



**Levity**  
CROP SCIENCE

# TRIAL REPORT: EVALUATION OF A GRAPE TRIAL

Summary: 4-5% Yield Increase which equates to R22,000.00 per hectare income increase.



Featured Products:

Lono K

Sulis

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## Introduction:

The Grape industry in South Africa (hereinafter referred to as RSA) is considered one of the most important crops being planted for a number of reasons, table grapes and raisin being two of the largest with a total area of 21 798 Ha of table grapes and 19 300 Ha for raisin. RSA produces a quantity of 2 708 767 MT of Table grapes and 88 000 MT of raisin grapes per annum.

At Levity Crop Science, we work closely with our farmers in an advisory role insofar as their crops are concerned in order to improve farmers productivity and enhance the quality of their final produce. All this whilst trying to solve the physiological disorders of the fruits if any and tailor making a solution that best suits the farmer's needs.

A trial was conducted in the Mookgophong (formerly known as Naboomspruit) area (RSA), in order to evaluate the effect of different Levity products on Crimson - and Red Globe Grapes. Conventional farming practises were followed and the products were applied as foliar applications.

## Material and Methods:

The trial evaluations were recorded on the Red Globe variety on the 12<sup>th</sup> of January 2021 and on the Crimson variety on the 18<sup>th</sup> of January 2021.

The products that were used in the trial were as follows:

1. *Lono K*: 15-0-7. Nitrogen (N) 15% w/w (154g/L), 15%w/w Potassium (K<sub>2</sub>O) 7%w/w
2. *Sulis*: EC Fertilizer. 5% Molybdenum and 0.8% Boron.

The data of the trial was collected from ten grape vines/trees on the control and ten vines/trees that were treated with Levity products on both of the varieties. Take note that fruit bunches were picked at random.

## Product Application

The products were applied as foliar sprays

The product application is as is shown below:

**Red Globe**- First harvest date: 12/01/21

Lono K

Litres per hectare	Date of application
10 ℓ/Ha	26/10/20
5 ℓ/Ha	13/11/20
5 ℓ/ Ha	12/12/20

Sulis

Litres per hectare	Date of application
1 ℓ/Ha	18/12/20
1 ℓ/ Ha	29/12/20

**Crimson-** First harvest date: 20/01/21

Lono K

Litres per hectare	Date of application
5 ℓ/ Ha	26/11/20
5 ℓ/Ha	19/12/20

Sulis

Litres per hectare	Date of application
1 ℓ/ Ha	22/12/20
1 ℓ/Ha	09/01/21

## General Remarks:

### Crimson

Overall, the treated vines/trees showed less vegetative growth, with stronger firmer stems. The average weight of five bunches from the treated grapes exceeded the average weight of the same quantity on the control.

The control had smaller berry and bunch sizes in comparison to the treated vines and it was surprising to see that the average brix percentage of the control was higher than the brix of the treated area. Both the treated grapes and the control had a higher brix percentage than what was necessary.

Both the trial and the control grapes didn't colour sufficiently, this may have been due to various extrinsic factors such as the climate or the season in which the trial took place. The colour of the grapes that were treated with the Sulis was better, and more uniform than the control. **(Figure 1)**

There was a 45% increase in the average weight of 5 bunches and a 39% weight increase of 50 berries on the treated grapes. There was a 30% overall weight increase between the treated Crimson grapes and the control. The 5 bunches of the trial had 157 berries more than the 5 bunches of the control thus showing the increased yield that was generated on the treated grapes.

### Red Globe

No Morphological traits were recorded. The results were recorded on the Red Globe variety as the trial data was collected on the same day that the crop was harvested. However, a difference between the leaf samples were evidently visible. The treated leaves were thicker and greener than the leaves from the control. **(Figure 2)** Two trials were conducted on the Red Globe variety. In the one trial the only product that was applied was Sulis and on the other trial, Sulis **(Figure 3)** and Lono K was applied. **(Figure 4)**

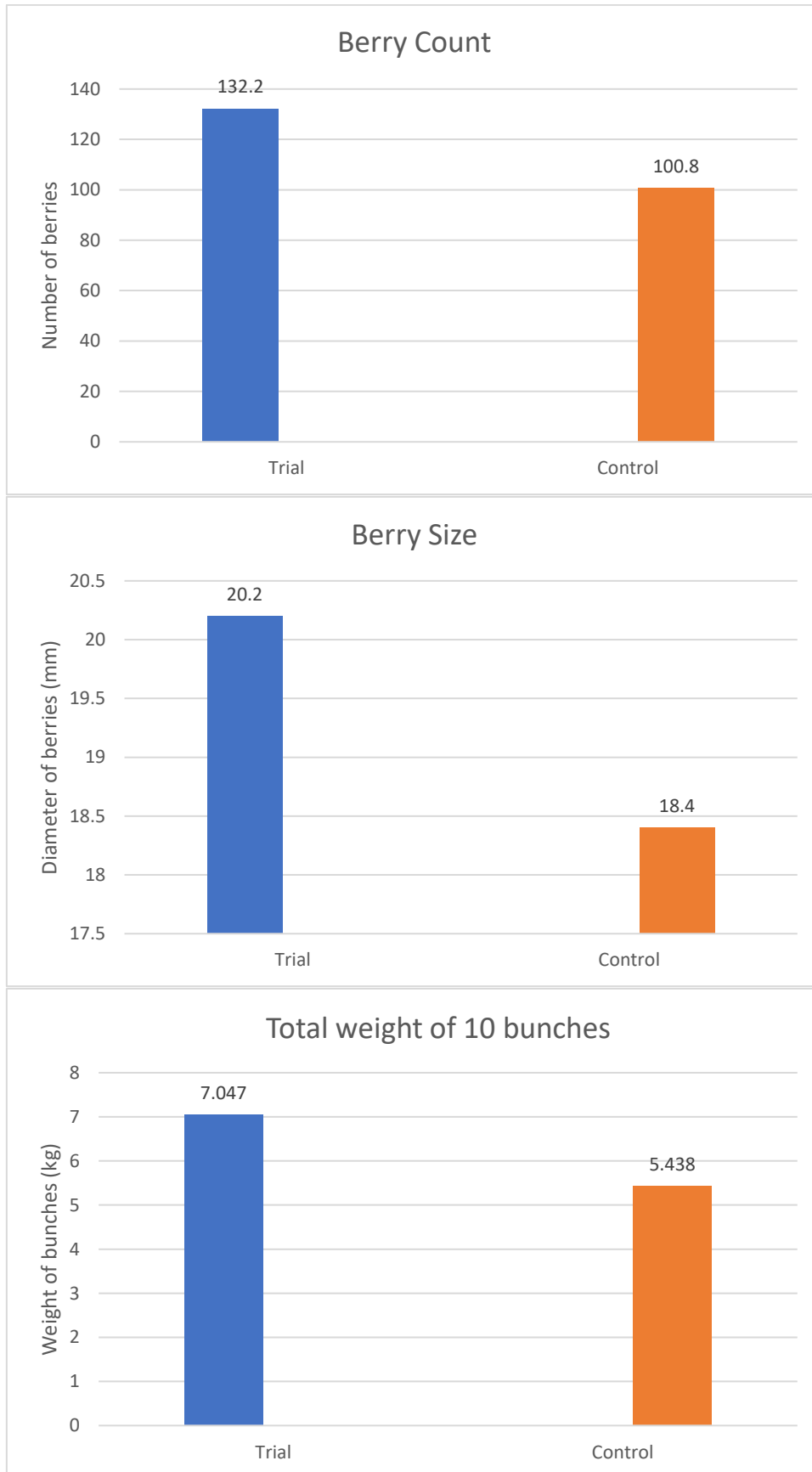
The average weight of the bunches on the trial where Sulis was applied, was quite substantially better than the weight of the bunches on both the control and the Lono K and Sulis trial. From the results recorded it is quite easy to see that there was a significant yield increase with the use of Levity's products.

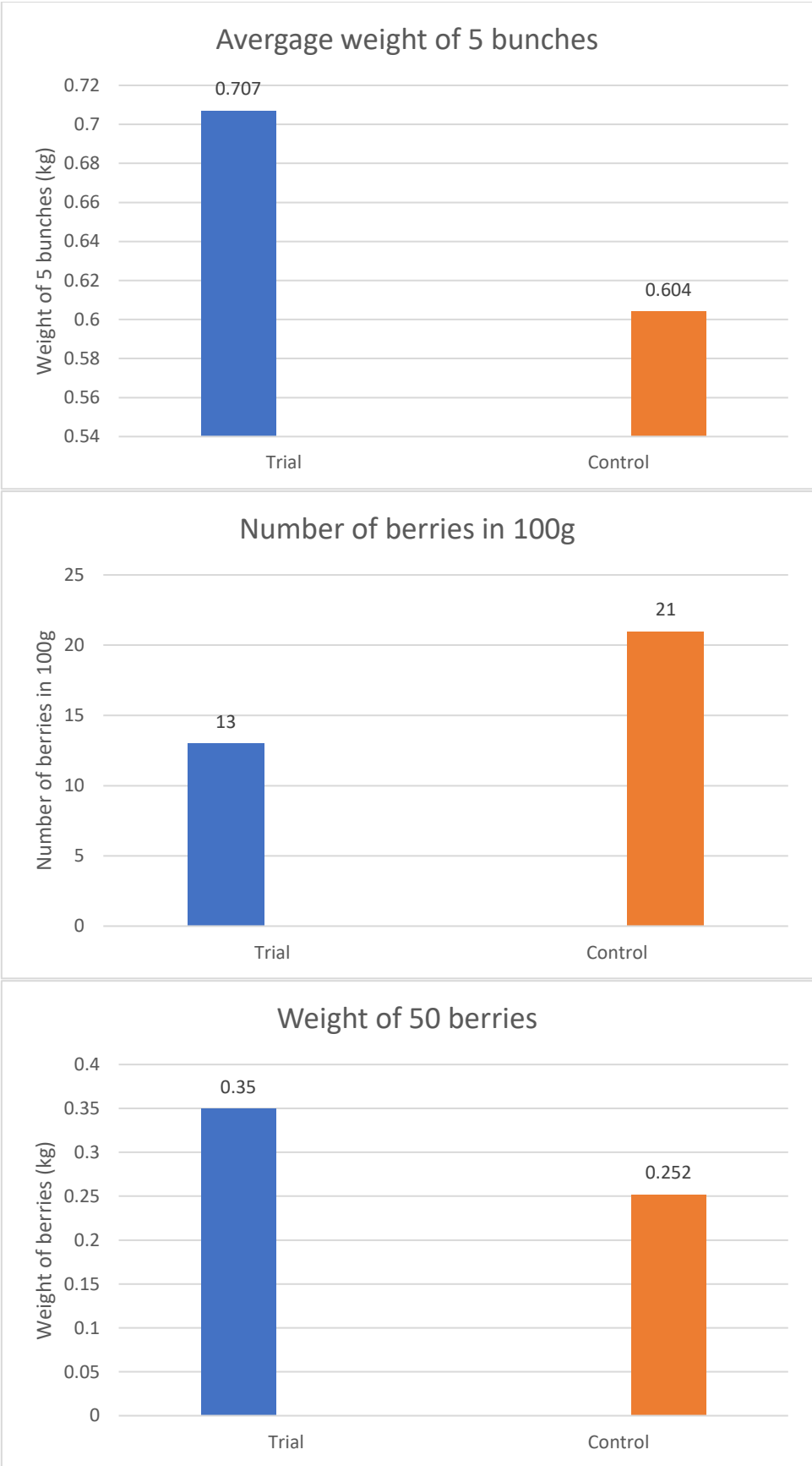
There was a 5% increase in the average weight of the 5 bunches between the treated grapes and the control. Further to the above, fewer berries were required in obtaining 100gms of the trial in comparison to the control which clearly shows an increase in yield. An overall yield increase of 5% was evident by making use of Levity's products.

The trial area did not conclude better Brix content, on the contrary, the control area had better Brix records, which was due to bigger berry size, which was conducted from having a smaller number of fruits in 100g as well as more bunch weight in addition to the weight of 50 berries. These three criteria proves that the trial berries were bigger in size, and since the plant is converting certain amount of brix equally to berries, then bigger berries will have less sugar distribution among themselves than smaller berries (Dilution effect).

# Figures

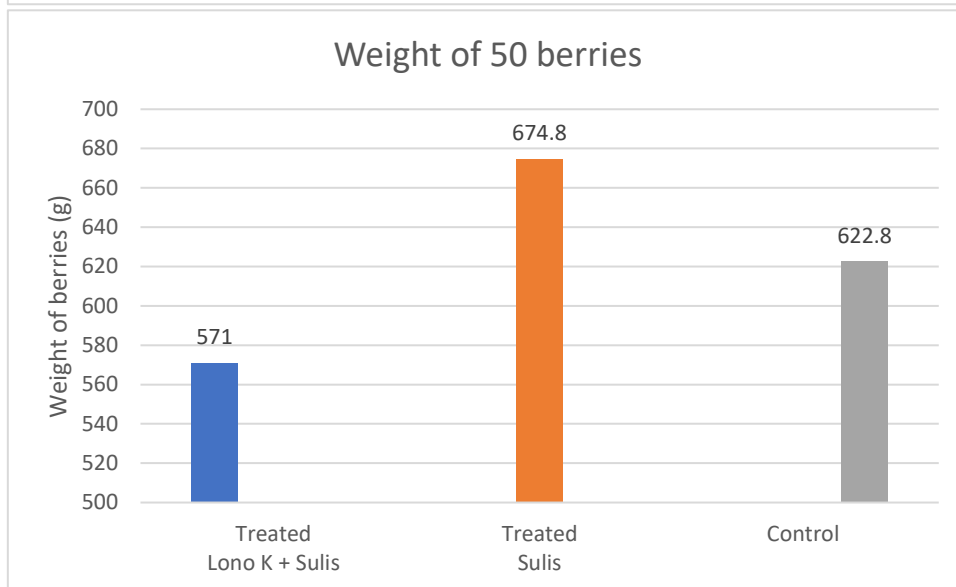
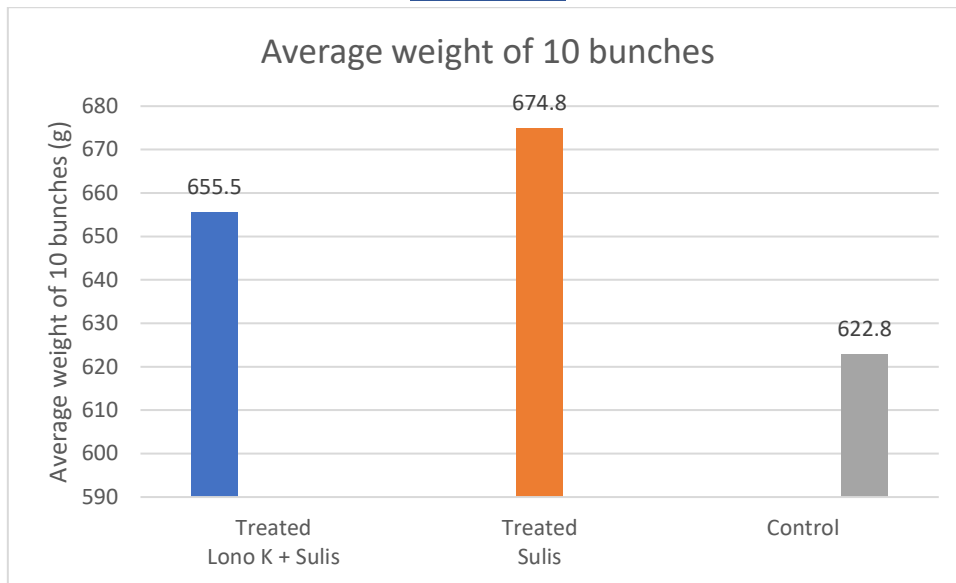
## Crimson

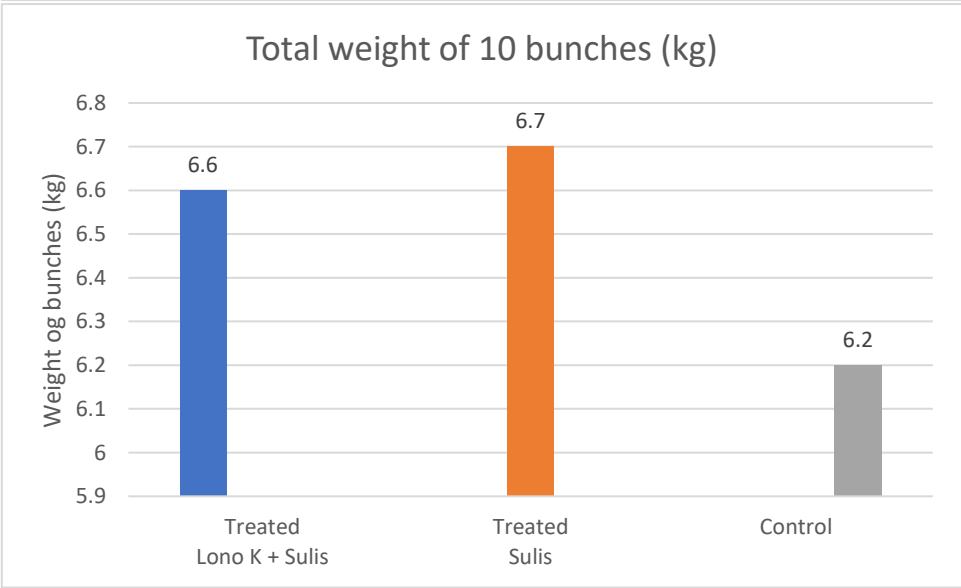
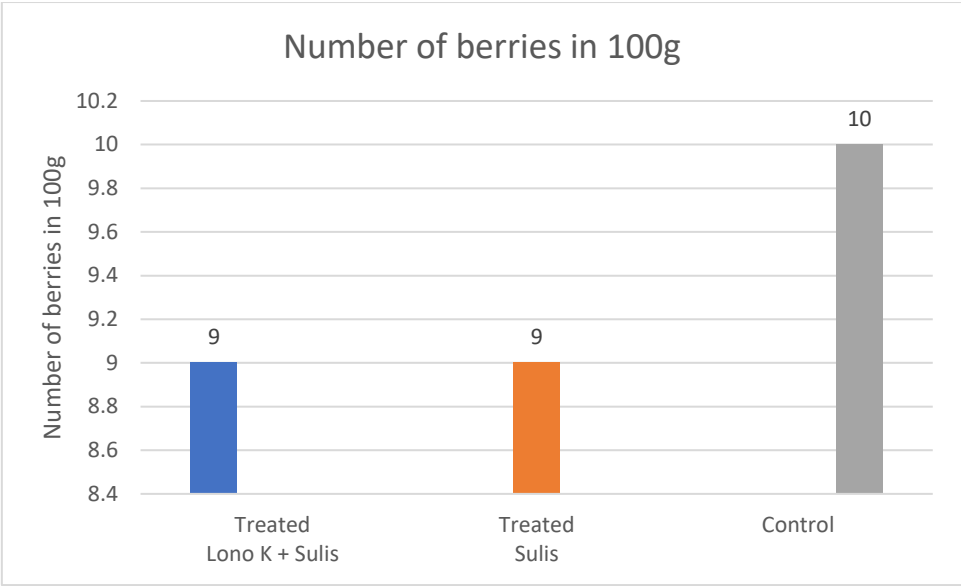






## Red Globe





## Statistical Summary

Crimson			
Morphological traits	Or (Before treatment)	After treatment	unit
Internodes Length	7.8	9.3	cm (average of 5 random plants)
Leaf width	11.78	8.5	Leaf Number 4 from the tip (average of 5 random plants)(cm)
Leaf length	8.44	5.74	Leaf Number 4 from the tip (average of 5 random plants)(cm)
1 year wood thickness at base	10	10.2	mm (average of 5 random plants)
Fruits Traits			
Average weight of 5 bunches	0.48	0.70	similar in size as much as possible (kg)
weight of 50 berries	0.25	0.35	randomly picked (kg)
Number of berries in 100g	21	13	randomly picked
Brix	18.9	18	0-20 (%)
Total weight of 20 bunches	5.44	7.05	Randomly picked from Harvest (kg)

## Morphological Traits

### Treated

Number of bunch	Internodes length	Leaf width	Leaf length	1 Year wood thickness at base	Grape size 12/01/21	Grape size2 18/01/21	Berry Count
<b>Row 40</b>	(cm)	(cm)	(cm)	(mm)	(mm)	(mm)	#
1	9	17	10.3	8	20	20	184
2	9.5	13.5	10	12.5	19	19	120
3	10	12	8.4	12.5	20	21	122
4	6	0	0	8	18	18	100
5	12	0	0	10	19	19	122
Average:	9.3	8.5	5.74	10.2	19.2	19.4	129.6

<b>Row 50</b>							
1	10	19	11.5	11	19	22	93
2	6	14.1	9.6	8	19	19	100
3	9.5	10.5	6.7	8	20	21	172
4	9.5	12.5	8	9.5	20	20	181
5	12	12.5	10.2	10	19	19	115
Average:	9.4	13.72	9.2	9.3	19.4	20.2	132.2

## Control

Number of bunch	Internodes length	Leaf width	Leaf length	1 Year wood thickness at base	Grape size 12/01/21	Grape size2 18/01/21	Berry Count
<b>Row 30</b>	(cm)	(cm)	(cm)	(mm)	(mm)	(mm)	#
1	4	13.7	10	8.5	18	18	89
2	10	15.7	10	12	20	19	138
3	6	0	0	8.5	18	18	80
4	9	16.5	13.2	12	19	19	86
5	10	13	9	9	18	18	111
Average:	7.8	11.78	8.44	10	18.6	18.4	100.8

## Fruit Traits

### Treated

	Average weight of 5 bunches (kg)	Weight of 50 berries (kg)	Number of berries in 100g	Brix (%)	Total weight of 10 bunches (kg)
<b>Row 40</b>					7.047
	0.918	0.32	15	15.9	
	0.691			18.5	
	0.938			16.4	
	0.502				
	0.461				
Average:	0,702				
<b>Row 50</b>					
	0.562	0.35	13	18.9	
	0.458			18.2	
	0.995			16.9	
	0.942				
	0.58				
Average:	0,707				18

## Control

	Average weight of 5 bunches (kg)	Weight of 50 berries (kg)	Number of berries in 100g	Brix (%)	Total weight of 10 bunches (kg)	
<b>Row 30</b>						
	0.799	0.24	23	18.4	5.438	
	0.789			18.8		
	0.349			19.4		
	0.62					
	0.462					
Average:	0,604					18.9
<b>Row 32</b>						
	0.41	0.25	21	18.5		
	0.699			18.8		
	0.364			19.4		
	0.464					
	0.482					
Average:	0,484				18.9	

Red Globe			
Morphological traits	Or (Before treatment)	After treatment	unit
Internodes Length	N.A.	N.A.	cm (average of 5 random plants)
Leaf width	N.A.	N.A.	Leaf Number 4 from the tip (average of 5 random plants)
Leaf length	N.A.	N.A.	Leaf Number 4 from the tip (average of 5 random plants)
1 year wood thickness at base	N.A.	N.A.	mm (average of 5 random plants)
Fruits Traits			
Average weight of 5 bunches	6.23	6.55	similar in size as much as possible (kg)
weight of 50 berries	566	573	randomly picked (g)
Number of berries in 100gm	10	9	randomly picked
Brix	14.13	12.07	0-20 (%)
Total weight of 10 bunches	6.23	6.56	Randomly picked from Harvest (kg)

## Fruit Traits

### Treated – Lono K + Sulis

	Weight of bunch	Weight of 50 berries	Number of berries in 100g	Brix	Total weight of 10 bunches
	(g)	(g)	(#)	(%)	(kg)
	693	571	9	12.7	6.6
	782			11.6	
	789			11.9	
	723				
	614				
	565				
	363				
	860				
	605				
	561				
Average	655.5			12.0666667	

## Treated – Sulis

	Weight of bunch	Weight of 50 berries	Number of berries in 100g	Brix	Total weight of 10 bunches
	(g)	(g)	(#)	(%)	(kg)
	1403	573	9	13.7	6.7
	419			12.1	
	675			13.2	
	713				
	481				
	802				
	648				
	561				
	439				
	607				
Average:	674.8			13	

## Control

	Weight of bunch	Weight of 50 berries	Number of berries in 100g	Brix	Total weight of 10 bunches
	(g)	(g)	(#)	(%)	(kg)
	824	566	10	14.7	6.2
	682			13.6	
	881			14.1	
	572				
	543				
	642				
	469				
	594				
	293				
	728				
Average:	622.8			14.1333333	

## Pack House Results

When comparing the trial results with the increased percentage of fruit successfully packed by the pack house; both showed that there was a 4% yield increase.

A 4% yield increase equals an income of R26 000/ha in value; the Levity Crop Science fertilizer program that was followed cost R4 000/ha, therefore an increase of R22 000/ha was obtained.

A better yield increase possibly might have been achieved if the complete Levity fertilizer program was followed.

### Levity - Lono K & Sulis trial Kontant Red Globe E7B (Row 6-14)

	Block	Crates	Export	Local	Total	ha	4,5kg/ha
Row 1-5	E7A	953	1282	509	1791	0,3456	5182
Row 6-14	E7B	1866	1803	1609	3412	0,6318	5400

### All data is 4.5kg equivalent

Date	Blok	Crates	Export	Ratio	Local	%
08-Jan	E7A	60	106	1,883333	7	25,0
12-Jan	E7A	69	124	1,869565	5	
19-Jan	E7A	109	217	1,990826		
22-Jan	E7A	101	164	1,831683	21	63,69
25-Jan	E7A	174	305	1,91954	29	
27-Jan	E7A	183	327	2,010929	41	
01-Feb	E7A	149	39	1,798658	229	
03-Feb	E7A	30	0	1,666667	50	11,33
05-Feb	E7A	34	0	1,882353	64	
08-Feb	E7A	44	0	1,431818	63	
		953	1282		509	

### All data is 4.5kg equivalent

Date	Blok	Crates	Export	Ratio	Local	%
08-Jan	E7B	52	91	1,87	6	16,4
12-Jan	E7B	113	204	1,87	7	
19-Jan	E7B	141	281	1,99		
22-Jan	E7B	186	303	1,84	40	57,82
25-Jan	E7B	175	307	1,92	29	
27-Jan	E7B	280	501	2,01	63	
01-Feb	E7B	438	116	1,80	674	
03-Feb	E7B	134	0	1,69	226	25,78
05-Feb	E7B	148	0	1,89	279	
08-Feb	E7B	199	0	1,43	285	
		1866	1803		1609	



## Pictures



**Picture 1 – Crimson Grapes (Un-uniform colour) Control**



**Picture 2 – Red Globe Leaves (Left Control – Right Treated)**



**Picture 3 – Red Globe Sulis**



**Picture 4 – Red Globe Sulis & Lono K**



*Picture 5 – Red Globe bunch control*



*Picture 6 – Red Globe bunch treated*

## Final Conclusion

On the Crimson variety there was a 45% increase in the average weight of 5 bunches and a 39% increase in the weight of 50 berries. Which is an overall 30% increase in weight. On the Red Globe variety there was a 5% increase in the average weight of 5 bunches and a 1% increase in weight of 50 berries. Which is an overall 5% increase in weight.

### Crimson

<b>Crimson</b>	
Increase in internodes length	19.2 %
Decrease in leaf width	38.6 %
Decrease in leaf length	47 %
Increase in 1 year wood thickness at base	2 %
Increase in the average weight of 5 bunches	45 %
Increase in weight of 50 berries	38.9 %
Difference in number of berries in 100g	8
Increase in the total weight of 5 bunches	29.6 %

### Red Globe

<b>Red Globe</b>	
Increase in the average weight of 5 bunches	5.2 %
Increase in weight of 50 berries	1.2 %
Difference in number of berries in 100g	1
Increase in the total weight of 5 bunches	5.3 %