Click here for previous

HOE 22870 is clofop acid, HOE 23408 is diclofop-methyl, RH 2915 is oxyfluorfen

SPECIES	HOE 23408 0.15 KG/HA		HOE 23408 0.90 KG/HA		HOE 23408 5.40 KG/HA	
			40	xxxxxxxx	0	
			36	xxxxxxx	0	
RICE (60)	66	xxxxxxxxxxxxx				
	71	xxxxxxxxxxxxxx				
			126	xxxxxxxxxxxxxxxxxxxx +	116	xxxxxxxxxxxxxxxxxxxx +
PIGEON P (61)	58	xxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
	93	xxxxxxxxxxxxxxxxxx				
			111	xxxxxxxxxxxxxxxxxxx +	111	xxxxxxxxxxxxxxxxxxx +
COWPEA (62)	103	xxxxxxxxxxxxxxxxxxx +	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx
	100	xxxxxxxxxxxxxxxxxxx				
			97	xxxxxxxxxxxxxxxxxx	97	xxxxxxxxxxxxxxxxxx
CHICKPEA (63)	81	xxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
	93	xxxxxxxxxxxxxxxxxx				
			103	xxxxxxxxxxxxxxxxxxx +	93	xxxxxxxxxxxxxxxxxx
GRNDNUT (64)	103	xxxxxxxxxxxxxxxxxxx +	79	xxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
	93	xxxxxxxxxxxxxxxxxx				
			137	xxxxxxxxxxxxxxxxxxx +	100	xxxxxxxxxxxxxxxxxxx
SOYABEAN (65)	125	xxxxxxxxxxxxxxxxxxx +	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
	100	xxxxxxxxxxxxxxxxxxx				
			107	xxxxxxxxxxxxxxxxxxx +	107	xxxxxxxxxxxxxxxxxxx +
COTTON (66)	86	xxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
	100	xxxxxxxxxxxxxxxxxxx				
			92	xxxxxxxxxxxxxxxxxx	39	xxxxxxxx
JUTE (67)	92	xxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx
	100	xxxxxxxxxxxxxxxxxxx				
			92	xxxxxxxxxxxxxxxxxx	92	xxxxxxxxxxxxxxxxxx
KENAF (68)	75	xxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
	100	xxxxxxxxxxxxxxxxxxx				
			91	xxxxxxxxxxxxxxxxxx	72	xxxxxxxxxxxxxx
SESAMUM (70)	117	xxxxxxxxxxxxxxxxxxx +	100	xxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
	93	xxxxxxxxxxxxxxxxxx				
			104	xxxxxxxxxxxxxxxxxxx +	92	xxxxxxxxxxxxxxxxxx
TOMATO (71)	110	xxxxxxxxxxxxxxxxxxx +	79	xxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
	86	xxxxxxxxxxxxxxxxx				
			5	x	0	
OR PUNCT (73)	55	xxxxxxxxxxx	14	xxx	0	
	64	xxxxxxxxxxxxx				

PRE-EMERGENCE SELECTIVITY EXPERIMENT

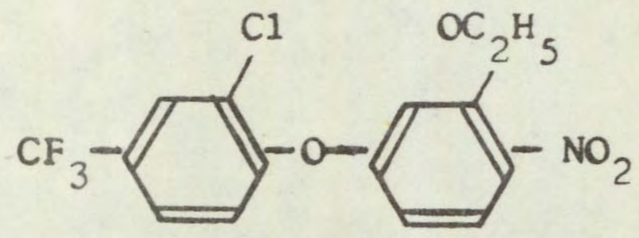
SPECIES		HOE 23408 0.15 KG/HA		HOE 23408 0.90 KG/HA		HOE 23408 5.40 KG/HA
ELEU IND	14	xxx	0		0	
(74)	50	xxxxxxxxxx	0		0	
ECH CRUS	44	xxxxxxxxx	0		0	
(75)	57	xxxxxxxxxxx	0		0	
ROT EXAL	85	xxxxxxxxxxxxxxxx	85	xxxxxxxxxxxxxxxx	70	xxxxxxxxxxxxx
(76)	79	xxxxxxxxxxxxxxx	43	xxxxxxxxx	21	xxxx
DIG SANG	62	xxxxxxxxxxxx	19	xxxx	0	
(77)	64	xxxxxxxxxxxxx	21	xxxx	0	
AMAR RET	143	xxxxxxxxxxxxxxxxxxx +	64	xxxxxxxxxxxxx	50	xxxxxxxxxx
(78)	93	xxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
TAG MIN	94	xxxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx	51	xxxxxxxxx
(80)	93	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
CYP ROTU	95	xxxxxxxxxxxxxxxxxx	87	xxxxxxxxxxxxxxxx	95	xxxxxxxxxxxxxxxxxx
(86)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx

RH 2915

Code number RH 2915 **Trade name** -

Chemical name 2-chloro-1-(3-ethoxy-4-nitrophenoxy)-4-trifluoromethyl benzene

Structure



Source

Rohm and Haas (UK) Ltd
Lennig House
2 Masons Avenue
Croydon
Surrey
CR9 3NB

Information available and suggested uses

RH 2915 is active pre- and post-emergence against a wide range of annual grass and broad-leaved weeds and certain perennials e.g. Convolvulus arvensis. Greater activity occurs with post-emergence treatments, when Cyperus esculentus is also controlled. However some perennials may regrow after earlier top kill. Residual pre-emergence control of new germinating weeds can occur as a result of post-emergence spraying. It is suggested for use in: soybeans, cotton and peanuts at 0.56-1.12 kg a.i./ha pre-plant incorporated, 0.28-0.84 kg/ha pre-emergence and 0.28-1.12 kg/ha directed post-emergence; wheat and rice at 0.14-0.28 kg/ha post-emergence; dormant forage legumes at 0.28-2.24 kg/ha; sugar beet at 0.28-1.12 kg/ha directed post-emergence; tree, vine and plantation crops at 0.56-2.24 kg/ha directed post-emergence. It is also compatible with several other herbicides including paraquat, to which it adds pre-emergence soil activity.

Formulation used 24% w/v a.i. emulsifiable concentrate

Spray volume for activity experiment 305 l/ha
for selectivity experiment 417 l/ha

RESULTS

Full results are given in the histograms on pages 35-40 and potential selectivities are summarised in the following table.

RATE (kg ai/ha)	CROPS: vigour reduced by 15% or less	WEEDS: number or vigour reduced by 70% or more
1.8	none	none listed as no crops tolerant

(Table continued overleaf)

RATE (kg ai/ha)	CROPS: vigour reduced by 15% or less	WEEDS: number or vigour reduced by 70% or more
0.3	field bean chick pea groundnut soyabean	Alopecurus myosuroides Poa annua Sinapis arvensis Polygonum lapathifolium Galium aparine Stellaria media Solanum nigrum Rottboellia exaltata Tagetes minuta + species below
0.05	species above + barley oat dwarf bean pea rape kale maize rice pigeon pea cow pea cotton	Poa trivialis Tripleurospermum maritimum Chenopodium album Veronica persica Rumex obtusifolius Holcus lanatus Allium vineale Eleusine indica Echinochloa crus-galli Digitaria sanguinalis Amaranthus retroflexus

Comments on results

Activity experiment (see page 35)

A high level of activity was found on the annual species, particularly on perennial ryegrass, Avena fatua and kale. With all six species phytotoxicity to established plants was greater as a result of the foliar spray than with the soil drenches, the latter showing very little effect on any of the three broad-leaved species. With perennial ryegrass, A. fatua and kale, much more pre-emergence activity occurred with the surface spray than when the herbicide was incorporated into the soil, suggesting the possibility of uptake by the emerging shoots. However with dwarf bean more activity was found when the herbicide was incorporated into the soil.

Symptoms

Severe scorch symptoms developed fairly rapidly on leaves as a result of the foliar spray. However buds and shoots were not always inactivated, suggesting little translocated effect, while leaves which did develop were often trapped and therefore deformed. With the pre-emergence treatments die-back occurred soon after emergence, while at lower doses leaf trapping was again a feature. A darker green colour of leaves was often seen with all types of application.

Thus the pattern of activity and the symptoms produced are very typical of dinitrophenyl-ether herbicides e.g. nitrofen. However RH 2915 is much more active.

Soil persistence

Holcus lanatus was selected as the test species to monitor persistence because of its extreme sensitivity (100% kill at the low dose of 0.05 kg/ha). This dose was undetected when the soil was assayed, sixteen weeks later, but the higher doses of 0.3 and 1.8 kg/ha were still causing 65 and 100% shoot fresh weight reductions respectively fifty weeks after treatment.

Selectivity among temperate species

In the selectivity test, control of several mainly small seeded broad-leaved and grass weeds was found. Composite and polygonaceous weeds were very sensitive, all being controlled at 0.05 kg/ha. Annual grasses were also sensitive with the exception of A. fatua, which required the highest dose for adequate control.

In the perennial species, Allium vineale proved to be very susceptible, shoots dying back after emergence at 0.05 kg/ha and only one very weak plant survived. All other underground bulbils failed to produce new shoots and eventually died. Convolvulus arvensis suffered 54 and 100% kill initially from doses of 0.3 and 1.8 kg/ha, observations showing that most of the shoots were killed just before or after emergence. All other perennial species were resistant.

Most crops were severely damaged by RH 2915. However large seeded legumes showed some tolerance, field bean at 0.3 kg/ha; dwarf bean and pea at 0.05 kg/ha. The cereals, barley and oat, and the brassicae, kale and rape, were the only other tolerant crops but only at the low dose of 0.05 kg/ha.

Although this test indicates that selectivity is marginal, the high level of weed control might justify further experimentation perhaps as a contact pre-emergence spray in bean crops. The relatively long period of persistence could prove advantageous for control of late germinating weeds, while danger to subsequent crops could probably be overcome by ploughing/incorporating before the latter are sown. Some further experimentation on A. vineale, at least in pots, may be worth while, in view of its increasing importance in many areas and the lack of adequate control measures. A further pot experiment, at lower doses than used here, may also be worth while to investigate the possible control of Holcus lanatus, Poa trivialis and Rumex obtusifolius in perennial ryegrass.

Selectivity among tropical species

Extremely high activity was shown on the small-seeded annual grasses and on Amaranthus and jute, these being killed at 0.05 kg/ha. Tagetes and Rottboellia were also controlled at 0.3 kg/ha and selectivity was excellent at this dose in groundnut, soyabean and chickpea. A slightly lower dose would be selective against a smaller range of weeds in maize, rice and pigeon pea. Although not truly selectively controlled, O. punctata was considerably more susceptible than rice and there might be some useful degree of control of this serious weed. Only very low doses would be completely safe in cotton and cowpea. There was negligible activity on Cyperus rotundus, but the very high activity of this herbicide on annual weeds will warrant further testing in a wide range of tropical crops.

ACTIVITY EXPERIMENT

RH 2915

		0.1 kg/ha	0.5 kg/ha	2.5 kg/ha
DWARF BEAN	F	xxxxxxxxxxxxxxx xxxxx	xxxxxxxxxxxxxxx xxxxx	xxxxxxxxxxxxxxx xxxx
	S	xxxxxxxxxxxx xxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxxxx
	P	xxxxxxxxxxxxxx xxxxxxxxxxxxxx	xxxxxxxxxxxxxxx + xxxxxxxxxxxxx	xxxxxxxxxxxxxx xxxxxxxxxx
	I	xxxxxxxxxxxxxxx + xxxxxxxxxxxxx	xxxxxxxx xxxxx	xxxxxxxx xxxxx
KALE	F	xxxxxxxxxxxxxxx xxxxxx	xxxxxxxxxxxxxxx xxxx	xxxxxxxxxx xx
	S	xxxxxxxxxxxxxxx xxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxxx
	P	xxxxxxxxxxxxxxx + xxxxxxxxx	x xxx	o o
	I	xxxxxxxxxxxx xxxxxxxxxxxxxx	xxxxxxxxxxxxx xxxxxxxxxxxx	xxxxxxxxx xxxxxxxxx
POLYGONUM AMPHIBIUM	F	xxxxxxxxxxxxxxx + xxxxxxxxxxx	xxxxxxxxxxxxxxx + xxxxxxx	xxxxxxxxxxx xxxxxxx
	S	xxxxxxxxxxxxxxx xxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxx
	P	xxxxxxxxxxxx xxxxxxxxxxx	xxxxxxxxxxxxx xxxxxxxx	xxxxxxxxxx xxxxxxxxxx
	I	xxxxxxxxxxxxxx xxxxxxxxxxxxx	xxxxxxxxxxxxx xxxxxxxxxx	xxxxxxxxxx xxxxxxxxx
PERENNIAL RYEGRASS	F	xxxxxxxxxxxxxxx xxxxxxxxx	xxxxxxxxxxxxxxx xxxxxx	xxxxxxx xxxx
	S	xxxxxxxxxxxxxxx xxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxx	xxxxxxxxxxxxx xxxxxx
	P	x xxxx	o o	o o
	I	xxxxxxxxxxxxxxx + xxxxxxxxxxxxxx	xxxxx xxxxxxxxx	o o
AVENA FATUA	F	xxxxxxxxxxxxxxx xxxxxxxxx	xxxxxxxxxxxxxxx xxxxxx	o o
	S	xxxxxxxxxxxxxxx xxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxx	xxxxxxxxxx xxxxx
	P	xxxxxxx xxxxxxxxx	o o	o o
	I	xxxxxxxxxx xxxxxxxxxxx	xxxxx xxxxxxxxx	o o
AGROPYRON REPENS	F	xxxxxxxxxxxxxxx xxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxx	xxxxxxxxxxxxxxx xxxxx
	S	xxxxxxxxxxxxxxx xxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxx
	P	xxxxxxxxxxxxxxx xxxxxxxxxxxxx	xxxxxxxxxxxxx xxxxxxxxxxx	xxxxxxxxxxxxxx xxxxxxxxxx
	I	xxxxxxxxxxxxxx xxxxxxxxxxxxxx	xxxxxxxxxxxxxx xxxxxxxxxx	xxxxxxxxxxxxx xxxxxxxxxx

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

SPECIES		RH 2915 0.05 KG/HA		RH 2915 0.3 KG/HA		RH 2915 1.8 KG/HA
WHEAT	111	xxxxxxxxxxxxxxxxxxxx +	87	xxxxxxxxxxxxxxxxx	103	xxxxxxxxxxxxxxxxxxxx +
(1)	79	xxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	43	xxxxxxxxx
BARLEY	102	xxxxxxxxxxxxxxxxxxxx +	96	xxxxxxxxxxxxxxxxxxx	77	xxxxxxxxxxxxxxx
(2)	86	xxxxxxxxxxxxxxxxx	57	xxxxxxxxxxx	43	xxxxxxxxx
OAT	87	xxxxxxxxxxxxxxxxx	80	xxxxxxxxxxxxxxxx	27	xxxxx
(3)	86	xxxxxxxxxxxxxxxxx	50	xxxxxxxxxx	29	xxxxxx
PER RYGR	55	xxxxxxxxxx	7	x	0	
(4)	50	xxxxxxxxx	7	x	0	
ONION	14	xxx	0		0	
(8)	14	xxx	0		0	
DWF BEAN	100	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx
(9)	100	xxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxx	71	xxxxxxxxxxxx
FLD BEAN	91	xxxxxxxxxxxxxxxxx	104	xxxxxxxxxxxxxxxxxx +	78	xxxxxxxxxxxxxxx
(10)	100	xxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx
PEA	91	xxxxxxxxxxxxxxxxx	91	xxxxxxxxxxxxxxxx	104	xxxxxxxxxxxxxxxxxx +
(11)	100	xxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	64	xxxxxxxxxxxx
W CLOVER	3	x	0		0	
(12)	14	xxx	0		0	
RAPE	95	xxxxxxxxxxxxxxxxx	32	xxxxxx	0	
(14)	100	xxxxxxxxxxxxxxxxxx	57	xxxxxxxxxx	0	
KALE	103	xxxxxxxxxxxxxxxxxx +	61	xxxxxxxxxxx	33	xxxxxxx
(15)	86	xxxxxxxxxxxxxxxx	43	xxxxxxxxx	29	xxxxxx
CARROT	82	xxxxxxxxxxxxxxx	77	xxxxxxxxxxxxxx	15	xxx
(18)	79	xxxxxxxxxxxxxxx	57	xxxxxxxxxx	29	xxxxxx

PRE-EMERGENCE SELECTIVITY EXPERIMENT

SPECIES	RH 2915 0.05 KG/HA		RH 2915 0.3 KG/HA		RH 2915 1.8 KG/HA	
LETTUCE	79	xxxxxxxxxxxxxxxx	29	xxxxxx	0	
(20)	57	xxxxxxxxxxx	29	xxxxxx	0	
SUG BEET	101	xxxxxxxxxxxxxxxxxxxx +	39	xxxxxxxx	4	x
(21)	79	xxxxxxxxxxxxxxxx	29	xxxxxx	7	x
AVE FATU	99	xxxxxxxxxxxxxxxxxxxx	59	xxxxxxxxxxxx	0	
(26)	86	xxxxxxxxxxxxxxxx	43	xxxxxxxxx	0	
ALO MYOS	81	xxxxxxxxxxxxxxxx	22	xxxx	1	x
(27)	79	xxxxxxxxxxxxxxxx	36	xxxxxxx	7	x
POA ANN	31	xxxxxx	0		0	
(28)	36	xxxxxxx	0		0	
POA TRIV	0		0		0	
(29)	0		0		0	
SIN ARV	200	xxxxxxxxxxxxxxxxxxxx +	30	xxxxxx	0	
(30)	71	xxxxxxxxxxxxxx	14	xxx	0	
RAPH RAP	100	xxxxxxxxxxxxxxxxxxxx	70	xxxxxxxxxxxxxx	25	xxxxx
(31)	79	xxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx	29	xxxxxx
TRIP MAR	49	xxxxxxxxxx	0		0	
(33)	29	xxxxxx	0		0	
POL LAPA	52	xxxxxxxxxx	0		0	
(35)	36	xxxxxxx	0		0	
GAL APAR	55	xxxxxxxxxxx	20	xxxx	0	
(38)	71	xxxxxxxxxxxxxx	29	xxxxxx	0	
CHEN ALB	13	xxx	0		0	
(39)	21	xxxx	0		0	

SPECIES	RH 2915 0.05 KG/HA		RH 2915 0.3 KG/HA		RH 2915 1.8 KG/HA	
STEL MED	70	xxxxxxxxxxxxxx	3	x	0	
(40)	86	xxxxxxxxxxxxxxxxx	21	xxxx	0	
VER PERS	0		0		0	
(42)	0		0		0	
SOL NIG	35	xxxxxxx	0		0	
(43)	50	xxxxxxxxxx	0		0	
RUM OBTU	5	x	0		0	
(44)	7	x	0		0	
HOLC LAN	0		0		0	
(45)	0		0		0	
AG REPEN	91	xxxxxxxxxxxxxxxxx	82	xxxxxxxxxxxxxxx	91	xxxxxxxxxxxxxxxxx
(47)	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx
ALL VIN	10	xx	0		0	
(49)	14	xxx	0		0	
CIRS ARV	82	xxxxxxxxxxxxxxx	68	xxxxxxxxxxxxx	95	xxxxxxxxxxxxxxxxxx
(50)	93	xxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxx	57	xxxxxxxxxx
TUS FARF	87	xxxxxxxxxxxxxxxx	87	xxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(51)	100	xxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
CONV ARV	81	xxxxxxxxxxxxxxx	46	xxxxxxxxx	0	
(52)	86	xxxxxxxxxxxxxxxx	36	xxxxxxx	0	
MAIZE	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	70	xxxxxxxxxxxxx
(58)	100	xxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	43	xxxxxxxxx
SORGHUM	105	xxxxxxxxxxxxxxxxxxx +	100	xxxxxxxxxxxxxxxxxxx	47	xxxxxxxxx
(59)	79	xxxxxxxxxxxxxxx	64	xxxxxxxxxxxx	29	xxxxxx

SPECIES	RH 2915 0.05 KG/HA		RH 2915 0.3 KG/HA		RH 2915 1.8 KG/HA	
RICE	79	xxxxxxxxxxxxxxxx	75	xxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx
(60)	93	xxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	50	xxxxxxxxxx
PIGEON P	87	xxxxxxxxxxxxxxxxx	77	xxxxxxxxxxxxxxx	0	
(61)	86	xxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxxx	0	
COWPEA	111	xxxxxxxxxxxxxxxxxxx +	95	xxxxxxxxxxxxxxxxxxx	47	xxxxxxxxx
(62)	93	xxxxxxxxxxxxxxxxxxx	57	xxxxxxxxxxx	21	xxxx
CHICKPEA	97	xxxxxxxxxxxxxxxxxxx	81	xxxxxxxxxxxxxxxx	73	xxxxxxxxxxxxxxx
(63)	93	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	57	xxxxxxxxxxx
GRNDNUT	93	xxxxxxxxxxxxxxxxxx	103	xxxxxxxxxxxxxxxxxxx +	93	xxxxxxxxxxxxxxxxxx
(64)	93	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx
SOYABEAN	112	xxxxxxxxxxxxxxxxxxx +	125	xxxxxxxxxxxxxxxxxxx +	125	xxxxxxxxxxxxxxxxxxx +
(65)	86	xxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx
COTTON	107	xxxxxxxxxxxxxxxxxxx +	107	xxxxxxxxxxxxxxxxxxx +	96	xxxxxxxxxxxxxxxxxx
(66)	86	xxxxxxxxxxxxxxxxx	57	xxxxxxxxxxx	43	xxxxxxxxx
JUTE	0		0		0	
(67)	0		0		0	
KENAF	110	xxxxxxxxxxxxxxxxxxx +	29	xxxxxx	6	x
(68)	79	xxxxxxxxxxxxxxxx	57	xxxxxxxxxxx	21	xxxx
SESAMUM	33	xxxxxxx	0		0	
(70)	50	xxxxxxxxxx	0		0	
TOMATO	52	xxxxxxxxxx	6	x	6	x
(71)	64	xxxxxxxxxxxxx	14	xxx	7	x
OR PUNCT	83	xxxxxxxxxxxxxxxxx	102	xxxxxxxxxxxxxxxxxxx +	9	xx
(73)	50	xxxxxxxxxx	36	xxxxxxx	29	xxxxxx

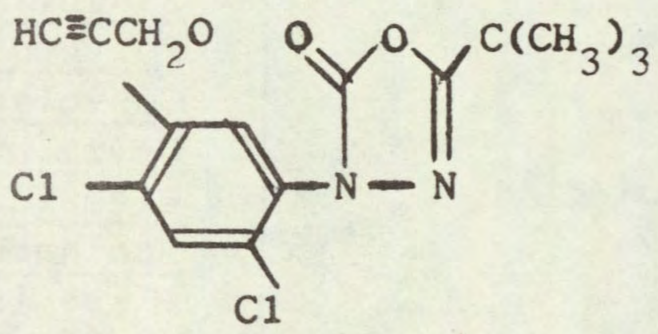
SPECIES		RH 2915 0.05 KG/HA		RH 2915 0.3 KG/HA		RH 2915 1.8 KG/HA	
ELEU IND	3	x	0		0		
(74)	7	x	0		0		
ECH CRUS	10	xx	0		0		
(75)	7	x	0		0		
ROT EXAL	105	xxxxxxxxxxxxxxxxxxxx +	15	xxx	0		
(76)	86	xxxxxxxxxxxxxxxxx	29	xxxxxx	0		
DIG SANG	0		0		0		
(77)	0		0		0		
AMAR RET	0		0		0		
(78)	0		0		0		
TAG MIN	99	xxxxxxxxxxxxxxxxxxxx	9	xx	0		
(80)	71	xxxxxxxxxxxxxx	36	xxxxxxx	0		
CYP ROTU	95	xxxxxxxxxxxxxxxxxx	118	xxxxxxxxxxxxxxxxxxxx +	71	xxxxxxxxxxxxx	
(86)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	

RP 20630

Code number RP 20630 Trade name -

Chemical name 3-(2,4-dichloro-5-prop-2-ynyloxyphenyl)-5-t-butyl -1,3,4-oxadiazolin-2-one

Structure



Source

Rhône Poulenc
Division Phytosanitaire
25 quai Paul Doumer
92408 Courbevoie
France

via May and Baker Ltd
Ongar Research Station
Fyfield Road
Ongar
Essex

Information available and suggested uses

Suggested for pre- and post-emergence weed control in soyabean, sunflower, aubergine, onion (bulb) and certain other crops, between 0.75 and 1.5 kg/ha. Pre-emergence application is said to be better than post-emergence.

Formulation used 40% w/v a.i. flowable cream

Spray volume for activity experiment 305 l/ha
for selectivity experiment 417 l/ha

RESULTS

Full results are given in the histograms on pages 45-50 and potential selectivities are summarised in the following table.

RATE (kg ai/ha)	CROPS: vigour reduced by 15% or less	Weeds: number or vigour reduced by 70% or more
1.8	groundnut	Avena fatua Raphanus raphanistrum Tripleurospermum maritimum Galium aparine Stellaria media Allium vineale Rottboellia exaltata + species below

(Table continued overleaf)

RATE (kg ai/ha)	CROPS: vigour reduced by 15% or less	WEEDS: number or vigour reduced by 70% or more
0.3	species above + wheat barley	Alopecurus myosuroides Poa annua Poa trivialis Sinapis arvensis Polygonum lapathifolium Convolvulus arvensis Oryza punctata Eleusine indica Echinochloa crus-galli + species below
0.05	species above + oat perennial ryegrass* dwarf bean field bean pea kale carrot lettuce sugar beet radish maize sorghum rice pigeon pea chick pea soyabean tomato	Chenopodium album Veronica persica Solanum nigrum Rumex obtusifolius Holcus lanatus Digitaria sanguinalis Amaranthus retroflexus

* but note a stand reduction of 24%

Comments on results

Activity experiment (see page 45)

RP 20630 exhibited a high level of activity, particularly with pre-emergence applications. Activity occurred also on established plants, the soil drench treatments being more damaging than the foliar spray for all species except dwarf bean, this difference being particularly noticeable with the grasses. The foliar spray was more effective on the broad-leaved species than on the grasses. In the pre-emergence treatments, the surface spray was markedly more active than when incorporated into the soil for perennial ryegrass, kale and Polygonum amphibium, suggesting the possibility of shoot uptake for these species. The other three species showed a similar degree of response to both pre-emergence treatments.

A comparison of the activity tests of RP 20630 and the chemically related oxadiazon shows that the latter is more active as a foliar spray but in the soil treatments, particularly the soil drenches, RP 20630 is more effective. However the level of activity of pre-emergence surface

sprays on the two annual grasses was similar for both herbicides (Richardson and Dean, 1974, Richardson and Dean 1976 in press).

Symptoms

Contact scorch damage as a result of the foliar spray and wilting with soil drench treatments occurred within a few days of spraying. Pre-emergence applications at higher doses caused death soon after the plants emerged. At lower doses leaves were often trapped and consequently deformed. An intensification of the green colour of leaves was seen with all of the soil treatments. However the most characteristic symptom occurring in all application methods, but mainly with the soil treatments, was a severe browning or necrosis in the region of the vascular tissue (midrib and veins) of stems and leaves. There was also a tendency for plants to recover from initially quite severe damage, suggesting little systemic or translocated effect. Thus the symptoms produced on susceptible species are very similar to those caused by the dinitrophenyl ethers and oxadiazon.

Soil persistence

Holcus lanatus was the most sensitive of the temperate grass species tested and was selected to monitor persistence. The dose of 0.05 kg/ha gave an 88% kill of plants initially, survivors suffering a 95% reduction in fresh weight of their shoots. This dose was undetectable sixteen weeks later. After twenty seven weeks, 0.3 kg/ha was also undetectable but the highest dose of 1.8 kg/ha caused a 90% reduction in shoot fresh weight, fifty weeks after application. Thus there is a moderate period of persistence in the soil but it would appear to be less than that found previously with oxadiazon (Richardson and Dean, 1976, in press).

Selectivity among temperate species

In the selectivity experiment, several annual grass and broad-leaved weeds were controlled, although some gaps in the weed spectrum are apparent. A certain weakness is apparent with the resistance of Stellaria media, a weed which is usually controlled by most pre-emergence herbicides except dinitrophenyl ethers and oxadiazon. However this weed is not quite as resistant to RP 20630 as to oxadiazon. The crucifers (Sinapis arvensis and Raphanus raphanistrum) were also not as easily controlled as other small seeded weed species, again comparing with the above mentioned herbicides. Another similarity to these is the sensitivity of the two perennials, Allium vineale and Convolvulus arvensis, and the resistance of Agropyron repens, Cirsium arvense and Tussilago farfara. Generally, broad-leaved weeds were more sensitive to RP 20630 than to oxadiazon but annual grass weeds showed a similar degree of response to both herbicides. However the cereals, wheat and barley were more tolerant to RP 20630 than they were to oxadiazon, while large seeded legumes (peas and beans) were more tolerant to oxadiazon (Richardson and Dean, 1976 in press). Onion (from seed) proved to be sensitive.

Potential selectivities found in this test which are of interest and deserve some further investigation are the control of Alopecurus myosuroides and Poa species in wheat and barley; Veronica persica and Chenopodium album in sugar beet; Holcus lanatus and Rumex obtusifolius in perennial ryegrass; Solanum nigrum in pea. The possible control of this latter species in tomato, i.e. a solanaceous weed in a crop of the

same botanical family, is interesting and suggests that investigations in potatoes might be worth while.

Selectivity among tropical species

Extremely high activity was shown on jute, Amaranthus retroflexus and Digitaria sanguinalis and there was good control of other annual grasses at 0.3 kg/ha. Good selective control of a wide range of weeds should be possible at about this dose in cotton, groundnut and chick pea. Rice does not appear outstandingly tolerant but selectivity of RP 20630 against grass weeds in this crop should be comparable to that of oxadiazon. There was also some indication of selectivity against the wild rice O. punctata. In most respects this compound behaves in a very similar manner to oxadiazon on the tropical species. It has interesting potential selectivities and high activity but will have to be cheaper than oxadiazon to have any good prospect of widespread use.

ACTIVITY EXPERIMENT

RP 20630

		0.1 kg/ha	0.5 kg/ha	2.5 kg/ha
DWARF BEAN	F	xxxxxxxxxxxxxxx xxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxx	xxxxxxxxxxxxxxx xxxxxxx
	S	xxxxxxxxxxxxxxx xxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxx
	P	xxxxxxxxxxxxxxx xxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxx	o o
	I	xxxxxxxxxxxxxxx xxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxx	xx xx
KALE	F	xxxxxxxxxxxxxxx xxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxx
	S	xxxxxxxxxxxxxxx xxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxx	xxxxxxxxxxxxxxx xxxxxx
	P	xxxx xxxxxx	x xx	o o
	I	xxxxxxxxxxxxxxx + xxxxxxxxxxxxx	xxxxxxxxxxxxx xxxxxxxxx	xxxx xxxxxx
POLYGONUM AMPHIBIUM	F	xxxxxxxxxxxxxxx xxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxx
	S	xxxxxxxxxxx xxxxxxxx	xxxx xxxxxx	xx xxx
	P	xxxxxxxxxxxxxx xxxxxxxxxx	x x	o o
	I	xxxxxxxxxxxxxx + xxxxxxxxxxx	xxxxxxxxxxxxxx + xxxxxxxx	xx xx
PERENNIAL RYEGRASS	F	xxxxxxxxxxxxxxx xxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxx
	S	xxxxxxxxxxxxxxx xxxxxxx	xxxxxxxxxxxxxx xxxx	xxxxx xx
	P	xx xxxxx	o o	o o
	I	xxxxxxxxxxxxxxx + xxxxxxxxxxxxx	xxxxxxxxx xxxx	xx xx
AVENA FATUA	F	xxxxxxxxxxxxxxx xxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxx
	S	xxxxxxxxxxxxxxx xxxxxxxx	xxxxxxxxxx xxxxxx	xxx xxxx
	P	xxxxxxxxxx xxxxxxxxxx	xxxxxxxxxx xxxxxxx	xxx xxx
	I	xxxxxxxxxx xxxxxxxxxxx	xxxxxxxxxxxxxx xxxxxx	xxxxx xx
AGROPYRON REPENS	F	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxxx
	S	xxxxxxxxxxxxxxx xxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxx	xxxxxxxxxxxxxxx xxxxx
	P	xxxxxxxxxxxxxxx xxxxxxxxxxxxxx	xxxxxxxxxxxxxx xxxxxxxxx	xxxxxxxxxxxxxxx xxxxx
	I	xxxxxxxxxxxxxx xxxxxxxxxxxxxx	xxxxxxxxxxxxx xxxxxxxx	xxxxxxxxxxxxxx xxxxx

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

SPECIES	RP 20630 0.05 KG/HA		RP 20630 0.30 KG/HA		RP 20630 1.80 KG/HA	
WHEAT	111	xxxxxxxxxxxxxxxxxxxx +	111	xxxxxxxxxxxxxxxxxxxx +	95	xxxxxxxxxxxxxxxxxx
(1)	93	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	43	xxxxxxxxx
BARLEY	83	xxxxxxxxxxxxxxxxx	96	xxxxxxxxxxxxxxxxxxx	70	xxxxxxxxxxxxx
(2)	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx
OAT	100	xxxxxxxxxxxxxxxxxxx	87	xxxxxxxxxxxxxxxxx	7	x
(3)	100	xxxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx	7	x
PER RYGR	76	xxxxxxxxxxxxxxx	31	xxxxxx	0	
(4)	100	xxxxxxxxxxxxxxxxxxx	43	xxxxxxxxx	0	
ONION	68	xxxxxxxxxxxxx	0		0	
(8)	57	xxxxxxxxxxx	0		0	
INF BEAN	83	xxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	0	
(9)	100	xxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	0	
FLD BEAN	91	xxxxxxxxxxxxxxxxx	104	xxxxxxxxxxxxxxxxxxx +	52	xxxxxxxxxx
(10)	100	xxxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	43	xxxxxxxxx
PEA	104	xxxxxxxxxxxxxxxxxxx +	78	xxxxxxxxxxxxxxx	39	xxxxxxxx
(11)	86	xxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	57	xxxxxxxxxx
W CLOVER	36	xxxxxxx	0		0	
(12)	50	xxxxxxxxxx	0		0	
RAPE	95	xxxxxxxxxxxxxxxxxx	21	xxxx	0	
(14)	71	xxxxxxxxxxxxxx	29	xxxxxx	0	
KALE	80	xxxxxxxxxxxxxxxx	42	xxxxxxxx	19	xxxx
(15)	86	xxxxxxxxxxxxxxxxx	50	xxxxxxxxxx	21	xxxx
CARROT	87	xxxxxxxxxxxxxxxxx	106	xxxxxxxxxxxxxxxxxxx +	44	xxxxxxxxx
(18)	100	xxxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	50	xxxxxxxxxx

SPECIES		RP 20630 0.05 KG/HA		RP 20630 0.30 KG/HA		RP 20630 1.80 KG/HA
LETTUCE	96	xxxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx	25	xxxxx
(20)	86	xxxxxxxxxxxxxxxx	57	xxxxxxxxxxx	36	xxxxxxx
SUG BEET	90	xxxxxxxxxxxxxxxxxx	66	xxxxxxxxxxxxx	19	xxxx
(21)	86	xxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	29	xxxxxx
AVE FATU	99	xxxxxxxxxxxxxxxxxxxx	91	xxxxxxxxxxxxxxxxxx	0	
(26)	100	xxxxxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx	0	
ALO MYOS	96	xxxxxxxxxxxxxxxxxxx	8	xx	0	
(27)	86	xxxxxxxxxxxxxxxx	29	xxxxxx	0	
POA ANN	99	xxxxxxxxxxxxxxxxxxxx	23	xxxxx	0	
(28)	86	xxxxxxxxxxxxxxxx	36	xxxxxxx	0	
POA TRIV	105	xxxxxxxxxxxxxxxxxxx +	0		0	
(29)	50	xxxxxxxxxx	0		0	
SIN ARV	180	xxxxxxxxxxxxxxxxxxx +	20	xxxx	0	
(30)	100	xxxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx	0	
RAPH RAP	95	xxxxxxxxxxxxxxxxxx	35	xxxxxxx	25	xxxxx
(31)	93	xxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx	14	xxx
TRIP MAR	108	xxxxxxxxxxxxxxxxxxx +	36	xxxxxxx	7	x
(33)	100	xxxxxxxxxxxxxxxxxxx	43	xxxxxxxxx	14	xxx
POL LAPA	157	xxxxxxxxxxxxxxxxxxx +	0		0	
(35)	100	xxxxxxxxxxxxxxxxxxx	0		0	
GAL APAR	89	xxxxxxxxxxxxxxxxxx	34	xxxxxxx	0	
(38)	93	xxxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx	0	
CHEN ALB	10	xx	0		0	
(39)	21	xxxx	0		0	

SPECIES	RP 20630 0.05 KG/HA		RP 20630 0.30 KG/HA		RP 20630 1.80 KG/HA	
STEL MED	82	xxxxxxxxxxxxxxxx	44	xxxxxxxxx	26	xxxxx
(40)	100	xxxxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx	50	xxxxxxxxxx
VER PERS	5	x	0		0	
(42)	14	xxx	0		0	
SOL NIG	17	xxx	0		0	
(43)	43	xxxxxxxxx	0		0	
RUM OBTU	5	x	0		0	
(44)	14	xxx	0		0	
HOLC LAN	12	xx	0		0	
(45)	21	xxxx	0		0	
AG REPEN	100	xxxxxxxxxxxxxxxxxxx +	91	xxxxxxxxxxxxxxxxx	109	xxxxxxxxxxxxxxxxxxx +
(47)	100	xxxxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx	50	xxxxxxxxxx
ALL VIN	83	xxxxxxxxxxxxxxxx	31	xxxxxx	21	xxxx
(49)	79	xxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	21	xxxx
CIRS ARV	55	xxxxxxxxxx	109	xxxxxxxxxxxxxxxxxxx +	68	xxxxxxxxxxxxx
(50)	93	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx
TUS FARF	100	xxxxxxxxxxxxxxxxxx	75	xxxxxxxxxxxxxx	87	xxxxxxxxxxxxxxxx
(51)	100	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxx
CONV ARV	69	xxxxxxxxxxxxx	0		0	
(52)	71	xxxxxxxxxxxxx	0		0	
MAIZE	100	xxxxxxxxxxxxxxxxxx	80	xxxxxxxxxxxxxx	50	xxxxxxxxx
(58)	86	xxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	36	xxxxxx
SORGHUM	100	xxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxx	47	xxxxxxxx
(59)	100	xxxxxxxxxxxxxxxxxx	57	xxxxxxxxxx	29	xxxxx

SPECIES		RP 20630 0.05 KG/HA		RP 20630 0.30 KG/HA		RP 20630 1.80 KG/HA
RICE	97	xxxxxxxxxxxxxxxxxx	84	xxxxxxxxxxxxxxxx	31	xxxxxx
(60)	100	xxxxxxxxxxxxxxxxxxx	57	xxxxxxxxxx	21	xxxx
PIGEON P	97	xxxxxxxxxxxxxxxxxx	48	xxxxxxxxx	0	
(61)	100	xxxxxxxxxxxxxxxxxxx	50	xxxxxxxxx	0	
COWPEA	95	xxxxxxxxxxxxxxxxxx	111	xxxxxxxxxxxxxxxxxxx +	63	xxxxxxxxxxxx
(62)	79	xxxxxxxxxxxxxxx	50	xxxxxxxxx	43	xxxxxxxx
CHICKPEA	97	xxxxxxxxxxxxxxxxxx	89	xxxxxxxxxxxxxxxxx	32	xxxxxx
(63)	86	xxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx
GRNDNUT	93	xxxxxxxxxxxxxxxxxx	103	xxxxxxxxxxxxxxxxxxx +	93	xxxxxxxxxxxxxxxxxx
(64)	93	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
SOYABEAN	125	xxxxxxxxxxxxxxxxxxx +	87	xxxxxxxxxxxxxxxx	112	xxxxxxxxxxxxxxxxxx +
(65)	100	xxxxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx	64	xxxxxxxxxxxx
COTTON	96	xxxxxxxxxxxxxxxxxx	107	xxxxxxxxxxxxxxxxxxx +	75	xxxxxxxxxxxxx
(66)	79	xxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	50	xxxxxxxxx
JUTE	0		0		0	
(67)	0		0		0	
KENAF	63	xxxxxxxxxxxx	0		0	
(68)	71	xxxxxxxxxxxxx	0		0	
SESAMUM	65	xxxxxxxxxxxx	0		0	
(70)	71	xxxxxxxxxxxxx	0		0	
TOMATO	92	xxxxxxxxxxxxxxxxx	0		0	
(71)	93	xxxxxxxxxxxxxxxxxx	0		0	
OR PUNCT	106	xxxxxxxxxxxxxxxxxx +	55	xxxxxxxxxx	14	xxx
(73)	57	xxxxxxxxxx	29	xxxxx	14	xxx

SPECIES		RP 20630 0.05 KG/HA		RP 20630 0.30 KG/HA		RP 20630 1.80 KG/HA
ELEU IND	76	xxxxxxxxxxxxxxx	6	x	0	
(74)	50	xxxxxxxxxx	14	xxx	0	
ECH CRUS	47	xxxxxxxxx	3	x	0	
(75)	43	xxxxxxxxx	21	xxxx	0	
ROT EXAL	120	xxxxxxxxxxxxxxxxxxxx +	35	xxxxxxx	0	
(76)	93	xxxxxxxxxxxxxxxxxx	43	xxxxxxxxx	0	
DIG SANG	12	xx	0		0	
(77)	21	xxxx	0		0	
AMAR RET	21	xxxx	0		0	
(78)	21	xxxx	0		0	
TAG MIN	111	xxxxxxxxxxxxxxxxxxx +	56	xxxxxxxxxxx	64	xxxxxxxxxxxxx
(80)	100	xxxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx	57	xxxxxxxxxxx
CYP ROTU	79	xxxxxxxxxxxxxxx	111	xxxxxxxxxxxxxxxxxxx +	134	xxxxxxxxxxxxxxxxxxx +
(86)	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxx

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Appendix 1. Species, abbreviations, cultivars and stage of growth at assessment

	Designation and computer serial number	Cultivar or source	No. per pot	Depth of planting (cm)	Stage of growth at assessment (untreated controls, leaf numbers exclusive of cotyledons)
Temperate species					
Wheat (Triticum aestivum)	WHEAT (1)	Maris Huntsman	8	1.2	5 leaves
Barley (Hordeum vulgare)	BARLEY (2)	Maris Mink	8	1.2	5 leaves
Oat (Avena sativa)	OAT (3)	Condor	8	1.2	4½-5 leaves
Perennial ryegrass (Lolium perenne)	PER RYGR (4)	S 23	15	0.6	6 leaves, tillering
Onion (Allium cepa)	ONION (8)	Robusta	15	0.6	2 leaves
Dwarf bean+ (Phaseolus vulgaris)	DWF BEAN (9)	The Prince	3	1.8	1½ trifoliate
Field bean (Vicia faba)	FLD BEAN (10)	Maris Bead	4	1.8	6 leaves
Pea (Pisum sativum)	PEA (11)	Dark Skinned Perfection	4	1.2	8 leaves
White clover (Trifolium repens)	W CLOVER (12)	S 100	20	0.6	3 trifoliate leaves
Rape (Brassica napus oleifera)	RAPE (14)	Victor	12	0.6	3½ leaves
Kale (Brassica oleracea acephala	KALE (15)	Marrowstem	12	0.6	3½ leaves
Carrot (Daucus carota)	CARROT (18)	Chantenay Red Core	12	0.6	2½-3 leaves
Lettuce (Lactuca sativa)	LETTUCE (20)	Borough Wonder	12	0.6	5-6 leaves

+ temperate species raised under higher temperature regime

	Designation and computer serial number	Cultivar or source	No. per pot	Depth of planting (cm)	Stage of growth at assessment (untreated controls, leaf numbers exclusive of cotyledons)
Sugar beet (Beta vulgaris)	SUG BEET (21)	'Klein E'	15	0.6	2½-3 leaves
Avena fatua	AVE FATU (26)	Ditchley 1969	15	1.2	3½-4 leaves
Alopecurus myosuroides	ALO MYOS (27)	B and S supplies 1972	100	0.6	5 leaves, tillering
Poa annua	POA ANN (28)	WRO 1972	30	0.6	6 leaves, tillering
Poa trivialis	POA TRIV (29)	Watts 1972	45	0.6	6 leaves, tillering
Sinapis arvensis	SIN ARV (30)	WRO 1965	25	0.6	3½-4 leaves
Raphanus raphanistrum	RAPH RAP (31)	Long Black Spanish	12	0.6	2½ leaves
Tripleurospermum maritimum	TRIP MAR (33)	WRO 1971	20	Surface	10 leaves
Senecio vulgaris	SEN VULG (34)	WRO 1972	40	0.6	6 leaves
Polygonum lapathifolium	POL LAPA (35)	WRO 1971	20	0.6	4½ leaves
Polygonum aviculare	POL AVIC (36)	WRO 1971	30	0.6	6 leaves
Galium aparine	GAL APAR (38)	WRO 1972	20	0.6	6-8 whorls
Chenopodium album	CHEN ALB (39)	WRO 1972	25	0.6	8 leaves
Stellaria media	STEL MED (40)	B and S supplies 1972	20	0.6	16 leaves
Veronica persica	VER PERS (42)	WRO 1973	20	0.6	6 leaves
Solanum nigrum+	SOL NIG (43)	B and S supplies 1973	30	0.3	5½-6½ leaves

+ temperate species raised under higher temperature regime

	Designation and computer serial number	Cultivar or source	No. per pot	Depth of planting (cm)	Stage of growth at assessment (untreated controls, leaf numbers exclusive of cotyledons)
Rumex obtusifolius	RUM OBTU (44)	WRO 1969	15	0.3	4-5 leaves
Holcus lanatus	HOLC LAN (45)	WRO 1973	40	0.6	6 leaves, tillering
Agropyron repens	AG REPEN (47)	WRO Clone 31	6/	1.2	4½-5 leaves
Allium vineale	ALL VIN (49)	WRO 1973	22*	1.2	2½-3 leaves
Cirsium arvense	CIRS ARV (50)	WRO Clone 1	4//	1.2	6 leaves
Tussilago farfara	TUS FARF (51)	WRO Clone 1	4/	1.2	4-5 leaves
Convolvulus arvense	CONV ARV (52)	WRO Clone 1	5//	1.2	12 leaves
Tropical species (grown under higher temperature regime)					
Maize (Zea mays)	MAIZE (58)	Caldera	5	1.8	5-5½ leaves
Sorghum (Sorghum bicolor)	SORGHUM (59)	YE-90-L	10	1.2	4½ leaves
Rice (Oryza sativa)	RICE (60)	I R 5	12	0.6	3½-4 leaves
Pigeon pea (Cajanus cajan)	PIGEON P (61)	Jamaica 1974	7	1.2	6-7 leaves
Cowpea (Vigna unguiculata)	COWPEA (62)	Nigeria 1974	7	1.2	1-1½ trifoliate leaves
Chickpea (Cicer arietinum)	CHICKPEA (63)	Ethiopia 1970	6	1.2	8½-9 leaves
Groundnut (Arachis hypogea)	GRNDNUT (64)	S.38	5	1.8	4-6½ leaves
Soyabean (Glycine max)	SOYABEAN (65)	Wayne	6	1.2	1-2 trifoliate leaves

/ one node rhizome fragments // 4 cm root fragments * aerial bulbils

	Designation and computer serial number	Cultivar or source	No. per pot	Depth of planting (cm)	Stage of growth at assessment (untreated controls, leaf numbers exclusive of cotyledons)
Cotton (Gossypium hirsutum)	COTTON (66)	Samaru 26J	5	1.2	1-2 leaves
Jute (Corchorus olitorius)	JUTE (67)	Egypt 1971	12	0.6	2½-3 leaves
Kenaf (Hibiscus cannabinus)	KENAF (68)	Thai Native 1968	10	0.6	2-2½ leaves
Sesamum (Sesamum indicum)	SESAMUM (70)	Uganda 1972	10	0.6	4 leaves
Tomato (Lycopersicum esculentum)	TOMATO (71)	Ailsa Craig	10	0.6	2-2½ leaves
Oryza punctata	OR PUNCT (73)	Swaziland 1974	18	0.6	2½-3 leaves
Eleusine indica	ELEU IND (74)	WRO 1964	18	0.6	3½-4 leaves
Echinochloa crus-galli	ECH CRUS (75)	WRO 1970	15	0.6	4-4½ leaves
Rottboellia exaltata	ROT EXAL (76)	Rhodesia 1971	12	1.2	3½-4 leaves
Digitaria sanguinalis	DIG SANG (77)	Shell Research Ltd. 1965	20	0.1	3½-4 leaves
Amaranthus retroflexus	AMAR RET (78)	WRO 1969	20	0.1	5-7½ leaves
Tagetes minuta	TAG MIN (80)	Kenya 1974	15	Surface	2-4 leaves
Cyperus esculentus	CYP ESCU (85)	WRO Clone 2 (ex South Africa)	6**	1.8	3½-5 leaves/ shoot
Cyperus rotundus	CYP ROTU (86)	WRO Clone 1 (ex Rhodesia)	5**	1.8	7-7½ leaves/ shoot
Oxalis latifolia	OXAL LAT (87)	WRO Clone 2 (Cornwall)	20 bulbs	1.2	nil germination

** tubers

ABBREVIATIONS

ångström	Å	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	concn	hydrogen ion concentration*	pH
concentration × time product	ct	inch	in.
concentration required to kill 50% test animals	LC50	infra red	i.r.
cubic centimetre*	cm^3	kilogramme	kg
cubic foot*	ft^3	kilo ($\times 10^3$)	k
cubic inch*	in^3	less than	<
cubic metre*	m^3	litre	l.
cubic yard*	yd^3	low volume	LV
cultivar(s)	cv.	maximum	max.
curie*	Ci	median lethal dose	LD50
degree Celsius*	^oC	medium volume	MV
degree centigrade*	^oC	melting point	m.p.
degree Fahrenheit*	^oF	metre	m
diameter	diam.	micro ($\times 10^{-6}$)	µ
diameter at breast height	d.b.h.	microgramme*	µg
divided by*	÷ or /	micromicro (pico: $\times 10^{-12}$)*	µµ
dry matter	d.m.	micrometre (micron)*	µm (or µ)
emulsifiable concentrate	e.c.	micron (micrometre)*×	µm (or µ)
equal to*	=	miles per hour*	mile/h
fluid	fl.	milli ($\times 10^{-3}$)	m
foot	ft	milliequivalent*	m.equiv.
		milligramme*	mg
		millilitre	ml

* The name micrometre is preferred to micron and µm is preferred to µ.

millimetre*	mm
millimicro* (nano: $\times 10^{-9}$)	n or mμ
minimum	min.
minus	-
minute	min
molar concentration*	M (small cap)
molecule, molecular	mol.
more than	>
multiplied by*	×
normal concentration*	N (small cap)
not dated	n.d.
oil miscible concentrate	o.m.c. (tables only)
organic matter	o.m.
ounce	oz
ounces per gallon	oz/gal
page	p.
pages	pp.
parts per million*	ppm
parts per million by volume*	ppmv
parts per million by weight*	ppmw
percent(age)*	%
pico (micromicro: $\times 10^{-12}$)	p or μμ
pint	pint
pints per acre	pints/ac
plus or minus*	±
post-emergence	post-em.
pound	lb
pound per acre*	lb/ac
pounds per minute	lb/min
pound per square inch*	lb/in^2
powder for dry application	p. (tables only)
power take off	p.t.o.
precipitate (noun)	ppt.
pre-emergence	pre-em.
quart	quart
relative humidity	r.h.
revolution per minute*	rev/min
second	s
soluble concentrate	s.c.
soluble powder	s.p.
solution	soln
species (singular)	sp.
species (plural)	spp.
specific gravity	sp. gr.
square foot*	ft^2
square inch*	in^2
square metre*	m^2
square root of*	$\sqrt{}$
sub-species*	ssp.
summary	s.
temperature	temp.
ton	ton
tonne	t
ultra-low volume	ULV
ultra violet	u.v.
vapour density	v.d.
vapour pressure	v.p.
varietas	var.
volt	V
volume	vol.
volume per volume	v/v
water soluble powder	w.s.p. (tables only)
watt	W
weight	wt
weight per volume*	w/v
weight per weight*	w/w
wettable powder	w.p.
yard	yd
yards per minute	yd/min

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

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