

SFF&F Project 19025 – Meeting the increasing demand for New Zealand Extra Virgin Olive Oil

Milestone MS01 Focus Grove and Field Days Report

November 2019

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Introduction

The purpose of the Sustainable Food and Fibres Futures project is:

To increase the production of established olive groves to meet the increasing demand for New Zealand Extra Virgin Olive Oil. The target is an additional 5kg (20%) per tree.

A second objective is to develop an alternate/more organic approach to improving grove production.

The project uses five focus groves in each main growing region that have demonstrated a commitment to best practice principles. These groves have already implemented the recommendations of the previous Sustainable Farming Fund Project and have demonstrated their success. They will now implement and trial new approaches, measure outcomes and host field days to share their experiences with other growers.

The project also includes a number of groves who wish to trial a more organic approach to improving tree health and benefit from increased crop loads. These groves will also implement and trial recommended new approaches, measure outcomes and host field days to share their experiences with other growers.

The methods use expert tree crops horticultural advice focusing in four key aspects of grove management.

1. Introducing practical, affordable tree pruning regimes that improve light distribution for stimulating flowering and fruit growth, aiding effective spray coverage and inducing adequate annual shoot growth to provide the required bud sites for new flower production – on an annual basis.
2. Introducing an appropriate nutritional programme that will ensure there are sufficient nutrients for plant growth which will impact on yield.
3. Improving tree health by disease control using affordable protectant spray programmes to manage foliage diseases that defoliate olive trees, a primary cause of low productivity in NZ groves.
4. Developing an alternate/more organic programme methodologies that will address nutritional deficiencies and improve tree health to manage foliage diseases as above.

This report outlines the current baseline of all of the Focus Groves and is based on the Focus Grove visits and Field Days held in October/November 2019, carried out by the specialist consultant engaged as part of the project; Dr Stuart Tustin from Plant and Food Research. All groves had soil tests carried out prior to the visits and received recommendations on nutritional requirements.

This report is based on the comments from the Focus Grove visits by the project consultant and Focus Grove owners coupled with discussion at the Field Days with attendees.

Foreword - Organic Recommendations

Recommendations have been developed for groves wishing to adopt a more organic approach based on processes used in organic apple orchards. Groves wishing to become registered as organic need to contact a recognised association immediately as this will be a tree year process. The most widely recognised organic association is Bio-Gro.

Spraying for Disease Control

After research and consultation, Stuart Tustin has recommended following the organic apple orchard approach for disease control with the same application rate as Manzate. The products recommended are Kocide and Kumulus, which are the most cost effective options available and will give some persistency. Kocide contains Copper and Kumulus contains Sulphur. Per 1,000 litres/ha the recommendation is 320g Kocide and 1.8kg Kumulus.

The spray should be applied every 20 days or after 20mm¹ rain. However the maximum Copper application permitted by most organic registration bodies is 3kg per ha per annum. That means no more than 9 sprays annually which poses a challenge to controlling disease. From mid-summer to late summer, when it can be anticipated to be dry (no rain), it is possible to deviate from the spray regime. Under these conditions it is possible to omit the Copper and run out to 40 days between sprays. Spraying could be left for up to two months maximum if there was no rain but this is not particularly recommended.

People wishing to become registered as organic should check the above advice is acceptable by the registration body they are working with.

There are no organic alternatives to Protek which would normally be recommended to address Anthracnose at flowering.

Grass and Weed Management

There are no approved alternatives to glyphosate herbicides, such as Roundup. Stuart Tustin recommends using lambs if possible to keep the grove tidy. They need to be monitored and moved out as soon as they have eaten the grass down or they may start eating the bark and damage the trees. Lambs are recommended rather than sheep which can reach higher and chew off new growth. The lambs will also eat off the water shoots saving a tiresome job.

It is possible growers could buy a moving arm mowing attachment to mow between the trees but this could not be used if there were irrigation lines on the ground.

Another option for minimizing weeds around trees is to re-sow the typical strip between and around with a rye/clover mix.

There is a section in the Olives NZ Best Practice Management e-manual on Grove Floor Management. Copy and paste the following link into your web browser.

[http://Member:!ONZ!2012!@olivesnz-emanual.org.nz/SITE_Default/SITE_members/SITE_BMP_IOP/Grove_Floor/Soil surface/Maintenance.html](http://Member:!ONZ!2012!@olivesnz-emanual.org.nz/SITE_Default/SITE_members/SITE_BMP_IOP/Grove_Floor/Soil_surface/Maintenance.html)

¹ The 20/20 recommendation for this regime and Manzate is because of product efficacy.

Focus Groves Status

Northland

The Focus Grove visits and Field Days were held on Tuesday 27th October as follows.

Olives on the Hill, Mangawhai

There were 16 attendees from Auckland, Northland and Waiheke Island who were welcomed to Olives on the Hill by owners Chris and Linda Smith. Olives on the Hill has approximately 1300 trees and was established in 2002.

Thank you to Chris and Linda for arranging morning tea for attendees.

This grove is one of the original Focus Groves and has benefited from continuous improvement to overall grove health and increased grove production.

Olives on the Hill focus grove block produces more than double the harvest tonnage of the regional average.

The soil tests showed that the grove is especially low on Potassium which affects flowering. Recommendation is Potassium Sulphate and Lime asap. Boron is low, which is required for fruit set - foliar application is recommended, as this will have rapid uptake by the tree, and can be added to Protek or to Manzate before flowering. As flowering is underway it can also be done now at Olives on the Hill and will help with fruit set. Solubor is the recommended product as it is cheap and effective. It was recommended to get advice on rates /dilution rate in the spray mix from the supplier because trace element are very hazardous if they are over supplied to the plant – toxic reactions.

Also noted that PH is at 5.9 where 6- 6.5 ideal. Solubility is affected by low pH so needs to be addressed.

An attendee raised that there was an issue with cost of contractor fertilizer application although fertilizer is not particularly expensive. Julie Mays from Oliven am Meer suggested smaller groves can apply lime prills/balls by hand, which works well for them. Stuart said you can also mix other fertilizer in with this if required. He suggested that it may be possible to pick up a small fertiliser applicator for a tractor, as these were often available second hand.

Despite the Frantoio block still being a work in progress, the point was reiterated that the 2019 harvest is twice the regional average. Plus there is potential to increase harvest further.

Trees looking very healthy with only a little disease, Peacock Spot and minimal anthracnose. Chris noted that 15-20 kg per tree was harvested with mechanical harvester however with hand harvesting 40kg. Perhaps a combination is optimal?

Chris said that he had completed a heavy prune in Frantoio block but heavy flowering may offset any potential loss in crop. He has done two applications of Protek and one final one due. Chris said it has been very wet for past two months which poses a challenge to getting tractor and sprayer out into grove. Stuart noted there was still minor problems with dieback

in Leccino caused by Anthracnose, which was progressively being addressed with pruning. Stuart added that there was no scale here, which has been noted around the other regions.

In relation to future pruning Stuart said that the conservative approach has helped maintain productivity but it was now time to take out taller branches to reduce tree height. This will result in spray being more effective. Chris said he was on track to take out tree tops and reduce the height.

Stuart summarised that Olives on the Hill is looking excellent and the grove has made amazing progress. He said the previously diseased trees are now healthier throughout and also with excellent flowering. He said there is real potential for a very good crop.

Stuart's future recommendation is for leaf tests preferably in January or otherwise July. If done in January then adjustments can be made to improve crop load. Stuart showed where to take leaves from for the leaf tests and said the testing company would advise on quantity required.

In response to Chris's question about an alternate to Roundup as not effective with crawling weed, Stuart said that perhaps use Buster alternatively with Roundup. Chris said that thistles were also an issue and Stuart said addressing pH will reduce these.

In general discussion Linda noted that trees on a contracted grove gave higher harvest tonnage, perhaps because the trees are more widely planted at 6 X 6 but the trees had also been pruned on an ongoing basis. The grove has also removed Leccino which seems to breed disease.

It was noted that access to contract harvesting is an issue and impacts on harvest recovery. Prue Taylor from number 29 on Waiheke Island suggested using woofers as they work well and the only cost is feeding/hosting them. This has worked very well for them over the years. Stuart flagged that with increasing harvest tonnage there will be pressure on existing processing capacity.

There was also an issue in Northland with people not harvesting all their trees. This was because of the cost of harvesting and processing, and the sale price of olives in bulk. The contrary to this is that a number of groves have more demand than they can supply off their own groves so may buy certified EVOO in bulk off other growers. There needs to be regional co-ordination on matching those who need more oil with those who have surplus capacity. There is a Buy/Sell section on the Olives NZ website and Grahame Taylor said he has found the advice invaluable in growing his business.

It was suggested that Olives NZ should do more to promote the OliveMark and NZ EVOO. Linda Smith reminded that Olives NZ had carried out substantial consumer research in 2018 and marketing recommendations had been presented at 2018 Conference. The outcome was that regional representatives discussed the marketing recommendations with their regions but the overwhelming feedback was that while demand exceeded supply there was no point in investing in high level marketing. The consumer survey and marketing recommendation papers are on the Olives NZ website.



Out in the grove at Olives on the Hill



Stuart explains how restructured tree has opened up that canopy for light and spray penetration



Stuart shows where to take leaves for testing



Impressive flowering at Olives on the Hill

Cove Olives, Kaiwaka

Wayne and Wendy Ellery-Robinson welcomed growers to their grove. They are interested in following a more organic approach to managing their grove. Cove Olives is one of three groves planted together, each with approximately 1,000 trees. Wayne and Wendy have just started to work on their grove and neither of the other groves are being maintained.

The soil test showed that pH and Potassium are low and these nutrients are required for plant growth and yield. Also Boron is low and needed for flower viability and fruit set. The recommended applications are Sulphate of Potash to be applied immediately and again next year, followed by another soil test. Also recommended is Lime, to be applied immediately. The low Boron can be addressed with the foliar application recommended for Olives on the Hill.

This was our first visit to Cove Olives and the observation about the state of the trees was that these were tall, mature trees. No sign of regrowth because trees have not been pruned. Lack of spraying evidenced in patchy flowering and dead wood. These whole branches need removing. Trees need opening up for light penetration, so big cuts are needed. Wayne said that restructuring of trees has started, working variety at a time and this was intended to be a 12 month cycle. Stuart recommended taking out lower branches to encourage regrowth.

Lichen is evidence that trunks are damp and dark, which will be addressed progressively with pruning.

Stuart commented that organic spraying regime could be almost twice as much in relation to frequency compared to Manzate, depending on the products used, but this was not being advocated. Stuart said the potential of the grove will be constrained if intervention not implemented. Sulphate based Kumulus plus Kocide fungicide is suggested as an alternative to Manzate. This recommendation is based on work with organic apple orchards. Both compounds are approved by the main organic registration organisations.

However Wayne and Wendy said they do not wish to implement a spray programme, organic or otherwise. Their preferred approach is to continue with an aggressive prune every second year after harvest.

Stuart said that the disease is a significant issue and evidenced through lack of leaves. Lack of leaves means poor crop and constrained growth. Biennial bearing is evident and will continue unless disease is addressed and tree health improved. He suggested removing the Leccino to reduce disease.

Wayne and Wendy said they also need to figure out what they would do with the increased production if they proactively work on disease management.

For weed control Stuart suggested look at using lambs as they will do less damage than sheep. There are no cheap organic herbicides. Cultivation is not an option as it is bad for the soil.

Given the state of the grove Chris Smith suggested coppicing every second tree as a good option to aggressive pruning. He said in hindsight that this is what they should have done at Olives on the Hill as it would have fast tracked their grove.

Te afternoon concluded with afternoon tea and many thanks to Wayne and Wendy for their hospitality.



Cove Olives – Stuart contemplating



Lichen on most trees evident



Stuart suggesting to Wayne where to make pruning cuts

Hawke's Bay

Aquiferra

Bob Marshall and Shona Thompson welcomed 24 people to the Field Day held on Thursday 31st October. In addition to olive growers from Hawkes Bay, Bay of Plenty and Wairarapa, also in attendance were representatives from Horticulture, Hortplus, Farmlands and the SFF&F Advisor from MPI, Fiona Clark.

Aquiferra has approximately 600 trees and was one of the previous Focus Groves, It is regarded as an exemplary grove. **Aquiferra, along with Kakariki in Nelson, leads grove production nationally.** It was noted that Hawke's Bay is the highest producing region in relation to kilos harvested per tree. However it was also noted that a number of groves in the region (that don't follow the Focus Grove programme) had no or very poor harvests. This included the two "super" groves.

Stuart Tustin said the Aquiferra trees have dark and healthy leaves and look in far better health and condition than any he has seen in Europe. The other grove looking as good is River Grove in Wairarapa which hopefully can be visited in October 2020 as part of Field Days/Conference/Awards Dinner weekend.

Bob said there is a much reduced problem with biennial bearing, this year the Frantoio produced slightly under 20kg per tree. 2018 was 25kg. He said Shona has just completed regrowth pruning vs renovation pruning. Perhaps one year in three sees one major limb removed.

The soil test showed that pH is on the high side and needs to be monitored. Phosphorous and Potassium are low and need to be increased for plant growth and yield. The recommended applications are Sulphate of Potassium and Triple Super to be applied immediately. Stuart said that a leaf test history should be developed, with testing in January and July preferable.

Stuart reiterated that Aquiferra is an exemplary grove and shows what can and should be achieved. He said early flowering is looking good. David Henderson from Bay of Plenty commented that he follows the advice from Olives New Zealand and is delighted with the results in their olive grove. He added that the Processing Practices Seminars are especially useful for processors and not to be missed.

Bob said the spray next week will be Manzate, Protek and Boron. In response to a question, Stuart said most groves in New Zealand are low on Boron so pretty much safe to spray without having done soil tests. It is best to get on ahead of flowering but during flowering is ok. Stuart said that flowering is very stressful therefore necessary to ensure trees are well set up to cope. Plus ensuring good protection in flowering will result in good fruit set and ongoing protection against Anthracnose.

Stuart reflected on fruit set this year where we saw bunches of olives vs single fruit. First time this has been reported.

Garry Burlace from Horticulture reiterated the importance of proactive disease management

as if Anthracnose is apparent on fruit, nothing can be done to address this. He noted that the results of the Focus Grove programme are apparent in fruit set and crop load.

Stuart recommended the general approach for pruning depends on method of harvesting. For machine harvested trees he suggested 5 good sized limbs whereas hand harvesting with shakers is better suited to say 10 smaller limbs so that these can be grabbed.

Stuart said it is not unreasonable to expect 25kg per tree in a healthy grove with machine harvest. He added that hand harvesting will result in a higher harvest per tree. Bob added that sometimes lower harvest can result in higher oil yield and that is potential for future work.

In Hawke's Bay, as in several other regions, it was noted that good spring rain has resulted in good moisture levels. Stuart recommended separating the drip lines at Aquiferra to widen water spread and penetration. This will improve efficiency. Bob said the Awards Head Judge from Spain had suggested the same thing.

Stuart said as groves improve health there will be a corresponding increase in requirements for water. He recommended a similar requirement to apple orchards maybe 35 litres per tree per day. Bob said when required Aquiferra is irrigating 26-28 litres per tree every second day which is a minimum requirement. This is from April as is needed. Stuart added the best time to irrigate is at night.

The afternoon concluded with afternoon tea. Many thanks to Bob and Shona for their hospitality.



Out in the grove at Aquiferra



Stuart showing impressive new growth extension



Bob explains the spray programme at Aquiferra



Flowering at Aquiferra



Showing where to take leaf samples

Nelson

The Focus Grove visits and Field Days were held on Monday 4th November as follows.

Kakariki Olives, Redwood Valley

Approximately 13 people, including several from Marlborough, were welcomed to Kakariki Olive Grove by owners Ray and Brenda Gregory.

Kakariki is regarded as a commercial grove with approximately 3100 trees established in 2000. It was one of the original Focus Groves and has shown outstanding improvement to grove health and increased production. In fact **Kakariki produces almost double the average harvest tonnage for the Nelson region and their Focus Grove block currently leads average grove production nationally.** Kakariki also produced a Gold/Best in Class oil for 2019 NZ EVOO Awards. This is an exemplary grove.

Pruning – Ray said the main focus is still taking out one large limb and tidying skirts. It was noted that the prunings have been cleared away and the grove is looking very impressive. With a growing market, the grove regeneration has been managed to maintain production. Stuart suggest taking the tops out next year where possible to reduce height. He said the trees are looking really healthy with excellent regrowth and more shoot stems apparent. This will be triggered by sun and may have burst by March.

Disease – Ray has got three sprays on since harvest. Stuart pointed out there was very little leaf loss and big healthy leaves. He said there was very good flowering across the grove and this is now the norm for Kakariki. That is biennial bearing has been pretty much eliminated. Ray said that Manzate is costing \$5 per tree per annum for spray and labour so is a small investment for the return in improved crop load.

Soil tests showed that Potassium and Magnesium are low so will be addressed with adding Epsom Salts to the Ravensdown olive tree and sulfate mix which will be applied now. Stuart explained that low Potassium could impact on oil yield, which was why it was important to address. Water is needed to enable uptake of nutrients. Boron application is recommended including in first Protek application at very start of flowering.

Stuart said it was good to do soil tests in early spring so deficiencies can be addressed and could positively impact on fruit. Plant nutrition is all about measuring, monitoring and addressing. History provides an excellent record and guide for the future.

Stuart said growers need to remember that olives are a low value crop so need cost effective options whereas companies will try and upsell to a more expensive option with additives that are not required.

John Dunlop said they had seen that slower application with higher water for disease control gives better and more effective coverage. Stuart agreed this was a good approach as branches need to be fully wet.

Stuart advised that leaf testing is needed now as next step and in time to be able to impact on olive fruit development. His strong recommendation was that these be done in January

as once again deficiencies may be able to be addressed with foliar spray to positively impact on the olive crop.

Stuart said there was potential to get the crop to 25kg across the grove and then up to 30kg. See photo of new buds and Stuart pointing out new growth. Stuart said vigorous regrowth needs to left to clearly identify most dominant.

The group then adjourned for lunch at the Moutere pub.



Out in the grove at Kakariki



No sign of disease



Healthy new growth



New buds are apparent



Flowering at Kakariki

Neudorf Olives, Upper Moutere

After lunch Susan Pine welcomed 12 fellow growers to their grove. Neudorf Olives was established in 2001 and has approximately 1,000 trees. They have their own processing plant. The Pines are considering a more organic approach to managing their grove.

Soil test showed the old grove is looking good. The new grove is low on pH and would need annual Lime application. Phosphorus also very low, as is Potassium. Potash Super applied now will help with tree health and future production. Boron is also low and a foliar spray should be applied now and this may be able to be added to other spray products.

Susan explained that they have implemented a radical approach to pruning unruly trees and to enable hand harvesting using Stihl branch shakers. Stuart commented that 45mm is maximum branch diameter for most branch shakers. Pruning is done by chainsaw and Stuart encouraged working towards the traditional vase shape for hand harvesting and light penetration. He also reiterated that new growth is required to offset biennial bearing.

Susan said that Frantoio is a good performer and with less biennial bearing. Especially compared to Koroneiki and Leccino. She said that while Frantoio may have less crop, this was offset by a higher oil yield. Barnea is affected by Anthracnose and not harvested. Flowering is looking pretty good and across the grove.

Susan said they currently weed spray with herbicide and use Protek and a foliar spray, Grow More Finish. She was interested in the option for organic spraying to control disease.

Stuart recommended following the organic apple orchard approach with same application rate as Manzate. The products recommended are Kocide with Kumulus, which will give some persistency. Per 1,000 litres/ha the recommendation is 320g Kocide and 1.8kg Cumulus. Kocide contains Copper and Kumulus contains Sulphur.

The spray should be applied every 20 days or after 20mm rain. However Stuart noted that the maximum Copper application permitted by most organic registration bodies is 3kg per ha per annum. That means no more than 9 sprays which poses a challenge to controlling disease. From mid-summer to late summer, when it can be anticipated to be dry (no rain), it is possible to deviate from the spray regime. Under these conditions it is possible to omit the Copper and run out to 40 days between sprays.

Based on vineyard and apple orchards following organic approach, spray application is typically more frequently. However for the purpose of this project the Manzate spraying frequency will be trialed and monitored.

Stuart said that foliar spray is only used in an organic regime driven by need, for example as determined by leaf testing.

Susan said she was appreciative of the discussion around adopting an organic approach and she may well rethink this approach. Her concern was that the production level may not achieve the desired level. Also she was not really seeing an added premium for added product costs/more expensive product.

Stuart said there was a misnomer that organic means no spraying but the reality is more spraying with alternate products. This includes more expensive fungicides than Manzate but for our trials the same spray regime is recommended - that is the 20/20 approach. Stuart also said if you want to register organic then you need to register with Bio-Gro (or similar) and be herbicide/spray free for three years. There is also a requirement for the processing plant to have a full clean down before processing an organic crop. Stuart said that organic has proven to be far less sustainable and also has reduced production.

Chris Piper suggested that Ammonium Sulfamate could be used as an organic herbicide. However follow-up with Horticulture was that the product was not approved by organic organisations.



Neudorf Olives - out in the grove



Susan Pine explaining the rational for the pruning strategy



Stuart contemplating regeneration from aggressive pruning



Stuart discussing disease with Susan Pine



Flowering at Neudorf Olives

Weka Olives, Ngatimoti

Peter and Laurie Rothenberg welcomed 18 fellow growers to their grove. Weka Olives was established in 2008 with 1400 trees. There are three distinct blocks to the grove and the Rothenbergs have selected one (Gate Block) to be the trial organic block. This block comprises 200 Leccino and Frantoio trees. The aim is to improve production.

Laurie explained that there is no spraying carried out apart from weed spray. There has been minimal pruning and only on a 3 year cycle. Stuart Tustin pointed out that there was very little new growth or new leaf growth. The trees are dense with a high level of disease but they are of a good height. Leaf drop will impact on future crop and needs to be addressed. Stuart suggested the centre needs to be taken out to open up trees and enable spray and light penetration. He emphasised that pruning needs to be done at least annually and often a secondary pruning is recommended after fruit set to avoid over cropping and biennial bearing.

Stuart said mulching of finer prunings and then spread around the trees helps with water retention and weed control. Larger prunings make ideal firewood.

Flowering is late and is quite light, which will impact on harvest tonnage. For example there is potential for clusters of 9 olives but 1 only apparent.

Stuart said that a spray programme must be implemented to address the high level of disease in the grove. As the Rothenbergs want to trial an organic approach Stuart recommended using the Kocide/Kumulus regime.

Soil tests show low levels in pH, Olsen Phosphorous, Potassium and Boron. Lime is required to address the pH, Triple Super to improve Phosphorous and Sulphate of Potash to improve Potassium. These need to be applied to the soil as soon as possible and Stuart recommended that Laurie talk with Horticulture about making a mix for single application with a spreader. A foliar application of Boron is also required asap to aid in fruit set. Solubor is the recommended product as it is cheap and effective. However it was essential to get advice on rates /dilution rate in the spray mix from the supplier.

Weed spraying can be done as a minimum in spring and then again late January. Frequent spray is more for aesthetics and obviously not required in drought conditions. As an organic alternative to weed spraying Stuart suggested the Rothenbergs could look at a swing arm mower for their tractor as they did not want to use sheep in the grove.

The afternoon concluded with drinks and nibbles. Thank you to Peter and Laurie for their hospitality.



Out at the Gate Block at Weka Olives



Stuart showing signs of Anthracnose and other disease



Stuart contemplates poor flowering



Stuart shows where to make the next cut

Bruce and Jill Chapman welcomed 20 growers to Terrace Edge on Tuesday 5th November.

Terrace Edge Olives was established in 2006 with approximately 2,000 trees. It is one of the original Focus Groves and, while facing challenges in following the recommendations, has still managed to produce double the average harvest for the Canterbury region.

Terrace Edge was named the 2018 Organic Vineyard of the year. As part of the SFF&F project they have two sections to their olive grove; one following the previous project recommendations and in particular the Manzate spraying regime, while the other will follow organic principles.

The Field Day started with a recap on the success of the previous project and the main focus points for this new project. Stuart said that organic options have been developed and these were discussed. Bruce Chapman had raised some organic options with Stuart which he had researched. Stuart said that copper with fish oil may improve sticking to trees but is not worth the added cost. Lime Sulphur is highly corrosive and may be too harsh for olive trees and also new growth. It would require suited application with breathing apparatus and can impact on photosynthesis. Potassium bicarbonate, milk powder, Protector are used in vineyards to control powdery mildew. However noted they may only have minimal effect with the diseases in olive trees. Stuart's summary was that these are expensive options and not shown to work with olives. Therefore the recommendation for Kocide (Copper) and Kumulus (Sulphur) is seen as the best option. For April - July you can leave out Kocide in every alternative spray to meet the limitation on the amount of Copper than can be applied on an annual basis if there is no rain. But it is important to spray before rain, so if no rain leave out the Kocide for up to 40 days maximum.

John Field Dodson talked about his observations with biodynamic farming focus on soil health. Stuart said while this approach was interesting there was no scientific proof that it was effective.

Malcolm noted that later harvest olives more resilient to frost and of course have a higher yield.

Stuart reminder that flowering is starting so need to add Protek to the spray regime to head off Anthracnose. He suggested also applying Boron for good fruit set. We want to see bunches of fruit again like this year.

Groves should look to do soil and leaf tests in January if soil tests have not already been done. This will enable intervention to improve fruit quality with foliar spray. This could be added to Manzate and best done when dews start.

The group then went out into the grove where Bruce Chapman said the Head Judge from Spain had done some pruning and these trees were the first visited. Agusti advocated 3-4 main limbs with new growth about a metre up. He also said to cut off tall branches a few metres up rather than full limbs. Malcolm McKenzie pointed out that this left branches outside net catchment plus that don't shake properly. Stuart said these trees were over pruned compared to our NZ experience where 5 limbs with renewal is working well. He said the way the trees had been pruned will encourage a bird's nest of growth. Stuart pointed out that Agusti has cut off renewal growth. Stuart said that the previous Focus Grove Project has clearly shown that trees pruned New Zealand style are much more productive than Northern Hemisphere trees, which also suffer badly from biennial bearing.

Stuart pointed out the good regrowth on previously pruned trees. He recommended leaving new branches to sort themselves out before removing any. Malcolm said the droopy branches need removing if mechanical harvesting as they will catch up nets.

Bruce explained his rationale to divide the grove in half, which is so he can benchmark the organic vs Manzate approach. Stuart reiterated no spray is not an option as trees just slowly degenerate. The organic approach should see an improvement in groves, probably not as much as with Manzate, but better than no spraying.

Flowering is looking to be variable in the grove, some trees are excellent others are light. But disease - Peacock Spot, Cercospora, is apparent. There are also signs of Anthracnose and Stuart said the more prescribed spray programme to be implemented by Bruce should address these.

Stuart discussed the soil test results. Phosphorus levels need addressing. Stuart recommended all groves should have soil tests done and then talk with their agricultural supplier about their recommendations. However need to be careful that suppliers do not oversell products.

Next Field Day Bruce suggested having a workshop in the grove with teams looking at and discussing trees and identifying which branches should be removed.

Thanks to Bruce and Jill for hosting the Field Day and to everyone who contributed to the shared lunch.



Discussion time at Terrace Edge



Out in the grove – Bruce describes Agusti's pruning



Bruce showing cuts made by Agusti



Stuart showing where regrowth was cut off



Good regrowth on previous cut



Good flowering

Wairarapa

The Focus Grove visits and Field Days were held on Wednesday 6th November as follows.

Leafyridge Olive Grove, Masterton

Andrew Priddle, Wairarapa Branch Chair, welcomed more than 40 people to Leafyridge Grove including fellow growers from Wairarapa, Kapiti and Hawke's Bay and guests from Horticulture, Jack's Machinery Ltd and other local industry contractors. Leafyridge is one of the original Focus Groves. Leafyridge was established in 1999 and is regarded as a commercial grove with 3800 trees plus they lease/manage several other neighbouring groves to increase their production capability.

Craig Leaf-Wright, co-owner of Leafyridge, has followed an aggressive pruning regime to get the trees back into the desired shape and size. This has impacted on harvest tonnage but the results will become apparent over the next year or so. The grove is looking very healthy, disease is looking to be well under control and there is very good flowering across the grove.

Stuart described the majority of groves as having become 'senile' because we have not known what works in NZ. Now with the first Focus Grove project we have been able to learn how to renovate the groves and implement an effective spray program that has suppressed disease. This has resulted in increasing productivity in these groves to typically twice the regional average. He said we are not looking at prettying the trees until we remediate them. Once back under control we can work on vase shape.

Stuart pointed out latent buds on the trunks which may burst out next year. He discussed the importance of pruning for harvest method, which at Leafyridge was mechanical harvesting. Stuart suggested to maximize harvest growers could follow the mechanical harvester with nets and branch shakers. Groves that are doing this are recovering another 2-5kg on average but up to 7kg. Groves should be able to calculate whether the additional crop recovered merits the additional cost incurred.

Stuart said secondary pruning was necessary to address potential over production, for effective harvesting and to offset biennial bearing.

Craig said he has carried out major pruning in the Frantoio and new growth shows the success of this approach.

Gayle Sheridan raised how Agusti had pruned trees at Terrace Edge and had taken out too many branches plus higher up which would see massive regrowth where you didn't want it, creating a problem for later. The New Zealand approach is appropriate in our groves.

Soil test showed Potassium very low and Potash Super already applied. This will help trees cope with stress, e.g. flowering, drought. Boron is also low and will be addressed with a foliar spray. At Leafyridge three soil tests carried out because of difference in major blocks.

Steven Price raised that some groves in the region were harvesting too early because of the threat of frost and this was impacting on oil yield. There was discussion around pruning to minimise frost damage. Steven said a -5 frost had burnt outer olives at River Grove but

these fell off the trees prior to harvest. He summarised that the later the harvest the higher the yield.

There was also a comment that shelter belts that were needed when groves were being established may no longer be required and may now be causing problems in the grove - not allowing flow of air through the grove, competing for nutrition and moisture. These shelter belts could now be at least thinned out.

Stuart said that leaf testing is now needed to understand any mineral deficiencies which may be able to be addressed and impact on olives ahead of harvest; size, oil accumulation. Garry Burlace from Horticulture supported the need to do leaf test even if it's an on year as addressing the deficiencies will set the trees up to even out biennial bearing.

Stuart explained new project approach where we are paralleling an organic approach to disease control, grove health and improved productivity. He noted that Bella Olea, a grove going through conversion to organic, would be visited in the afternoon. He said that organic sprays could typically have an issue with persistency so theoretically need more spraying but will be constrained by limits imposed by organic registration. The Copper product recommended as part of our project is a softer option that won't burn the leaves. The project recommendation is a combination spray of Kocide and Kumulus, Stuart advocated the 20 days or 20 ml rain or deviation with in that spray regime. Stuart said the 20 days is because efficacy of the products.

However he pointed out that permission has to be obtained for Copper use by the organic registration organisation and there may be restricted use, for example maximum kilos to be used per ha on an annual basis. Some organisations require approval for each application. Lisa Buchan from Waikawa Glen, also in conversion to organic, said this was the case with Organic Farm NZ and in fact they would probably not allow the use of Copper on an ongoing basis.

Because of the limit on Copper application Stuart said the period when there is less disease pressure and rainfall is the time to back off the Kocide application and just use Kumulus.

Brucie Donald from Jack's Machinery Ltd commented that Copper impact is being seen in kiwifruit in green spots developing on the fruit.

Brucie was formally introduced by Gayle Sheridan as his company had a range of products that would be of interest to growers. Brucie said this included the Multione harvester that could be a cost effective solution for groves that want to take over harvesting. The attachment could be mounted to a tractor provided it could deliver 65 litres of oil per minute to the shaker plus can carry the weight. He said it was \$29k for the harvester and up to \$20k on modification of a standard tractor. Alternatively there were Multione tractors available that suited the harvester and came with a variety of other attachments, for example loading bars, mulcher, etc. The machinery is imported from Italy and there are already a number of the harvesters being used in New Zealand. Brucie said owning your own harvester gives control over timing of harvesting and the payback period might make this a worthwhile for many groves. Jacks Machinery Ltd are becoming a Silver Sponsor of

Olives New Zealand and more information on their product range would be emailed out to members in due course.

The Field Day then adjourned for lunch.



A great turn-out at Leafyridge Gove



Craig Leaf-Wright showing a well pruned tree



Andrew Priddle and Stuart Tustin discussing latent buds and which branch to remove next



Stuart discussing pruning for harvest method



Flowering at Leafyridge



Multione Tractor from Jack's Machinery Ltd

Bella Olea Olive Grove, Greytown

Around 50 people reconvened after lunch at Bella Olea Grove, Greytown owned by Chris and Hilary Penman. The Penmans produced a Gold medal EVOO in 2019 and are transitioning to becoming an organic registered grove. Their grove of approximately 850 trees was established in 2000.

Chris Penman welcomed fellow growers and guests including Fiona Clark, our MPI Advisor. He gave an overview of Bella Olea and said it was in the second year of a three year organic conversion registered with Organic Farm NZ. He was using Copper and Sulphur sprays and was working on pruning. He has used sheep for weed/grass management but had not had any on the grove for several months. The grove is now overgrown and will need mowing before sheep can be put back in. Ian Juno suggested putting in a mineral block to stop the sheep eating the tree bark. Chris said sheep are great for cleaning out suckers and he would normally take the sheep off a month prior to harvest. Chris said they mainly machine harvest but also some hand harvesting. Biosea (seaweed) foliar spray is being used.

Stuart said that the current spray programme is not working as there is a lot of disease; Peacock Spot, Cercospora and Anthracnose. There is also poor flowering across the grove. Trees have lichen on the trunks and branches.

Andrew Priddle said there were crowded trees growing into each other. Plus his harvester can't get into trees and other branches are outside the harvest net. Stuart said that a big intervention is required in the grove to deal with tree structure, disease and to eventually improve crop load.

Andrew Priddle is working on pruning the grove and showed the branches typically to be removed. Stuart pointed out that spray won't reach tall branches. He identified which branches should be removed on several trees to open up the trees for light and spray penetration. This means it won't take as long to spray.

It was noted that Leccino need good 600mm stump for regrowth where other varieties don't.

Chris said he wants to improve productivity through improved tree health and soil health. He hopes this will aid also in the control of disease. He was focusing on the biology of the soil.

Stuart said Pathology is associated with health not wellness. Being healthy does not mean disease resistant and that is why spraying is so necessary. He said that cultivation of soil is not recommended for grass/weed control because it destroys soil structure, microspore structure and oxygen supply. Cultivation is destructive to soil, turns soil over and aerates soil, causes acceleration of organic material loss.

Stuart suggested putting mulching back around trees, as this would create good organic matter, which will help water retention and insect life may provide a more attractive food source for birds rather than olives. He said worm casts are a doing sign of soil health.

The soil test showed that Magnesium and Boron are particularly low. A fertiliser mix was recommended by Q Labs comprising mainly Limestone, MagCarb, Manganese Suphate, Muriate of Potash and much lower amounts of Zinc Sulphate, Copper Sulphate and Cobalt Sulphate. Further soil testing was highly recommended after application to re-evaluate the soil fertility.

It was noted that being organic may not mean a price differential but it may differentiate the product for those consumers looking for an organic option.



Bella Olea – out in the grove



Andrew Priddle discussing restructuring



Good regrowth but lichen apparent



Unpruned tree



Partially pruned



Main limbs removed



Disease apparent



Some excellent flowering at Bella Olea but on pruned branches



Gate sign

General Comments

Value of the Focus Grove Projects

The value of the Focus Grove Projects was re-emphasised when visiting the new Focus Groves that aspire to be organic and the advice given by the 2019 Head Judge for the New Zealand EVOO Awards.

Stuart Tustin described the majority of olive groves in New Zealand as being in a 'senile' state, which is they are in an extremely poor condition. Whilst some of these may be attributed to neglect, the majority are because growers have been following grove management practices from particularly the Northern Hemisphere and also Australia. This relates primarily to canopy management and has not been appropriate. The advice available on managing the diseases that are prevalent in New Zealand has also not been effective. The first Focus Grove Project introduced new concepts in canopy management as well as disease control measures that have been hugely successful. The groves following the first Focus Grove Project recommendations have turned their groves into healthy groves with disease suppressed and increased production from under 10kg per tree to average of more than 20kg per tree. These groves produce typically double the average for their region.

The new organic Focus Groves are generally in an even worse condition than the previous Focus Groves were when that first project started in 2016. It is going to be extremely rewarding if these groves can have their tree health and productivity improved through this new project.

That the Northern Hemisphere pruning practices are not appropriate for New Zealand was evidenced again in the advice from the 2019 Head Judge from Spain. The approach he recommended saw pruning for aesthetics and not production. In fact he actually removed productive and new growth, reducing the productivity of those trees.

At all of the Field Days there was extremely positive comments from attendees about the knowledge and advice transferred and gained. There was overwhelming support for the new project to continue with the focus on increasing and maintaining grove productivity, as well as looking at alternate/more organic approaches.

It is apparent that quality of information shared at the Field Days just gets better and better.

Disease Management

The Disease Management Fact Sheets referred to during the Field Days can be found below.

Cercospora and Peacock Spot - Manzate spray regime

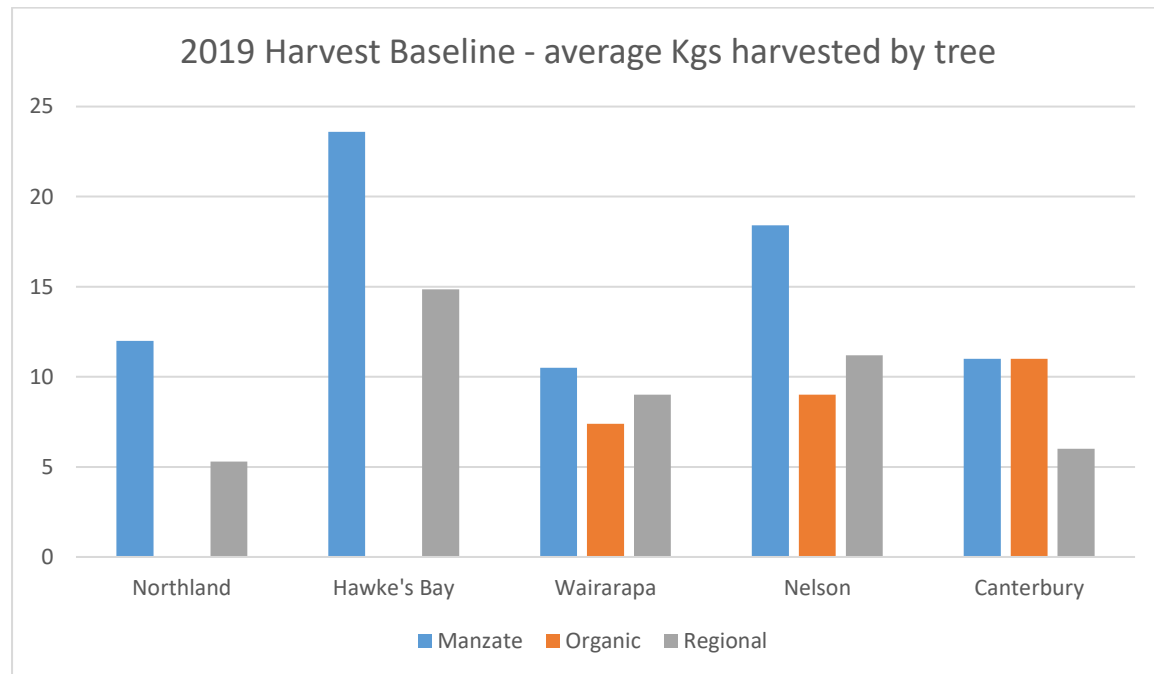
<https://www.olivesnz.org.nz/wp-content/uploads/2010/09/Disease-Management-Fact-Sheets-updated-November-2017.pdf>

Anthraxnose – Protek application

<https://www.olivesnz.org.nz/wp-content/uploads/2018/11/Anthraxnose-Bulletin-October-2018.pdf>

Baseline Harvest Data

A snapshot for 2019 harvest data as below is to be used as a baseline for this project. These figures compare average harvest figures across the grove whereas the pervious project was limited to the Focus Grove Frantoio blocks.



Summary

All of the original Focus Groves (known as the Manzate groves) continue to follow the recommended programme for proactive disease management using Manzate and canopy management. The vastly improved tree health is apparent across all of these groves with very little or no disease and plenty of lush leaf. The tree structure across these groves has dramatically improved, enabling light and spray penetration and ease of effective harvest. Indeed most of these groves have reached an exemplary stage and are exemplars for the wider olive growing industry in New Zealand.

The new Focus Groves (known as the organic groves) have received advice on tree health, soil nutrition and pruning. The specific advice in relation to implementing a spray regime to suppress disease is based on the regime used by organic apple orchards. Stuart Tustin advised the groves aspiring to become organic register with an appropriate organisation asap because of the three year process involved. The most widely recognised organic association is Bio-Gro. but with an annual fee totaling more than \$2,000. The association used by Waikawa Glen and Bella Olea is Organic Farm NZ and costs significantly less at \$300 annually. However it would appear that this association is much more rigid in operation and is certainly not as well known (neither Stuart Tustin nor the Horticulture team knew of it). Growers who are interested in organics need to be aware that MPI is developing a national organic standard which will be legislated. The bill is due for its first reading in Parliament before Christmas and will eventually become established and all organic organisations must comply with the standard. Therefore growers need to check with their organics association that they will be working towards compliance with the new standard.

All of the groves had soil tests completed with appropriate recommendations on the applications required. Several groves have already progressed with the recommendations and there is an expectation that the other groves will also implement their recommendations.

All of the groves are requested to have leaf tests done in January so that deficiencies can be addressed and potentially positively impact on the 2020 crop load.

An issue that came up at several Field Days was the mismatch of supply and demand. It was noted that there are groves that are not harvesting to their full potential while other groves are having to buy in bulk from outside their region to meet demand. While Olives NZ has an EVOO Buy/Sell section on the website which works well, the mismatch is best dealt with on a regional basis. There needs to be co-ordination in putting growers with excess supply in touch with growers who need more capacity than they have.