Australian Wool Innovation Limited

MANAGING CHEMICAL RESISTANCE

CASE STUDY: REBALANCING FLYSTRIKE PREVENTION TOOLS IN A NON-MULESED ENTERPRISE

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PETER AND ANGELA SCHUSTER

Location:	Central West New South Wales
Property size:	5,500 ha
Climate:	Temperate
Rainfall:	600 mm annual average
Merino sheep:	Self-replacing fine non-mulesed Merino flock
Flock size:	10,000 sheep, joining 4,500 ewes to Merino rams
Merino wool:	Average 18-micron bright stylish wool

Peter and Angela Schuster operate a mixed farming and grazing operation across 5,500 ha south of Dubbo in Central West NSW, incorporating dryland and irrigated cropping as well as sheep and cattle enterprises. The average annual rainfall is about 600 mm which falls fairly consistently but not always reliably throughout the year.

The Schusters' main sheep enterprise is based on a Merino flock, with the sale of wool and surplus stock an important income source. The flock comprises about 10,000 sheep with 4,500 ewes to be joined to Merino rams in 2022. In 2016 the Schusters moved to a non-mulesed enterprise and in doing so have reconfigured their flystrike management approach.

Managing flystrike in a non-mulesed enterprise has been a learning curve for the Schusters. Mulesing is one tool in the toolbox when it comes to controlling flystrike and chemicals are another. Taking one tool out of the toolbox doesn't mean solely relying on another but rather, for the Schusters, it increases the importance of rebalancing the remaining tools in an integrated approach to flystrike management.

PROACTIVE APPROACH TO FLYSTRIKE

The Schusters have experienced periods where fly activity has extended throughout the year (such as in 2020). These years have reinforced the need for an annual plan to ensure they can implement a range of preventative activities in a timely manner. Labour shortages have also emphasised the importance of staying ahead of a problem by being proactive rather than reactive.

They proactively manage their flystrike risk through an annual plan that includes:

- annual shearing (double shearing for rams);
- annual crutching (double crutching for ewes but not lambs or wethers);
- careful attention to correct tail length when marking lambs;
- the use of preventative chemicals at defined times of the year and depending on fly pressure;
- rotation of the chemical groups used, including those used for lice control;
- a tight five week lambing and marking in a low fly risk month; and
- culling struck animals.

"There is no silver bullet when it comes to flystrike management and chemicals definitely aren't the only tool. Shearing, crutching, paddock selection and worm management as well as selecting sheep that are more resistant to flystrike are just as important," says Peter.

SHEARING AND CRUTCHING

Shearing and crutching are important preventative activities and the Schusters focus on carefully managing their relationship with shearers to ensure access when they need them. This includes developing an annual plan in consultation with the shearing contractor and then staying in touch with the contractor throughout the year to ensure the plan stays on track.

"We're careful not to cut things too fine so that we still have a number of weeks of cover from a preventative chemical application up our sleeve leading into crutching or shearing at high-risk times of the year so that if the contractor is held up, our sheep are still protected," says Peter. "We shear in May to optimise lambing rather than necessarily control flystrike but the short wool length at lambing does help reduce the build-up of afterbirth and stain which attract flies."

CORRECT TAIL LENGTH CRUCIAL

Flies are attracted to warm, moist conditions such as may occur around the breech, particularly in daggy sheep.

"Tail length is absolutely critical in a non-mulesed operation," says Peter who goes on to say, "Tails that are too short prevent the sheep, particularly ewes, from directing faeces and urine away from the breech leading to dags and urine stain which attract flies. A small portion of one age group of our sheep have tails that were docked too short at lamb marking. While not a problem for the wethers, this group of short tail ewes account for 90% of flystrike in the operation. The link is undeniable."

Cutting tails just below the fourth joint with a cauterizing hot knife is what the Schusters aim for at marking and they work closely with the operator to see that this is achieved. The cauterizing results in a bare tail butt and a wound which heals quickly with minimal blood loss.

"Short tails used to be manageable before we stopped mulesing but now getting the tail length right is the single most important practice to get right in our management of breech strike. We aim for a tail that is one or two joints longer than what we used to end up with when mulesing," says Peter.

"It's counterintuitive in a way that a longer tail than we were used to on mulesed sheep would help prevent breech strike on non-mulesed sheep but that's the way it has worked out. We've found that the sheep can expel faeces and urine more effectively and it may be that the tail wagging that the sheep are now capable of doing with a longer tail also helps repel flies."

CHEMICALS JUST ONE PART OF THE SOLUTION

The Schusters find they do not need to use a preventative treatment for body strike on mature sheep but do apply a backline treatment to lambs shortly after marking and will consider the need for an additional treatment on the lambs depending on the severity of the fly season.

"We keep an eye on young sheep up to classing in August but after classing and the removal of susceptible sheep, body strike is not usually an issue for us," says Peter. On the rare occasion body strike is observed, these sheep are shorn immediately and sold once they have fully recovered.

Rams are treated with preventative chemicals and shorn twice a year to minimise the risk of flystrike. Particular attention is paid to the poll of horned rams when applying preventative treatments.

Preventative chemicals are generally not required off shears in May but will be applied to the rams, ewes and wethers in August/September when the lambs are marked and also treated on the marked area.

The Schusters have not noticed any obvious signs of chemical resistance in blowflies, but they are proactively trying to avoid or at least delay the issue.

"While we have not seen an obvious shortening of the period of effectiveness of chemicals, we manage our expectations and don't push the envelope by running chemicals through to the expiry of the label protection period while high risk flystrike conditions prevail."

"We have had times when the chemicals have not performed to their label claims but can generally put this down to environmental influences including extreme weather events, paddock conditions, application error or underlying susceptibility issues. While we do our best, things still go wrong from time to time which means regular monitoring is essential," says Peter.

MANAGING OTHER PARASITES

Dags increase the risk of flystrike but are not generally a problem in the area except due to dietary changes and the Schusters aim to manage and minimise this risk by introducing sheep to new pastures or supplementary feeds slowly. "Transitioning to grain or grazing crops are high risk events requiring careful management. When we get this wrong, crutching is the only solution," says Peter.

Dags caused by scouring due to worms haven't been a problem in recent years as the main worm challenge has been caused by barber's pole worm which does not cause scouring.

Lousicides that are also registered for fly control have been incorporated into their flystrike management plan to manage chemical group rotation with notable success.

"We consider the chemical group we may have used for lice control when planning which preventative chemical group we will apply early in the fly season," says Peter.

BREEDING AND SELECTION KEY

Breeding and selection to reduce the number of susceptible sheep is also critical. The Schusters look to introduce rams and retain ewes that have the following traits:

- white, bright wool with good staple length;
- moderate skin development (body wrinkle); and
- broad backs with minimal breech wrinkle.

"Using an independent classer is very important as they see many more sheep and different types of sheep to us and can be more objective in their assessment of some traits. We work very closely with our classer to ensure they understand what we are working toward and have a long term (10 year) plan in place to improve our flock," says Peter.

"Moving to non-mulesed has changed the way we look at our sheep and requires attention to particular traits that improve their ability to resist flystrike including bright, white wool, low wrinkle and conformation, particularly along the backline and rear end."

MONITORING AND TREATMENT

Monitoring is another important activity undertaken during certain times of year to ensure any fly struck sheep are identified and appropriately treated to limit pain and suffering to the struck animal, minimise production losses and to reduce the fly population.

"We monitor our sheep closely and try to get around high risk mobs at least every couple of days, particularly at high-risk times. During these inspections we look for sheep that are behaving strangely, off by themselves or showing obvious signs of strike," says Peter.

Animal welfare is a critical part of the business but doesn't necessarily have to add to the workload. Wherever possible, monitoring sheep for flystrike is incorporated into other essential activities such as checking watering points, pastures and fences as well as during paddock moves.

Any sheep that are identified with flystrike are removed from the mob and treated.

If a number of sheep in a mob become struck, the Schusters yard the mob and treat the affected sheep. They then work to identify the underlying cause of the flystrike rather than presume chemical resistance. Some causes unrelated to chemical efficacy may include:

- incorrect application of the chemical;
- particularly favourable flystrike conditions;
- dags, caused by scouring or worms; or
- paddock selection (for example damp, still areas and the presence of grass seeds).

Central to treatment is the removal of wool from the fly struck area.

"If not enough wool is removed, you are wasting your time. We then treat with a knockdown chemical to kill maggots and bag the wool and maggots so they won't mature," says Peter.

"Workplace health and safety is an important consideration here as well. Regardless of the chemical being used we encourage careful handling according to the label instructions and with the appropriate personal protective equipment," says Peter.

Over the years, the Schuster's have found that if flystrike is not treated with a knockdown chemical even when the infected wool is removed, any remaining maggots can migrate and initiate new strike elsewhere on the sheep. According to veterinary advice and depending on the severity of the strike, they also often treat the affected sheep with an antibiotic and analgesic to combat infection, relieve pain and speed recovery.

THE FUTURE

"We're constantly learning and refining our plan based on our experiences. We don't assume we have it right or apply a set and forget policy as that is sure to deliver a poor result. We're constantly reviewing what happened each season and our plan and looking at what we can do better next time."

Market opportunities are starting to open up for the Schusters with increased demand for non-mulesed wool and accreditation opportunities. While this is not the motivating factor, the Schusters welcome the opportunity to present their wool to the market and take advantages of premiums which may follow from being accredited as non-mulesed.

"In response to enquiry via our broker and their encouragement, our wool is currently marketed through the Authentico integrity scheme and declared as non-mulesed via the National Wool Declaration (NWD). We will continue to monitor marketing opportunities as the non-mulesed sector expands and present our wool accordingly," Peter adds.

KEY POINTS

- Be proactive rather than reactive – have a plan in place.
- Have a short, timely lambing and get the tail length right at marking.
- Use an independent classer to remove susceptible sheep.
- Select for traits that improve the sheep's ability to resist flystrike.
- Use the full range of flystrike management tools.
- Don't set and forget – be prepared to change your plan.

Table 1: The Schuster's operational calendar for their sheep enterprise

Class	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Ewes	Crutch WEC*	Join (5 weeks) Dicyclanil (breech) WEC	WEC	Scan WEC	Shear Lousicide (off-shears) Vaccinate WEC	Move to lambing paddocks	Lamb	Dicyclanil (breech) Class maiden ewes	Class (wet/dry)	Class (wet/dry)	Non- Dicyclanil (breech) Wean Condition score	
Wethers	Crutch WEC				Shear Lousicide (off-shears) Vaccinate			WEC Dicyclanil (breech)		Drench		
Lambs	Crutch WEC				Shear Lousicide (off-shears) Vaccinate		Lamb	Mark Dicylanil (breech)		Vaccinate (booster) Dicyclanil (back)	Wean Drench	
Rams	Vet check Drench Dicyclanil (body and breech)	Join			Shear Lousicide (off-shears) Vaccinate		Dicyclanil (body and breech)			Purchase rams		Shear
Other	Irrigation	Irrigation	Irrigation Planting	Planting	Planting	Planting					Irrigation Harvest	Irrigation Harvest

*WEC = Worm Egg Count testing, drench if required