FIELD OBSERVATIONS ON THE PREVENTION OF BREECH STRIKE IN MERINO SHEEP BY JETTING WITH ALDRIN, BHC, DIELDRIN AND ENDRIN.

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SUMMARY.

Aldrin and dieldrin (both at 0.1 and 0.05 per cent.) and endrin (0.05 per cent.) protected ewes against breech strike for periods ranging from four weeks to nine weeks. BHC was inferior to both aldrin and dieldrin.

I. INTRODUCTION.

Interest in jetting to control blowfly strike in sheep has revived since it was shown that the chlorinated hydrocarbons protected sheep against blowfly strike. Waterhouse and Scott (1950), Shanahan (1951), and Downing, Harbour and Stones (1952) reported that DDT protected sheep for longer periods than BHC. Fielder and du Toit (1952) reported favourably on dieldrin after insectary trials, and Graham (1954) found that both aldrin and dieldrin gave lasting protection against body strike under field conditions in New South Wales. Riches and O'Sullivan (1955) compared aldrin, BHC, and dieldrin for the prevention of body strike under semi-field conditions, but no results have come to our notice comparing aldrin, BHC, dieldrin, and endrin in the prevention of breech strike.

During the last two years observations have been made under field conditions on the value of these insecticides for this purpose. This work was designed initially to obtain corroborative field evidence for the semi-field trials conducted by Riches and O'Sullivan (1955), but no waves of body strike occurred. However, breech strike was quite prevalent and this paper reports the results that were obtained. This work was undertaken on the Toorak Field Station, Julia Creek, which carries a flock of plain-breeched Peppin Merino sheep.

II. OBSERVATIONS IN 1954.

(1) Methods.

The first trial was conducted during the autumn of 1954, when aldrin, BHC and dieldrin were compared. Four groups were set up by random selection from 557 Merino weaners of mixed sexes between 5 and 7 months of age; each group contained between 55 and 65 ewe weaners. None had been shorn, crutched, or treated with the Mules or tail strip operations. At marking the tails had been cut level with the tip of the vulva of the ewe lambs as recommended by the Joint Blowfly Committee (1943).

Each sheep was identified by a numbered ear tag and all the animals were run together throughout the trial. The shoulders, back and breech of each sheep were examined carefully once a week for the presence of blowfly eggs and/or larvae.

The sheep were treated on February 19, 1954, when an 0·1 per cent. solution of aldrin, BHC and dieldrin was jetted into the wool of the breech and along the back of each sheep in Groups 1, 2 and 3, respectively. The fourth group was kept as an untreated control. The insecticide was dissolved in commercial xylol and emulsified in Lissapol NX. Carbon tetrachloride was added to bring the specific gravity to 1. The diluted jetting fluid was applied from a 3-jet nozzle, each jet having an aperture of $\frac{1}{16}$ in. Care was taken to saturate the wool to the skin and about half a gallon of fluid was applied to each sheep. That which drained off was not re-used. Sheep that were struck—i.e., on which viable larvae were seen—were dressed with a proprietary dressing containing DDT and a larvicide.

The rainfall recorded during the trial was:—

	in.		in.
February 23	0.66	March 9	0.4
March 4	3.52	March 10	0.8
March 5	2.55	April 17	0.10

(2) Results.

Fourteen sheep had slight strikes when treated on Feb. 19.

Table 1 shows for the ewe weaners in each group at each observation:—

(*a*) Number of ewe weaners on which eggs only were recorded—i.e., from which larvae did not develop. (Repeat ovipositions are shown in brackets.)

(*b*) Number of these sheep on which viable larvae developed for the first time.

(*c*) Number of ewe weaners that suffered a restrike.

Very few strikes developed in the wethers in any group. Oviposition occurred in 7 of the 59 wethers in the aldrin-treated group, in 3 of the 57 treated with dieldrin, in 4 of the 55 in the BHC-treated group, and in 5 of the 49 in the control group. Larvae established themselves on 6 wethers in the aldrin group, on 1 in the dieldrin group, on 2 in the BHC group, and on 4 in the controls.

III. OBSERVATIONS IN 1955.

(1) Methods.

In 1955 observations were made on four groups of uncrutched Merino weaners born in October-November, 1954. Each group contained 50 ewes and 50 wethers selected at random and identified by ear tags. The treatment

TABLE 1.

INCIDENCE OF EGGS AND/OR LARVAE ON EWE WEANERS, 1954.

Treatments and Number of Ewe Weaners in Each Group Originally.		Number of Ewe Weaners on Which Eggs Only Were Recorded (i.e., From Which Larvae did not Develop).				Number of Ewe Weaners on Which Viable Larvae Developed for the First Time.				Number of Restrikes on Ewe Weaners.			
		Aldrin 0·1% 55	BHC 0·1% 58	Dieldrin 0·1% 59	Control 65	Aldrin 0·1% 55	BHC 0·1% 58	Dieldrin 0·1% 59	Control 65	Aldrin 0·1% 55	BHC 0·1% 58	Dieldrin 0·1% 59	Control 65
Date.	Weeks after Treatment.												
19/2/54													
5/3/54	2						4		7				
12/3/54	3						6		14				
19/3/54	4					2	18	2	9		1		1
29/3/54	5	7	3	9	2	3	1	3	6		2		
5/4/54	6	10 (1)	8	14 (5)	7 (1)	3	2	1	2		2		6
12/4/54	7	8 (5)	3 (1)	6 (5)		2	1	1			4		1
19/4/54	8	4 (3)	4 (1)	4 (3)	1			5		4	5		6
26/4/54	9	1 (1)					2	2	1		3	1	5
3/5/54	10	2 (2)				1	1	1		2	9	3	4
10/5/54	11					3	1			3	2	2	3
17/5/54	12					1		1	1	2	1		2
	Total ..	32	18	33	10	15	46	16	40	11	29	6	28

TABLE 2.

INCIDENCE OF EGGS AND/OR LARVAE ON EWE WEANERS, 1955.

—		Number of Ewe Weaners on Which Eggs Only Were Recorded (i.e., From Which Larvae did not Develop).				Number of Ewe Weaners on Which Viable Larvae Developed for the First Time (i.e., Fresh Strikes).				Number of Restrikes on Ewe Weaners.			
Treatments and Number of Ewe Weaners in Each Group Originally.		Aldrin. 0·05% 50	Dieldrin. 0·05% 50	Endrin. 0·05% 50	Control. 50	Aldrin. 0·05% 50	Dieldrin. 0·05% 50	Endrin. 0·05% 50	Control. 50	Aldrin. 0·05% 50	Dieldrin. 0·05% 50	Endrin. 0·05% 50	Control. 50
Date.	Weeks after Treatment.												
24/2/55	3								4				
3/3/55	4								8				1
10/3/55	5					2			5				3
17/3/55	6		1	1	1	1			4				3
25/3/55	7	3	1 (1)	5 (1)	1	1			3				4
2/4/55	8	2 (1)	2 (1)			1			1				3
9/4/55	9	2 (2)	1	3		1	4	4					3
16/4/55	10	4 (1)	3	6 (3)		3		4	1	1	3	6	6
22/4/55	11					4	2	1	1		1	3	3
29/4/55	12								1				
	Total ..	11	8	15	2	13	6	9	28	1	4	9	26

for each group was decided by the toss of a coin. The sheep were jetted on Feb. 1 and the insecticides used were, respectively, aldrin 0.05% (Group 1), dieldrin 0.05% (Group 2), and endrin 0.05% (Group 3). The fourth group was kept as an untreated control. Half-a-gallon of fluid was used in jetting the breech and along the back of each sheep. The back and breech of each animal was inspected each week and the incidence of blowfly eggs and/or larvae recorded. Upon being struck—i.e., with the development of viable larvae—the affected wool was saturated with an 0·05% solution of the material with which they were originally treated.

The following rainfall was recorded during the period:—

	in.		in.
February 9	0.27	March 1	0.20
February 10	0.27	March 2	0.09
February 11	0.70	March 7	0.10
February 12	0.68	March 11	0.64
February 13	0.09	March 12	0.36
February 19	1.05	March 18	0.05
February 21	1.21	March 19	0.02
February 22	0.03	March 21	0.10
February 23	2.95	April 21	0.03
February 24	0.12	April 22	0.22

(2) Results.

(a) Ewes.

Table 2 shows:—

(*a*) The number of ewe weaners on which blowfly eggs only were recorded—i.e., from which larvae did not develop. (Repeat ovipositions are shown in brackets.)

(*b*) The number of these ewes on which viable larvae developed for the first time.

(*c*) The number of ewe weaners that suffered a restrike.

(b) Wethers.

Blowfly eggs occurred on the crutch and tail of one wether in the aldrin-treated group on Apr. 2. Larvae occurred on the right side of the crutch of the same animal on Apr. 22. Larvae occurred on the left-hand side of the crutch of one sheep in the dieldrin-treated group on Apr. 2. Neither eggs nor larvae were observed on any sheep in the untreated controls or the group treated with endrin.

IV. DISCUSSION.

In both trials breech strike continued to occur in the controls during the time these observations were made, although after the sixth week the majority were restrikes. Both aldrin and dieldrin gave good protection against breech strike for four weeks when used at a dilution of 0.1 per cent. during a

severe wave. After the sixth week the rate of breech strike in sheep treated with aldrin and dieldrin was similar to that in the controls throughout this trial. BHC at 0·1 per cent. proved inferior to both aldrin and dieldrin.

When used at 0.05 per cent. dilution in 1955, aldrin gave slightly less satisfactory protection against breech strike in ewe weaners than dieldrin or endrin. No strikes developed in sheep treated with dieldrin and endrin until the ninth week, by which time six sheep (12 per cent.) of the ewe portion of the aldrin-treated group were struck. After the ninth week the rate of breech strike amongst the treated sheep was not very different from that in the controls. Eggs failed to develop into active larvae on comparable numbers of sheep in both the aldrin- and dieldrin-treated groups in each trial.

It is improbable that endrin will become popular as a jetting fluid, because it is very costly. There seems little to choose between aldrin and dieldrin on the protection they afforded. They both gave shorter protection against breech strike than Graham (1954) reported against body strike. This is not surprising, as the wool on the breech of sheep of this class is readily soiled with urine. This and rain could help wash out the insecticide. The humid conditions that prevailed would have impeded the drying of the wool and could have facilitated the breakdown of the insecticide in the wool. In view of the seasonal conditions that prevailed at the time of these trials it is not surprising that a large proportion of the controls were struck.

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