Treatment	rate kg a.i./ha	Mean % reduction
Cyan/2,4-DP	0.25/1.5	98
" "	0.3/1.5	97.9
Cyan/ MCPA /2,4-DP	0.25/0.3/1.2	97.8
Standard	Recommended rate	98

weed coverreductions were not analysed as they were so obviously significant.

1972

The winter wheat trial results in 1972 are shown as percentage reduction of weed cover by species The spring barley trial results are shown as percentage reduction by site.

Control of weed species in winter wheat 43 days after application

Percentage reduction

Treatments (kg a.i./ha)

SPECIES	MCPA .24 2,4-D.47 2,4-DP 1.77	cyanazine .25 2,4-DP 1.5	cyanazine .25 MCPA .30 2,4-D.P. 1.2	MCPA .43 2,4-D 1.29 Ioxynil 0.17 Bromoxynil 0.26	No of weeds /sq. metre in control
Viola arvensis	95	92	97	95	37
Myosotis arvensis	79	65	65	79	48
Stellaria media	98	100	100	98	50
Matricaria inodora	100	88	83	83	24
Lamium purpureum	53	100	100	95	74
Polygonum aviculare	100	100	100	100	9

Spring barley percentage reduction in weed cover at harvest

Site No.	MCPA .4 2,4-DP 1.6	MCPA .2 2,4-D .4 2,4-DP 1.5	cyanazine 0.25 2,4-DP 1.5	cyanazine .25 MCPA .3 2,4-[illegible] 1.2	MCPA .29 2,4-DP .87 Ioxynil .12 Bromoxynil .17	Control Percen-tage weed remaining
1	100	100	100	-	-	3
2	99	98	97	-	-	9
3	86	87	92	-	-	53
4	93	95	93	-	-	50
5	-	-	100	100	100	3
6	-	-	99	100	99	7
7	-	-	96	97	93	55
8	-	-	100	99	100	5
9	-	-	-	100	-	2
10	-	-	-	100	-	8
11	-	-	-	90	-	45
12	-	-	-	96	-	50

All treatments effectively controlled the main species at present in the trials, these were Matricaria inodora, Lamium amplexicanle, Polygonum persicaria, Polygonum aviculare, Polygonum convolvulus, Myosotis arvensis.

1973

Three spring barley trials were completed in 1973; the results are shown as nos. of weeds remaining per square metre.

Number of weeds per square metre

Treatment kg a.i./ha

Site	MCPA .2 2,4-D .4 2,4-DP 1.5	MCPA . .4 2,4-DP 1.6	cyanazine 0.25 2,4-DP 1.5	MCPA .29/ 2,4-DP .87 Ioxynil .12 bromoxynil .17	Control
1	5	0	0	3	99
2	1	0	0	0	116
3	8	3	2	2	36
Total	14	3	2	5	251

All treatments gave an effective degree of weed control, the best overall weed control was from the cyanazine/2,4-DP mixture.

Leeks and Onions

Weed Control

General weed control results for all sites are set out in Table 1 and individual responses of the principle weeds encountered are summarised in Table 2. 85% weed control was taken as being commercially acceptable. Of the three application timings employed i.e. pre-transplanting split application or post emergence/transplanting, the split application gave the best weed control, even at equivalent total rates of chemical.

Pre-transplanting treatment was the least effective. As a split application 1.12 kg a.i./ha of cyanazine followed by 1.68 kg a.i./ha gave excellent weed control. Propachlor at 4.48 kg a.i./ha pre-transplanting gave a good initial control of weeds, but in the relatively high organic matter soils did not have a long persistance. However, if the pre-transplanting use of propachlor was followed by a post-transplanting application of cyanazine at rates as low as 1.12 kg a.i./ha a long lasting weed control of almost 100% was achieved.

As a post emergence/transplanting treatment cyanazine gave acceptable weed control at rates of 2.24 kg a.i./ha and above, but its effectiveness at a particular site depended greatly on whether or not resistant weeds were present. When weeds such as Polygonum aviculare or Poa annua were absent 1.68 kg a.i./ha of cyanazine was adequate for acceptable control, but in their presence it was difficult to achieve even at higher rates.

Polygonum aviculare was prevalent at site 5 and was well past the seedling stage at spraying and although all rates of cyanazine controlled all other species present, the amount of P. aviculare increased, to colonise areas left by other weeds.

This was reflected in the poor weed control score at this site.

Good control of the other weed species was achieved by the split applications and the post emergence/transplanting treatments. At 2.24 kg a.i./ha cyanazine outstanding control of well established plants of Urtica urens & Stellaria media was achieved. Seedlings of Matricaria spps, Chenopodium album and Senecio vulgaris were well controlled, as were young plants of Capsella bursa-pastoris. The degree of control of these species by the pre transplanting treatments alone was generally not acceptable.

W.L. 63611 had no consistant advantage over cyanazine when used as an alternative, although at Site 5 because of its inherently higher contact activity it gave better control of well established Polygonum aviculare at comparable rates.

There was no difference in weed control whether cyanazine was applied as a S.C. or as a W.P.

Crop Damage - See Table 1

In 5 of the 6 trials reported there was no significant crop damage and at the remaining site (Number 5 - drilled leeks) there was slight thinning at 3.36 and 4.48 kg a.i. of both cyanazine and W.L. 63611. This particular crop had been sprayed at an advanced stage and had suffered from weed competition. Both leeks and onions were slightly less tolerant of W.L. 63611 than of cyanazine.

While transplanted crops were treated both pre and post transplanting with no damage, treatment of drilled crops pre-emergence in observation plots caused crop thinning, as did treatment post emergence but before the 'crook' stage.

Besides the trials listed, observation plots on drilled onions (varieties Robusta and Bola) in 1972 showed the crop to be tolerant of cyanazine at 3.36 kg a.i./ha applied post crook.

TABLE 1

Mean % Weed Control and Crop Damage

Treatments/Rate (kg a.i/ha)		Site Nos 1 D.L.	2 T.L.	3 T.L.	4 T.L.	5 D.L.	6 D.O.*	MEAN	MEAN CROP DAMAGE EWRC SCALE 1-9
Pre Transplanting									
cyanazine	1.12	-	-	45	-	-	-	45	1.5
	1.68	-	-	68	-	-	-	68	1.8
	2.24	-	-	73	-	-	-	73	2.0
	3.36	-	-	87	-	-	-	87	2.5
Propachlor	4.48	-	-	-	25	-	-	25	1.3
Split Applications									
cyanazine/cyanazine									
	1.12/1.12	-	-	92	98	-	-	95	2.6
	1.12/1.68	-	-	-	97	-	-	97	2.3
	1.12/2.24	-	-	95	98	-	-	97	2.5
	2.24/1.12	-	-	95	-	-	-	95	2.3
	2.24/2.24	-	-	96	-	-	-	96	3.0
cyanazine/WL 63611									
	1.12/1.12	-	-	-	97	-	-	97	2.5
	1.12/1.68	-	-	-	98	-	-	98	2.0
	1.12/2.24	-	-	-	98	-	-	98	2.3
propachlor/cyanazine									
	4.48/1.12	-	-	-	99	-	-	99	1.7
	4.48/1.68	-	-	-	99	-	-	99	2.0
	4.48/2.24	-	-	-	99	-	-	99	1.0
post.emerg/transplanting									
cyanazine	1.12	86	-	-	-	-	88	87	1.5
	1.68	82	80	84	-	77	94	83	1.9
	2.24	88	-	84	-	57	94	80	2.1
	2.80	-	-	-	-	75	95	85	2.2
	3.36	93	96	85	-	71	97	88	1.9
	4.48	-	96	-	-	77	-	87	3.7
	6.72	-	98	-	-	-		98	2.5
WL 63611	1.68	-	-	-	-	47	-	47	2.5
	2.24	-	-	-	-	81	-	81	1.5
	2.80	-	-	-	-	85	-	85	2.8
	3.36	-	-	-	-	85	-	85	4.0
	4.48	-	-	-	-	91	-	91	4.5
prometyrne	1.12	-	-	-	90	-	-	90	1.8
	1.68	-	-	87	-	-	-	87	2.0
aziprotryne	1.96	-	-	-	-	28	-	28	2.8
	2.24	-	-	-	93	-	-	93	1.5
CONTROL								100	2.5
Days from last treatment		14	45	20	32	42	140		

*D L= drilled leeks. T L = transplanted leeks. D.O. = drilled onions.

Table 2

MEAN% Control of Individual Weed Species

Treatment/Rate kgs a.i./ha		Polygonum aviculare	Urtica urens	Stellaria media	Poa annua	Matricaria spps	Senecio vulgaria	Capsella bursa-pastoris	Mean
Pre-transplanting									
cyanazine	1.12	-	48	49	27	48	-	0	34.4
	1.68	-	71	66	22	66	-	64	57.8
	2.24	-	75	65	43	71	-	77	66.2
	3.36	-	89	76	54	86	-	72	75.4
propachlor	4.48	-		17	0	-	63	-	26.7
split applications									
cyanazine/cyanazine									
	1.12/1.12	-	99(2)	99(2)	39(2)	91(2)	100	85	85.5
	1.12/1.68	-	100	99	39	100	100	-	87.6
	1.12/2.24	-	99(2)	100(2)	37(2)	95(2)	100	100	88.5
	2.24/1.12	-	97	100	41	87	-	100	85.0
	2.24/2.24	-	99	100	46	86	-	100	86.2
cyanazine/WL 63611									
	1.12/1.12	-	99	99	22	100	100	-	84.0
	1.12/1.68	-	100	100	28	100	100	-	85.6
	1.12/2.24	-	100	99	50	100	100	-	89.8
propachlor/cyanazine									
	4.48/1.12	-	99	99	-	-	98	-	98.7
	4.48/1.68	-	99	100	-	-	100	-	99.7
	4.48/2.24	-	99	99	-	-	100	-	99.3
post emerg/transplanting									
cyanazine	1.12	65	100	94	87	-	82	-	85.6
	1.68	30(2)	97(3)	93(4)	37(3)	100	91	-	74.7
	2.24	37(2)	99(2)	99(3)	92	100	100	-	87.8
	2.80	0		99(2)	93	100	91	-	76.6
	3.36	41(2)	99(3)	98(4)	58(3)	100	100	-	82.7
	4.48	0	98	97(2)	78	100	-	-	74.6
	6.72	-	99	97	85	-	-	-	93.7
WL 63611	1.68	0	-	100	-	99	-	-	66.3
	2.24	19	-	100	-	100	-	-	73.0
	2.80	19	-	100	-	99	-	-	72.7
	3.36	35	-	100	-	100	-	-	78.3
	4.48	57	-	100	-	100	-	-	85.7
prometyrne	1.12	-	97	96	0	-	85	-	69.5
	1.68	-	100	-	22	45	-	-	55.7
aziprotryne	1.96	15	-	99	-	0	-	-	38.0
"	2.24	-	97	95	22	-	92	-	76.5

( ) = no of sites where more than 1

Raspberries

Weed control was assessed 12 weeks after application at site 1 and 8 weeks after at site 2, assessment was an overall visual assessment of percentage ground cover by individual species, but because of light infestations of some species only the cover by the predominant weeds is shown by each site.

Table 1

Overall weed cover by the main species (mean of 4 blocks)

Treatment	kg a.i./ha	Site No 1 Stellaria media	Site No 1 Overall	Site 2 Stellaria media	Site 2 Agropyron repens	Site 2 Overall
A. chlorthiamid	4.62	10.0	13	0.25	1.3	1.75
B. bromacil	1.12	2.8	3.9	-	2.6	2.6
C. cyanazine/ atrazine	1.79/0.90	2.5	3.9	0.1	3.1	4.0
D. "	2.39/1.20	2.6	4.4	-	9.1	10.0
E. "	3.59/1.80	1.3	1.4	-	2.4	2.4
F. "	0.90/0.90	5.9	7.5	-	1.3	1.6
G. "	1.35/1.35	2.0	2.4	-	2.5	2.9
H. "	1.79/1.79	1.5	2.0	-	4.1	4.5
I. atrazine wp	1.68	3.3	4.1	-	2.1	2.1
J. atrazine grans	1.68	4.1	4.5	0.25	3.4	4.5
K. control		69.0	78.0	42.5	8.8	93
least significant difference between two treatment means P = 0.05		2.7	4.0		5.2	6.1

All treatments, with the exception of the cyanazine/atrazine 2:1 mixture at 2.39/1.20 kg a.i./ha at site 2, gave an adequate and significant control of the main weeds.

Effects upon crop growth

Assessments of effect upon the crop were completed at the end of the growing season. The assessments consisted of the number of stools (alive and dead), number and length of canes. These variates were analysed without transformation as were the ratios, canes per stool, cane length per stool and per plot. The treatment means are shown and the appropriate least significant differences for comparison with the control and with the standard, which was taken to be bromacil at 1.12 kg a.i./ha.

Table II Site 1

Treatment means with respect to stools and canes

Treatment	No of stools	No of canes	total cane length/plot (cms)	canes/stool	cane length/ stool (cms)	av.length of cane (cms)
A	9.5+	15.5+	1421+	1.6+	152+	93
B*	12.5	26.3	2723	2.1	217	103
C	12.5	28.8	2958	2.3	236	103
D	11.8	24.0	2247	2.0	191	94
E	11.8	21.0	2066+	1.8	177	98
F	12.0	24.3	2337	2.0	196	96
G	11.5	24.3	2190	2.1	190	92
H	12.5	26.3	2772	2.1	221	106
I	11.5	25.3	2360	2.2	200	94
J	12.0	26.8	2611	2.2	217	97
K	10.8+	15.3+	1102+	1.4+	103+	73+
L.S.D. between control or 1.5 standard* and treatments		5.4	646	0.4	49	17

P=0.05

+ treatments significantly worse than the standard

Table III Site 2

Treatment means with respect to stools and canes

Treatment	No of stools	No of canes	total cane length/plot (cms)	canes/stool	cane length/ stool (cms)	av.length of cane (cms)
A	9.8	23.0	1661	2.3	166	72+
B*	11.8	21.5	1930	1.8	164	91
C	11.3	19.8	1753	1.8	160	88
D	12.3	19.8	1767	1.6	143	89
E	12.8	23.5	1912	1.9	152	82
F	12.0	24.3	2108	2.0	172	85
G	11.3	19.0	1622	1.7	146	86
H	12.0	21.5	1955	1.7	160	93
I	12.3	20.0	1755	1.7	144	87
J	13.0	21.3	1857	1.6	141	86
K	5.5+	5.8+	387+	1.1+	69+	65+
L.S.D. between control or 3.0 standard* and treatments		7.6	652	0.4	34	12

P=0.05

+=treatments significantly less than the standard.

In all cases the standard was significantly better than the control, and, generally the control value was so low that all treatments had an advantage over the control although in a few cases these differences were not significant. Treatment 'A' chlorthiamid, was significantly worse than the standard at site 1 in all the assessed variates due largely to the number of dead stools. The number of dead stools was not analysed as they came mainly from the chlorthiamid plots in site 1 and the control plots in site 2. In general the performance of the cyanazine/ atrazine mixture, treatments C-H inclusive, was comparable to or better than the standard, although there was a dosage effect with the 2:1 mixture, treatment E, at site no. 1

Forestry

Weed Control & Tree Health

Weed control was assessed at each site at the end of the season, at site 1 assessment was 142 days after treatment, and at site 2 it was 163, 137 and 103 days after the March, April and May respective applications. A figure of silvicultural acceptability was arrived at and is expressed as 30% weed cover remaining. ref Allen M.G. et al (1972)

At the time of application the trees were counted in each plot and were categorised as healthy or damaged, they were counted and categorised once again when the weed control was assessed.

Table I
Site 1

Treatment: Compound	kg a.i./ha	Mean % weed cover	Tree Numbers: Initially Healthy.	Initially Damaged.	Finally Healthy.	Finally Damaged
atrazine w.p.	4.48	24	8	4	11	0
atrazine granules	4.48	18	14	0	14	2
chlorthiamid	3.36	24	13	4	17	1
"	4.20	19	12	4	13	2
cyanazine/atrazine	2.69/2.69	15	11	2	14	0
" "	3.58/3.58	14	14	2	15	1
" "	4.48/4.48	12	13	1	14	0
" "	2.39/1.20	24	13	2	12	0
" "	4.78/2.39	17	13	3	13	1
" "	9.55/4.78	12	14	1	16	0
control		79	16	1	15	1
Maximum value signif less than control P=0.05		67				

The table presents the observed mean % weed cover for each treatment.

All treatment gave significantly less weed cover than the control; and all were below the required figure of 30%. Increased doses gave reduced weed cover. The lowest figures were obtained with the highest rates of the two cyanazine/atrazine mixtures.

At this site atrazine granules gave better weed control than atrazine wettable powder at equivalent rates. There were no significant differences in tree counts with different treatments.

The total nos. of trees initially and finally was almost identical and in general the number of healthy trees increased over the period.

Table II

The data from the March and April applications at this site were transformed by using log $(\frac{x}{100-x})$. The detransformed data is shown in the table.

Site 2 March application

Treatment Compound	kg a.i./ha	Detransformed mean % weed cover	Tree numbers Initially Healthy.	Initially Damaged.	Finally Healthy.	Finally Damaged.
atrazine w.p.	4.48	24	13	0	13	0
atrazine granules	4.48	30	11	0	10	0
chlorthiamid	3.36	21	16	0	16	0
chlorthiamid	4.20	22	13	0	12	0
cyanazine/atrazine	2.69/2.69	19	15	0	15	0
" "	3.58/3.58	11	14	0	14	0
" "	4.48/4.48	13	12	0	12	0
" "	2.39/1.20	49[x]	14	0	14	0
" "	4.78/2.39	15	16	0	15	1
" "	9.55/4.78	7	12	0	12	0
Control		85	14	0	14	0
Maximum value signif less than control P = 0.05		77				

x this treatment in block 3 received a faulty application, data therefore refers to 3 blocks only.

Table III

April application

Treatment Compound	kg a.i./ha	Detransformed mean % weed cover	Tree numbers Initially Healthy.	Initially Damaged.	Finally Healthy.	Finally Damaged.
atrazine w.p.	4.48	15	12	0	12	0
atrazine granules	4.48	27	11	1	12	0
Chlorthiamid	3.36	14	9	3	12	0
cyanazine/atrazine	2.69/2.69	14	14	1	14	0
chlorthiamid	4.20	10	12	1	11	2
cyanazine/atrazine	3.58/3.58	11	14	0	14	0
" "		9	14	2	16	0
" "	2.39/1.20	25	10	3	12	0
" "	4.78/2.39	8	13	3	17	0
" "	9.55/4.78	6	9	2	11	0
Control		83	12	2	13	0
Maximum value signif less than control P = 0.05		75				

Table IV

Site 2 May application

Treatment Compound	Dose kg a.i./ha	Detransformed mean % weed cover	Tree numbers Healthy	Damaged	Healthy	Damaged
atrazine w.p.	4.48	15	12	0	12	0
atrazine granules	4.48	51	12	1	13	0
cyanazine/atrazine	2.69/2.69	17	10	2	10	1
" "	3.58/3.58	10	11	1	12	0
" "	4.48/4.48	7	14	1	16	0
" "	2.39/1.20	31	13	1	14	0
" "	4.78/2.39	9	14	0	15	0
" "	9.55/4.78	5	16	0	15	0
Control		82	9	1	9	1
Maximum value signif less than control P = 0.05		65				

In all months of application all treatments gave significantly less weed cover than the controls, but the cyanazine/atrazine 2.39/1.20 treatment gave unacceptably high results (30%) when applied in March and May. At this site atrazine granules were consistently worse than atrazine w.p., in April were worse than any other treatment, and in May were 20% worse than the only unacceptable cyanazine/atrazine mixtures.

In the months that they were compared chlorthiamid granules, at both application rates, were better than atrazine w.p. or granules. Increased rates of both cyanazine/atrazine mixtures gave decreased weed cover, the lowest rate of the 1;1 mixture was consistently better than the lowest rate of the 2;1 mixture and gave a better result in every month than atrazine w.p. or granules.

There were no significant differences, as far as tree health was concerned, between any treatment. The number of healthy trees generally increased by the end of the period. It was noticeable at both sites that the cyanazine/atrazine treatments were faster acting than other treatments.

DISCUSSION

Cereals

Scotland

Observations of the trials and of commercial applications indicated that in 1973 the cyanazine mixtures were not quite so rapid in action as in previous years, but the end result was the extremely clean bottom to the crop previously reported ref Luckhurst R. J. et al (1972).

Of the mixtures used, the cyanazine/M[illegible] mixtures showed themselves to be effective wide spectrum herbicides well suited to Scottish conditions. The slightly higher rate of 0.37/1.68 kg a.i./ha was the most reliable and effective of the two formulations used. The trials reported showed that the volume of water used to apply the cyanazine/M[illegible] mixtures was not of vital importance and the indications were that a volume of 180 litres/ha was sufficient. In the spring oat trials trial no. 1 was treated at a much earlier crop stage than trial no. 2, this is reflected in the yields where all treatments, with the exception of cyanazine/mecoprop reduced the yield.

Denmark

Trials and commercial experience have indicated that cyanazine/pheonoxy alkanoic acid mixtures are less dependent upon air temperatures at the time of application than the commercial standards used i.e. Ioxynil mixtures. Temperatures of 8-10°c proved sufficient, but as with all post emergence herbicides the temperature following application was the most important. The use of mixtures of specific phenoxy alkanoic acids, may result in resistant weed species colonising and 'building up', the addition of cyanazine to these mixtures will prevent this from occurring.

Leeks & onions

The trials reported showed that cyanazine provided highly effective weed control together with good crop selectivity when used pre/post transplanting or post emergence in leeks and onions and was equivalent or superior to commercial standards used.

While pre transplanting use alone gave poor results, the split application gave excellent weed control without damage; 1.12 kg a.i./ha pre followed by 1.68 kg a.i./ha post transplanting gave good control of the weed spectrums encountered.

The aziprotryne and prometryne gave acceptable but not exceptional weed control and while propachlor gave very poor results when used alone pre-transplanting, its use in a split treatment with 1.12 kg a.i./ha of cyanazine, the propachlor as a pre planting treatment followed by the cyanazine when the crop had recovered from transplanting, was very promising and gave approximately 99% weed control.

Both cyanazine and W.L. 63611 gave acceptable weed control when used both post transplanting and post emergence at 2.24 kg a.i./ha provided that resistant weeds, particularly Polygonum aviculare were not prevalent and beyond the seedling stage at the time of application. Neither chemicals caused any crop damage provided that transplanted crops had recovered from being transplanted and drilled crops were past the crook stage prior to application. W.L. 63611 had no consistant advantage over cyanazine.

The leek crop often germinates unevenly and it is important to ensure that all plants in a stand are at the correct stage for spraying, by which time weeds present could be large and hence difficult to control. Ideally a pre-emergence herbicide should be used inconjunction with post-emergence cyanazine. Propachlor at 4.48 kg a.i./ha again appeared to be a suitable candidate. This type of split application is especially important where resistant weeds are likely to be found for it is essential that they should not be allowed to grow out of the seedling stage before cyanazine is applied.

Application of both cyanazine and W.L. 63611 showed that herbicidal activity occurred in two main stages; contact action resulting in leaf scorch, followed by root uptake and subsequent death. The second stage depended on soil moisture and could be delayed by drought or cold conditions following application.

Raspberries

All the treatments used in the trials were effective in controlling the weeds that were present; chlorthiamid, at the rate used, was effective but in trial 1 appeared to break down and allow colonisation by Stellaria media before the end of the 12 week period that elapsed between application and assessment, this trial however had an organic matter content of almost 6% whereas in trial no. 2 with an organic matter content of 2.5% and over the shorter 8 week period, it gave excellent control of all weeds including Agropyron repens and was better than any other treatment except for the 1:1 cyanazine/atrazine mixture applied at 0.90/0.90 kg a.i./ha. Bromacil was effective in both trials and gave adequate weed control.

Atrazine wettable powder was more effective than atrazine granules which appeared to give variable results. The cyanazine/atrasine mixtures looked extremely promising as these offer a range of treatment doses which could be 'tailored' by the grower. The most consistent treatment was 1.35/1.35 kg a.i./ha of these cyanazine/atrazine mixtures.

With regard to the effect of treatments on cane length and crop health generally, chlorthiamid tended to reduce the numbers of canes produced in comparison with the standard at site no. 1, which had a high organic matter content than at site no. 2 where the chlorthiamid plots produced more canes and a greater length of cane per stool than the standard; it is possible that this apparent anomaly in results from the two sites might be due to the positioning of the plots in site no. 1. A further analysis of the residuals in the total cane length analysis suggests that there was variation within the blocks; in particular there were two poor areas in the trial, and by virtue of the randomisation the majority of the chlorthiamid plots fell within this poor area.

Forestry

Because of the problem of carting water to remote areas, the use of granular herbicides, such as chlorthiamid, has become a standard practice in many planted areas, and to revert to a liquid formulation would be regarded by many foresters as a retrograde step, however, the trials reported have shown that outside the time limits for the application of chlorthiamid there is at the moment no available alternative in granular form; atrazine granules were not consistent enough to warrant consideration. The percentage reduction in weed cover following application of the cyanazine/atrazine mixtures was acceptable and, in the case of the 2.69/2.68 kg a.i./ha treatment, it was generally superior to atrazine w.p. The treated trees showed great tolerance to even the highest rates of the mixtures, thereby allowing foresters as great a flexibility of choice of the degree of weed suppression outside the time limits of chlorthiamid as they already have within those limits.

Acknowledgements

The authors wish to thank the many farmers, British and Danish, growers and foresters who co-operated in providing trial sites. Thanks are also due to Shell Research Ltd. who carried out the statistical analysis.

References

Chapman T. Jordon D. Payne D. H. and Hughes W. I.
W.L. 19805 A new triazine herbicide Proc 9th Br. Weed Control Conf (1968) 1018-1025

Luckhurst R. J. Allen M. G. and O'Doherty P. C.

The use of cyanazine mixtures for weed control in cereals Proc 11th Br. Weed Control Conf (1972) 698-708.

Aldhous J. R. 'The effect of 2,6-Dichlorothiobenzamide on species planted in the forest' 7th Br. Weed Control Conf (1964) 267-275

de Gouville B. and Allen M. G.
'Weed Control in young forest plantations with chlorthiamid'
Columa Conference, Paris (1965)

Allen M. G. 'Experiments with 2,6-Dichlorothiobenzamide (chlorthiamid) in planted areas of soft and hard woods' 8th Br. Weed Control Conf. (1966) 135-140

Brown R. M. 'The effect of chlorthiamid on young forest trees' 9th Br. Weed Control Conf (1968) 975-980

Cherry M. 'A quiet revolution in forestry' Big Farm Management No. 7 1972

Allen M. G. and Reid D. F. 'Further experiments with 2,6-Dichlorothiobenzamide (chlorthiamid) in planted areas of softwoods' 11th Br. Weed Control Conf (1972) 583-590