

WORLDWIDE  *fruit*

Water Stewardship Case Studies

South Africa



DENNEGEUR

Case Study 2:

Dennegeur Farms

Worldwide Fruit Limited are investing in Water Stewardship across their supply-base and will be presenting 12 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

Summary

Dennegeur is situated in the Elgin Valley, about 70 km southeast of Cape Town, in South Africa's Western Cape Province. Dennegeur has been in the family since 1948 and over the years they have progressed to high density production of mainly apples and some pears. They also have their own packing facility on the farm. With the help of an environmental consultant, Dennegeur has developed an Environmental Management Plan that speaks directly to the 3 pillars of Sustainable Development: Promoting **Social** and **Economic** wellbeing, while protecting the **Environment**. Their Social Investment Strategy includes a number of initiatives for adults and kids alike. Their Environmental Management Strategy consists of initiatives to promote biodiversity, maximise water use efficiency, and minimise negative impacts on water quality, to name just a few. Dennegeur has come a long way to being the successful business they are today, and some of the drivers of their success include irrigation scheduling, monitoring their systems and just getting the basics right.

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Dennegeur's History & Culture

Dennegeur is situated in the picturesque Elgin Valley, which lies about 70 km southeast of Cape Town. The Elgin Valley is an intensively farmed district and is renowned for its apple and pear orchards. Dennegeur started in 1948 with a 50-hectare farm and over the years has expanded to a combined unit of about 300 hectares. The first dam on the farm was built in 1952. Over the years Dennegeur has progressed to high density development, mainly apples and some pears. Dennegeur has also been packing fruit in their own packing facility on the farm, since the beginning of production.



View over Dennegeur Farms and the Elgin Valley. Photo: Carina Wessels

We had the privilege of visiting Dennegeur and had conversations with Stephan Beukes, Chief Executive Officer, Charl Koole, Head of Production, and Andrew Purnell, Environmental Consultant, to learn more of the challenges, successes, or failures they have experienced as a business, and what some of their plans into the future include.

Tell us about the history and culture of the farm and your journey to where you are today?

Dennegeur has a rich family history. Stephan's grandfather, Sas Beukes, bought the farm from his dad in 1948 and planted the first \pm 500 apple trees. Stephan's father, Josias Beukes, joined the business in 1973 and when grandfather Sas retired in 1976, Josias persisted in the expansion of the business to about ten times the size it started with. Stephan joined the business in 2001, after working in the UK in the fruit industry. Although Stephan started on the production side, he is now CEO of the business and his father, Josias, has retired fully about 18 months ago.

Social Investment at Dennegeur

“We’re a family business in essence, and people are close to our hearts. The fruit industry is a very labour-intensive practice and people, for us, is not only a key stakeholder, but also a pivotal leg of the success of our business. A lot depends on how you develop people, how you manage productivity, efficiency, and if you can also be an employer of choice.”

– Stephan Beukes

Dennegeur is not only passionate about their products, but also their local community. Some of their Social Investment Projects for kids include for example the Dennegeur Creche and After Care Centre, and for adults, a Training Kitchen and Farm Clinic. Dennegeur has also started an extensive environmental awareness drive, with environmental staff training, and environmental education for local kids. Future plans include an outdoor gym on the farm. It is clear that Dennegeur’s Social Responsibility Culture is part of their business strategy rather than a compliance strategy.



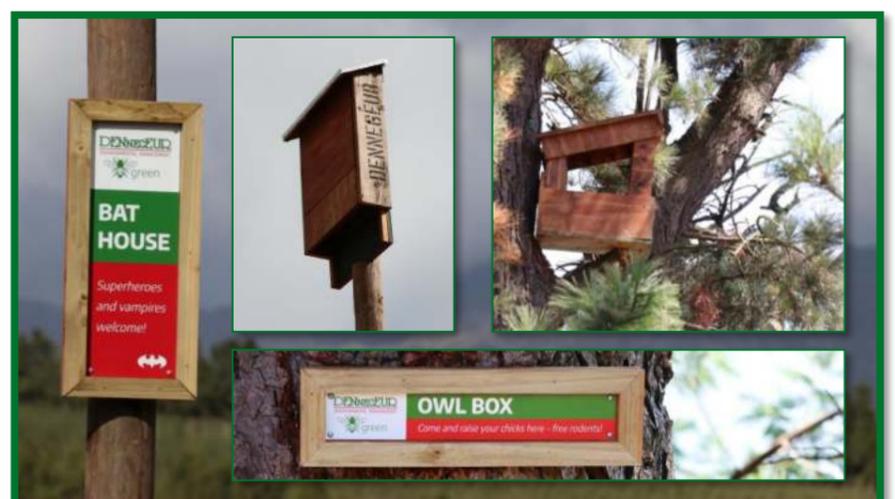
In-field training: staff would walk around the farm and learn to view everything through the eyes of an environmental manager.



As part of Dennegeur’s environmental education holiday programme, these kids helped build owl boxes and bat houses.



Local kids building a floating wetland as part of the environmental education holiday programme.



Owl boxes and bat houses are part of Dennegeur’s environmental awareness drive.

Photos: Dennegeur Farms

Environmental Management at Dennegeur

“We’ve always seen ourselves as stewards of the land we farm on.” – Stephan Beukes

A few years ago, Dennegeur employed an environmental consultant, Andrew Purnell, to assist them in delivering a more sustainable environmental output and making future plans that will allow them to farm hand in hand with the very biodiverse environment they found themselves in. The result was an Environmental Management Plan (EMP) to be proud of.

DENNEGEUR

ENVIRONMENTAL MANAGEMENT



The bee green icon, is Dennegeur’s environmental icon, developed for the purpose of creating awareness around the environment.

It became quite clear why the EMP is so exceptional when Andrew condensed its objectives for us: “We need to address the **impacts** of our **unique production and support processes**, on the **unique habitat and ecological systems** on and around our farm, within the context of **local environmental and socio-economic development** priorities”. It directly speaks to the 3 pillars of Sustainable Development: Promoting **Social** and **Economic** wellbeing, while protecting the **Environment**.

Andrew Purnell, Environmental Consultant, Eco Farms - “As Stephan said, they have always wanted to be employers of choice, I’ve always wanted to find clients of choice. And for me, the values I’ve experienced in working with the Dennegeur team, they’ve kind of incubated my whole Environmental Management business through their wholehearted commitment to what I see as the only right way of doing Environmental Management, so I’m also super grateful for that opportunity. At Dennegeur, although our approach is largely aligned with the ISO system, I think we’ve got something unique in the way that we approach things, we’ve got a very solid management tool.”

To develop the EMP, Dennegeur’s first step was a process-based risk assessment which identified about 218 environmental risks on the farm. These risks were ranked according to likelihood and consequence. Interestingly, water use or loss rated low. This is in part due to Dennegeur’s understanding of ecological water quality parameters, as water moves over the farm, in addition to the measures already in place to minimise water use for irrigation. At some stage in developing the EMP, Dennegeur also made use of the SHERPA tool: “The SHERPA tool provided us with some high-level strategic awareness, and it opened our eyes to some areas that we hadn’t necessarily picked up through our risk-based processes. So it was definitely useful.”

For more information see www.mysherpa.co.za



Photo: Dennegeur Farms

In line with their focus to foster sustainable communities and to limit their impact on the environment, Dennegeur has opted for solar energy to power their cold storage facilities.

“Our Environmental Management Plan is very action focused.”

– Andrew Purnell

As part of their EMP, Dennegeur focuses on a priority activity each year. Last year Dennegeur’s environmental focus was waste management. They did studies to determine their overall waste production and ultimately reduce it. They also implemented a really large separation at source recycling initiative with the 92 households on the farm, and developed household recycling posters for each household. A Soil Management Plant was also developed last year. Dennegeur chose to make water their environmental focus for 2021.

Water Management Strategy

The Elgin area has been blessed that they have never had a shortage of water on their farms. The Eikenhof dam, one of the main supplying dams in the Elgin Valley, was built in the 1970’s and is a 100% privately owned, privately built dam. An abundance of water is available through the Eikenhof Groenland Irrigation Scheme. All of the farm systems in the Elgin Valley are also very well designed so they can use water optimally.

Despite the above and the fact that water related risks scored relatively low on Dennegeur’s environmental risk assessment, as a scarce resource and in the regional context of climate change, Dennegeur management places a high focus on water conservation as part of their EMP.

The aim of Dennegeur’s water management strategy is to

- maximise the efficiency of water consumption
- minimise negative impacts on water quality

Maximise Water Use Efficiency

Dennegeur has come a long way to get to where they are today. Around 2006 they changed their infrastructure and started scheduling irrigation. It was trial and error in the beginning, but they quickly saw that after an hour the orchards would be wet all the way to the root zone. Their biggest problem was compaction of the top soil when they started to change their processes. They learned that the younger trees have to be irrigated for shorter times but more regularly. They also saw that certain trees would produce less than others and these trees would need special treatment. For example, these trees would be thinned first, extra fertiliser would be applied, or emitters would be changed for optimal irrigation.

Nowadays, Dennegeur's Head of Production, Charl Koole, and his production team, have got it all down to a science, giving just enough water at just the right time. Dennegeur has 2 onsite weather stations which provide them with a weather forecast twice a day. Maximum temperature and relative humidity are considered the two most important factors. For example, if the temperature forecast is over 27°C and relative humidity is under 30%, they will plan for early morning pulse irrigation of 6 rounds of 10 minutes each, for between an hour to an hour and a half, depending on the size of the area. Other key factors include for example the efficiency of the emitters and the state of the trees. Schedules are different between bearing, half-bearing, and non-bearing trees. Orchard layout is also important. Row and/or terrace orientation is designed for optimal water retention and controlled run-off. Regular mulching to reduce evaporation rates are also applied, especially to young orchards with minimal foliage cover. Wind rows are planted in prominent locations on orchard boundaries to slow down surface windspeed and consequently reduce drying out of the surface soil layer.



Harvest time. Photo: Dennegeur Farms



Harvest time. Photo: Dennegeur Farms



Charl Koole, Dennegeur's Head of Production, showing us their new water pumphouse. Photo: Carina Wessels

Minimise Negative Impacts on Water Quality

A number of related plans and initiatives form part of Dennegeur's water management strategy to minimise negative impacts on water quality and also contribute to overall water conservation:

Ecological water quality mapping - Dennegeur wants to understand the change in water quality as water move over the farm's natural systems, essentially requiring ecological sampling in the streams throughout the farm. Dennegeur has done two baseline studies, one in the wet and one in the dry season, giving them a good overview of water quality on the farm. They are also consistently gathering data which will ultimately allow them to determine trends over a longer period of time.

Constructed wetland - Packhouse waste water usually runs out into one of the natural drainage lines. Water quality tests have found that chlorine in the water is significantly reduced when it goes into the main drainage line, however, Dennegeur wants to reduce this chemical loading even more. For this purpose, they are planning a constructed wetland in an old unused dam. The area will be excavated shortly and planted with indigenous wetland plants over the next 2-3 months. This area is also close to a housing complex, where they possibly want to integrate biological treatment of sewage.

Waterless enviroloo systems - Dennegeur has started to install waterless field toilets (composting toilets) to reduce the use of chemical toilets in the field.

Maintenance schedule for farm machinery – To mitigate risks from sources or activities that could cause water (and soil) pollution, a regular maintenance schedule is in place with the on-farm workshop for all farm machinery to prevent pollution from oil leaks.



A key strategy in promoting good water and biodiversity management at Dennegeur, include the clearing of invasive alien plants, erosion monitoring and restoration planting. In the foreground is an alien clearing site, with restoration of natural vegetation in progress. Photo: Dennegeur Farms

Minimise Negative Impacts on Water Quality

Clearing invasive alien plants - Seasonal workers used to clear invasive alien plants on the farm, however these workers often did not have the knowledge of which species to remove, and Dennegeur ended up spending a lot of money with little results. Now, an Alien Clearing Plan is in place and systematically being implemented in the natural areas of the farm. Dennegeur now has their own inhouse specialist alien clearing teams, which consists of local young people, in order to promote job creation in the local communities. The income from the sellable alien wood gets directed towards Dennegeur's environmental budget and the wood scraps get chipped up for mulch. Dennegeur has left a controlled cluster of Eucalyptus (originally introduced into Southern Africa from Australia) as this cluster is not directly in a drainage line or water course. The value of these trees in terms of bees and other biodiversity is higher than the amount of water it uses, and a variety of raptors also roost there.

Erosion monitoring and restoration planting - Alien clearing is of course only the first half of the story. Dennegeur has started with post alien clearing erosion monitoring to identify priority areas for restoration planting, and the installation of erosion control measures. Dennegeur also has a Restoration Management Plan, which includes planting of indigenous trees from the Western Cape Department of Agriculture's LandCare programme in certain conservation management areas on the farm. The Restoration Plan also includes the development of an [Elgin Shale Fynbos](#) nursery. The aim is that the nursery be used for restoration planting, but also be a job creation opportunity project, and hopefully inspire other farms in the area to buy plants from there to plant in their own alien clearing sites.



Left: Dennegeur's alien clearing team. Right: The restoration nursery. Photos: Dennegeur Farms.

[Elgin Shale Fynbos](#) is a critically endangered vegetation type, due to most of its original habitat being transformed for agriculture, forestry and the construction of the Theewaterskloof and Steenbras dams. It is only found in the Elgin Basin east of Grabouw, and the Villiersdorp Basin around Vyeboom, with a few small pockets outside these regions.

Biodiversity Management Strategy

Conservation areas make up almost 25% of the Dennegeur farm and include aquatic and terrestrial natural areas. Many of the already mentioned initiatives also contribute to Dennegeur's biodiversity management strategy, such as their extensive environmental awareness drive, clearing alien invasive vegetation, and restoration of natural habitat. Other projects include biodiversity monitoring through [iNaturalist](#). Through this programme they have identified one of the last remaining populations of the flowering plant *Aspalathus monosperma*. Now, Dennegeur is particularly focussing on alien clearing and natural habitat restoration in the area where this plant occurs. Although it is a very nondescript little bush, it is nice to know that Dennegeur has a super-rare species on the farm and is trying to protect it.



Dennegeur is using a repurposed apple bin, placed next to a small well vegetated dam, as an “Insect Hotel”. It includes a wide variety of “crawl spaces” for insects to utilise and the back of the bin is filled with pine cones, which provide great structural habitat.

Photos: Dennegeur Farms



Dennegeur has a very strong focus on managing soil moisture and oxygen levels, to promote soil biodiversity and good water management. If these levels are kept at optimum, it promotes soil microbial activity, which encourages macro-organisms (such as earthworms), which help with soil compaction, and which stimulate root growth. The following is thus monitored on a daily basis:

- Soil moisture (scale of 1-5)
- Root growth
- Is natural composting taking place
- Are earthworms present
- Are fungal threads visible
- Are compaction layers visible

To further promote the activation of micro-organism activity, compost is applied when planting new trees. During the first 5 years after planting, compost and mulch is applied twice. Fertilizer application is also informed by comprehensive soil and leaf sample analysis. This is to ensure minimum sufficient quantities are applied for crop load and tree growth, and to reduce the risk of eutrophication.

The Biggest Driver to Dennegeur's Success

“Since 2006, the biggest driver to our success in terms of production was probably irrigation scheduling. If you take the same orchards that was in the ground then and is still in the ground now, we’ve doubled our production on those orchards. But not only scheduling, also monitoring our systems, and getting the basics right.” – Stephan Beukes



Charl Koole, Dennegeur's Head of Production (front) and Stephan Beukes, Chief Executive Officer (back).

Photo: Carina Wessels



Charl Koole, demonstrating the benefits of mulching, especially on younger trees with little foliage cover.

Photo: Carina Wessels



Photo: Dennegeur Farms