

WORLDWIDE  *fruit*

Water Stewardship Case Studies

South Africa

**Case Study 7:
Waterford Farm**

Worldwide Fruit Limited are investing in Water Stewardship across their supply-base and will be presenting Water Stewardship case studies from supplying farms over the next 12 months. Their aim is to raise awareness of the challenges that South African growers deal with on a daily basis. Water management challenges and the solutions implemented to overcome them will be explored, but we will also see how growers are driving ongoing good management of water resources. Apart from water, case studies will also look at current sustainability strategies implemented and plans for improving sustainability into the future.

- Case study 1: Boomerang Fruits
- Case study 2: Dennegeur Farms
- Case study 3: De Keur
- Case Study 4: Dreem Fruit (Delecta)
- Case Study 5: Cerasus Farming (Stems)
- Case Study 6: Morgenzon Farm (Rubisco)



**The
Fruit Farm
Group**

Case Study 7: Waterford Farm (TFFG)

Summary

The Fruit Farm Group (TFFG) is an international business with operations in four countries over three continents. Waterford Farm is one of TFFG’s South African farms and is located in the KwaZulu-Natal midlands region, where they focus purely on avocados. For Waterford farm, water is critical to farm efficiently and be competitive in a pressurised market. Water use monitoring and recording is an important Key Performance Indicator for them. Even though the majority of Waterford’s water comes from rainfall, they do irrigate in the dry season, especially on younger trees. They have redesigned their irrigation system to gravity irrigate, leading to improved efficiency and massive electricity savings. TFFG also wants to be leaders in regenerative agriculture. With their farming methods, they aim to produce the healthiest fruit and vegetables nature can grow, while promoting soil health and combatting climate change.

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About TFFG & Waterford Farm

The Fruit Farm Group (TFFG) was created in 2014. With their diverse product portfolio, their operations are geographically spread in four countries over three continents. Across South Africa, TFFG has well-established, best-in-class farming operations located in strategic production regions. Six farms and five packhouses supply a wide variety of fruit throughout the year, such as apples, pears, avocados, and grapes.

Waterford Farm is one of TFFG's South African farms and is located in the Richmond region of the KwaZulu-Natal (KZN) midlands. The KZN midlands is a scenic region of farmland characterised by rolling hills, green pastures, forests, and an abundance of rivers, dams, and waterfalls. The region lies between Pietermaritzburg and the majestic Drakensberg Mountains, a 243 000 hectare mountain range that forms a formidable barrier between KZN and Lesotho.

We had the privilege to visit Waterford Farm and speak to Athol Currie, general manager at Waterford and TFFG's regional manager in KZN. TFFG acquired Waterford in 2008. It used to consist of two separate farms – Aloe Corner (a citrus farm) and Waterford Farm (a macadamia farm) – under two very different management systems. The two farms were amalgamated, and over a four year period all citrus and macadamias were removed. Waterford focusses purely on avocados now, with 100 of the 116 hectare farm planted with avocado trees. 80% of their avocados is from the popular Hass variety, while 20% consists of the Pinkerton variety. Pinkerton lengthens their season. Waterford is the most southerly avocado producing unit in TFFG and harvests last. Because the region is cooler, their fruit can stay on the trees longer and they can harvest up until December. In the northern regions (Limpopo province) they start harvesting as early as February. Waterford only starts harvesting Pinkerton in June and Hass in July.



The KwaZulu-Natal midlands is characterised by rolling hills, green pastures, forests, and an abundance of rivers, dams, and waterfalls. Photo: Carina Wessels

TFFG is also a 50% shareholder in a packhouse in the town of Richmond, where Waterford Farm packs all their fruit. The packhouse is 16 kilometres from the farm and is also supplied by four other growers.

Avocados are not very labour intensive. At the moment Waterford has 16 permanent skilled workers, consisting of a supervisor, four people responsible for irrigation, a few chainsaw operators, and tractor drivers. Waterford uses mostly seasonal workers during harvest time. They bring in 30 to 40 casual labourers from the local region.



Waterford's irrigation supervisor, Scelo Xaba. Photo: Carina Wessels

Water management

The majority of Waterford's water comes from rainfall. Similar to other regions in South Africa, Waterford has experienced two heavy drought years, however, this season has started off with very good rainfall. Irrigation is required more in younger blocks, as younger trees require a different watering regime. Waterford irrigates out of a private dam. The dam's main source of water is the Illovo river, of which they have water rights to. Water from the river is monitored and managed by their local Water User Association (WUA), the Illovo WUA. Athol mentions that they are very fortunate to have water rights. Some farmers in the region rely only on rainfall and it is a limiting factor, especially when you are getting to a pressurised market situation. "But we've never actually gone over our allocated water, which is hugely positive for us, especially looking at the two years we've come out of", says Athol.



Left: The Illovo river. Right: Young avocado orchard. Photos: Carina Wessels

For Waterford, one of the lessons learned during the drought was that they have been over irrigating their orchards. They invested in electronic probes to monitor soil moisture, and since then their water savings have been immense. When they started analysing the figures, they learned that they could cope with less water, even in drier seasons.

Even though avocados don't need as much irrigation in high rainfall areas, Waterford is concerned about challenges lying ahead. Previously the KZN midlands were almost dominated by dryland sugarcane production, but for various reasons (e.g., sugar tax etc.), many farmers are switching to macadamias now. These farmers will start to draw water from the Illovo river. "Luckily WUAs have enormous power and guys won't be able to pump water illegally", says Athol, and adds "I believe that if we all work together, if we monitor our irrigation properly, we don't over irrigate, we only give the tree what it requires, we are efficient, we check our systems on a regular basis, and if we record everything, we'll be OK."

Back in 2008, when they acquired the two farms that make up Waterford now, one of the main challenges was irrigation. The two farms had totally different irrigation systems, based on older technology. Some of the orchards were also dryland orchards. Therefore, one of the first things they did was to soil map the farms and plan irrigation upgrades. The idea was to make irrigation more efficient, to conserve water, but also electricity. They merged and redesigned the system. They started to pump into a holding dam at night (in South Africa there is the option to be on an off-peak electricity tariff to save on energy cost), and then during the day they would gravity irrigate from the dam. They use two very small (2½ kilowatt) pumps to boost the gravity irrigation system. This system led to higher water use efficiency and huge energy cost savings.



Left: Microjet irrigation under avocado tree. Right: Holding dam for gravity irrigation. Photos: Carina Wessels

Avocados in the high rainfall areas have traditionally been irrigated by microjet irrigation systems, however Athol tells us that there's quite a strong movement at the moment to drip irrigation. There are pros and cons for both systems, drip may lead to about a 10% water saving, but micros have other advantages. Because an avocado tree has got leaves all the way to the ground, you need to keep a nice cool mesic climate underneath the tree, which Athol feels micros are better suited for. "Especially in high rainfall areas, where it rains a lot for seven or eight months of the year, you get massive surface root expansion, but as soon as you go into winter and you go onto a drip system, you start reducing that root area. This is a problem for us, and that's why I prefer a micro system that wets the whole area under the tree", says Athol.

“Water is critical and without it you're not going to farm efficiently. You won't be competitive” – Athol Currie

Waterford is currently trialling with nets on three and a half hectares of their Pinkerton variety, as Pinkerton is very susceptible to wind, sun, and hail damage. Nets also have the added benefit of water savings through reduced evaporation. They have seen that the average temperature is around 5-6°C cooler under the nets, which is advantageous, as avocados prefer a cooler, more temperate climate. If the trial is successful and can improve their exports, they will put another 20 hectares under nets.



Three and a half hectares of Waterford's Pinkerton variety is currently under nets as a trial.
Photo: Carina Wessels

Regenerative agriculture

“We want to be leaders in regenerative agriculture” – Athol Currie

What is regenerative agriculture?

Regenerative agriculture describes farming and grazing practices that rebuild soil organic matter and restore degraded soil biodiversity. It has many benefits, such as improving the water cycle, and storing more carbon in the ground, ultimately aiding in climate change reversal.

The Fruit Farm Group - *Our regenerative farming methods aim to produce the healthiest fruit and vegetables nature can grow. At the same time, we foster living soil and functioning ecosystems that work to retain water and provide plants with the nutrients they need. We believe:*

- *Healthy soils produce healthy food*
- *A vibrant ecosystem makes our farms more successful*
- *The Regeneration of the Earth's natural resources is our responsibility*



Waterford avocados. Photo: Carina Wessels

One of the fundamental principles of regenerative agriculture is to reduce agrochemical and fertiliser inputs. One of the reasons other farmers are moving to drip irrigation, is that they put their fertiliser through their irrigation system (mineralised irrigation system). Athol argues that more often than not, too much fertiliser is applied through these systems, as farmers see their soil as a growing medium, instead of a living medium. “They are not promoting soil health, and that really goes against what TFFG is about essentially. With our fertiliser systems now, we really want to promote regenerative agriculture”, says Athol.

The avocado industry is very fortunate to spray very little, if any, pesticides. Generally, avocados have a very low pest recruitment potential. Because avocados do not ripen on the tree, they are too hard for fruit flies or false codling moths to sting or bite. In the KZN midlands particularly, no pesticides have been sprayed on Waterford Farm for 8 years. One of the big reasons for this is that they are not in a monoculture environment. This is not necessarily the case in the northern provinces, where there are wall-to-wall avocados, macadamias and bananas planted next to each other. Despite the fact that avocados are a poor host for most pests, pest recruitment from macadamias onto avocados can be a problem, usually as soon as the macadamias have been harvested.

Waterford Farm also stays away from herbicides and rather use mechanical mowers to mow underneath the trees if necessary. They are aiming to cover all their orchard floors with cover crops. Athol says that it's a whole mindset change from having these beautiful mowed pristine orchards before, to accepting it to look a little bit scruffy with the cover crops now. But he has learned to live with it. The benefits they get from that, and the beneficial insects living there, including predatory insects and pollinators, are numerous.

Regenerative agriculture encourages no tillage, as tillage releases stored carbon from the soil, accelerating global warming. Waterford has invested in no till planters for their cover crops. They have trialled various cover crops for the past 6 years and are now planting a subtropical cover crop mix that works really well. Cover crops have many benefits, such as to prevent soil erosion, regulate moisture, attract pollinators, assist in weed and pest management, serve as mulch and organic matter, add nitrogen, and it can be used for grazing or forage.

Athol says that they are probably two thirds of the way down their regenerative agriculture road. A next step would be to bring animals into Waterford's orchards. This will have its challenges, for example to keep the animals away from the trees and only in the rows, but the benefits are numerous. For example, animals would keep the grasses under control, and they also leave behind organic fertiliser which would allow Waterford to drastically reduce their fertiliser inputs. Furthermore, avocados are pollinated by flies, and animals would naturally increase the fly population. They have considered cattle and chickens, but sheep will probably be their best option as it will also diversify their income source. These will be grass-fed lamb, living off the orchard floor.



Waterford's subtropical cover crop mix in the foreground and avocado orchards in the background.
Photo: Carina Wessels

Climate change

TFFG has been aware for a while of the role that agriculture is playing in climate change. Concerns for TFFG include heat and decreasing rainfall with limited resources. They can already see the effects of climate change as they have to harvest earlier than usual. They are also seeing receding frost lines, and have not been experiencing the cold they are used to. Storms are also becoming more violent. There is definitely a concern around this as it impacts their export potential (blemished fruit cannot be exported). Other farmers are also planting crops where they never would have, which is putting pressure on resources. Athol thinks that going into climate change they will have to be aware of expansion with limited resources and manage their resources carefully.

TFFG have also been aware for a while of what they can do to play their part in slowing down climate change. They believe regenerative agriculture is the way to go. “It’s not just talk, it’s something we take to heart. We still have a lot to learn, but I think we need to play our part. Climate change is very real”, says Athol.

Final words on sustainability

According to Athol, being in a competitive market, it’s about quality, volume, and critical mass, but more importantly it is also about the story behind your operations. What you are doing to be more sustainable. However, it’s important that audits do not just become a box-ticking exercise, you’ve got to live them, you’ve got to make it part of your management too. For example, TFFG has incorporated the GlobalGAP programme into their management systems so that managers live it daily. “I think that’s where we’ve been quite successful”, says Athol. TFFG also uses Sherpa, an online sustainability management system, as their main sustainability platform (www.mysherpa.co.za).



Athol Currie, general manager at Waterford and TFFG regional manager in KZN. Photo: Carina Wessels