

Investigations into Insecticide Resistance In Blowflies and Anthelmintic Resistance in Roundworms

Dr. Ben Brown BVSc.(hons) MACVSc.

- Field and laboratory studies with the “Nimmitabel” strain of Australian Green Blowfly
- The prevalence of anthelmintic resistance on Australian sheep farms (2009-2012)

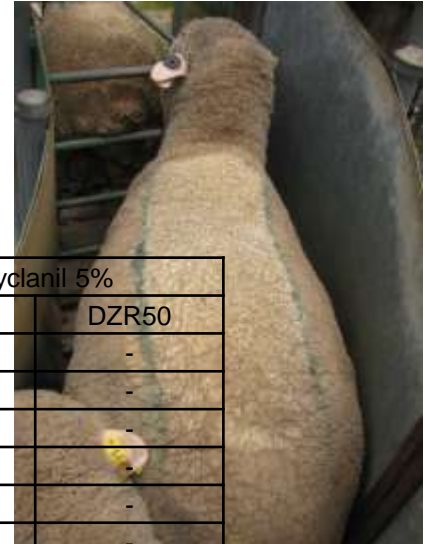


protecting the future of your flock



Larval implant study 2011/12

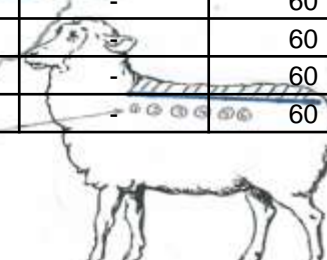
- Larval implant study

- Both products performed as per label claim independent of strain used.
- Conducted using sheep treated with either Vetrazin® SO or CLiK® SO using larvae from the Nimmitabel strain or a triazine susceptible reference strain.



Implant week	Control		Cyromazine		Dicyclanil 5%	
	CYR-LS	DZR50	CYR-LS	DZR50	CYR-LS	DZR50
2	0	-	35	-	-	-
4	0	-	50	-	-	-
5	0	-	54	-	-	-
6	0	0	60	60	60	-
7	0	-	55	-	-	-
10	0	0	55	60	60	-
11	0	-	50	-	60	-
13	0	-	60	-	60	-
14	0	-	17	-	60	-
18	10	-	-	-	60	60

 Dip on edge of treatment zone.
 Treatment zone.

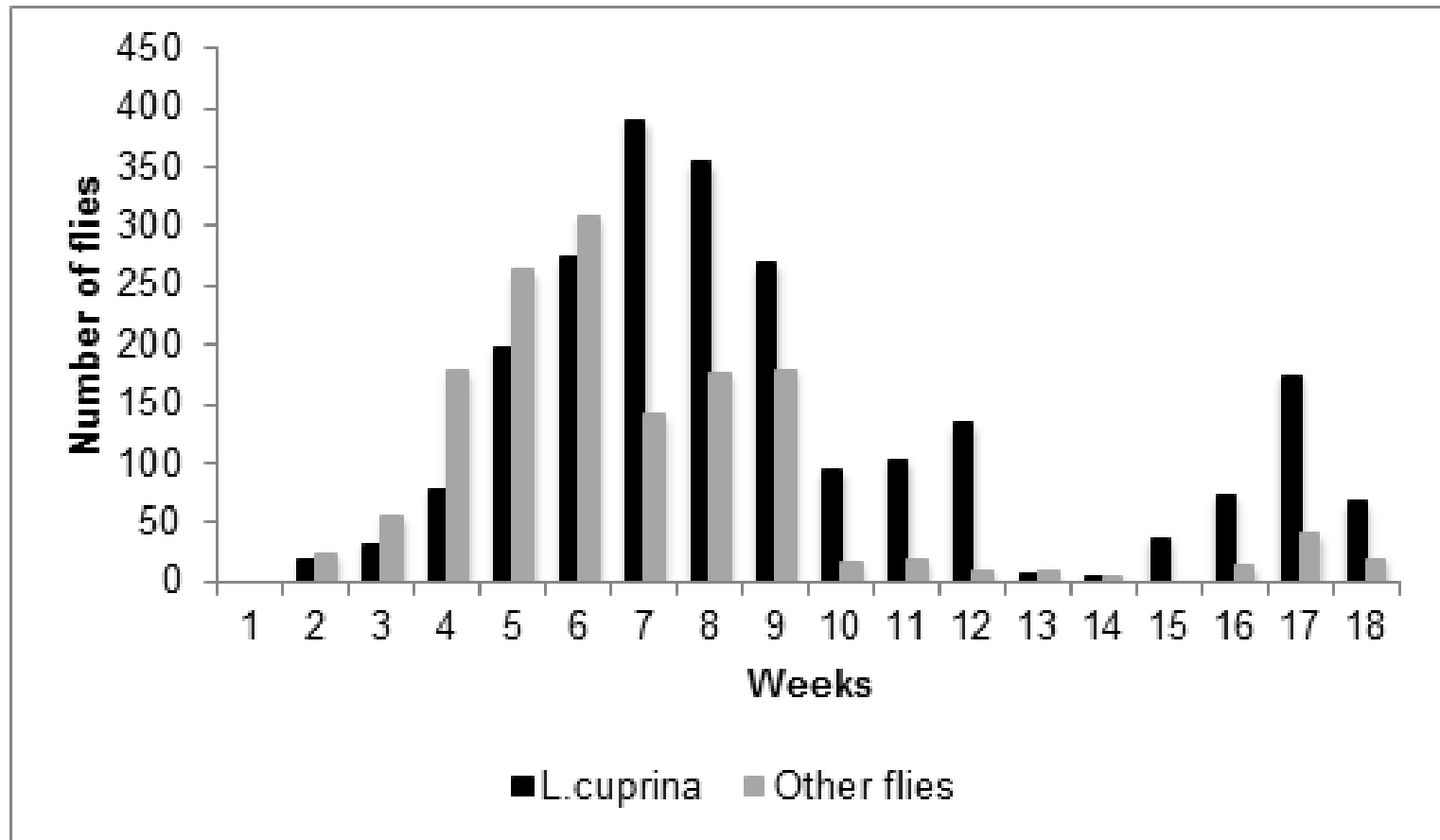


Field study 2011/12

- Conducted on original Nimmitabel property.
 - 385 lambs treated with Vetrazin ® Spray On and 198 lambs treated with CLiK ®, December 2011.
 - Continually monitored by producer and once every 4 weeks by Novartis for any strike.
 - Fly trap, dag and climate data recorded.



Field study 2011/12



Field study 2011/12

- Results:-

- 1 dag strike at 4 weeks in Vetrazin treated group (no skin damage).
- No strike in either group up to 14 weeks.
- At 18 weeks, 5 lambs with breech strike in Vetrazin treated group.
- No strikes in CLiK[®] treated group.

Week post-treatment	5	6–13	14–15	16	17	18
Cyromazine treated sheep						
Treated sheep remaining in study	386	385	385	354	353	353
No. strikes	1	0	0	0	0	5
Cumulative strike rate (%)	0.26	0.26	0.26	0.28	0.28	1.70
Dicyclanil 5% treated sheep						
Treated sheep remaining in study	198	198	198	198	198	198
No. strikes	0	0	0	0	0	0
Cumulative strike rate (5)	0	0	0	0	0	0

Conclusions

These studies demonstrated that, against this field isolate, under both field and controlled laboratory conditions, Vetrazin[®] spray-on and CLiK[®] each maintained the registered protective period after treatment.

- Use Integrated Pest Management (IPM)
 - chemical and non chemical means of making sheep less attractive to fly.
- Use a different chemical to treat fly struck sheep to the one you used to prevent fly strike (different mode of action).
- Use different chemicals for treatment of fly and lice.
- Product application:- use products that suit your management in a sustainable manner that maximises productivity and animal welfare
 - “Do it once and do it right”.



Current drench resistance in Australia.

Aim: - Conduct a survey of submissions to veterinary diagnostic laboratories

WECRT's conducted between 1 January 2009 and 30th March 2012

Criteria for inclusion:-

- 10 or more animals per group
 - Concurrent untreated control group
 - Larval differentiation conducted
 - >100 epg/genus
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- 394 submissions received (4 discarded) – 2.5% of farmers?
 - **Resistance is always defined as <95% efficacy.**

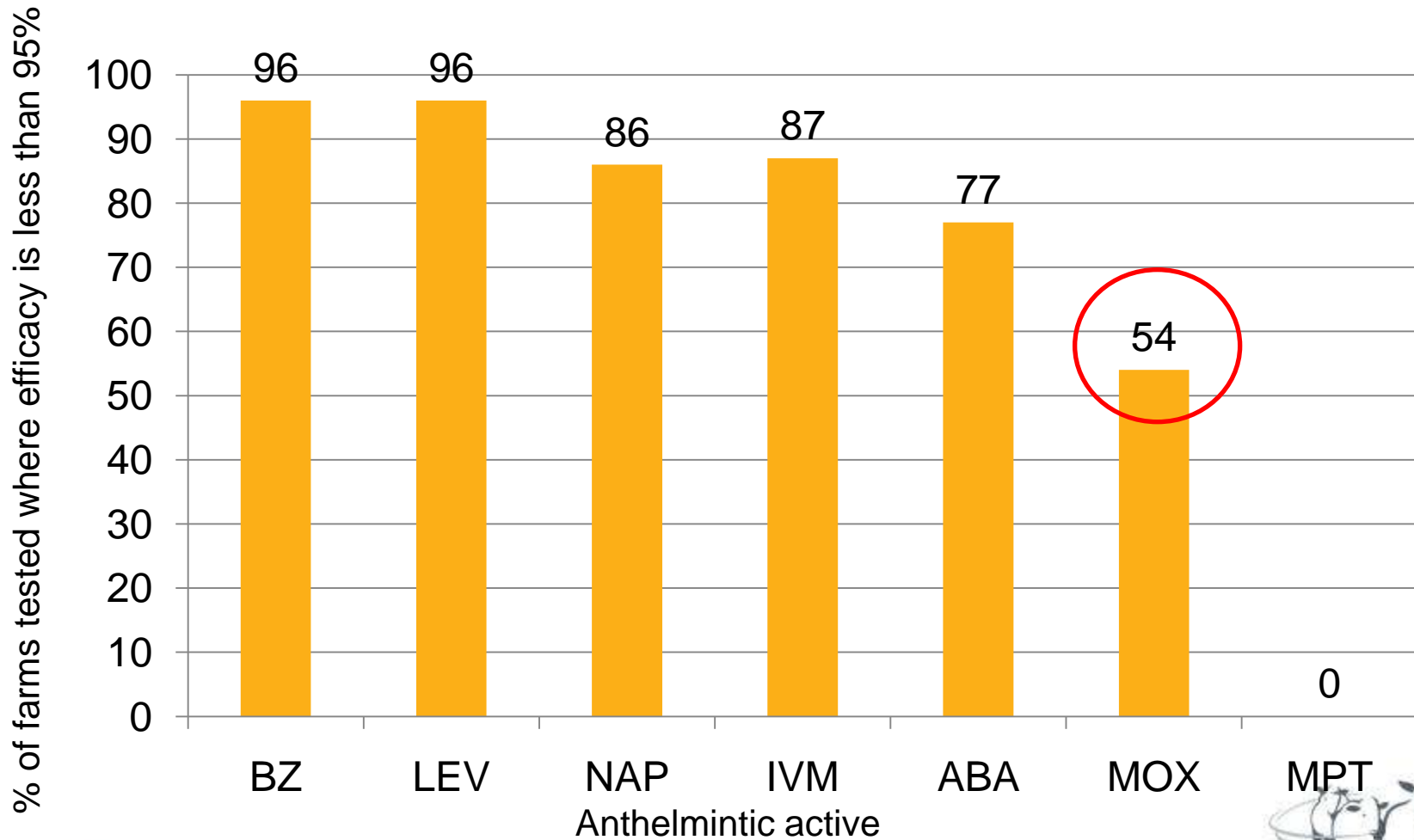


Results: Single active ingredients

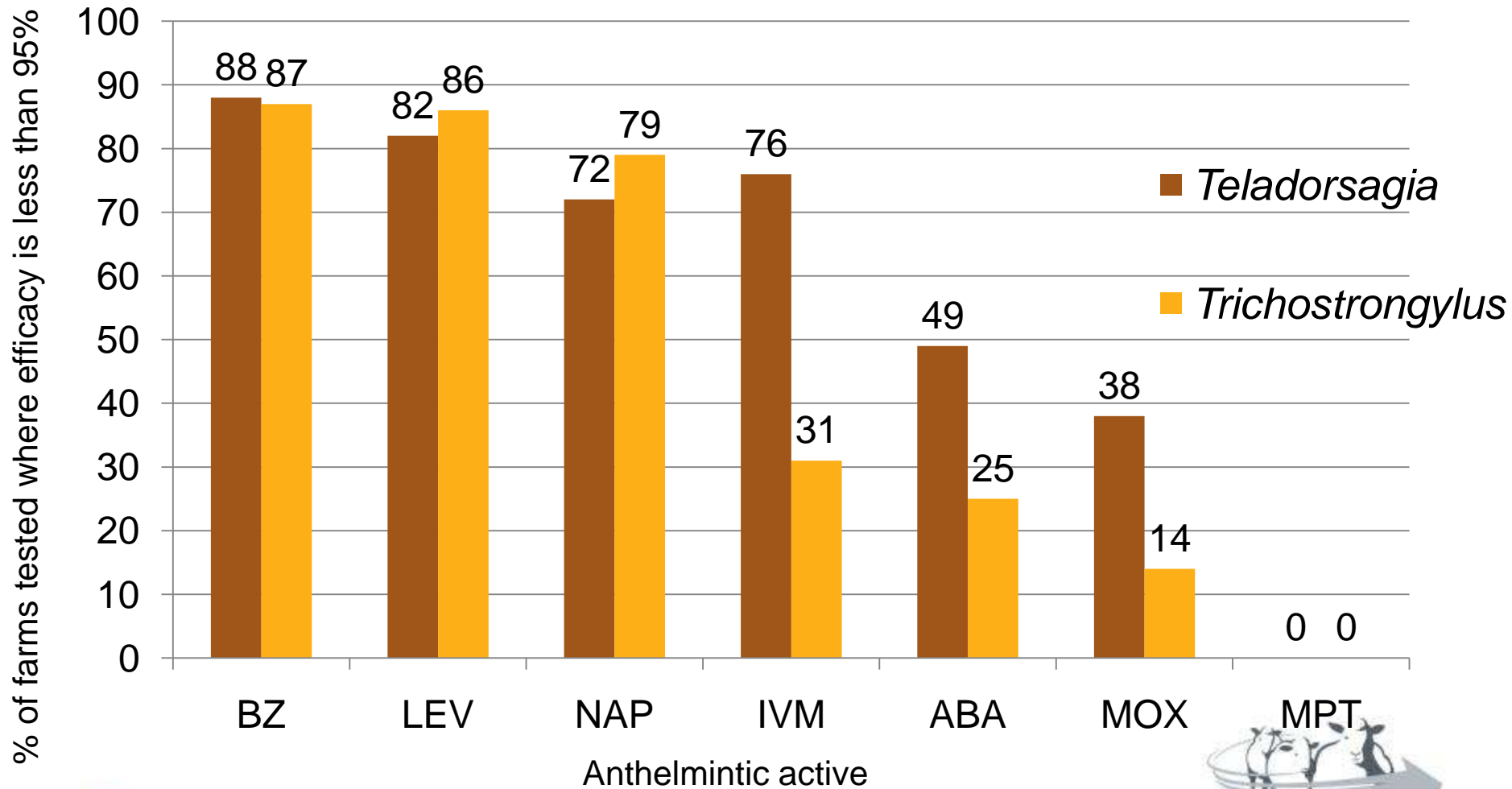
Table 1: National summary of proportion of WECRTs with <95% WECR in sheep

Active Ingredient(s)	<i>Teladorsagia</i>	<i>Trichostrongylus</i>	<i>Haemonchus</i>	Any Parasite
	(Small Brown Stomach Worm) % Properties	(Black Scour Worm) % Properties	(Barbers Pole Worm) % Properties	
BZ	88	87	75	96
LEV	82	86	30	96
NAP	72	79	15	86
IVM	76	31	74	87
ABA	49	25	83	77
MOX	38	14	52	54
CLOS	N/A	N/A	43	N/A
MPT	0	0	0	0

Summary - Single actives across *any* species

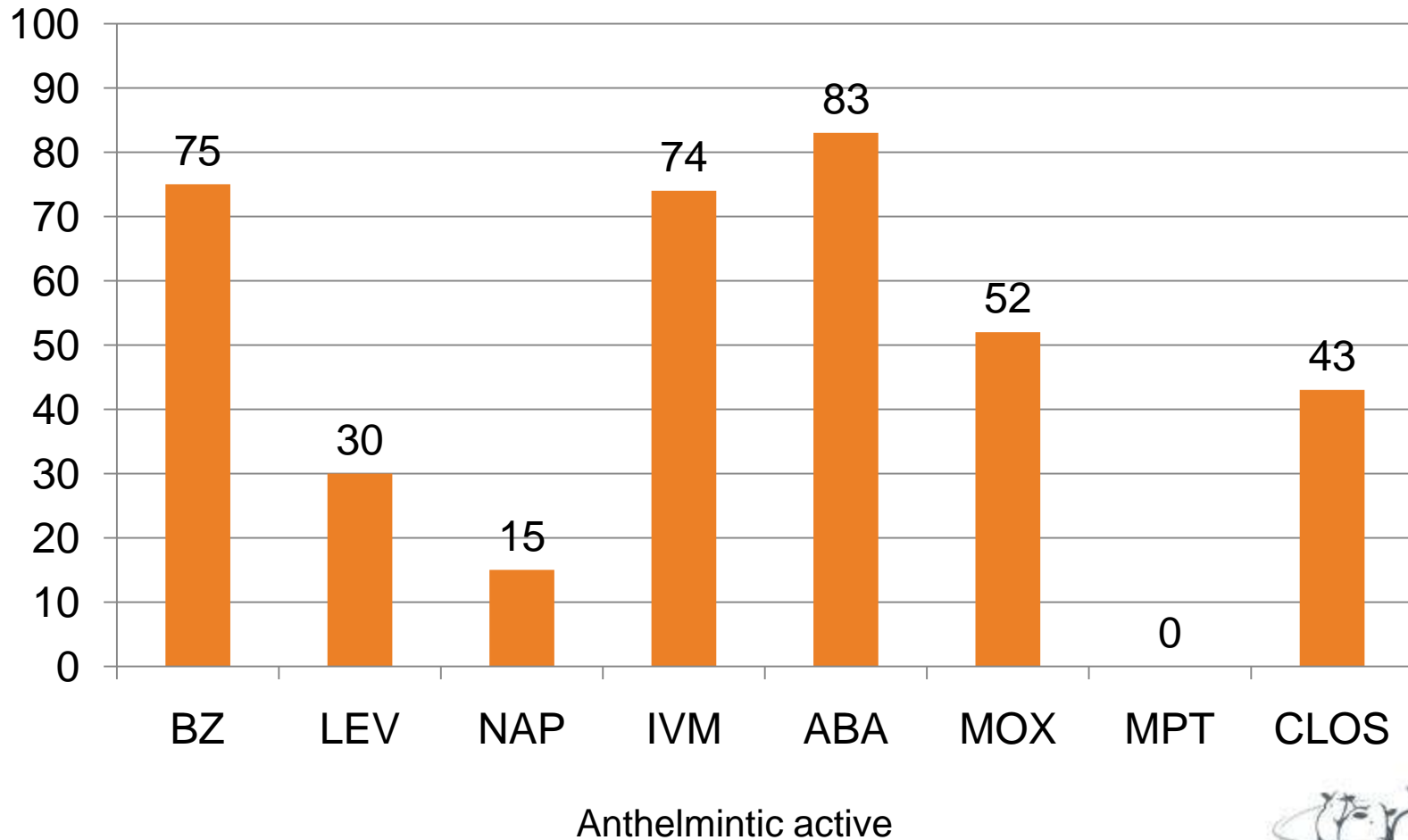


Summary - Scour worms (*Trichostrongylus* and *Teladorsagia*)



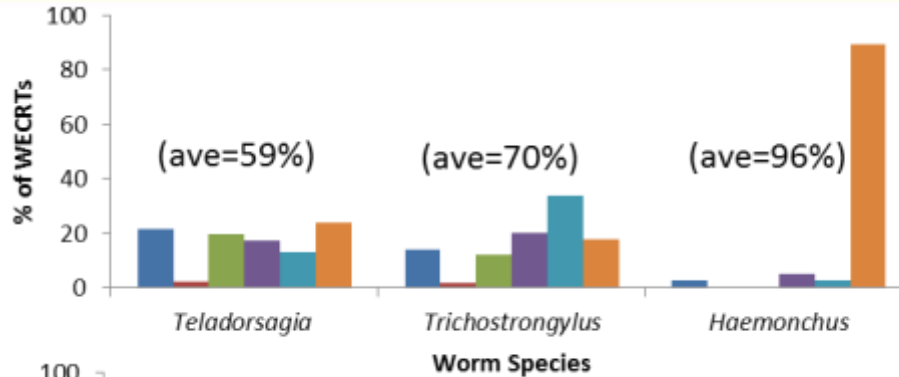
Summary – Barbers Pole Worm (*Haemonchus*)

% of farms tested where efficacy is less than 95%

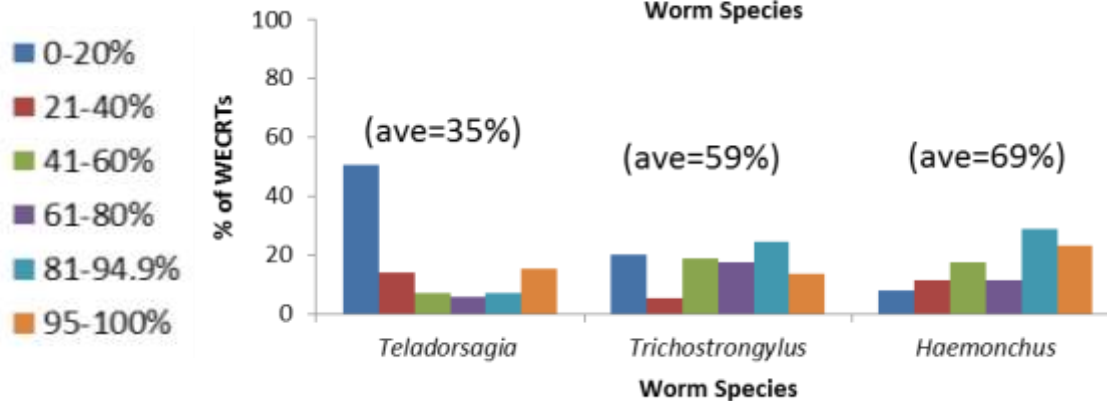


Range of efficacy by anthelmintic

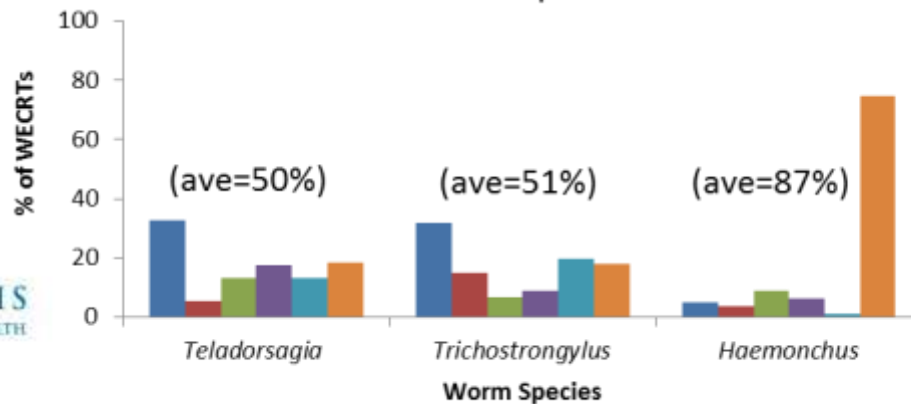
Naphthalophos



Benzimidazole

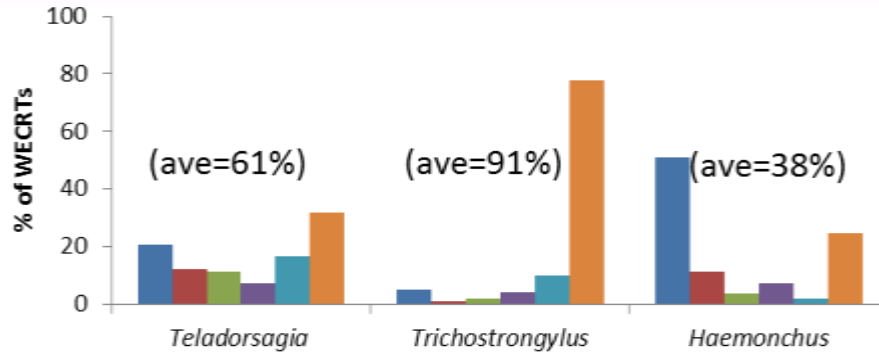


Levamisole

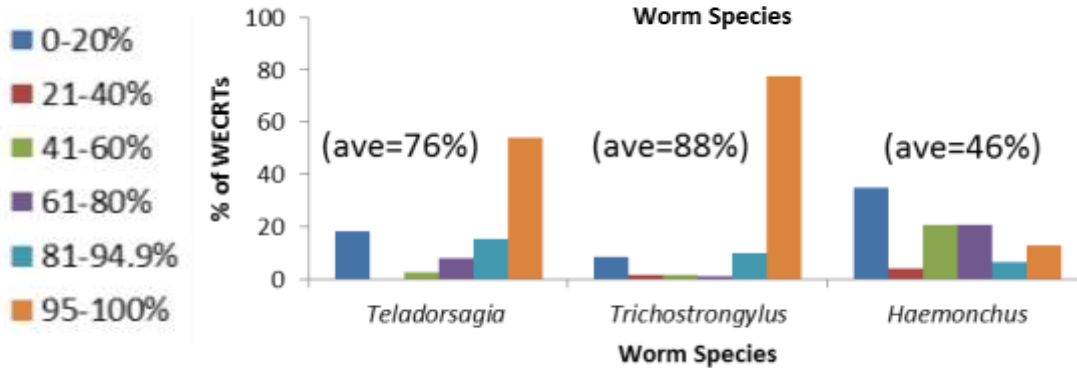


Range of efficacy by anthelmintic

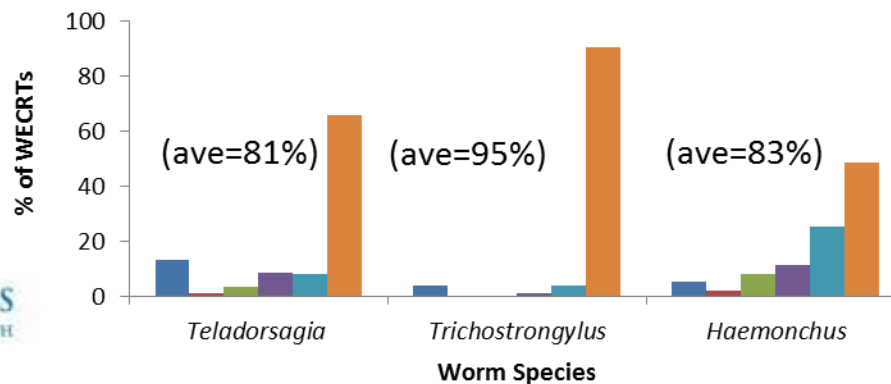
Ivermectin



Abamectin



Moxidectin



Results: Combination products

Active Ingredient(s)	<i>Teladorsagia</i> % Properties	<i>Trichostrongylus</i> % Properties	<i>Haemonchus</i> % Properties	Any Parasite % Properties
BZ/LEV	79	48	19	81
LEV/NAP	67	67	13	69
BZ/NAP	57	73	20	74
BZ/PYR	47	33	14	53
BZ/LEV/NAP	59	55	11	74
BZ/LEV/ABA	22	6	14	28
BZ/LEV/IVM	27	20	11	35
BZ/LEV/CLOS/ABA	0	0	44	44

Drench to maximise productivity *and* minimise resistance.

If you rely on the older drench classes (including the ML's) aim to *preserve* them while maintaining *productivity*...

How?

- WECRTs every 2-3 years to know the status of *your* farm
- Effective quarantine drenching (don't buy someone else's problem!)
- Within season rotation of drenches – have a drench plan!
- Use of older actives in combination – this delays/slows resistance
- Incorporation of new actives in rotation *now* (they can't help you on the shelf)
- Drench check 10-14 days after short acting drenches

