Yuma Celery Trial

Fall 2024

Pacific Minerals

Zeolite & Compost

Robert Masson
Assistant Ag Extension Agent

THE UNIVERSITY OF ARIZONA
Cooperative Extension
Yuma County

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Transplanted: 10/21/24
Wet Date: 10/22
Phos-Acid (Drip): 10/29 (13.3 Gal/AC)
50# N – UAN-32 (Drip) 11/12
50# N – UAN-32 (Drip) 11/25
50# N – UAN -32 (Drip) 12/18
50# N – UAN -32 (Drip) 1/31

Harvest 3/18/25

Cleanup crop of sudangrass grown during the summer with no ferts. Mown and biomass removed.

42” Raised Beds
Twin plant lines 6” spacing
Transplanted Celery
Variety: Enterprise Organic KC241379

Skip irrigation applied to all plots. Reference plots for full irrigation are average of other full water trials in field.

Products Evaluated:
Low rate of zeolite: OganicMAX-ZL
High rate of zeolite: OrganicMAX-ZH
Compost including zeolite: OrganicMAX-ZDB; Soil, Seed, and Water LLC Blend

Trial Summary

- A celery trial was conducted in Yuma from 10/21/24 – 3/18/25 comparing zeolite and zeolite infused compost against an untreated control.
- The trial was grown with reduced water when compared to other research trials grown in the same field (13.1 inches instead of 20.2)
- Initial trial included a drip application of zeolite, but this idea was dropped when zeolite did not fully incorporate into water in jar test
- Initial canopy measurements made with greenseeker handheld NDVI showed increased canopy growth in compost treatment compared to UTC
- Similar stalk weight yield measurements were seen across treatments (KG/ Stalk) F value 0.2115 (significant differences of scores below 0.10 or 0.05)
- Significant improvement to stalk circumference with compost and high zeolite producing larger produce F value 0.0654
- Similar stalk lengths observed f value 0.4427
- Although moisture probes were used in-season results are inconclusive due to limited number used. More probes should be used in the future to document water retention in soil

REPORT NUMBER
24-276-0217
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Oct 8, 2024
ACCOUNT
57161
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Oct 2, 2024

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TODAY'S DATE
Oct 08, 2024

Robert Masson

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IDENTIFICATION
THE UNIVERSITY OF ARIZONA COOP
YAC
ICEBERG LETTUCE

SOIL ANALYSIS REPORT

INFO SHEET: 1726219

LAB NUMBER	SAMPLE IDENTIFICATION	ORGANIC MATTER L.O.I.	PHOSPHORUS			POTASSIUM (NEUTRAL AMMONIUM ACETATE EXCHANGEABLE)	MAGNESIUM (NEUTRAL AMMONIUM ACETATE EXCHANGEABLE)	CALCIUM (NEUTRAL AMMONIUM ACETATE EXCHANGEABLE)	SODIUM (NEUTRAL AMMONIUM ACETATE EXCHANGEABLE)	pH		CATION EXCHANGE CAPACITY C.E.C.	PERCENT BASE SATURATION (COMPUTED)				
			P_1 (WEAK BRAY) 1:7	P_2 (STRONG BRAY) 1:7	OLSEN BICARBONATE P	K	Mg	Ca	Na	SOIL pH 1:1	BUFFER INDEX		% K	% Mg	% Ca	% H	% Na
436		percent RATE	ppm RATE	ppm RATE	ppm RATE	ppm RATE	ppm RATE	ppm RATE	ppm RATE			meq/100g					
83123	Southwest	1.4 VL	5 VL	107 VH	13 M	408 VH	892 VH	4118 M	356 VH	8.4		30.6	3.4	24.3	67.2	0.0	5.1
83124	SouthEast	1.6 L	9 L	115 VH	12 M	390 VH	804 VH	3948 H	415 VH	8.2		29.2	3.4	22.9	67.5	0.0	6.2
83125	Northeast	1.5 VL	13 L	106 VH	13 M	420 VH	911 VH	4322 M	418 VH	8.3		32.1	3.4	23.7	67.2	0.0	5.7
83126	Northwest	1.6 L	9 L	114 VH	12 M	418 VH	915 VH	4268 H	368 VH	8.3		31.6	3.4	24.1	67.4	0.0	5.1

LAB NUMBER	NITRATE-N (FIA) SURFACE			SUBSOIL 1			SUBSOIL 2			Total lbs/A	SULFUR S ICAP	ZINC Zn DTPA	MANGANESE Mn DTPA	IRON Fe DTPA	COPPER Cu DTPA	BORON B SORB. DTPA	EXCESS LIME RATE	SOLUBLE SALTS 1:1	
436	ppm	lbs/A	depth (in)	ppm	lbs/A	depth (in)	ppm	lbs/A	depth (in)		ppm RATE	ppm RATE	ppm RATE	ppm RATE	ppm RATE	ppm RATE		mmhos/cm RATE	
83123	5	12	0-8							12	86 VH	2.7 M	6 L	38 VH	2.0 VH	0.9 M	H	1.0 L	
83124	37	89	0-8							89	124 VH	1.8 M	3 VL	20 H	1.9 VH	1.1 M	H	1.4 M	
83125	21	50	0-8							50	105 VH	1.5 M	12 M	41 VH	1.7 H	1.0 M	H	1.3 M	
83126	4	10	0-8							10	96 VH	2.6 M	6 L	21 H	1.7 H	0.9 M	H	1.1 M	

REV.10/17

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ADDITIONAL SOIL ANALYSIS

Labnum *436*	Sample ID	Total Nitrogen LECO ppm
83123	Southwest *Depth: 0-8*	578
83124	SouthEast *Depth: 0-8*	567
83125	Northeast *Depth: 0-8*	771
83126	Northwest *Depth: 0-8*	698

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SODIUM ADSORPTION RATIO REPORT

Method Lab Number	Sample Id	CALCULATED Sodium Adsorption Ratio	SATURATED PASTE EXTRACTION Sodium (Water Soluble) mg/L	Magnesium (Water Soluble) mg/L	Calcium (Water Soluble) mg/L
Units					
43683123	Southwest	3.1	86	12	37
43683124	SouthEast	3.8	156	25	87
43683125	Northeast	2.3	51	7	24
43683126	Northwest	3.2	89	12	40

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SOIL FERTILITY RECOMMENDATIONS (POUNDS PER ACRE)

YOUR SAMPLE NUMBER (LAB NUMBER)	INTENDED CROP	YIELD GOAL	PREVIOUS CROP	SOIL AMENDMENTS					N NITROGEN	P_2O_5 PHOSPHATE	K_2O POTASH	Mg MAGNE-SIUM	S SULFUR	Zn ZINC	Mn MANGA-NESE	Fe IRON	Cu COPPER	B BORON
				LIME LBS/A OF	LIME TON	GYPSUM TONS/A		ELEMENTAL SULFUR LBS/A										
Southwest (43683123)	LETTUCE	BEST	RYE- bu			0.9	OR	160	125	100	--	--	--	--	1.7	--	--	--

REV. 12/03

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LAWN AND GARDEN

ANALYTICAL LABORATORY FINDINGS

SAMPLE IDENTIFICATION		Southwest				
LABORATORY NUMBER		43683123				
ANALYTE	UNITS	RESULTS	LOW	MEDIUM	OPTIMUM	V. HIGH
NITROGEN						
ORGANIC MATTER	%	1.4				
NITRATE-N	ppm	5				
PHOSPHORUS	ppm	18				
POTASSIUM	ppm	408				
MAGNESIUM	ppm	892				
MICRO-NUTRIENTS						
SULFUR	ppm	86				
ZINC	ppm	2.7				
MANGANESE	ppm	6				
IRON	ppm	38				
COPPER	ppm	2.0				
BOORON	ppm	0.9				
CALCIUM	ppm	4118				
SODIUM	ppm	356				
SOLUBLE SALTS	mmhos/cm	1.0				
EXCESS LIME RATE		H				
pH		8.4				
BUFFER INDEX						
C.E.C.	meq/100g	30.6				

MIDWEST SUGGESTIONS FOR LETTUCE

POUNDS PER	100 sq. ft.	1000 sq. ft.	Acre	
SUGGESTED FERTILITY GUIDELINES				
NITROGEN (N)	0.29	2.87	125	
PHOSPHATE (P_2O_5)	0.23	2.30	100	
POTASH (K_2O)	--	--	--	
MAGNESIUM (Mg)	--	--	--	
SULFUR (S)	--	--	--	
ZINC (Zn)	--	--	--	
MANGANESE (Mn)	0.00	0.04	1.7	
IRON (Fe)	--	--	--	
COPPER (Cu)	--	--	--	*Surface Nitrate Depth: 0-8*
BORON (B)	--	--	--	
SUGGESTED AMENDMENT GUIDELINES				
LIME				
ELEMENTAL SULFUR	0.4 OR	4 OR	160 OR	
GYPSUM	4.1	41.3	1800	

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SOIL HEALTH ASSESSMENT

ANALYTICAL LABORATORY FINDINGS

SAMPLE IDENTIFICATION		Southwest	
LABORATORY NUMBER		43683123	
ANALYTE	UNITS	RESULTS	LOW MEDIUM OPTIMUM VERY HIGH
H3A EXTRACTION			
ORTHOPHOSPHATE-P	ppm	39.7	
PHOSPHORUS	ppm	43	
POTASSIUM	ppm	125	
MAGNESIUM	ppm	441	
CALCIUM	ppm	4172	
SODIUM	ppm	331	
IRON	ppm	22	
ALUMINUM	ppm	58	
WATER SOLUBLE			
NITRATE-N	ppm	7	
AMMONIACAL-N	ppm	1.2	
ORTHOPHOSPHATE-P	ppm	3.19	
CARBON	ppm	207.0	
TOTAL NITROGEN	ppm	14.6	
1 DAY CO_2C BURST		14.00	
ORGANIC CARBON	ppm	207.0	
ORGANIC NITROGEN	ppm	6.4	
ORGANIC C/N RATIO		32.3	

ADDITIONAL NITROGEN CREDIT IDENTIFIED VIA HANEY TEST: **N/A. Sample depth not 0-6"**

NITROGEN RECOMMENDATIONS MAY INCLUDE ADDITIONAL NITROGEN CREDITS BASED ON PREVIOUS CROPS AND NITROGEN MINERALIZATION RATES.

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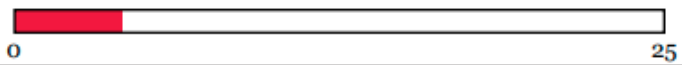
SOIL HEALTH CALCULATION



The **H3A Soil Extractant** was developed by Haney*. This extract is designed to mimic organic acids produced by living plant root systems. These organic acids increase nutrient availability in the root zone.

The **Water Soluble Extract** provides a snapshot of nutrients that are immediately available to the plants.

The **CO_2 Burst** test is very good indicator of soil health. This test measures the amount of CO_2 naturally released from the soil due to the activity of the soil microbes through microbial respiration. This test is very dependent on the amount of carbon that is available to the soil microbes and the form that the carbon is in. As the available carbon increases in your soil the Microbial respiration will increase.

Organic Carbon is the available total water extractable organic carbon from your soil. This pool of carbon is roughly 80 times smaller than the Soil Organic Matter. The organic carbon pool reflects the energy/food source that is driving the soil microbes.

The **Organic Nitrogen** pool is replenished by fresh plant residues, manure, composts, and dying soil microbes.

The **Organic C/N ratio** is a critical component of the nutrient cycle. A soil C/N ratio above 20 generally indicates that Nitrogen will be tied up and not available to plants. The ideal range for the Organic C/N ratio will be from 8:1 to 15:1.

The **Soil Health Calculation** uses the CO_2 Burst, Organic Carbon, Organic Nitrogen, and the C/N ratio to generate the soil health number. This calculation looks at the balance of soil carbon and nitrogen and their relationship to microbial activity. This number represents the overall health of your system. Soil values will range from 0 to 25. A soil with a value below 7 would be considered low. You want to see this number increase as you make changes and adjustments. Keeping track of this number will allow you to gauge the effects of your management practices over time.

*Modifications to the New Soil Extractant H3A-1: A Multinutrient Extractant
R.L. Haney (a); E.B. Haney (b); L.R. Hossner (c); J.G. Arnold (a)

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SOIL HEALTH ASSESSMENT

ANALYTICAL LABORATORY FINDINGS

SAMPLE IDENTIFICATION		SouthEast	
LABORATORY NUMBER		43683124	
ANALYTE	UNITS	RESULTS	LOW MEDIUM OPTIMUM VERY HIGH
H3A EXTRACTION			
ORTHOPHOSPHATE-P	ppm	38.6	
PHOSPHORUS	ppm	42	
POTASSIUM	ppm	135	
MAGNESIUM	ppm	450	
CALCIUM	ppm	4352	
SODIUM	ppm	419	
IRON	ppm	21	
ALUMINUM	ppm	60	
WATER SOLUBLE			
NITRATE-N	ppm	46	
AMMONIACAL-N	ppm	1.1	
ORTHOPHOSPHATE-P	ppm	2.28	
CARBON	ppm	178.9	
TOTAL NITROGEN	ppm	58.7	
1 DAY CO_2C BURST		11.00	
ORGANIC CARBON	ppm	178.9	
ORGANIC NITROGEN	ppm	11.6	
ORGANIC C/N RATIO		15.4	

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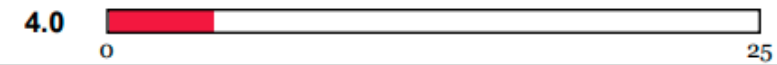

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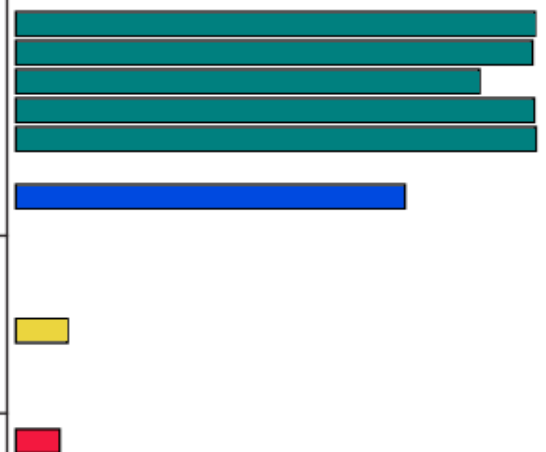
SOIL HEALTH ASSESSMENT

ANALYTICAL LABORATORY FINDINGS

SAMPLE IDENTIFICATION	Northeast
LABORATORY NUMBER	43683125

ANALYTE	UNITS	RESULTS
H3A EXTRACTION		
ORTHOPHOSPHATE-P	ppm	35.9
PHOSPHORUS	ppm	39
POTASSIUM	ppm	135
MAGNESIUM	ppm	469
CALCIUM	ppm	4331
SODIUM	ppm	407
IRON	ppm	23
ALUMINUM	ppm	67
WATER SOLUBLE		
NITRATE-N	ppm	28
AMMONIACAL-N	ppm	1.0
ORTHOPHOSPHATE-P	ppm	2.32
CARBON	ppm	182.9
TOTAL NITROGEN	ppm	38.1
1 DAY CO_2C BURST		8.00
ORGANIC CARBON	ppm	182.9
ORGANIC NITROGEN	ppm	9.1
ORGANIC C/N RATIO		20.1



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SOIL HEALTH CALCULATION

3.5

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SOIL HEALTH ASSESSMENT

ANALYTICAL LABORATORY FINDINGS

SAMPLE IDENTIFICATION		Northwest				
LABORATORY NUMBER		43683126				
ANALYTE	UNITS	RESULTS	LOW	MEDIUM	OPTIMUM	VERY HIGH
H3A EXTRACTION						
ORTHOPHOSPHATE-P	ppm	38.2				
PHOSPHORUS	ppm	41				
POTASSIUM	ppm	134				
MAGNESIUM	ppm	462				
CALCIUM	ppm	4213				
SODIUM	ppm	362				
IRON	ppm	22				
ALUMINUM	ppm	66				
WATER SOLUBLE						
NITRATE-N	ppm	5				
AMMONIACAL-N	ppm	1.1				
ORTHOPHOSPHATE-P	ppm	3.07				
CARBON	ppm	218.6				
TOTAL NITROGEN	ppm	12.9				
1 DAY CO_2C BURST		12.00				
ORGANIC CARBON	ppm	218.6				
ORGANIC NITROGEN	ppm	6.8				
ORGANIC C/N RATIO		32.2				

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Jar Test

- Mixed water with zeolite to determine drip irrigation compatibility
- Zeolite never fully dissolved into the water
- Based on these results the initial treatment with drip applied zeolite was removed from trial.

Trial Details

Apr-4-2025 (T12 Zeolite Cel Fall 24) ARM 2024.4 Trial Map Page 1 of 1

University of Arizona

Testing efficacy of zeolite and compost

Trial ID: T12 Zeolite Cel Fall 24
Protocol ID: T12 Zeolite Cel Fall 24 Location: Yuma Arizona Trial Year: 2024
Project ID: T12 Zeolite Cel Fall 24
Study Director: Robert Masson Sponsor Contact:
Investigator:

Trial Map Treatment Description

Trt	Code	Description
1	CHK	UTC
2		High Zeolite: OrganicMAX-ZH 1 TON/A
3		Low Zeolite: OrganicMAX-ZL .5 TON/A
4		Soil, Seed, and Water Zeolite Compost Blend 10 TON/A

21124	22122	23123	24121
21112	22113	23111	24114
21101	22104	23103	24102
21093	22092	23094	24091
21084	22081	23083	24082
21072	22073	23074	24071

Celery grown using different soil amendments under slightly droughted conditions
Trt 1: UTC
Trt 2: Zeolite High Level (1 Ton/A)
Trt 3: Zeolite Low Level (0.5 Ton/A)
Trt 4: Soil,Seed,Water Zeolite Compost blend (10 Ton/A)

Treatments - Line 7

Trt Line	Trt No.	Type	Treatment Name	Form Conc	Form Unit	Form Type	Description	Rate	Rate Unit	Other Rate
1	1	CHK	UTC							
2	2	ADDI	0.5 Ton/AC Zeolite: OrganicMAX-ZH			D	Zeolite_Spread	1	TON/A	
3	3	ADDI	1.0 Ton/AC Zeolite: OrganicMAX-ZL			D	Zeolite_Spread	0.5	TON/A	
4	4	ADDI	10 Ton/AC Soil, Seed, and Water Zeolite Compost Blend			D	Compost	10	TON/A	
5										
6										
7										
8										
9										

Irrigation

Irrigation Date	Type	Irrigation Hours	Full or Skip Irrigation Applied	Water Used in Full Water Trts (AC IN)	Total Water Used in Reduced Water Trts	
10/21	Sprinkler	12	Full	1.2	1.2	
10/22	Sprinkler	12	Full	1.2	1.2	
10/23	Sprinkler	8	Full	0.8	0.8	
10/29	Drip	3	Full	0.6	0.6	
10/31	Sprinkler	4	Full	0.4	0.4	
11/11	Drip	5	Full	0.9	0.9	
11/19	Drip	5	Full	0.9	0.9	
11/25	Manifold installation					
11/25	Drip	2	Full	0.4	0.4	
12/1	Drip	4	Start Skip	0.7		
15/5	Drip	6	Full	1.1	1.1	
12/9	Drip	5	Skip	0.9		
12/13	Drip	4	Full	0.7	0.7	
12/17	Drip	5	Full	0.9	0.9	
12/25	Drip	4	Skip	0.7		
Page Total		**79**		**11.4**	**8.2**	

Entire trial irrigated at reduced rate

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

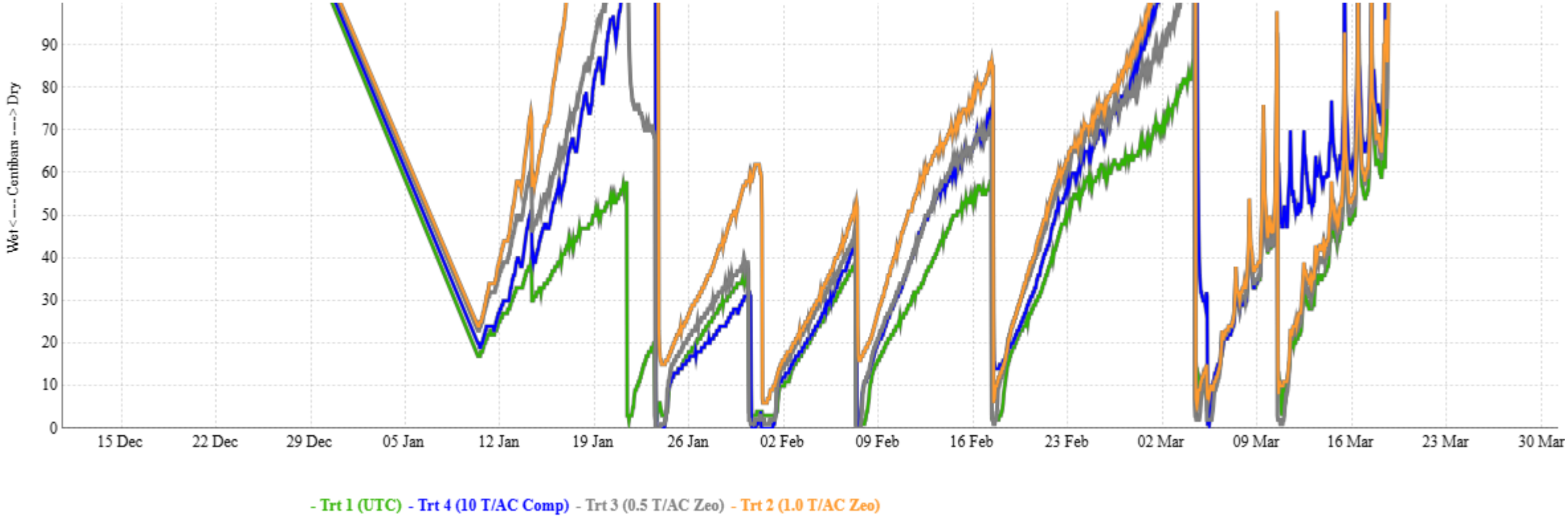
Irrigation

Irrigation Date	Type	Irrigation Hours	Full or Skip Irrigation Applied	Water Used in Full Water Trts (AC IN)	Total Water Used in Reduced Water Trts	
1/3/25	Drip	4	Full	0.7	0.7	
1/13	Drip	4	Skip	0.7		
1/20	Drip	4	Full	0.7	0.7	
1/24	Drip	6	Skip	1.1		
1/30	Drip	4	Full	0.7	0.7	
2/7	Drip	4	Skip	0.7		
2/13	Drip	4	Skip	0.7		
2/18	Drip	4	Full	0.7	0.7	
2/26	Drip	4	Skip	0.7		
3/4/25	Drip	4	Full	0.7	0.7	
3/6	Drip	4	Full	0.7	0.7	
3/13	Drip	4	Full	0.7	0.7	
Page Sum		**50**		**8.8**	**4.9**	
Grand Total		**129**		**20.2**	**13.1**	

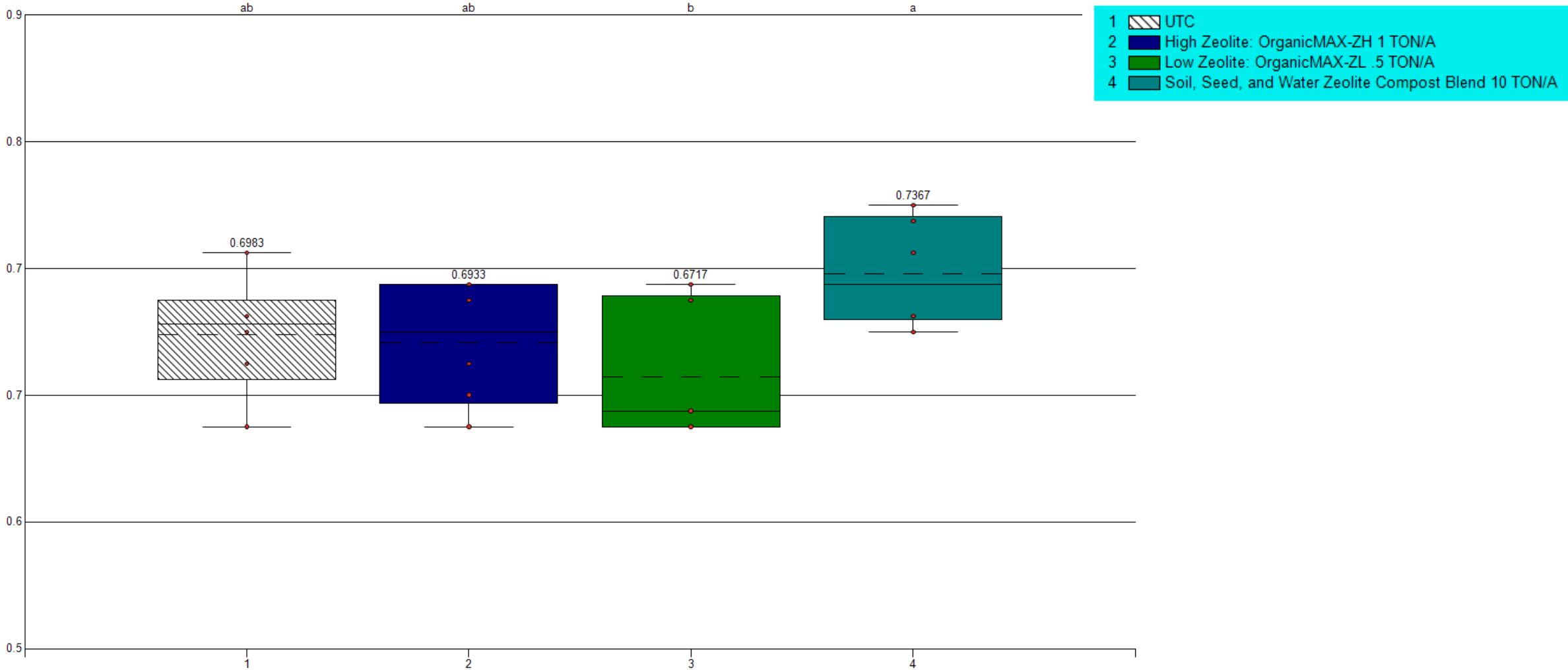
Entire trial irrigated at reduced rate

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

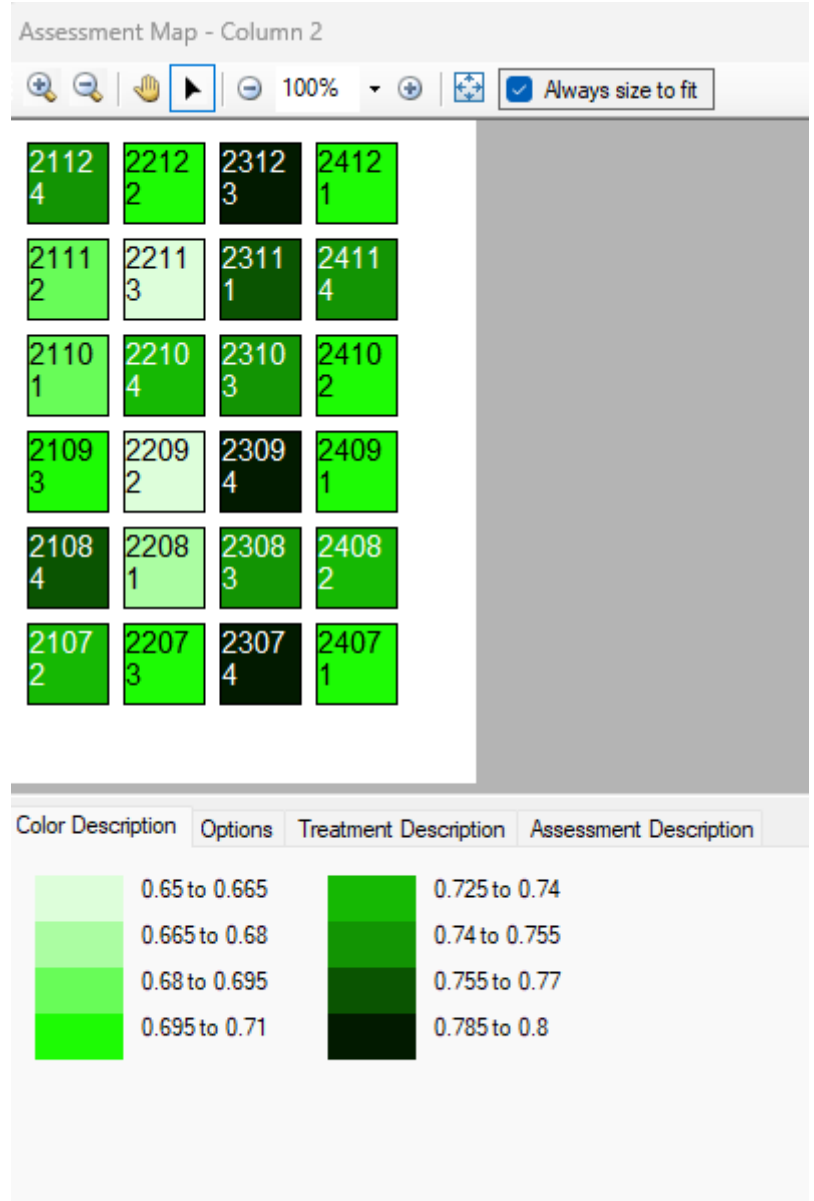
IC-10 Moisture Meter Measurments

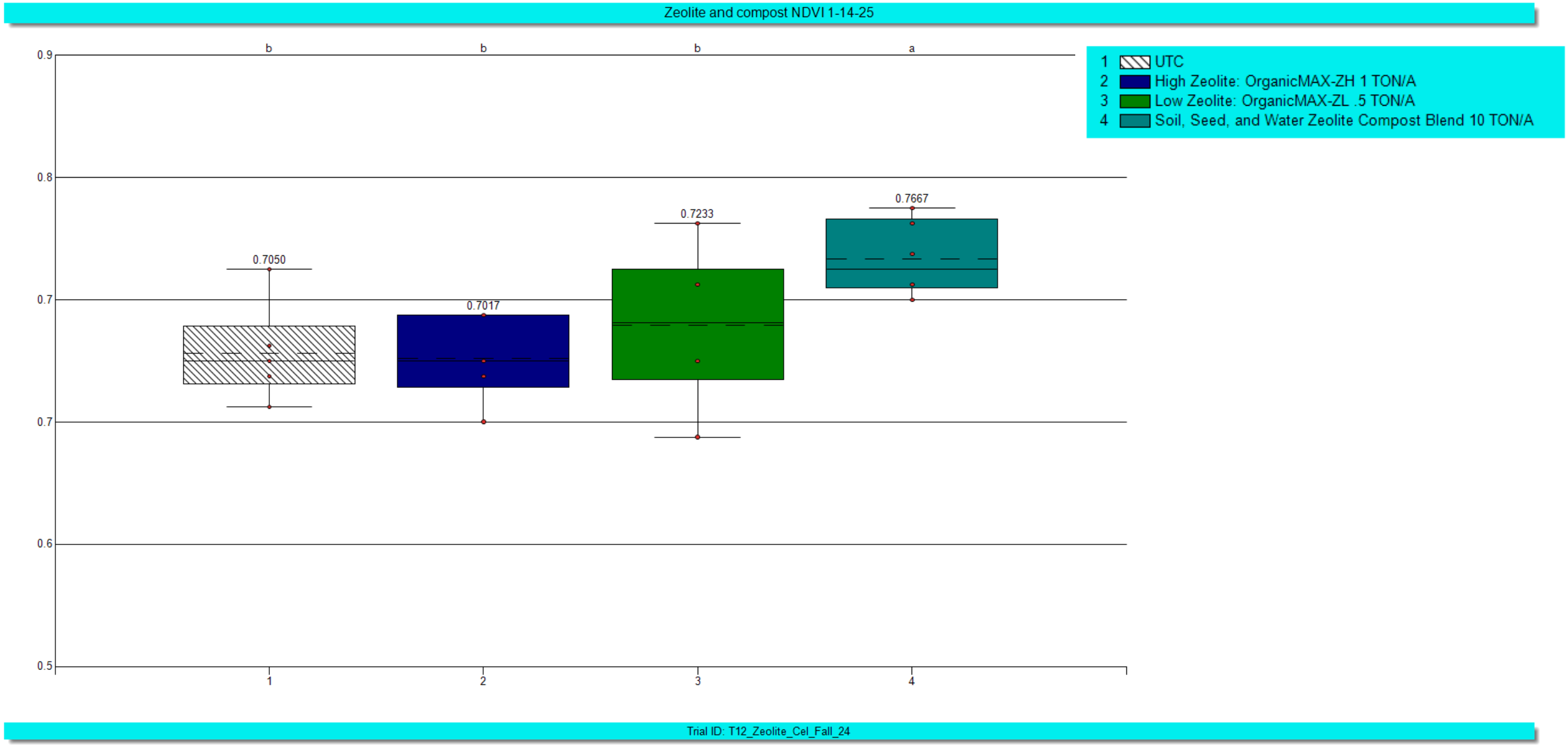


Zeolite and compost NDVI

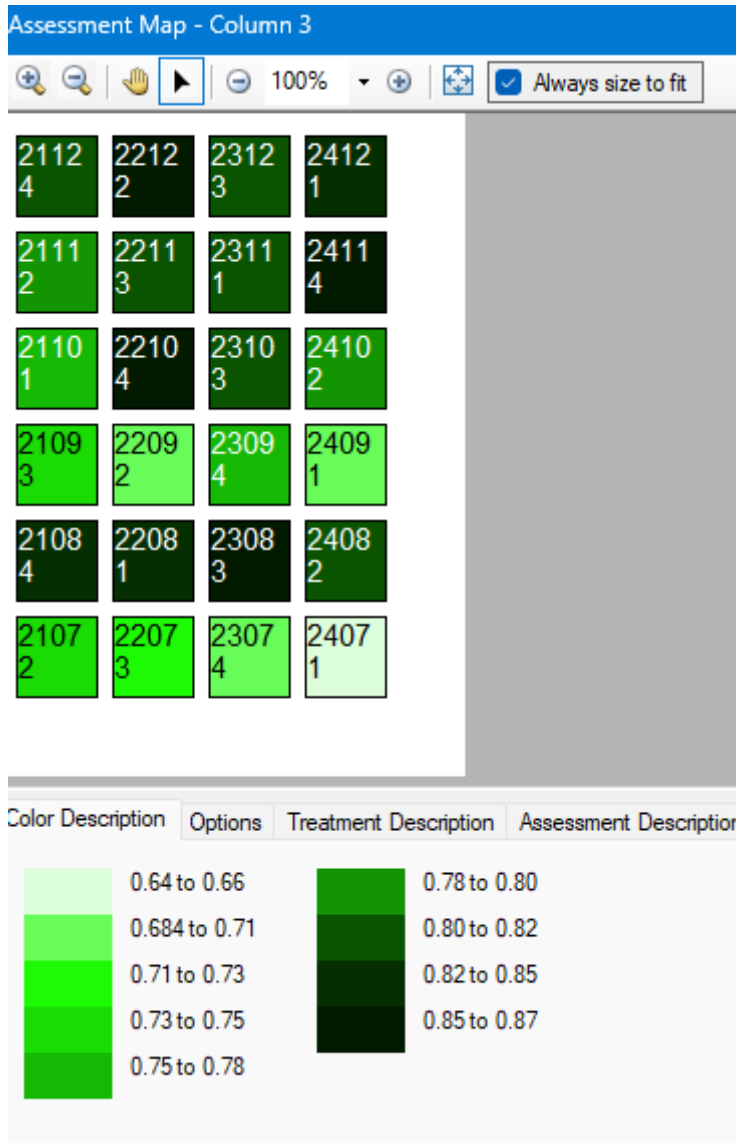


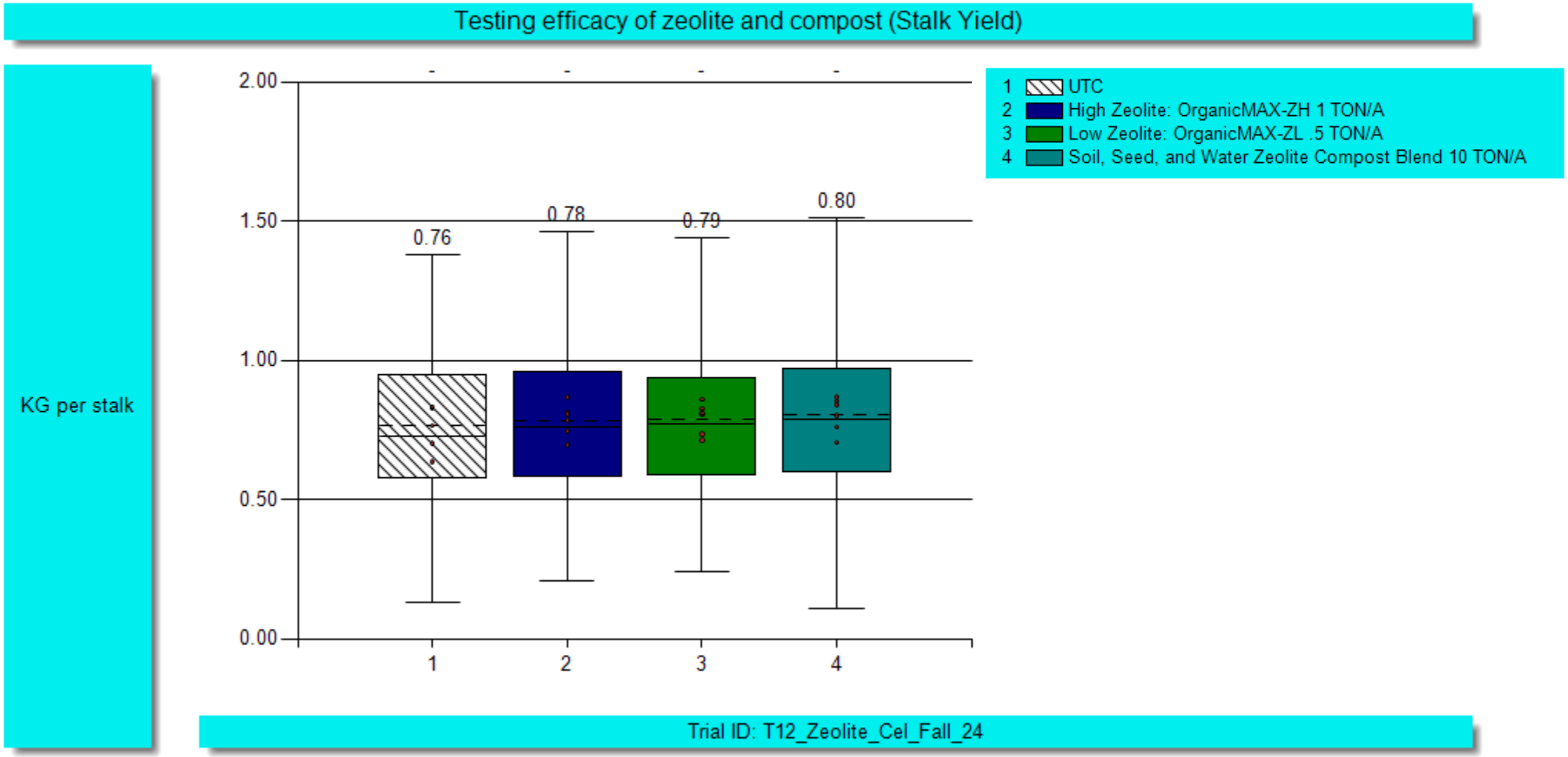
Trial ID: T12_Zeolite_Cel_Fall_24


Assessment Map - Column 2
100%
Always size to fit
21124
22122
23123
24121
21112
22113
23111
24114
21101
22104
23103
24102
21093
22092
23094
24091
21084
22081
23083
24082
21072
22073
23074
24071
Color Description
Options
Treatment Description
Assessment Description
0.65 to 0.665
0.665 to 0.68
0.68 to 0.695
0.695 to 0.71
0.725 to 0.74
0.74 to 0.755
0.755 to 0.77
0.785 to 0.8

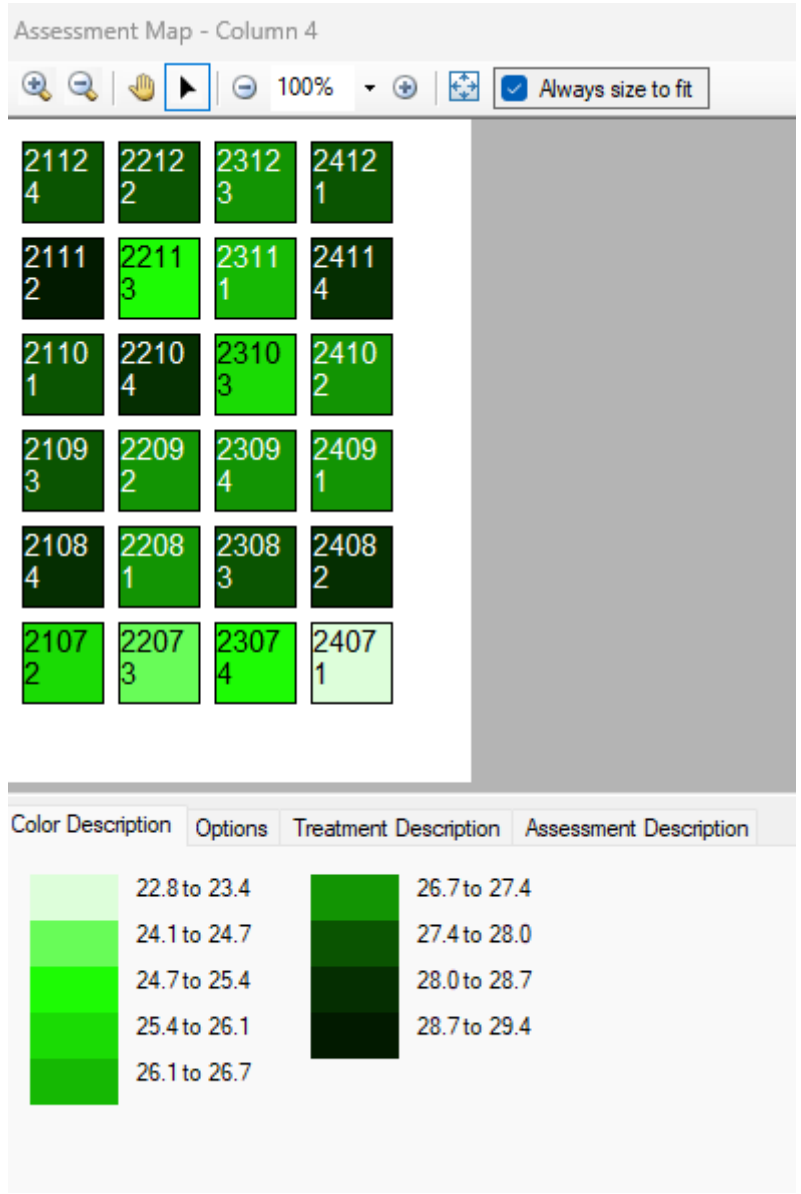

Zeolite and compost NDVI 1-14-25
b
b
b
a
0.9
0.8
0.7
0.7
0.6
0.5
0.7050
0.7017
0.7233
0.7667
1
2
3
4
1 UTC
2 High Zeolite: OrganicMAX-ZH 1 TON/A
3 Low Zeolite: OrganicMAX-ZL .5 TON/A
4 Soil, Seed, and Water Zeolite Compost Blend 10 TON/A
Trial ID: T12_Zeolite_Cel_Fall_24

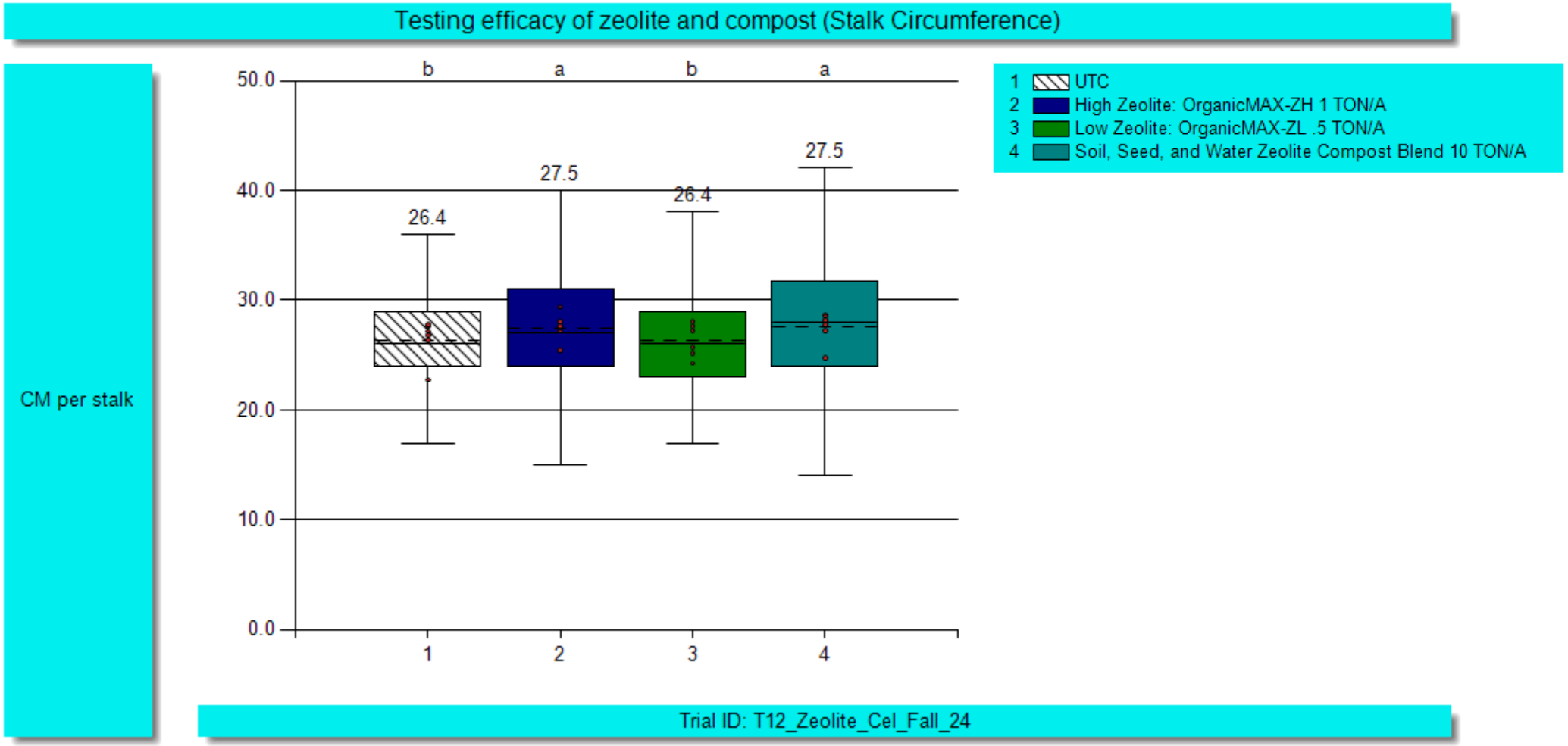
Column 2


Assessment Map - Column 3
100%
Always size to fit
21124
22122
23123
24121
21112
22113
23111
24114
21101
22104
23103
24102
21093
22092
23094
24091
21084
22081
23083
24082
21072
22073
23074
24071
Color Description
Options
Treatment Description
Assessment Description
0.64 to 0.66
0.684 to 0.71
0.71 to 0.73
0.73 to 0.75
0.75 to 0.78
0.78 to 0.80
0.80 to 0.82
0.82 to 0.85
0.85 to 0.87

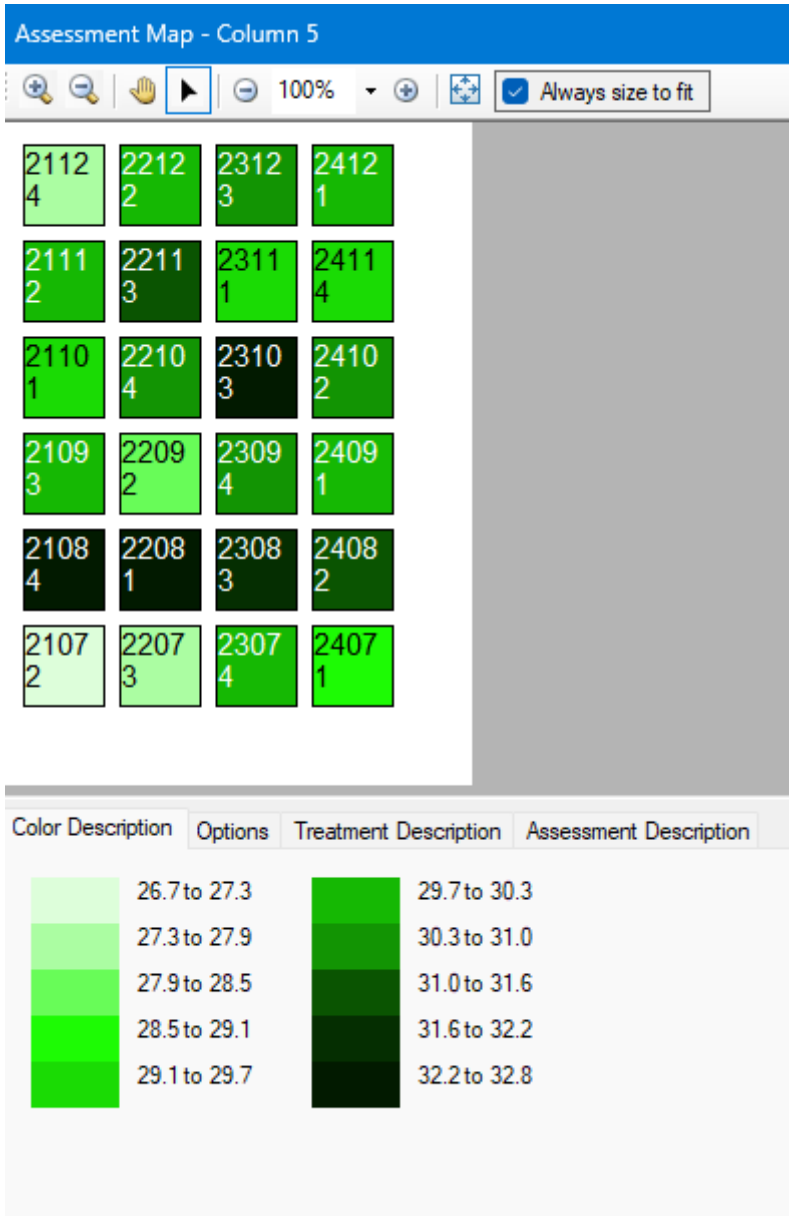

Testing efficacy of zeolite and compost (Stalk Yield)
KG per stalk
2.00
1.50
1.00
0.50
0.00
0.76
0.78
0.79
0.80
1
2
3
4
1 UTC
2 High Zeolite: OrganicMAX-ZH 1 TON/A
3 Low Zeolite: OrganicMAX-ZL .5 TON/A
4 Soil, Seed, and Water Zeolite Compost Blend 10 TON/A
Trial ID: T12_Zeolite_Cel_Fall_24

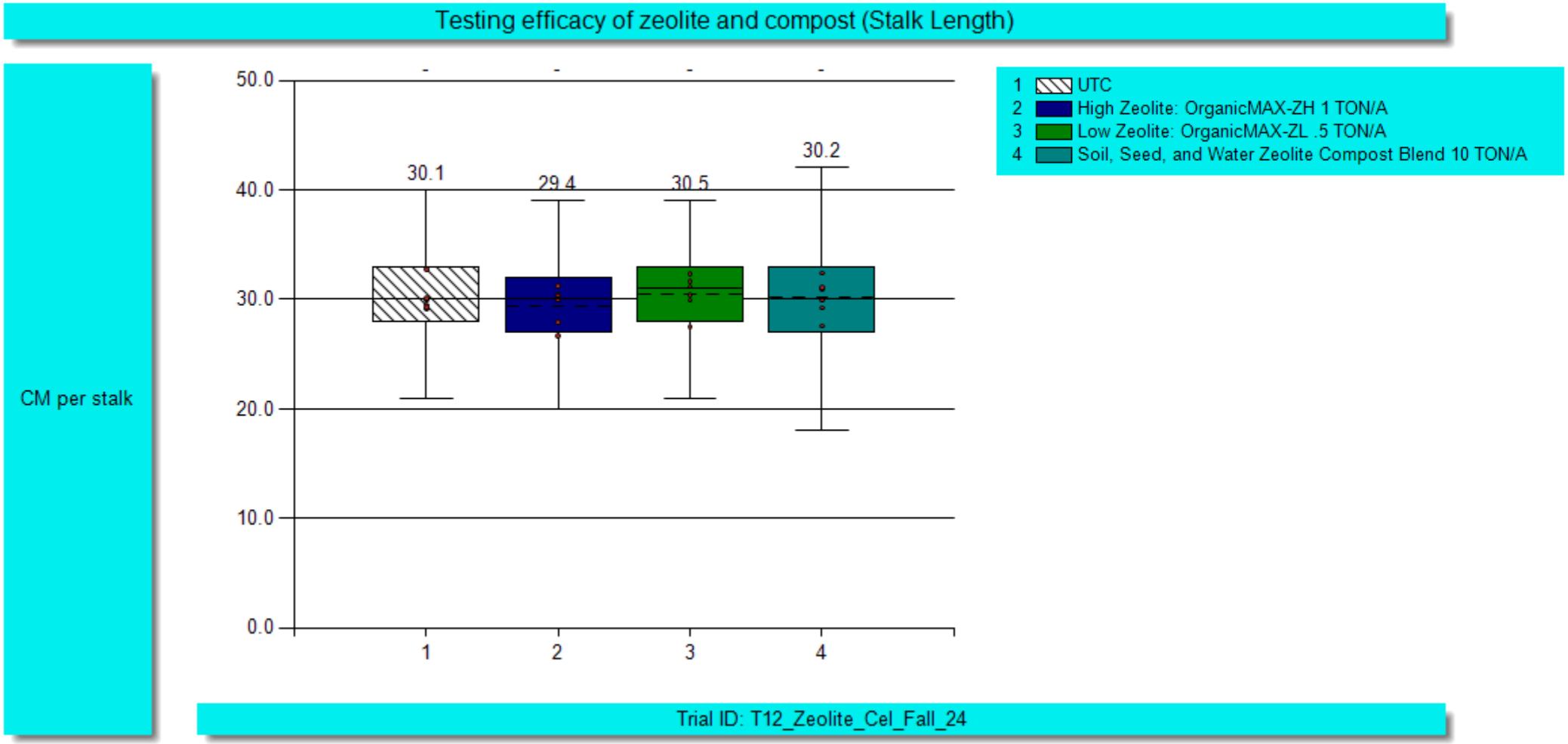
Column 3


Assessment Map - Column 4
100%
Always size to fit
21124
22122
23123
24121
21112
22113
23111
24114
21101
22104
23103
24102
21093
22092
23094
24091
21084
22081
23083
24082
21072
22073
23074
24071
Color Description
Options
Treatment Description
Assessment Description
22.8 to 23.4
24.1 to 24.7
24.7 to 25.4
25.4 to 26.1
26.1 to 26.7
26.7 to 27.4
27.4 to 28.0
28.0 to 28.7
28.7 to 29.4

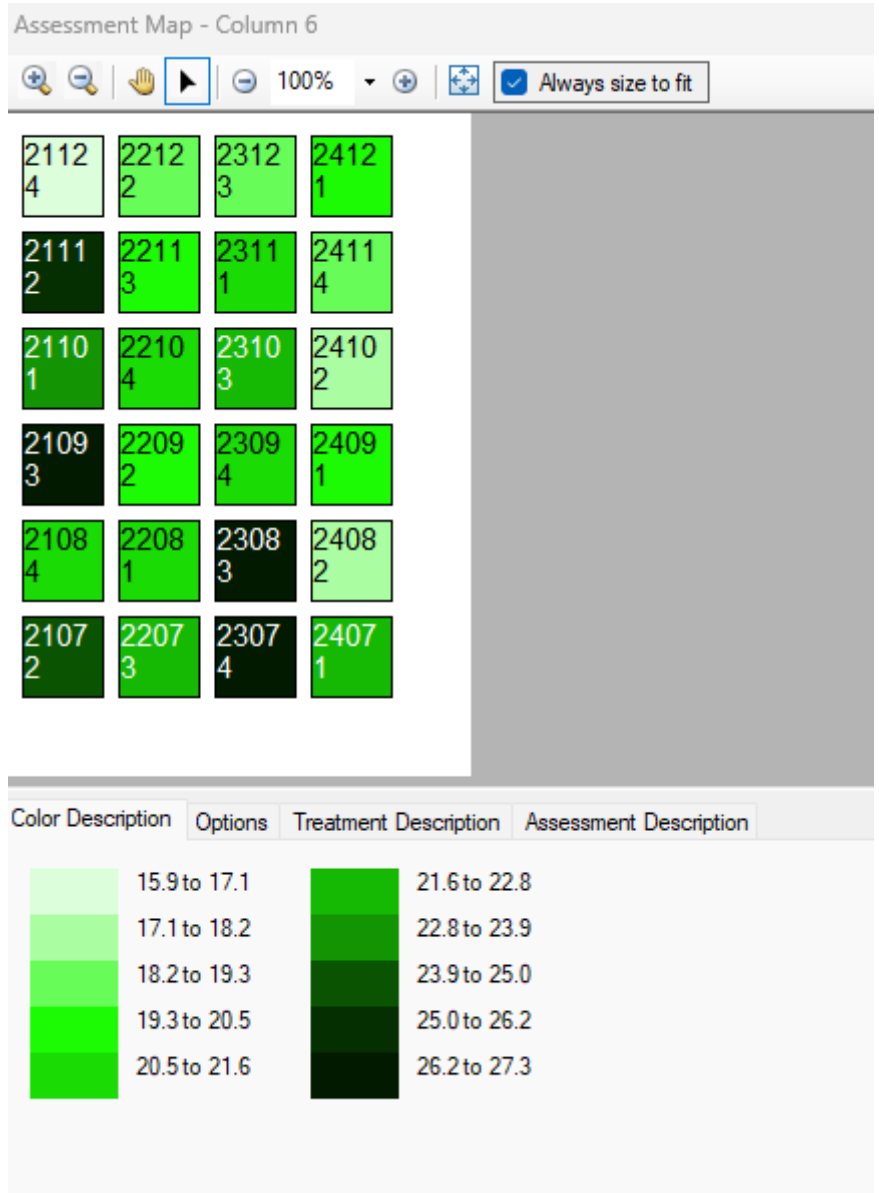

Testing efficacy of zeolite and compost (Stalk Circumference)
CM per stalk
50.0
40.0
30.0
20.0
10.0
0.0
b
a
b
a
26.4
27.5
26.4
27.5
1
2
3
4
1 UTC
2 High Zeolite: OrganicMAX-ZH 1 TON/A
3 Low Zeolite: OrganicMAX-ZL .5 TON/A
4 Soil, Seed, and Water Zeolite Compost Blend 10 TON/A
Trial ID: T12_Zeolite_Cel_Fall_24

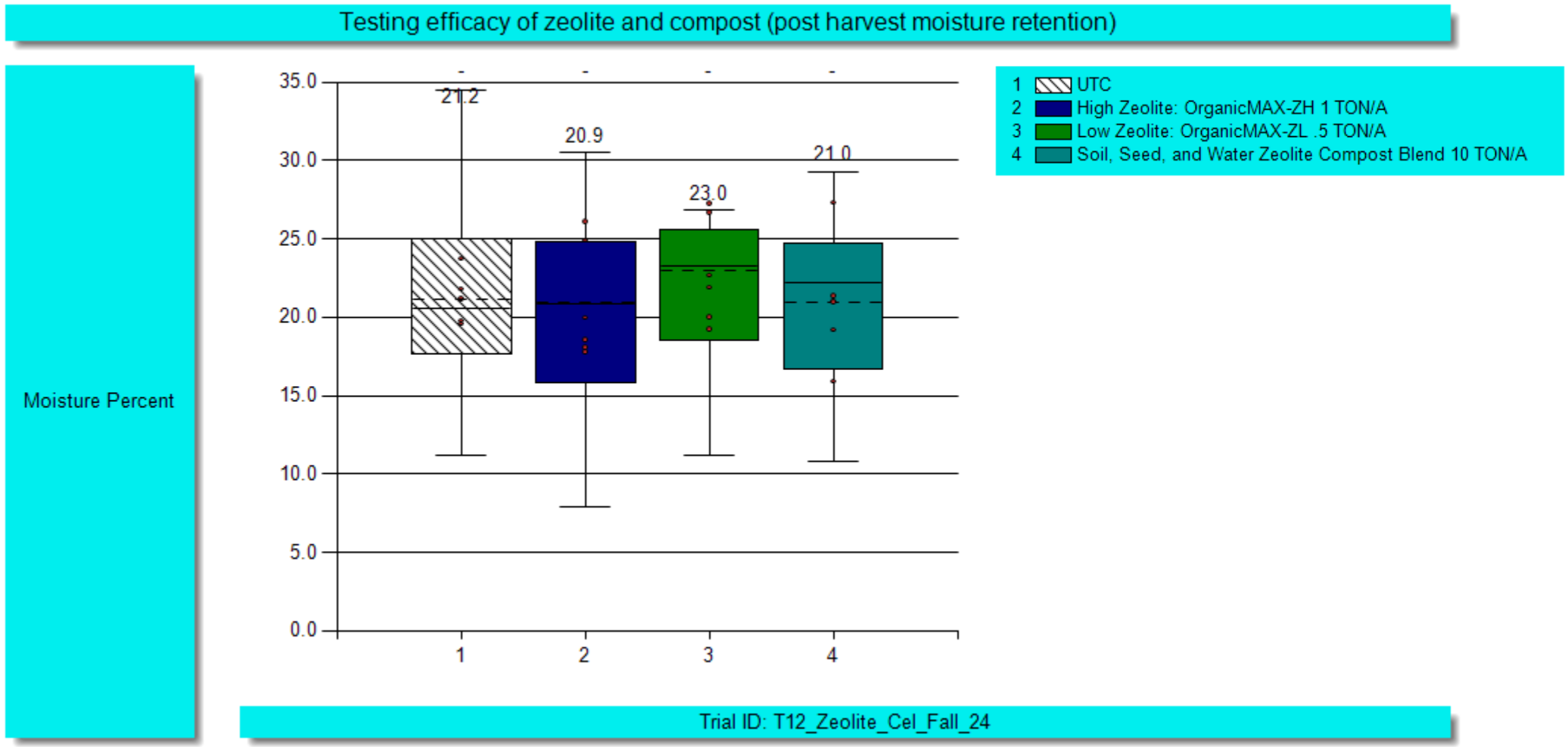
Column 4


Assessment Map - Column 5
100%
Always size to fit
21124
22122
23123
24121
21112
22113
23111
24114
21101
22104
23103
24102
21093
22092
23094
24091
21084
22081
23083
24082
21072
22073
23074
24071
Color Description
Options
Treatment Description
Assessment Description
26.7 to 27.3
27.3 to 27.9
27.9 to 28.5
28.5 to 29.1
29.1 to 29.7
29.7 to 30.3
30.3 to 31.0
31.0 to 31.6
31.6 to 32.2
32.2 to 32.8


Testing efficacy of zeolite and compost (Stalk Length)
CM per stalk
50.0
40.0
30.0
20.0
10.0
0.0
30.1
29.4
30.5
30.2
1
2
3
4
1 UTC
2 High Zeolite: OrganicMAX-ZH 1 TON/A
3 Low Zeolite: OrganicMAX-ZL .5 TON/A
4 Soil, Seed, and Water Zeolite Compost Blend 10 TON/A
Trial ID: T12_Zeolite_Cel_Fall_24

Column 5


Assessment Map - Column 6
100%
Always size to fit
21124
22122
23123
24121
21112
22113
23111
24114
21101
22104
23103
24102
21093
22092
23094
24091
21084
22081
23083
24082
21072
22073
23074
24071
Color Description
Options
Treatment Description
Assessment Description
15.9 to 17.1
17.1 to 18.2
18.2 to 19.3
19.3 to 20.5
20.5 to 21.6
21.6 to 22.8
22.8 to 23.9
23.9 to 25.0
25.0 to 26.2
26.2 to 27.3


Testing efficacy of zeolite and compost (post harvest moisture retention)
Moisture Percent
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
21.2
20.9
23.0
21.0
1
2
3
4
1 UTC
2 High Zeolite: OrganicMAX-ZH 1 TON/A
3 Low Zeolite: OrganicMAX-ZL .5 TON/A
4 Soil, Seed, and Water Zeolite Compost Blend 10 TON/A
Trial ID: T12_Zeolite_Cel_Fall_24

Column 6

University of Arizona

Testing efficacy of zeolite and compost

Trial ID: T12 Zeolite Cel Fall 24
Protocol ID: T12 Zeolite Cel Fall 24 Location: Yuma Arizona Trial Year: 2024
Project ID: T12 Zeolite Cel Fall 24
Study Director: Robert Masson Sponsor Contact:
Investigator:

Rating Date			Dec-17-2024	Jan-14-2025	Mar-18-2025	Mar-18-2025	Mar-18-2025
SE Group No.			4	5	1	2	3
Rating Unit					KG	CM	CM
Rating Min/Max/Interval					0.01, 2, -	1, 80, -	1, 80, -
Number of Subsamples			1	1	42	41	41
Description			NDVI 1	NDVI 2	Stalk Weight	Stalk Circumfer>	Stalk Length
Number of Decimals					2	1	1
Data Entry Date			Mar-31-2025	Mar-31-2025	Mar-26-2025	Mar-26-2025	Mar-26-2025
Trt No.	Treatment Name	Rate Rate Unit	Plot	1	2	3	4	5
1	UTC		2407	0.700	0.710	0.64	22.8	29.1
			2208	0.750	0.670	0.83	26.8	32.8
			2409	0.710	0.700	0.70	27.0	29.9
			2110	0.640	0.690	0.77	27.6	29.4
			2311	0.680	0.760	0.82	26.4	29.1
			2412	0.710	0.700	0.83	27.6	30.0
			Mean =	0.698	0.705	0.76	26.4	30.1
2	High Zeolite: OrganicMAX-ZH	1 ton/a	2107	0.730	0.730	0.75	25.4	26.7
			2408	0.720	0.730	0.81	28.1	31.2
			2209	0.640	0.660	0.70	27.1	27.9
			2410	0.680	0.700	0.79	27.3	30.4
			2111	0.660	0.690	0.80	29.4	30.2
			2212	0.730	0.700	0.87	27.5	29.9
			Mean =	0.693	0.702	0.78	27.5	29.4
3	Low Zeolite: OrganicMAX-ZL	0.5 ton/a	2207	0.730	0.700	0.71	24.3	27.5
			2308	0.650	0.750	0.86	28.0	31.7
			2109	0.640	0.700	0.73	27.7	29.9
			2310	0.640	0.750	0.81	25.7	32.3
			2211	0.650	0.650	0.80	25.2	31.2
			2312	0.720	0.790	0.82	27.2	30.4
			Mean =	0.672	0.723	0.79	26.4	30.5
4	Soil, Seed, and Water Zeolite Compost Blend	10 ton/a	2307	0.710	0.800	0.71	24.8	29.9
			2108	0.750	0.770	0.84	28.2	32.4
			2309	0.710	0.790	0.76	27.2	30.9
			2210	0.780	0.740	0.85	28.7	30.9
			2411	0.770	0.750	0.87	28.4	29.2
			2112	0.700	0.750	0.80	27.9	27.6
			Mean =	0.737	0.767	0.80	27.5	30.2

University of Arizona

Testing efficacy of zeolite and compost

Trial ID: T12 Zeolite Cel Fall 24
Protocol ID: T12 Zeolite Cel Fall 24 Location: Yuma Arizona Trial Year: 2024
Project ID: T12 Zeolite Cel Fall 24
Study Director: Robert Masson Sponsor Contact:
Investigator:

Rating Date		Dec-17-2024	Jan-14-2025	Mar-18-2025	Mar-18-2025	Mar-18-2025
SE Group No.		4	5	1	2	3
Rating Unit				KG	CM	CM
Rating Min/Max/Interval				0.01, 2, -	1, 80, -	1, 80, -
Number of Subsamples		1	1	42	41	41
Description		NDVI 1	NDVI 2	Stalk Weight	Stalk Circumfer>	Stalk Length
Number of Decimals				2	1	1
Data Entry Date		Mar-31-2025	Mar-31-2025	Mar-26-2025	Mar-26-2025	Mar-26-2025
Trt No.	Treatment Name	Rate Rate Unit	1	2	3	4	5
1	UTC		0.698 ab	0.705 b	0.76 -	26.4 b	30.1 -
2	High Zeolite: OrganicMAX-ZH	1 ton/a	0.693 b	0.702 b	0.78 -	27.5 a	29.4 -
3	Low Zeolite: OrganicMAX-ZL	0.5 ton/a	0.672 b	0.723 b	0.79 -	26.4 b	30.5 -
4	Soil, Seed, and Water Zeolite Compost Blend	10 ton/a	0.737 a	0.767 a	0.80 -	27.5 a	30.2 -
LSD P=.10			0.0385	0.0379	0.031	0.94	1.19
Standard Deviation			0.0380	0.0375	0.031	0.93	1.17
CV			5.43	5.18	3.92	3.45	3.91
Levene's F			0.122	1.742	0.352	0.198	0.19
Skewness			0.0073	0.1499	-0.6946	-1.0643*	-0.2881
Kurtosis			-0.9378	-0.7548	-0.2016	1.0448	-0.1562
Replicate F			0.989	0.318	14.432	7.787	4.583
Replicate Prob(F)			0.4566	0.8944	0.0001	0.0009	0.0098
Treatment F			3.036	3.817	1.692	2.971	0.947
Treatment Prob(F)			0.0618	0.0325	0.2115	0.0654	0.4427

Leaf Analytical Report

Robert Masson

Attn: Robert Masson
Client or PO: Yuma County Coop Extension

JMLord, Inc.
4184 N. Knoll Drive
Fresno, CA 93722
(559) 268-9755
jmlord@jmlordinc.com

Group: **39257** Date Received: 3/6/2025 Report Date: 3/7/2025

Sample	Field Name	Percentages (%) N	P	K	Ca	Mg	Na	Cl	S	Parts Per Million (ppm) B	Cu	Fe	Mn	Zn	NO3	PO4	% K(ext)
Crop: **Celery**																	
39257 - 1	S1-T9-1	4.08	0.55	3.68	2.06	0.54	1.120	2.81	1.38	47	10	106	71	70	1,167	3,564	3.76
39257 - 2	S2-T9-2	4.37	0.58	3.75	1.81	0.49	0.983	2.59	1.19	51	10	97	61	63	569	3,198	3.65
39257 - 3	S3-T9-3	4.05	0.53	3.49	2.36	0.59	1.450	2.91	1.72	37	9	93	87	73	2,312	3,650	4.13
39257 - 4	S4-T9-4	3.94	0.55	3.39	2.21	0.56	1.200	2.95	1.45	38	10	100	85	75	2,554	3,393	4.16
39257 - 5	S5-T10-1	4.26	0.67	4.15	1.14	0.41	0.751	2.04	0.90	69	13	119	42	69	1,009	3,745	3.49
39257 - 6	S6-T10-2	4.43	0.65	4.03	1.35	0.43	0.757	2.19	0.98	65	12	133	49	68	867	2,840	3.56
39257 - 7	S7-T10-3	4.21	0.63	3.67	1.61	0.48	0.884	2.35	1.18	51	11	114	60	71	1,319	3,254	3.74
39257 - 8	S8-T10-4	3.99	0.60	3.56	1.46	0.43	0.959	2.50	1.07	53	11	100	56	71	2,217	3,724	3.61
39257 - 9	S9-T11-1	4.38	0.62	3.90	1.28	0.45	0.715	1.82	0.94	58	12	106	53	71	877	3,585	3.24
39257 - 10	S10-T11-2	4.24	0.65	3.67	1.11	0.42	0.714	1.74	0.91	59	14	118	47	73	1,181	3,860	3.32
39257 - 11	S11-T11-3	4.30	0.65	3.86	1.58	0.44	0.833	2.32	1.16	58	11	111	61	71	1,685	3,728	3.97
39257 - 12	S12-T11-4	4.10	0.54	3.52	2.63	0.62	1.270	2.76	1.70	45	11	130	91	78	1,647	3,807	3.93
39257 - 13	S13-T12-1	4.27	0.78	4.13	1.36	0.48	0.775	1.99	1.10	68	15	140	62	86	1,767	4,094	3.47
39257 - 14	S14-T12-2	4.41	0.74	4.25	1.60	0.48	0.885	2.32	1.16	61	14	124	67	86	2,411	4,286	3.68
39257 - 15	S15-T12-3	4.21	0.72	4.28	1.30	0.42	0.810	2.16	0.99	60	13	114	52	80	2,290	3,953	3.56
39257 - 16	S16-T12-4	4.24	0.71	4.15	1.09	0.41	0.804	2.15	0.77	63	13	139	47	74	1,866	3,754	3.41

*BDL = Below Detectable Limits

Group: **39257** Date Received: 3/6/2025 Report Date: 3/7/2025

Sample	Field Name	Percentages (%)								Parts Per Million (ppm)							%
		N	P	K	Ca	Mg	Na	Cl	S	B	Cu	Fe	Mn	Zn	NO3	PO4	K(ext)
Recommended levels for Celery																	
	Low	0.7	0.25	7.0	2.20	0.30				25	5	22	10				
	High	1.5	0.50	9.5	3.50	0.60				60	15	100	100				

Trial 12 – Pacific Mineral (Celery)


T12 - Pacific Mineral
Celery
Plot 1
Plot: 2017
Trt: 2


T12- Pacific Mineral
Celery
Plot 2
Plot: 2207
Trt: 3


T12 - Pacific Mineral
Celery
Plot 3
Plot: 2307
Trt: 4


T12 - Pacific Mineral
Celery
Plot 4
Plot: 2407
Trt: 1


T12 - Pacific Mineral
Celery
Plot 5
Plot: 2108
Trt: 4


T12 - Pacific Mineral
Celery
Plot 6
Plot: 2208
Trt: 1


T12 - Pacific Mineral
Celery
Plot 7
Plot: 2308
Trt: 3


T12 - Pacific Mineral
Celery
Plot 8
Plot: 2408
Trt: 2


T12 - Pacific Mineral
Celery
Plot 9
Plot: 2109
Trt: 3


T12 - Pacific Mineral
Celery
Plot 10
Plot: 2209
Trt: 2


T12 - Pacific Mineral
Celery
Plot 11
Plot: 2309
Trt: 4


T12 - Pacific Mineral
Celery
Plot 12
Plot: 2409
Trt: 1


T12 - Pacific Mineral
Celery
Plot 13
Plot: 2110
Trt: 1


T12 - Pacific Mineral
Celery
Plot 14
Plot: 2210
Trt: 4


T12 - Pacific Mineral
Celery
Plot 15
Plot: 2310
Trt: 3


T12 - Pacific Mineral
Celery
Plot 16
Plot: 2410
Trt: 2


T12 - Pacific Mineral
Celery
Plot 17
Plot: 2111
Trt: 2


T12 - Pacific Mineral
Celery
Plot 18
Plot: 2211
Trt: 3


T12 - Pacific Mineral
Celery
Plot 19
Plot: 2311
Trt: 1


T12 - Pacific Mineral
Celery
Plot 20
Plot: 2411
Trt: 4


T12 - Pacific Mineral
Celery
Plot 21
Plot: 2112
Trt: 4


T12 - Pacific Mineral
Celery
Plot 22
Plot: 2212
Trt: 2


T12- Pacific Mineral
Celery
Plot 23
Plot: 2312
Trt: 3


T12 - Pacific Mineral
Celery
Plot 24
Plot: 2412
Trt: 1

Trial 12 – Pacific Mineral (Celery)

1/13/25


T12 - Pacific Mineral
Celery
Plot 2107


T12 - Pacific Mineral
Celery
Plot 2108


T12 - Pacific Mineral
Celery
Plot 2109


T12 - Pacific Mineral
Celery
Plot 2110


T12 - Pacific Mineral
Celery
Plot 2111


T12 - Pacific Mineral
Celery
Plot 2112


T12 - Pacific Mineral
Celery
Plot 2207


T12 - Pacific Mineral
Celery
Plot 2208


T12 - Pacific Mineral
Celery
Plot 2209


T12 - Pacific Mineral
Celery
Plot 2220


T12 - Pacific Mineral
Celery
Plot 2211


T12 - Pacific Mineral
Celery
Plot 2212


T12 - Pacific Mineral
Celery
Plot 2307


T12 - Pacific Mineral
Celery
Plot 2308


T12 - Pacific Mineral
Celery
Plot 2309


T12 - Pacific Mineral
Celery
Plot 2320


T12 - Pacific Mineral
Celery
Plot 2311


T 12 - Pacific Mineral
Celery
Plot 2312


T12 - Pacific Mineral
Celery
Plot 2407


T12 - Pacific Mineral
Celery
Plot 2408


T12 - Pacific Mineral
Celery
Plot 2409


T12 - Pacific Mineral
Celery
Plot 2410


T12 - Pacific Mineral
Celery
Plot 2411


T12 - Pacific Mineral
Celery
Plot 2412