

The control of breech strike in unmulesed & clipped sheep (AWI Project WP301)

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Background

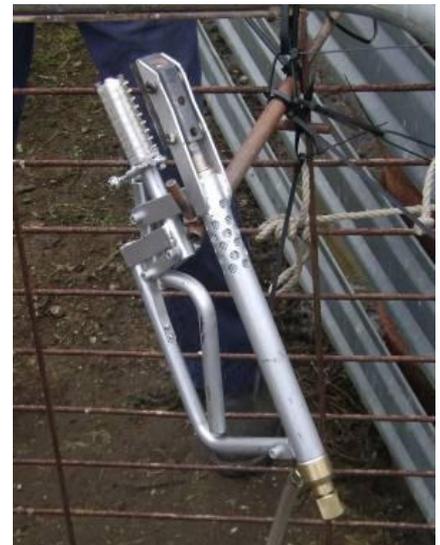
- 1) With unmulesed merinos in SE Australia:
 - Dag \Rightarrow increased risk of breech strike
 - Altered management – crutching, shearing, more supervision
 - Increased reliance on chemicals
- 2) Opportunity for better timing of chemical applications ('IPM'):
 - Routine treatments given to 50% weaners & 40% ewes (IPM-s survey)
 - Fly life-cycle \Rightarrow Early season treatment
 - no adult flies during winter
 - overwintered larvae emerge in Sep-Oct



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Study design (Oct 2008-Mar 2011)

- Three treatment groups in 3 Victorian flocks:
 - 300-400 sheep/ group
 - Ewes only Farms 1 & 3, also wethers on Farm 2
- Group 1 – ‘Mulesed + tactical treatment’
- Group 2 – ‘Clipped + tactical treatment’
- Group 3 – ‘Not mulesed + early season treatment’
(dicyclanil (Clik™) or cyromazine in Sep-Oct)



Aims of study

- 1) Measure prevalence of breech strike in unmulesed sheep given an early season treatment
- 2) Compare prevalence of breech strike of clipped sheep with the 'gold standard' (mulesed sheep)
[both groups treated tactically]
- 3) Assess risk factors for breech strike
- 4) Compare management & costs/ returns for the 3 groups

Observations

- 1) Prevalence of breech strike (spring & autumn)
- 2) Risk factors for breech strike:
 - a) Dag & urine stain
 - b) Breech wrinkle
 - c) Breech bare area scores & measurements
- 3) Production/ welfare:
 - a) Bodyweight, survival, fleece weight
 - b) Time to crutch & shear, weight of crutchings
 - c) Breech cuts
- 4) Fly numbers (Lucitraps™)

3 x spring-lambing merino flocks:

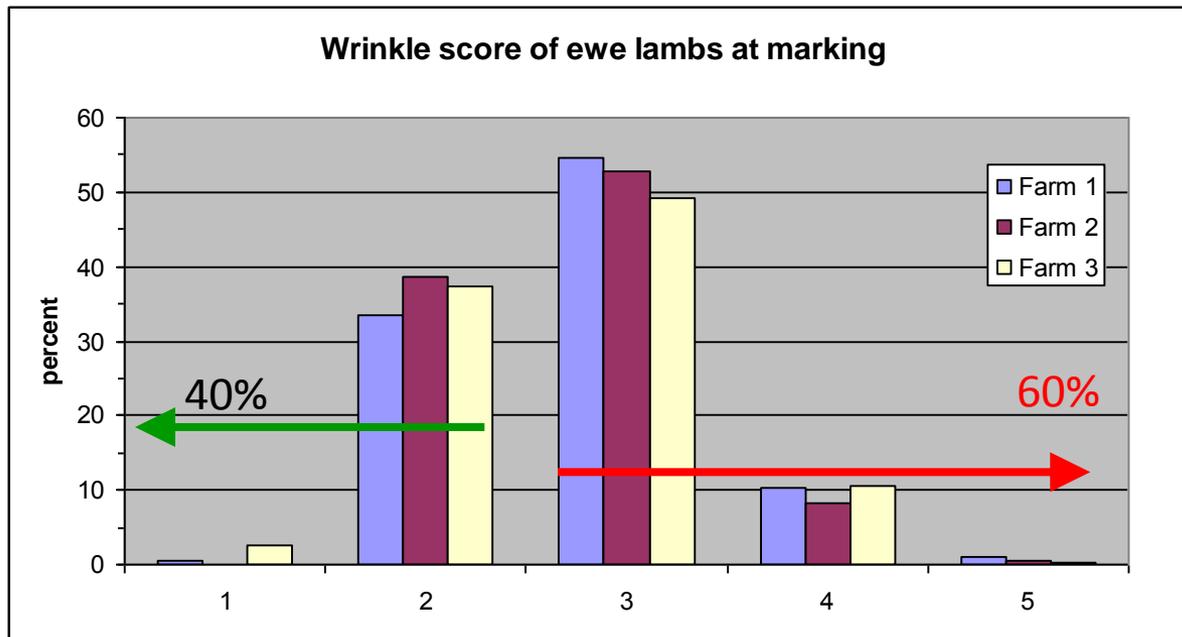
- 1) Coleraine, 680 mm; 18.5 micron – index breeds own rams using an index, shears March (weaners Mar)
- 2) Ballarat, 620 mm; 17.5 micron – traditional fine wool base flock, recently started breeding own rams, shears Dec
- 3) East Gippsland, 600 mm; 18.5 micron – medium-fine wool base & Hazeldean rams, shears Dec (wnrs March)



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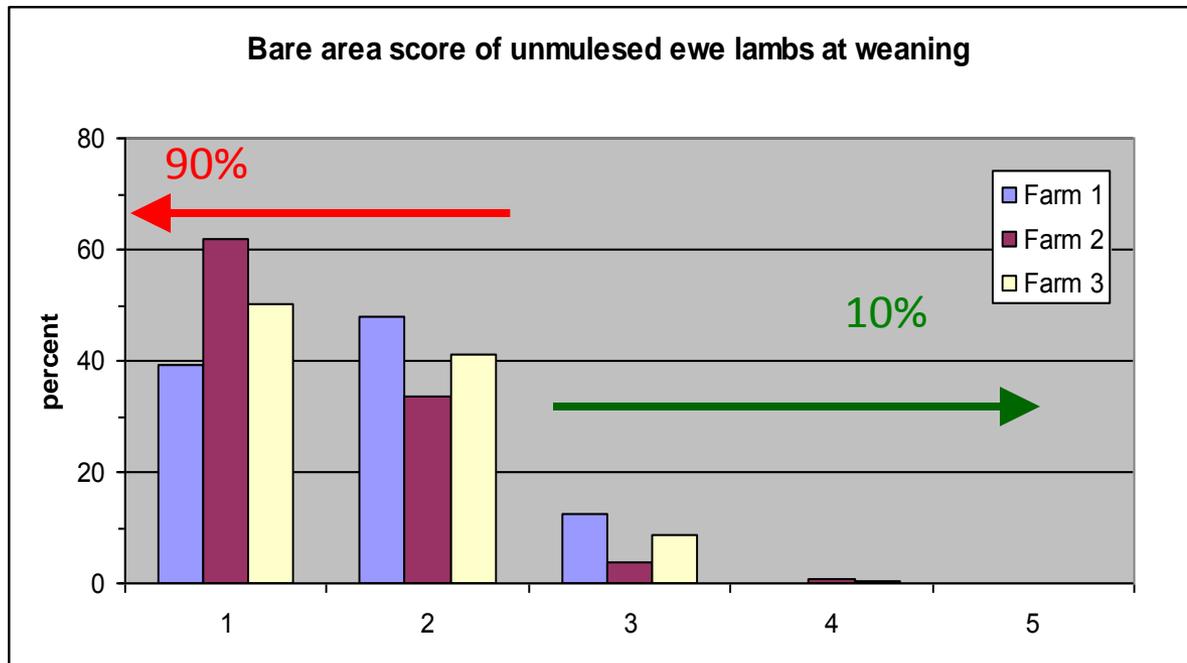
Results – Breech wrinkle score at marking

- Average scores = 2.8, 2.7 & 2.7
- A high proportion of sheep are susceptible (score ≥ 3)



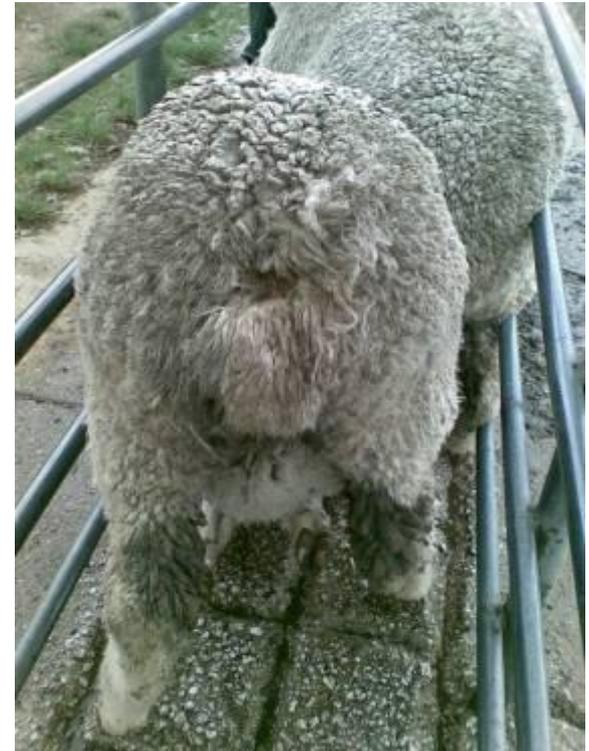
Bare area score at weaning

- Not much bare area & little variation
- Average bare score of unmulesed = 1.9, 1.4 & 1.6



Breecch strike in spring/ early summer – Clipped sheep

- Hoggets: 8-18% (mulesed 0-3%)
- Maiden ewes: 12-15% (mulesed 2-7%)
- Relative risk of breecch strike in Clipped vs. Mulesed:
 - Hoggets 3.0-18.5 times more at risk
 - Maiden ewes 1.7-7.8 times more at risk
- Clips gave little protection against breecch strike during highest risk period



Breecch strike in spring/ early summer – Unmulesed sheep

- When protected by an IGR insecticide (spring/early summer):
 - Hoggets: 0-2.6% (mulesed 0-3%)
 - Maiden ewes: 1.4-3.4% (mulesed 2-7%)
- **Not significantly different to mulesed**



Breecch strike – summer/ autumn (Ewes)

Farm	Birth year	'Season'	Group	Spring-early summer (Unmulesed protected)	Summer-early autumn (Unmulesed not protected)	Relative risk summer/ autumn
1	2008	2010-11	Mulesed	1.9 ^a	0.0 ^a	Reference
			Clipped	14.8 ^b	0.0 ^a	-
			Unmulesed ^{Dic}	3.4 ^a	2.8 ^b	(7.0)
3	2008	2010-11	Mulesed	7.2 ^a	3.5 ^a	Reference
			Clipped	12.5 ^b	3.2 ^a	-
			Unmulesed ^{Cyr}	1.4 ^c	8.5 ^b	2.4

Breech strike – summer/ autumn (Hoggets)

Farm	Birth year	'Season'	Group	Spring-early summer (Unmulesed protected)	Summer-early autumn (Unmulesed not protected)	Relative risk in summer/ autumn
1	2008	2009-10	Mulesed	0.7 ^a	-	-
			Clipped	13.2 ^b	-	-
			Unmulesed ^{Dic}	2.6 ^a	-	-
	2009	2010-11	Mulesed	2.2 ^a	0.0 ^a	Ref
			Clipped	18.1 ^b	0.3 ^a	-
			Unmulesed ^{Cyr}	0.0 ^a	0.7 ^a	-
2	2008	2009-10	Mulesed	0.2 ^a	0.2 ^a	Ref
			Clipped	3.6 ^b	8.3 ^b	38.7
			Unmulesed ^{Dic}	0.0 ^a	4.9 ^c	22.9
3	2008	2009-10	Mulesed	2.9 ^a	0.0 ^a	Ref
			Clipped	8.6 ^b	0.9 ^a	-
			Unmulesed ^{Dic}	0.6 ^a	2.3 ^b	(9.0)
	2009	2010-11	Mulesed	2.5 ^a	1.3 ^a	Ref
			Clipped	9.9 ^b	5.2 ^a	3.9 ^{ns}
			Unmulesed ^{Cyr}	0.8 ^a	14.9 ^b	11.1

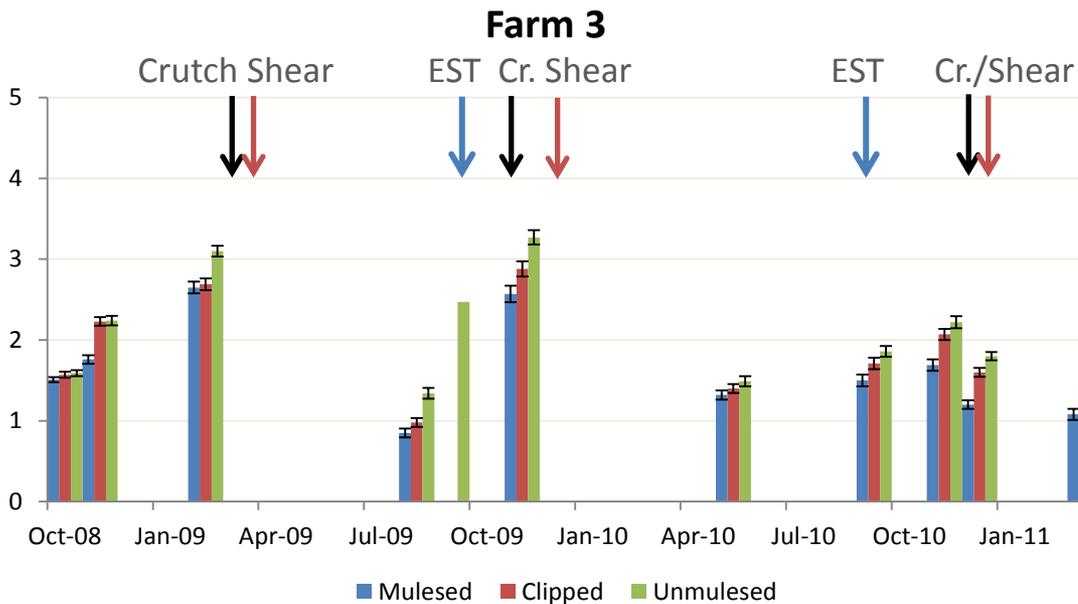
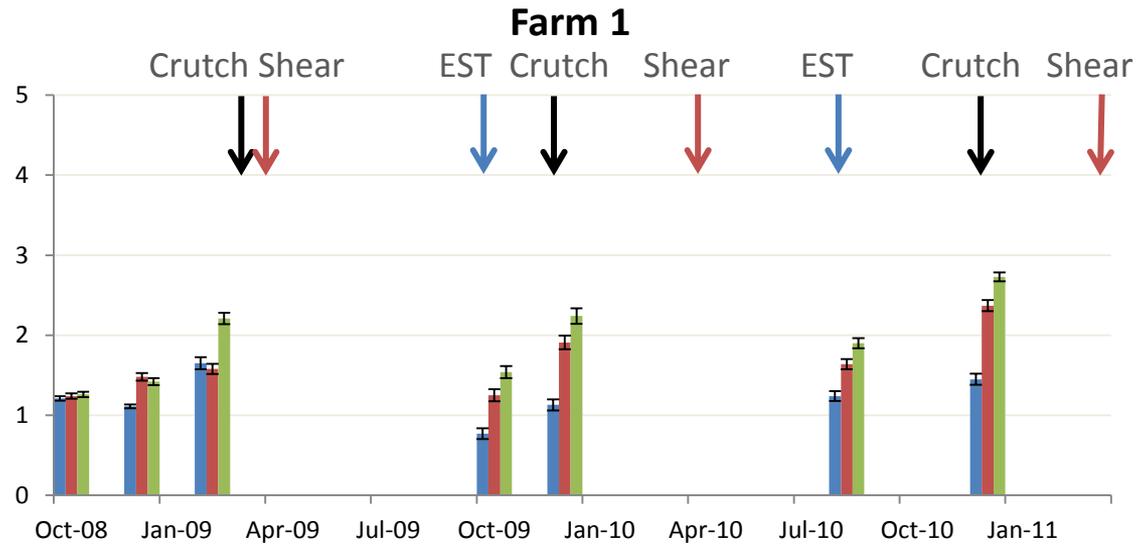
Risk factors for breech strike - overview

- 1) Unmulesed – significantly more dag, stain & breech wrinkle, smaller bare area
- 2) Clipped – partway between and generally significantly different to mulesed and unmulesed
- 3) Calculated Odds Ratios for breech strike:
 - Dag greatest risk (10/20 analyses):
 - 8-41× in Clipped during spring
 - 12-85× in Unmulesed during summer/ autumn
 - Urine stain significant for 5/ 18 analyses (OR 3.3-10.2)
 - Bare area significant for 1/ 10 analyses (OR = 0.4)
 - Surprisingly, wrinkle didn't increase risk



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Dag scores – 2008 drop



Dag scores

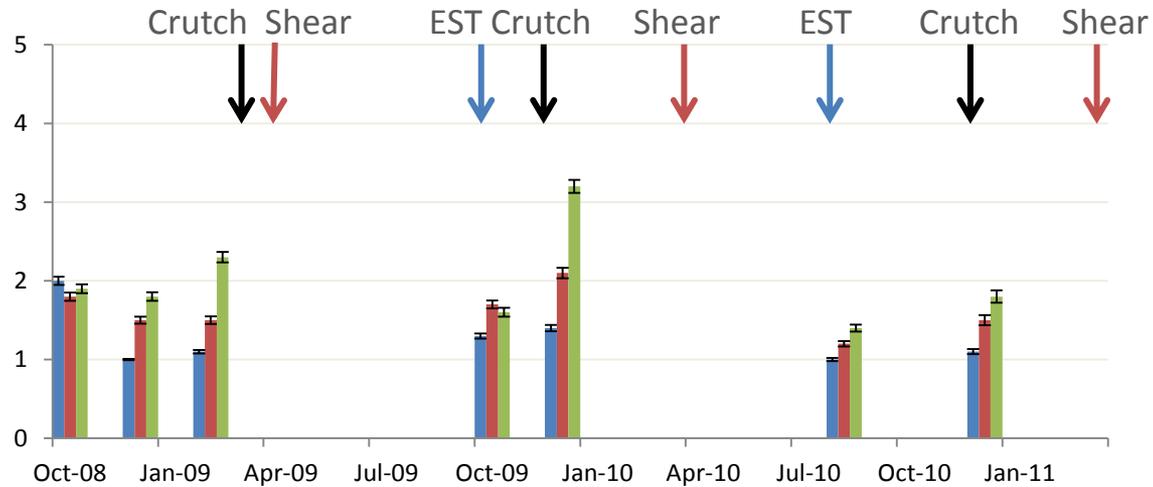
- Average (percentage with 'severe dag' [scores ≥ 4]) when insecticide applied

Farm	Born	Class	Scored	Mulesed	Clipped	Unmulesed
1	2008	Hogget	Oct-09	0.8 ^a (4.7%)	1.3 ^b (7.4%)	1.5 ^c (10.2%)
		Maiden	Aug-10	1.2 ^a (0.7%)	1.6 ^b (3.6%)	1.9 ^c (4.5%)
	2009	Hogget	Oct-10	1.5 ^a (4.9%)	1.6 ^a (7.3%)	1.8 ^b (7.0%)
		Maiden	Sep-10	1.5 ^a (7.1%)	1.7 ^b (9.0%)	1.9 ^b (7.4%)
3	2008	Hogget	Sep-09	-	-	2.5 (21.3%)
		Maiden	Sep-10	1.5 ^a (7.1%)	1.7 ^b (9.0%)	1.9 ^b (7.4%)
	2009	Hogget	Sep-10	2.4 ^a (25.3%)	2.5 ^a (26.3%)	2.8 ^b (34.7%)

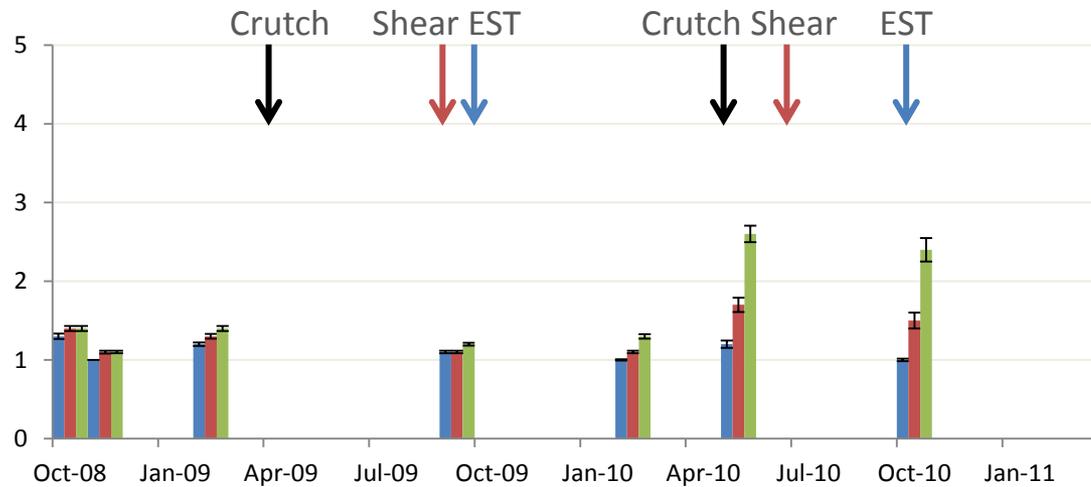


Stain scores – 2008 drop

Farm 1



Farm 2



Breech wrinkle

Farm	Class	Assessed	Breech wrinkle		
			Mulesed	Clipped	Unmulesed
1	Maiden	Mar-11	1.2 ^a	2.4 ^b	3.0 ^c
2	Hogget	Jun-10	1.5 ^a	2.7 ^b	3.0 ^c
3	Maiden	Dec-10	1.7 ^a	2.5 ^b	3.2 ^c

Breech bare area

Farm	Class	Assessed	Bare area		
			Mulesed	Clipped	Unmulesed
1	Maiden	Mar-11	3.1 ^a	2.5 ^b	2.0 ^c
2	Hogget	Jun-10	3.2 ^a	1.5 ^b	1.2 ^c
3	Maiden	Dec-10	2.8 ^a	2.8 ^a	2.6 ^b

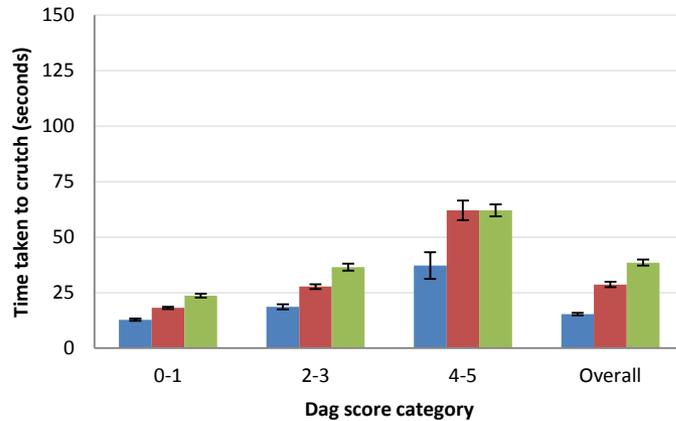
Management – time to crutch & weight of crutchings

- Unmulesed sheep took longer and were more difficult to crutch:
 - Weaners – 1.3-2.2 times longer; 40-150% heavier crutchings
 - Hoggets – 1.3-2.5 x longer; 50-180% heavier crutchings
 - Maiden ewes – 1.4-1.5 x longer; 50-90% heavier crutchings
- Clipped sheep were intermediate:
 - Weaners – 10-50% longer; 0-80% heavier crutchings
 - Hoggets – 30-90% longer; 30-160% heavier crutchings
 - Maidens – 30-35% longer; 30-70% heavier crutchings



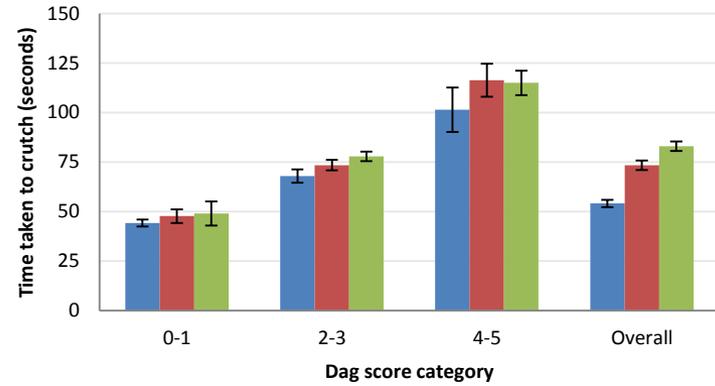
Time taken to crutch

Farm 1 – Hoggets Dec 2009



■ Mulesed ■ Clipped ■ Unmulesed

Farm 1 – Maiden ewes Dec 2010



■ Mulesed ■ Clipped ■ Unmulesed



Cut breech scores

- Scored on a 0-3 scale on 6 occasions:
 - 0 = no cuts
 - 1 = minor cuts
 - 2 = multiple (>3) minor cuts or 'moderate' cuts
 - 3 = severe cut(s)
- Unmulesed sheep:
 - 26-45% had severe or multiple cuts (a score ≥ 2)
 - ⇒ 2.0-10.6 x risk of severe cuts compared with mulesed
- Clipped sheep:
 - 21-41% had cut scores ≥ 2
 - ⇒ 1.8-7.7 x risk of severe cuts compared with mulesed



Changed costs for a 'high dag' flock

- Partial budgets calculated for 3000 ewe self-replacing flock with a main shearing in March (~Farm 1) or Dec (~Farm 3)
- Management of mulesed sheep in March shorn flock:
 - Crutch in December; clean up 10% prior to shearing
 - Dicyclanil (Clik™) to ewes in August & lambs at weaning in Dec
- Modify management for unmulesed and clipped sheep:
 - Jet all sheep other than ewes with cyromazine in Sep-Oct
 - Treat weaners & hoggets with vetrazin in April (once every 3 years)
 - Clean up 20% (Clipped) or 30% (unmulesed) adults before shearing
 - Additional crutch of hoggets in high dag flocks
 - Average dag score increases by 0.5 (clipped) or 1.0 (unmulesed)



Partial budget – March shorn

Item	Unmulesed		Clipped	
	per head (\$)	Amount (\$)	per head (\$)	Amount (\$)
1) Increased shearing cost	0.05	327	0.03	164
2) Increased crutching cost	0.10	654	0.05	327
3) Extra crutch of hoggets (mulesed hogget =\$1)	1.10	2,200	1.05	2,100
4) Foregone wool income from hogget crutch (1800 c/kg clean)	0.40	800	0.20	400
5) Extra clean up of adult sheep before shearing				
a) 10% ≥ DS3 for unmulesed, 5% for Clipped	0.80	363	0.80	182
b) 10% ≤ DS2, 5% for Clipped	0.15	68	0.15	34
6) Lower hogget fleece value (increased PCS from extra crutch)	0.40	800	0.20	400
7) Jet hoggets & wethers in Sep-Oct	0.60	2,100	0.60	2,100
8) Additional jet to hoggets & weaners in April (1 in 3 years)	0.60	400	0.60	400.00
9) Changed deaths (+3% mulesed weaners, +1% clipped and unmulesed hoggets & ewes)		3,350		3,350
10) Less saving on mulesing/ additional cost of Clips (70% marking)	-0.60	-1,260	0.80	1,680
11) Extra supervision		Variable ^A		Variable ^A
12) Deduct better production of mulesed weaners		Variable ^A		Variable ^A
TOTAL increased costs		\$9,804		\$11,137
TOTAL increased costs per DSE		\$1.20		\$1.37

Changed costs for a 'high dag' flock

Budget output	March shorn		Dec shorn	
	Unmulesed	Clipped	Unmulesed	Clipped
Total increased costs	\$9,804	\$11,137	\$14,685	\$15,886
Total increased cost/ DSE	\$1.20	\$1.37	\$1.80	\$1.95
Increased costs over Total enterprise costs (SW FMP)	+7.7%	+8.8%	+11.6%	+12.5%
Clip price for breakeven with unmulesed (clip + application)		\$0.77		\$0.83

- Most influence from additional crutching and insecticide treatments, increased mortalities



Conclusions

1. Early season treatment effectively controlled breech in spring
 - Even when applied over severe dag
2. Clips provided little protection against strike in spring/ early summer
 - Need to treat like an unmulesed sheep
3. Dag was the most important risk factor for breech strike
4. The cost of managing clipped & unmulesed sheep was significantly greater:
 - Additional crutching, crutching takes longer & removes more wool
5. Critical need to control scouring & breed for less breech wrinkle:
 - Good worm control
 - Cull daggy sheep (esp. rams)
 - Genetic selection (less dag & breech wrinkle)
 - (other causes of scouring?)



Acknowledgements

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2008

L.cuprina life-cycle:

Eggs ⇨ 1st ⇨ 2nd ⇨ 3rd instars ⇨ wandering larvae
(leave sheep 4-5 d after eggs laid)

