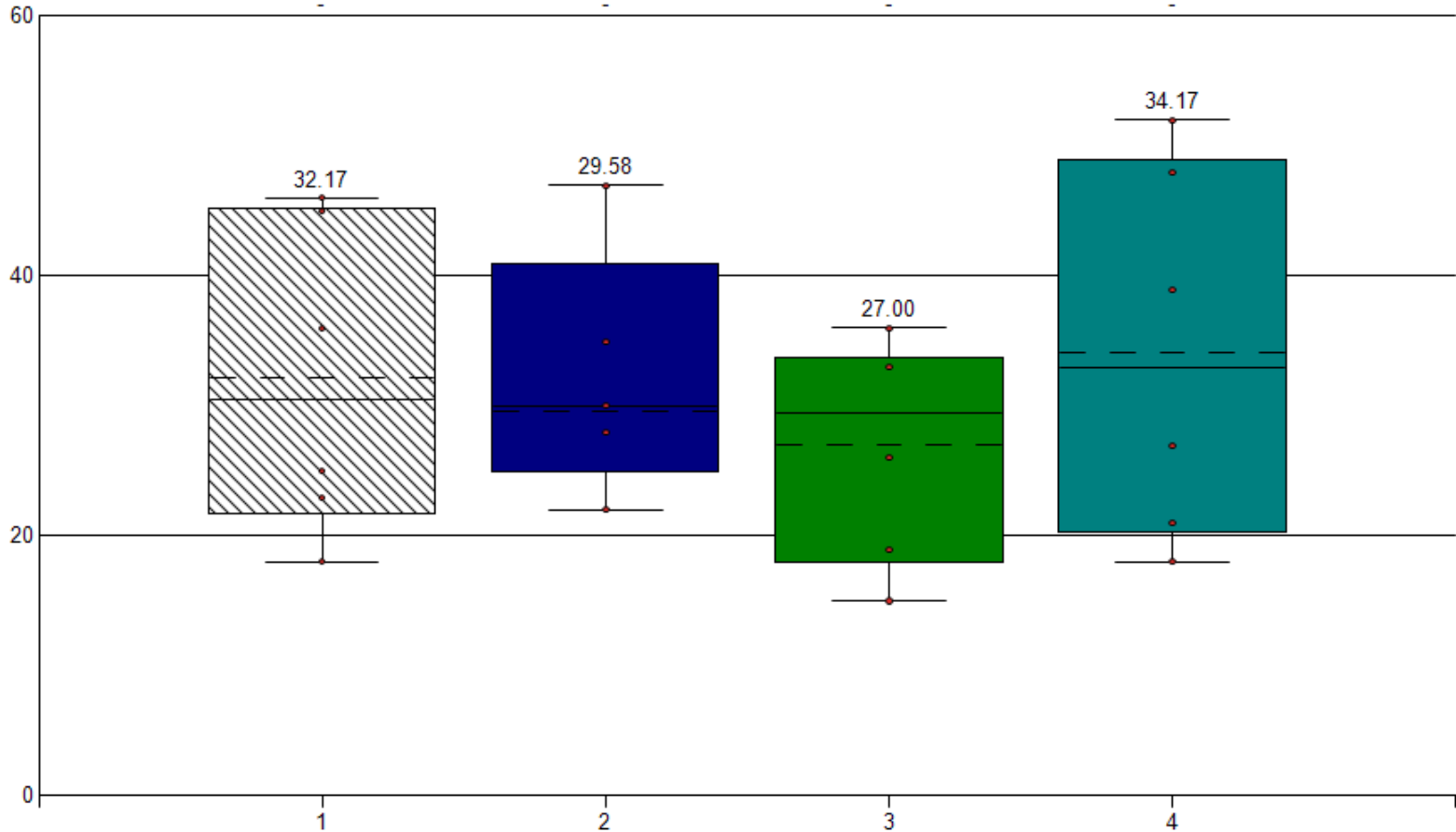
Percent Na



- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Yuma Romaine - BalaSal Trial - Fall 2025 - End of Trial Soil Samples

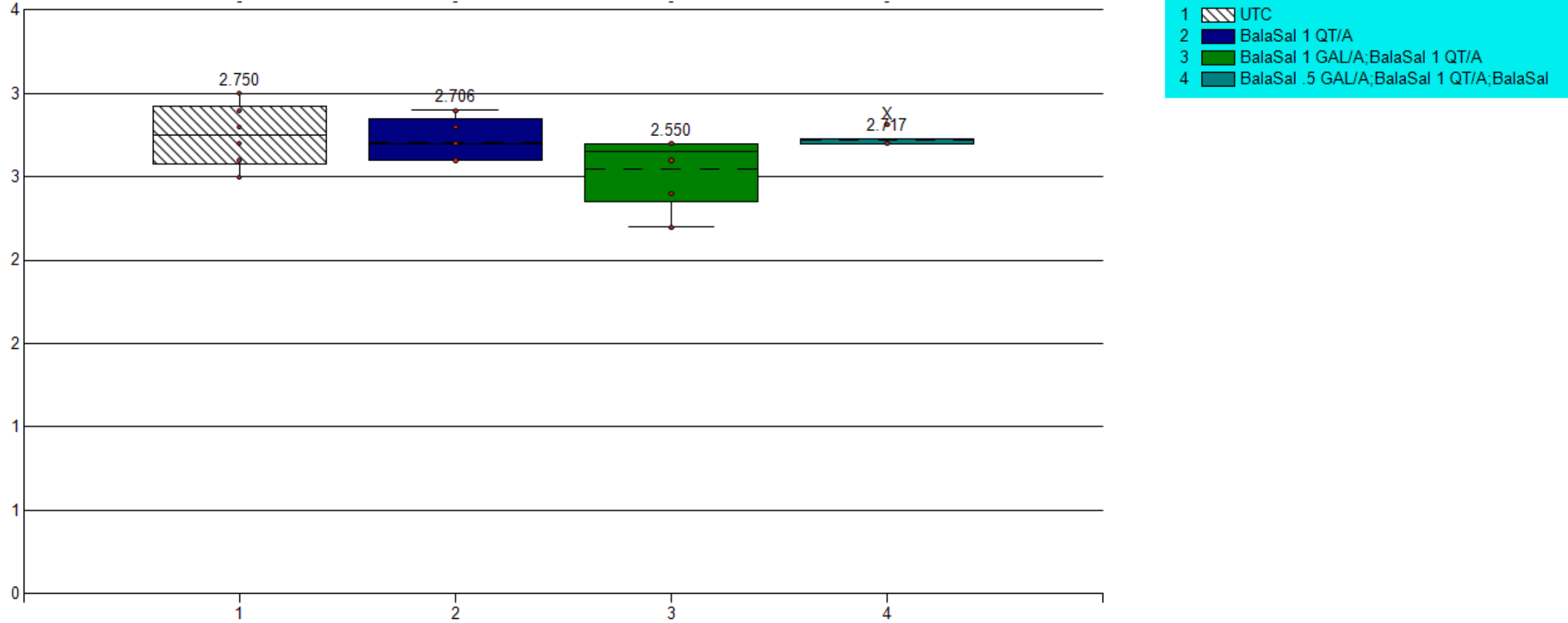
Bicarb



- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Yuma Romaine - BalaSal Trial - Fall 2025 - End of Trial Soil Samples

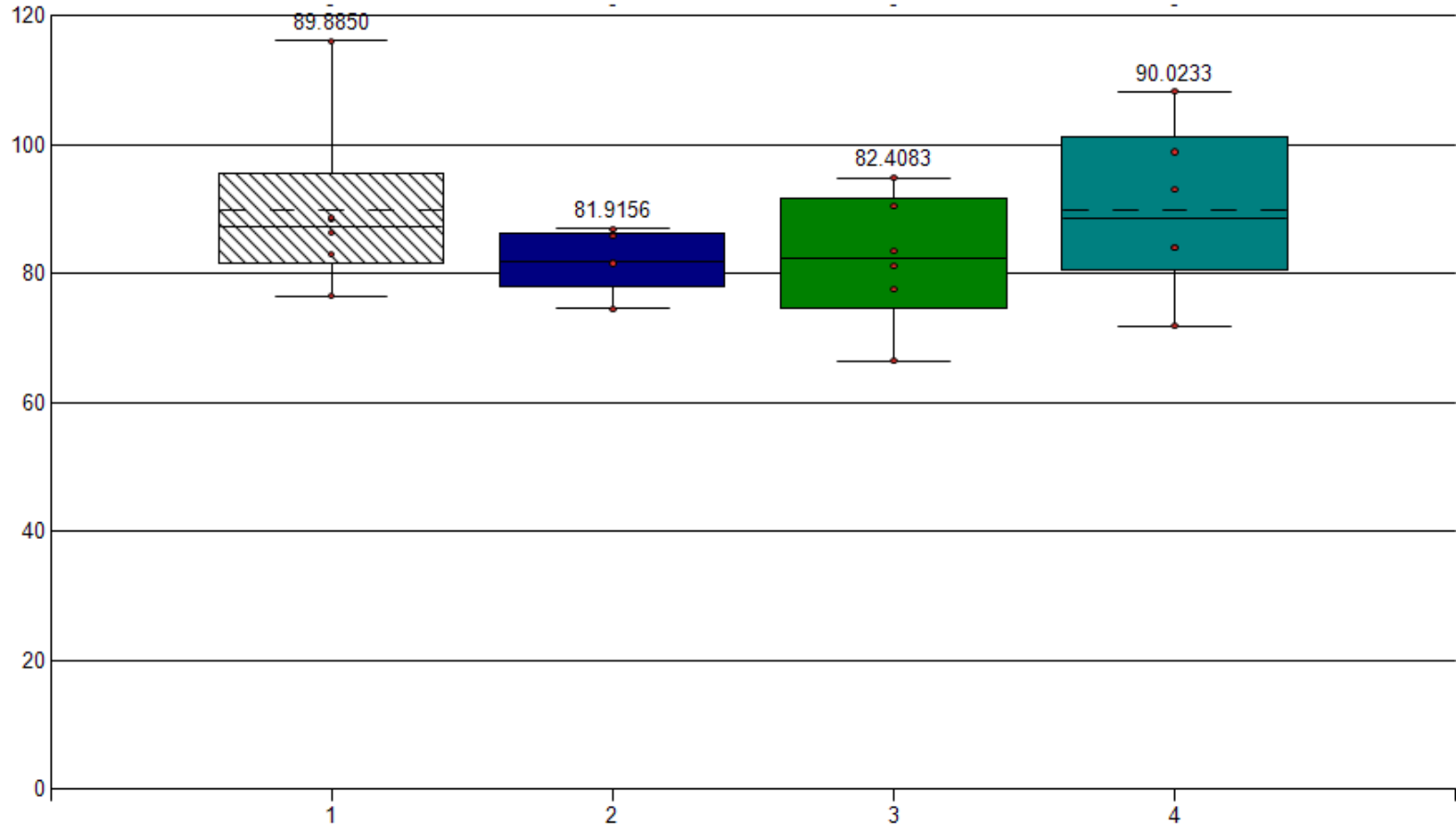
SAR



Trial ID: T-7_BalaSal_Rate_Romaine_2025

Yuma Romaine - BalaSal Trial - Fall 2025 - End of Trial Soil Samples

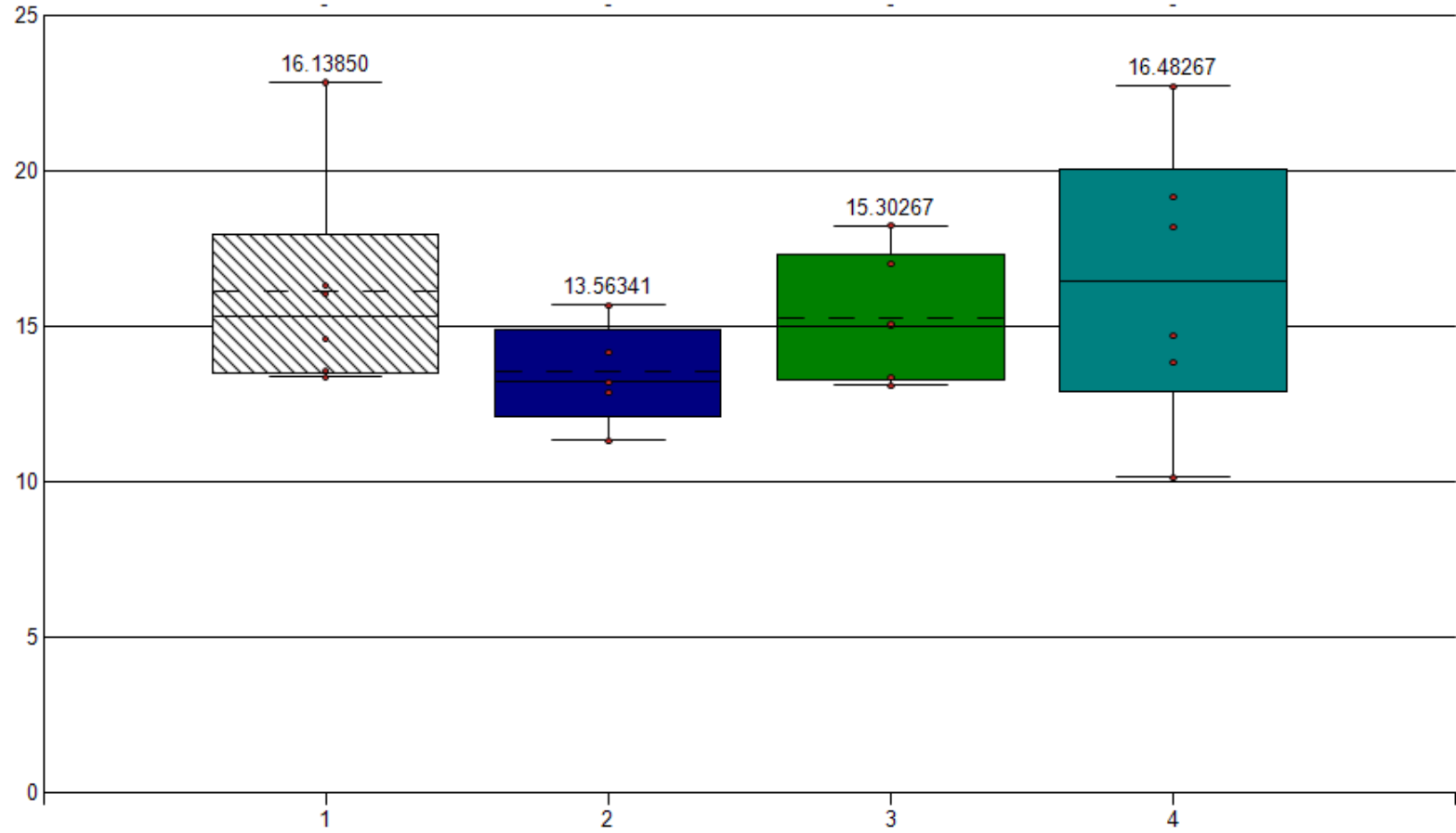
mg/L SAR_NA



- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Yuma Romaine - BalaSal Trial - Fall 2025 - End of Trial Soil Samples

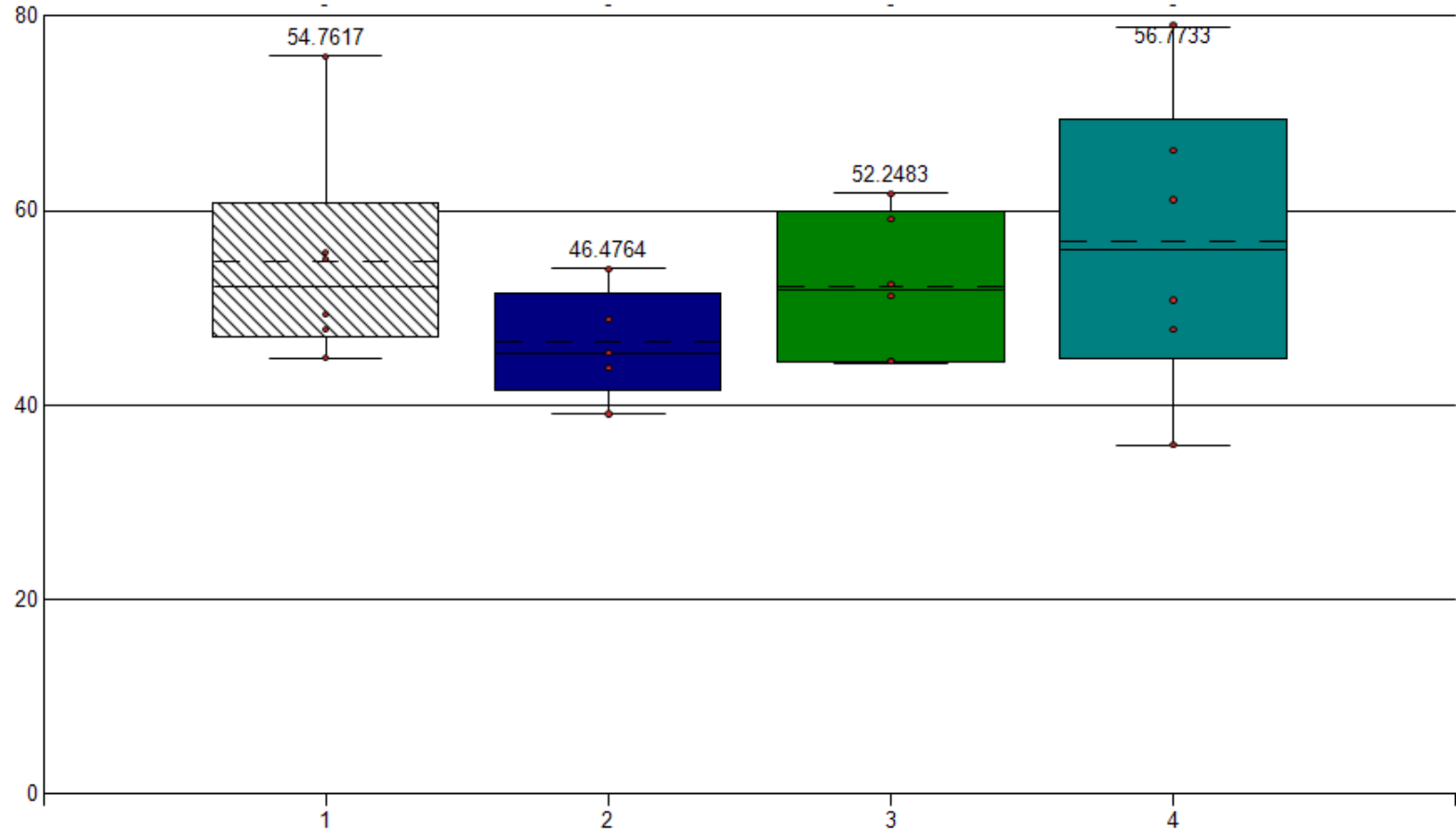
mg/L SAR_MG



- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Yuma Romaine - BalaSal Trial - Fall 2025 - End of Trial Soil Samples

mg/L SAR_CA



- 1 UTC
- 2 BalaSal 1 QT/A
- 3 BalaSal 1 GAL/A; BalaSal 1 QT/A
- 4 BalaSal .5 GAL/A; BalaSal 1 QT/A; BalaSal

Plot Photos





Plot-1707
Trt-3



Plot-1807
Trt-2











Plot-1902
Trt-4



Plot-1603
Trt-3









Plot-1604
Trt-2

1604



Plot-1704
Trt-4





Plot-1904
Trt-1



Plot-1605
Trt-3













