WEED RESEARCH ORGANIZATION

TECHNICAL REPORT No. 42

THE ACTIVITY AND POST-EMERGENCE SELECTIVITY OF SOME RECENTLY DEVELOPED HERBICIDES: KUE 2079A, HOE 29152, RH 2915, TRICLOPYR AND DOWCO 290

HOE 29152 is trifop-methyl, KUE 2079A is flothiurin, RH 2915 is oxyfluorfen, Dowco 290 is clorpyralid

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THE ACTIVITY AND POST-EMERGENCE SELECTIVITY OF SOME RECENTLY DEVELOPED HERBICIDES: KUE 2079A, HOE 29152, RH 2915, TRICLOPYR AND DOWCO 290

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SUMMARY

Five herbicides were examined for their early post-emergence selectivity on 36 temperate and 26 tropical crop and weed species. The route of action for one of these herbicides, HOE 29152, was determined on six selected species in a separate test.

KUE 2079A gave good control of most annual broad-leaved weeds, two annual grasses and Cirsium arvense, but only a few crops were tolerant, notably carrot. Among the tropical species, rice showed no more than moderate tolerance.

HOE 29152 was highly active on grass species both as a foliar spray and through the soil, both pre-and post-emergence. In the selectivity experiment it gave outstanding control of annual and perennial grass weeds and was well tolerated by onion and many broad-leaved crops both temperate and tropical. It could also be useful for control of volunteer cereals in these crops. Broad-leaved weeds were generally resistant.

RH 2915 was highly phytotoxic and showed very limited selectivity, only six temperate crops tolerating the lowest dose, at which only three annual broad leaved weeds were controlled. Oxalis latifolia was controlled at 0.8 kg/ha.

Temperate and tropical cereals were tolerant to triclopyr but only three annual broad-leaved weeds were selectively controlled.

Dowco 290 showed outstanding control of composite weeds, including Cirsium arvense, while temperate and tropical cereals, perennial ryegrass and brassica crops showed good tolerance. Certain crops were highly sensitive such as carrot, lettuce and all leguminous species.

INTRODUCTION

The pre- and post-emergence selectivites of new herbicides are investigated on a large number of pot-grown crop and weed species at WRO. The objectives are to discover selectivities, crop and weed susceptibilities and to obtain experience of the type of effects produced by each compound. Attention is drawn to the limitations of these investigations; eg use of only one crop variety or source of weed species and growth in one particular soil type at only one depth of sowing without intraspecific competition. Consequently the results should only be used as a guide for further work; plant responses in pot experiments can be very different to those in the field.

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The present report gives indications of the post-emergence selectivity of five new herbicides. Results of an activity experiment are included for HOE 29152 to provide information on levels of phytotoxicity, type and route of action. Those for RH 2915, triclopyr and Dowco 290 were reported previously (Richardson et al, 1976; Richardson and Parker, 1976b).

METHODS AND MATERIALS

(a) Activity experiment (AE)

The activity experiment was carried out on six selected species as described previously (Richardson and Dean, 1974). Four annual species were raised from seeds and two perennials from rhizome fragments. Herbicides were applied by four different methods: (i) post-emergence to the foliage only, avoiding contact with the soil, (ii) post-emergence to the soil only, as a drench avoiding foliage contact, (iii) pre-emergence to the soil surface, (iv) pre-emergence with thorough incorporation, before planting. Species data are summarised in Table 1 and soil and environmental conditions in Table 2. The pre-emergence treatments for kale, dwarf bean and perennial ryegrass had to be repeated (AE 1 b) due to contamination of control pots in the earlier test (AE 1 a).

Table 1. Plant data for activity experiments (AE)

Species	Cultivar/ source	No. per pot at spraying		Depth of planting (cm)	Post-emergence stage of growth at spraying	Stage of growth at assessment	
		pre-	post-			pre-	post-
Dwarf bean (Phaseolus vulgaris)	The Prince	3	2	1.8	2 unifoliate leaves	$1\frac{1}{2}$-$2\frac{1}{2}$ trifoliate leaves	$1\frac{1}{2}$-2 trifoliate leaves
Kale (Brassica oleracea acephala)	Marrow-stem	15	5	0.6	$1\frac{1}{2}$-$2\frac{1}{2}$ leaves	$3\frac{1}{2}$-4 leaves	3-4 leaves
Polygonum amphibium	WRO Clone 1	6	5	1.2	$3\frac{1}{2}$-4 leaves	6-8 leaves	9 leaves
Perennial ryegrass (Lolium perenne)	S 23	20	10	0.6	3-5 leaves, tillering	6 leaves, tillering	10 leaves, tillering
Avena fatua	Farthing-hoe 1972	12	4	1.2	$3\frac{1}{2}$ leaves	4-7 leaves tillering	9 leaves, tillering
Agropyron repens	WRO Clone 31	6	5	1.2	3 leaves	5-7 leaves, tillering	9 leaves, tillering

(b) Post-emergence selectivity experiment

The technique for this experiment was as before (Richardson and Parker 1976 a). Plants were raised in 10 cm diameter plastic pots in a soil, peat, sand mixture (4:1:1 by volume). The soil was taken from a field at Begbroke Hill (Begbroke North). Soil conditions are summarised in Table 2. Planting dates were staggered so that the majority of plants had reached the 2-4 leaf stage by the time of spraying. Temperate species were raised in the open and tropical species in the glasshouse. Environmental conditions during the course of the experiment are recorded in Table 2.

Table 2. Soil and environmental conditions

Experiment number, type and herbicide(s) included	AE 1a HOE 29152	AE 1b HOE 29152 repeat pre-emergence treatments	Post-emergence selectivity test KUE 2079A, HOE 29152, RH 2915, triclopyr, Dowco 290	
Date of spraying	29.4.76	7.6.76	8.7.76	
Main assessment completed	27.5.76	9.7.76	28.7.76	
Organic matter (%)	4.2	4.2	4.2	
Clay content (%)	13	13	13	
pH	7.0	7.0	7.0	
John Innes base fertilizer (g/kg)	5.0	5.0	2.5	
DDT (5% dust) (g/kg)	0.5	0.5	0.5	
Fritted trace elements (g/kg)	0.25	0.25	0.25	
Epsom salts (g/kg)	1.0	1.0	1.0	
Temperature (°C)			Temperate	Tropical
Mean	30	24	20	26
Maximum	32	37	32	33
Minimum	9	12	12	17
Relative humidity (%)				
Mean	53	55	50	50
Maximum	90	90	76	70
Minimum	26	18	10	23

Before spraying all species were thinned to constant number per pot. Certain plant material was pre-treated to improve establishment. Chenopodium album seeds were soaked in 0.1 M potassium nitrate solution and kept in the light 2 days prior to planting. Veronica persica seeds were sown in sterilized soil and seedlings transplanted into the potting medium. Seedlings of Polygonum aviculare were transplanted from a field at Begbroke. Tubers of Cyperus esculentus were stored moist at 2°C for 5 weeks prior to planting to break dormancy while bulbs of Oxalis latifolia were stored at 2°C for 4 weeks prior to planting. Perennial species were propagated vegetatively as denoted in Appendix 1.

To protect from soil-borne pathogens all seeds except Chenopodium album, Polygonum aviculare and the temperate cereals were pretreated with one of the following: thiram, Harvesan organomercury (for Avena fatua) or ethylmercuric phosphate + dieldrin (for sugar beet). Temperate cereal seeds were purchased already treated with a mercurial seed dressing.

Stages of growth (exclusive of cotyledons) at spraying are summarised in Appendix 1. After spraying the plants were protected from rainfall for 24 hours and then given an overhead watering to wash any residues off the foliage. The pots were then returned to their original position in the glasshouse or the open. Additional fertiliser in solution and insecticide and fungicide were applied to individual species as required.

Radish (Raphanus raphanistrum) was included for ease of propagation and may be regarded as a crop or weed. Soyabean (Glycine max) unfortunately failed to germinate in this experiment.

(c) Assessment and processing of results

Results were assessed and processed as before (Richardson and Dean, 1974). Stages of growth at the time of assessment are given in Appendix 1. Survivors were counted and scored on a 0-7 scale as previously, where 0 = dead and 7 = control.

Histograms are presented for each treatment and consist of a pair of figures; the upper figure represents mean plant survival and the lower, mean vigour score, both calculated as percentages of untreated controls. The same information is displayed as a histogram where each 'x' represents a 5% increment, but in the activity experiment histograms, each 'x' represents a 7% increment. A '+' indicates a value in excess of 100%; 'R' indicates a result based on one replicate only and 'M' represents a missing treatment.

A table of observed selectivities, using the criteria specified, is presented for each compound along with comments to highlight salient points.

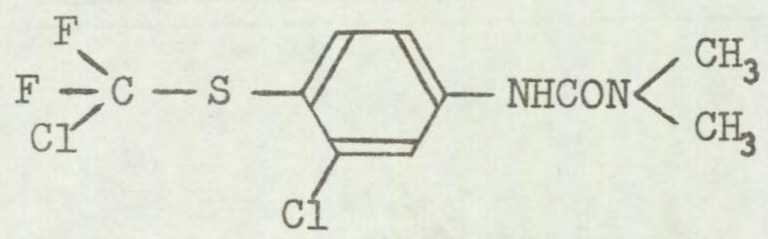
Several species, notably the perennials, were kept for a period of several weeks to observe later effects on the degree of recovery from injury and these final observations are referred to in the text.

KUE 2079A

Code number KUE 2079A Trade name Clearcide

Chemical name N-(3-chloro-4-chlorodifluoromethylthiophenyl)-N',N'-dimethylurea

Structure



Source

Bayer UK Ltd
Agrochem Division
Eastern Way
Bury St Edmunds
Suffolk IP32 7AH

Information available and suggested uses

Suggested for control of mainly broad-leaved weeds up to the four leaf stage and grass weeds at germination in wet paddy rice prior to and after transplanting as well as post-emergence in broadcast wet paddy. Mixtures are available with other herbicides used for control of grass weeds in rice thus giving a broader spectrum of weed control ie molinate (granule formulation) and benthiocarb (granule and emulsifiable concentrate formulations). The recommended dose of the 4% a.i. granule formulation is 30 kg of product/ha.

Formulation used 25% w/v a.i. emulsifiable concentrate

Spray volume for selectivity experiment 345 l/ha

RESULTS

Full histogram results are presented on pages 8-13 and potential selectivities are summarised in the following table.

RATE (kg a.i./ha)	CROPS: vigour reduced by 15% or less	WEEDS: number or vigour reduced by 70% or more
4.0	None	None listed as no crops tolerant
1.0	carrot	Avena fatua Poa annua Raphanus raphanistrum Tripleurospermum maritimum Senecio vulgaris Polygonum aviculare Galium aparine Chenopodium album Cirsium arvense Amaranthus retroflexus + species below

RATE (kg a.i./ha)	CROPS: vigour reduced by 15% or less	WEEDS: number or vigour reduced by 70% or more
0.25	species above + wheat perennial ryegrass sorghum groundnut	Sinapis arvensis Solanum nigrum Stellaria media Spergula arvensis Rumex obtusifolius

Symptoms

These were seen to be fairly typical of photosynthetic inhibitors. Scorch and necrosis of sprayed foliage was accompanied by chlorosis and yellowing, the latter symptoms being more obvious at lower doses.

Post-emergence selectivity among temperate species

All annual broad-leaved weeds were controlled at 1.0 kg/ha or lower, with the exception of Polygonum lapathifolium and Veronica persica, both of which required 4.0 kg/ha for adequate control. The perennial, Cirsium arvense was eventually killed at 0.25 kg/ha. Annual grass weeds were generally more resistant than broad-leaved weeds, only Avena fatua and Poa annua being controlled at 1.0 kg/ha. Although both perennial grasses, Agropyron repens and Agrostis stolonifera were reduced in vigour by 50% with 1.0 kg/ha initially, some plants succeeded in recovering even from 4.0 kg/ha.

Carrot was the only crop to tolerate 1.0 kg/ha. Wheat and perennial ryegrass tolerated 0.25 kg/ha and were only slightly reduced in vigour at 1.0 kg/ha.

KUE 2079A shows good potential selective control of several weeds in carrots and comparison with linuron and other herbicides used in this crop may be worthwhile. A subsequent pot test has shown a somewhat lower margin of selectivity between annual grasses and perennial ryegrass. Although Cirsium arvense was less sensitive in a more recent pot test, there is still some selectivity between it and perennial ryegrass. Environmental factors may have played some part here, as the later test was carried out under glass. Owing to the importance of Cirsium arvense as a weed in all three of the tolerant crops (carrot, perennial ryegrass and wheat) further investigation may be worthwhile.

Post-emergence selectivity among tropical species

Annual broad-leaved weeds (and small-seeded crops) were susceptible to the lower doses of 0.25 and 1 kg/ha, the Solanaceae being particularly sensitive. Grass weeds and perennials were by contrast generally resistant and hardly controlled at 4 kg/ha.

There would scarcely be useful general selectivity against broad-leaved weeds even in the more resistant crops, - groundnut, cotton, cowpea and cereals - but there could perhaps be some potential for control of specific Solanaceae at low doses.

The damage to rice at the higher doses, and minor effects at the lowest dose were unexpected and suggest that the variety used, Blue Bonnett, may perhaps not be as tolerant as others. However, there could perhaps still be good selectivity as a pre-emergence treatment in this and other crops. Results of a pre-emergence selectivity test will be published later.

POST-EMERGENCE SELECTIVITY EXPERIMENT

SPECIES		KUE 2079A 0.25 kg/ha		KUE 2079A 1.0 kg/ha		KUE 2079A 4.0 kg/ha
WHEAT (1)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	75	xxxxxxxxxxxxxxx
	93	xxxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	43	xxxxxxxxx
BARLEY (2)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	70	xxxxxxxxxxxxxx
	79	xxxxxxxxxxxxxxxx	43	xxxxxxxxx	29	xxxxxx
OAT (3)	100	xxxxxxxxxxxxxxxxxxxx	90	xxxxxxxxxxxxxxxxxx	40	xxxxxxxx
	79	xxxxxxxxxxxxxxxx	50	xxxxxxxxxx	14	xxx
PER RYGR (4)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	25	xxxxx
	100	xxxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxxx	36	xxxxxxx
ONION (8)	50	xxxxxxxxxx	20	xxxx	20	xxxx
	43	xxxxxxxxx	7	x	7	x
DWF BEAN (9)	100	xxxxxxxxxxxxxxxxxxxx	75	xxxxxxxxxxxxxxx	25	xxxxx
	71	xxxxxxxxxxxxxx	57	xxxxxxxxxx	21	xxxx
FLD BEAN (10)	67	xxxxxxxxxxxx	0		0	
	43	xxxxxxxxx	0		0	
PEA (11)	100	xxxxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx	0	
	79	xxxxxxxxxxxxxxxx	36	xxxxxxx	0	
W CLOVER (12)	85	xxxxxxxxxxxxxxxxx	5	x	0	
	50	xxxxxxxxxx	14	xxx	0	
RAPE (14)	10	xx	0		0	
	14	xxx	0		0	
KALE (15)	80	xxxxxxxxxxxxxxxx	0		0	
	64	xxxxxxxxxxxxx	0		0	

POST-EMERGENCE SELECTIVITY EXPERIMENT

SPECIES	KUE 2079A 0.25 kg/ha		KUE 2079A 1.0 kg/ha		KUE 2079A 4.0 kg/ha	
CABBAGE	40	xxxxxxxx	10	xx	0	
(16)	43	xxxxxxxxx	14	xxx	0	
CARROT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	62	xxxxxxxxxxx
(18)	86	xxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	50	xxxxxxxxxx
PARSNIP	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	17	xxx
(19)	79	xxxxxxxxxxxxxxxx	57	xxxxxxxxxxx	14	xxx
LETTUCE	100	xxxxxxxxxxxxxxxxxxxx	0		0	
(20)	57	xxxxxxxxxxx	0		0	
SUG BEET	80	xxxxxxxxxxxxxxxx	10	xx	0	
(21)	64	xxxxxxxxxxxxx	21	xxxx	0	
AVE FATU	90	xxxxxxxxxxxxxxxxxx	40	xxxxxxxx	0	
(26)	64	xxxxxxxxxxxxx	29	xxxxxx	0	
ALO MYOS	100	xxxxxxxxxxxxxxxxxxxx	87	xxxxxxxxxxxxxxxxx	6	x
(27)	86	xxxxxxxxxxxxxxxxx	36	xxxxxxx	14	xxx
POA ANN	75	xxxxxxxxxxxxxxx	25	xxxxx	0	
(28)	57	xxxxxxxxxxx	36	xxxxxxx	0	
POA TRIV	100	xxxxxxxxxxxxxxxxxxxx	40	xxxxxxxx	0	
(29)	86	xxxxxxxxxxxxxxxxx	36	xxxxxxx	0	
SIN ARV	0		0		0	
(30)	0		0		0	
RAPH RAP	40	xxxxxxxx	0		0	
(31)	50	xxxxxxxxxx	0		0	

POST-EMERGENCE SELECTIVITY EXPERIMENT

SPECIES	KUE 2079A 0.25 kg/ha		KUE 2079A 1.0 kg/ha		KUE 2079A 4.0 kg/ha	
TRIP MAR	75	xxxxxxxxxxxxxxx	5	x	0	
(33)	43	xxxxxxxxx	21	xxxx	0	
SEN VULG	100	xxxxxxxxxxxxxxxxxxxx	0		0	
(34)	100	xxxxxxxxxxxxxxxxxxxx	0		0	
POL LAPA	100	xxxxxxxxxxxxxxxxxxxx	81	xxxxxxxxxxxxxxxx	31	xxxxxx
(35)	79	xxxxxxxxxxxxxxxx	57	xxxxxxxxxxx	21	xxxx
POL AVIC	100	xxxxxxxxxxxxxxxxxxxx	29	xxxxxx	0	
(36)	71	xxxxxxxxxxxxxx	36	xxxxxxx	0	
GAL APAR	100	xxxxxxxxxxxxxxxxxxxx	0		0	
(38)	71	xxxxxxxxxxxxxx	0		0	
CHEN ALB	42	xxxxxxxx	17	xxx	0	
(39)	50	xxxxxxxxxx	43	xxxxxxxxx	0	
STEL MED	0		0		0	
(40)	0		0		0	
SPER ARV	0		0		0	
(41)	0		0		0	
VER PERS	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	20	xxxx
(42)	100	xxxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxxx	14	xxx
RUM OBTU	0		0		0	
(44)	0		0		0	
HOLC LAN	100	xxxxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx	0	
(45)	79	xxxxxxxxxxxxxxxx	36	xxxxxxx	0	

POST-EMERGENCE SELECTIVITY EXPERIMENT

SPECIES	KUE 2079A 0.25 kg/ha		KUE 2079A 1.0 kg/ha		KUE 2079A 4.0 kg/ha	
AG REPEN	100	xxxxxxxxxxxxxxxxxxxx	87	xxxxxxxxxxxxxxxxx	50	xxxxxxxxxx
(47)	79	xxxxxxxxxxxxxxxxx	50	xxxxxxxxxx	43	xxxxxxxxx
AG STOLO	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	30	xxxxxx
(48)	71	xxxxxxxxxxxxxx	50	xxxxxxxxxx	21	xxxx
CIRS ARV	40	xxxxxxxx	0		0	
(50)	36	xxxxxxx	0		0	
MAIZE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(58)	79	xxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx	57	xxxxxxxxxx
SORGHUM	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	12	xx
(59)	86	xxxxxxxxxxxxxxxxx	57	xxxxxxxxxx	14	xxx
RICE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(60)	79	xxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx	43	xxxxxxxxx
PIGEON P	50	xxxxxxxxxx	0		0	
(61)	43	xxxxxxxxx	0		0	
COWPEA	100	xxxxxxxxxxxxxxxxxxxx	62	xxxxxxxxxxxx	0	
(62)	71	xxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	0	
CHICKPEA	90	xxxxxxxxxxxxxxxxxx	10	xx	0	
(63)	64	xxxxxxxxxxxxx	29	xxxxxx	0	
GRNDNUT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	67	xxxxxxxxxxxxx
(64)	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx
COTTON	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	90	xxxxxxxxxxxxxxxxxx
(66)	71	xxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	57	xxxxxxxxxx

POST-EMERGENCE SELECTIVITY EXPERIMENT

SPECIES	KUE 2079A 0.25 kg/ha		KUE 2079A 1.0 kg/ha		KUE 2079A 4.0 kg/ha	
JUTE	50	xxxxxxxxxx	50	xxxxxxxxxx	0	
(67)	50	xxxxxxxxxx	21	xxxx	0	
KENAF	100	xxxxxxxxxxxxxxxxxxxx	6	x	56	xxxxxxxxxx
(68)	57	xxxxxxxxxx	7	x	14	xxx
TOBACCO	10	xx	0		0	
(69)	21	xxxx	0		0	
SESAMUM	0		0		0	
(70)	0		0		0	
TOMATO	0		0		0	
(71)	0		0		0	
OR PUNCT	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(73)	86	xxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx	50	xxxxxxxxx
ELEU IND	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	50	xxxxxxxxx
(74)	71	xxxxxxxxxxxxx	50	xxxxxxxxx	29	xxxxx
ECH CRUS	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(75)	86	xxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx	36	xxxxxx
ROTT EXA	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	95	xxxxxxxxxxxxxxxxxx
(76)	93	xxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	57	xxxxxxxxxx
DIG SANG	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	81	xxxxxxxxxxxxxxx
(77)	79	xxxxxxxxxxxxxxx	57	xxxxxxxxxx	43	xxxxxxxx
AMAR RET	69	xxxxxxxxxxxxx	6	x	0	
(78)	57	xxxxxxxxxx	36	xxxxxx	0	

POST-EMERGENCE SELECTIVITY EXPERIMENT

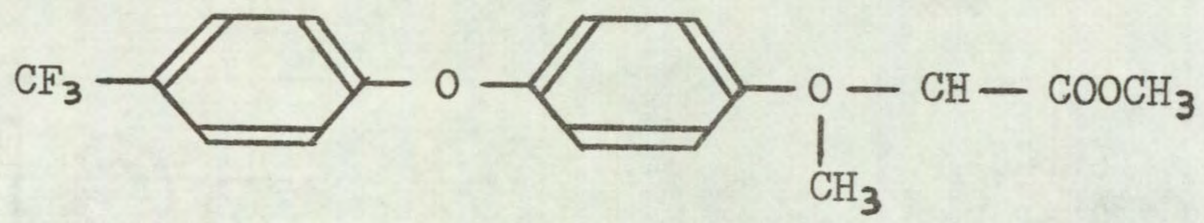
SPECIES	KUE 2079A 0.25 kg/ha		KUE 2079A 1.0 kg/ha		KUE 2079A 4.0 kg/ha	
PORT OLE (79)	100 71	xxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxx	83 36	xxxxxxxxxxxxxxxxx xxxxxxx	67 14	xxxxxxxxxxxxx xxx
SOL NIG (81)	0 0		0 0		0 0	
SNOW POL (83)	100 71	xxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxx	100 79	xxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxxx	90 50	xxxxxxxxxxxxxxxxx xxxxxxxxxx
CYP ESCU (85)	100 71	xxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxx	100 64	xxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxx	100 50	xxxxxxxxxxxxxxxxxxxx xxxxxxxxxx
CYP ROTU (86)	100 86	xxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxxxx	100 86	xxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxxxx	100 71	xxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxx
OXAL LAT (87)	92 71	xxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxx	83 64	xxxxxxxxxxxxxxxxx xxxxxxxxxxxxx	75 57	xxxxxxxxxxxxxxx xxxxxxxxxxx

HOE 29152

Code number HOE 29152

Chemical name 2[4(4-trifluoromethyl-phenoxy)-phenoxy]-methylpropionate

Structure



Source

Hoechst UK Ltd
Agricultural Department
Hoechst House
Salisbury House
Hounslow
Middlesex TW4 6JH

Information available and suggested uses

Control of perennial and annual grasses in broad-leaved crops. Dose for perennials eg Agropyron repens 2-3 kg ai/ha; for annuals eg Avena fatua 0.75-1.5 kg ai/ha.

Formulation used 36% w/v a.i. emulsifiable concentrate

Spray volume for activity experiment 340 l/ha
for selectivity experiment 345 l/ha

RESULTS

Full histogram results are given on pages 17-23 and potential selectivities are summarised in the following table.

RATE (kg a.i./ha)	CROPS: vigour reduced by 15% or less	WEEDS: number or vigour reduced by 70% or more
4.0	carrot chickpea	Poa annua Solanum nigrum + species below
1.0	species above + onion white clover cabbage parsnip pigeon pea cowpea kenaf tomato	Agropyron repens Oryza punctata + species below

RATE (kg a.i./ha)	CROPS: vigour reduced by 15% or less	WEEDS: number or vigour reduced by 70% or more
0.25	species above + dwarf bean field bean pea rape kale lettuce sugar beet radish groundnut jute tobacco	Avena fatua Alopecurus myosuroides Poa trivialis Holcus lanatus Agrostis stolonifera Eleusine indica Echinochloa crus-galli Rottboellia exaltata Digitaria sanguinalis Snowdenia polystachya

Comments on results

Activity experiment

Grasses were very susceptible to all four application methods, particularly the foliar spray and the surface pre-emergence treatments which caused similar degrees of phytotoxicity. Incorporation of the herbicide into the soil led to a decrease in phytotoxicity as compared to the surface spray, this difference being especially noticeable with perennial ryegrass and suggesting the possibility of entry through the emerging shoots.

Broad-leaved species were generally tolerant, the foliar and pre-emergence treatments causing only minor non-lethal effects. Established broad-leaved plants were completely tolerant to soil drench applications.

Symptoms

Grasses treated post-emergence ceased to make any further growth and died back steadily, accompanied by chlorosis. The foliar spray caused some scorch of leaves and later, brown necrotic spots and lesions appeared along the length of the leaf blades. Pre-emergence treatments on grasses resulted in die back usually from an early growth stage (one to three leaves) this again being accompanied by chlorosis. Higher doses prevented Agropyron emerging either from the soil or from the leaf sheath. On Avena fatua, with the low dose of the foliar and surface pre-emergence spray, the only symptom seen on the shoots was a tendency to lean over or even collapse. Despite this, plants treated with the foliar spray still managed to produce panicles. Observation of the roots showed that these were poorly developed while secondary roots were stunted. These symptoms on Avena fatua are very reminiscent of those caused by HOE 23408 reported previously (Richardson et al, 1976).

The foliar spray caused some scorch initially on the foliage of broad-leaved species, brown necrotic spots and lesions being evident. However, with the majority of species growth was not affected, the new buds developing normally. Exceptions to this were found with pea, field bean, kale and cabbage the newly developing foliage showing some slight epinasty and a tendency for leaves to stick together causing consequent deformities.

Post-emergence selectivity among temperate species

Only a few plants of Agropyron repens eventually survived at 0.25 kg/ha, all other annual and perennial grasses being killed at this dose, with the exception of Poa annua. This species was killed at 4.0 kg/ha but was relatively resistant at lower doses. In contrast broad-leaved weeds were resistant, only Solanum nigrum being adequately controlled at 4.0 kg/ha although there was kill of a few plants of Galium aparine and Senecio vulgaris at this same dose.

Broad-leaved crops were generally tolerant of HOE 29152. Carrot showed outstanding tolerance even at 4.0 kg/ha while parsnip and white clover were only slightly affected at this dose. Large seeded legumes satisfied the criteria of selectivity only at 0.25 kg/ha. This was also the case for sugar beet, lettuce and the brassicas kale, radish and rape but these exhibited only minor symptoms at 1.0 kg/ha. Onion showed outstanding tolerance, recovering well from minor effects at 4.0 kg/ha. In contrast, all three cereals and perennial ryegrass were either killed or severely damaged even at the lowest dose of 0.25 kg/ha.

This herbicide offers considerable potential for selective post-emergence control of grass weeds, including volunteer cereals, in onion and many broad-leaved crops. However, if good performance is confirmed on established perennial grasses it could also prove to be of great benefit in several other situations where annual and perennial grass weeds are a problem, eg in direct drilling and minimum tillage, in horticulture and forestry. The high tolerance of white clover and the sensitivity of perennial ryegrass suggests the possibility of using HOE 29152 as a regulator of ryegrass in mixed swards of these species, provided that the dose to suppress ryegrass can be accurately gauged.

Post-emergence selectivity among tropical species

Annual broad-leaved weeds were a little more affected by HOE 29152 than by (the related) HOE 23408 in a previous experiment (Richardson & Parker, 1976a) but they were still not effectively controlled at 4 kg/ha.

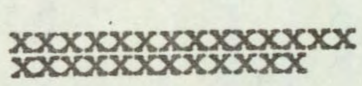
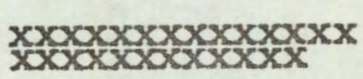
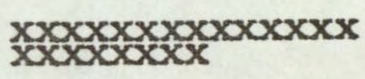
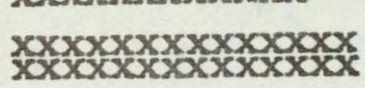
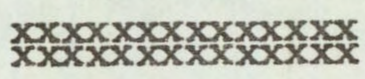
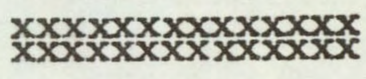
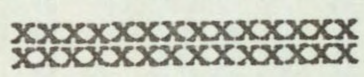
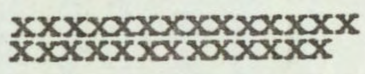
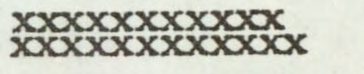
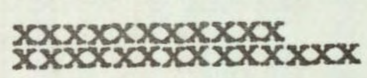
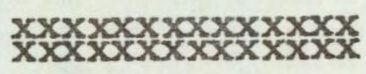
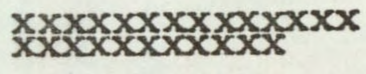
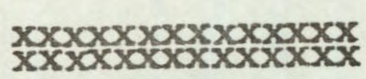
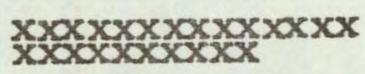
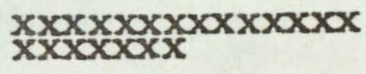
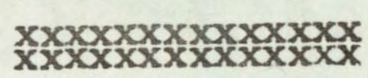
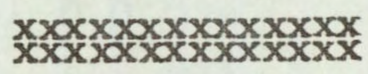
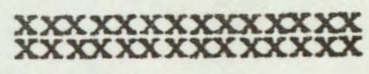
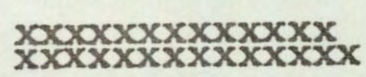
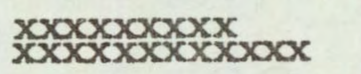
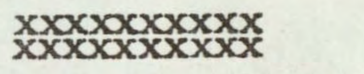
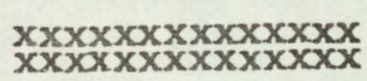
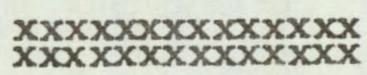
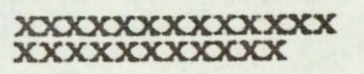
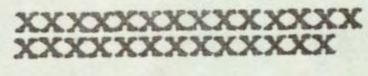
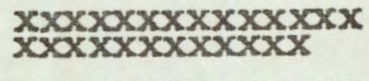
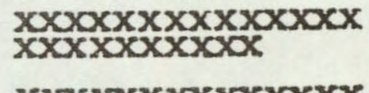
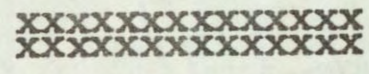
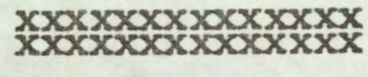
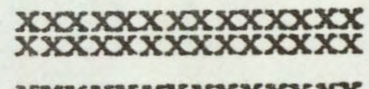
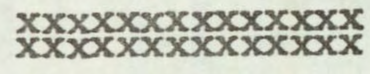
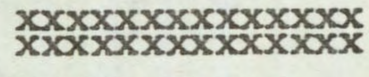
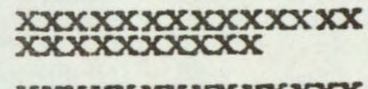
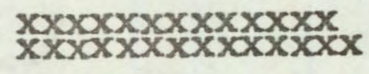
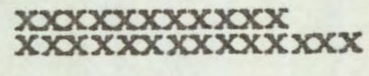
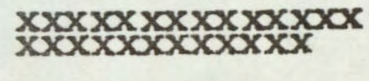
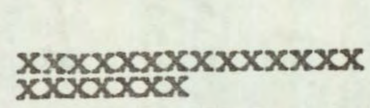
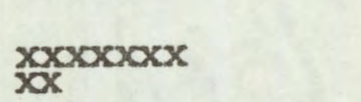
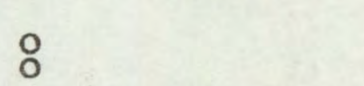
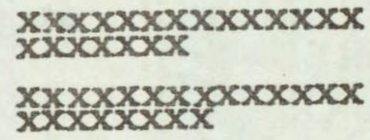
The activity of HOE 29152 also appears to be greater than HOE 23408 on the annual grasses most of which, including Rottboellia, were affectively controlled at 0.25 kg/ha. Only O. punctata required 1 kg/ha. The perennial Cyperus spp and Oxalis were tolerant.

In general the selectivity pattern of this compound is similar to those of HOE 23408 and HOE 22870. The legumes again show excellent tolerance though groundnut was rather more affected than others. Soyabeans unfortunately failed in this experiment and no results could be obtained.

Selectivity of HOE 29152 against annual grasses in the legumes and in jute, kenaf, tobacco and tomato appears very comparable to that of HOE 23408. Sesamum was relatively more susceptible, but was very small at the time of spraying.

ACTIVITY EXPERIMENT

HOE 29152

		0.25 kg/ha	1.0 kg/ha	4.0 kg/ha
DWARF BEAN	F			
	S			
	P	 +	 +	
	I		 +	
KALE	F			
	S			
	P			
	I	 +	 +	
POLYGONUM AMPHIBIUM	F			
	S			
	P	 +		
	I			 +
PERENNIAL RYEGRASS	F			
	S			
	P			
	I	+		
AVENA FATUA	F			
	S			
	P			
	I			
AGROPYRON REPENS	F			
	S			
	P			
	I			

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

POST-EMERGENCE SELECTIVITY EXPERIMENT

SPECIES	HOE 29152 0.25 kg/ha		HOE 29152 1.0 kg/ha		HOE 29152 4.0 kg/ha	
WHEAT	100	xxxxxxxxxxxxxxxxxxxx	37	xxxxxxx	0	
(1)	14	xxx	7	x	0	
BARLEY	100	xxxxxxxxxxxxxxxxxxxx	20	xxxx	0	
(2)	50	xxxxxxxxxx	7	x	0	
OAT	0		0		0	
(3)	0		0		0	
PER RYGR	0		0		0	
(4)	0		0		0	
ONION	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(8)	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
DWF BEAN	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(9)	86	xxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx	43	xxxxxxxxx
FLD BEAN	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(10)	86	xxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxxx	57	xxxxxxxxxx
PEA	100	xxxxxxxxxxxxxxxxxxxx	83	xxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(11)	93	xxxxxxxxxxxxxxxxxx	57	xxxxxxxxxx	57	xxxxxxxxxx
W CLOVER	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(12)	93	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
RAPE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	10	xx
(14)	100	xxxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxxx	14	xxx
KALE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	40	xxxxxxxx
(15)	100	xxxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	36	xxxxxxx

SPECIES	HOE 29152 0.25 kg/ha		HOE 29152 1.0 kg/ha		HOE 29152 4.0 kg/ha	
CABBAGE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	90	xxxxxxxxxxxxxxxxxx
(16)	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	50	xxxxxxxxxx
CARROT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(18)	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx
PARSNIP	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(19)	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx
LETTUCE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(20)	100	xxxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	64	xxxxxxxxxxxx
SUG BEET	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(21)	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	71	xxxxxxxxxxxxx
AVE FATU	0		0		0	
(26)	0		0		0	
ALO MYOS	0		0		0	
(27)	0		0		0	
POA ANN	100	xxxxxxxxxxxxxxxxxxxx	80	xxxxxxxxxxxxxxxx	0	
(28)	79	xxxxxxxxxxxxxxxx	57	xxxxxxxxxxx	0	
POA TRIV	0		0		0	
(29)	0		0		0	
SIN ARV	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	90	xxxxxxxxxxxxxxxxxx
(30)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx
RAPH RAP	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	90	xxxxxxxxxxxxxxxxxx
(31)	100	xxxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxxx	50	xxxxxxxxxx

POST-EMERGENCE SELECTIVITY EXPERIMENT

SPECIES	HOE 29152 0.25 kg/ha		HOE 29152 1.0 kg/ha		HOE 29152 4.0 kg/ha	
TRIP MAR	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(33)	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx
SEN VULG	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	60	xxxxxxxxxxxx
(34)	100	xxxxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	64	xxxxxxxxxxxxx
POL LAPA	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(35)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxxx
POL AVIC	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(36)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
GAL APAR	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx
(38)	93	xxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	43	xxxxxxxxx
CHEN ALB	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(39)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx
STEL MED	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(40)	93	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxxx
SPER ARV	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(41)	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxxx
VER PERS	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(42)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx
RUM OBTU	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(44)	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx
HOLC LAN	0		0		0	
(45)	0		0		0	

POST-EMERGENCE SELECTIVITY EXPERIMENT

SPECIES		HOE 29152 0.25 kg/ha		HOE 29152 1.0 kg/ha		HOE 29152 4.0 kg/ha	
AG REPEN	100	xxxxxxxxxxxxxxxxxxxx	0		0		
(47)	36	xxxxxxx	0		0		
AG STOLO	10	xx	20	xxxx	0		
(48)	7	x	7	x	0		
CIRS ARV	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	80	xxxxxxxxxxxxxxxx	
(50)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx	
MAIZE	17	xxx	0		0		
(58)	14	xxx	0		0		
SORGHUM	0		0		0		
(59)	0		0		0		
RICE	100	xxxxxxxxxxxxxxxxxxxx	0		0		
(60)	64	xxxxxxxxxxxxx	0		0		
PIGEON P	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	
(61)	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxxx	
COWPEA	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	
(62)	93	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxxx	
CHICKPEA	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	
(63)	93	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	
GRNDNUT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	
(64)	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	64	xxxxxxxxxxxx	
COTTON	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	
(66)	71	xxxxxxxxxxxxxx	64	xxxxxxxxxxxxx	64	xxxxxxxxxxxxx	

POST-EMERGENCE SELECTIVITY EXPERIMENT

SPECIES		HOE 29152 0.25 kg/ha		HOE 29152 1.0 kg/ha		HOE 29152 4.0 kg/ha
JUTE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(67)	86	xxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx	50	xxxxxxxxxx
KENAF	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(68)	86	xxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx
TOBACCO	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	40	xxxxxxxx
(69)	86	xxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx	43	xxxxxxxxx
SESAMUM	100	xxxxxxxxxxxxxxxxxxxx	80	xxxxxxxxxxxxxxxx	0	
(70)	71	xxxxxxxxxxxxxx	57	xxxxxxxxxxx	0	
TOMATO	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(71)	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	57	xxxxxxxxxxx
OR PUNCT	83	xxxxxxxxxxxxxxxxx	8	xx	0	
(73)	50	xxxxxxxxxx	14	xxx	0	
ELEU IND	10	xx	0		0	
(74)	7	x	0		0	
ECH CRUS	0		0		0	
(75)	0		0		0	
ROTT EXA	70	xxxxxxxxxxxxxx	0		0	
(76)	21	xxxx	0		0	
DIG SANG	31	xxxxxx	0		0	
(77)	29	xxxxxx	0		0	
AMAR RET	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	94	xxxxxxxxxxxxxxxxxxxx
(78)	86	xxxxxxxxxxxxxxxxx	57	xxxxxxxxxxx	43	xxxxxxxxx

POST-EMERGENCE SELECTIVITY EXPERIMENT

SPECIES		HOE 29152 0.25 kg/ha		HOE 29152 1.0 kg/ha		HOE 29152 4.0 kg/ha
PORT OLE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(79)	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx
SOL NIG	100	xxxxxxxxxxxxxxxxxxxx	90	xxxxxxxxxxxxxxxxxx	20	xxxx
(81)	100	xxxxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	50	xxxxxxxxxx
SNOW POL	20	xxxx	0		0	
(83)	7	x	0		0	
CYP ESCU	100	xxxxxxxxxxxxxxxxxxxx	67	xxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(85)	86	xxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
CYP ROTU	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(86)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
OXAL LAT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(87)	79	xxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxxx

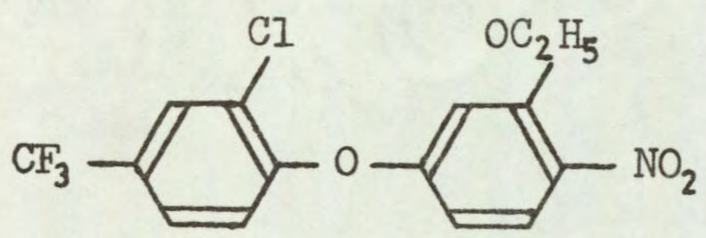
RH 2915

Code number RH 2915

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

Common name (WSSA) Oxyfluorfen

Structure



Source

Rohm and Haas (UK) Ltd
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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 eg 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 foruse in: soybeans, cotton and groundnuts 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 selectivity experiment 345 l/ha

RESULTS

Full results are given in the histograms on pages 26-31 and potential selectivities are summarised in the following table.

RATE (kg a.i./ha)	CROPS: vigour reduced by 15% or less	WEEDS: number or vigour reduced by 70: or more
0.8 and 0.2	none	none listed as no crops tolerant

RATE (kg a.i./ha)	CROPS: vigour reduced by 15% or less	WEEDS: number or vigour reduced by 70% or more
0.05	wheat oat perennial ryegrass kale cabbage carrot	Spergula arvensis Rumex obtusifolius Solanum nigrum

Comments on results

Activity experiment

Activity experiment data, symptoms and pre-emergence selectivities of RH 2915 were reported previously (Richardson et al, 1976). It closely resembled other nitrophenyl ether herbicides such as nitrofen, but was generally more active. Because of its considerable foliar contact action it was thought worthwhile to examine it for post-emergence selectivity at relatively low doses.

Post-emergence selectivity among temperate species

A high level of activity was found, no crop tolerating more than 0.05 kg/ha. At this dose, only six crops were tolerant while only three annual broad-leaved weeds were controlled. Rumex obtusifolius was susceptible, while perennial ryegrass was tolerant, the earlier pre-emergence selectivity test having indicated a possibility of selectivity between these species (Richardson et al, 1976). Although wheat and carrot were reduced in vigour by only 21% at 0.2 kg/ha and certain other annual weeds were then susceptible, such as composites and Galium aparine, most grass weeds and the two Polygonum species were still not adequately controlled. Thus, development as a selective post-emergence herbicide in the six crops listed is unlikely, but it could still prove useful as a contact pre-emergence treatment, the earlier pre-emergence test showing slightly better weed control and moderate soil persistence. Crop tolerance was again rather limited however (Richardson et al, 1976).

Post-emergence selectivity among tropical species

Annual broad-leaved weeds were well controlled at 0.8 kg/ha and annual grasses almost adequately at the same dose. The perennial Cyperus species were only temporarily damaged but Oxalis latifolia was more completely suppressed at 0.8 kg/ha.

All crops were seriously scorched at the higher doses and none were tolerant even of the very low dose of 0.05 kg/ha. There was some apparent selectivity between tomato and Solanum nigrum, but this may have been because the S. nigrum was very small at the time of spraying.

Some post-emergence selectivity might be achieved in row crops by directed spraying or by granular formulation but it appears that this compound is more interesting as a pre-emergence treatment (see Richardson et al, 1976). The activity on Oxalis deserves further testing in comparison with pre-emergence treatments.

POST-EMERGENCE SELECTIVITY EXPERIMENT

SPECIES	RH 2915 0.05 kg/ha		RH 2915 0.2 kg/ha		RH 2915 0.8 kg/ha	
WHEAT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	87	xxxxxxxxxxxxxxxxx
(1)	100	xxxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxxx	57	xxxxxxxxxxx
BARLEY	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx
(2)	64	xxxxxxxxxxxxx	57	xxxxxxxxxx	29	xxxxxx
OAT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	30	xxxxxx
(3)	86	xxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx	21	xxxx
PER RYGR	100	xxxxxxxxxxxxxxxxxxxx	80	xxxxxxxxxxxxxxxx	25	xxxxx
(4)	100	xxxxxxxxxxxxxxxxxxxx	57	xxxxxxxxxx	29	xxxxxx
ONION	100	xxxxxxxxxxxxxxxxxxxx	90	xxxxxxxxxxxxxxxxxx	60	xxxxxxxxxxxx
(8)	71	xxxxxxxxxxxxxx	57	xxxxxxxxxx	36	xxxxxxx
DWF BEAN	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(9)	57	xxxxxxxxxxx	50	xxxxxxxxxx	29	xxxxxx
FLD BEAN	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	83	xxxxxxxxxxxxxxxxx
(10)	64	xxxxxxxxxxxxx	50	xxxxxxxxxx	21	xxxx
PEA	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	17	xxx
(11)	64	xxxxxxxxxxxxx	36	xxxxxxx	21	xxxx
W CLOVER	100	xxxxxxxxxxxxxxxxxxxx	75	xxxxxxxxxxxxxxx	20	xxxx
(12)	57	xxxxxxxxxxx	29	xxxxxx	14	xxx
RAPE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	0	
(14)	71	xxxxxxxxxxxxxx	43	xxxxxxxxx	0	
KALE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	90	xxxxxxxxxxxxxxxxxx
(15)	93	xxxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	43	xxxxxxxxx

POST-EMERGENCE SELECTIVITY EXPERIMENT

SPECIES		RH 2915 0.05 kg/ha		RH 2915 0.2 kg/ha		RH 2915 0.8 kg/ha
CABBAGE	100	xxxxxxxxxxxxxxxxxxxxxx	90	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxxx
(16)	86	xxxxxxxxxxxxxxxxxx	57	xxxxxxxxxx	29	xxxxxx
CARROT	100	xxxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxxx
(18)	93	xxxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx
PARSNIP	100	xxxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxxx
(19)	71	xxxxxxxxxxxxxx	57	xxxxxxxxxx	57	xxxxxxxxxx
LETTUCE	100	xxxxxxxxxxxxxxxxxxxxx	0		0	
(20)	57	xxxxxxxxxx	0		0	
SUG BEET	100	xxxxxxxxxxxxxxxxxxxxx	50	xxxxxxxxx	60	xxxxxxxxxxx
(21)	50	xxxxxxxxx	43	xxxxxxxxx	36	xxxxxxx
AVE FATU	100	xxxxxxxxxxxxxxxxxxxxx	70	xxxxxxxxxxxxx	0	
(26)	71	xxxxxxxxxxxxxx	36	xxxxxxx	0	
ALO MYOS	100	xxxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxxx	31	xxxxxx
(27)	79	xxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx	21	xxxx
POA ANN	100	xxxxxxxxxxxxxxxxxxxxx	60	xxxxxxxxxxx	5	x
(28)	79	xxxxxxxxxxxxxxxxx	36	xxxxxxx	7	x
POA TRIV	100	xxxxxxxxxxxxxxxxxxxxx	90	xxxxxxxxxxxxxxxxxx	35	xxxxxxx
(29)	79	xxxxxxxxxxxxxxxxx	43	xxxxxxxxx	14	xxx
SIN ARV	100	xxxxxxxxxxxxxxxxxxxxx	60	xxxxxxxxxxx	0	
(30)	71	xxxxxxxxxxxxxx	43	xxxxxxxxx	0	
RAPH RAP	100	xxxxxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx	0	
(31)	71	xxxxxxxxxxxxxx	21	xxxx	0	

SPECIES		RH 2915 0.05 kg/ha		RH 2915 0.2 kg/ha		RH 2915 0.8 kg/ha
TRIP MAR (33)	85	xxxxxxxxxxxxxxxxx	0		0	
	50	xxxxxxxxxx	0		0	
SEN VULG (34)	70	xxxxxxxxxxxxxx	0		0	
	43	xxxxxxxxx	0		0	
POL LAPA (35)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	69	xxxxxxxxxxxxxx
	64	xxxxxxxxxxxx	50	xxxxxxxxxx	36	xxxxxxx
POL AVIC (36)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx
	100	xxxxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	50	xxxxxxxxxx
GAL APAR (38)	81	xxxxxxxxxxxxxxxx	0		0	
	50	xxxxxxxxxx	0		0	
CHEN ALB (39)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	43	xxxxxxxxx
STEL MED (40)	100	xxxxxxxxxxxxxxxxxxxx	55	xxxxxxxxxxx	0	
	93	xxxxxxxxxxxxxxxxxxxx	36	xxxxxxx	0	
SPER ARV (41)	0		0		0	
	0		0		0	
VER PERS (42)	100	xxxxxxxxxxxxxxxxxxxx	10	xx	0	
	64	xxxxxxxxxxxxx	7	x	0	
RUM OBTU (44)	12	xx	0		0	
	7	x	0		0	
HOLC LAN (45)	100	xxxxxxxxxxxxxxxxxxxx	0		0	
	71	xxxxxxxxxxxxxx	0		0	

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