

PESTICIDE USAGE IN SCOTLAND

SURVEY REPORT 57

CATTLE 1984

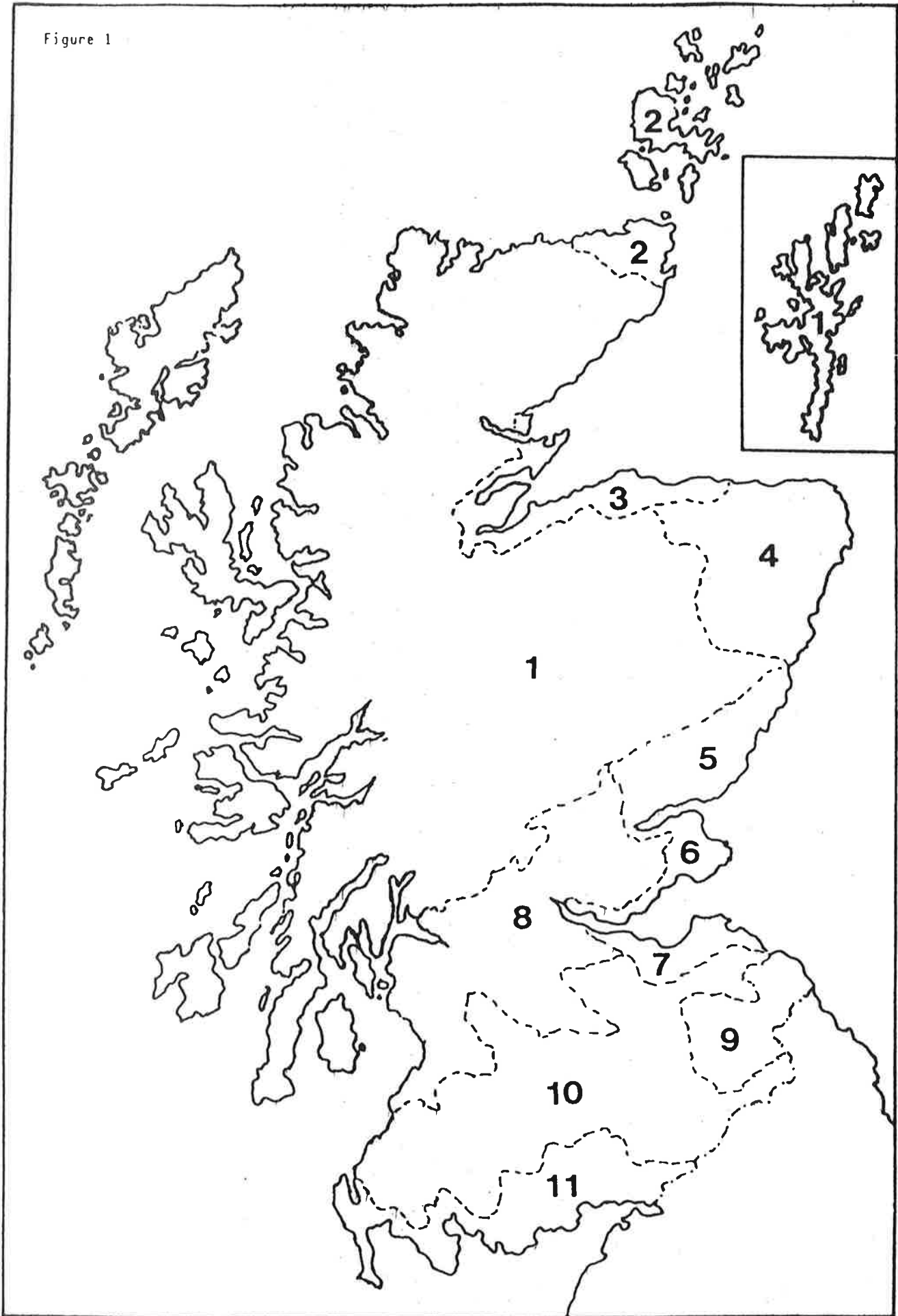
H. M. BOWEN

**Agricultural Scientific Services
Department of Agriculture and Fisheries for Scotland
East Craigs, Edinburgh**

**J. WOOD
A. MANN**

**Agricultural and Food Research Council
Scottish Agricultural Statistics Service
West Mains Road
Edinburgh**

Figure 1



- 1. Highlands and Islands
- 2. Caithness/Orkney
- 3. Moray Firth
- 4. Aberdeen

- 5. Angus
- 6. E Fife
- 7. Lothian

- 8. Central Lowlands
- 9. Tweed Valley
- 10. Southern Uplands
- 11. Solway

PESTICIDES USED ON CATTLE 1984

SUMMARY

A survey of 224 beef and 120 dairy holdings showed that warble fly treatments were applied on 52% of beef and 47% of dairy holdings. The proportions of cattle treated on each type of holding were 46% and 32% of beef and dairy respectively. Treatment against nuisance and biting flies was done by 3% of beef and 31% of dairy holdings involving 2% of beef and 19% of dairy cattle. The fabric of dairy buildings was treated with residual insecticides on about 22% of holdings and space sprays or slow release strips were used by 28% of holdings. Only 3% of beef holdings used insecticides either in or on the buildings. Treatment against lice was done by 47% of beef and 39% of dairy holdings, involving 19% and 18% of beef and dairy cattle respectively.

The principal chemicals used against warble flies were ivermectin, phosmet and fenthion. Nuisance and biting flies were treated mostly with cypermethrin, permethrin and tetrachlorvinphos. Gamma-HCH remained the main chemical treatment against lice.

INTRODUCTION

This is the second survey of the usage of pesticides on cattle in Scotland, the first being in 1977/78 (Reference 1). Cattle are treated with pesticides to control warble flies (Hypoderma spp.), the subject of an eradication scheme, various biting and nuisance fly including head flies (Hydrotea irritans) implicated in the transmission of summer mastitis, and lice. Acaricides are occasionally used to control mange mites. Space sprays and slow release strips are used in and around dairies and milking parlours.

METHOD

Because beef and dairy cattle are distributed differently within Scotland and because husbandry requirements can differ both between regions and classes of cattle, two separate samples were drawn, one of beef cattle and the other of dairy.

For the previous survey in 1977/78 a simple preliminary postal survey of a large number of holdings was undertaken to determine which farms used pesticides. From the information obtained then it was decided that a preliminary survey was not required for the present survey.

Where holdings were visited and found to have both classes of cattle, data were collected only in respect of the class specified in the sample.

Both samples were drawn using data from the June 1983 Agricultural census (Reference 2). Holdings with 10 or more cattle were divided into four size groups, 1. 10-49 cattle 2. 50-99; 3. 100-149; 4. 150 or more. For the beef cattle sample, all the regions shown in Figure 1 were considered separately. Dairy units were concentrated mainly into the Central lowland and Solway areas (Regions 8 and 11), so these two regions were considered separately, along with a third which consisted of the remainder of the country. The quantitative information collected at the interviews was summed within each region and size group, and this data was then raised to give an estimate of Scottish usage.

The numbers of farms visited and the appropriate raising factors, calculated from the June 1984 Agricultural Census (Reference 3), are shown in Tables 1 and 2. The survey presents the estimated usage on approximately 1.1 million beef and 0.44 million dairy cattle, over 1 year old.

RESULTS

WARBLE FLIES

Since the last survey, treatment against warble fly has been subject to legislation. This began in 1978 when it was estimated that the proportion of cattle infected by warble fly larvae in the UK was in excess of 34% (Reference 4). By 1982 when the incidence of warbles was sufficiently reduced, the Warble Fly (Scotland) Order (1978) was replaced by the Warble Fly (Scotland) Order (1982). This made the incidence of warbles notifiable and provision was made for the designation of infected areas within which cattle movement restrictions could be applied and treatment made compulsory. 139 cases were recorded in Scotland in 1982 but only 32 and 20 in the two following years. To assist in treating persistent

infestations, some of the Western Isles were designated as infected areas in 1982 and 1983. Also, in 1984, an infected area was designated in Dumfries and Galloway. In 1985, 5 cases were recorded, two of these being known to have been imported from Somerset and Ireland (Reference 5).

The figures in Table 3 show that in Scotland as a whole, 52% of all beef holdings applied treatment to 46% of all beef cattle. Corresponding figures in 1977 were 38% and 33%. This 52% was made up of 14% using pour-on formulations only, 35% using ivermectin and 3% using both systems.

There was appreciable regional variation, both in the proportions of cattle treated and the proportions of holdings which gave any treatment (figures from both Highland and Caithness/Orkney regions should be treated with considerable caution as the sample was very small). Figures from Fife indicated that only 19% of beef cattle were treated whereas 58% of those in the Solway region received treatment. The proportions of holdings giving treatment in these regions were 38% and 59% respectively.

The corresponding figures for dairy herds are given in Table 4 which shows that 47% of holdings treated 32% of all cattle. In 1977 the corresponding figures were 44% and 27%. In the current survey 28% used pour on compounds 18% used ivermectin and 1% used both treatments.

In 1984, with the exception of phosmet, the use of which increased slightly (Table 7), the overall quantities of systemic organophosphorous compounds used were considerably less than in the previous survey. This reduction is thought to be due to the introduction and widespread adoption of ivermectin, largely to control helminths but also to control warble larvae. Although the estimated quantity used (Table 7) was very small, it should be remembered that compared with the organophosphorus compounds, ivermectin, which is administered by injection, is an extremely active compound, the dose rate being only 200 microgrammes per kg of body weight (typically one hundredth of an o.p. dose). Its use was routine on many holdings, more especially beef

enterprises, as it is not licensed for use on cattle producing milk for human consumption. When used in dairy units it was applied to young animals and dry cows.

The majority, 95%, of warble treatments were given between October and December with the remaining 5% between January and March.

NUISANCE AND BITING FLIES

As shown in Table 5, the control measures against these groups of flies were very largely restricted to the dairy sector where 31% of holdings used either residual sprays on the cattle or insecticidal ear tags or both. In the previous survey in 1977/78 22% of holdings applied treatment, usually crotoxyphos. This has mostly been replaced by cypermethrin and permethrin used either as a spray or in ear tags. Ear tags containing fenvalerate were newly marketed and only a small usage was recorded. One farmer applied DDT at an uncertain rate (an uncleared use). Many farmers suggested that the persistence of both sprays and ear tags was appreciably less than that claimed.

Synergized pyrethrins were applied on and around cattle in 20% of dairy premises at milking time, either from aerosol cans or hand operated sprayers (this compared with 43% in 1977/78). Dichlorvos strips were found on 8% of holdings (13% in the previous survey) although the amount of ventilation present in milking parlours and associated areas made their effectiveness doubtful.

The fabric of the dairy buildings was treated with residual insecticides on 22% of holdings compared with only 4% in the previous survey. As then, the most used chemical was tetrachlorvinphos but smaller quantities of cypermethrin and permethrin were also used. Two farmers used DDT on the walls around cattle collecting areas. It should be pointed out that DDT was not cleared for use on either cattle or buildings.

In contrast to the relatively frequent treatment on and around dairy cattle, beef cattle were rarely in contact with insecticides used against nuisance and biting flies.

LICE

The incidence and pattern of treatment against lice was complicated by the widespread use of ivermectin and the organophosphorus warble insecticides, both of which are effective against lice throughout their life cycle except at the egg stage. Whatever treatment is used, it is recommended that a second treatment be applied about 6 weeks later. Table 6 shows the proportion of holdings on which specific louse treatments were used and also the proportions of cattle which were treated. The figures do not include treatments directed at warble or helminth infestations but do include those applications of ivermectin or systemic OP's used at half rate and applied against lice. Many farmers relied on the warble fly treatments alone to keep infestations of lice to what was thought a reasonable level.

The proportion of holdings treating against lice was broadly similar to the 45% found in the previous survey. However, the quantity of gamma-HCH (the standard specific) used was much less, 118 kg active ingredient compared with 591 kg. (Table 7). This was only partly due to the use of ivermectin specifically against lice. Several farmers suggested to interviewers that problems with lice had diminished considerably since the introduction of the routine warble treatments.

MANGE

Three infestations of unidentified species of mange mites were recorded during the survey, two on beef holdings and one on a dairy holding. Both infestations in the beef herds were treated with ivermectin and in the dairy herd with a gamma-HCH dressing.

CONCLUSIONS AND DISCUSSION

This survey reports the pesticide situation at the end of a period of compulsory use of insecticide, either systemic OP's or ivermectin, which has successfully controlled the warble fly in Scotland. It is thought that the usage of OP's will now decline but that of ivermectin will continue at least at its present level but largely to control helminths. Both these classes of chemical, together with gamma-HCH may continue to be used in the control of lice.

When considering the usage of pesticides other than against warble larvae, the differences between the beef and dairy herds were considerable, particularly in relation to the control of nuisance and biting flies. The use of two samples, one beef and one dairy tended to obscure the fact that very many holdings held both classes of cattle. At interview, the only class considered was that which came into the sample (only two holdings were drawn in both samples). What could not be established was, that if a holding had both classes of animal, whether the farmer's attitude to one class affected his treatment of the other, e.g. whether the possession of a dairy herd, with its greater attention to such matters as fly control, influenced any decisions concerning the beef herd. Similarly, as Tucker pointed out in relation to the 1978/79 survey, the possession of both beef and dairy animals could result in that holding being drawn in a small size group for the one sample, but the farmer's attitude towards the maintenance of this smaller fraction may be influenced by his being the manager of a very large herd.

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TABLE 1 The number of holdings sampled in each region, stratified by size

BEEF SAMPLE	SIZE GROUP				Total
	1	2	3	4	
Region	1	2	3	4	Total
Highlands	2	3	1	0	6
Caithness/Orkney	2	2	2	2	8
Moray coast	4	6	4	5	19
Aberdeen	9	15	11	21	56
Angus	3	4	0	9	16
Fife	2	1	1	3	7
Lothian	1	2	2	3	8
Central Lowlands	6	10	6	10	32
Tweed valley	2	4	4	6	16
Southern Uplands	2	6	6	8	22
Solway	3	5	9	17	34
Scotland	36	58	46	84	224

DAIRY SAMPLE	SIZE GROUP				Total
	1	2	3	4	
Region	1	2	3	4	Total
Central Lowlands	2	9	15	23	49
Solway	2	5	9	26	42
Rest of Scotland	1	4	7	17	29
Scotland	5	18	31	66	120

TABLE 2 Raising Factors

BEEF SAMPLE	SIZE GROUP			
	1	2	3	4
Region				
Highlands	705.50	134.00	131.00	86.00
Caithness/Orkney	369.00	188.00	67.00	60.00
Moray coast	159.00	62.33	31.50	22.80
Aberdeen	145.56	64.00	29.91	14.38
Angus	153.67	77.25	109.00	12.33
Fife	84.50	115.00	58.00	16.00
Lothian	136.00	38.50	15.50	15.00
Central Lowlands	240.50	82.70	50.17	20.00
Tweed Valley	114.50	41.75	28.00	18.33
Southern uplands	184.50	50.17	33.83	18.25
Solway	200.33	88.40	29.22	15.82

DAIRY SAMPLE	SIZE GROUP			
	1	2	3	4
Region				
Central lowlands	119.00	52.22	31.87	18.09
Solway	71.00	47.20	27.00	12.11
Rest of Scotland	249.00	72.50	40.00	18.41

TABLE 3 Percentage of beef holdings treating against warbles and percentage of beef cattle treated

	% holdings	% cattle
Highlands *	21	23
Caithness/Orkney*	100	92
Moray	36	32
Aberdeen	54	42
Angus	47	38
Fife	38	19
Lothian	29	50
Central Lowlands	51	38
Tweed Valley	82	55
Southern uplands	59	38
Solway	59	58
Scotland	52	46

* Very small sample in these regions

TABLE 4 Percentage of dairy holdings treating against warbles and percentage of dairy cattle treated

	% holdings	% cattle
Central Lowlands	37	22
Solway	75	55
Rest of Scotland	38	26
Scotland	47	32

TABLE 5 Percentage of holdings treating against nuisance and biting flies and percentage of cattle and buildings treated

	Holdings treating cattle (%)	Cattle treated (%)	Fabric of buildings treated (%)	Proportion using space sprays and aerosols (%)
Beef holdings	3	2	1	2
Dairy holdings	31	19	22	28

TABLE 6 Percentage of holdings treating against lice and the percentage of cattle treated

	Proportion of holdings treating (%)	Proportion of cattle treated (%)
Beef holdings	47	19
Dairy holdings	39	18

TABLE 7 Quantities of active ingredients used

Chemical	Quantity (Kg) used on			1978 Total
	Beef cattle holdings	Dairy cattle holdings	Total	
Crotoxyphos	.	30.1	30.1	795
Crufomate	.	50.6	50.6	2818
Cypermethrin	4.0	297.1	301.1	.
Deltamethrin	.	+	+	.
DDT	.	97.6	97.6	.
Dichlorvos	+	26.8	26.8	76
Famphur	19.9	13.8	33.7	.
Fenthion	189.1	82.5	271.6	540
Fenvalerate	.	2.6	2.6	.
Gamma-HCH	96.4	21.2	117.6	591
Ivermectin	28.0	4.2	32.2	.
Permethrin	41.6	108.2	149.8	.
Phosmet	704.6	519.2	1223.8	1021
Pyrethrins	2.4	12.3	14.7	10
Rotenone	1.0	92.9	93.9	+
Tetrachlorvinphos	21.4	250.2	271.6	174

+ represents less than 0.5 Kg

