

Branding Fluid Analysis Project: Findings

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1. Introduction

In 2006 the Australian Wool Exchange Ltd (AWEX) carried out a trial to establish the commercial and processing implications for branding fluid contamination found in sale lots in all regions. Samples from 142 lots contaminated by brands were sent to CSIRO Textile and Fibre Technology in Geelong, Victoria. The size of the samples taken was between 20 and 100 grams. The results of 142 samples tested for scourability according to AS 4054 and were then returned to AWEX and information for those lots tested obtained from marketing reporting databases for selling seasons 2005-06 and 2006-07.

2. Price impact of branding fluid contamination

Concurrently, hedonic analysis was conducted by Madeleine Ryan as part of her honours thesis for the University of Sydney, Agriculture economics faculty, on the 05/06 season to assess the price impact that contamination with branding fluid has for all lots audited as R1, R2 and R3¹.

The price analysis of all fleece lots ($n=1843$) found that discounts are particularly large for superfine wools (less than or equal to 18.5 micron), ranging from 19c/kg for light branding contamination (R1) to 110c/kg for medium-level branding contamination (R2). Lots with fibre diameter greater than 20.6 micron, but less than 23.5 micron (medium category) also attracted significant discounts. For example, medium level contamination (R2) received an average discount of 58c/kg.

Table 1 Discounts to Merino fleece lots containing branding contamination, selling season 2005-06 (c/kg clean).

	R1 (Light)	R2 (Medium)	R3 (Heavy)
Superfine ($\leq 18.5\mu$)	-18.75	-110.12	-85.16
Fine ($\geq 18.6\mu, \leq 20.5\mu$)	-7.50	-46.30	-68.65
Medium ($\geq 20.6\mu, \leq 23.5\mu$)	-4.29	-58.38	-49.88

¹ Note that according to AWEX ID version 3.0 (July 1 2006) an R1, 2 or 3 qualifier is defined by both quantity and intensity with consideration also given to staple length. A matrix explaining AWEX-ID brand qualifier application is provided in the appendices of this paper.

3. Testing for scourability

142 Samples were tested by CSIRO according to AS 4054 "Scourable Branding Substances for Greasy Wool" using the colour measurement equipment described in the International Wool Textile Organisation (IWTO) Test method 56. This test method had previously be evaluated to predict the likely scouring performance of brands applied to a fleece in a prescribed method in line with current commercial scouring practices. After carding the scoured samples they were measured for colour difference by comparison to the original wool and graded on a pass-fail scale. The results indicate that 58 samples out of the 142 (41 per cent) failed to scour and comb out. Further breakdown of these results by region, branding fluid colour and micron category is given below (Tables 2 & 3).

Understandably, there were a proportionately greater number of failed responses for medium (R2) - to heavily (R3)-contaminated lots in all regions.

Table 2 Lots tested by CSIRO, divided into region of sale and level of branding severity.

	R1		R2		R3		Total
	<i>Pass</i>	<i>Fail</i>	<i>Pass</i>	<i>Fail</i>	<i>Pass</i>	<i>Fail</i>	
West	27	9	1	5	3	1	46
South	28	22	3	5	3	7	68
North	15	6	2	1	2	2	28
Total	107		17		18		142
% Failed	35		65		56		41*

*Weighted average of total failed lots at all levels of severity.

Table 3 Merino fleece lots sold in 2005-06, with some level of branding present. Lots are divided into Merino micron categories and level of branding severity.

	R1	R2	R3	Total
Superfine ($\leq 18.5\mu$)	147	29	19	195
Fine ($\geq 18.6\mu, \leq 20.5\mu$)	523	52	35	610
Medium ($\geq 20.6\mu, \leq 23.5\mu$)	854	76	44	974
Total	1524	157	98	1843

Table 4 Merino fleece lots sold in 2005-06, divided into region of sale and level of branding severity. These lots are those containing some level of branding contamination only.

Note: The figures in italics are proportionate to overall lots affected by branding substances.

	R1	R2	R3	Total
West	722	37	3	765
	<i>0.39</i>	<i>0.02</i>	<i>0.00</i>	<i>0.42</i>
South	508	9	41	558
	<i>0.28</i>	<i>0.00</i>	<i>0.02</i>	<i>0.30</i>
North	352	115	53	520
	<i>0.19</i>	<i>0.06</i>	<i>0.03</i>	<i>0.28</i>
Total	1582	161	100	1843
	<i>0.86</i>	<i>0.09</i>	<i>0.05</i>	<i>1.00</i>

4. Results by Colour

This information was available for only 74 lots. Table 5 shows that of these remaining lots, 64 lots contained blue or green brands, of which 38 per cent failed to scour out under the conditions of test method AS 4054.

Forty two per cent of brands in lots with colour unknown failed to scour out. While there may have been more insightful conclusions drawn if this information had been available, given that this is a considerable proportion of lots tested, the results indicate that processor concern is justified, regardless of colour.

Table 5 Lots tested by CSIRO, divided into colour of brand, where known, and level of branding severity.

	Blue/Green		Red/Other		Unknown		Total
	Pass	Fail	Pass	Fail	Pass	Fail	
R1	37	20	3	5	24	18	107
R2	1	4	0	0	6	6	17
R3	2	0	2	0	9	5	18
Total	64		10		68		142
% Failed	38		50		42		41*

***Weighted average of total failed lots at all levels of severity.**

5. Results by Region

In 2005-06 (Table 4) indicate that 86 per cent of the 1843 fleece lots contain light branding contamination (R1) only, with a greater number of lots affected in the Western selling region. However, there were still a considerable number of medium (R2)- and heavily (R3)-contaminated lots sold, of which there were proportionately more in the Northern region.

Out of the 142 samples tested 19 per cent were from the Northern region (sold in Sydney or Newcastle), 33 per cent were sold in the Western region (Fremantle), and 48 per cent were taken from the Southern region. Of these, 75 per cent were considered to be lightly contaminated (R1), 12 per cent contained medium-level branding (R2) and 13 per cent were heavily contaminated (R3).

According to their wool statistical area is insightful in that it gives an indication of those regions in which branding contamination appears to be more common. Table 5 suggests that wool which originates from the Midlands region of Western Australia is more likely to have branding contamination, however the sample is too small to be indicative of any real trend in branding fluid usage.

Table 6 Top 10 Wool Statistical Areas (WSAs) for 142 lots tested by CSIRO.

	Statistical Division, State	Wool Statistical Area Code*	Number Lots
1	Midlands, Western Australia	W07, W11, W14	17
2	Unidentified	N99, Q99, S99, V99, W99	16
3	Lower Great Southern, Western Australia	W09, W10	12
4	Loddon-Campaspe, Victoria	V05, V06, V07, V15	7
5	Central West, New South Wales	N15, N19, N25	6
	North Western, New South Wales	N09, N14, N36	6
6	South East, South Australia	S29, S30	5
	Yorke & Lower North, South Australia	S15, S17	5
	Northern, South Australia	S05, S06, S09	5
	Central Highlands	V22, V26	5

*** Only those WSA codes included in samples tested included here.**

Research did show that Western Australian state laws applicable to animal identification for livestock sales had mandatory requirements for sheep to be branded before sale.

6. Information on how brands were applied

In the original planning of the project it was envisaged that with broker help the researchers could obtain information (such as application time etc.) on those brands that failed. Efforts to get further feedback via brokers regarding how the branding fluid was applied in those lots that failed was difficult for a number of reasons : broker/client relationship sensitivity and a significant number of lots were more than two years old and therefore it was difficult to obtain recent and accurate information.

7. Market size for Branding fluid products

In 2005, 57 000 litres of Si-ro-mark™ sheep branding fluid were manufactured (Morisset, pers.comm., 2006). Branding fluid sales were valued at \$535 197.65 in 2004-05 (APVMA 2005). Four- and five-litre tins of Si-ro-mark™ retail for around \$30. A 5-litre tin is capable of marking approximately 1000 sheep if used according to instructions (Chemical Recovery Co. 1997).

8. Branding fluid suppliers

There were twenty manufacturers producing Si-ro-mark™ under licence in the 1960s (Taylor 1988), it is now manufactured exclusively by a single chemical company operating out of South Australia and sold by under a number different brands. A list of current brands registered with the Australian Pesticides and Veterinary Medicines Authority (APVMA) is presented in the below table.

Table 7 Si-ro-mark™ branding fluids registered to the Australian Pesticides and Veterinary Medicines Authority, 2006-07

	Category	Registrant	Formulation	Chemical Group	1 st Register
Elderado	Branding substance	Elders Ltd.	Topical solution/ Suspension	Benzene (142g/L), Solvent (99g/L)	30-Oct 1997
CRG	Branding substance	Chemical Recovery Co. Ltd.	Topical solution/ Suspension	Benzene (142g/L), Solvent (99g/L)	30-Oct 1997
David Grays*	Branding substance	David Gray & Co.	Topical spray/lotion	Benzene (142g/L), Solvent (99g/L)	30-Oct 1997
CRT	Branding substance	Ruralco. Holdings Ltd.	Topical solution/ Suspension	Benzene (142g/L), Solvent (99g/L)	30-Oct 1997
National Jumbuck	Branding substance	Landmark Operations Ltd.	Topical solution/ Suspension	Benzene (142g/L), Solvent (99g/L)	30-Oct 1997
Primac Elders Ltd	Branding substance	Elders Ltd.	Topical solution/ Suspension	Benzene (142g/L), Solvent (99g/L)	30-Oct 1997

AWEX were also in contact with the principal/inventor of the Baa Brand applicator, a branding applicator mechanism that had an advantage in that the design prevented growers being able to mix solvents to the branding fluid.

9. Implications for growers

New technologies such as the National Livestock Identification Scheme (NLIS) are not for everyone in terms of on-farm flock management. Growers that do brand their sheep need to be aware of the following:

- ✓ Excessive applications levels should be avoided
- ✓ Place the Si-ro-mark fluid container in lukewarm water for a few minutes if the fluid is too thick.

- ✓ Brand sheep immediately after shearing
- ✓ Brands should have a face width that does not exceed 4mm
- ✓ Use branding fluid sparingly
- ✓ It's preferable that brands be applied to the head

10. Conclusion and implications for the wool industry

There has been some industry feedback to suggest that the branding fluid formulation and Australian Standards be revisited. On the surface of the results from this study this would appear to be an appropriate response. However, any research work with the formulations and or reviewing of the Australian/New Zealand Standards (AS/NZS 4054-1992) would take considerable time and expense. More importantly, none of these actions will assuage the the very real fears of processors that the branding fluid has been applied in strict adherence to the standard (i.e. no organic solvents have been added, the brand face is no wider than 4mm).

It is this element of risk that would suggest the best solution is to improve the extension and education of wool growers and the wool harvesting team (shearers, shedhands, classers, pressers) and ensure that brands-affected wool is removed from premium fleece and skirting lines , and classed into a line that is "made for brands-affected wool" and the bale is labelled "BND".

Since 2001/02 there have been concerted campaigns by AWEX in sending letters to Woolclassers when brands have been sighted (R1 or R2) in fleece and skirting wool. Statistics on the number of the infringement letters sent to Woolclassers would suggest that the message is slowly but surely succeeding.

Table 8: Clip Inspection Statistics for Branding Fluid 2003 - 2006

Year	2003	2004	2005	2006*
Infringement Type				
Brands in Fleece (R1, R2)	1526	1171	1098	77
Brands in Non fleece (R1, R2)	67	63	64	6
Lines of Brands not identified	39	21	9	1

* As at January 2007

A clear problem with these campaigns and for the wool industry to consider is that while the wool classer receives the technical feedback and market information regarding branding fluids, quite often the party responsible for applying the marking substance: the wool grower, does not.

Other studies regarding branding fluid/marketing substances are currently being conducted in Argentina and New Zealand with some work focussing on formulations for different climates (rainfalls). To the best of the authors' knowledge there has been nothing published in regards this work as at January 2007.

References

- Australian Pesticides and Veterinary Medicines Authority (APVMA) (2006). *Veterinary Chemical Product Sales for the Financial Year 04/05* APVMA Gazette, 5 September. [Online] <http://www.apvma.gov.au/gazette/gazette0609p19.pdf> (accessed on 14 December 2006).
- Australian Wool Exchange (AWEX) (2004). *Preparation of Australian Wool Clips: The Woolclasser. Code of Practice for AWEX Quality System*, Australian Wool Exchange Ltd., Sydney.
- Australian Wool Exchange (AWEX) (2006). *AWEX-ID: Description of the Non-Measured Characteristics of Greasy Wool – Appraisal Guidelines* Version 3.0S Standards Australia, 1 July.
- Australian Wool Exchange (AWEX) (2006). *AWEX Wool Statistics Yearbook: 2005-06 Season* Australian Wool Exchange Ltd., Sydney.
- Australian Wool Innovation (AWI) (2003). *The AWI 2003 Non-Wool Contamination Survey*, Australian Wool Innovation Ltd. And CSIRO, Sydney.
- Campbell, N.J., Hanrahan, P.D., Russell, I.M., Roberts, G.S. and Horton, B.J. (1998). Modelling pesticide residues on greasy wool: Experimental studies, *Australian Journal of Experimental Agriculture* 38, 441-449.
- Chemical Recovery Co. (1997). *Si-ro-mark™ Sheep Branding Fluid*, draft label, Chemical Recovery Co. Pty. Ltd.
- Lipson, M. (1951a). The problem of brands in wool. *The Textile Journal of Australia*, 26, 295-298.
- Lipson, M. (1951b). The development of sheep branding fluids removable by scouring. *Australian Journal of Applied Science* 2, 200-204.
- Luccock, J. (1805). *The Nature and Properties of Wool*. E. Baines, Leeds.
- O'Donnell, D., Dickson, A. and Wood, A. (2006). Sheep industry outlook to 2010-11: Both wool and meat critical to the industry's future. *Australian Commodities* 13, 60-70.
- NSW Department of Primary Industries (DPI) (2006). *NLIS Sheep and Goats* NSW DPI. www.agric.nsw.gov.au/reader/nlis-sheep-goats (accessed on 12 December 2006).
- Plant, J.W., Horton, B.J., Armstrong, R.T.F. and Campbell, N.J. (1999). Modelling pesticide residues on greasy wool: Using organophosphate and synthetic pyrethroid survey data, *Australian Journal of Experimental Agriculture* 39, 9-19.
- Standards Australia (1992). *Scourable Branding Substances for Greasy Wool: Australian/New Zealand Standard. A/NZS 4054-1992*, Sydney.
- Standards Australia (2005). *Scourable Branding Substances for Greasy Wool (Draft)*. Joint Standards Australia/Standards New Zealand Committee TX-012 –Wool, Sydney.
- Taylor, J.M. (1988). Australian Innovation in Textile Technology. In *Technology in Australia 1788-1988. Australian Science and Technology Heritage Centre*, University of Melbourne <http://www.austehc.unimelb.edu.au/tia/284.html> (accessed on 29 November 2006).
- Wood, G.F. (1964). A scourability test for sheep branding fluids, *The Textile Journal of Australia* 39, 11-13.

Appendix 1 AWEX ID Version 3.0 Branding Fluid Qualifiers

8.9.10 Brands (R)

Sheep brands applied on the fleece, to identify a producers flock, are often present when shearing is performed. The existence of Brands is reported by using the character R.

Associated Conditions or Restrictions

When determining whether to apply the R1 qualifier, the length of the wool should be considered. The presence of a small amount brand on short wool, eg lambs, will be of more concern to processors, than the same amount on full-length fleece wool.

The code R3 should only be applied to lots of wool prepared as a line of brands.

Fleece Wool

		(Brands) INTENSITY		
		Light	Medium	Severe
QUANTITY	Odd (<1 hf) (<1%)	-	R1	R1
	Low (1-5hf) (1-15%)	R1	R1	R2
	Medium (6-12hf) (16-33%)	R2	R2	R3
	High (13hf+) (>33%)	R3	R3	R3

Pieces

		(Brands) INTENSITY		
		Light	Medium	Severe
QUANTITY	Odd (<1 hf) (<1%)	-	R1	R1
	Low (1-5hf) (1-15%)	R1	R1	R2
	Medium (6-12hf) (16-33%)	R2	R2	R3
	High (13hf+) (>33%)	R3	R3	R3