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## ACTIVITY EXPERIMENT

CHLORTOLURON

$$0.6 \text{ kg a.i./ha}$$
 1.9 kg a.i./ha 5.7 kg a.i./ha

F

XXXXXXXXXXXXXXXXX

XXXXXXXXXXXXXX XXXXX

XXXXXXXXXXXXXXXX

DWARF BEAN	S P I	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXX O O O O	xxxx o o o
KALE	F S I	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
POLYGONUM AMPHIBIUM	F S P I	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX





XXXXXX

P

I

XXXXXX

XXX 00

Control

XXXXXXXXXXXXX % No. of survivors % Vigour XXXXXXXXXXXX

XX

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F = Post-emergence, foliar application Key: S = Post-emergence, soil drench P = Pre-emergence, surface film I = Pre-planting, incorporated

## CHLORTOLURON

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PRE-EMERGENCE SPECIES POST-EMERGENCE No. 1.68 0.1 0.56 5.04 1.6 0.4 kg a.i./ha kg a.i./ha (1) 111/86 103/43 100/100 100/93 100/64 WHEAT 47/14 (2) 83/71 100/93 100/50 100/79 BARLEY 77/36 0/0 (3) 31/21 OAT 6/14 0/0 88/64 63/36 0/0

a francisco a fran					~, ~		00700	0,0
	PER RYGR	(4)	3/14	0/0	C/C	100/100	31/21	C/0
	ONION	(8)	38/43	30/29	0/0	70/86	50/50	0/0
	DWF BEAN	(9)	83/2.9	67/14	50/21	100/71	100/29	100/21
	FLD BEAN	(10)	63/43	32/21	16/7	100/64	0/0	0/0
	PEA	(11)	88/43	106/36	88/36	100/100	100/79	100/57
	W CLOVER	(12)	0/0	0/0	0/0	100/50	13/14	0/0
	KALE	(15)	0/0	0/0	c/c	89/79	0/0	0/0
	CABBAGE	(16)	-	-		100/79	30/29	30/7
	SWEDE	(17)	0/0	0/0	0/0	100/79	80/21	0/0
	CARROT	(18)	0/0	0/0	0/0	100/100	75/57	0/0
	PARSNIP	(19)	-	-	-	50/43	0/0	C/O
	LETTUCE	(20)	23/29	0/0	0/0	0/0	0/0	0/0
	SUG BEET	(21)	71/86	0/0	0/0	100/79	100/64	50/36
	AVE FATU	(26)	100/21	11/14	0/0	100/93	88/79	0/0
	ALO MYOS	(27)	43/29	27/21	4/7	89/79	44/21	0/0
	POA ANN	(28)	43/21	19/14	0/0	71/50	57/2.9	0/0
	POA TRIV	(29)	-	-	-	56/50	0/0	0/0
	SIN ARV	(30)	-	-	-	100/100	50/21	0/0
	RAPH RAP	(31)	-	-	-	100/86	30/21	20/7
	CHRY SEG	(32)	-	-	-	M/100r	M/29r	M/Or
	TRIP MAR	(33)	-	-	-	100/100	0/0	0/0
	SEN VULG	(34)	90/43	C/0	0/0	100/86	6/14	0/0
	POL LAPA	(35)	6/7	6/7	6/14	100/71	0/0	0/0
	POL AVIC	(36)	-	-	-	100/71	25/21	0/0
	RUM CRIS	(37)	-	-	-	75/50	0/0	0/0
	GAL APAR	(38)	73/71	113/50	53/21	100/100	100/57	0/0
	CHEN ALB	(39)	0/0	C/0	0/0	92/29	0/0	0/0
	STEL MED	(40)	0/0	0/0	0/0	25/43	0/0	0/0
	SPER ARV	(41)	-	-	-	44/50	0/0	0/0

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KEY = No. of plants surviving/Vigour of survivors
Untreated = 100/100

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#### CHLORTOLURON

PRE-EMERGENCE No. POST-EMERGENCE SPECIES 0.56 1.68 5.04 0.4 0.1 1.6 kg a.i./ha kg a.i./ha 82/21 82/29 9/7 100/93 100/57 100/57 (47) AG REPEN 75/22 100/86 88/43 (48) AG STOLO -86/50 54/29 118/79 (49)ALL VIN -27/29 0/0 0/0 (50) CIRS ARV -1000 13/14 63/57 0/0 (51) TUS FARF ----/0 -/0 -/0 (53) RUM ACET ---100/93 100/100 (58) 100/100 100/71 100/79 100/57 MAIZE 100/100 100/71 75/93 100/93 138/93 50/71 (59) SORGHUM 100/79 25/36 (60)0/0 RICE ------100/86 104/71 104/50 100/50 (64)104/93 0/0 GRNDNUT 100/93 69/14 46/7 100/43 (65) 0/0 0/0 SOYABEAN 100/79 111/29 100/64 (66) 158/100 126/79 0/0 COTTON 0/0 0/0 (67) 0/0 JUTE ------100/64 0/0 (68) 45/36 25/7 0/0 0/0 KENAF 50/50 0/0 (69) 0/0 TOBACCO ---------100/86 (74)25/21 0/0 19/29 0/0 0/0 ELEU IND 100/100 19/14 100/64 0/0 108/57 0/0 (75) ECH CRUS 100/93 100/93 100/71 ROT EXAL (76) -------36/14 0/0 (77) 0/0 DIG SANG ---0/0 0/0 0/0 (78) AMAR RET --8/7 0/0 0/0 PORT OLE (79) ---103/86 63/64 63/36 (82) CYN DACT --93/100 86/100 103/100 97/100 104/100 (86) 109/100 CYP ROTU

KEY = No. of plants surviving/Vigour of survivors
Untreated = 100/100



NHC (CH3), CN C, H, NH-

C]



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Information available and suggested uses

Approved for control of annual broad-leaved weeds and Poa annua pre- or post-emergence in pea.

It is approved in mixture with (i) linuron for control of annual weeds pre-emergence in potato and (ii) MCPB for control of annual weeds postemergence in pea.

Wettable powder 50% w/w a.i. Formulation used

Spray volume

338 1/ha (30.1 gal/ac)

#### RESULTS

Full results are given on pages 29-30 and potential selectivities are summarised in the following table.



## Table 9. Potential pre-emergence selectivities

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RATE (kg a.i./ha)	CROPS: vigour reduced by 15% or less	WEEDS: number or vigour reduced by 70% or more
4.48	maize sorghum	Poa annua Galium aparine Agropyron repens Allium vineale Tussilago farfara Rumex acetosella Eleusine indica Echinochloa crus-galli + species below
1.12	as above + field bean pea groundnut soyabean cotton kenaf	Avena fatua Alopecurus myosuroides Senecio vulgaris Polygonum lapathifolium Chenopodium album Stellaria media Cirsium arvense Digitaria sanguinalis
0.28	None listed as no weeds controlled	None

## Comments on results

## Activity experiment (see page 29)

Only minor effects occurred as a result of the foliar spray, these being more obvious on broad-leaved rather than the grass species. Most activity was found as a result of the soil treatments. Post-emergence soil drenches were usually more effective than pre-emergence treatments. In the latter, surface applications caused more toxicity than when the herbicide was incorporated into the soil. This fact should be borne in mind when considering the results of the pre-emergence selectivity test, where incorporation was carried out. # 1 · 1 · · ·

#### Symptoms

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Minor scorch symptoms were found with the foliar spray. In the soil treatments, chlorosis preceded necrosis and die-back. Germination was not affected by pre-emergence treatments. Thus symptoms are the same as those for other herbicides which inhibit photosynthesis.

## Soil persistence

Using perennial ryegrass as test species, a very short period of persistence in the soil was indicated. Although all doses were initially lethal, by the time of the first bioassay, six weeks after spraying, only the 4.48 kg/ha dose was just detectable.

## Selectivity among temperate species

## Pre-emergence

A fairly broad spectrum of weed control was found. At 1.12 kg/ha the two annual grass weeds, <u>Avena</u> and <u>Alopecurus</u> were controlled along with five broad-leaved weeds. <u>Poa annua</u> was also severely affected at this dose (69% kill of plants). At the higher dose, <u>Galium aparine</u> and all other weeds, including the perennials were susceptible.

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Field bean and pea were the only crops to withstand 1.12 kg/ha. The sensitivity of certain other crops (cereals, ryegrass and sugar beet) suggests the possible control of these species should they occur as volunteer weeds in pea or field bean.

Selectivity among tropical species

## Fre-emergence

Control of tropical annual weeds was weak at 1.12 kg/ha, only <u>Digitaria</u> being just adequately suppressed. Good control of all the annuals in the test was achieved at 4.48 kg/ha and maize and sorghum were undamaged. The selectivity in maize is well known but the result on sorghum is more interesting and suggests that comparison with atrazine would be worthwhile where the latter is marginal in safety.

Several other crops tolerated 1.12 kg/ha but damage on kenaf and soyabean was severe at 4.48 kg/ha suggesting little useful selectivity. Cotton, however, confirmed its relative tolerance, suffering only moderate

damage at the high dose.



## ACTIVITY EXPERIMENT

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## CYANAZINE

#### 0.56 kg a.i./ha 0.14 kg a.i./ha

## 2.24 kg a.i./ha

F	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
S	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
P	XXXXXXXXXXXXX	

. . .

and the state with the second state of the sec

0 0

BEAN	P	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	8
	I	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXX XXXXX
	F	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
	S	XXXXXX XXXX	8	8
KALE	Ρ	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	8	8
	I	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXX XXXXXXX	8
	F	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
POLYGONUM	S	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XX XX
AMPHIBIUM	P	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXX XXX
	I	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
	F	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
PERENNTAT.	S	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXX XXX	8
RYEGRASS	P	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXX XXXXX	8
	I	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	8
	F	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
AVENA FATUA	S	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	8	8
	P	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXX XXXXXXXXX	8
	I	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	8
	F	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
AGROPYRON	S	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
REPENS	P	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
	I	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

DWARF

XXXXXXXXXXXXXXXXX

#### XXXXXXXXXXXXX % No. of survivors Control xxxxxxxxxx % Vigour

Key: F = Post-emergence, foliar application S = Post-emergence, soil drench P = Pre-emergence, surface film I = Pre-planting, incorporated

## CYANAZINE

\*\*\*

1.1

100 P

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SPECIES	No.		PRE-EMERGENCE				
		0.28	1.12	4.48	kg a.i./ha		
WHEAT	(1)	118/100	32/14	8/7			
BARLEY	(2)	89/100	69/29	0/0			
OAT	(3)	100/93	0/0	0/0			
PER RYGR	(4)	93/100	10/21	0/0			

ONION	(8)	105/79	83/50	8/7	
DWF BEAN	(9)	100/100	83/50	67/14	
FLD BEAN	(10)	47/100	95/100	32/21	
PEA	(11)	88/100	141/100	71/50	
W CLOVER	(12)	66/71	0/0	0/0	
KALE	(15)	100/100	47/64	0/0	
SWEDE	(17)	113/100	0/0	0/0	
CARROT	(18)	63/100	0/0	0/0	
LETTUCE	(20)	123/93	0/0	0/0	
SUG BEET	(21)	84/86	0/0	0/0	
AVE FATU	(26)	133/100	0/0	0/0	
ALO MYOS	(27)	101/93	4/14	0/0	
POA ANN	(28)	89/86	31/36	0/0	
SEN VULG	(34)	160/86	0/0	0/0	
POL LAPA	(35)	127/100	6/29	12/29	
GAL APAR	(38)	87/100	120/86	60/14	
CHEN ALB	(39)	79/86	0/0	0/0	
STEL MED	(40)	98/93	0/0	0/0	
AG REPEN	(47)	109/100	109/57	36/14	
ALL VIN	(49)	96/71	129/57	107/29	
CIRS ARV	(50)	95/100	27/86	0/0	
TUS FARF	(51)	100/93	100/100	13/14	
RUM ACET	(53)	-/100	-/36	-/0	
MAIZE	(58)	100/100	100/100	100/100	
SORGHUM	(59)	125/100	150/100	88/86	
GRNDNUT	(64)	104/100	104/93	91/43	
SOYABEAN	(65)	92/100	69/86	0/0	
COTTON	(66)	47/100	111/100	63/79	
KENAF	(68)	45/93	82/100	0/0	
ELEU IND	(74)	85/100	81/71	0/0	
DIG SANG	(77)	86/93	21/29	0/0	
ECH CRUS	(75)	117/100	98/79	0/0	
CYP ROTU	(86)	104/100 KEY= No. o Untreated	115/100 f plants surv: = 100/100	93/93 iving/Vigour of	survivors

#### ACKNOWLEDGEMENTS

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Appendix I. Species, abbreviations, cultivars and stages of growth at assessment for pre-emergence selectivity experiments

	Designa-		C 11:	N	Depth	Stage of
Spacias	tion and E	Expt	Cultivar	NO.	or nlan-	assessment
species	serial	No	source	pot	ting	(untreated
	number				(cm)	controls)

1.10

## TEMPERATES

Wheat (Triticum aestivum)	WHEAT (1)	1 2 3	Jufy Jufy Kolibri '69	8 8 8	1.2 1.2 1.2	$4-4\frac{1}{2}$ leaves $4-4\frac{1}{2}$ leaves 4-5 leaves
Barley (Hordeum vulgare)	BARLEY (?)	1 2 3	Proctor Proctor '69	8 8 8	1.2 1.2 1.2	4 leaves 41 leaves 42 leaves 42 leaves
Oat (Avena sativa)	OAT (3)	1 2 3	Blenda Blenda Condor '69	8 8 8	1.2 1.2 1.2	4-4 <sup>1</sup> / <sub>2</sub> leaves 4 leaves 4 leaves
Perennial ryegrass (Lolium perenne)	PER RYGR (4)	1	S 23 S 23	25	C.6	4-5 leaves, tillering 3 <sup>1</sup> -4 leaves, tillering
		-	0.00	1.0	0 /	AFI

15 4-5 leaves, S 23 0.6 3 tillering

Cocksfoot (Dactylis glomerata)	CKSEOOT	1	S 143	50	0.6	4-41/2 leaves
	(5)	2	-	-	-	-
		3	-	-	-	

S 50 1 25 5-6 leaves, 0.6 tillering Timothy TIMTHY 2 (6) (Phleum pratense) ----3 ----

1

2

3

Onion (Allium cepa)

ONION (8)

Bedfordshire 15 0.6 Champion Bedfordshire 15 0.6 Champion 20 Rijnsburger

 $2-2\frac{1}{2}$  leaves  $2-2\frac{1}{2}$  leaves 2 leaves 0.6

The Prince  $3 \quad 1.8 \quad 2-2\frac{1}{2} \quad trifo-$ 

Dwarf bean	DWF BEAN		And Alance			liate leaves
(Phaseolus vulgaris)	(9)	2	The Prince	3	1.8	1 <sup>1</sup> / <sub>2</sub> trifo-
		3	The Prince	3	1.8	liate leaves 1 <sup>1</sup> / <sub>2</sub> trifo- liate leaves
		1	Blue Rock	4	1.2	4-41 leaves
Field bean	FLD BEAN	2	Blue Rock	4	1.2	4-5 leaves
(Vicia faba)	(10)	3	Maris Bead	4	1.8	$3\frac{1}{2}-4$ leaves

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## Appendix I. (Cont.)

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Species	Designa- tion and computer serial	Expt No	Cultivar or source	No. per pot	Depth of plan- ting	Stage of growth at assessment (untreated
	number				(cm)	controls)

Big Ben 1.2 6 leaves 1 4

AND INCOMENDATION OF THE OWNER OWNER

Dee	DEA	+	Dig Den	4	1.0	o reaves
rea	FER	2	Big Ben	4	1.2	51-61 leaves
(Pisum sativum)	(11)	3	Dark Skinned	4	1 8	5-6 1000000
		~	Darfaction	-	+.0	JO TEGALD
			Perrection			
White clover	W CLOVER	1	S 100	20	0.6	$2-2\frac{1}{2}$ trifo-
(Trifolium repens)	(12)					liste lesves
LALALOLL GIN LCPCID/	1-0/	2	C 100	20	0.6	21 toifon
		6	5 100	20	0.0	
						liate leaves
		3	S 100	20	0.6	2 trifoliate
						leaves
Kale	KATE	1	Marrowstem	15	0.6	$3-3\frac{1}{2}$ leaves
(Brassica oleracea	(1c)	2	Marrowstem	15	0.6	31-41 leaves
acephala)	(15)	3	Marrowstem	10	0.6	$3\frac{1}{2}-4$ leaves
						4
Swede	SWEDE	1	Bangho1m	10	0.6	$34\frac{1}{2}$ leaves
(Proceion monue)	(17)	2	Bangho1m	10	0.6	$3\frac{1}{2}-4$ leaves
(Drassica napus)	(17)	3	Lord Derby	10	0.6	3-4 leaves
	CADDOT	1	Chantenay	10	0.6	21 leaves
Larrot	CARROT		Red Core			
(Daucus carota)	(18)	2	Chantenav	10	0.6	2-21 leaves
			Pod Coro	-0	0.0	e c2 reaves
		2	Chantone	10	~ ~	2 4 4
		3	Chantenay	10	0.0	3=4 leaves
			Red Core			
		1	Trocadero	14	0.6	4-5 leaves
Lettuce	LETTUCE		Improved		0.0	T J LCAVCO
(Lactuca sativa)	(20)	2	Improveo	1.4	0 /	
		2.	Irocadero	14	0.6	
			Improved			
		. 3	Borough	14	0.6	5½ leaves
			Wonder			
		1	V.A	10	1 0	2 4 3
Sugar beet	SUG BEET	T	Kleine E	10	1.2	3=4 leaves
(Beta vulgaris)	(21)	5	Kleine E	18	1.2	23 <sup>±</sup> leaves
		3	Kleine E	15	1.2	3-4 leaves
		1	Wytham 1961	8	1.2	$4-4\frac{1}{2}$ leaves
Avena fatua	AVE FATU	2	-	8	12	
	(26)	3	Harwell 1063	8	1 2	4-5 leaves
		5	marwerr 1905	0	+ . C	4 J LEAVES
		1	South Leigh	40	0.6	3-4 leaves.
Alopecurus	ALO MYOS		1963			tillering
nyosuroides	(27)	2		10	0.6	3-1 100000
		6		40	0.0	tilloring
		2	WDO 1067	20	0.6	5 loover
		2	MKO 1907	50	0.0	Jina jina
						tillering

# Appendix I. (Cont.)

Designa-Depth Stage of tion and Cultivar No. of growth at Expt Species computer planper or assessment No seria1 pot ting source number (cm)

-

Dee ammuta

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(untreated controls)

10.00

mister

Foa annua	(28)	2.		-	-	-	
		3	WRO	1968	2.5	0.6	5 leaves
Senecio vulgaris	SEN VIIIG	1	WRO	1965	20	C.6	$5\frac{1}{2}-6\frac{1}{2}$ leaves
	(31)	2			20	0.6	41-51 leaves
	(34)	3	WRO	1967	20	0.6	4-6 leaves
Polygonum	POL LAPA	1	WRO	1964	15	0.6	$4-4\frac{1}{2}$ leaves
lapathitolium	(35)	2	WRO		15	0.6	21-31 leaves
		3	WRO	1968	15	0.6	3 leaves

2

3

2

Polygonum aviculare

POL AVIC (36)

POA ANN

-10.0 Wytham 1967 20 0.6 450

-

Galium aparine

GAL APAR (38)

C.6  $5-5\frac{1}{2}$  whor 1s Wytham 1966 15 2 15 0.6 7 whor 1s -

	1.007	3	Bletchingdon	15	0.6	3 whor1s
Chenopodium album	CHEN ALB	1	Wytham 1965	50	0.6	7-9 leaves
	(39)	23	Wytham Gosford Road	50 25	0.6	$6\frac{1}{2}-7\frac{1}{2}$ leaves 4-6 leaves
Stellaria media	STEL MED	1	WRO 1964	50	0.6	11-13 leaves
	(40)	2	WRO	20	0.6	13 leaves
		3	WRO 1968	50	C.6	.10 leaves
Agropyron repens	AG REPEN (47)	1 2 2	Headington Headington	6×6	1.2	$4\frac{1}{2}$ leaves
		.)	who clone	0	1.1	4-5 leaves

3++ 1.2 Begbroke tillering 1 Agrostis stolonifera AG STOLO 2. ---(48) 3 ----1 design. Allium vineale ALL VIN 2 --1060 (49) 6+ 3 WRO 1967 1.2 3 leaves 1 --Cirsium arvense CIRS ARV 2 4++ ---(50) 1.2 61 leaves 3 WRO clone

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#### (Cont.) Appendix I.

Stage of Depth Designagrowth at of Cultivar No. tion and Expt assessment plan- · per or computer Species No (untreated ting pot source serial controls) (cm) number

-

<u>Tussilago farfara</u>	TUS FARF (51)	1 ? 3 WRO clone	- - 4 1.8	4 <sup>1</sup> / <sub>2</sub> leaves	
<u>Convolvulus</u> arvensis	CONV ARV (52)	1 ? 3 WRO clone	  4		
Rumex acetosella	RUM ACET (53)	3 WRO clone	477 1.?	5-10 leaves	
TROPICALS Maize (Zea mays)	MAIZE (58)	1 Inra 200 2 Inra 200 3 Inra 200	4 1.2 4 1.2 6 1.2	51 leaves 41-51 leaves 54 leaves	
		1 -			

Sorghum

SORGHUM

RICE

(60)

42-52 leaves 1.2

141

AND TO

(59) (Sorghum bicolor) 1.2 5 leaves 6 5868 Uganda 3 1968

2

1

2

3

1

?

3

1

2

Rice (Oryza sativa)

Groundnut

GRNDNUT (64) (Arachis hypogea)

3-4 leaves, 1.2 16 Dickwea tillering 31-4 leaves 1.2 16 Sri Lanka 1.2 Koglandii '65 10

4

51-6 leaves 1.2 Natal Common 4 51-61 leaves 1.2 4 Nigeria 4-5 leaves 1.8 4 Natal Common

-

4

4

Soyabean (Glycine max) SOYABEAN (65)

Hursts 3

-

4<sup>‡</sup> trifo-1.2 liate leaves 1ª trifo-1.8 liate leaves

Cotton (Gossypium hirsutum)	COTTON (66)	1	Samaru 265	4	1.2	2-21 leaves
		2	Samaru 26S	4	1.2	31-41 leaves
		3	Samaru 26S	6	1.8	2 leaves
Kenaf ( <u>Hibiscus</u> cannabinus)	KENAF (68)	1 2 3	- Thai Native	- 6	- 1.2	1½ leaves

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#### Appendix I. (Cont.)

Designa-Stage of Depth Cultivar No. growth at tion and of Expt Species computer planper assessment or No ting serial (untreated pot source (cm) controls) number

Eleusine indica

ELEU IND

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	(74)	3	1967-2	15	0.6	$3\frac{1}{2}$ leaves	
<u>Echinochloa</u> <u>crus-galli</u>	ECH CRUS (75)	1 2 3	Wytham	- 15	0.6	5 leaves	A REAL PROPERTY OF A REAL PROPER
<u>Rottboellia</u> <u>exaltata</u>	ROT EXAL (76)	1 2 3	- Henderson Res. Sta.	- 10	-	5 leaves	
<u>Digitaria</u> <u>sanguinalis</u>	DIG SANG (77)	1 2 3	Wytham 1961 Wytham Ex Shell Res. Sta.	20 20 15	0.6	4-5 leaves 5 leaves 6 leaves	

1

2

Amaranthus

AMAR RET

retroflexus (78) C.6  $7\frac{1}{2}$  leaves 15 3 Ex Shell Res. Sta.

2

----CYP ESCU Cyperus esculentus 2 ----(85) 3 5\*\* 1.2 WRO -81-91 1eaves 3\*\* 1.2 Wytham 1 CYP ROTU Cyperus rotundus 3\*\* 1.2 8-9 leaves 2 Wytham (86) 5\*\* 1.2 3 Clone 1 -

fone node rhizome pieces fone root sections

\* aerial bulbils \*\* tubers

-

-

-

40515

+ bu1bs ++ 2 node fragments

![](_page_13_Picture_14.jpeg)

# <u>Appendix II.</u> Species, abbreviations, cultivars and stages of growth at spraying and assessment for post-emergence selectivity experiment

	Designa-		No.		Stage of
	tion and	Cultivar	plants	Stage of	growth at
Species	computer	or	at	growth at	assessment
	serial	source	spray-	spraying	(untreated
	number		ing		controls)

- 37 -

## TEMPERATES

 $5\frac{1}{2}$  leaves, WHEAT Wheat 4 3 leaves Kolibri tillering (1) (Triticum aestivum)  $5\frac{1}{2}$  leaves, BARLEY Barley 3 leaves Sultan 4 tillering (2) (Hordeum vulgare)  $5\frac{1}{2}$  leaves, OAT Oat 3 leaves Condor 4 tillering (3) (Avena sativa)  $5\frac{1}{2}$  leaves, PER RYGR Perennial ryegrass  $2-2\frac{1}{2}$  leaves S 23 8 tillering (Lolium perenne) (4)ONION Onion 4 or 6 2 leaves 3 leaves Rijnsburger (8) (Allium cepa) 11 tri-2 uni-DWF BEAN Dwarf French bean

(Phaseolus vulgaris) (9) The Prince 3 foliates foliates

Field bean (Vicia faba)
FLD BEAN (10)
Maris Bead 2 or 3  $2-2\frac{1}{2}$  leaves 5 leaves

PeaPEADark skinned2 or 33 leaves8 leaves(Pisum sativum)(11)perfection3 leaves8 leaves

White cloverW CLOVERS 1001 tri-3 tri-(Trifolium repens)(12)S 10081 tri-5 tri-

Kale<br/>(Brassica oleracea<br/>acephala)KALE<br/>(15)Marrowstem4 or 5 $1\frac{1}{2}$ -2leaves $3\frac{1}{2}$ leaves

Cabbage (Brassica oleracea (1) capitata)

CABBAGE (16) Primo 5  $1\frac{1}{2}-2$  leaves  $3\frac{1}{2}$  leaves 198 1 1 1 9

Swede (Brassica napus)	SWEDE (17)	Lord Derby	5	2 leaves	$3\frac{1}{2}$ leaves
Carrot ( <u>Daucus carota</u> )	CARROT (18)	Chantenay Red Core	6	1 <sup>1</sup> / <sub>2</sub> leaves	$3\frac{1}{2}-4$ leaves
Parsnip ( <u>Pastinaca sativa</u> )	PRSNIP (19)	Hollow Crown	6	1 <sup>1</sup> / <sub>2</sub> leaves	3 leaves
Lettuce (Lactuca sativa)	LETTUCE (20)	Borough Wonder	6	2 leaves	5 <sup>1</sup> / <sub>2</sub> leaves

# Appendix II. (Cont.)

sectory is the production of marks of the sector of the se

2

Species	Designa- tion and computer serial number	Cultivar or source	No. plants at spray- ing	Stage of growth at spraying	Stage of growth at assessment (untreated controls)
ugar beet Beta vulgaris)	SUG BEET (21)	Klein B	6	2 leaves	41 leaves

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<u>Avena fatua</u>	AVE FATU (26)	Boxworth 1967	4	31 leaves	51 leaves, tillering
Alopecurus myosuroides	ALO MYOS (27)	Rothamsted 1968	3 or 6	2-2 <del>2</del> leaves	tillering
Poa annua	POA ANN (28)	Twyfords 1970	2 or 5	2-3 leaves	5 leaves, tillering
Poa trivialis	POA TRIV (29)	Twyfords 1969	8	2 <sup>1</sup> / <sub>2</sub> -3 leaves	2-5 tillers
Sinapis arvensis	SIN ARV (30)	WRO 1966	6	2 <del>1</del> -3 <del>1</del> leaves	7 leaves
Raphanus	RAPH RAP (31)	Black Spanish	5	2-2 <sup>1</sup> / <sub>2</sub> leaves	51 leaves

Lapitalitber un		~part ~			
Chrysanthemum segetum	CHRY SEG (32)	WRO 1968	5	3-4 leaves	8-10 leaves
Tripleurospermum maritimum	TRIP MAR (33)	WRO 1969	8	4 leaves	7-10 leaves
Senecio vulgaris	SEN VULG (34)	WRO 1967	8	2 <del>1</del> -3 <del>1</del> leaves	5-6 leaves
Polygonum lapathifolium	POL LAPA (35)	WRO 1967	8	1-12 leaves	32-4 leaves
Polygonum aviculare	POL AVIC (36)	WRO 1969 1	or 3	2 <del>1</del> -3 <del>1</del> leaves	8 leaves
Rumex crispus	RUM CRIS (37)	Bletchingdon 1967	6	$1\frac{1}{2}-2$ leaves	32-42 leaves
Galium aparine	GAL APAR (38)	WRO 1969 2	or 4	1-1 <sup>1</sup> / <sub>2</sub> rosettes	4 <del>2</del> rosettes
Chenopodium album	CHEN ALB (39)	Gosford Road 1967	6	3-4 leaves	6 leaves
Stellaria media	STEL MED (40)	Wytham 1967	8	4-6 leaves	12 leaves
Spergula arvensis	SPER ARV (41)	WRO 1964	8	1-1 <del>]</del> rosettes	3 rosettes

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# Appendix II. (Cont).

20

Species	Designa- tion and Cultivar p computer or serial source s number		No. plants at spray- ing	Stage of growth at spraying	Stage of growth at assessment (untreated controls)
Agropyron repens	AG REPEN (47)	WRO clone 31	4	2 <del>1</del> -3 leaves	51-6 leaves

Agrostis stolonifera	AG STOLO (48)	WRO clone 1	4	2-22 leaves	7 leaves, tillering
TROPICALS					
Maize (Zea mays)	MAIZE (58)	Inra 200	2	3 <sup>1</sup> / <sub>2</sub> leaves	6-7 leaves
Sorghum (Sorghum vulgare)	SORGHUM (59)	SB 68 70-1 2	or3	2 leaves	6-7 leaves
Rice (Oryza sativa)	RICE (60)	Kogbandi 65-6	4	2 leaves	5-6 leaves, tillering
Groundnut (Arachis hypogea)	GRNDNUT (64)	Natal Common	2	3 leaves	6 leaves

Soyabean (Glycine max)	SOYABEAN (65)	Altona	2	1 tri- foliate	3 tri- foliates
Cotton (Gossypium hirsutum)	COTTON (66)	Samaru	2	1 tri- foliate	3-4 leaves
Jute ( <u>Corchorus</u> <u>olitorius</u> )	JUTE (67)	Trinidad	9	2월 leaves	7-8 leaves
Kenaf (Hibisous cannabinus)	KENAF (68)	Thailand 1968	4	1 leaf	5 leaves
Tobacco (Nicotiana tabacum)	TOBACCO (69)	Yellow Mammoth	5	3 leaves	5-6 leaves

1

Eleusine indica	ELEU IND (74)		8	31 leaves	7-8 leaves
Echinochloa crus-galli	ECH CRUS (75)	WRO 1966	6	31 leaves	6-7 leaves
Rottboellia exaltata	ROTT EXA (76)	Philippines	4	2-3 leaves	6 leaves
Amaranthus retroflexus	AMAR RET (78)	WRO 1968	7	2 leaves	6-7 leaves

# Appendix II. (Cont).

2,2

Species	Designa- tion and computer serial number	Cultivar or source	No. plants Stage at growth spray- ing	of growth at at assessment ng (untreated controls)
Portulaca oleracea	PORT OLE (79)	WRO 1967	6 6 leaves	12-16 leaves
Cynodon dactylon	CYN DACT (82)	Clone 2	3 or 4 4 leaves	
Cyperus rotundus	CYP ROTU (86)	Clone 1 1970 stock	5** 5-6 leav	es 8-10 leaves

- 40 -

/ one node rhizome pieces \*\* tubers

![](_page_17_Picture_3.jpeg)

## ABBREVIATIONS

angström	R	freezing point	f.p.
Abstract	Abs.	from summary	F.s.
acid equivalent*	a.e.	gallon	gal
acre	ac	gallons per hour	gal/h
active ingredient*	a.i.	gallons per acre	gal/ac
approximately equal to*		gas liquid chromatography	GLC
aqueous concentrate	a.c.	gramme	g
bibliography	bibl.	hectare	ha
boiling point	b.p.	hectokilogram	hkg
bushel	bu	high volume	HV
centigrade	C	horse power	hp
centimetre*	cm	hour	h
concentrated	concd	hundredweight*	cwt
concentration concentration x	concn	hydrogen ion concentration*	pH
time product	ct	inch	in.
concentration		infra red	i.r.
50% test animals	LC50	kilogramme	kg
cubic centimetre*	cm <sup>3</sup>	kilo (x10 <sup>3</sup> )	k
cubic foot*	ft <sup>3</sup>	less than	<
cubic inch*	in <sup>3</sup>	litre	1.
cubic metre*	m <sup>3</sup>	low volume	LV
cubic yard*	yd 3	maximum	max.
cultivar(s)	cv.	median lethal dose	LD50
curie*	Ci	medium volume	MV
degree Celsius*	°c	melting point	m.p.
degree centigrade	°c	metre	m
degree Fahrenheit*	°F	micro (x10 <sup>-6</sup> )	μ
diameter	diam.	microgramme*	μg
diameter at breast height	d.b.h.	<pre>micromicro (pico: x10<sup>-12</sup>)*</pre>	щ
divided by*	e or /	micrometre (micron)*	$\mu m$ (or $\mu$ )
dry matter	d.m.	micron (micrometre)*†	$\mu m$ (or $\mu$ )
emulsifiable		miles per hour*	mile/h
concentrate	e.c.	milli $(x10^{-3})$	m
equal to*	=	milliequivalent*	m.equiv.
fluid	f1.	milligramme	mg
foot	ft	millilitre	m1
t The name micrometre i	s preferred to	micron and µm is preferred t	to µ.

.

millimetre*	mm	pre-emergence	pre-em.
millimicro*		quart	quart
(nano: x10 <sup>-9</sup> )	n or mu	relative humidity	r.h.
minimum	min.	revolution per minute*	rev/min
minus	-	second	S
minute	min	soluble concentrate	S.C.
molar concentration*	M (small cap)	soluble powder	s.p.
molecule, molecular	mol.	solution	soln
more than	>	species (singular)	sp.
multiplied by*	X	species (plural)	spp.
normal concentration*	N (small cap)	specific gravity	sp. gr.
not dated	n.d.	square foot*	ft <sup>2</sup>
oil miscible	O.M.C.	square inch	in <sup>2</sup>
concentrate	(tables only)	square metre*	m <sup>2</sup>
organic matter	O.M.	square root of*	
ounce	OZ	sub-species*	580.
ounces per gallon	oz/gal	summary	Se
page	p.	tomnoroturo	temp
pages	pp.	ton	ton
parts per million	ppm	tonno	+
parts per million		ultre leu relume	TITN
by volume	ppmv	ultra-low volume	OTA
parts per million by weight	DDWW	ultra violet	ueve
nercent(age)	%	vapour density	V.a.
nico		vapour pressure	v.p.
(micromicro: x10 <sup>-12</sup> )	p or µµ	varietas	var.
pint	pint	volt	V
pints per acre	pints/ac	volume	vol.
plus or minus*	+	volume per volume	V/V
post-emergence	post-em	water soluble powder	W.S.p. (tables only)
pound	1b	watt	W
pound per acre*	lb/ac	weight	wt
pounds per minute	lb/min	weight per volume*	w/w
pound per square inch*	$1b/in^2$	weight ner weight*	w/w
powder for dry	p.	wettable nowder	WaDa
application	(tables only)	ward	vd
power take off	p.t.o.	Jara Jara Jara	vd/min
precipitate (noun)	ppt.	yards per minute	JAMITH

\* Those marked \* should normally be used in the text as well as in tables etc.

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- 51. The activity and selectivity of the herbicides methabenzthiazuron, metoxuron, chlortoluron and cyanazine. September 1978. W G Richardson and C Parker. Price - £2.20.

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![](_page_23_Picture_2.jpeg)