TECHNICAL UPDATE

Elanco DrenchChecks 2022-2024 – National Summary

Dr Nicholas Rolls BSc BVSc(Hons)
Technical Services Veterinarian
Elanco Australasia

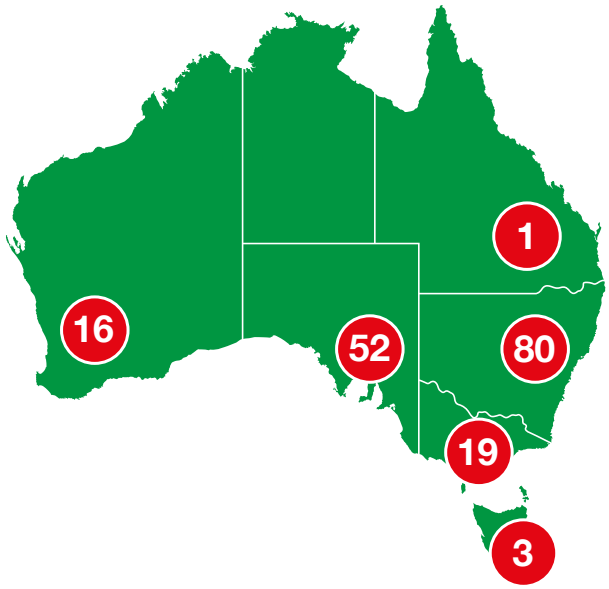
Resistance to drenches is one of the biggest challenges to effective worm control faced by sheep producers. The use of ineffective drenches can result in significant loss of income by impacting on production – and make resistance even worse over time.

Producers are not typically aware that some of the drenches they are using are not working – and many don't ever check.

Based on the most recently available estimate, internal parasites cost the Australian sheep industry AU$665 million per annum.[1] AU$102.5 million is attributable to the increased expense associated with control measures, but the vast majority (AU$562.5 million) is due directly to reduction in income from production loss. It is clearly worth getting worm control right – and making the effort to check.

Getting worm control right depends on a number of factors, chemical and non-chemical. Integrated parasite management (IPM) is widely regarded as industry best practice[2], involving effective grazing management strategies to prepare low worm-risk paddocks along with long-term initiatives such as breeding sheep with increased resistance and resilience to worms. However, strategic chemical use does remain a vital component of integrated and effective worm control.

Figure 1: Elanco DrenchChecks conducted by State (2022–2024).



It is important to make sure that chemicals are used sustainably as part of a strategic program, that they are fully effective and that monitoring occurs to ensure the right drench is given at the right time.[3]

A significant number of DrenchChecks were carried out by Elanco around Australia between 2022 and 2024 (Figure 1) – and the findings serve as an important reminder of the importance of monitoring.

Results give an indication of how serious and widespread drench resistance is – not just to the older single and dual actives, but also to triple combination treatments and even to the most potent macrocyclic lactone (ML) drenches such as moxidectin.

171 drench checks were completed (see Table 1):

- 94 results provided reassurance that the drench given was effective against the worms present at the time of treatment.
- 77 results gave an indication that worms lived through the drench and were likely to be resistant to that drench.

Table 1: Summary of Elanco DrenchChecks (2022–2024).

	Total	Demonstrated as effective	Evidence of resistance
Abamectin (ABA)	3	1	2
Levamisole (LEV)	1	0	1
Duo (BZ/LV)	2	0	2
Triple (ABA/BZ/LEV)	49	27	22
Triple (MOX/BZ/LEV)	18	11	7
MOXIDECTIN	20	5	15
MOX LA injection	18	12	6
ABA/BZ LA capsule	4	0	4
ABA/CLOS	8	3	5
CLOS + BZ/LEV	1	1	0
ABA/BZ/LEV/CLOS	9	6	3
DERQ/ABA	17	11	6
DERQ/ABA + BZ/LEV	1	1	0
MPL	1	0	1
MPL/ABA	18	15	3
MPL/ABA + BZ/LEV	1	1	0
	171	**94**	**77**

How is drench resistance measured?

Drench resistance is recognised as occurring when a drench is unable to reduce the worm burden by more than 95% (with appropriate statistical considerations[4]) – as may be measured by worm egg counts (WEC) in the faeces of sheep before and after treatment, and identification of the worm species present before and after treatment (through the process of larval culture in the laboratory).

Practical testing for drench resistance on-farm can be done with a relatively high level of accuracy by identifying, weighing, treating and monitoring the WEC (with larval culture and differentiation) in individual sheep in specific treatment groups (known as worm egg count reduction tests (WECRTs) or faecal worm egg count reduction tests (FECRTs).[5]

Alternatively, a 'simple, fast and low cost indication of possible drench resistance'[5] is to use what is known as a DrenchCheck – the use of two WECs – one before and one after a drench (10-14 days later) to check the extent to which the drench reduced the worm burden present at the time of treatment.

DrenchChecks can be conducted by simply collecting 10 individual faecal samples from a mob at random in the paddock at each time-point, rather than needing to monitor animals individually. On that basis, samples are not necessarily collected from the same sheep, but are simply a random representation of the mob. Accordingly, this is a less precise measure of drench efficacy – but the trade-off is that it can be carried out much more easily.

We can measure just the overall reduction in WEC, but more accurate information can be generated when larval cultures are conducted – as this tells us exactly which worm species have survived and are likely to be resistant. Some drenches may continue to be effective against some worm species (and therefore be useful when those worms are present), but not against others (and be ineffective when those worm species are present or dominant in the worm population). Without larval differentiation, we can test if the drench has been effective against that worm burden at that time but we can't confirm the presence or absence of resistance.

If a farm 'tests' a drench and efficacy against a given worm species (reduction in WEC attributable to that species, when comparing samples before and after the drench) is shown to be 90%, by way of example, this is less than the 95% reduction required that would indicate susceptibility – and that worm species would be deemed resistant. Resistance can also be significantly 'worse' i.e. efficacy can be significantly lower than the threshold – achieving just a 20% reduction, by way of example. In this way, drench resistance testing and calculation of observed efficacy allows us to assess not just if resistance is present – but also how severe the resistance is. In some cases, drenches can even become completely ineffective i.e. 0% efficacy.

DrenchChecks though are not an accurate quantitative test for resistance due to the extent of underlying statistical variation (unless clearly reducing the WEC to 0 epg) – and often the overall worm burden or representation of certain species is very low at the time of testing. While specific results can be calculated (% reductions, as shown here in this TechNote) – that do show when drenches have been effective or when they haven't been effective – it is important to note that **they are an indication only**.

Full drench resistance testing (FECRT/WECRT) is always recommended to more accurately determine resistance status.

Industry best practice guidelines[2] recommend conducting drench resistance tests (WECRTs) every 2-3 years, to be aware of the drench resistance status on your own property – and because drench resistance increases over time.

How were the DrenchChecks conducted?

Elanco promoted DrenchChecks nationally between 2022 and 2024 to increase awareness of the importance of monitoring drench efficacy. Producers were able to register online in order to participate, or through direct contact with their Rural Reseller and Elanco Territory Manager. WEC kits were provided free of charge and submitted to an independent laboratory, with assistance in the protocol and sample collection process provided by the Elanco Territory Manager – either directly in person, or indirectly depending on location.

Submissions had to meet standard diagnostic guidelines. 171 complete submissions were received and analysed.

How did the older single and dual actives perform?

Just six DrenchChecks were performed on older single and dual actives. Resistance is already well recognised[6] to levamisole (LEV), the benzimidazoles (BZ), dual combinations of LEV/BZ and to abamectin (ABA) – and this was evident in the DrenchCheck results (Table 2).

How did triple drenches perform?

Combination treatments have been widely advocated to slow the development of drench resistance. They have also been beneficial in maintaining the useful life of many of the older actives on some properties through the additive efficacy attained by using multiple actives together. Abamectin-based triple drenches, and more recently moxidectin-based triple drenches, are widely used.

The DrenchChecks conducted between 2022 and 2024 clearly demonstrated that high efficacy cannot be assumed. It is important to check. 22 farms out of 49 (45%) that tested an abmectin-based triple drench had evidence of resistance – with overall efficacy of 50% or below in some cases, and indications of similarly low efficacy against some individual worm species (Table 4). High efficacy was demonstrated on the other 27 farms that tested an abamectin-based triple drench. 7 farms out of 18 that tested a moxidectin-based triple drench had evidence of resistance (Table 5).

Table 2: Summary of DrenchChecks conducted on older single and dual actives.

Location	Pre-drench WEC (epg)	Drench	Post-drench WEC (epg)	% reduction WEC			
				Overall	*Haemonchus*	*Trichostrongylus*	*Teladorsagia*
Cummins 1, SA	228	ABA	0	100	NA	100	100
Cleve, SA	312	ABA	84	73	NA	34	90
Tamworth, NSW	5292	ABA	1518	71	67	82	NA
Young, NSW	204	BZ/LEV	12	94	NA	NA	NA
Tooraweenah, NSW	882	BZ/LEV	84	90	100	0	NA
Cummins 2, SA	534	LEV	60	89	NA	92	77

How did closantel-based combination drenches perform?

Closantel has long been relied upon as a useful tool in control of *Haemonchus*, based on its narrow spectrum of activity and level of persistence in some formulations. The DrenchChecks conducted between 2022 and 2024 clearly showed that even in combination with other broad spectrum actives, resistance is common and can be severe (Table 3). Persistence is also clearly limited, when low efficacy is demonstrated 10-14 days after treatment. Importantly, when scour worms are present (*Trichostrongylus* and *Teladorsagia*/*Ostertagia*), closantel has no activity against these species – which then isolates the older active/s in the combination (e.g. just abamectin, or ABA/BZ/LEV) – and resistance to the older actives is already well documented.[6]

Table 3: Summary of DrenchChecks conducted on closantel-based combinations.

Location	Pre-drench WEC (epg)	Drench	Post-drench WEC (epg)	% reduction WEC			
				Overall	*Haemonchus*	*Trichostrongylus*	*Teladorsagia*
Henty 1, NSW	2100	CLOS/ABA	0	100	100	NA	NA
Stuart Town, NSW	426	CLOS/ABA	0	100	100	100	NA
Henty 2, NSW	756	CLOS/ABA	12	98	NA	NA	NA
Whorouly South, VIC	582	CLOS/ABA	12	98	100	NA	70
Murup, WA	120	CLOS/ABA	12	90	NA	100	81
Armidale, NSW	4068	CLOS/ABA	713	82	83	NA	NA
Holbrook 1, NSW	366	CLOS/ABA	156	57	58	100	0
Coonamble, NSW	480	CLOS/ABA	288	40	35	78	NA
Sandigo, NSW	96	CLOS/ABA/ BZ/LEV	0	100	100	100	100
Pearlah, SA	168	CLOS/ABA/ BZ/LEV	0	100	NA	100	100
Green Patch, SA	180	CLOS/ABA/ BZ/LEV	0	100	NA	100	100
Millicent, SA	2964	CLOS/ABA/ BZ/LEV	18	99	100	NA	100
Daysdale, NSW	738	CLOS/ABA/ BZ/LEV	6	99	100	99	99
Holbrook 2, NSW	1650	CLOS/ABA/ BZ/LEV	42	97	NA	NA	NA
Cowra, NSW	174	CLOS/ABA/ BZ/LEV	12	93	100	100	31
Lake Cargelligo, NSW	1164	CLOS/ABA/ BZ/LEV	120	90	56	96	90
Newbridge, NSW	2346	CLOS/ABA/ BZ/LEV	390	83	90	76	89
Narromine, NSW	1044	CLOS + BZ/LEV	0	100	100	100	100

Table 4: Summary of DrenchChecks conducted on abamectin-based triple actives.

Location	Pre-drench WEC (epg)	Drench	Post-drench WEC (epg)	% reduction WEC			
				Overall	*Haemonchus*	*Trichostrongylus*	*Teladorsagia*
Culcairn 1, NSW	7872	ABA/BZ/LEV	0	100	100	100	100
Young 1, NSW	4806	ABA/BZ/LEV	6	100	100	100	NA
Morven, NSW	1596	ABA/BZ/LEV	0	100	100	100	100
Young 2, NSW	246	ABA/BZ/LEV	0	100	100	100	100
Clare 1, SA	750	ABA/BZ/LEV	0	100	100	100	100
Waterloo, SA	420	ABA/BZ/LEV	0	100	NA	100	100
Wirrabara, SA	720	ABA/BZ/LEV	0	100	NA	100	100
Brinkworth, SA	216	ABA/BZ/LEV	0	100	NA	100	100
Hanson, SA	90	ABA/BZ/LEV	0	100	NA	NA	100
Ki Ki, SA	5160	ABA/BZ/LEV	12	100	100	99	NA
Kybybolite, SA	138	ABA/BZ/LEV	0	100	100	100	100
Esperance, WA	276	ABA/BZ/LEV	0	100	NA	100	100
Parndana, SA	78	ABA/BZ/LEV	0	100	NA	100	100
Yarrabandi, NSW	432	ABA/BZ/LEV	0	100	100	100	100
Grenfell, NSW	384	ABA/BZ/LEV	0	100	NA	100	100
Yass, NSW	894	ABA/BZ/LEV	0	100	NA	100	100
Tooraweenah, NSW	2640	ABA/BZ/LEV	0	100	100	100	NA
Tatong, VIC	90	ABA/BZ/LEV	0	100	100	100	NA
Ganmain, NSW	108	ABA/BZ/LEV	0	100	NA	100	100
Manoora, SA	713	ABA/BZ/LEV	0	100	NA	100	100
Green Patch, SA	606	ABA/BZ/LEV	0	100	NA	100	100
Clare 2, SA	648	ABA/BZ/LEV	0	100	NA	100	NA
Lemont, TAS	984	ABA/BZ/LEV	6	99	NA	NA	NA
Glenthompson, VIC	504	ABA/BZ/LEV	6	99	100	99	99
Merrijig, VIC	1152	ABA/BZ/LEV	6	99	100	99	99
Loxton 1, SA	6618	ABA/BZ/LEV	72	99	100	82	NA
Indigo Valley, VIC	3366	ABA/BZ/LEV	20	99	98	100	99
Jerilderie, NSW	708	ABA/BZ/LEV	6	99	NA	100	94
Kingston SE 1, SA	378	ABA/BZ/LEV	12	97	97	NA	94
Forest Grove, WA	360	ABA/BZ/LEV	12	97	100	96	69
Casterton, VIC	138	ABA/BZ/LEV	6	96	NA	NA	NA
Barmedman, NSW	120	ABA/BZ/LEV	6	95	NA	100	94
Cookardinia, NSW	2982	ABA/BZ/LEV	162	95	NA	96	72
Nulla Vale, VIC	102	ABA/BZ/LEV	6	94	NA	NA	NA
Taralga, NSW	60	ABA/BZ/LEV	6	90	NA	NA	NA
Ournie, NSW	2310	ABA/BZ/LEV	324	86	99	50	NA
Nevertire, NSW	108	ABA/BZ/LEV	18	83	NA	NA	NA
Cooma, NSW	222	ABA/BZ/LEV	42	81	NA	NA	81
Kingston SE 2, SA	366	ABA/BZ/LEV	84	77	NA	71	86
Culcairn 2, NSW	636	ABA/BZ/LEV	174	73	92	0	NA
Bowning, NSW	180	ABA/BZ/LEV	54	70	NA	69	71
Coreen, NSW	84	ABA/BZ/LEV	36	57	NA	26	67
Rockley, NSW	126	ABA/BZ/LEV	60	52	NA	43	62
Curramulka, SA	240	ABA/BZ/LEV	120	50	NA	100	33
Condingup, WA	204	ABA/BZ/LEV	102	50	100	100	0
Loxton 2, SA	533	ABA/BZ/LEV	306	43	NA	NA	NA
Baringhup West, VIC	30	ABA/BZ/LEV	18	40	NA	0	61
Brentwood, SA	198	ABA/BZ/LEV	372	0	NA	0	0
Coonawarra, SA	36	ABA/BZ/LEV	42	0	94	59	0

Table 5: Summary of DrenchChecks conducted on moxidectin-based triple actives.

Location	Pre-drench WEC (epg)	Drench	Post-drench WEC (epg)	% reduction WEC			
				Overall	*Haemonchus*	*Trichostrongylus*	*Teladorsagia*
Hopefield, NSW	1866	MOX/BZ/LEV	0	100	100	NA	NA
Mangoplah, NSW	786	MOX/BZ/LEV	0	100	100	100	100
Corny Point, SA	1896	MOX/BZ/LEV	0	100	NA	100	100
Lilliput, VIC	4284	MOX/BZ/LEV	0	100	100	100	100
Alma Park, NSW	240	MOX/BZ/LEV	0	100	NA	100	100
Goulburn, NSW	438	MOX/BZ/LEV	0	100	100	100	100
Terip Terip, VIC	7302	MOX/BZ/LEV	0	100	100	100	100
Crookwell, NSW	222	MOX/BZ/LEV	0	100	100	100	100
Wirrabara, SA	582	MOX/BZ/LEV	0	100	100	100	NA
Kiana, SA	54	MOX/BZ/LEV	0	100	NA	100	100
Angaston, SA	636	MOX/BZ/LEV	6	99	NA	100	98
Lochaber, SA	384	MOX/BZ/LEV	18	95	100	99	66
Kingstown, NSW	1974	MOX/BZ/LEV	114	94	90	98	96
Wynyard, TAS	570	MOX/BZ/LEV	54	91	NA	0	95
Young, NSW	3336	MOX/BZ/LEV	378	89	90	43	NA
Stanthorpe, QLD	2292	MOX/BZ/LEV	762	67	67	NA	NA
Swan Hill, VIC	168	MOX/BZ/LEV	66	61	NA	100	43
Stewart Range, SA	66	MOX/BZ/LEV	72	0	0	0	100

How did moxidectin perform?

Moxidectin is the most potent of the macrocyclic lactones (MLs) on the market for sheep. It also provides a level of persistence which is attractive to many producers – with the level of persistence varying between worm species and product formulation. Of the DrenchChecks conducted on mid-length formulations (e.g. oral or mid-length injectable), resistance was evident on some properties – particularly in *Haemonchus* and *Ostertagia/Teladorsagia* (Table 6). ML resistance is well known to be more common in these worm species[6], as demonstrated here.

Table 6: Summary of DrenchChecks conducted on mid-length moxidectin formulations.

Location	Pre-drench WEC (epg)	Drench	Post-drench WEC (epg)	% reduction WEC			
				Overall	*Haemonchus*	*Trichostrongylus*	*Teladorsagia*
Kingscote, SA	132	MOX	0	100	NA	100	100
Eden Valley, SA	582	MOX	6	99	NA	100	98
St Arnaud, VIC	1134	MOX	36	97	NA	99	96
Lore River, WA	228	MOX	6	97	NA	NA	NA
Frances, SA	402	MOX	12	97	NA	NA	NA
Keppock, SA	624	MOX	24	96	100	99	93
Merriwa, NSW	7554	MOX	378	95	95	100	NA
Katanning 1, WA	102	MOX	6	94	NA	97	93
Holbrook, NSW	876	MOX	53	94	94	NA	94
Everton Upper, VIC	4224	MOX	540	87	86	100	100
Young 1, NSW	252	MOX	48	81	85	71	90
Murringo, NSW	276	MOX	60	78	69	99	61
Esperance, WA	96	MOX	24	75	0	100	94
Barellan, NSW	96	MOX	24	75	73	90	75
Auburn, SA	186	MOX	48	74	NA	93	73
Katanning 2, WA	36	MOX	12	67	NA	100	40
Young 2, NSW	342	MOX	132	61	30	100	67
Gibson, WA	273	MOX	126	54	100	96	0
Young 3, NSW	96	MOX	150	0	0	0	22
Millicent, SA	72	MOX	126	0	0	0	0

Of the DrenchChecks conducted on long-acting (LA) formulations, resistance was again evident on some properties – particularly in *Haemonchus* and *Ostertagia/Teladorsagia* (Table 7). Some of these DrenchChecks were carried out as late as 60-90 days post-treatment, given the label protection period for *Haemonchus* and *Ostertagia/Teladorsagia* is 91 days. Primer drenches had also been given concurrently at the time of treatment in some cases (Table 7).

Table 7: Summary of DrenchChecks conducted on long-acting (LA) moxidectin formulations.

Location	Pre-drench WEC (epg)	Drench	Post-drench WEC (epg)	Days post-treatment	% reduction WEC				Primer
					Overall	*Haemonchus*	*Trichostrongylus*	*Teladorsagia*	
Parndana, KI, SA	2376	MOX LA	0	60-90	100	100	100	100	DERQ/ABA
Lucindale, SA	24	MOX LA	0	60-90	100	100	100	100	BZ/LEV
Lilliput, VIC	54	MOX LA	0	10-14	100	NA	NA	NA	ABA/BZ/LEV
Stewart Range, SA	354	MOX LA	0	40-50	100	NA	100	100	BZ/LEV
Boyup Brook, WA	210	MOX LA	0	40-50	100	NA	100	100	No primer
Hanwood, NSW	72	MOX LA	0	60-90	100	100	100	100	MPL/ABA
Mokup, WA	174	MOX LA	0	10-14	100	NA	100	100	MPL/ABA
Nevertire 1, NSW	204	MOX LA	0	10-14	100	100	100	100	MPL/ABA
Nevertire 2, NSW	1128	MOX LA	0	10-14	100	100	100	100	MPL/ABA
Walbundrie, NSW	9930	MOX LA	120	60-90	99	99	100	NA	ABA/BZ/LEV/CLOS
Cuballing, WA	858	MOX LA	12	10-14	99	NA	NA	NA	No primer
Coles, SA	1170	MOX LA	6	10-14	99	100	100	87	BZ/LEV
Port Lincoln, SA	462	MOX LA	12	60-90	97	NA	NA	NA	No primer
Cookardinia, NSW	1644	MOX LA	114	10-14	93	0	100	99	No primer
Newstead, WA	342	MOX LA	48	60-90	86	90	NA	72	DERQ/ABA
Mansfield, VIC	870	MOX LA	138	60-90	84	86	NA	60	ABA/BZ/LEV
Inman Valley, SA	516	MOX LA	84	60-90	84	87	NA	0	MPL
Sedgwick, VIC	168	MOX LA	96	60-90	43	NA	NA	2	No primer

How did capsules perform?

Slow-release anthelmintic capsules are another form of long-acting (LA) products that were widely used by producers. The DrenchChecks conducted on capsules (combination ABA/BZ) demonstrated severe resistance (Table 8). There were no DrenchChecks conducted on capsules in 2024, with capsules no longer available in Australia.

Table 8: Summary of DrenchChecks conducted on long-acting (LA) capsules.

Location	Pre-drench WEC (epg)	Drench	Post-drench WEC (epg)	% reduction WEC			
				Overall	*Haemonchus*	*Trichostrongylus*	*Teladorsagia*
Parndana, KI, SA	138	ABA/BZ LA	186	0	NA	92	0
Tungkillo, SA	108	ABA/BZ LA	108	0	NA	0	48
Mt Pleasant, SA	30	ABA/BZ LA	168	0	NA	NA	NA
Boyup Brook, WA	132	ABA/BZ LA	180	0	NA	NA	84

How did the newer actives perform?

The industry has been fortunate in more recent years to have 2 newer actives available, in monepantel and derquantel. The DrenchChecks conducted on products containing these actives generally demonstrated very high efficacy (Table 9 and Table 10), but there were also some early warning signs that even the newer actives face the same challenges in terms of selection pressure for resistance – and we must continue to use these actives with care and in line with industry best practice guidelines[2] to protect their high level of efficacy.

Table 9: Summary of DrenchChecks conducted on the abamectin/derquantel combination.

Location	Pre-drench WEC (epg)	Drench	Post-drench WEC (epg)	% reduction WEC			
				Overall	*Haemonchus*	*Trichostrongylus*	*Teladorsagia*
Kentucky, NSW	2838	ABA/DERQ + BZ/LEV	6	100	100	100	100
Narrandera 1, NSW	60	ABA/DERQ	0	100	100	100	100
Grong Grong, NSW	228	ABA/DERQ	0	100	100	100	100
Mansfield, VIC	216	ABA/DERQ	0	100	100	100	100
Rand, NSW	396	ABA/DERQ	0	100	NA	100	100
Boggabri, NSW	5964	ABA/DERQ	24	100	NA	NA	NA
Kongorong, SA	786	ABA/DERQ	0	100	100	100	100
Narrandera 2, NSW	192	ABA/DERQ	0	100	100	100	100
Narrandera 3, NSW	90	ABA/DERQ	0	100	100	100	100
Collie, NSW	5016	ABA/DERQ	60	99	99	100	81
Ballandoran, NSW	1596	ABA/DERQ	12	99	98	100	100
Walcha, NSW	1488	ABA/DERQ	30	98	98	100	NA
Bendoc, VIC	1062	ABA/DERQ	24	98	98	100	98
Bray, SA	174	ABA/DERQ	6	97	NA	91	97
Telopea Downs, VIC	372	ABA/DERQ	24	94	NA	94	100
Waterloo, SA	408	ABA/DERQ	48	88	100	100	22
Glen Innes, NSW	3108	ABA/DERQ	486	84	83	100	NA
Neilrex, NSW	1746	ABA/DERQ	1476	15	15	NA	NA

Table 10: Summary of DrenchChecks conducted on the abamectin/monepantel combination.

Location	Pre-drench WEC (epg)	Drench	Post-drench WEC (epg)	% reduction WEC			
				Overall	*Haemonchus*	*Trichostrongylus*	*Teladorsagia*
Cookardinia, NSW	2874	MPL/ABA + BZ/LEV	0	100	100	100	100
Narooma, NSW	708	MPL/ABA	0	100	100	100	100
Bundarra, NSW	222	MPL/ABA	0	100	100	NA	NA
Naracoorte, SA	294	MPL/ABA	0	100	100	NA	NA
Harden 1, NSW	24	MPL/ABA	0	100	NA	NA	NA
Ournie, NSW	2310	MPL/ABA	6	100	100	100	NA
Wallandbeen, NSW	582	MPL/ABA	0	100	100	100	100
Pingelly, WA	264	MPL/ABA	0	100	NA	100	100
Harefield 1, NSW	144	MPL/ABA	0	100	100	100	100
Gilgandra, NSW	4536	MPL/ABA	0	100	100	NA	NA
Combaning, NSW	978	MPL/ABA	0	100	100	100	100
East Devonport, TAS	468	MPL/ABA	0	100	NA	100	100
Esperance, WA	312	MPL/ABA	0	100	NA	100	100
Loxton, SA	378	MPL/ABA	0	100	NA	100	100
Harden 2, NSW	504	MPL/ABA	0	100	100	100	100
Guyra, NSW	6366	MPL/ABA	12	100	100	100	NA
Windellaya, NSW	594	MPL	6	99	93	100	100
Harefield 2, NSW	264	MPL/ABA	18	93	NA	NA	NA
Lucindale, SA	558	MPL/ABA	120	78	63	100	89
Petherick, SA	204	MPL/ABA	168	18	NA	0	49

TECHNICAL UPDATE

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So what are my options?

The best option of all is to perform your own DrenchCheck – or a full drench resistance test (WECRT) where possible – and seek appropriate advice on drench selection.

The DrenchCheck data across 2022-2024 highlights the widespread nature of resistance, but there is no substitute for data from your own farm. The nature of drench resistance will depend on many factors, including environment and previous drench history and worm control strategies.

The DrenchCheck data also highlights the importance of effective quarantine drenching. Buying sheep that are carrying resistant worms is the quickest way of all to develop resistance on your own property – and this data provides substantial evidence that this is highly likely with any new sheep introduced.

Monepantel is from a completely novel drench class and can provide very high efficacy against *Haemonchus*, *Trichostrongylus* and *Teladorsagia/Ostertagia*[7]. It is also known to be effective against worms that are resistant to other drench actives, even those worms that are resistant to 3 or 4 other actives[8] – making it ideal as a component in any quarantine drench and as a superior strategic drench on farm – even if the resistance status of other drench classes is unknown or if resistance to other actives is already severe.

It is likely that we will need to continue to rely on the older drench classes for some time to come. By incorporating monepantel now into a within-season rotation with the older drench classes this will help protect these actives, slow the development of resistance[9] and ensure these actives remain useful in the future.

The DrenchCheck data provides a basis for some key 'take-home' messages, and alignment with best practice recommendations[2]:

- Conduct a DrenchCheck on your own property as an indication of drench effectiveness.
- Where possible, conduct a full WECRT on your own property to know which drenches are effective against which worm species.
- Use only fully effective drenches (ideally >98% efficacy).
- Use drench actives in combination (e.g. Zolvix Plus = monepantel + abamectin).
- Rotate drenches each time you treat a mob of sheep.
- Quarantine drench all new sheep introduced to your farm with a fully effective drench.
- Adopt IPM principles (grazing management, nutrition and genetics).
- Incorporate newer drench actives, such as monepantel, into your program now.

Contact your local Elanco Territory Manager for drench and WormBoss advice 1800 226 324.

For full product details, contact Elanco on 1800 995 709 or by email productsupportau@elancoah.com

Always read and follow label directions.
Good agricultural practice is essential for optimal worm control.

Resistance may develop to any chemical. Ask your local veterinary practitioner or animal health advisor for recommended parasite management practices for your area to reduce development of resistance. It is advisable that a resistance test be conducted before any parasite treatment is used. Use in accordance with the registered label directions and regional drench decision guidelines (www.wormboss.com.au).

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