

Karsten trails Klein Pella Northern Cape 2014

The Karsten group have vineyards in Klein Pella - possibly one of the harshest environments in which commercial agriculture is performed. As such we believed it to be the best testing ground of AquaBoost AG. The Karsten group provided a 5 Ha block split in to 3 blocks 601, 602 and 603. The block had uniform sandy, difficult soil with excessive water needs and struggling 2nd growth year trellised table grapes. The objective of this trail was to increase plant root size and maturation while balancing resources and overcoming the natural problems of sand soil and 40 C plus temperatures.

Sampling, measurement, watering, nutrition and other protocols were performed by a professional Karstens team. An automatic watering system s used which is activated by soil moisture level. From the single data extract it can be seen that water remained in the active root zone for longer. With the extreme temperature and active commercial farming objectives more water was applied on some of the AquaBoost AG blocks as the vegetative growth was significantly quicker.

Below results provided without changed by Senior Farm Manager Willem van Aarde.

AquaBoostAG trial data

Stem diameters was measured with a calliper right below the irrigation pipe. All sections was measured from the side of the Prime orchards

Spad readings were taken by measuring 10 leafs per section. The fourth leaf from the growing tip were measured every time

Results

	<u>Ave</u> <u>Dim</u>	<u>Variation</u>
<u>Control</u>	<u>15,39</u>	<u>1</u>
<u>3L/Ha</u>	<u>18,17</u>	<u>1,181</u>
<u>5L/Ha</u>	<u>19,22</u>	<u>1,249</u>

Orchard 601 : Aquaboost 3L/ha every 6

Row	Section	Spad	Vine 1	Vine 2	Vine 3	Vine 4	Vine 5	Vine 6	Average
5	3	28,6	19	16	15	15	19	16	16,67
10	8	25,3	19	22	21	22	20	15	19,83
15	13	25,7	17	17	21	20	17	16	18,00

Average Spad	26,53	Total average trunk diameter (mm) :	18,17
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Orchard 602 : Control

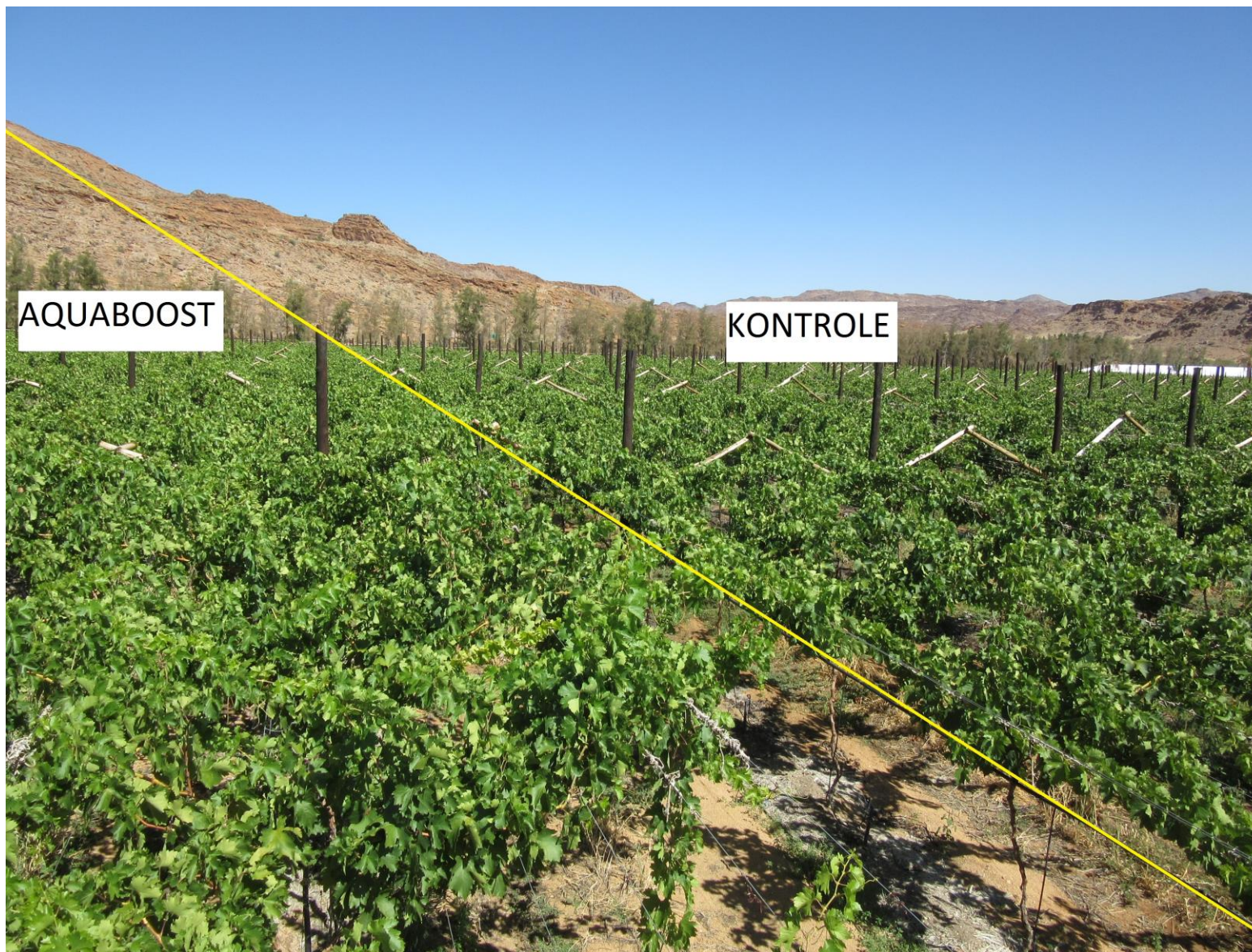
Row	Section	Spad	Vine 1	Vine 2	Vine 3	Vine 4	Vine 5	Vine 6	Average
5	3	27,5	15	13	14	14	15	15	14,33
10	8	23,3	17	15	15	15	20	14	16,00
15	13	24,9	14	16	17	18	16	14	15,83
Average Spad	25,23	Total average trunk diameter (mm):							15,39

Orchard 603 : Aquaboo 5L/ha every 6 weeks

Row	Section	Spad	Vine 1	Vine 2	Vine 3	Vine 4	Vine 5	Vine 6	Average
5	3	27,9	19	18	21	22	20	21	20,17
10	8	27,8	19	18	17	17	20	15	17,67
15	13	27,4	24	19	20	20	18	18	19,83
Average Spad	27,70	Total average trunk diameter :							19,22

Orchard 603 also received Fulvic acids later in the season.

Picture 1: Shows a visible difference in canopy density

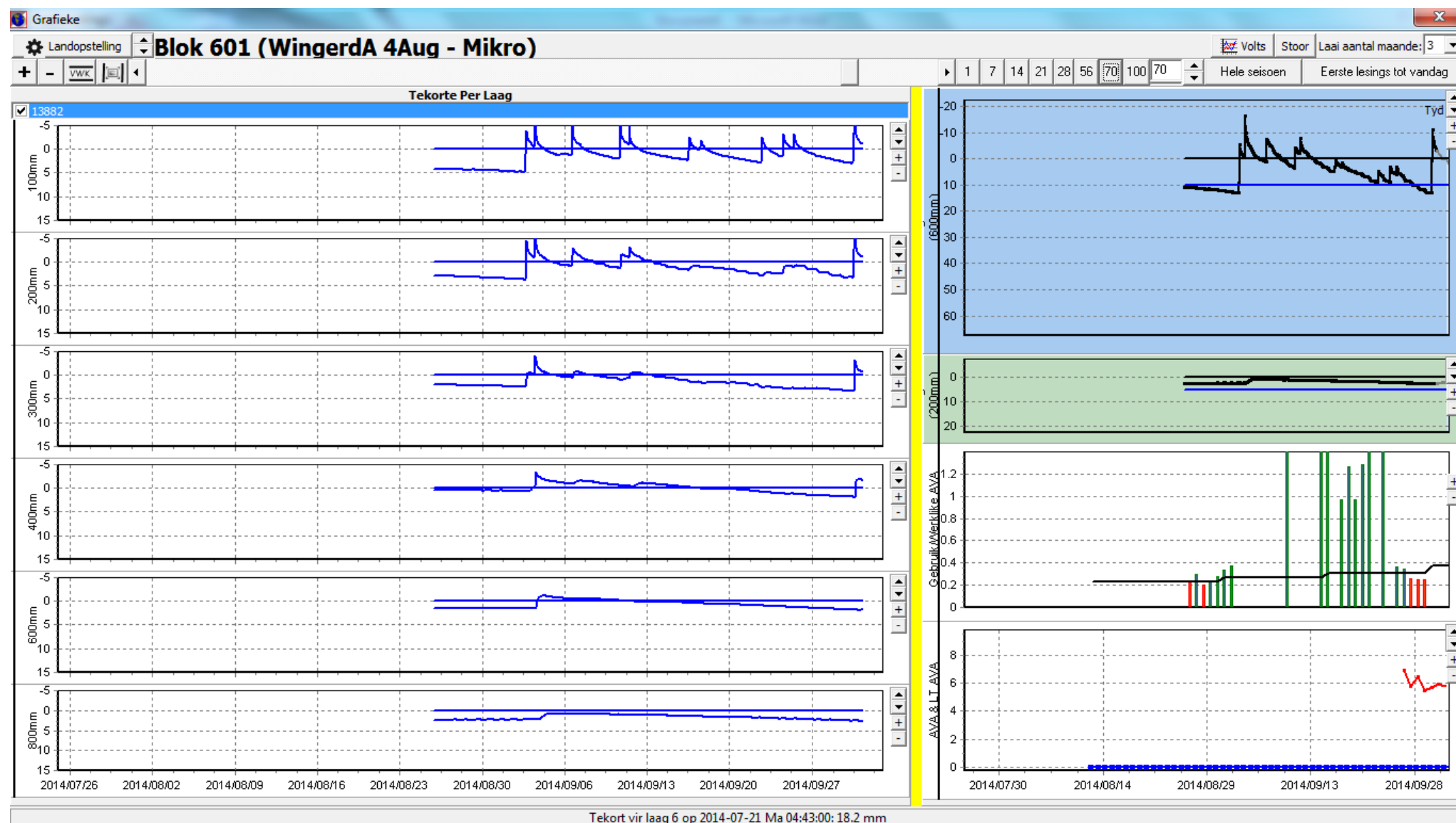


Picture 2: Shows a visible difference in canopy density



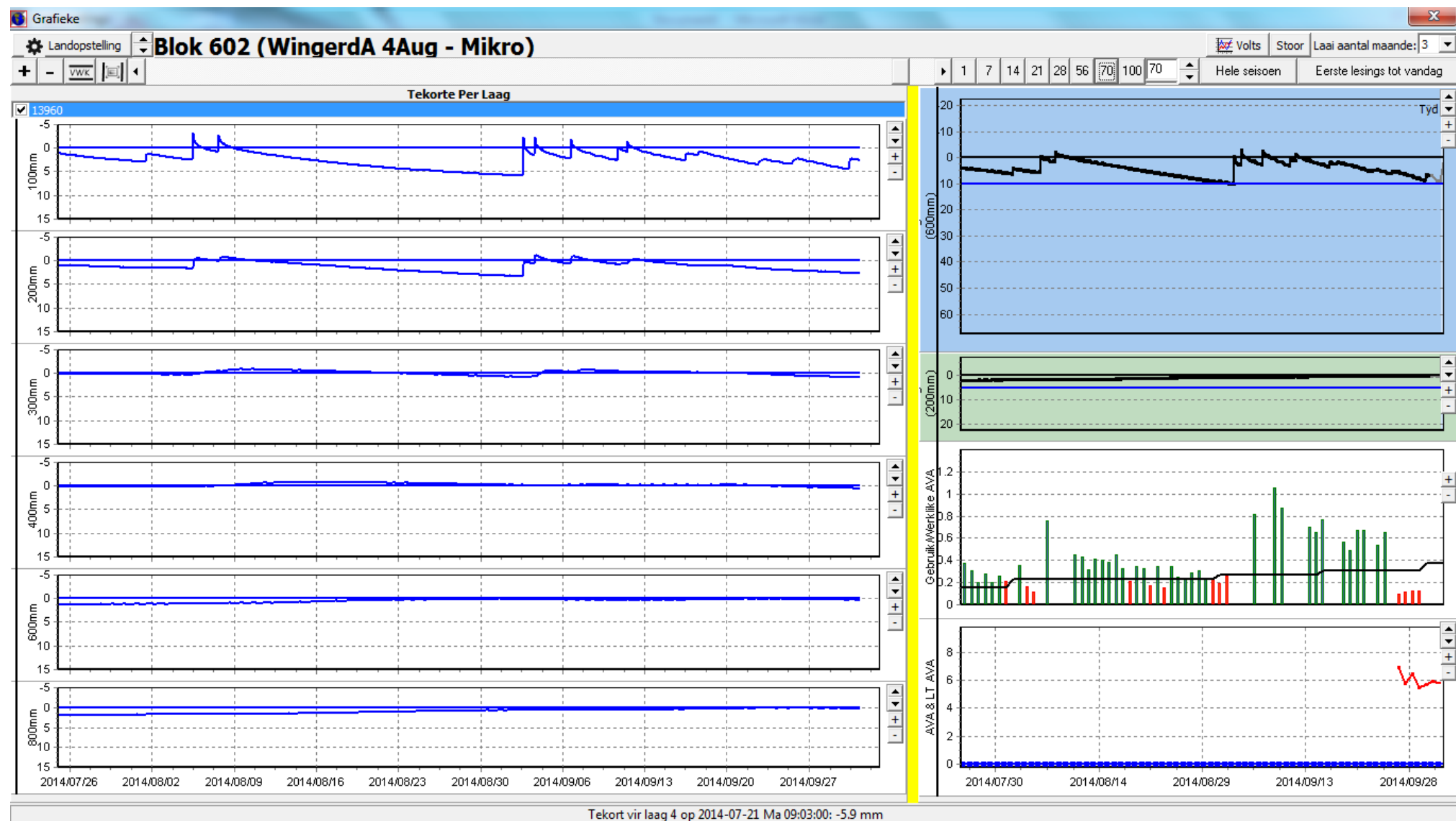
Aquaboost Trail - Initial Data Sets (Start Growing Season/Young Vine 2nd growth season)

Block 601 - Application (verify dosage etc - see end)

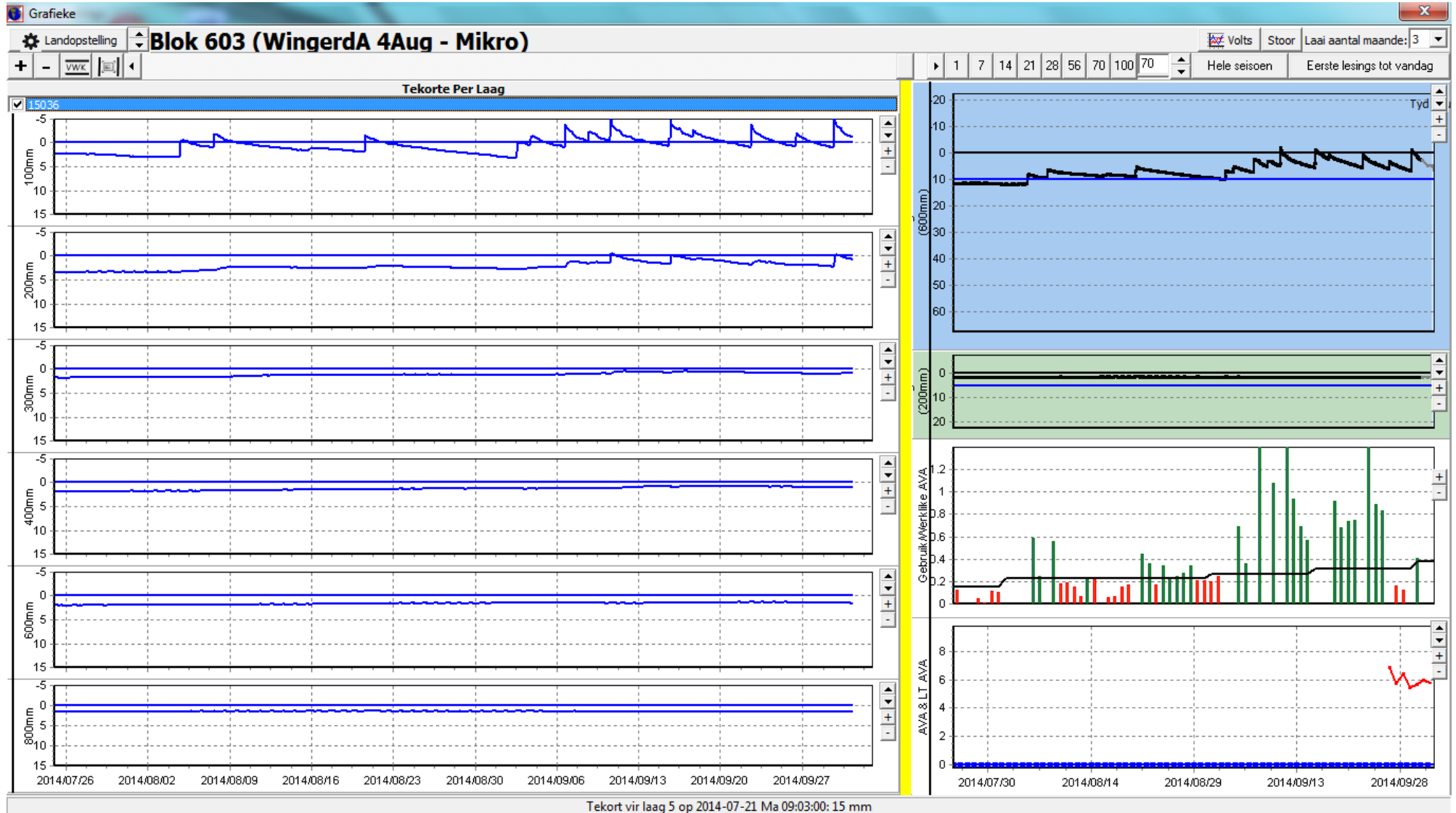


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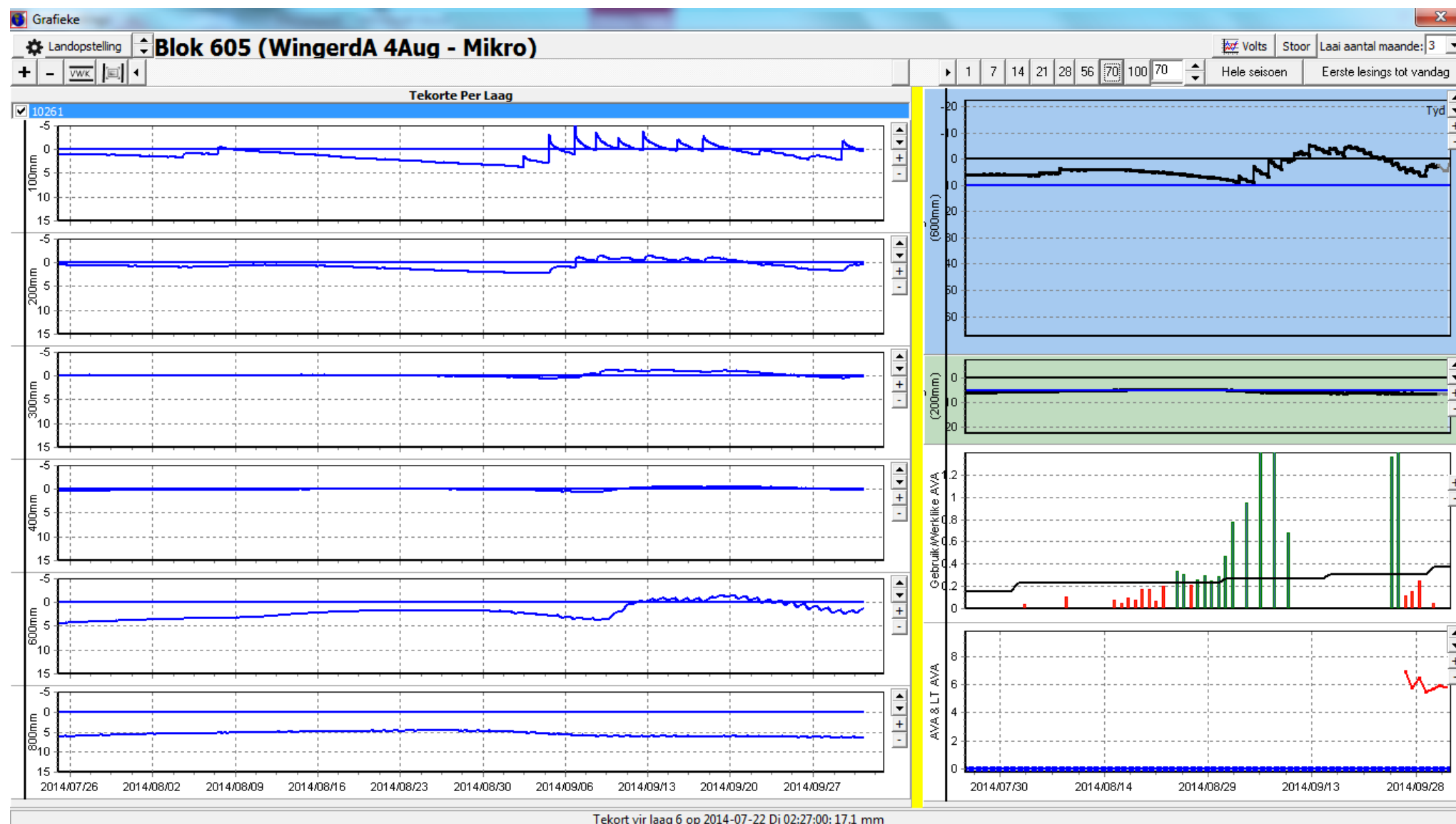
Block 602 - Control



Block 603 - Treated



Block 605 - Control



Irrigation period week 30 onwards/Besproeiing van week 30 tot nou.

- (Behandel) Blok 601 - 652mm
- (Kontrole) Blok 602 - 606mm
- (Behandel) Blok 603 - 564mm - 7 Besproeiings
- (Kontrole) Blok 605 - 591mm - 9 besproeiings** (heel ander grond tipe)

Block 601 slopes towards 602. Soil analysis showed that block 603 and 605 had more clay.

See soil analysis below

- 601,603 - 5% Clay; 605 <3%
- 605 lower Ca
- 601 Fe 30mg/kg

Ave = 603.25mm Applied 3L and 5L

<i>Behandel</i>		<i>Kontrole</i>	
Mean	608	Mean	598.5
Standard Error	44	Standard Error	7.5
Median	608	Median	598.5
Mode	#N/A	Mode	#N/A
Standard Deviation	62.2254	Standard Deviation	10.60660172
Sample Variance	3872	Sample Variance	112.5
Kurtosis	#DIV/0!	Kurtosis	#DIV/0!
Skewness	#DIV/0!	Skewness	#DIV/0!
Range	88	Range	15
Minimum	564	Minimum	591
Maximum	652	Maximum	606
Sum	1216	Sum	1197
Count	2	Count	2

Savings

After the growth season irrigation continuous and a 35% reduction in water and irrigation system usage was noted. This had large cost saving and maintenance advantages

15% electricity reduction (all water is pumped for the Orange River at an upward elevation

Table 1: Bemlab soil sample analysis

Verslag No.: **GR7550_a** (Vervang verslag no.: GR007550.DOC)

Hanno van Wyk
Klein Pella
Posbus 6098
Welgemoed
7530

Grondontledingsverslag

Datum ontvang: 17/03/2014

Datum ontleed: 20/03/2014

Boord	Lab. No.	Diepte (cm)	Grond	pH (KCl)	Weerst. (Ohm)	H ⁺ (cmol/kg)	Klip (Vol %)	P Bray II mg/kg	K	Uitruilbare katione (cmol(+)/kg)				Cu	Zn	Mn	B	Fe mg/kg	C %
										Na	K	Ca	Mg						
Blok 601	7550	30	Sand	7.4	3040		16	28	47	0.12	0.12	6.65	1.26	1.30	12.4	39.3	0.24	29.13	0.24
Blok 603	7551	30	Sand	7.4	3250		15	27	61	0.09	0.16	6.83	1.32	1.51	19.0	42.0	0.35	17.58	0.20
Blok 605	7552	30	Sand	6.5	3410		14	103	49	0.09	0.13	5.57	1.33	1.27	18.8	37.9	0.32	15.98	0.26
Metodes [#]				3108	3106	3109		3117		3113	3113	3113	3113	3115	3115	3115	3114		3107

Indien pH > 7.0 is word die Olsen metode(3118) vir die bepaling van P gebruik.

[#]Verwys na BemLab werkinstruksies

Basis Versadiging

Boord No.	Lab. No.	Na %	K %	Ca %	Mg %	T-Waarde cmol/kg
Blok 601	7550	1.42	1.48	81.64	15.46	8.15
Blok 603	7551	1.08	1.87	81.38	15.67	8.40
Blok 605	7552	1.24	1.77	78.25	18.74	7.11

Meganiese ontleding

Boord No.	Lab. No.	Klei %	Slik %	Fyn Sand %	Medium Sand %	Groewe Sand %	Klip % (v/v)	Klassifikasie	Waterhouvermoë 10 kPa %	Waterhouvermoë 100 kPa %	Waterhouvermoë 1000 kPa mm/m
Blok 601	7550	4.8	2	59.3	29.3	4.6	16.0	Sa	16.92	6.77	101.5
Blok 603	7551	4.8	2	59.4	29.4	4.44	15.4	Sa	17.01	6.80	102.2
Blok 605	7552	2.8	2	19.6	30	45.6	14.5	Sa	13.74	7.97	57.7

Discussion

The 3L and 5L AquaBoost AG showed 18% and 25% increase respectively in average shoot diameter of the young vines. Water usage was reduced by more than 35% with a 15% plus saving in electricity during the winter months. Treated vines matured quicker, had a significantly improved root system and improved canopy. These factors result in improved drought and heat resistance which in turn means lower and shorter irrigation needs which reduce potential fungal and bacterial infection possibilities