Calformate & Osmoshield - Citrus

Grower Report 2024

agreya™
Sustainable Agriculture

Trial Information Sheet

Calformate Features

- Rich Source of Calcium
- Rapid Uptake and translocation
- Small Molocule compared to most chelates
- Natural Osmo regulator to increase transport within the plant and mitigate stress.
- Synergistic Boron

Analysis

- Total Nitrogen (N) ..... 1.2% w/w
- Organic Nitrogen ..... 1.2% w/w
- Calcium (Ca) water soluble ..... 24% w/w
- Boron (B) water soluble ..... 0.9% w/w

Trial Information Sheet

Osmoshield Technical Features

- Glycine betaine 97% from natural origin
- Increases the activity of antioxidant enzymes (↓ROS).
- Maintains the integrity of the cell membrane
- Has a positive effect on enzyme activity
- Decreases fruit dehydration and loss of firmness
- Natural Osmo-regulator to increase transport within the plant and mitigate stress.
- Maintains active transpiration flow increasing photosynthesis

Report Focus

- Two sites at Trentham (1 x Nadorcott, 1 x Ippolito)
- One site at Yelta (Ippolito)
- One site at Nangiloc (Nadorcott, Summer Gold)

Trial Information Sheet

Methods

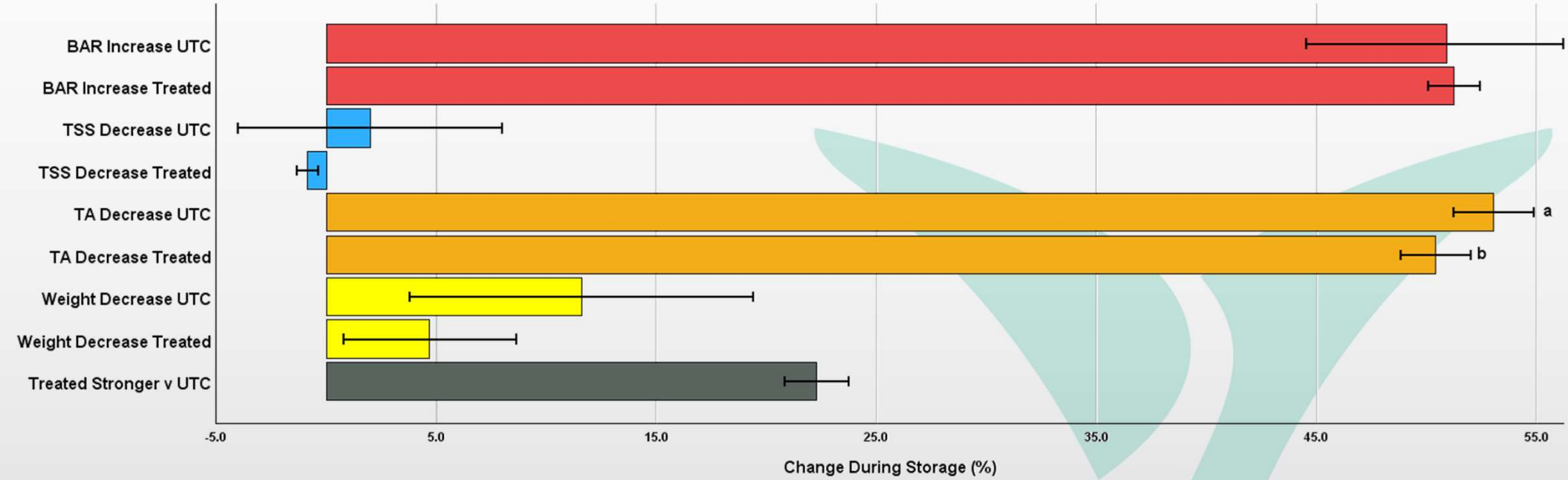
- Treatment with grower standard equipment and harvested at commercial maturity
- 2 rows per treatment with 2 buffer rows
- Harvest 6 fruit/tree, 5 trees/replicate, 3 replicates/treatment, Treated and Control (n=180)
- Test Timings: Harvest and after Storage (~50 days @ 0.5-1^{o}c + Transport ~10 days @ ambient)
- Tests: Weight, Firmness (penetrometer and sleeve), brix, titration (+texturometer, MDA, transpiration, Ion Leakage)
- Data Analysis t-test of differences with SPSS at $\alpha = .05$ (+ Cross Tabs)

Findings

- Statistical changes in treated fruit were found over the storage period compared to untreated fruit, such as
  - Changes in BAR ranging from 8.7 - 27.7% lower
  - 1.7 -15.85% less loss of Titratable Acidity (TA)
  - 2.89 - 22.5% greater skin firmness compared to untreated at harvest
  - Up to 4.95% less loss of TSS
- Positive trends were also noted in the treated fruit, such as
  - 2.2% lower increase in TSS
  - 1.85 - 6.9% less weight loss

Storage Changes (%)

Trentham Nadorcott



Error Bars: +/- 1 SE, Bars with a different letter within coluur groups are significantly different at p<.05

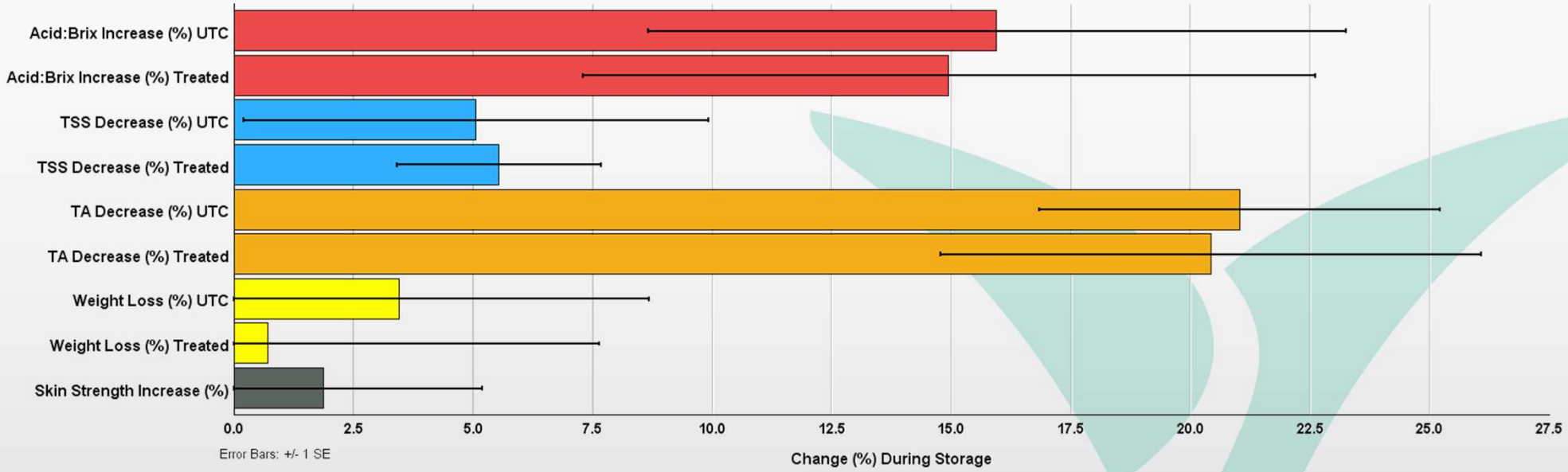
Activity	Date	Treatment	Rate
Application	01-May	Calformate	200g/100L
Harvest	22-July	OsmoShield	100g/100L
Pre-Store Evaluation	23-July	Water Rate	2500L/Ha
Post Store Evaluation	25-Sept		

<u>Trends in Treated:</u>

Less reduction in TSS, TA and Weight, an increase in skin strength, no significant difference in BAR.

Storage Changes (%)

- Trentham Ippolito



Activity	Date	Treatment	Rate
Application	01-May	Calformate	200g/100L
Harvest	22-July	OsmoShield	100g/100L
Pre-Store Evaluation	23-July	Water Rate	2500L/Ha
Post Store Evaluation	25-Sept		

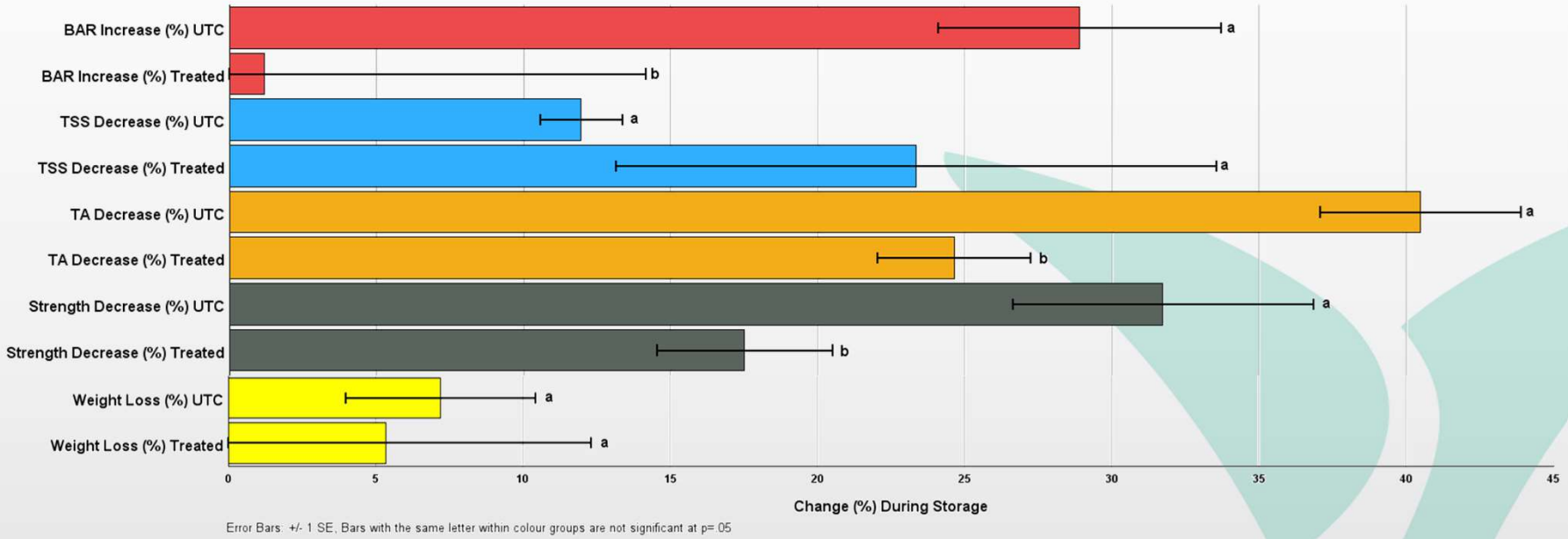
<u>Trends in Treated:</u>

No difference in Brix:Acid, TSS, TA.

Less weight loss and greater skin strength.

Storage Changes (%)

Yelta Ippolito



Activity	Date	Treatment	Rate
Application	16-May	Calformate	200g/100L
Harvest	4-July	OsmoShield	100g/100L
Pre-Store Evaluation	5-July	Water Rate	2500L/Ha
Post Store Evaluation	25-Sept		

<u>Trends in Treated:</u>

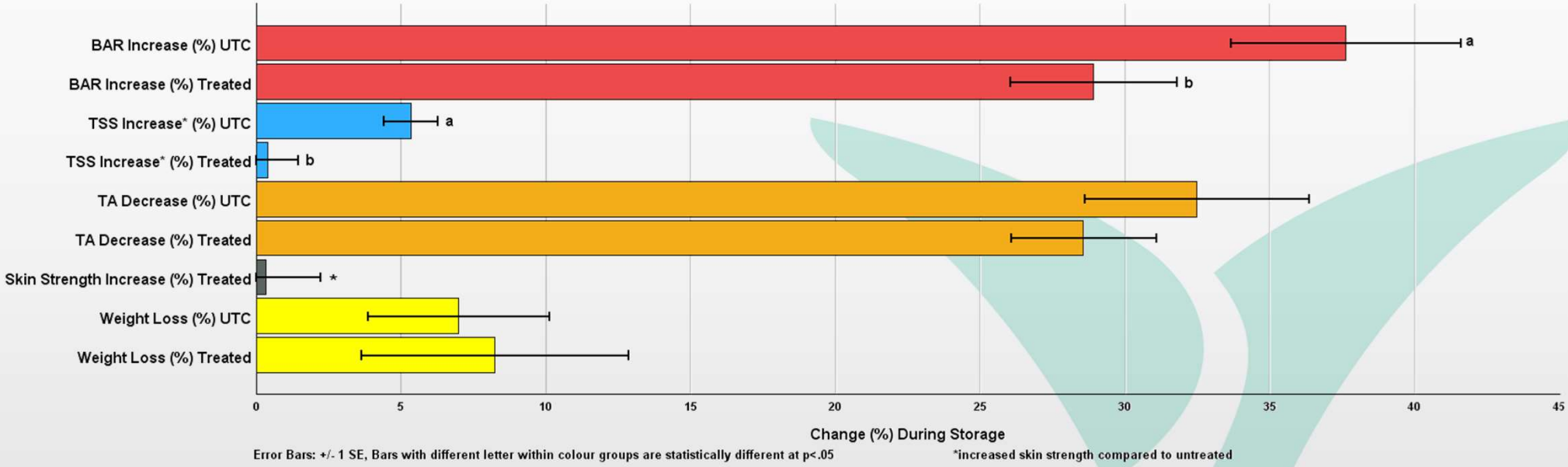
Less increase in Brix:Acid ratio

Greater decrease in TSS

Less decrease in TA, skin strength and weight loss.

Storage Changes (%)

- Nangiloc Summer Gold



Activity	Date	Treatment	Rate
Application	14-May	Calformate	200g/100L
Harvest	24-July	Osmoshield	100g/100L
Pre-Store Evaluation	24-July	Water Rate	2500L/Ha
Post Store Evaluation	25-Sept		

<u>Trends in Treated:</u>

Less increase in Brix:Acid ratio

Less decrease in TSS, TA, skin strength.

Increased weight loss

Summary

Parameter	Trentham Nadorcott	Nangiloc Nadorcott		Trentham Ippolito	Yelta Ippolito	Nangiloc Summer Gold
Spray Timing	✓	X		✓	X	✓
Brix Acid Ratio	+	NA		+	+*	+*
Total Soluble Solids	+	-		-	-	+*
Titratable Acidity	+*	+		+	+*	+
Weight Change	+	-*		+	+*	-
Skin Strength	+*	+	-*	+	+*	+*

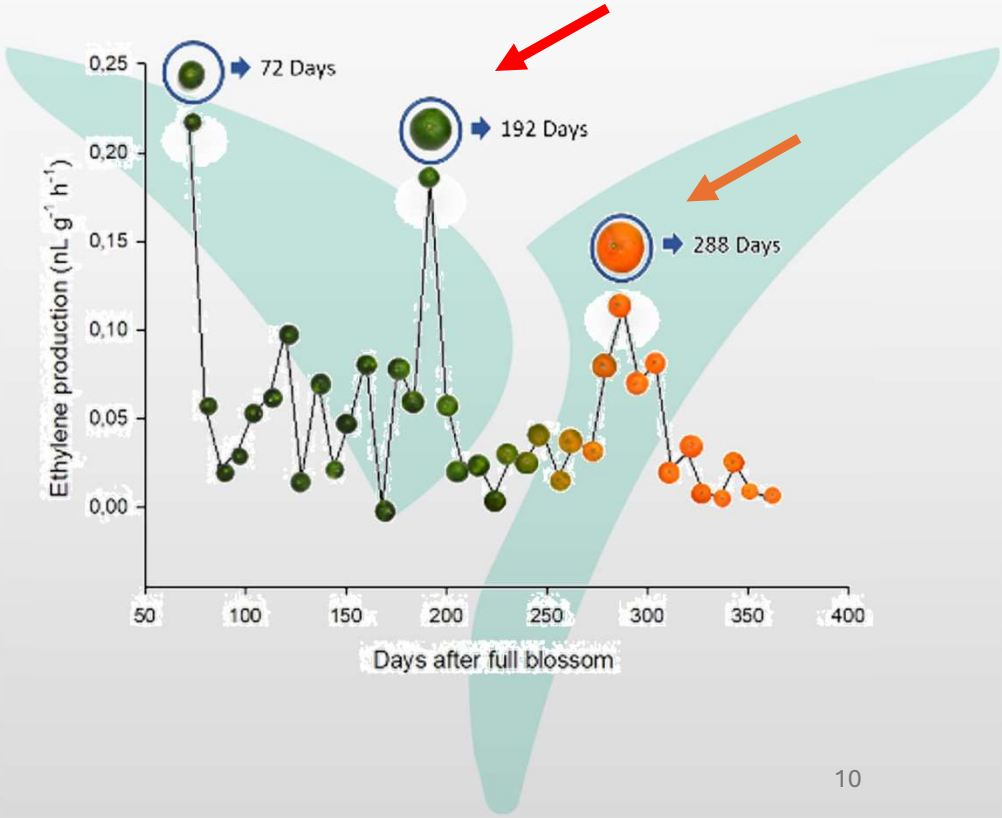
✓ = On time X = Late - = Negative Trend + = Positive Trend */* = Significant

Recommendations

- Timing sprays to correct phenological stage is critical in all varieties to increase chances of post harvest benefits.
- Sprays should commence at the beginning of colour change which coincides with the second ethylene peak.

Nadorcott: Too Late

Summer Gold: Just Late

Ippolito: Too Late

Nadorcott: Correct