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Mr. O. Robertson
Te Puna

23rd May 2024

Dear Owen

TECHO's Backyard Limited Fertilizer Recommendation for 2024 - 2025 Avocado Season

➤ **Season Overview**

The 2023/2024 was a culmination of many aspects over a long period leading to a poor crop volume with very sensitive, poor quality fruit for the NZ avocado industry as a whole. There was very little that was in our control to manipulate this result, however it has afforded us perspective on how the trees and fruit will react in such a situation. By knowing this we can identify and flag these specific aspects and react accordingly if we encounter them in future seasons.

Looking forward to the 2024/2025 season, the prospects seem markedly up with a strong fruit set with tree condition looking favourable considering the heavy crop load on certain orchards. We have had a favourable Spring, Summer, Autumn period with good sunshine hours with timeous rain in between to ensure fruit could size up and nutrients were plant-available to afford a good vegetative flush to support the crop load. With a good vegetative flush that has come though, it does lend the possibility of a good repeat flower and potential fruit set. We need to be mindful of this as this current fertilizer recommendation is there to support the tree condition in accordance with this possible fruit set potential. Whilst we have a better period of relatively drier weather, the pressure from Phytophthora Root Rot will still be present and tree decline from a compromised root system is not always immediate.

The goal is to influence the trees bearing potential, tree condition, and fruit quality by manipulating the inputs on orchard and general orchard management practices.

➤ **Soil pH, Magnesium and Calcium**

The pH levels within the soil have remained relatively stable and within the ideal range of pH (H₂O) is 5.8 - 6.5. Due to this there is no need for any application of lime.

The calcium levels within the soil are still at the upper end of the norm and continue to create an imbalance within the soil cation ratio. Not wanting to aggravate this further there would be no need for any gypsum application.

We do, however, want to maintain uptake of Ca into the tree with readily available Ca. I have recommended a split application of calcium nitrate to help boost the immediate need of Ca within the tree at critical periods. Calcium nitrate is a good, readily available form of calcium to help with fruit development and improve the eventual post-harvest quality. The first application should be applied at early fruit set, with the subsequent application applied one month later. Please be very astute to the timing!

The magnesium levels within soil have shown a decline for 2 seasons in a row despite an application of magnesium sulphate last year. There has not been a significant boost in the leaf levels but this could be due to an upset cation ration with higher Ca and K. We hope to afford better balance over time. I have recommended a single application of magnesium sulphate to help boost the levels and improve the soil balance.

➤ **Nitrogen**

The leaf N levels appear to be behaving themselves and have dropped slightly. This is a good sign and as long as there is not excessive soil moisture, the vegetative response from the tree can be manipulated. Our primary focus now needs to be keeping this balanced throughout the orchard with the aim of a leaf N level of 2.4. For this coming season it has been advised that slight boost of N is done based off of a theoretical crop load. The amounts will be adjusted when the crop estimate is revised following fruit set.

➤ **Phosphorous**

The phosphorous levels within the soil are high and the leaf levels are at the upper end of the norm. I do not see any need for any P to be applied. Any further application could be detrimental to the hanging potential of the fruit and overall fruit quality.

➤ **Potassium**

The K levels within the soil are at a good level and show a good portion in the cation ratio. The leaf levels of K have remained steady and are at the top end of the ideal range. I do not want to push the levels too high as it can create issues around Ca and Mg uptake, so the recommendation reflects a slight cut back for the tree to make use of the reserves it has. The main source of K will be in the form of potassium sulphate.

➤ **Zinc & Boron**

The Boron levels within the leaf are steady. We will be aiming for a slight boost in applications this season to push the levels slightly higher. Boron plays a critical role in flower and pollen development, and leaf levels fluctuate easily. Please note the timing.

The Zn levels within the leaves are steady but have not seen the increase we would have hoped to see. I have recommended that you continue with heavy application of Zn in the form of zinc sulphate. It must be noted that newly applied Ca and P can bind Zn within the soil to make it unavailable to the tree. Zn should be applied at least 2 months after or prior to any Ca and P applications. Please apply the Zn in mounds/dollops (x3 equidistant around the tree) or banding evenly around the tree within the micro wetted area and under the mulch if possible. If you spread the Zn it becomes bound and unavailable to the roots.

You may include a chelated Zn in your foliar sprays.

➤ **Extra notes**

NB: Please note that if at any stage within the season that the estimated "Target Harvest 2025" figure is likely to change or needs to be adjusted (increased or decrease) it is essential to let me know ASAP. That figure places a significant role within the recommendation process.

I have attached the Mulders Chart as reference for the specific antagonistic effects that specific elements have upon one another. This will help highlight the importance of correct application timing of each element to have optimum uptake.

I would recommend that a chelate Zn foliar spray during the flower period to help with the low Zn levels. You may also include a foliar B at the same time.

If you have any questions or concerns, please contact me. This recommendation is not 'set in stone' and is up for discussion.

If you have any products which you may want to use in place of the recommended products, I can make adjustments to the recommendation where need be.

Kind Regards,

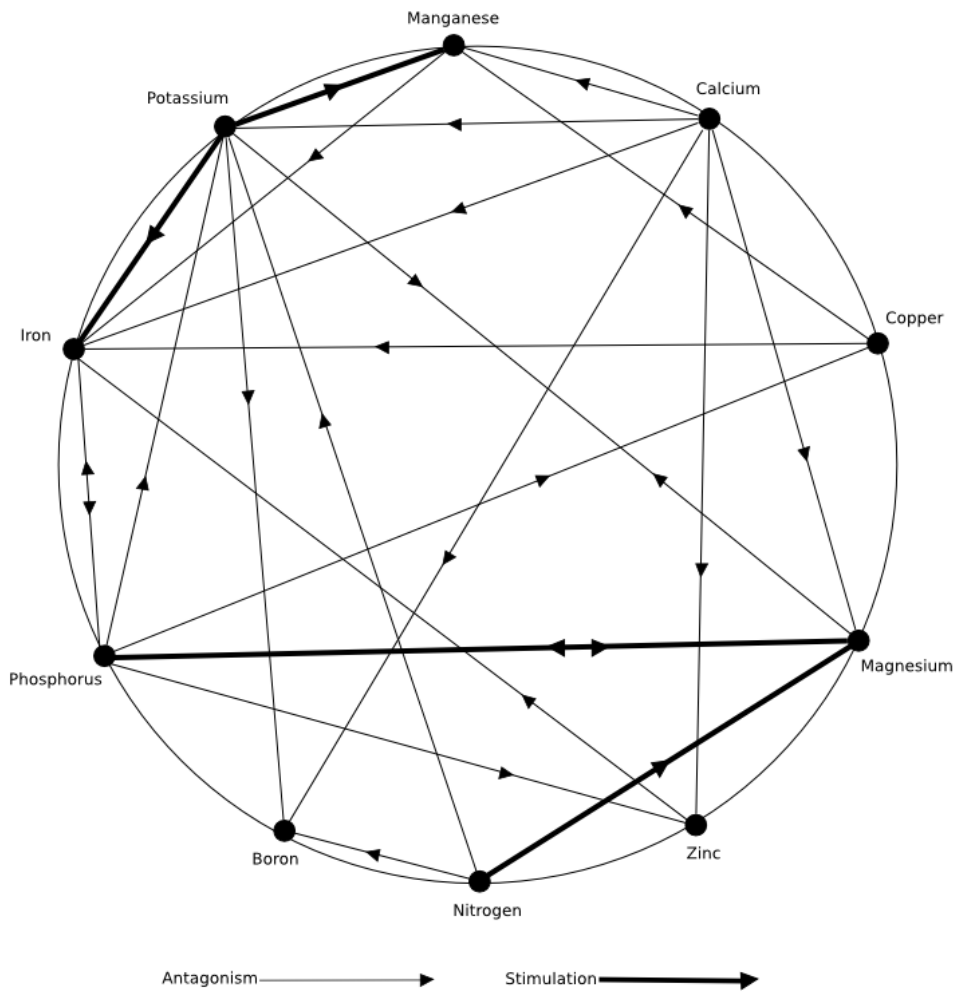


Richard Kok
Technical Manager
Avoco

Disclaimer

This recommendation has been compiled with information presently available and in good faith, but with the express condition that AVOCO and consultant accepts no responsibility for any loss or damage resulting directly or indirectly from the use thereof.

MULDER'S CHART



Leaf and Soil Analysis

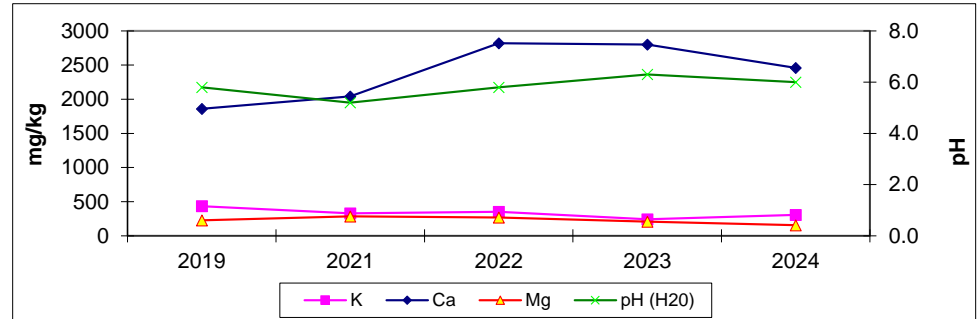
Farm Owen Robertson Block H1 Cultivar Hass Plant Date 2005 Spacing 10x10 No Trees 260

Soil Analysis

		mg / kg											
Norms	5.8-6.5	11-29	200-400	1000-3000	100-400	0-90	10-50				0-10		
Year	pH (H ₂ O)	P (Olsen)	K	Ca	Mg	Na	Zn	Mn	Fe	B	Al	N	% Clay
2019	5.8	137	434	1860	226	14	14	31	76	4	1539		
2021	5.2	176	328	2040	285	18	16	29	90	17	1564		
2022	5.8	80	352	2820	267	23	17	23	70	4	1540		
2023	6.3	59	242	2800	209	14	14	18	62	6	1496		
2024	6.0	54	305	2460	156	18	301	11	44	4	1480		

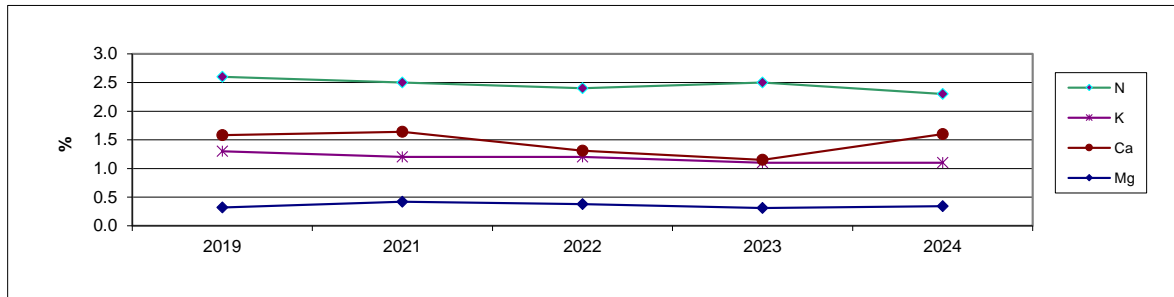
Cation Ratio (cmol/L) expressed as a percentage

	Ideal	4-8	60-75	15-20	0-2
Year	S	K	Ca	Mg	Na
2019	12.32	9.01	75.49	15.02	0.49
2021	13.46	6.24	75.78	17.38	0.59
2022	17.29	5.21	81.55	12.67	0.58
2023	16.39	3.78	85.42	10.43	0.37
2024	14.44	5.40	85.18	8.86	0.55



Leaf Analysis

		%				mg/kg							
Norms	2.4-2.6	0.08-0.15	0.75-1.15	1.2-2.0	0.4-0.8	0.2-0.6	25-100	50-250	50-150	30-70	<0,25	10	
Year	N	P	K	Ca	Mg	S	Zn	Mn	Fe	B	Cl	Cu	
2019	2.6	0.17	1.3	1.58	0.32	0.28	35	134	42	30	0.13	106	
2021	2.5	0.16	1.2	1.64	0.42	0.27	31	169	67	39	0.12	46	
2022	2.4	0.18	1.2	1.31	0.38	0.23	27	116	49	35	0.09	29	
2023	2.5	0.16	1.1	1.15	0.31	0.24	30	102	49	39	0.07	45	
2024	2.3	0.14	1.1	1.60	0.34	0.23	27	87	42	39	0.10	36	



Comments:

Soil pH good
 Leaf N good
 Leaf Ca good
 Leaf Zn and B need a boost

Richard Kok





Nutrient removal factors for a high potential soil (>24% Clay), giving an indication of fertilizer rates to maintain tree health

Kg / hectare	
N	81
P	14.4
K	117

Owen Robertson
19 Snodgrass Road
Te Puna

Fertilizer Recommendation
2024/2025
May (Rev 1)

Hass

Block	H1
Spacing	10x10
Trees/ha	100
Total number of trees	260
Harvest 2019	6.9
Harvest 2020	20.5
Harvest 2021	17.1
Harvest 2022	17
Harvest 2023	8.1
Estimate Harvest 2024	23
Target Harvest 2025	18

Product	Month	g/tree
Calcitic Lime	ASAP (July)	0
Calcium Nitrate (15.5% N 19.5% Ca)	Early fruit set (Oct)	600
	One month later (Nov)	600
Magnesium sulphate (16% Mg)	August	1000
CAN (26% N)	January	600
	February	800
	March	600
	April	600
Potassium sulphate (38% K)	October	1000
	December	800
	February	800
Boronate (15% B) HAND APPLY (SPREAD)	August	300
	December	300
Zinc sulphate (22% Zn) HAND APPLY (IN MOUNDS)	February	1000

Actual advised amounts of each element:

N Total Kg hectare	86
P Total Kg Hectare	0
K Total Kg Hectare	99

Note:

Advised amounts for N and K should be revised in December/January according to crop load, fruit drop and tree condition.

Richard Kok

DISCLAIMER

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