

# The New Zealand olive industry - contributing to the environment

*“Fruit and oil produced by olive trees are good for your health but olive trees are also good for the environment”.*

**Francesco Seranti, International Olive Council at COP22. November 2016.**

## Introduction

With global warming causing damage to the earth and its people, there is an increased focus on how an industry contributes (or not) to the environment. In relation to food, people want to know where their food has come from and how it has been grown. Sustainable farming and good agricultural practices help in reducing greenhouse gas emissions, thereby playing a significant role in combating climate change.

The production process of a litre of olive oil emits up to 2.5 kg of CO<sub>2</sub> into the atmosphere. Hence the growing importance that the olive oil industry is taking, not only for the health benefits that the product brings to people, but also for the capacity of its production process to combat pollution.

This paper looks at how the New Zealand olive industry makes a positive contribution to the environment. In particular; cleaner air, biodiversity, resource utilisation, healthy water, healthy soil and nutrient efficiency. There are also some case studies showing how olive growers and processors in New Zealand are contributing towards regeneration of the land.

## Trees contribution to the environment

Trees absorb carbon dioxide (remove carbon dioxide from the air) as they grow and the carbon that they store in their wood helps slow the rate of global warming. The amount of carbon that is stored in a tree directly corresponds to its size. On average, carbon makes up half of a tree's dry weight. Trees reduce wind speeds and cool the air as they lose moisture and reflect heat upwards from their leaves.

Trees thus contribute to their environment by providing oxygen, improving air quality, climate improvement, conserving water, preserving soil, and supporting wildlife. During the process of photosynthesis, trees take in carbon dioxide and produce the oxygen we breathe.

Provisional studies by the International Olive Council indicate that a hectare of olive trees cancels out one person's annual carbon footprint and the production of a litre of olive is environmentally positive. These studies show olive oil production is beneficial for the environment. (See <http://carbonbalance.internationaloliveoil.org/en> )

**Note that olive trees are evergreen so their contribution to the environment continues 365 days of the year.**

## Better land use

The most obvious contribution to the environment is the change in land use where olive groves are established. Typically, such areas are under pastoral management often in dryland zones that are converted to permanent perennial tree crop management. This reduces cultivation (loss of soil carbon) and establishes a tree crop that in itself is a carbon sink by virtue of tree growth into wood.

Prunings are mostly returned to mulch the soil adding to soil carbon accumulation. Olive trees are not typically used in tree offset carbon calculators because of their size but this should be reviewed.

So overall shifting from pastoral to permanent tree crop is a major positive land use change for sustainability and environmental benefits.

## Principles of good agricultural practices

Olives New Zealand has undertaken a number of projects since its inception that promote good and sustainable agricultural practices. Most recently the Focus Grove Projects carried out with assistance from the Sustainable Farming Fund and the Sustainable Food, Fibre and Futures Fund. Specifically as follows.

### Control of disease and pests

The main diseases that affect the olive trees in New Zealand are Peacock Spot, Cercospora and Anthracnose, because of the maritime climate. Olives New Zealand studies have shown the use of Manzate, a broad spectrum fungicide used on a wide range of crops, to be the most effective approach to managing Peacock Spot and Cercospora. Some studies have shown that Manzate has no negative residual impact on the environment. Olives NZ has had residue testing carried out on EVOO and none has been detected. The recommended approach for preventing Anthracnose is Protek. Protek is a broad spectrum systemic fungicide used for controlling a range of diseases in many crops.

Olives NZ has also developed an organic approach to managing disease using copper and sulphur based products to manage the wet weather diseases of Peacock Spot and Cercospora. For preventing Anthracnose the use of Serenade Optimum is recommended. Serenade Optimum is a bio-fungicide/bactericide used particularly to protect against the effects of soil and foliar bacterial and fungal diseases, for example powdery mildew and botrytis and sour rot in grapes.

Olives NZ promotes that all people using any of the above products attends a GrowSafe course to understand the responsible and effective use of agrichemicals.

### Control of weeds

The most effective herbicide used in olive groves is glyphosate. Olives NZ promotes that this is applied a maximum of twice annually and preferable only once in spring. Olives NZ has glyphosate residue testing carried out on Extra Virgin Olive Oil and so far there has been a negative result.

Other approaches encouraged for managing weeds to make a more positive contribution to the eco system include mulching and mowing. Mulching is where the prunings are applied back around the trees which suppresses weeds, encourages water retention and increases nitrogen in the soil. In relation to mowing, longer timing between mowing to enable the development of a longer sward is encouraged. Once mown this creates a 'carpet' which again will then suppress weeds and assist in water retention. Both mulching and mowing should also increase the organic matter in the soil (that is the broken down plant/root material). This leads to healthier soil, with thriving networks of microbes. This creates a healthy environment for these essential bacteria and fungi to exist in,

higher levels of organic matter that help hold on to moisture, and a greater ability to sequester carbon. It all equals more resilient soil.

Increased use of clover in olive groves is making a positive contribution to soil health by reducing the need for herbicide intervention for weed control.

#### Use of irrigation

Many regions require the use of irrigation in dry seasons (summer, autumn) to assist in the development of the fruit and to avoid stressing the trees. Olives NZ promotes that irrigation is controlled and monitored to ensure maximum effectiveness and best use of this resource.

#### Soil nutrition

Olives NZ strongly promotes that soil and leaf tests are carried out on a regular basis as a regenerative approach to land use. The application of fertilisers and foliar sprays is then recommended based on the results of these tests. Investment in appropriate nutrients leads to improved soil and tree health and overall a better production footprint.

#### Processing practices

The processing of olives into oil generates waste product as the oil is extracted and leaves behind the solids of the fruit, pit and stone, known as pomace. In New Zealand, where only Extra Virgin Olive Oil is produced, this pomace needs to be disposed of. Typically it is left to dry out or compost and then used as mulch or added to other ingredients to make fertiliser or stock fodder.

#### Packaging

Olives New Zealand promotes the use of re-useable and recyclable packaging for Extra Virgin Olive Oil. This is a contractual requirement to use the red OliveMark on products. This packaging includes preferably dark glass bottles or tins. If clear glass bottles are used then these are packaged in cardboard boxes. For food service the oil is often sold in food grade plastic containers.

Many producers also offer a 'refill' service which means that containers can be re-used.

#### Health Benefits

The natural health benefits of Extra Virgin Olive Oil are well documented and produced with little environmental impact. Thus Extra Virgin Olive Oil contributes to individual and social wellbeing.

For information on the many health benefits see

<https://www.oliveoiltimes.com/health-news>

#### Summary

The olive industry in New Zealand contributes to diversification of land use. Best practice methodologies result in more efficient and environmentally friendly use of the land. A regenerative approach is promoted to improve the health of our soils, to regenerate and leave it better than it was before. Innovative use of prunings and processing waste also contribute to the environment.

The production process of a litre of olive oil emits up to 2.5 kg of CO<sub>2</sub> into the atmosphere. Hence the growing importance that the olive oil industry is taking, not only for the health benefits that the product brings to people, but also for the capacity of its production process to combat pollution.

A healthy environment equates to healthy people, as well as the many health benefits of Extra Virgin Olive Oil itself, and the New Zealand olive industry is doing its best to contribute to this.

## Stories

### Cairnmuir Olives, Central Otago

*During processing we dump the pomace along with the leaves from the de-leafer. After harvest we add mulched pruning and heap it up and leave it for 2 or 3 years. The composting is very static, as the heap should be turned at intervals.*

### Mystery Valley Produce, Bay of Plenty

*The waste from our two stage press is the consistency of cow manure. I let it dry out on a landing area till about now, then mix it with leftover hay to get the right dryness for composting. Regular turning is the secret.....which I do with my bobcat. I have purchased a tractor mounted spreader which can handle compost and I have been spreading it back on our fields. The compost is quite acidic I believe so I used to add lime prior to spreading. Soil tests have shown that my regular fertiliser programme has left us with a basic level and the recommendation this year was not to bother with the lime. This addition of organic material is important for my hay field as the hay is fed out on different on different fields which then benefit from manure.*

### Olive Press Central Otago

*I turn the waste into compost with a mix of old hay, manure, olive leaf from processing. Then spread it over my cherry block and will use it in the olive grove.*

### Onemata Grove, Bay of Plenty

*We spread the pomace under kiwifruit vines as mulch. It also helps with weed suppression and soil nutrition.*

### Pressing Engagements, Martinborough



*Making briquettes from olive press waste is not a new idea. I understand that briquettes have been used throughout olive growing areas of the world as a heating source including cooking, firing kilns & power generation.*

*These briquettes are made by Pressing Engagements from the by-product of the processing of extra virgin olive oil. These are individually handmade onsite by strong handsome local men & air dried through the Martinborough summer.*

*I have made briquettes for several years for my own use in my wood burner, barbecue & outdoor fire & found them excellent for their high heat output. These are now available to the public from selected outlets in the area.*

*These are not firelighters - add them to an established fire & you will end up with a bed of hot embers.*

### Rata Olive Grove and Processing Plant, Marton

*We are planning to make a place on the farm to put the waste from the processing plant. We will be mixing the pomace with lime and any old straw, baleage etc. as recommended by Leafyridge Olives. Once it has broken down it will be used as fertiliser and put back on the trees.*

*In our grove we put wool dags and scrappy wool around new trees as we plant, this lasts for a couple of years and then we replace when necessary. It helps retain moisture while also providing some nutrients for the trees. It is also very effective in suppressing weeds around the trees.*

*We used to be able to sell dags but no one takes them any more so this is a way to use them.*

*We also graze lambs in the grove when the trees are big enough. They are very effective at “mowing” the grass and really thrive in the warm environment provided by the trees.*

*We also trap possums and throw them around the grove when the olives are ripening. This brings the Hawks which do play a role in scaring off smaller birds. We find the birds are much worse in a dry year when their other food source is depleted.*

#### Stoney Creek Grove and Processing Plant, Hawke's Bay

*Two of us did a lot of looking into waste products from olive pressing. We both had cattle and sheep at the time, we found that the pomace was ideal for feeding to both. We never needed to drench our stock.*

*When the stock had any skin rashes I made up liquid with pure lavender oil mixed with extra virgin olive oil put it in a spray bottle. I treated the stock with it on a daily basis and it cleared up in no time. I also found a similar mixture effective in treating a cow that had an udder breakout.*

*After discussing my experience with pomace as fodder with a horse breeder and trainer, she is now feeding olive waste to her horses with beneficial results*

#### The Olive Press Marlborough

*Currently we are fortunate to have a large winery who has been set up to deal with grape marc as a mulch/fertiliser and can take our pomace. Because it holds different nutrients there is appeal. Our waste is, however, quite sloppy so we are looking at ways of reducing the water content to make it more appealing to other potential takers.*

#### Wells Grove Estate, Howick, Auckland

*We operate a 2 phase processing system which the Europeans have deemed to be more environmentally acceptable and friendly. This means that the 'solids and the vegetable water' are mixed as one- as opposed to a 3 phase system in which the olive oil, solid waste and the vegetable water are all separated and have to be treated separately.*

*We tip the waste on a trail between the rows of trees. We then further spread the waste more thinly with a tractor and blade. This can cause some minor burn back of the grass if not spread thin, or I have waited too long to spread more thinly with the tractor. However, the grass recovers in the spring and no traces are evident generally by the summer. The first mow after spreading then further disperses any heavy clumps of sansa (??) waste.*

*I try not to tip the waste between the same rows in consecutive years and intend to cover the whole grove eventually – but that depends on how wet the ground has got each year. The access is the limiting factor for me, even with 'chains' on the tip truck.*

*I haven't counted the tonnes of waste spread around the groves, but we have been doing this practise for 20 years and with regular soils tests we haven't seen any issues and our humus content has remained pretty consistent.*

*I have a paper from an Italian University which did an assessment on the environment and claimed that the 2 phase processing system did very little damage to the environment when spread on the soils.*

## Waikōkopu Olive Grove and Orchard

Story to come on bio char and using charcoal in art.

### Bio Char

Biochar is a super charcoal made by heating any biomass – for example, corncob, husk or stalk, potato or soy hay, rice or wheat straw – without oxygen. All of the cellulose, lignin and other, non-carbon materials gasify and are burned away. What remains is pure carbon – 40% of the carbon originally contained in the biomass.

Why is it so valuable?

Climate change is threatening food security around the world. When farmers use Biochar as a soil amendment they will benefit from:

- Bigger yields
- Healthier soil
- Lower acidity
- Better water retention
- Stronger plants
- Richer soil life
- Less contamination
- Higher fertility
- Promotes seed germination