



Transitioning to Non-Mulesed Sheep

Producer case study: Managing dag

Project overview

The Meat & Livestock Australia (MLA) funded “Transitioning Towards Non-Mulesed Sheep” Producer Demonstration Site (PDS) project aimed to support sheep producers transition to non-mulesed (NM) flocks through utilising existing tools and resources available. Producers developed their own, property-specific transition plans and participated in regular group meetings to share experiences and improve skills.

Three “Towards NM Sheep” groups were run across Victoria and a fourth group was located in the South-West Slopes region of NSW. Producers had the opportunity to run a demonstration on their property to evaluate management and genetic options that could assist with moving to, and managing, a non-mulesed flock.

Clarifying causes and options to reduce dag

A common concern among all groups was crutching ease or getting contractors to crutch NM sheep, particularly if sheep had too much wrinkle or dag. There was also concern that being NM may lead to higher dag scores than in mulesed sheep. Apart from being a major risk factor for breech flystrike, dag increases costs of crutching and reduces income from soiled wool. Reducing breech wrinkle through breeding and selection, and investigating options to reduce dag, were priorities for many participants.

Many producers in the higher rainfall areas felt that their improved pastures may be a driver of dag in winter to early spring and wanted to evaluate if feeding fibre would reduce dag.

Scouring and consequent dag formation can have several causes. Identifying the cause of dag is important to work out appropriate management options. Causes of dag include:

- High worm burden – scouring associated with high worm egg counts (WECs) is most common in sheep less than 1-year-old and lambing ewes.
- Hypersensitivity scouring (low worm egg count scouring) – an immune reaction to worm larvae in some sheep. This is more likely to present in sheep older than 1-year of age. This condition is highly repeatable – the same sheep scour each year – and has a genetic basis.
- Bacterial infections or protozoan parasites.
- Diet/feedbase – forages that have been anecdotally associated with scouring include capeweed, forage oats and brassica crops. Perennial ryegrass, or sometimes phalaris, have also been associated with scouring in winter to early spring. The reasons why this occurs are not well understood. Some possible causes could be high quality lush feed (lack of fibre, high protein/nitrates), sudden changes of feed/pasture type (shifting from dead to green feed or to different amounts of feed on offer or different species), and in the case of perennial ryegrass can be due to toxins produced by fungal endophytes.
- Acidosis – from introducing grain too rapidly.

Selecting rams with low DAG and low WEC ASBVs as well as culling ewes (from 2–3 years of age) that repeatedly have high dag scores (due to being genetically hypersensitive) is the long-term strategy to reduce dag in the flock.

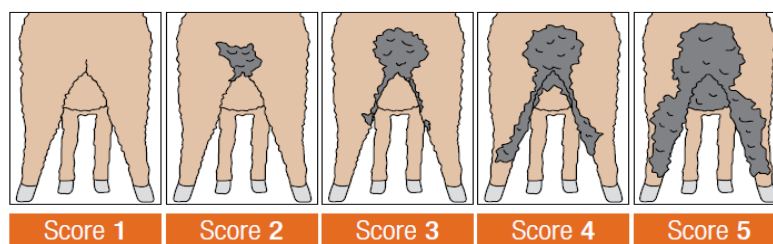


Image 1. Dag scores (Visual sheep scores, AWI/MLA 2019)

Demonstration site producers

Edward Blackwell, from Dunkeld in south-west Victoria and Gerard, Belinda Ryan and Joe Druce from Baynton, in central Victoria, conducted dag management demonstrations on their properties.

The Blackwells run a self-replacing fine (19 μm) Merino flock and ceased mulesing all lambs in 2017. Around 40% of ewes are joined to a terminal ram for prime lambs. They lamb in September and shear in summer. They started their NM journey in 2007, when they participated in an AWI breech clip trial (as an alternative to mulesing). In 2008 they decided to leave a portion of lambs NM but tail stripped only. In 2009 they decided not to mules but only tail strip the whole drop. By 2017 they were confident they could manage the flock without tail stripping.

They have been purchasing plain-bodied rams and classing out ewes with high dag and wrinkle over the years to ensure sheep are more suited to being NM. Daggy ewes are identified and “repeat offenders” go into the terminal mob. They crutch their own sheep so they can identify sheep that are too wrinkly which also go into the terminal mob.

“We didn’t want to become chemical reliant, so apart from fly chemical at marking, we don’t blanket treat sheep. We are more reactive with fly chemicals if we need them. We wanted to treat the cause and not the symptoms. Flystruck sheep are also classed out.”

“We wanted to focus on dag in the PDS as we felt we were not consistent enough with managing dag. It’s a cost – sheep take longer to crutch, adds to flystrike pressure and loss of wool value. Even though we were a long way down path of NM and thought we were pretty good with WECs to keep on top of worms and drenches, we didn’t know whether dag was due to worms, lack of fibre or plant morphology at the time of grazing. We focused on worm management to keep the demo simple.”
Edward Blackwell, Dunkeld.

The Ryans and Druces run a self-replacing fine (18 μm) Merino flock and a Coopworth flock turning off prime lambs. Currently, all Merino lambs are mulesed. Lambing is in August, shearing of adult sheep is in summer and weaners in April. They are working towards their plan to cease mulesing. More emphasis is being put on reducing breech wrinkle and dag to breed more breech flystrike resistant sheep. Maintaining fleece weight and fibre diameter are also priorities in the breeding objective. They are currently conducting a Merino sire evaluation demonstration to compare progeny from rams with lower EBWR ASBVs, and improved carcass traits, than their current ram source to evaluate the impact on wool traits.

“We wanted to focus on dag in the PDS as this is a big issue in our environment particularly in the weaner sheep. We need to get on top of dag before we can feel confident to cease mulesing. We do monitor WECs but wanted to rule out worms as a cause and see if feeding fibre in winter would reduce dag.” Gerard Ryan, Baynton.

Demonstration sites – methodology

This demonstration is relevant for flocks that have ceased mulesing or those still mulesing who have a high incidence of dag during winter and spring, particularly in the weaner sheep.

The demonstration aimed to investigate factors that may be contributing to dag and the effectiveness of improved worm control, or feeding fibre, during winter and early spring on liveweight and dag score.

This demonstration made use of a long-acting drench to rule out worms as a contributing factor for dag. This left the feedbase and bacterial infections as possible causes of dag to investigate.

At Dunkeld, in June 2022, 630 ewe weaners (2021 drop) were randomly drafted into three treatment groups of 210 sheep and identified by their eID tag. Treatments compared were the normal farm practice short-acting drench (SA), a long-acting injection drench (LA) with an oral primer drench, and a short-acting drench with a mineral supplement injection (SA + Min). Sheep were run as one mob and rotationally grazed. Standard farm practice was to provide fibre (hay) in the paddock in winter, so the effect of fibre was not investigated.



Image 2 Edward Blackwell, Dunkeld - PDS producer advocate and demo site host.

At Baynton, in July 2022, 200 ewe weaners (2021 drop) were randomly drafted into four treatment groups of 50 sheep and identified by their eID tag. Treatments compared were the normal farm practice short-acting drench (SA) and a long-acting injection drench (LA) with an oral primer drench. Sheep were run together in one paddock. The drench treatments were repeated for sheep allocated to another similar paddock where they were fed fibre (good quality vetch hay) in a hay feeder. When sheep were weighed and WEC samples taken, the mobs and paddocks were swapped over and the hay feeder moved. This was done to ensure paddock variation in worm contamination didn't bias the results. (NB: sheep had adequate green pasture available during the trial).

On both properties weaners had been recently shorn so were dag-free. At the start of the trial, sheep were weighed and a worm egg count (WEC) determined. Drench treatments were then applied. Follow up WECs were taken from each treatment mob every 30 days and sheep were weighed (NB: at Dunkeld, a bulk WEC was taken from the three mobs in the paddock on 26/9/22 as it was too wet to yard the sheep). A second short-acting drench was administered to the SA mobs on both farms based on the follow up WECs. The LA mobs received an exit oral drench on completion of the trial. Visual dag scores were assessed at the end of the trial based on the AWI and MLA 'Visual Sheep Scores' booklet (2019).

Results

Dunkeld

- Sheep in the two short-acting treatment groups were drenched twice during the trial based on the Day 1 and Day 30 WEC results. The long-acting group did not require follow up drenching during the trial period (Figure 1).
- The WECs for the two SA mobs increased to 780–810 e.p.g by the end of the trial (Day 130). This indicated that these mobs may have required a third SA drench at Day 90 to prevent this escalation in WECs (individual mob WECs weren't available at Day 90).
- The LA mob had a higher daily weight gain over the trial period and a lower average dag score than the two SA mobs (Table 1).

Table 1 Table 1 Weaner weight gains and dag scores at Dunkeld.

Treatment	Weight gain (kg) 23/6/22 to 9/11/22	Dag score 9/11/22
Control (short-acting Triple drench)	15.6	2.6
SA + Mineral injection (short-acting Triple drench + Min)	15.3	2.3
Long-Acting (LA moxidectin + Zolvix)	17.2	1.8

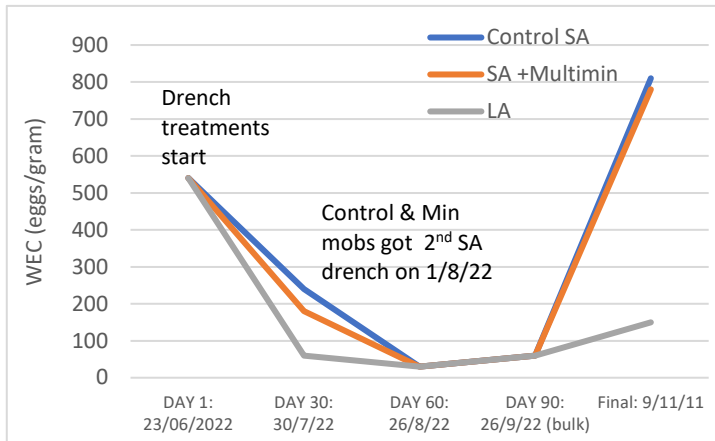


Figure 1 Worm Egg Counts (WEC) at Dunkeld.

“The take away message for us was monitoring for WECS, which we thought we were good at, but we were a bit behind the 8-ball. A week in a weaner’s life in the middle of August makes a difference as they can pick up worms very quickly and the dag starts to accumulate. We found that ruling out worms, with a long-acting drench, that not only were we getting a liveweight gain in the weaners but this reduced dag.”

“We need to be more vigilant with worm egg counting. We don’t want to blanket drench with long-acting drenches as this won’t do drench resistance any good. We prefer to use short-acting drenches on weaners and hoggets as we can run them in to drench anytime. Need to do more WEC monitoring – rather than at 5–6 weeks need to come in at 4 weeks to prevent dag accumulating by springtime.”

- Edward Blackwell, Dunkeld.

Baynton

- Sheep in the two short-acting treatment groups were drenched twice during the trial based on the Day 1 and Day 30 WEC results. The long-acting group did not require follow up drenching during the trial period (Figure 2).
- Over the trial period, the two LA mobs had a higher weight gain of 1.6–2.0 kg than the SA mobs (Table 2).
- Within a drench treatment, adding fibre reduced weights gains by 2.2–2.6 kg. The reduced weight gain would be due to sheep substituting good quality pasture for the hay.
- The best weight gain was in the LA mob which was 4.2 kg heavier than the SA + fibre mob.
- There was no difference in dag score between treatments (Table 2). As the SA mobs were being monitored closely for WECs they were drenched a second time before WECs escalated and this possibly prevented an increase in dag.
- Feeding fibre had no effect on dag score.

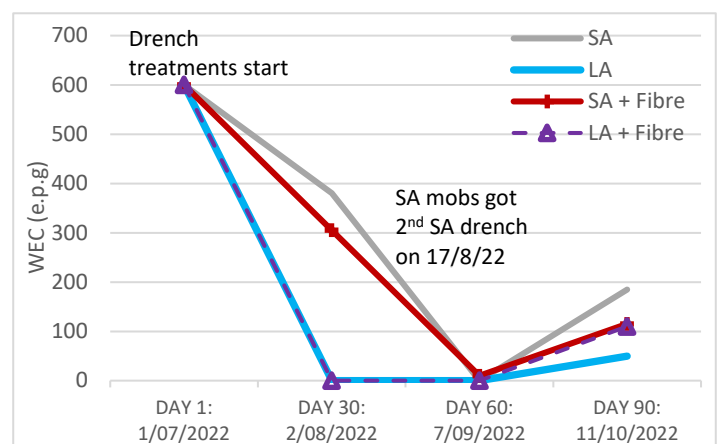


Figure 2 Worm egg counts (WEC) at Baynton.

Table 2 Weaner weight gains and dag scores at Baynton.

Treatment	Weight gain (kg) 8/7/22 to 11/10/22	Dag score 11/10/22
Control/SA (short-acting Zolvix drench)	12.2	2.1
Long-Acting (LA moxidectin + Zolvix)	13.8	2.0
Control/SA + FIBRE (short-acting Zolvix drench)	9.6	2.1
Long-Acting + FIBRE (LA moxidectin + Zolvix)	11.6	1.9

“In the demo we found our weaners had much lower dag than what we would normally see in winter/early spring with our usual WEC monitoring and drench program. The majority of the dag issue (in 2022) was worm-related and not due to the pasture. Feeding fibre was of no benefit.

“We will do WECs on the weaners more frequently such as every 30 days or so, rather than the 6–8 weeks that we normally take them, to be able to pick up earlier if the WECs are increasing and keep on top of the worms and dag

- Gerard Ryan, Baynton.

“Now we have recorded dag scores on individual sheep, we will be able to see if the ewes with higher dag scores will be ‘repeat offenders’ and can class them out.”

- Joe Druce, Baynton.



Image 3 Joe Druce and Belinda Ryan, Baynton – feeding fibre (vetch hay) to weaner sheep did not reduce dag but did reduce liveweight gains.

Conclusions

- The PDS methodology allowed the main cause of dag in the weaners to be diagnosed as being due to worms.
- Monitoring WECs every 30 days in winter/early spring allowed producers to keep on top of worms and prevent dag accumulating.
- Improved worm control increased liveweight gains by around 2kg during the trial period. This had a net benefit of \$5.18/head per year.
- Feeding fibre did not reduce dag but did reduce weight gains in weaner sheep by 2.4kg on average. Feeding fibre, without improving worm control, had a net cost of \$17/head.

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