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TECHNICAL REPORT No.102

THE POST-EMERGENCE SELECTIVITY IN WARM-CLIMATE SPECIES OF TWO RECENTLY DEVELOPED HERBICIDES: FD 4026 (PP604) AND BAS 51700H.

BAS 517 00H is cycloxydim, FD 4026 (PP604) is tralkoxydim

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CONTENTS

NOTE

WILSON, A.K. (1987) The post-emergence activity in warm-climate species of two recently developed herbicides: ICIA 0604 (FD 4026) and BAS 517 00H. Technical Report, Long Ashton Research Station, Weed Research Department, Bristol, UK. No.102,pp. 27.

THE POST-EMERGENCE SELECTIVITY IN WARM-CLIMATE SPECIES OF SOME RECENTLY DEVELOPED HERBICIDES: ICIA 0604 (FD 4026) and BAS 517 OOH

ANITA K. WILSON

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SUMMARY

Five herbicides were evaluated as overhead post-emergence treatments in a glasshouse pot experiment on 40 crop and weed species from tropical or warm temperate regions. Three of these products are still confidential and the results of tests with these chemicals will be published later. Maize and sorghum were included in two sets, one of which was treated with a seed dressing of the safeners 1,8-naphthalic anhydride (NA)and CGA 92194 respectively. A broad-leaved weed, Trianthema portulacastrum, was tested for the first time.

Both herbicides included in this report gave excellent selective control of many annual grass weeds, including Rottboellia cochinchinensis, and the perennial grass Cynodon dactylon in a wide range of crops.

ICIA 0604 (FD 4026) gave the best range of selective weed control at the highest dose of 0.64 kg ai/ha in onions, several legumes, jute and kenaf. Sorghum and rice were tolerant of the lowest dose of 0.04 kg ai/ha but few weeds were controlled.

BAS 517 00H gave an excellent spectrum of weed control at the lowest dose of 0.05 kg ai/ha in the sensitive crops, jute, kenaf and sesamum. Eight crops, including onions, several legumes, cotton and aubergine, were tolerant of the top dose of 0.08 kg ai/ha. R.cochinchinensis was controlled by the middle dose of 0.2 kg ai/ha giving selectivity in onions, legumes, cotton and aubergines.

INTRODUCTION

This report covers the third evaluation to be conducted jointly with the Herbicide Performance Group of LARS and continues the series of Technical Reports first published at WRO. The results of the temperate species will be published separately in the same series of reports.

The objectives of the work published here are exactly as indicated in previous reports in this series, i.e. to provide a guide to the potential usefulness of new compounds in the crops tested. Owing to the relatively artificial conditions of glasshouse pot experiments, it must be emphasized that the results are to be regarded only as a guide, and that further field testing is essential to confirm any of the interesting leads revealed. This report gives post-emergence selectivity data for two new herbicides.

METHODS AND MATERIALS

Techniques were as described by Richardson and Parker (1977), all herbicides being applied as foliar treatments. Plants were raised in 9 cm diameter plastic pots in a silt loam soil taken from Green Ore on the Mendips, near Bristol. Planting dates were staggered so that the majority of the species would reach a pre-determined stage by the time of spraying. All species were raised in the tropical glasshouse. Species were sown as detailed in Appendix 1, each being replicated twice for each treatment and their growth stage at spraying was recorded. Soil and environmental details are given in Table 1. Pre-planting treatments to improve germination included the storage of Cyperus esculentus tubers at 4°C for two weeks before planting. Chromolaena odorata was exposed to light during germination under a thin covering of sand.

Most seeds were pre-treated with thiram to protect against soil-borne pathogens. Some seeds had been pre-dressed with unknown compounds.

Maize and sorghum were used with and without a seed treatment of 'safener'. For maize, the seeds were shaken with a quantity of technical 1,8-naphthalic anhydride (NA) equivalent to 0.5% of seed weight. For sorghum, the seeds were shaken with a quantity of 70% CGA 92194 (N-1(1,3-dioxolan-2-yl -methoxy)-imino-benzene acetonitrile) equivalent to 0.2% ai of seed weight.

Before spraying, each species was thinned to a constant number per pot.

Herbicides were applied using a laboratory sprayer embodying a Kemetal nozzle No. 80015 operating at a pressure of 207 kpa (30lb/in^2) and moving at 0.54 m/sec 30 cm above the soil. Subsequent watering was from overhead.

Assessment and processing of results

Results were processed as described by Richardson and Dean (1973). Surviving plants were counted and scored for vigour on a 0-7 scale where 0 = dead and 7 = no different from the untreated control.

Pairs of histograms are presented for each treatment, the upper representing the plant survival and the lower the vigour score, both calculated as percentages of the untreated controls. Each 'x' represents a 5% increment. A '+' indicates a value in excess of 100%.

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

The perennial weeds Cyperus spp., and Cynodon dactylon, together with Mimosa pigra, Commelina diffusa and Chromolaena odorata were kept for an extra period to observe later effects and/or recovery from injury.

Table 1. Soil and environmental conditions

Date of spraying: 23, 28 July, 4, 7 August, 1987.

Main assessment completed: 20-24 August 1987.

Soil:

Mendip silt loam + 15% v/v medium sand

pH	6.0

Particle analysis:	%
Coarse sand	2.1
Medium sand	41.4
Fine sand	13.8
Silt	26.6
Clay content	16.1
Organic matter	4.6

Fertilizer added	
Vitax Q4	3.3 g/l
contains	%
N	5.3
P	7.5
K	10.0
Mg	3.0
Fritted trace elements	0.2

Temperature (°C)	
mean	23
maximum	34
minimum	20

Relative humidity (%)	
mean	64
maximum	88
minimum	40

BAS 517 00H is cycloxydim, FD 4026 (PP604) is tralkoxydim

Type text here

tralkoxydim

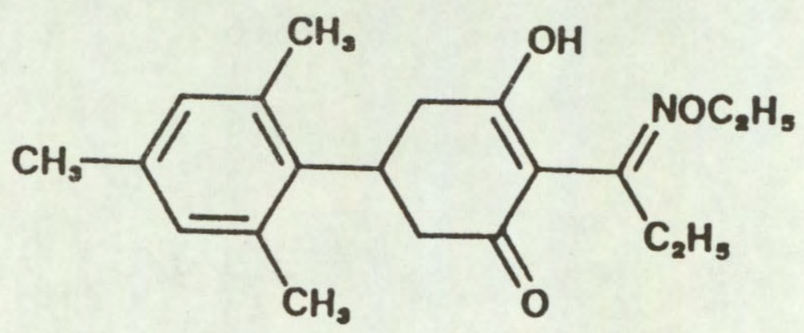
Code number ICIA 0604
(FD 4026/PP604)

Trade names Grasp
Splendor

Common name tralkoxydim

Chemical name 2-[1-(ethoxyimino)propyl]-3-hydroxy
-5-mesitylcyclohex-2-enone.

Structure



Source ICI Agrochemicals
Fernhurst
Haslemere
Surrey
UK.

Information available and suggested uses:

Post-emergence applications in cereals to control grass weeds including *Avena* spp., *Phalaris* spp., *Setaria viridis* and *Alopecurus myosuroides*.

Formulation used 9.6% ec.

Spray volume 328 l/ha.

RESULTS

Full results are given in the histograms on pages 7-10 and potential selectivities are summarized in the following table.

ICIA 0604 (FD 4062) POST-EMERGENCE tralkoxydim

Dose (kg ai/ha)	Crops: vigour reduced by less than 15%.	Weeds: Number or vigour reduced by 70% or more.
0.64	onion	Eleusine indica
	pigeon pea	Digitaria sanguinalis
	chick pea	Snowdenia polystachya
	groundnut	Phalaris minor
		Cynodon dactylon
		+ weeds below
0.16	crops above +	Rottboellia cochinchinensis
	soyabean	Oryza barthii
	jute	+ weeds below
	kenaf	
0.04	crops above +	Echinochloa crus-galli
	tomato	Ischaemum rugosum
	sorghum	
	cotton	
	sesamum	
	rice	

BAS 517 00H is cycloxydim, FD 4026 (PP604) is tralkoxydim

ICIA 0604 (FD 4026). POST-EMERGENCE

COMMENTS ON RESULTS

ICIA 0604 (FD 4026) gave excellent selectivity of several annual grass weeds including Snowdenia polystachya and Phalaris minor, and the perennial grass Cynodon dactylon, in onions and large-seeded legume crops at the highest dose of 0.64 kg ai/ha. Rottboellia cochinchinensis was controlled by 0.16 kg ai/ha with soyabeans, jute and kenaf showing good tolerance of this dose. Tomato, cotton, sesamum, sorghum and rice were tolerant of 0.04 kg ai/ha but weed control was poor at this dose.

The selective control of Echinochloa crus-galli in rice at the lowest dose of 0.04 kg ai/ha is interesting. Rice was damaged by 0.16 kg ai/ha, but had begun to regrow vigorously. This recovery could be significant in field conditions, possibly allowing the control of Oryza barthii at 0.16 kg ai/ha.

Most of the broad-leaved crops and onions were fairly resistant to ICIA 0604 (FD 4026) but there was no control of any broad-leaved weeds. The tolerance of jute, kenaf and sesamum may warrant further work to see if varying the sowing depth will give tolerance of a higher dose to improve the range of weeds within these crops.

ICIA 0604 (FD 4026) appears to be less selective than the related sethoxydim in pot experiments, but comparison of the two herbicides in the field would be valuable to establish their range of activity.

BAS 517 00H is cycloxydim, FD 4026 (PP604) is tralkoxydim

TRIAL NUMBER 878

FD 4026

SPECIES	0.040 kg/ha		0.160 kg/ha		0.640 kg/ha	
ONION	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(8)	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
MILLET	100	xxxxxxxxxxxxxxxxxxx	20	xxxx	0	
(57)	50	xxxxxxxxxx	14	xxx	0	
MAIZE+S	100	xxxxxxxxxxxxxxxxxxx	0		0	
(58)	36	xxxxxxx	0		0	
MAIZE	100	xxxxxxxxxxxxxxxxxxx	0		0	
(59)	36	xxxxxxx	0		0	
SORG+S	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(60)	79	xxxxxxxxxxxxxxx	57	xxxxxxxxxx	21	xxxx
SORGHUM	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(61)	100	xxxxxxxxxxxxxxxxxxx	43	xxxxxxxxx	14	xxx
TOMATO	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	114	xxxxxxxxxxxxxxxxxxx+
(62)	86	xxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx
PIGEON P	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(63)	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
COWPEA	90	xxxxxxxxxxxxxxxxxx	90	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(64)	79	xxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	71	xxxxxxxxxxxxx
CHICKPEA	87	xxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(65)	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
GRNDNUT	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(66)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
SOYABEAN	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(67)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
COTTON	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(68)	100	xxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx

BAS 517 00H is cycloxydim, FD 4026 (PP604) is tralkoxydim

TRIAL NUMBER 878

FD 4026

SPECIES		0.040 kg/ha		0.160 kg/ha		0.640 kg/ha
JUTE	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(69)	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx
KENAF	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(70)	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx
TOBACCO	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(71)	79	xxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	71	xxxxxxxxxxxxx
SESAMUM	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(72)	100	xxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
RICE	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(74)	93	xxxxxxxxxxxxxxxxxx	57	xxxxxxxxxx	29	xxxxxx
ELEU IND	100	xxxxxxxxxxxxxxxxxxx	75	xxxxxxxxxxxxxxx	56	xxxxxxxxxx
(76)	50	xxxxxxxxx	36	xxxxxxx	14	xxx
ECH CRUS	58	xxxxxxxxxxx	0		0	
(77)	29	xxxxxx	0		0	
ROT COCH	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	13	xxx
(78)	50	xxxxxxxxx	21	xxxx	14	xxx
DIG SANG	100	xxxxxxxxxxxxxxxxxxx	94	xxxxxxxxxxxxxxxxxx	6	x
(79)	93	xxxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx	7	x
AMAR HYB	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(80)	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
PORT OLE	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	94	xxxxxxxxxxxxxxxxxx
(81)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
SOL NIG	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(83)	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
BROM PEC	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(84)	86	xxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	64	xxxxxxxxxxxx

BAS 517 00H is cycloxydim, FD 4026 (PP604) is tralkoxydim

TRIAL NUMBER 878

		FD 4026					
SPECIES		0.040 kg/ha		0.160 kg/ha		0.640 kg/ha	
SNO POL	69	xxxxxxxxxxxxxx	81	xxxxxxxxxxxxxxxx	19	xxxx	
(85)	71	xxxxxxxxxxxxxx	43	xxxxxxxxx	7	x	
PHAL MIN	100	xxxxxxxxxxxxxxxxxxxx	58	xxxxxxxxxxxx	25	xxxxx	
(86)	71	xxxxxxxxxxxxxx	43	xxxxxxxxx	7	x	
CYP ROTU	92	xxxxxxxxxxxxxxxxxx	108	xxxxxxxxxxxxxxxxxxxx+	92	xxxxxxxxxxxxxxxxxx	
(88)	93	xxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	
CYN DACT	86	xxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	
(90)	79	xxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	29	xxxxxx	
AUBGIN	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	
(91)	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	
LENTIL	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	
(92)	93	xxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	
MUNGB	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	
(93)	93	xxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	
COMMEL	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	
(95)	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	
EUPHOR	109	xxxxxxxxxxxxxxxxxxx+	109	xxxxxxxxxxxxxxxxxxx+	109	xxxxxxxxxxxxxxxxxxx+	
(96)	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	
ORY BATH	90	xxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	60	xxxxxxxxxxx	
(97)	71	xxxxxxxxxxxxx	21	xxxx	14	xxx	
MIM PIG	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	
(98)	93	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	
CHROM	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	
(101)	93	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	
ISCH RU	44	xxxxxxxxx	12	xx	0		
(104)	21	xxxx	7	x	0		

TRIAL NUMBER 878

FD 4026

SPECIES	0.040 kg/ha		0.160 kg/ha		0.640 kg/ha	
TRIA POR	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(105)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx

BAS 517 00H is cycloxydim, FD 4026 (PP604) is tralkoxydim

BAS 517 00H

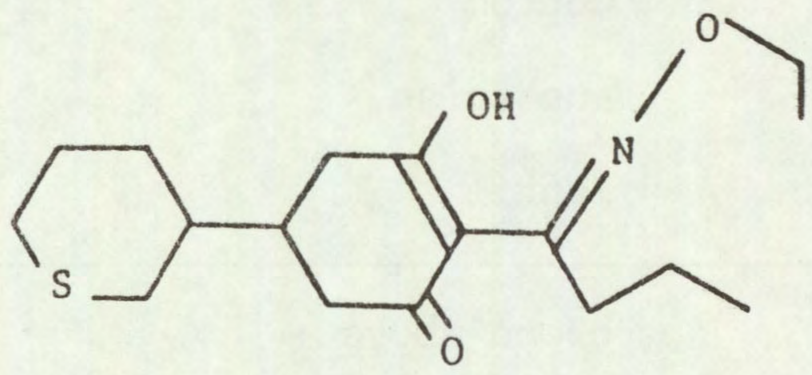
Code number BAS 517 00H

Trade name Focus (proposed)

Common name cycloxydim

Chemical name (2-[1-(ethoxyimino)butyl]-3-hydroxy-5-(tetrahydro-2H-thiopyran-3-yl)-2 cyclohexen-1-one

Structure



Source BASF (UK) Ltd
Agricultural Division
Lady Lane
Hadleigh
Ipswich
Suffolk IP7 6BQ

Information available and suggested uses

Control of annual grasses (0.1 to 0.2 kg ai/ha) and perennial grasses (0.15 to 0.4 kg ai/ha) in broad-leaved crops.

Formulation used Emulsifiable concentrate 20% ai

Spray volume 328 l/ha

RESULTS

Full results are given in the histograms on pages 14-17 and potential selectivities are summarised in the following table.

BAS 517 00H is cycloxydim, FD 4026 (PP604) is tralkoxydim

BAS 517 OOH POST-EMERGENCE cycloxydim

Dose (kg ai/ha)	Crops: vigour reduced by less than 15%	Weeds: Numbers or vigour reduced by 70% or more
0.80	onion pigeon pea chickpea groundnut soyabean cotton aubergine lentil	All weeds below
0.20	crops above + mungbean	Rottboellia cochinchinensis Bromus pectinatus + weeds below
0.05	crops above + jute kenaf sesamum	Eleusine indica Echinochloa crus-galli Digitaria sanguinalis Snowdenia polystachya Phalaris minor Cynodon dactylon Oryza barthii Ischaemum rugosum

BAS 517 OOH POST-EMERGENCE

COMMENTS ON RESULTS

Eight crops, including onions, legumes and broad-leaved crops were tolerant of post-emergence sprays of BAS 517 OOH at the highest dose of 0.8 kg ai/ha. Nearly all the weeds were controlled by the lowest dose of 0.05 kg ai/ha, with the exception of Rottboellia cochinchinensis and Bromus pectinatus which were controlled by 0.2 kg ai/ha.

This means that BAS 517 OOH gives excellent selective control of annual grasses plus the perennial grass Cynodon dactylon in a wide range of legumes, broad-leaved crops, and onions.

The selectivity of grass weeds in onions is of great interest, since grasses compete strongly with onions and it is well known that early competition from weeds is critical in the establishment of the crop. Since emergence of the onion crop is erratic and spread over a long period of time, it is sometimes necessary to back-up pre-emergence weed control with post-emergence sprays, and this aspect warrants further work in the field.

BAS 517 OOH could give the opportunity for varying the crop rotation by using a cotton crop, for example, to take advantage of a change of herbicide use to reduce the Rottboellia cochinchinensis problem in a following maize crop. It may also be a useful chemical to use in a sequential application or tank mix with a herbicide such as acifluorfen or fluometuron to control the broad-leaved weeds, but further work would be needed to establish its compatibility in this respect and compare its field performance with already established compounds such as sethoxydim.

BAS 517 00H is cycloxydim, FD 4026 (PP604) is tralkoxydim

TRIAL NUMBER 878

	BAS 517					
SPECIES	0.050 kg/ha		0.200 kg/ha		0.800 kg/ha	
ONION	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(8)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
MILLET	0		0		0	
(57)	0		0		0	
MAIZE+S	0		0		0	
(58)	0		0		0	
MAIZE	0		0		0	
(59)	0		0		0	
SORG+S	17	xxx	0		0	
(60)	7	x	0		0	
SORGHUM	17	xxx	0		0	
(61)	7	x	0		0	
TOMATO	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(62)	79	xxxxxxxxxxxxxxx	64	xxxxxxxxxxxx	71	xxxxxxxxxxxxx
PIGEON P	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(63)	93	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
COWPEA	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(64)	79	xxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	71	xxxxxxxxxxxxx
CHICKPEA	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(65)	93	xxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
GRNDNUT	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(66)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
SOYABEAN	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(67)	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
COTTON	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(68)	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx

BAS 517 00H is cycloxydim, FD 4026 (PP604) is tralkoxydim

TRIAL NUMBER 878

BAS 517

SPECIES	0.050 kg/ha		0.200 kg/ha		0.800 kg/ha	
JUTE	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(69)	86	xxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
KENAF	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(70)	86	xxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx
TOBACCO	90	xxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(71)	79	xxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
SESAMUM	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(72)	86	xxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
RICE	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	0	
(74)	57	xxxxxxxxxx	36	xxxxxxx	0	
ELEU IND	94	xxxxxxxxxxxxxxxxxx	19	xxxx	0	
(76)	29	xxxxxx	7	x	0	
ECH CRUS	0		0		0	
(77)	0		0		0	
ROT COCH	100	xxxxxxxxxxxxxxxxxxx	13	xxx	0	
(78)	43	xxxxxxxxx	7	x	0	
DIG SANG	75	xxxxxxxxxxxxxx	0		0	
(79)	29	xxxxxx	0		0	
AMAR HYB	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(80)	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
PORT OLE	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(81)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxx
SOL NIG	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(83)	93	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxx
BROM PEC	100	xxxxxxxxxxxxxxxxxxx	44	xxxxxxxxx	0	
(84)	64	xxxxxxxxxxxxx	14	xxx	0	

BAS 517 00H is cycloxydim, FD 4026 (PP604) is tralkoxydim

TRIAL NUMBER 878

BAS 517

SPECIES		0.050 kg/ha		0.200 kg/ha		0.800 kg/ha
SNO POL	31	xxxxxx	0		0	
(85)	21	xxxx	0		0	
PHAL MIN	83	xxxxxxxxxxxxxxxx	0		0	
(86)	14	xxx	0		0	
CYP ROTU	73	xxxxxxxxxxxxxxx	65	xxxxxxxxxxxxx	96	xxxxxxxxxxxxxxxxxx
(88)	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
CYN DACT	29	xxxxxx	14	xxx	0	
(90)	21	xxxx	7	x	0	
AUBGIN	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(91)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxx
LENTIL	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(92)	93	xxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxx
MUNGB	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(93)	93	xxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxx
COMMEL	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(95)	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
EUPHOR	109	xxxxxxxxxxxxxxxxxxx+	109	xxxxxxxxxxxxxxxxxxx+	109	xxxxxxxxxxxxxxxxxxx+
(96)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
ORY BATH	90	xxxxxxxxxxxxxxxxx	40	xxxxxxxx	0	
(97)	29	xxxxxx	14	xxx	0	
MIM PIG	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(98)	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
CHROM	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(101)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
ISCH RU	37	xxxxxxx	0		0	
(104)	14	xxx	0		0	

TRIAL NUMBER 878

BAS 517

SPECIES	0.050 kg/ha		0.200 kg/ha		0.800 kg/ha	
TRIA POR	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(105)	93	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx

BAS 517 00H is cycloxydim, FD 4026 (PP604) is tralkoxydim

ACKNOWLEDGEMENTS

I am grateful to C.M. Marshall for processing the experimental data and to Miss J. Wyatt and R.F. Hughes and glasshouse staff for technical assistance. The work was carried out with financial support from the European Economic Community (EEC) under contract no. TSD.A.198(UK)H.

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RICHARDSON, W.G. and PARKER, C. (1977). The activity and post-emergence selectivity of some recently developed herbicides: KUE 2079A, Hoe 29152, RH 2915, triclopyr and Dowco 290. Technical report, Agricultural Research Council, Weed Research Organization, 42, pp. 53.

Appendix 1. Species, abbreviations, varieties and stages of growth at spraying and assessment for post-emergence selectivity test.

	Designation and computer serial number	Cultivar or Source	Stage of growth at spraying (No. of true leaves	Stage of growth at assessment (untreated controls, leaf nos, exclusive of cotyledons)
Onion (Allium cepa)	ONION (8)	Rijnsburger	1.5	4 - 5
Millet (Pennisetum americanum)	MILLET (57)	ex Bornu	3 - 4	8.5 - 9.5
Maize + safener (NA) (Zea mays)	MAIZE + S (58)	LG11	3 - 4	7.5 - 8
Maize (Zea mays)	MAIZE (59)	LG11	3 - 4	8.5
Sorghum + safener (Sorghum bicolor)	SORGHUM + S (60)	TUB 22	3.5 - 4.5	7.5 - 8.5
Sorghum (Sorghum bicolor)	SORGHUM (61)	Tub 22	3.5 - 4.5	7.5 - 8
Tomato (Lycopersicum esculentum)	TOMATO (62)	Moneymaker	2.5 - 3.5	5.5 - 6.5
Pigeon pea (Cajanus cajan)	PIGEON P (63)	ICPL 138	1.5	5.5 - 6.5
Cowpea (Vigna unguiculata)	COWPEA (64)	TRS	1	2.5 - 3.5
Chickpea (Cicer arietinum)	CHICKPEA (65)	ILC 482	5.5 - 6.5	16.5 - 17.5
Groundnut (Arachis hypogaea)	GRDNUT (66)	Robut 33-1	4.5	8.5 - 11.5
Soyabean (Glycine max)	SOYABEAN (67)	Amsoy	1.5	4.5
Cotton (Gossypium hirsutum)	COTTON (68)	Coker 315	1 - 1.5	4 - 4.5
Jute (Corchorus olitorius)	JUTE (69)	JRC 7447	1 - 2	11.5 - 12.5
Kenaf (Hibiscus cannabinus)	KENAF (70)	ex Sudan	2.5	6.5 - 7.5

Cont'd/....

Appendix 1 cont'd..

	Designation and computer serial number	Cultivar or Source	Stage of growth at spraying (No. of true leaves	Stage of growth at assessment (untreated controls, leaf nos, exclusive of cotyledons)
Tobacco (Nicotiana tabacum)	TOBACCO (71)	North Carolina 2326	4	6.5 - 7.5
Sesamum (Sesamum indicum)	SESAMUM (72)	75403-B	1.5	4 - 5.5
Rice (Oryza sativa)	RICE (74)	IR 36 Philippines	3 - 4	5.5 - 6.5
Eleusine indica	ELEU IND (76)	Zimbabwe 1980	3.5 - 4.5	8.5 - 10.5
Echinochloa crus-galli	ECH CRUS (77)	S. Africa 1979	2.5 - 3	8 - 8.5
Rotboellia cochinchinensis (= R. exaltata)	ROT COCH (78)	Zimbabwe 1978	3	6 - 6.5
Digitaria sanguinalis	DIG SANG (79)	USA 1979	3 - 3.5	Tillered
Amaranthus hybridus	AMAR HYB (80)	USA 1980	3.5 - 4.5	8.5
Portulaca oleracea	PORT OLE (81)	Israel 1973	3.5 - 4.5	6 - 8 pairs
Bromus pectinatus	BROM PEC (84)	Tanzania 1981	2.5 - 3	7.5 - 8.5
Solanum nigrum	SOL NIG (83)	UK 1985	4 - 5	9.5 - 10.5
Snowdenia polystachya	SNOW POL (85)	Ethiopia 1983	3.5 - 4.5	6.5 - 7.5
Phalaris minor	PHAL MIN (86)	India 1979	3	7 - 8
Cyperus rotundus	CYP ROTU (88)	Zimbabwe WRO Clone 1	5 - 6	10.5 - 11.5
Cynodon dactylon	CYN DACT (90)	Sudan WRO Clone 2	3 - 7	well developed stolons up to 100 cm long

Cont'd..

Appendix 1. Cont'd..

	Designation and computer serial number	Cultivar or Source	Stage of growth at spraying (No. of true leaves	Stage of growth at assessment (untreated controls, leaf nos, exclusive of cotyledons)
Aubergine (Solanum melongena)	AUBGIN (91)	Moneymaker (F_1 hybrid)	1.5	4 - 4.5
Lentil (Lens culinaris)	LENTIL (92)	Syrian local ILL 4401	6 - 7	15.5 - 16.5
Mungbean (Phaseolus aureus)	MUNGB (93)	CES-ID-21	1.5	3.5 - 4.5
Commelina diffusa	COMMEL (95)	USA 1985	3 - 3.5	Stolons up to 44 cm long
Euphorbia heterophylla	EUPHOR (96)	Brazil 1985	3 - 3.5	5.5 - 8.5
Oryza barthii	ORY BATH (97)	Senegal 1981	2.5 - 3.5	7.5 - 8.5
Mimosa pigra	MIM PIG (98)	Thailand 1985	2	4.5 - 5.5
Chromolaena odorata	CHROM (101)	Malaysia 1986	2 - 2.5	4 - 4.5
Ischaemum rugosum	ISCH RU (104)	Thailand 1982	3 - 3.5	7 - 8.5
Trianthema portulacastum	TRIA POR (105)	India 1978	2 - 2.5	6 - 8

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 x time product	ct	inch	in.
concentration required to kill 50% test animals	LC50	infra red	i.r.
		kilogramme	kg
cubic centimetre*	cm^3	kilo ($x10^3$)	k
cubic foot*	ft^3	less than	<
cubic inch*	in^3	litre	l.
cubic metre*	m^3	low volume	LV
cubic yard*	yd^3	maximum	max.
cultivar(s)	cv.	median lethal dose	LD50
curie*	Ci	medium volume	MV
degree Celsius*	^oC	melting point	m.p.
degree centigrade	^oC	metre	m
degree Fahrenheit*	^oF	micro ($x10^{-6}$)	µ
diameter	diam.	microgramme*	µg
diameter at breast height	d.b.h.	micromicro (pico: $x10^{-12}$)*	µµ
divided by*	÷ or /	micrometre (micron)*	µm (or µ)
dry matter	d.m.	micron (micrometre)*†	µm (or µ)
emulsifiable concentrate	e.c.	miles per hour*	mile/h
		milli ($x10^{-3}$)	m
equal to*	=	milliequivalent*	m.equiv.
fluid	fl.	milligramme	mg
foot	ft	millilitre	ml

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

millimetre*	mm
millimicro* (nano: $x10^{-9}$)	n or mμ
minimum	min.
minus	-
minute	min
molar concentration*	M (small cap)
molecule, molecular	mol.
more than	>
multiplied by*	x
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: $x10^{-12}$)	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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Type text here

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