Flystrike and the Fly Lifecycle - Strategic use of CLiK®

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Professional Services Veterinarian

Eneabba Field Day, WA – March 13th 2014
Agenda

• Cost of flystrike
  – Financial & Welfare
• Fly Lifecycle
• Flystrike Control
• Flystrike Prevention (vs. Treatment)

• Length of Protection
• Quality of Protection
• RainLock™
• Application

Pick your CLiK.
Highest cost diseases for sheep

The reality of flystrike
Covert strikes – non expanding, no derangement, no staining

- Due to fewer flies and less than ideal conditions
- Maybe 100 larvae (vs 500-1000)
- Up to 5 times more common than overt strikes
- Can last for up to 3 months – length of fly season?

Can contribute substantially to fly population = lost production
Effects of flystrike on productivity

• “A single artificially induced flystrike with L. sericata larvae was associated with a rapid decline in food intake in sheep, with a consequent reduction in liveweight. Loss of weight ranged from 0.5 to 5.5 kg over four to six days, and recovery to pre infestation weight taking three to 36 days”

• Small strikes, total lesion <150 mm diameter

• Prevention is key

Ref: Heath et al. The effects of artificially induced fly strike on food intake and liveweight gain in sheep. NZ Vet J. 35:50-52
Hidden costs of strike

Losses caused by:

- Deaths.
- Lost meat and wool production.
- Damage to skins.
- Cost of chemicals and labour.
- Reduced fertility.
- Animal welfare.
• *Lucilia cuprina* (Australian Sheep Blowfly) starts over 90% of strikes

• Effectively an obligate parasite

• Others flies include:
  – “Brown Blowflies” (*Calliphora* spp)
  – secondary flies such as the hairy maggot fly (*Chrysomya* spp)

• Flies can survive in a wide range of habitats but:
  – prefer warm and wet conditions
  – mainly seasonal
  – don’t travel far
Blowfly Strike - Risk factors

- Wet fleece, especially second wetting – rain, urine, humidity, long wool, tail length
- Wrinkled fleece – cause of moisture retention
- Fleece rot, lumpy wool
- Diarrhoea/dags, soiled perineum, pizzle
- Tissue damage – wounds, docking, grass seed, foot abscesses /footrot
Fly Biology and Lifecycle

Lucilia cuprina

Eggs L1 L2 L3 Pupae

Sandra de Catt JCU

NSW DPI

Pick your CLiK.

NOVARTIS ANIMAL HEALTH
12-24hrs

2-3 weeks in warm weather

4-5 days to maturity

3-5 days

6-10 days

Maggots drop from sheep and pupate OR - Overwinter if soil temperature is less than 15°C

Ref: NSW DPI
Synchronous emergence based on soil temperature

Blowfly Strike - Control

- **Industry best-practice = FlyBoss**

- **Integrated Pest Management (IPM)**
  - chemical and non chemical means of making sheep less attractive/susceptible to fly

- Crutching, shearing, worm control, nutrition, breech modification, plain/bare breech breeding

- **Appropriate and strategic use of chemicals**
Blowfly Strike - Prevention

- Based on fly biology to prevent multiplication
- Benefits of early/proactive prevention include:
  - Productivity (immediate) – once strikes occur – lost production
  - Productivity (subsequent) – further fly development, covert strikes
  - Residue issues in wool
  - Labour costs (treatment & monitoring)
Prevent the problem

Ref: McKenzie et al
When is your flystrike season?
When is the flystrike season?

Eneabba flystrike risk profile:

Your latitude -30.0222 and longitude 115.2783
Nearest weather station with suitable data Eneabba
When is the flystrike season?

Example of Eneabba flystrike risk profile:
### BOM weather data – Eneabba rainfall (mm)

<table>
<thead>
<tr>
<th></th>
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<th>Sep</th>
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<td>76.1</td>
<td>46.1</td>
<td>23.9</td>
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### BOM weather data – Eneabba rainfall (mm)

#### “Normal” fly season?

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Reducing the flystrike risk

Late summer shearing:
Reducing the flystrike risk

Late summer shearing and crutching in spring:

- Breech strike
- Body strike
- Other strike
Reducing the flystrike risk

Using CLiK® after crutching in spring:
Reducing the flystrike risk

Spring shearing:
Average length of flystrike threat as perceived by farmers:

- Western Australia (WA): 16.1 weeks
- Victoria (Vic): 16.6 weeks
- New South Wales (NSW): 17.3 weeks

Length of protection

Longer Protection with CLiK

Data from APVMA labels

*Registered label claims. Always read the relevant product label before use.

Extinosad® is a registered trademark of Elanco Animal Health.

Vetrazin® is a registered trademark of Novartis AG, Basel, Switzerland.

Coopers Blowfly & Lice® is a registered trademark of Schering-Plough Animal Health.

Pick your CLiK.
Cyromazine products

Spray-on = 6% cyromazine
• Ready-to-use spray-on product
• Provides 11 weeks protection
• minimum 6 weeks wool

Liquid concentrate = 50% cyromazine
• To be diluted for application by jetting
• Provides up to 14 weeks protection
• minimum 6 weeks wool
CLiK® Spray-On (dicyclanil)

- 5% dicyclanil
- Ready to use spray-on product
- Only product registered for “season-long” protection (18-24 weeks)
- Any length wool (3 month withhold)
- Rain-Lock™ Technology – resists washout
CLiK breaks the lifecycle - IGR

Fly life cycle illustration

- Deposition of eggs in the fleece
- 1st Larval Stage. No mouthparts
- CLiK breaks the cycle here, before damage occurs
- Average life cycle 2-4 weeks
- Fly emergence after 2 weeks warm weather
- 2nd and 3rd Larval Stages. Mouthparts very active and feed constantly.

About 18 hrs after hatching

Pick your CLiK.
Quality of protection – RainLock technology explained

<table>
<thead>
<tr>
<th>Active</th>
<th>Water Solubility</th>
<th>Octanol to water ratio</th>
<th>LC&lt;sup&gt;100&lt;/sup&gt; for Lucilia cuprina</th>
<th>How does this influence quality of protection??</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dicyclanil (CLiK®, CliKZiN®, CLiKPlus®)</td>
<td>0.03%</td>
<td>4.9</td>
<td>0.04</td>
<td>Dicyclanil has 6 times greater affinity for wool grease and is 44 times less water soluble.</td>
</tr>
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<td>Cyromazine (e.g. Vetrazin®, CyroFly®, Venus®)</td>
<td>1.3%</td>
<td>0.8</td>
<td>0.5</td>
<td>Cyromazine has 6 times less affinity for wool grease and is 44 times more water soluble.</td>
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The CLiK formulation:

- Suspo-emulsion (Oil in water)
- Stabiliser/emulsifier
- Interacts with electrolytes in fleece on contact
- Actively binds into wool grease

Rain-lock technology explained

Pick your CLiK.
Rain-Lock - Better technology

CLiK’s “rain-lock” technology binds tightly to the grease in wool fibres to resist washing out under rainfall. Other formulations only bind loosely to wool fibres and are susceptible to washing out under rainfall.

Pick your CLiK.
Rainfast studies

**Rainfall Study**

Comparison of Dicyclanil 5% and Cyromazine 6% when exposed to heavy rainfall*

<table>
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<th>% of active retained at tip of fleece after exposure to rainfall</th>
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<td>Dicyclanil / CLiK</td>
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<td>Cyromazine Spray on</td>
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*Novartis Animal Health studies (data on file): Dicyclanil/CLiK: 50 mm rain in 1 hour twice on Days 4 and 9. Cyromazine Spray on: 50 mm in 2 hours once.
Mobility in fleece

- The level of dicyclanil down the staple and sides of the fleece was unaffected by rainfall.
- There was chemical detected at high levels away from the initial application band.

- 140 mg/kg
- 70 mg/kg
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<td><strong>Highest in last 20 years</strong></td>
<td>122.0</td>
<td>88.4</td>
<td>42.8</td>
<td>63.0</td>
<td>34.0</td>
<td>57.2 (2000)</td>
<td>93.2 (2008)</td>
<td>137.2 (1999)</td>
</tr>
<tr>
<td><strong>2nd Highest in last 20 years</strong></td>
<td>114.7</td>
<td>76.6</td>
<td>41.8</td>
<td>59.2</td>
<td>25.8</td>
<td>33.6 (2011)</td>
<td>38.8 (1996)</td>
<td>52.9 (2010)</td>
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Low volume spray-ons: correct application is crucial
CLiK Application

Season long blowfly strike protection is as easy as...

1. Spray first band from neck to tail
2. Spray second band overlapping midline
3. Spray third band to cover breech

See label for dosage rates and when treating muesling and marking wounds.

Pick your CLiK.
CLiK Application

Season long blowfly strike protection is as easy as...

See label for dosage rates and when treating muesling and marking wounds.

1. Spray first band from neck to tail
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3. Spray third band to cover breech

- Volume per treatment band is based on **weight** not length of fleece.

Pick your CLiK.
Video of correct application technique:
Take home points

- Use FlyBoss as a resource

- Benefits in strategic preventative treatment with CLI KiK®
  - Length of protection
  - Quality of protection
  - RainLock™

- Fit with management and approach to risk