THE THIRD SEASON OF HARVISTA (AGROFRESH) SPRAY TRIALS INDICATE THAT, UNDER CERTAIN CONDITIONS, FRUIT SIZE AND YIELD IMPROVEMENTS ARE ALSO OBTAINABLE IN ADDITION TO THE POSTHARVEST OUTCOMES

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ABSTRACT

Four trials were initiated with a 1-methylcyclopropene tree spray (Harvista; AgroFresh) formulation on 'Hass' and 'Maluma' avocados during 2023. Two of these trials were performed during the late season in high altitude 'Hass' blocks while another two sprays were applied, during the 2024 pre-season, in low altitude 'Hass' and 'Maluma' blocks. The present report deals with the two late season trials. We found, firstly, that the ripening inhibition patterns of the fruit concurred with the results generated during similar trials that were performed during the 2021 and 2022 seasons. In addition, we recorded significant reductions in grey pulp, stem-end rot, and vascular browning after subjecting the fruit to storage periods that were longer than those used during the previous trials. However, the most important observation made during the 2023 season concerned fruit size and yield. In the one higher yielding and faster maturing block, fruit size and yield increases were registered for the two highest application rates only. In the second lower yielding and slower maturing block, both larger fruit and an increase in yield were recorded for all application rates. Considering the current results, two research approaches will be followed during the 2024 season. Early season sprays will firstly be applied to improve fruit size and yield. Secondly, sprays will again be applied nearer to the harvest date to cover the postharvest storage and ripening aspects. It is anticipated that the manufacturer will hereafter file for registration of the product in South Africa.

INTRODUCTION

Four trials were thus far performed with a 1-methylcyclopropene (1-MCP) tree spray preparation (Harvista; Agrofresh) during the 2021 (Kruger *et al.*, 2022) and the 2022 (Kruger *et al.*, 2023) seasons. The applications provided significant postharvest ripening inhibition effects in 'Hass' fruit, while a fruit size increase was also recorded during a late season trial performed in a high-altitude block.

During 2023, two 'Hass' trials were completed during the late season while an additional two trials were initiated during the 2024 pre-season in 'Hass' and 'Maluma' blocks. The present report deals with the results generated during the two late season trials.

MATERIAL AND METHODS

Two high altitude 'Hass' blocks in the Magoebaskloof valley were sprayed with Harvista during the third week of July 2023. The one block matured at a faster rate than the other and the two experimental sites are henceforth referred to as the 'faster maturing block' and the 'slower maturing block' (Fig. 1).

Both trials consisted of 5 application rates (0, 50, 100, 150, and 300 g ai/ha) that were replicated 5 times each. The replicates were laid out in a randomised block design pattern and each replicate consisted of 5 trees.

Both blocks were sprayed during the third week of July and fruit samples were collected after, respectively, 4, 7, 10, and 16 weeks. During the first three dates, 1 000 fruit were sampled per block. In each case, 200 fruit were sampled per treatment (40 fruit per replicate). Of these, 50 fruit per treatment (10 fruit per replicate) were directly ripened, while an-

other 75 fruit per treatment (15 per replicate) were stored for either 30 or 60 days at 5 °C. After storage, the avocados were ripened at 20 °C, after which a full set of quality evaluations was performed.

On the fourth sample date (16 weeks after spraying), the trees were stripped of all remaining fruit. After counting the number of fruit per replicate, each sample was split into two and stored for either 30 or 60 days before being ripened and evaluated. However, upon submission of this report we were still

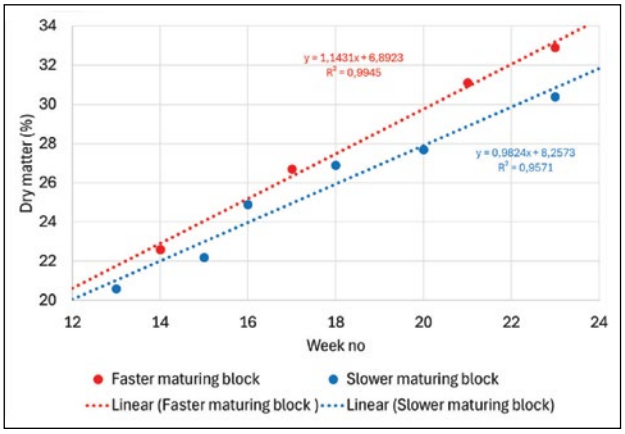

Figure 1: Dry matter content-based maturation rates of the faster and slower maturing blocks during the 2023 season.

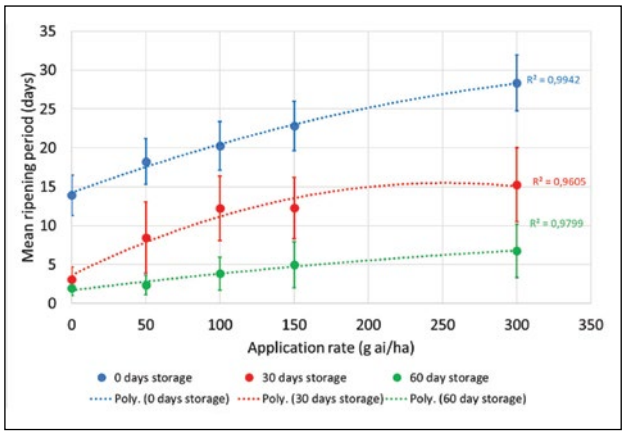

Figure 2: Mean ripening periods of 'Hass' fruit from the faster maturing block that were sampled four weeks after the spray treatment was applied. The fruit were stored for either 0, 30 or 60 days at 5 °C before being ripened at 20 °C. The vertical bars represent the standard deviation.

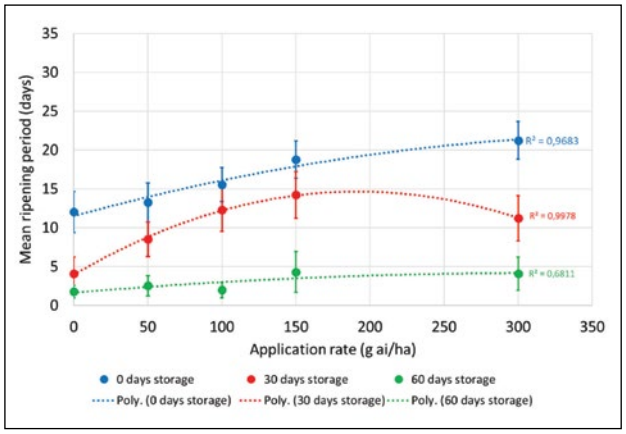

Figure 3: Mean ripening periods of 'Hass' fruit from the faster maturing block that were sampled seven weeks after the spray treatment was applied. The fruit were stored for either 0, 30 or 60 days at 5 °C before being ripened at 20 °C. The vertical bars represent the standard deviation.

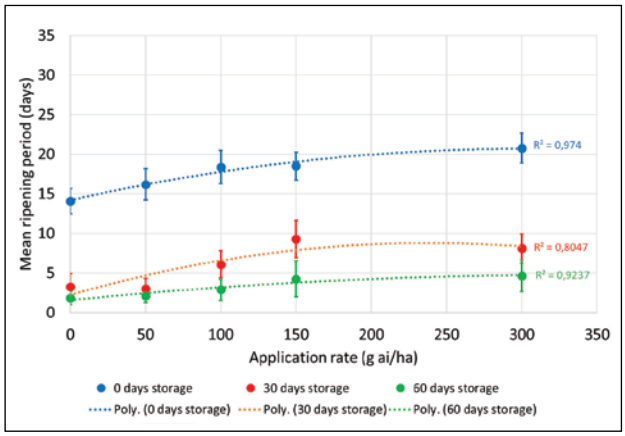

Figure 4: Mean ripening periods of 'Hass' fruit from the faster maturing block that were sampled ten weeks after the spray treatment was applied. The fruit were stored for either 0, 30 or 60 days at 5 °C before being ripened at 20 °C. The vertical bars represent the standard deviation.

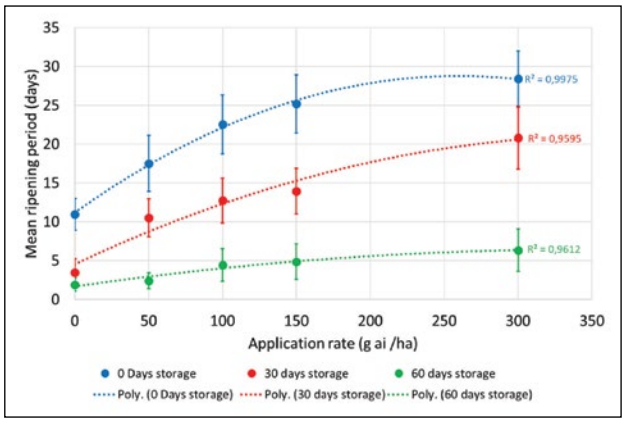

Figure 5: Mean ripening periods of 'Hass' fruit from the slower maturing block that were sampled four weeks after the spray treatment was applied. The fruit were stored for either 0, 30 or 60 days at 5 °C before being ripened at 20 °C. The vertical bars represent the standard deviation.

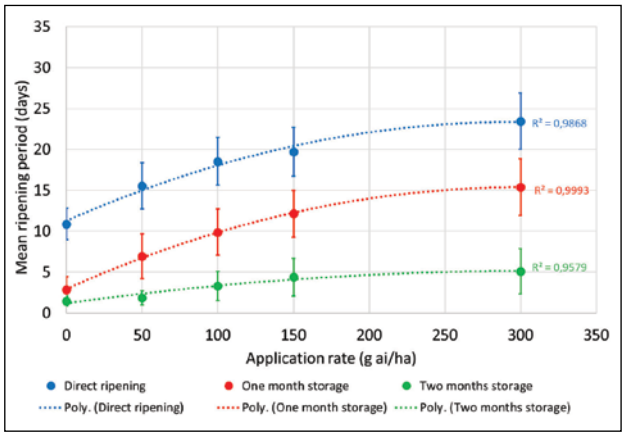

Figure 6: Mean ripening periods of 'Hass' fruit from the slower maturing block that were sampled seven weeks after the spray treatment was applied. The fruit were stored for either 0, 30 or 60 days at 5 °C before being ripened at 20 °C. The vertical bars represent the standard deviation.

processing the ripening and quality data from these large samples and only the most relevant fruit size and yield results are included in the present report.

RESULTS AND DISCUSSION

During the first two years of the study, we have presented the ripening results in extensive tables that displayed the daily percentage-based ripening profiles of the fruit which is of great importance to commercial ripeners. As these tables take up large swathes of printing space, we have summarised the current results in figures (tables will be used for registration purposes).

The ripening patterns of the faster maturing block, as recorded during the first three sampling dates, are shown in Figures 2-4, while those of the slower maturing block are shown in Figures 5-7. Overall, the ripening trends were similar to those reported during the previous two seasons:

- The mean ripening periods of all treatments moderately decreased as the sampling date advanced.
- The mean ripening periods of all treatments drastically decreased as the storage period became longer.
- The mean ripening periods correlated with the application rates in a curvilinear manner.
- In general, the Harvista treatments exhibited more ripening variation than the controls and the ripening variation usually increased as the application rate became higher.
- The ripening variation of the treated fruit decreased as the periods between spraying and sampling and the storage period increased.

The prevalences of the grey pulp physiological disorder as well as the stem-end rot and vascular browning pathological disorders are reported in Tables 1-18.

- The incidences of grey pulp in the faster maturing block are shown in Figures 1-3 while those for the slower maturing block are reported in Tables 4-6.
- As to be expected, the incidence of the disorder (grey pulp) increased as the fruit became more mature.
- This also applied to the storage period: the disorder (grey pulp) was absent in the directly ripened samples and it was considerably more prevalent in the samples that were stored for 60 days compared to those that were stored for 30 days.
- In general, the Harvista spray was quite effective at reducing the incidence of the disorder (grey pulp). In most instances, there was an inverse relationship between the incidence of the disorder

Table 1: Incidence of grey pulp in 'Hass' avocado fruit from the faster maturing block that were sampled four weeks after the spray treatment was applied. The fruit were stored for either 0, 30 or 60 days at 5 °C before being ripened at 20 °C. Mean incidences in the same column with similar lettering do not differ significantly (Chi square test, p > 0.05)

Application rate (g ai/ha)	Incidence of grey pulp per storage period (%)		
	0 days storage	30 days storage	60 days storage
0	0	5.3 a	6.7 a
50	0	0 b	5.3 a
100	0	1.3 ab	4 a
150	0	4 a	4 a
300	0	6.7 a	4 a

Table 2: Incidence of grey pulp in 'Hass' avocado fruit from the faster maturing block that were sampled seven weeks after the spray treatment was applied. The fruit were stored for either 0, 30 or 60 days at 5 °C before being ripened at 20 °C. Mean incidences in the same column with similar lettering do not differ significantly (Chi square test, p > 0.05)

Application rate (g ai/ha)	Incidence of grey pulp per storage period (%)		
	0 days storage	30 days storage	60 days storage
0	0	30.7 a	38.7 a
50	0	34.7 a	36 a
100	0	25.3 b	26.7 b
150	0	26.7 b	30.7 ab
300	0	24 b	26.7 b

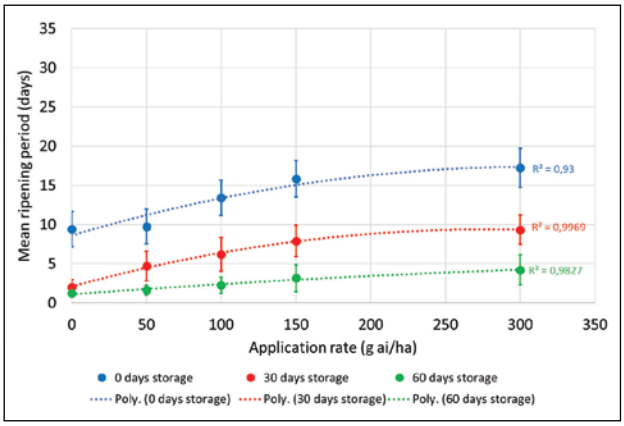

Figure 7: Mean ripening periods of 'Hass' fruit from the slower maturing block that were sampled ten weeks after the spray treatment was applied. The fruit were stored for either 0, 30 or 60 days at 5 °C before being ripened at 20 °C. The vertical bars represent the standard deviation.

Table 3: Incidence of grey pulp in 'Hass' avocado fruit from the faster maturing block that were sampled ten weeks after the spray treatment was applied. The fruit were stored for either 0, 30 or 60 days at 5 °C before being ripened at 20 °C. Mean incidences in the same column with similar lettering do not differ significantly (Chi square test, p > 0.05)

Application rate (g ai/ha)	Incidence of grey pulp per storage period (%)		
	0 days storage	30 days storage	60 days storage
0	0	41.3 a	98.7 a
50	0	38.7 a	73.3 b
100	0	18.7 b	44 c
150	0	18.7 b	29.3 d
300	0	17.3 b	37.3 d

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and the application rate, the higher application rates being more effective at inhibiting the development of the grey pulp symptom.
- In terms of the two pathological disorders, a similar trend to the above existed regarding the relationships between the incidences of the disorders on the one hand and the storage periods and application rates on the other. This applied to the primary stem-end rot infection for the faster maturing block (Tables 7-9) as well as for the slower maturing block (Tables 10-12). It also applied to the secondary vascular browning symptom in the faster maturing block (Tables 13-15) as well as for the slower maturing block (Tables 16-18).

The following observations were made pertaining to fruit size:
- In both the faster maturing block (Fig. 8) as well

Table 4: Incidence of grey pulp in 'Hass' avocado fruit from the slower maturing block that were sampled four weeks after the spray treatment was applied. The fruit were stored for either 0, 30 or 60 days at 5 °C before being ripened at 20 °C. Mean incidences in the same column with similar lettering do not differ significantly (Chi square test, p > 0.05)

Application rate (g ai/ha)	Incidence of grey pulp per storage period (%)		
	0 days storage	30 days storage	60 days storage
0	0	14.7 a	10.7 a
50	0	12 a	12 a
100	0	8 a	10.7 a
150	0	2.7 b	6.7 a
300	0	6.7 a	6.7 a

Table 5: Incidence of grey pulp in 'Hass' avocado fruit from the slower maturing block that were sampled seven weeks after the spray treatment was applied. The fruit were stored for either 0, 30 or 60 days at 5 °C before being ripened at 20 °C. Mean incidences in the same column with similar lettering do not differ significantly (Chi square test, p > 0.05)

Application rate (g ai/ha)	Incidence of grey pulp per storage period (%)		
	0 days storage	30 days storage	60 days storage
0	0	21.3 a	16 a
50	0	16 a	18.7 a
100	0	13.3 a	10.7 b
150	0	0 b	12 ab
300	0	0 b	10.7 b

Table 6: Incidence of grey pulp in 'Hass' avocado fruit from the slower maturing block that were sampled ten weeks after the spray treatment was applied. The fruit were stored for either 0, 30 or 60 days at 5 °C before being ripened at 20 °C. Mean incidences in the same column with similar lettering do not differ significantly (Chi square test, p > 0.05)

Application rate (g ai/ha)	Incidence of grey pulp per storage period (%)		
	0 days storage	30 days storage	60 days storage
0	0	33.3 a	96 a
50	0	30.7 a	74.7 b
100	0	18.7 b	41.3 c
150	0	10.7 c	29.3 d
300	0	8 c	18.7 e

Table 7: Incidence of stem-end rot in 'Hass' avocado fruit from the faster maturing block that were sampled four weeks after the spray treatment was applied. The fruit were stored for either 0, 30 or 60 days at 5 °C before being ripened at 20 °C. Mean incidences in the same column with similar lettering do not differ significantly (Chi square test, p > 0.05)

Application rate (g ai/ha)	Incidence of stem-end rot per storage period (%)		
	0 days storage	30 days storage	60 days storage
0	0	17.3 a	41.3 a
50	0	10.7 ab	29.3 b
100	0	10.7 ab	18.7 c
150	0	13.3 ab	17.3 cd
300	0	9.3 b	10.6 d

Table 8: Incidence of stem-end rot in 'Hass' avocado fruit from the faster maturing block that were sampled seven weeks after the spray treatment was applied. The fruit were stored for either 0, 30 or 60 days at 5 °C before being ripened at 20 °C. Mean incidences in the same column with similar lettering do not differ significantly (Chi square test, p > 0.05)

Application rate (g ai/ha)	Incidence of stem-end rot per storage period (%)		
	0 days storage	30 days storage	60 days storage
0	0	13.3 a	44 ab
50	0	6.7 b	33.3 b
100	0	5.3 b	50.7 a
150	0	2.7 b	30.7 b
300	0	2.7 b	18.7 c

Table 9: Incidence of stem-end rot in 'Hass' avocado fruit from the faster maturing block that were sampled ten weeks after the spray treatment was applied. The fruit were stored for either 0, 30 or 60 days at 5 °C before being ripened at 20 °C. Mean incidences in the same column with similar lettering do not differ significantly (Chi square test, p > 0.05)

Application rate (g ai/ha)	Incidence of stem-end rot per storage period (%)		
	0 days storage	30 days storage	60 days storage
0	0	25.3 a	97 a
50	0	29.3 a	96 a
100	0	5.3 c	56 b
150	0	4 c	30.7 c
300	0	17.3 b	20 d

as the slower maturing block (Fig. 9), the Harvista spray resulted in larger fruit.
- The mass increase was application rate dependent.
- However, there was an important difference between the two blocks:
  - In the faster maturing block, there was a size increase between the four-week and seven-week samples after which the fruit ceased to increase in size;
  - In the slower maturing block, the fruit sizes of the samples continued to increase over the 16-week sampling period.
- The individual fruit mass to application rate relationship of the 16-week sample (when the trees were stripped of all fruit) are shown in Figures 10 to 13:
  - The fruit from the slower maturing block were larger than those of the faster maturing block;

Table 10: Incidence of stem-end rot in 'Hass' avocado fruit from the slower maturing block that were sampled four weeks after the spray treatment was applied. The fruit were stored for either 0, 30 or 60 days at 5 °C before being ripened at 20 °C. Mean incidences in the same column with similar lettering do not differ significantly (Chi square test, p > 0.05)

Application rate (g ai/ha)	Incidence of stem-end rot per storage period (%)		
	0 days storage	30 days storage	60 days storage
0	0	17.3 a	25.3 a
50	0	16 a	21.3 a
100	0	13.3 a	14.7 b
150	0	14.7 a	12 b
300	0	13.3 a	10.7 b

Table 11: Incidence of stem-end rot in 'Hass' avocado fruit from the slower maturing block that were sampled seven weeks after the spray treatment was applied. The fruit were stored for either 0, 30 or 60 days at 5 °C before being ripened at 20 °C. Mean incidences in the same column with similar lettering do not differ significantly (Chi square test, p > 0.05)

Application rate (g ai/ha)	Incidence of stem-end rot per storage period (%)		
	0 days storage	30 days storage	60 days storage
0	0	22.7 a	84 a
50	0	18.7 a	33.3 b
100	0	9.3 b	16 c
150	0	13.3 ab	13.3 c
300	0	9.3 b	10.7 c

Table 12: Incidence of stem-end rot in 'Hass' avocado fruit from the slower maturing block that were sampled ten weeks after the spray treatment was applied. The fruit were stored for either 0, 30 or 60 days at 5 °C before being ripened at 20 °C. Mean incidences in the same column with similar lettering do not differ significantly (Chi square test, p > 0.05)

Application rate (g ai/ha)	Incidence of stem-end rot per storage period (%)		
	0 days storage	30 days storage	60 days storage
0	0	50.7 a	97.3 a
50	0	12 b	86.7 a
100	0	1.3 c	61.3 b
150	0	0 c	45.3 c
300	0	0 c	32 d

Table 13: Incidence of vascular browning in 'Hass' avocado fruit from the faster maturing block that were sampled four weeks after the spray treatment was applied. The fruit were stored for either 0, 30 or 60 days at 5 °C before being ripened at 20 °C. Mean incidences in the same column with similar lettering do not differ significantly (Chi square test, p > 0.05)

Application rate (g ai/ha)	Incidence of vascular browning per storage period (%)		
	0 days storage	30 days storage	60 days storage
0	0	14.7 a	37.3 a
50	0	10.7 a	22.7 b
100	0	8 ab	16 bc
150	0	12 a	13.3 bc
300	0	5.3 b	8 c

Table 14: Incidence of vascular browning in 'Hass' avocado fruit from the faster maturing block that were sampled seven weeks after the spray treatment was applied. The fruit were stored for either 0, 30 or 60 days at 5 °C before being ripened at 20 °C. Mean incidences in the same column with similar lettering do not differ significantly (Chi square test, p > 0.05)

Application rate (g ai/ha)	Incidence of vascular browning per storage period (%)		
	0 days storage	30 days storage	60 days storage
0	0	14.7 a	50.7 ab
50	0	6.7 b	41.3 b
100	0	5.3 bc	56 a
150	0	0 d	32 b
300	0	2.7 cd	18.7 c

Table 15: Incidence of vascular browning in 'Hass' avocado fruit from the faster maturing block that were sampled ten weeks after the spray treatment was applied. The fruit were stored for either 0, 30 or 60 days at 5 °C before being ripened at 20 °C. Mean incidences in the same column with similar lettering do not differ significantly (Chi square test, p > 0.05)

Application rate (g ai/ha)	Incidence of vascular browning per storage period (%)		
	0 days storage	30 days storage	60 days storage
0	0	25.3 a	97.3 a
50	0	28 a	96 a
100	0	5.3 b	56 b
150	0	1.3 c	30.7 c
300	0	2.7 c	17.3 d

- The relationship between the mass and application rate was also more favourable in the slower maturing block;
- The above tendencies further manifested in the fruit size count profiles of the two blocks (Figs. 12-13). The slower maturing block produced larger fruit and clear application rate-dependent trends were discernible.

• Interesting trends became evident when plotting the number of fruit per replicate with the mass-based yields:
- In the higher yielding, faster maturing block, only the two highest application rates diverged from the control (Fig. 14).
- In contrast, clear application rate dependent relationships were recorded for fruit number versus yield between the replicates in the lower yielding, slower maturing block:
  - The yields of all the treatments improved as the number of fruit per replicate increased. Most importantly, a dose dependent relationship was observed (Fig. 15);
  - A curvilinear relationship existed between the application rate and the mean number of fruit per replicate (Fig. 16);
  - A curvilinear relationship also existed between the application rate and the yield (Fig. 17);
  - In both the above cases, the 100, 150 and 300 g ai/ha treatments differed significantly from the control.

Table 16: Incidence of vascular browning in 'Hass' avocado fruit from the slower maturing block that were sampled four weeks after the spray treatment was applied. The fruit were stored for either 0, 30 or 60 days at 5 °C before being ripened at 20 °C. Mean incidences in the same column with similar lettering do not differ significantly (Chi square test, p > 0.05)

Application rate (g ai/ha)	Incidence of vascular browning per storage period (%)		
	0 days storage	30 days storage	60 days storage
0	0	17.3 a	21.3 a
50	0	17.3 a	21.3 a
100	0	10.7 b	13.3 b
150	0	9.3 b	12 b
300	0	2.7 c	9.3 b

Table 17: Incidence of vascular browning in 'Hass' avocado fruit from the slower maturing block that were sampled seven weeks after the spray treatment was applied. The fruit were stored for either 0, 30 or 60 days at 5 °C before being ripened at 20 °C. Mean incidences in the same column with similar lettering do not differ significantly (Chi square test, p > 0.05)

Application rate (g ai/ha)	Incidence of vascular browning per storage period (%)		
	0 days storage	30 days storage	60 days storage
0	0	21.3 a	48 a
50	0	16 a	30.7 a
100	0	9.3 b	14.7 a
150	0	10.7 b	12 b
300	0	9.3 b	9.3 b

Table 18: Incidence of vascular browning in 'Hass' avocado fruit from the slower maturing block that were sampled ten weeks after the spray treatment was applied. The fruit were stored for either 0, 30 or 60 days at 5 °C before being ripened at 20 °C. Mean incidences in the same column with similar lettering do not differ significantly (Chi square test, p > 0.05)

Application rate (g ai/ha)	Incidence of vascular browning per storage period (%)		
	0 days storage	30 days storage	60 days storage
0	0	46.7 a	98.7 a
50	0	9.3 b	86.7 a
100	0	1.3 c	62.7 b
150	0	0 c	46.7 c
300	0	0 c	33.3 d

The present set of trials is being performed for registration purposes and it is not our intention to provide in depth phenological or physiological explanations for the observed trends. However, based on our two-

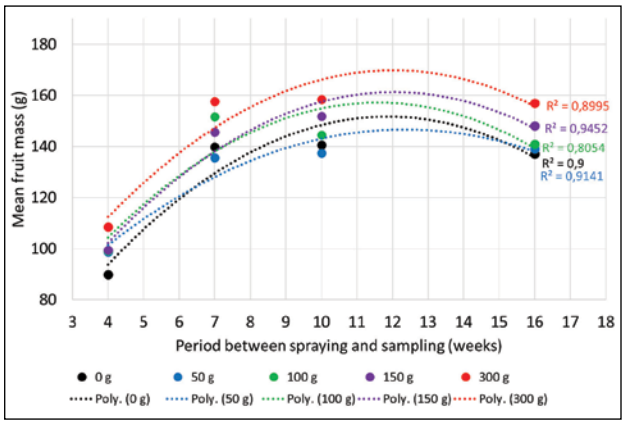

Figure 8: Mean fruit mass versus the application rate (g ai/ha) and period between spraying and sampling for the faster maturing block.

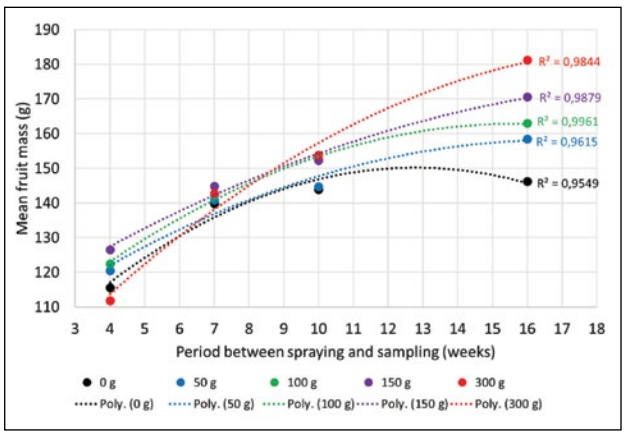

Figure 9: Mean fruit mass versus the application rate (g ai/ha) and period between spraying and sampling for the slower maturing block.

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and-a-half-decade commercial experience with Agrofresh's postharvest SmartFresh 1-MCP applications, we will provide concise explanations for the different observations made during the present study:

- The ripening inhibition effects are similar to those registered during the two previous seasons. They are also in the same ranges than those obtained with SmartFresh (with regard to the latter, an additional manipulatable variable, the period from spraying to harvest, exists for Harvista).
- The lower incidences of grey pulp recorded for the Harvista treatments were comparable to those recorded for commercial SmartFresh treatments

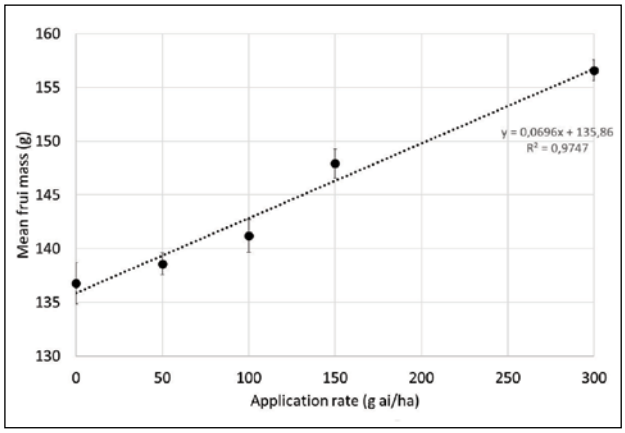

Figure 10: Mean fruit mass versus application rate for the faster maturing block when the trees were stripped 16 weeks after the sprays were applied. The vertical bars represent the standard error (95% confidence interval).

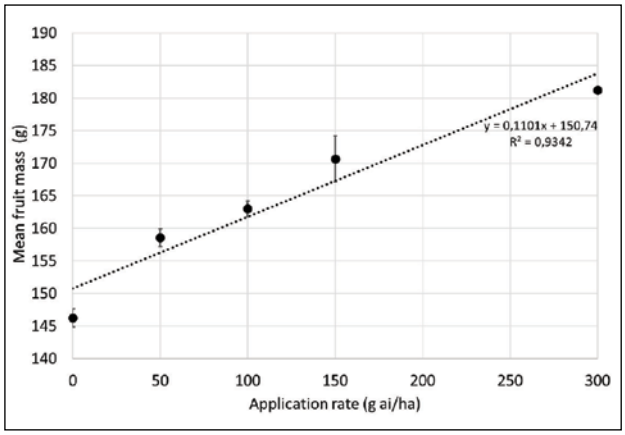

Figure 11: Mean fruit mass versus application rate for the slower maturing block when the trees were stripped 16 weeks after the sprays were applied. The vertical bars represent the standard error (95% confidence interval).

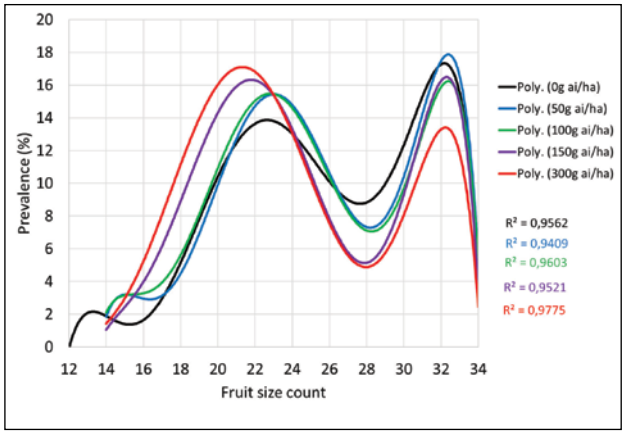

Figure 12: Fruit size count profiles of the faster maturing block. Size 32 represents the category that is commercially marketed as 'Size small' while Size 34 represents the 'Extra small' category.

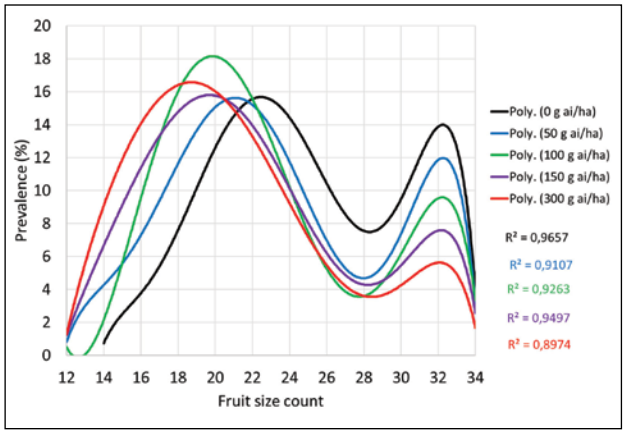

Figure 13: Fruit size count profiles of the slower maturing block. Size 32 represents the category that is commercially marketed as 'Size small' while Size 34 represents the 'Extra small' category.

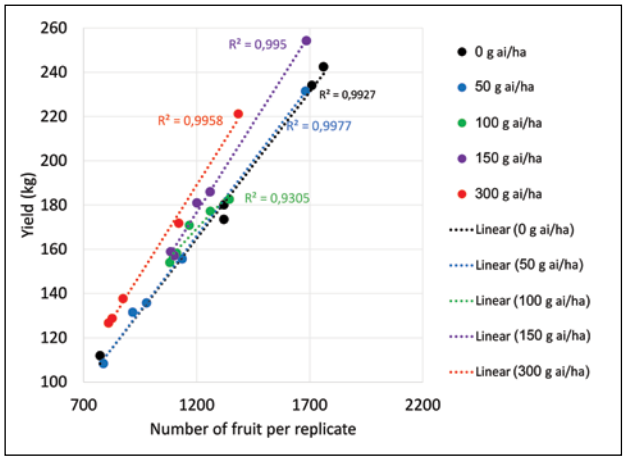

Figure 14: Mean yield per treatment per replicate versus fruit number per treatment per replicate for the faster maturing block 16 weeks after spraying when the trees were stripped of all fruit.

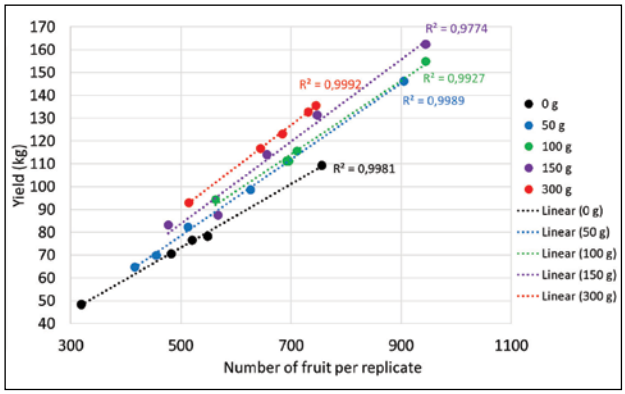

Figure 15: Mean yield per treatment per replicate versus fruit number per treatment per replicate for the slower maturing block 16 weeks after spraying when the trees were stripped of all fruit.

that were administered under the presently registered postharvest application rates.

- The reduction in stem-end rot and vascular browning pathology that occurred after simulated commercial ripening, is attributable to a lower rate of softening that took place during the simulated shipping phase (the fruit were stored under regular atmosphere during the present trials, but are exported under controlled atmosphere conditions which also inhibit untimely ripening).
- The reason why the fruit size increase only manifested in increased yields in the slower maturing block was because the spray treatments were applied too late in the faster maturing block (in terms of the interpretation of the results in the slower maturing block, we are of the opinion that Figure 15 provides a more realistic assessment than Figures 16 and 17 do).

We have since applied Harvista to early lower lying 'Hass' and 'Maluma' blocks in the Mooketsi area and will again spray higher lying trees at an earlier date during 2024 so as to increase Harvista's effect during the (seed maturation related) fruit growth period. At the conclusion of these trials, we will decide on the most appropriate timing and application rates for both the postharvest quality and the pre-harvest growth aspects.

Acknowledgements

The authors would like to sincerely thank ZZ2 for their major contribution towards the spray applications and the experimental fruit. We are also indebted to SAAGA for funding and Mark Penter for editing the report.

REFERENCES

KRUGER, F.J., VOLCHENK, G.O. & VOLSCHENK, E. 2022. First trials aimed at establishing the commercial potential of a 1-methylcyclopropene tree spray formulation (Harvista; Agrofresh) on avocado fruit. *SAAGA Yearb.* 45: 16-23.

KRUGER, F.J., VOLCHENK, G.O. & VOLSCHENK, E. 2023. Results from two trials performed with a 1-methylcyclopropene tree spray application during the 2022 season. *SAAGA Yearb.* 46: 16-40.

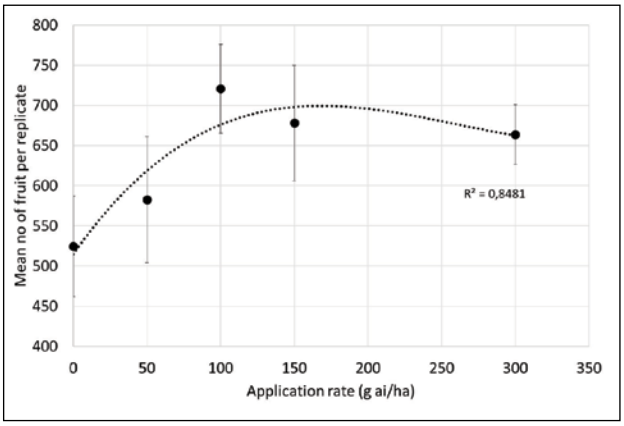

Figure 16: Mean number of fruit per replicate versus the application rate for the slower maturing block 16 weeks after spraying when the trees were stripped of all fruit. The vertical bars represent the standard error (95% confidence interval).

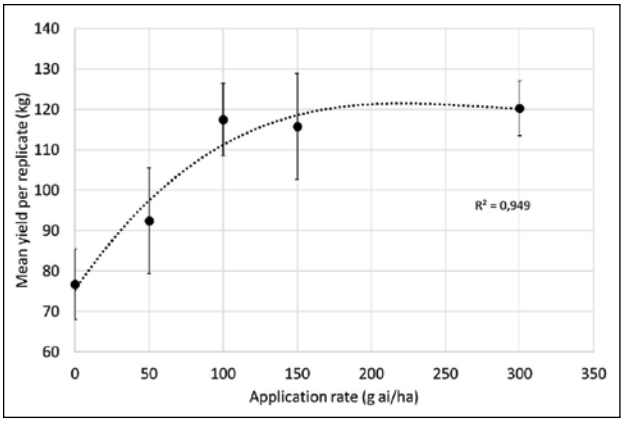

Figure 17: Mean yield per replicate versus the application rate for the slower maturing block 16 weeks after spraying when the trees were stripped of all fruit. The vertical bars represent the standard error (95% confidence interval).