Turning traditional cropping farmland into productive grasslands using tropical grasses, multispecies pasture cropping and saltbush

J Kirkby and L Kirkby

"Glenavon", Gravesend, NSW 2401: info@amaruladorpers.com

Abstract: *This paper is about transitioning traditional farming country and degraded native pastures back to healthy productive grasslands. There are several methods that can be utilized including multispecies cover cropping, multispecies pasture cropping and the establishment of tropical grasses. There are many challenges that are faced along the way, but the rewards and the benefits of a healthier ecosystem by swinging back to forages, far outweigh these.*

Key words: soil health, soil biology, groundcover, rainfall use efficiency, Dorpers

Introduction

After the purchase of a small farm in 2004 and the neighbour's farm in 2008, we were the owners of 890 ha of Gravesend farming country, 50 km east of Moree. Both farms were rundown with poor soil health due to constant ploughing, use of chemicals, lack of groundcover and nutritional grasses. Grain cash crops were originally grown, but good profits were usually thwarted by the weather. Our main business was Amarula Dorper Stud, so our objective was to swing our bare soil back to grass. We did try letting nature take its course through grazing, but the country was too degraded, and this method was very slow. We then introduced tropical grasses on farmland and started pasture cropping in the native grassland. Trees and saltbush were the next steps. Inadvertently we began to regenerate soil health and armour the soil for increased rainfall use efficiency and ultimately profitability.

Farm description

- Glenavon has an area of 890 ha and is located 50 km east of Moree, just south of the Gwydir River.
- Our annual average rainfall is 650 mm, usually a summer dominant rainfall with the remaining months providing generally even falls. Summer rain tends to be more variable than winter rain due to the incidence of thunderstorms in summer. The last three years have been very below average and getting worse as the drought continues. Year to date average is usually 310 mm. Our year to date rainfall to June this year has been 97 mm.
- Water access for livestock is excellent with a very good source of bore water that is piped to all 42 paddocks, with a portable trough system. The average paddock size is 15–20 ha. There are dams in some paddocks, but we do not have to rely on these. Our sheep prefer clean bore water.
- There are three soil types ranging from 60% black basalt, 30% red and 10% sandy loam, on a slightly undulating landscape.

Livestock

Amarula Dorper Stud was established in 2000 and is our main livestock enterprise. We breed Dorper and White Dorper sheep. We are currently running 800 stud ewes plus lambs and 300 young rams. Our moderately-sized, easy doing Dorpers are bred to cope in harsh conditions and be resilient to nutritional hardship. They are foragers and will eat bushes and shrubs and if managed properly can improve the species of plants within a pasture.

In the face of increasing climate variability, it is essential to have sheep which can both capitalise on good seasonal conditions but still perform under challenging ones. The Dorper can deposit and then utilise its body reserves when needed and utilise low-quality foods. This increases production rates from fewer inputs but also improves the survival and welfare of animals when faced with the harsh conditions of droughts in Australia. The less seasonal mating of Dorpers also allows producers more flexibility in matching the feed requirements

of the reproducing ewe to feed availability and allows mating systems to be altered according to seasonal conditions.

Pastures and/or forages for livestock

Tropical grasses. First established in 2008, we now have 250 ha of perennial tropical grasses including Premier digit, Bambatsi, green panic, Bisset and hatch creeping bluegrass, Floren bluegrass, and Rhodes grass. To improve the legume content of these tropicals, we have added clovers and medics with the hardiest being snail medics, rose clover and winter dormant old variety lucerne (Flairdale). We are seeing the native glycines flourish. Recently, we have successfully established perennial tropical legumes (Desmanthus) into our tropical grasses.

Native pasture. Our dominant grasslands are native pastures, with varying nutritional quality, including native bluegrasses, redgrass, plains grass, wallaby grass, to name a few. With our farming practices, we have seen native species including grasses, herbs, legumes and other plants returning.

Transitional farming country. We are using our new innovative farming practices on 150 ha to cover crop and turn this into productive grasslands.

Saltbush. We have established saltbush (along with tropical pastures) to increase drought tolerance, increase soil health, shade, shelter and water quality. It is a very drought tolerant plant that and can provide green leaf through the driest periods and especially the autumn/winter feed gap. It improves biodiversity and environmental sustainability. Dorpers thrive on saltbush.

Grazing management of these pastures is through rotational grazing strategies. This improves the flexibility of movement, increases the health of animals, the health of plants and soils and decreases the need for drenching.

Cropping

Conventional cropping methods have been used in the past, with oats being grown for fodder very successfully. But after attending a field day with speakers Colin Seis and Judy Earle in 2006, our quest began to implement new farming methods. We now use no synthetic fertilisers or chemicals.

Pasture cropping. This is done with a single crop species, usually, oats, into a perennial grass base improves soil structure, soil carbon, nutrient cycling and more efficient use of water while producing good crops for forage. This technique has increased our perennial grass species diversity and density while decreasing farming costs and increasing soil health.

Multi-species pasture cropping. This was experimented with when Justin discovered Gabe Brown and Ray Archuleta. This farming system mimics the native pastures where there is diversity, not a monoculture. We now use at least 10 or more different groups of plant species that produce good quality forage and have a range of different root systems. This includes broadleaves, grasses, fibrous and taproots, legumes, flowering plants and others to diversify our fodder cropping system. The greater the diversity of plants the greater diversity of microbes and the more robust and healthier the soil ecosystem.

Multi-species cover cropping. This is essential to rebuild soil health in degraded farming paddocks. The use of multi-species cover cropping will armour the soil, build soil health, organic matter and soil microbes. Once this is established, we can establish our tropical grasses and legumes. We have now eliminated the use of synthetic fertilizers for five plus years and chemical sprays for the last three years. All these methods grow more nutritious forage for our Dorpers. The intention is to split paddocks further, using temporary fences and solar powered gates, to increase the production of live-weight per ha. Livestock are integrated into this system to forage and trample excess herbage into groundcover. In our system, there is no such thing as a weed. We utilise our Dorpers to clean up our farming paddocks to remove spray resistant plants such as fleabane, barnyard grass and others.

Drought strategies

Our main drought strategy is to adjust our stocking in response to the 'rolling rainfall total'

and not rely on the average rainfall. There is no such thing as average. Our climate is getting hotter and dryer. As the 'rolling rainfall total' begins to decrease and forage reserves start to become depleted, destocking becomes the tool to maintain groundcover and conserve fodder in the paddock. Prior to the drought, we were running over 2000 Dorpers and 100 cows and calves. In early 2018 we started a destocking program, which has seen a steady decrease in our livestock numbers. This is to preserve our groundcover for a quick recovery when it does rain. Other drought strategies include early weaning and feedlotting, confined paddock feeding in sacrifice paddocks and more and more saltbush in the future.

Goals or business objectives

Out of adversity, comes opportunity. With the prolonged drought our end goals have changed with profit not production being our main driver. You don't have to be the biggest or the best and produce the most. It is all to do with profit at the end of the day.

Our short-term goal is to make it through this drought and maintaining groundcover and grass. This gives the land the ability to recover and regenerate quickly once the rain decides to fall. We also can take advantage of smaller falls as you need to maintain water infiltration and not let it all run away.

Our medium-term goal is to establish more saltbush in our native pasture country, for more resilience to drought, but also improved biodiversity and increased fodder reserves within the paddock. Also, to continue regenerating degraded pasture and establishing more tropical grasses, increasing organic matter and soil carbon.

Our long-term goal is to have all our land covered by biodiverse grasslands (either native or introduced tropical) along with more trees and saltbush established back on all our land. This leads to better guardianship of our natural resources and producing healthy highly nutritious food and livestock.

The swing back to forages

When we bought our farm in 2004, we were still following conventional farming methods of cropping with oats for fodder and wheat or barley as cash crops. Our soil was very much degraded with a soil carbon of 0.7% and the native pasture was taken over by less nutritious and desirable plants such as wiregrasses, spear grasses and kerosene grass. Most of the soil was scalded bare and brittle. The catalyst for change began as we were not making money from our crops and we needed to improve our pastures for our livestock health. Along came Colin Seis, Judy Earle, Christine Jones, Bart Davidson, Gary McDouall to name a few and in the last four years Gabe Brown and Ray Archuleta. These people have made a huge impact on our swing back to forages and the methods we have adapted to our farm to make these changes.

The initial obstacles to establishing our tropical pastures were the cost of seed and preparation of the soil prior to planting. Luckily, we were successful in obtaining grants from the CMA for seed costs. The biggest obstacle of all with establishing any pasture is rain. In our opinion, the establishment of good tropicals comes down to luck. You can prepare efficiently, but if you don't get the rain and follow up rain, then it can fail. Luckily, we can easily fix our native pasture through the simple use of multi-species pasture cropping.

The biggest opportunity we see for swinging back to biodiverse grasslands is the increasing health of our soil. Better soil health and diverse ecologies build resiliency into our farming operation and improve productivity, but more importantly profitability. Better soil health, higher organic matter and hence carbon increases infiltration rates, increases the water-holding capacity of the soil and therefore ultimately drought proofs a property. Our methods of farming have made it possible to weather most dry periods, while still being productive. There will be other droughts and next time we will have built resiliency into our natural resources with our management practices.

The future

The future is exciting. We have just won the North West Landcare award for excellence in farming for 2019 and go to the State final in October. This

gives us acknowledgment that we are on the right path. Our journey into regenerating our soil, plants and land doesn't stop now. Yes, we have been successful using new farming techniques and sustainable agricultural practices with the positive outcomes of improved environment and profitability. However, we are still learning and educating ourselves to look for more efficient methods of establishing grasslands.

Conclusions

Swinging back to forages and grasslands has been the most important change and challenge to our farm. The drought has tested our farm, soil and vegetation. We have still been productive but have had to destock and feed grain to remaining Dorper Stud Ewes while they are lambing, to retain our ground cover and recovery ability of our ecosystem. We will continue our journey and learn from failures and trial better establishment methods of tropical and native grasslands in our transitional farming country. Ultimately, the end goal is leaving our grasslands and other natural resources better for future generations.