

MLA Producer Demonstration Sites

BACKGROUND

Stirlings to Coast Farmers (SCF) currently has several sites operating as part of our Meat and Livestock Australia (MLA) funded Producer Demonstration Sites (PDS). Jeff and Kate Stoney, and the Slade family are adopting electronic identification (eID) tags (NLIS) and Pedigreescan technology to discover what genetic gains can be made through selection of maternal genetics.

Selecting desired traits based on the dams' genetics is possible because eID tags make the process simple and cost-effective to match lambs and ewes accurately. SCF have been utilising the Pedigreescan system in this project, which works by measuring lambs and ewes passing through a checkpoint and the eID tag records the time of each pass. Based on the timing of the sheep passing through the checkpoint, we can match ewes and lambs with reasonable accuracy.

The Curwen family hosted a 'Grain and Graze' demonstration in 2018 investigating the use of dual-purpose long season wheat to improve early season feed availability. Results for a similar 'Graze and Hay' trial hosted by Jarrod Beech in the 2018 season are also in this report.

METHODOLOGY

Curwen's Grain and Graze

A small paddock was sown by the Curwen family to DS Pascal and Longsword wheat on April 12, 2018, at South Stirlings. This paddock was then split in half, with a temporary fence, so we could graze one half of the paddock. We ended up with four distinct treatments;

1. Ungrazed Longsword
2. Grazed Longsword
3. Ungrazed DS Pascal
4. Grazed DS Pascal

In addition, we added a replicated broad-scale variety trial, sown with the air-seeder, in the ungrazed section. We evaluated the grain yields and basic grain quality of the following varieties;

1. Longsword
2. DS Pascal
3. DS Bennett
4. ADV.08.008 (experimental winter-wheat from DowSeeds)

50 ewes were placed in the 'grazed' section of the paddock on June 15th and removed on July 20th. Due to the ewes being pregnant, we were unable to measure their liveweight at the time of entering the paddock for grazing. We used a Greensseeker to measure the NDVI readings which gave us an estimation of the relative biomass of each treatment on a certain date.

See table two.

Harvest yields were determined by harvesting the air-seeder strips (known area) and weighing using the SCF weigh trailer.

Beech Grazing Oats trial

The hay yield of two small paddocks of Tuscana oats, sown on the same day, were compared after one was grazed for a two-week period and one was not grazed.

The 7.5 Ha paddock was grazed between July 13th and 27th by 50 merino hoggets.

SCF researchers weighed all 50 hoggets on July 13th and recorded the weights. The sheep were weighed again when they were removed from the paddock on July 27th.

Slade eID site

The Pedigreescan unit was set up at a gate-way leading to a water point in spring 2018 (See figure three). The Slade's stud ewe flock already had eID tags installed while the new season lambs had eID tags fitted prior to the demonstration. The mob had approximately 400 ewes.

The Pedigreescan unit operated from the 14th of September until October 2nd, averaging 1200 reads per day. Results will be analysed from livestock consultant Jonathan England to give an indication of how many matches were made in the mob and what level of confidence the software has in the match.

Andrew Slade will be DNA testing the lambs and ewes from the same mob so we will be able to compare the accuracy of the Pedigreescan unit to DNA matching. This was not part of the original scope of the project but adds an extra layer of data that most farmers will be interested in knowing.

Stoney eID site

Unfortunately, the planned PDS with Jeff and Kate Stoney did not eventuate in 2018 due to them experiencing a very poor season. Although a second eID site was sought we were unable to find an alternative in 2018.



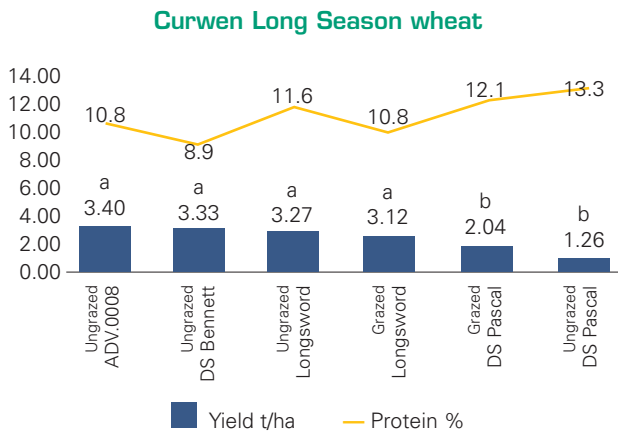


Figure 1: The grain yields (t/ha) of the Curwen Grain and Graze PDS at South Stirlings in 2018. The paddock was sown on the 12th of April and harvested on the 22nd of December. Poor yields in the DS Pascal variety were likely due to frost damage. Means followed by the same letter do not significantly differ ($P=0.05$ LSD).

RESULTS AND DISCUSSION

Curwen Grain and Graze wheat site

The results above indicate no significant yield difference between the grazed and ungrazed Longsword and DS Pascal treatments. However, the yields achieved in the paddock were below average for the region and it is highly probably that frost events decreased grain yields. South Stirlings suffered a very poor start to the 2018 growing season with dry conditions persisting until mid-June.

The variety with the shortest season-length in the demonstration was DS Pascal. Based on the higher yield in the grazed treatment it can be reasoned that the ungrazed treatment was severely frost damaged. The final yield of 2.04 (t/ha) in the grazed DS Pascal area is still a very poor result for the South Stirlings region. Frost was likely a major constraint on both DS Pascal treatments as well as the dry conditions after seeding.

The varieties tested in this demonstration, from shortest growing season to longest, are listed below. Visual observations of the ADV08.008 and DS Bennett indicate that neither variety were affected by frost. DS Pascal and Longsword appeared to have some frosted grains in the sample.

2018 results indicated the winter-type long-season wheat varieties were well suited to the April 12 sowing window. DS Pascal performed poorly when sown on April 12 in the South Stirlings district, with and without grazing treatments. This is important information to note as 2017 plot data, from a separate project, indicated that DS Pascal would perform well when sown in mid-April.

Table 1: Summary of the four wheat varieties tested in Curwen's grain and graze demonstration at South Stirlings in 2018.

Variety	Classification	Description
DS Pascal	APW	Early-season spring-wheat, suitable for a mid-April to early May sowing date.
Longsword	Feed	A fast maturing winter wheat.
ADV08.008	Unclassified	Winter awnless wheat, suitable for sowing from late March to early May.
DS Bennett	APW (eastern states)	Winter-type milling wheat. Ideal grazing variety with excellent re-growth and grain yield recovery after grazing.

Table 2: Normalised Difference Vegetation Index (NDVI) for the Curwen Grain and Graze demonstration site in 2018. 50 Heavily pregnant ewes were placed in the paddock on June 15th and removed on July 20th with their lambs.

Date	Description	Longsword	DS Pascal
June 15th	Pre-grazing	0.43	0.42
July 13th	During grazing	0.37	0.59
July 20th	End of grazing	0.36	0.49

Longsword was grazed preferentially by the ewes during June-July 2018 (Table 2). NDVI readings recorded on July 20th, showed the sheep started to eat some of the DS Pascal wheat. This was probably because the Longsword wheat had been grazed out by the sheep.

Liveweight gains were not measured at the Curwen demonstration due to the ewes being pregnant at the time of entering the paddock. The wheat crop provided an excellent place for the ewes to lamb with access to feed, shelter and water.

SUMMARY

Previous work from the Grain and Graze projects have indicated that wheat flowering dates can be set back two weeks after heavy grazing. The sheep in this trial did not heavily graze the DS Pascal due to a preference for the Longsword variety. It is unclear if a heavy grazing would have delayed the flowering time enough to avoid the frost damage in DS Pascal last year, given there were multiple frost events. With an early sowing date, it would be less risky for farmers to sow a true winter type wheat that has either vernalization and/or photoperiod triggers to initiate the reproductive phase of development.

The Curwen family were happy with the experiment to sow wheat earlier than “normal” and graze it once. 2018 was a very tough season for local farmers who fed out record amounts of grain to maintain livestock condition. Grain prices were very high due to drought-like conditions across the country at the time, and this made green feed even more valuable. During the June-July period there was no other green feed available on the farm for the ewes to eat. The Curwen’s believe that having significant areas planted to long-season wheat is an affordable way to plan for, and mitigate, drought conditions.

Beech grazing oats trial

The Beech’s graze and hay demonstration site consisted of a 7.5Ha paddock of Tuscana oats, grazed by 50 merino hoggets for 2 weeks. The sheep were weighed onto the paddock on the 13th of July, at an average weight of 37.43kg and weighed off on the 27th of July with an average weight of 42.70kg, an average weight gain of 5.27kg per animal.

The oats were then locked up for the rest of the year and set aside for hay. Jarrod Beech cut the crop when it was still quite green due to contractor availability. His final hay yield was 7t/ha on the 20th November. Jarrod estimated it was worth \$180/t which meant his gross revenue was \$1260/ha plus the two weeks of grazing value.

An adjacent paddock of ungrazed Tuscana oats was also made into hay and the hay yield was the same as the grazed paddock at 7t/ha.

Jarrod had some interesting observations about the Tuscana oats in comparison to Bannister oats which he grew in other paddocks. Tuscana stayed greener for a lot longer due to its longer season length. Jarrod feels this is a beneficial trait for the Tenterden/Kendenup area where they often have a longer Spring and cool temperatures during the October/November period. Despite a late break to the season the Tenterden area ended up having an excellent season in 2018.

All sheep grazed on the oats got the scours despite an up to date drenching regime. Jarrod is yet to solve this problem and he sees it as the biggest drawback to the grazing oats system. Jarrod wants to try grazing the oats earlier next year to make sure the crop doesn’t build up too much biomass before the sheep graze it. He speculates that keeping the biomass shorter for longer might help the sheep become accustomed to the richness of the feed.

Jarrod was extremely happy with his final hay yield and was surprised that there appeared to be little difference between the grazed and ungrazed paddocks of Tuscana oats. Jarrod will continue growing oats as a dual-purpose hay or grain and graze crop.

Slade eID site

Andrew Slade had great success in getting his stud ewe flock to move through the Pedigreescan race in 2018. Some ewes would have been through the race in 2017, which would have helped train others in the mob.

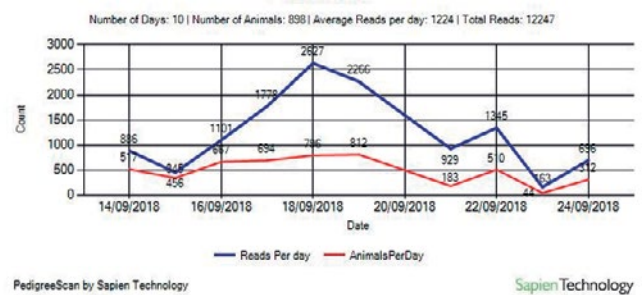


Figure 2: This graph was created by the Pedigreescan software by Sapien technology. Andrew Slade had 400 ewes in the mob and the average number of reads per day was 1224 between the 14th and 24th of September 2018 (10 days).

The excel files have been downloaded from the Pedigreescan reader and sent to Jonathan England (Next Generation Livestock Solutions) to match the ewes and lambs and provide a measure of accuracy for the match. At the time of writing this report Jonathan had not finished the analysis.



Figure 3: The Pedigreescan set-up by Andrew Slade at west Kendenup in 2018. Note the simple set-up Andrew used. Sheep had to pass through the make-shift race to get to the dam. This race was set up from September 14th to October 2nd, 2018. Photo courtesy of Andrew Slade.



Curwen Grain Graze 13th July 2018 (South facing)



Curwen Grain Graze 13th July 2018

WHAT NEXT?

Curwen Grain and Graze wheat site

The Curwen's have normally grazed barley crops for extra sheep feed early in the season. Due to disease pressure and declining yields, they hope to find a suitable wheat variety to replace barley as their grain and graze crop. DS Pascal wheat was considered a potential substitute to barley in their grain and graze system. In a normal sowing window of late April to late May it could fit this objective. However, the Curwen's are interested in long-season wheat varieties that will enable them to start their sowing program earlier and take advantage of substantial rainfall events no matter when they occur.

Through related long-season projects in conjunction with this MLA PDS project, SCF continue to find new varieties that need testing in our conditions. Two new winter type wheat varieties tested in 2018 were Illabo and DS Bennett.

At the Curwen 2018 site DS Bennett was not a stand-out, but it was a tough growing season in South Stirlings. In another farm-scale variety trial at west Mt Barker, DS Bennett topped the yields with an April 27 sowing date. DS Bennett yielded > 600kg/ha than the next best variety in the trial.

In another trial, Illabo was sown on June the 11th due to the late break to the season. The winter-type wheat was not expected to yield well due to the short growing season available after the late sowing date. As mentioned earlier in the report the Tenterden/Kendenup area had a very kind spring and Illabo was able to yield 5.24t/ha. This was much less than the top yielding spring-type wheat at the site which yielded 6.36t/ha. However, it shows that Illabo can maintain yield in a shorter growing season. We look forward to testing this variety with an earlier sowing date in 2020.

Slade eID demonstration

Once the Pedigreescan "Stockbook" analysis is obtained from Jonathan England we will be able to see which ewes and lambs were able to be matched and what degree of confidence the software has in each match.

Andrew Slade has taken DNA samples from his stud ewes and lambs, so their parentage can be determined. This offers a great opportunity to compare the results of the Pedigreescan with DNA testing. The Pedigreescan system is cheaper and easier than collecting DNA samples from the lambs and ewes. The accuracy of PedigreeScan will be key to Andrew Slade and others adopting the cheaper method for matching lambs and ewes.

In the last two years Andrew has completed the Pedigreescan work in September, so we can expect to be gathering the data in a similar time-frame in 2019.

Stoney sheep eID site

Jeff and Kate Stoney will be hoping for a much kinder season in 2019. Hopefully we can run the Pedigreescan unit again on Kate's lambs, so we can match them to the ewes. The aim for this project has been to match ewes and lambs so Jeff and Kate can measure the 100-day weaning weights of the lambs. The Stoney's want to use the information gained to cull ewes with poor performing lambs. This will hopefully drive productivity growth in the Stoney's prime lamb enterprise.

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