

Springlands Farm

Situated in the district of Waipounamu is Springlands Farm. This farm is 450 hectares effective area and has a soil type that ranges from light, free draining soil near the river, which is very recent and high in nutrients, to heavier silt loams on the terraces. The farm is run as a sheep, beef and dairy grazing farm. It is owned by Gavin and Kylie Tayles and is managed by Dave Ingham. Springlands' stocking rate is eighteen stock units to the hectare throughout the year and is increased to twenty-seven stock units to the hectare in the winter when the dairy cows are wintered on farm. Each year 60 hectares of winter crop is planted for their own stock and other farm's stock. This is an important revenue stream that creates economic viability and sustainability of the business. Some of this revenue goes back into the farm to pay for things like a new tractor with AdBlue which helps to reduce potential risks that can negatively affect Springlands' soil, air, living organisms and water. They do this as it helps achieve their goal, environmental sustainability doesn't happen without economic sustainability. If you can't create a system that is economically sustainable, then eventually the business will go broke and there will be no money to care for the land. The reason this is their goal is because they want to leave the farm in a better state than what they found it for future generations. They believe that a healthy farm equals a healthy planet that will look after them.

Soil is a very important factor of Springlands. It is what supplies the essential nutrients, oxygen, water and root support that the farm's plants need to grow and produce high yields for animals to eat. The soils on this farm are recent soils that range from light, free draining soils that are high in nutrients close to the riverbed to heavier silt loams on the terraces. The soil is naturally low in organic matter, below 2%. Due to organic matter being very important in the way that it is a natural sponge that holds water in the soil, it adds nutrients to the soil and is a home/attracts more microorganisms to the soil there are management practices in place that add organic matter. An average amount of organic matter would be 2-4% but if they added more than this to get the percentage greater than 5% their soil would be high in organic matter which would be good. A simple way that organic matter is added to the soil is via stock manure. When the stock graze the paddocks, their manure is added to the soil, adding organic matter and nutrients to the soil. Another way organic matter is added to the farm's soil is by winter grazing. Winter grazing on this farm consists of stock being break fed on fodder beet as well as receiving bailing. After the paddocks have been fed off there is crop and bailing residue left on the soil that breaks down and turns into organic matter. Although winter grazing is good for the soil in the way that it adds organic matter Dave must be careful that the soil isn't damaged from, pugging, becoming waterlogged and being cultivated. To prevent these potential risks there are plans in place. To prevent water logging and pugging the stock are back fenced so that they don't keep tracking back over the same soil. The bailing is put out before winter at the opposite end of the paddock to the stock so that the tractor isn't getting driven over the same uncovered soil each day, reducing tractor ruts and compaction of the soil. Before the start of winter Dave takes into consideration what the soil types are that the crop is in and then depending on if it is a light or heavy soil, he will decide what stock class to put on that paddock, i.e., a lighter animal such as calves will winter on a heavier soil that is prone to pugging rather than a heavier animal like dairy cows. Once a paddock of crop has been eaten it is cultivated. Depending on the soil type, nutrients and location the paddock will either go straight back into new grass or back into fodder beet then kale, then chicory then new grass. This crop rotation results in a healthier soil as different species add more nutrients and break the cycle of unwanted pests and diseases. When cultivating Dave uses a ripper. This breaks up the deeper soil and aerates the soil which repairs any pugging that was

made, freeing any waterlogged soil which allows more nutrients and microorganisms to enter the soil. It also allows for plant roots to travel deeper into the soil resulting in them being able to access more water and nutrients resulting in faster growth and higher yields. If all of the crop paddocks are producing higher yields then less paddocks are needed to be put into crop each year, reducing potential damage to the farm's soils. When a paddock is going from grass into crop it is ploughed but this can cause soil erosion, the loss of nutrients and microorganisms due to the exposure of weather conditions and when a paddock is ploughed, approximately three Tonnes per hectare of carbon dioxide is released into the atmosphere. To help put a stop to these problems and reduce the amount of carbon dioxide being released Dave has started to try direct drill the fodder beet.

One aspect of the environment that the owners, Gavin and Kylie as well as Dave the manager, want to look after on Springlands Farm is the air. They have taken into consideration what releases bad elements into the atmosphere such as tractors, urea, and stock and how these can be reduced. Tractors on Springlands farm are used quite a lot in a year for cultivation and numerous other jobs. Each year roughly ten thousand liters of diesel is used by the tractors. This results in pollutants such as nitrous oxide being released into the air. To reduce these pollutants, they direct drill paddocks which results in a lot less tractor hours therefore less diesel being used which results in less pollution. Another thing that they are doing to reduce this is that Gavin and Kylie have purchased a new tractor that has AdBlue. AdBlue reacts with the harmful gases that diesel makes and produces nitrogen, water and carbon dioxide which reduces the emissions by 95%. Another item that produces bad emissions is urea. If urea isn't washed into the ground properly then it can break down into ammonia which then goes into the atmosphere. This process is called volatilization. To mitigate this from happening urea is only applied to the paddocks at the correct amount that is needed (there isn't too much). Dave looks at the weather forecast before it is applied to make sure that there is going to be heavy dew or a small amount of rain to wash it into the soil. Doing this not only ends in a better result for the atmosphere but also for Gavin and Kylie who pay for the fertilizer as no fertilizer is wasted so they don't have to buy more. Springlands Farm is home to 12,500 stock units which consist of sheep, beef and dairy cows. All these animals are ruminants, so they produce methane which isn't good for the atmosphere. Sheep can produce up to 30 liters a day of methane and dairy cows can produce up to 200 liters. Rather than reducing stock numbers to reduce this Dave flushes the ewes well and looks after them so that the lambing percentage is increased. On average Springlands' lambing percentage has been 165% (excluding hoggets) which has increased by 15% in the last 3 years. This means that there can be less ewes on the farm. The young stock is looked after and fed to the best that they can be, which increases growth rates. This means that the weaning percentage is increased, and lambs can be culled earlier so they spend less time on the farm producing emissions. Which results in a smaller amount of kgs of greenhouse gases compared to one kg of product.

At Springlands Farm there are a lot of living organisms that need looked after. The soil contains many invertebrates such as earthworms (Lumbricus Terrestris) and living microorganisms (bacteria). To protect these organisms, herbicides, insecticides, pesticides and fungicides are carefully selected so that only the targeted species are harmed, not any of the positive species. Although grass grub (Costelytra Zealandica) is something that Springlands struggle with, the decision has been made to maximize grass production rather than to spray it with diazinon as this chemical kills all microorganisms. One thing that helps maximize grass production is the on-farm beehives. The farm provides a good healthy environment for the bees and the bees help pollinate Springlands' pastures. Around the farm there are

numerous bait stations which are used to control possums (Trichosurus Vulpecula) and rodents (Rattus Exulans). This helps the present bird populations. There are sometimes sightings of owls (Ninox Novaeseelandiae) and the New Zealand Falcon (Falco Novaeseelandiae) as well as other native and exotic birds. Not far from Springlands Farm there is a protected black billed seagull (Chroicocephalus Bulleri) colony. Black billed seagulls are endemic to New Zealand and are the most endangered gull in the world. Having bait stations on the farm helps to reduce the gull's predators, helping the population from going extinct.

Water is a treasured part of Springlands Farm. This is because approximately one kilometer of the Mataura River boundaries the farm. It is culturally significant to Ngai Tahu and the local Hokonui Runanga which they once used as a food gathering area where eels (Anguilla dieffenbachii), kanakana and koura (Paranephrops planifrons) could be caught. Today it is still used by the local community for this as well as duck shooting, swimming, boating and fly fishing. The Mataura River is also an important water source for local towns. To protect the river at Springlands from nitrates leaking into the water and stock damage it is permanently fenced off with a twenty-meter buffer zone. This buffer excludes stock from the water preventing any damage the stock could make. Buffer zones are abundant with organic matter, high levels of moisture and fine textured soils, these components are perfect for filtering out nitrate. The buffer zones at Springlands reduce the amount of nitrate that enters the water. This helps the nitrate levels in the Mataura River either stay at 1.3mg per liter like they have the past three years or be reduced. Which is a really good level as nitrate levels less than 50mg per liter are safe to drink. It also creates a catchment zone for any runoff or sediment from the farm. In summer the heat can cause algae blooms. To prevent this from happening there are willows planted along the riverbank which provides shade for fish and cools the water, preventing algae blooms. The willows also help to filter out nitrate before it reaches the water. The Mataura River is known to flood several times a year. This can cause a lot of damage to the waterway and surrounding area. To prevent damage, all the fences close to the river are two wires, this prevents the amount of debris that can get stuck and is cheaper to fix than a standard sheep fence. When there is a hole dug for the farm's waste Dave makes sure that it is not dug anywhere that floodwaters can reach this stops unwanted waste entering the water. When Dave hears of heavy rainfall that is coming, he is able to look at the Cattle Flat water meter 24 – 36 hours before a flood. This gives him information that can help him make decisions on whether he needs to move stock to higher or further away ground.

To Conclude Springlands Farm is an important part of Gavin and Kylie Tayles and Dave Ingham's life that they look after to sustain it for future generations. There are many different factors that have the potential to cause risks related to the 450 hectare farm's soil, air, living organisms and water but they have lots of different plans in place that mitigate these risks. Such as twenty meter buffer zones next to the river that mitigate the risk of stock damaging the water and nitrates entering the water. They farm with the thought that a healthy farm equals a healthy planet that will look after us. Because of this they take profits from the farm business and put them back into looking after the farm for things like mitigating risks rather than using the profits for themselves thus creating the healthy farm that looks after them.

References

Biernbaum, J. (2012). Michigan State University.

[Organic Matters: Feeding the Soil and Building Soil Quality \(msu.edu\)](https://www.maizecrops.org/organic-matters-feeding-the-soil-and-building-soil-quality)

Davey, F. (2020). Forest and Bird

[Black-billed gull ‹ Bird of the Year ‹ Forest & Bird](#)

Farming Online. (2014). Farming Online.

[Farming News - 20 per cent of world's CO2 from ploughing – soil scientist](#)

Ministry of Health. (2023). Ministry of Health

[Nitrate in drinking-water | Ministry of Health NZ](#)

Reay, D. (2006). GHG online.

[Methane - Ruminants \(ghgonline.org\)](https://www.ghgonline.org/)

Southland Express. (2023). Southland Express

[No need to worry about water nitrate levels: council | Southland Express](#)

Watson Fuels. (2023). Watson Fuels.

[AdBlue | Watson Fuels](#)

Vandette, K. (2017). Earth.com

[Natural buffer zones can filter nitrates from groundwater • Earth.com](#)