Australian Wool Innovation Limited

2018 BREECH FLYSTRIKE RD&E

TECHNICAL UPDATE

Sheep Ectoparasite Insecticide Resistance Update

Narelle Sales – NSW DPI

17 July 2018

❖ *The Project*

Australian Sheep Blowfly - *Lucilia cuprina*

Sheep Biting Louse – *Bovicola ovis*

❖ *The Problem*

Breech Strike.

Associated Challenges:

- **Breech confirmation.**
- **Soiling from urine and faeces.**
  - **Moisture**
  - **Odour**
  - **Protein source for flies and larvae.**

❖ *The Estimated Cost*

Clip wool and apply chemical $5.05/sheep (mostly labour - 10 minutes/sheep @ $30/hour)

(MLA (2015) Final Report B>AHE.0010 "Priority list of endemic diseases for the red meat industries")

❖ *The Problem*

Lousy sheep – Rubbed and chewed areas can also facilitate strike usually seen as body strike

❖ *2012-2014 Cyromazine Resistance - Levot, Langfield and Aiken*

Insecticide	Blowfly
Cyromazine	✓
Dicyclanil	✓
Ivermectin	

❖ *2012-2014 Cyromazine Survey*

State of Origin	Number of Populations with Low Level Cyromazine R
NSW	28 / 28
WA	5 / 17
Vic	1 / 6
SA	1 / 2
TAS	0 / 5
QLD	0 / 0
Total	36 / 58
Percentage	62%

Summary

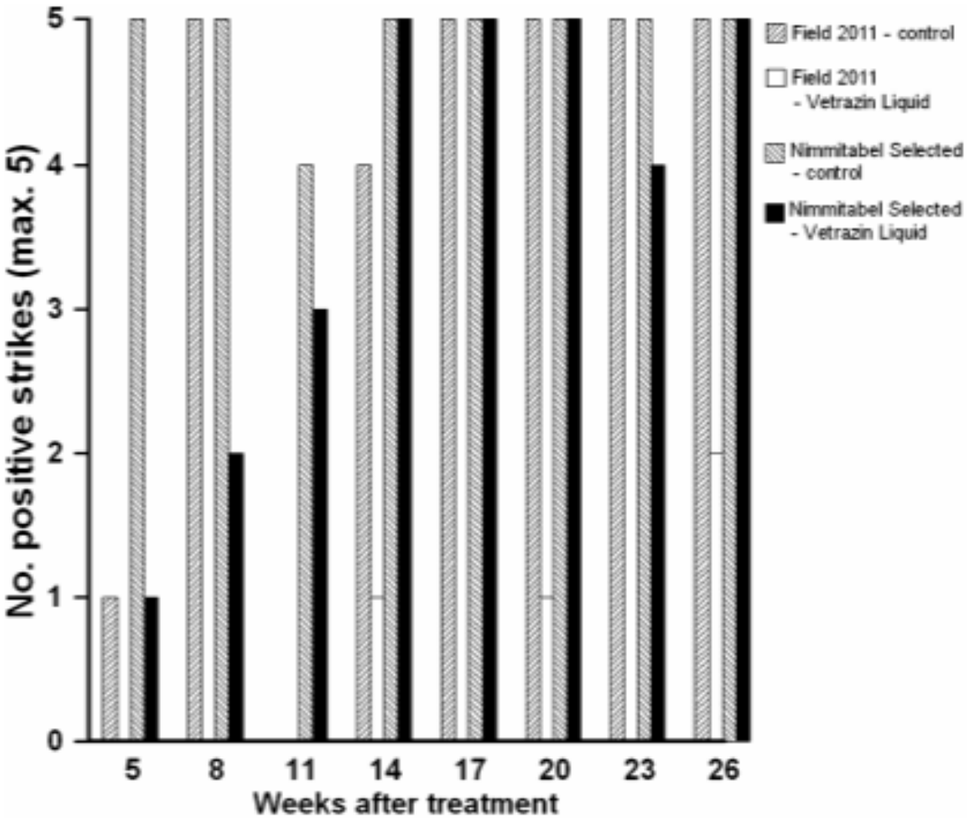
- **Highest frequency of Cyromazine resistant individuals in a population was 40%.**
- **Populations unable to survive 8 fold the Cyromazine Susceptible Discriminating Concentration (SDC).**
- **Populations with survivors in the Dicyclanil SDC = 8 / 36 (22%) .**
- **All populations with Dicyclanil survivors were from NSW**

❖ **Levot G.L A national breech strike R&D technical update 20th August 2014.**

❖ *2012-2014 Implant Trial*

Summary - Sheep treated with Cyromazine jetting Fluid

Positive implants Nimmitabel Selected Strain	Weeks Post-Treatment
1 / 5	5
2 / 5	8
3 / 5	11
5 / 5	14



❖ **Levot et. al. (2014) "Survival advantage of Cyromazine-resistant sheep blowfly larvae on Dicyclanil and Cyromazine treated Merinos." AVJ 92:11 421-426.**

❖ *2012-2014 Implant Trial*

Conclusions - Cyromazine and Dicyclanil treated sheep.

- **Cyromazine susceptible strain – Achieved registered protection periods.**
- **Cyromazine resistant strain (100% RR) – Zero product failures.**
- **Cyromazine resistant strain – Decreased protection periods.**
- **Recommended the adoption of management practices which minimise selection pressure.**

❖ **Levot G.L A national breech strike R&D technical update 20th August 2014.**

❖ *Current Survey*

State of Origin	Number of Populations
Kits Requested	71
Dead or not *L. cuprina*	3
NSW	10
Vic	4
SA	3
WA	1
TAS	0
QLD	0

❖ *The Insecticides*

Insecticide	Blowfly	Lice
Spinosad	✓	✓
Imidacloprid	✓	✓
Ivermectin	✓	
Abamectin		✓
Cyromazine	✓	
Dicyclanil	✓	
Diazinon	✓	✓
Diflubenzuron	✓	✓
Cypermethrin		✓
Total	7	6

❖ *Laboratory Techniques*

❖ *Initial Data*

Insecticide	Resistance Factors (RF)			
	Current Project Field Ranges (n= 15)	Previous Field Ranges	Year Published	Number of Strains (n=)
Spinosad	1.2 – 4.2	0.2 - 2.6	2002	41
Diazinon	17.8 – 42.9	7.0 - 28.2 4.7 - 37.1	1990 1991	33 48
Ivermectin	2.2 – 8.5	0.6 - 2.7 1.1 - 4.7	2002 2014	74 56
Imidaloclopri d	5.7 – 32.7	To Be Determined from this Project		
Diflubenzuron	7.9 - 93.5% Survival at Maximum Concentration (512 mg/L)			

❖ *Laboratory Techniques*

❖ *Initial Data*

Cyromazine	Populations with Survivors
SDD screen	9 / 15
8 fold SDD screen	0 / 15
R frequency (SDD bioassay)	4% to 90%

❖ *Thank You*

Questions?

❖ *Request for Larvae Samples; Required From All States*

State of Origin	Number of Populations
NSW	10
Vic	4
SA	3
WA	1
TAS	0
QLD	0

Please Contact

Narelle Sales or Monica Suann

Email:

narelle.sales@dpi.nsw.gov.au or

monica.suann@dpi.nsw.gov.au

Phone: 02 4640 6446.

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