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THE PRE-EMERGENCE SELECTIVITY IN WARM-CLIMATE SPECIES OF SOME RECENTLY DEVELOPED HERBICIDES: SMY 1500, PPG 884, PPG 1259, DPX M6316 AND FMC 57020.

SMY 1500 is ethiozin, PPG 884 is lactofen, PPG1259 is busoxinone, DPM-M6316 is thifensulfuron-methyl, FMC 57020 is clomazone

Anita K. Wilson and C. Parker

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NOTE

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THE PRE-EMERGENCE SELECTIVITY IN WARM-CLIMATE SPECIES OF SOME RECENTLY DEVELOPED HERBICIDES: SMY 1500, PPG 884, PPG 1259, DPX-M6316 and FMC 57020

Anita K. Wilson and C. Parker

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BS18 9AF, UK.

SUMMARY

Surface pre-emergence treatments of five herbicides were tested in a glasshouse pot experiment on 31 warm-climate crop and weed species. Maize and sorghum were each included in two sets, with and without seed dressings of the safeners, 1,8-napthalic anhydride (NA) on maize, and CGA 92194 on sorghum.

SMY 1500, a compound related to metribuzin was well tolerated by tomato and groundnut and moderately well by maize + safener, cotton and sesamum. It controlled a broad spectrum of annual grasses at 0.75 kg ai/ha. Bromus pectinatus and the broad-leaved weed Amaranthus retroflexus were controlled at the lowest dose of 0.25 kg ai/ha but Commelina diffusa and Euphorbia heterophylla were susceptible only at the highest dose of 2.25 kg ai/ha.

PPG 884 controlled only a limited range of weeds, but is of interest for its possible control of Euphorbia heterophylla in maize and large-seeded legumes.

PPG 1259 and DPX-M6316 controlled very few species at the doses used and are of doubtful value as pre-emergence treatments in tropical crops.

FMC 57020 controlled several annual grasses and Amaranthus retroflexus and is of interest for the selectivity it showed in kenaf, pigeon pea and jute as well as in maize and large-seeded legumes.

INTRODUCTION

In April 1985, following reorganisation within AFRC establishments, the Weed Research Organization (WRO) officially became part of the University of Bristol, Long Ashton Research Station, Bristol, UK., although the Tropical Weeds Unit did not move to Bristol until April 1986. Also in April 1985, the

Tropical Weeds Unit was able to resume evaluation of new herbicides on species of relevance to developing countries under a project (Contract No. TSD.A.198.UK(H)) partially funded by the European Economic Community.*

This report covers the last evaluation experiment on warm climate species to be done at WRO before the move to Bristol. Work on the temperate species continues and these results are reported separately. Relevant reports are Richardson and West (1986, 1987).

The objectives of the work reported 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 give pre-emergence selectivity data for five new herbicides.

METHODS AND MATERIALS

Techniques were used as described by Richardson and Dean (1973), all herbicides being applied as surface pre-emergence treatments. Species were sown as detailed in Appendix 1, each one being replicated twice for each treatment. Soil and environmental details are given in Table 1.

Table 1a

Date of spraying	16.10.85
Main assessment completed	15.11.85
Soil	
organic matter %	1.3
clay content %	16.0
pH	7.5
Added nutrients	
ammonium sulphate g/kg	0.5
superphosphate g/kg	1.0
potassium sulphate g/kg	0.6
fritted trace elements g/kg	0.1
hydrated magnesium sulphate g/kg	0.4

* This work had been previously carried out at the Weed Research Organization, Oxford, UK, under a joint arrangement between the Herbicide and Tropical Weeds Groups from 1960 - 1982.

Table 1b Environmental conditions

Temperature (°C)	
mean	22
maximum	30
minimum	14
Relative humidity (%)	
mean	50
maximum	76
minimum	32

Amaranthus retroflexus was soaked in 0.1M potassium nitrate before planting to improve germination. Cyperus esculentus failed to give adequate emergence even after pre-planting storage at 4 C for two weeks. Pennisetum setosum also failed to germinate satisfactorily in spite of exposure of the seeds to light.

To protect against soil-borne pathogens, most seeds were pre-treated with thiram. Some had been pre-dressed by the supplier. Those not treated at all were rice, Snowdenia polystachya and Bromus pectinatus.

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

Herbicides were applied using a laboratory sprayer fitted with an 8002E Spraying Systems Tee Jet operating at a pressure of 207 kpa (30 lb/in^2) and moving at 0.54 m/sec 30 cm above the soil. Subsequent watering was applied 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, 7 = no difference from the untreated control.

Pairs of histograms are presented for each treatment, the upper representing plant survival and the lower the vigour score, both calculated as percentage of untreated control. 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 with comments to highlight salient points.

The perennial Cyperus rotundus was kept for several weeks after the main assessment to observe later effects and/or recovery from injury.

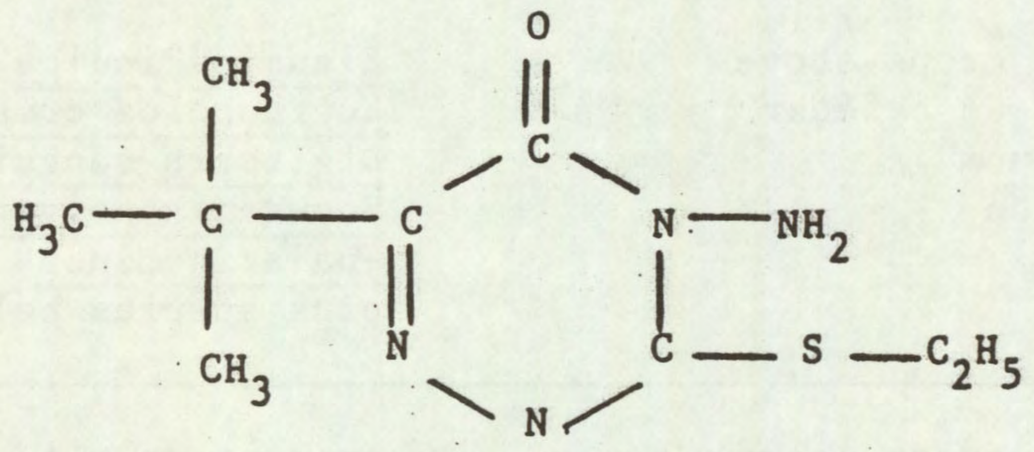
SMY 1500

Code number SMY 1500 Trade name Tycor

Common name Ebuzin (proposed)
Ethiozin (proposed)

Chemical name 4-amino-6-(1,1-dimethylethyl)-3-(ethylthio)-1,2,4-triazin-5(4H)-one

Structure



Source Bayer Agrochemicals (UK) Ltd.,
Eastern Way,
Bury St. Edmunds,
Suffolk, IP32 7AB

Information available and suggested uses

Control of Alopecurus myosuroides, Bromus spp. and broad-leaved weeds in cereals, pre-emergence, early and late post-emergence at 1.4 to 2.1 kg/ha.

Formulation used 60% w/w a.i. wettable powder

Spray volume 372 l/ha

RESULTS

Full results are given in the histograms on pages 3-10 and potential selectivities are summarised in the following table.

SMY 1500

Dose (kg ai/ha)	Crop plants: Vigour reduced by less than 15%	Weeds: Number or vigour reduced by 70% or more
2.25	tomato groundnut	Commelina diffusa Euphorbia heterophylla Oryza barthii plus species below
0.75	plus crops above maize + safener sesamum cotton	Eleusine indica Echinochloa crus-galli Digitaria sanguinalis Snowdenia polystachya Phalaris minor plus species below
0.25	plus crops above maize millet sorghum ± safener cowpea lentil mungbean soyabean	Amaranthus retroflexus Bromus pectinatus

Comments on results

This triazinone herbicide controlled Amaranthus retroflexus and most annual grasses at 0.75 kg ai/ha, but had little effect on other broad-leaved weeds and Rottboellia cochinchinensis.

Tomato proved highly resistant, as to be expected with a compound related to metribuzin. The resistance of soyabean was lower than expected, but results on groundnut, cotton, sesamum and maize (+ NA) are of particular interest and suggest that further work comparing SMY 1500 with metribuzin would be of value on all these species.

The tolerance of millet, soyabean and several legume crops to 0.25 kg ai/ha would be of interest only in relation to the control of particular weed species. The susceptibility of Bromus pectinatus at this dose, however, is notable, in view of the tolerance of wheat and barley (Richardson and West 1987). This will be followed up in further experiments, as Bromus pectinatus is becoming a serious problem in wheat and barley crops in the highlands of Kenya.

TRIAL NUMBER 535

SMY 1500

SPECIES		0.2500 kg/ha		0.7500 kg/ha		2.2500 kg/ha
MILLET	42	xxxxxxxx	117	xxxxxxxxxxxxxxxxxxxx+	33	xxxxxxx
(57)	100	xxxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxxx	29	xxxxxx
MAIZE+S	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(58)	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx
MAIZE	106	xxxxxxxxxxxxxxxxxxxx+	106	xxxxxxxxxxxxxxxxxxxx+	97	xxxxxxxxxxxxxxxxxx
(59)	100	xxxxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	57	xxxxxxxxxx
SORG+S	95	xxxxxxxxxxxxxxxxxx	109	xxxxxxxxxxxxxxxxxxx+	95	xxxxxxxxxxxxxxxxxx
(60)	100	xxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	50	xxxxxxxxxx
SORGHUM	85	xxxxxxxxxxxxxxxx	98	xxxxxxxxxxxxxxxxxx	46	xxxxxxxxx
(61)	100	xxxxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx	43	xxxxxxxxx
TOMATO	95	xxxxxxxxxxxxxxxxxx	110	xxxxxxxxxxxxxxxxxxx+	102	xxxxxxxxxxxxxxxxxxx
(62)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx
PIGEON P	71	xxxxxxxxxxxxxx	63	xxxxxxxxxxxx	39	xxxxxxxx
(63)	100	xxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx
COWPEA	106	xxxxxxxxxxxxxxxxxxx+	88	xxxxxxxxxxxxxxxxx	35	xxxxxxx
(64)	86	xxxxxxxxxxxxxxxx	57	xxxxxxxxxx	14	xxx
CHICKPEA	55	xxxxxxxxxx	68	xxxxxxxxxxxxx	0	
(65)	79	xxxxxxxxxxxxxxx	64	xxxxxxxxxxxx	0	
GRNDNUT	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(66)	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
SOYABEAN	100	xxxxxxxxxxxxxxxxxxx	109	xxxxxxxxxxxxxxxxxxx+	0	
(67)	100	xxxxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx	0	
COTTON	62	xxxxxxxxxxxx	124	xxxxxxxxxxxxxxxxxxx+	21	xxxx
(68)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	29	xxxxxx
JUTE	0		0		0	
(69)	0		0		0	

TRIAL NUMBER 535

SMY 1500

SPECIES		0.2500 kg/ha		0.7500 kg/ha		2.2500 kg/ha
KENAF	89	xxxxxxxxxxxxxxxxxx	0		0	
(70)	57	xxxxxxxxxxx	0		0	
SESAMUM	123	xxxxxxxxxxxxxxxxxxx+	105	xxxxxxxxxxxxxxxxxxx+	36	xxxxxxx
(72)	93	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx
RICE	113	xxxxxxxxxxxxxxxxxxx+	100	xxxxxxxxxxxxxxxxxxx	53	xxxxxxxxxxx
(74)	79	xxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx	29	xxxxxx
ELEU IND	107	xxxxxxxxxxxxxxxxxxx+	30	xxxxxx	0	
(76)	43	xxxxxxxxx	29	xxxxxx	0	
ECH CRUS	119	xxxxxxxxxxxxxxxxxxx+	17	xxx	0	
(77)	64	xxxxxxxxxxxxx	36	xxxxxxx	0	
ROT COCH	77	xxxxxxxxxxxxxxx	103	xxxxxxxxxxxxxxxxxxx+	86	xxxxxxxxxxxxxxxx
(78)	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
DIG SANG	100	xxxxxxxxxxxxxxxxxxx	0		0	
(79)	50	xxxxxxxxxx	0		0	
AMAR HYB	0		0		0	
(80)	0		0		0	
BROM PEC	21	xxxx	5	x	0	
(84)	36	xxxxxxx	14	xxx	0	
SNO POL	38	xxxxxxxx	0		0	
(85)	71	xxxxxxxxxxxxxx	0		0	
PHAL MIN	62	xxxxxxxxxxx	0		0	
(86)	50	xxxxxxxxxx	0		0	
CYP ROTU	109	xxxxxxxxxxxxxxxxxxx+	78	xxxxxxxxxxxxxxxx	65	xxxxxxxxxxxxx
(88)	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx
LENTIL	98	xxxxxxxxxxxxxxxxxxx	98	xxxxxxxxxxxxxxxxxxx	13	xxx
(92)	100	xxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	57	xxxxxxxxxx

TRIAL NUMBER 535

SMY 1500

SPECIES		0.2500 kg/ha		0.7500 kg/ha		2.2500 kg/ha
MUNGB	83	xxxxxxxxxxxxxxxxx	58	xxxxxxxxxxxx	0	
(93)	100	xxxxxxxxxxxxxxxxxxx	57	xxxxxxxxxxx	0	
TEFF	61	xxxxxxxxxxxx	0		0	
(94)	50	xxxxxxxxxx	0		0	
COMMEL	107	xxxxxxxxxxxxxxxxxxx+	114	xxxxxxxxxxxxxxxxxxx+	43	xxxxxxxxx
(95)	100	xxxxxxxxxxxxxxxxxx	57	xxxxxxxxxxx	29	xxxxxx
EUPHOR	95	xxxxxxxxxxxxxxxxx	80	xxxxxxxxxxxxxxx	0	
(96)	86	xxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx	0	
ORY BATH	83	xxxxxxxxxxxxxxxx	109	xxxxxxxxxxxxxxxxxx+	45	xxxxxxxxx
(97)	100	xxxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx	29	xxxxxx

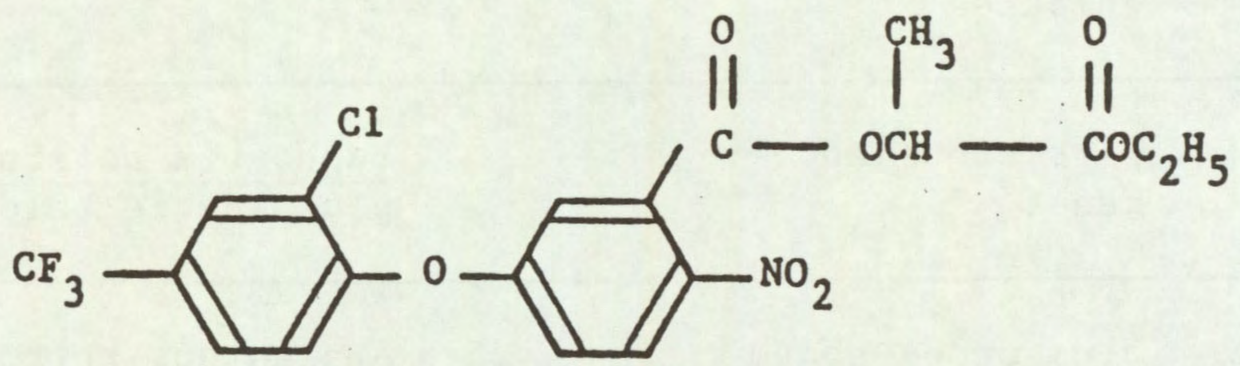
PPG 884

Code number PPG 884 Trade name Cobra

Common name Lactofen

Chemical name 1'-(carbethoxy)ethyl 5-[2-chloro-4-(trifluoro-methyl) phenoxy]-2-nitrobenzoate.

Structure



Source PPG Industries, Inc.,
One PPG Place,
Pittsburgh,
Pennsylvania 15272,
USA.

Information available and suggested uses

Broad-leaved weed control pre- and post-emergence in maize, row crops, e.g. soyabeans, peanuts, rice and cereals (0.1 to 0.25 kg/ha) and perennial crops (0.5 to 2.0 kg/ha).

Formulation used 24% a.i. emulsifiable concentrate

Spray volume 372 l/ha

RESULTS

Full results are given in the histograms on pages 14-16 and potential selectivities are summarised in the following table.

PPG 884

Dose (kg ai/ha)	Crops: Vigour reduced by less than 15%	Weeds: Number or vigour reduced by 70% or more
0.80	maize ± safener cowpea groundnut soyabean mungbean chickpea	Eleusine indica Digitaria sanguinalis Snowdenia polystachya plus species below
0.20	plus crops above kenaf	Euphorbia heterophylla plus specie below
0.05	plus crops above millet sorghum ± safener tomato pigeon pea jute rice lentil	Amaranthus retroflexus

Comments on results

Applied pre-emergence, PPG 884 controlled only a few weed species, mainly annual grasses, but not Rottboellia cochinchinensis, even at the highest dose of 0.80 kg ai/ha. Maize with or without safener and several of the large-seeded legume crops were tolerant of the two highest doses and further work on the control of Euphorbia heterophylla, which is a problem in these crops, could be of interest. Several crops, including tomato, jute and the small-grained cereals were tolerant of the lowest dose of 0.05 kg ai/ha but only the broad-leaved weed Amaranthus retroflexus was controlled at this dose. The resistance of kenaf to the intermediate dose of 0.20 kg ai/ha may be worth further investigation for use in areas where the difficult-to-control Euphorbia heterophylla is a particular problem.

Crops were more tolerant of PPG 884 as a pre-emergence application than as a post-emergence application (Wilson and Parker 1987). Fewer broad-leaved weeds were controlled pre-emergence and even though Euphorbia heterophylla was controlled at the middle dose of 0.20 kg ai/ha, Commelina diffusa which was controlled by this dose post-emergence was resistant to all doses, pre-emergence. The pre-emergence control of several annual grasses in the large-seeded legumes offers no advantages over the use of the related compound acifluorfen. The main use this compound would be for the control of Euphorbia heterophylla in maize and the legumes, and for the control of Snowdenia polystachya in maize.

TRIAL NUMBER 535

PPG 884

SPECIES		0.0500 kg/ha		0.2000 kg/ha		0.8000 kg/ha
MILLET	67	xxxxxxxxxxxxx	75	xxxxxxxxxxxxxxx	8	xx
(57)	100	xxxxxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx	14	xxx
MAIZE+S	92	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(58)	93	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx
MAIZE	97	xxxxxxxxxxxxxxxxxx	106	xxxxxxxxxxxxxxxxxxx+	106	xxxxxxxxxxxxxxxxxxx+
(59)	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
SORG+S	102	xxxxxxxxxxxxxxxxxxx	109	xxxxxxxxxxxxxxxxxxx+	75	xxxxxxxxxxxxxxx
(60)	86	xxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx	43	xxxxxxxxx
SORGHUM	98	xxxxxxxxxxxxxxxxxxx	91	xxxxxxxxxxxxxxxxxx	78	xxxxxxxxxxxxxxxx
(61)	100	xxxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	43	xxxxxxxxx
TOMATO	95	xxxxxxxxxxxxxxxxxx	15	xxx	0	
(62)	86	xxxxxxxxxxxxxxxx	43	xxxxxxxxx	0	
PIGEON P	39	xxxxxxxx	24	xxxxx	24	xxxxx
(63)	86	xxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	29	xxxxxx
COWPEA	97	xxxxxxxxxxxxxxxxxx	106	xxxxxxxxxxxxxxxxxxx+	88	xxxxxxxxxxxxxxxxx
(64)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
CHICKPEA	109	xxxxxxxxxxxxxxxxxxx+	82	xxxxxxxxxxxxxxxx	150	xxxxxxxxxxxxxxxxxxx+
(65)	93	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx
GRNDNUT	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(66)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
SOYABEAN	109	xxxxxxxxxxxxxxxxxxx+	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(67)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx
COTTON	93	xxxxxxxxxxxxxxxxxx	124	xxxxxxxxxxxxxxxxxxx+	83	xxxxxxxxxxxxxxxx
(68)	79	xxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	64	xxxxxxxxxxxx
JUTE	80	xxxxxxxxxxxxxxx	10	xx	0	
(69)	93	xxxxxxxxxxxxxxxxx	43	xxxxxxxxx	0	

TRIAL NUMBER 535

PPG 884

SPECIES	0.0500 kg/ha		0.2000 kg/ha		0.8000 kg/ha	
KENAF	89	xxxxxxxxxxxxxxxxxx	115	xxxxxxxxxxxxxxxxxxxx+	70	xxxxxxxxxxxxxx
(70)	86	xxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx
SESAMUM	27	xxxxx	0		0	
(72)	43	xxxxxxxxx	86	xxxxxxxxxxxxxxxxx	0	
RICE	93	xxxxxxxxxxxxxxxxxx	120	xxxxxxxxxxxxxxxxxxx+	60	xxxxxxxxxxxx
(74)	86	xxxxxxxxxxxxxxxxx	57	xxxxxxxxxxx	36	xxxxxxx
ELEU IND	111	xxxxxxxxxxxxxxxxxxx+	74	xxxxxxxxxxxxxxx	0	
(76)	86	xxxxxxxxxxxxxxxxx	57	xxxxxxxxxxx	0	
ECH CRUS	119	xxxxxxxxxxxxxxxxxxx+	119	xxxxxxxxxxxxxxxxxxx+	37	xxxxxxx
(77)	100	xxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	36	xxxxxxx
ROT COCH	120	xxxxxxxxxxxxxxxxxxx+	51	xxxxxxxxxx	51	xxxxxxxxxx
(78)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
DIG SANG	121	xxxxxxxxxxxxxxxxxxx+	64	xxxxxxxxxxxxx	9	xx
(79)	100	xxxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx	29	xxxxxx
AMAR HYB	0		0		0	
(80)	0		0		0	
BROM PEC	96	xxxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx	80	xxxxxxxxxxxxxxxx
(84)	100	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
SNO POL	92	xxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx	13	xxx
(85)	93	xxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	43	xxxxxxxxx
PHAL MIN	107	xxxxxxxxxxxxxxxxxx+	79	xxxxxxxxxxxxxxx	72	xxxxxxxxxxxxx
(86)	79	xxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	43	xxxxxxxxx
CYP ROTU	74	xxxxxxxxxxxxxx	61	xxxxxxxxxxx	78	xxxxxxxxxxxxxxx
(88)	100	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx
LENTIL	91	xxxxxxxxxxxxxxxxx	78	xxxxxxxxxxxxxxx	20	xxxx
(92)	86	xxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	57	xxxxxxxxxx

TRIAL NUMBER 535

PPG 884

SPECIES		0.0500 kg/ha		0.2000 kg/ha		0.8000 kg/ha
MUNGB	92	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(93)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
TEFF	113	xxxxxxxxxxxxxxxxxxx+	0		0	
(94)	79	xxxxxxxxxxxxxxx	0		0	
COMMEL	100	xxxxxxxxxxxxxxxxxxx	114	xxxxxxxxxxxxxxxxxxx+	100	xxxxxxxxxxxxxxxxxxx
(95)	86	xxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx
EUPHOR	132	xxxxxxxxxxxxxxxxxxx+	7	x	0	
(96)	100	xxxxxxxxxxxxxxxxxxx	21	xxxx	0	
ORY BATH	89	xxxxxxxxxxxxxxxxx	115	xxxxxxxxxxxxxxxxxxx+	77	xxxxxxxxxxxxxx
(97)	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx

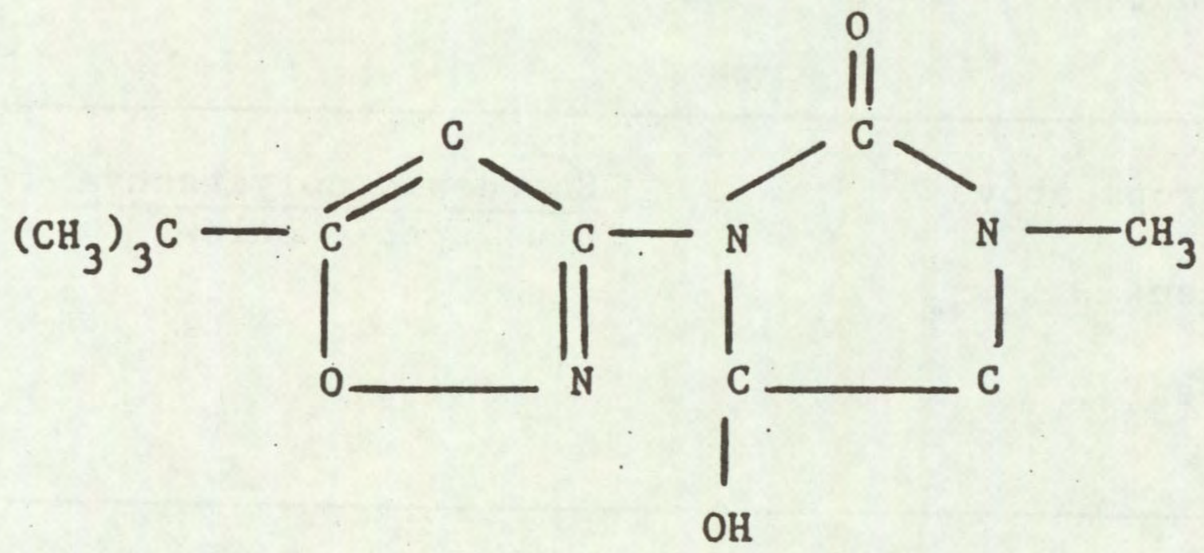
PPG 1259

Code number PPG 1259 Trade name/s

Common name Busoxinone (WSSA approved)

Chemical name 3-[5(1,1-dimethylethyl)-3-isoxazolyl]-4-hydroxy-1-methyl-2-imidazolidinone

Structure



Source PPG Industries, Inc.,
One PPG Place,
Pittsburgh,
Pennsylvania 15272,
USA.

Information available and suggested uses

Pre- and post-emergence control of broad-leaved weeds in cereals, grasses, conifers at 0.05 to 0.15 kg/ha.

Formulation used 60% a.i. emulsifiable concentrate

Spray volume 372 l/ha

RESULTS

Full results are given in the histograms on pages 19-21 and potential selectivities are summarised in the following table.

PPG 1259

Dose (kg ai/ha)	Crops: Vigour reduced by less than 15%	Weeds: Number or vigour reduced by 70% or more
1.0	maize ± safener sorghum ± safener pigeon pea cowpea chickpea groundnut cotton	species below
0.5	plus crops above tomato soyabean rice mungbean	Snowdenia polystachya plus specie below
0.25	plus crops above teff millet kenaf sesamum lentil	Amaranthus retroflexus

Comments on results

PPG 1259 had little herbicidal activity on both broad-leaved and grass weeds when applied pre-emergence at doses of 0.25, 0.5 and 1.00 kg ai/ha. Snowdenia polystachya and Amaranthus retroflexus were the only weeds controlled at this dose range, which is somewhat higher than the manufacturer's suggested dose range of 0.05 to 0.15 kg ai/ha. On the basis of this evaluation, this compound has no interesting potential in tropical crops as a pre-emergence herbicide.

TRIAL NUMBER 535

PPG 1259

SPECIES		0.2500 kg/ha		0.5000 kg/ha		1.0000 kg/ha
MILLET	83	xxxxxxxxxxxxxxxxx	75	xxxxxxxxxxxxxxx	42	xxxxxxxx
(57)	93	xxxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx
MAIZE+S	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(58)	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
MAIZE	106	xxxxxxxxxxxxxxxxxxx+	106	xxxxxxxxxxxxxxxxxxx+	106	xxxxxxxxxxxxxxxxxxx+
(59)	93	xxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxx
SORG+S	102	xxxxxxxxxxxxxxxxxx	95	xxxxxxxxxxxxxxxxx	95	xxxxxxxxxxxxxxxxx
(60)	100	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxx
SORGHUM	85	xxxxxxxxxxxxxxxx	98	xxxxxxxxxxxxxxxxxx	78	xxxxxxxxxxxxxxx
(61)	100	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxx
TOMATO	102	xxxxxxxxxxxxxxxxxx	102	xxxxxxxxxxxxxxxxxx	73	xxxxxxxxxxxxxx
(62)	100	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxx
PIGEON P	47	xxxxxxxxx	47	xxxxxxxxx	55	xxxxxxxxxx
(63)	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxx
COWPEA	71	xxxxxxxxxxxxx	97	xxxxxxxxxxxxxxxxx	97	xxxxxxxxxxxxxxxxx
(64)	100	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx
CHICKPEA	82	xxxxxxxxxxxxxxx	136	xxxxxxxxxxxxxxxxxx+	136	xxxxxxxxxxxxxxxxxx+
(65)	93	xxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxx
GRNDNUT	87	xxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx
(66)	86	xxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxx
SOYABEAN	91	xxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx	109	xxxxxxxxxxxxxxxxxx+
(67)	100	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxx
COTTON	103	xxxxxxxxxxxxxxxxxx+	103	xxxxxxxxxxxxxxxxxx+	83	xxxxxxxxxxxxxxxx
(68)	93	xxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
JUTE	77	xxxxxxxxxxxxxx	17	xxx	0	
(69)	79	xxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	0	

TRIAL NUMBER 535

PPG 1259

SPECIES	0.2500 kg/ha		0.5000 kg/ha		1.0000 kg/ha	
KENAF	121	xxxxxxxxxxxxxxxxxxxx+	89	xxxxxxxxxxxxxxxxxx	38	xxxxxxxx
(70)	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	50	xxxxxxxxxx
SESAMUM	100	xxxxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx	55	xxxxxxxxxx
(72)	100	xxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx
RICE	93	xxxxxxxxxxxxxxxxxx	120	xxxxxxxxxxxxxxxxxxx+	113	xxxxxxxxxxxxxxxxxxx+
(74)	93	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx
ELEU IND	122	xxxxxxxxxxxxxxxxxxx+	122	xxxxxxxxxxxxxxxxxxx+	56	xxxxxxxxxx
(76)	93	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx
ECH CRUS	95	xxxxxxxxxxxxxxxxxx	112	xxxxxxxxxxxxxxxxxxx+	85	xxxxxxxxxxxxxxxx
(77)	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
ROT COCH	129	xxxxxxxxxxxxxxxxxxx+	111	xxxxxxxxxxxxxxxxxxx+	60	xxxxxxxxxxx
(78)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
DIG SANG	94	xxxxxxxxxxxxxxxxxx	82	xxxxxxxxxxxxxxx	103	xxxxxxxxxxxxxxxxxxx+
(79)	93	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
AMAR HYB	0		0		0	
(80)	0		0		0	
BROM PEC	86	xxxxxxxxxxxxxxxx	75	xxxxxxxxxxxxxx	48	xxxxxxxxxx
(84)	100	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx
SNO POL	94	xxxxxxxxxxxxxxxxxx	13	xxx	18	xxxx
(85)	93	xxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx	57	xxxxxxxxxx
PHAL MIN	124	xxxxxxxxxxxxxxxxxxx+	72	xxxxxxxxxxxxxx	76	xxxxxxxxxxxxxxx
(86)	79	xxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx
CYP ROTU	78	xxxxxxxxxxxxxxx	87	xxxxxxxxxxxxxxxx	74	xxxxxxxxxxxxxxx
(88)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
LENTIL	104	xxxxxxxxxxxxxxxxxxx+	59	xxxxxxxxxxxx	91	xxxxxxxxxxxxxxxxx
(92)	86	xxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	64	xxxxxxxxxxxx

TRIAL NUMBER 535

PPG 1259

SPECIES	0.2500 kg/ha		0.5000 kg/ha		1.0000 kg/ha	
MUNGB	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	83	xxxxxxxxxxxxxxxxx
(93)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
TEFF	91	xxxxxxxxxxxxxxxxx	65	xxxxxxxxxxxx	0	
(94)	93	xxxxxxxxxxxxxxxxxx	57	xxxxxxxxxx	0	
COMMEL	107	xxxxxxxxxxxxxxxxxxx+	114	xxxxxxxxxxxxxxxxxxx+	100	xxxxxxxxxxxxxxxxxx
(95)	93	xxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
EUPHOR	110	xxxxxxxxxxxxxxxxxxx+	102	xxxxxxxxxxxxxxxxxx	132	xxxxxxxxxxxxxxxxxx+
(96)	100	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxx
ORY BATH	109	xxxxxxxxxxxxxxxxxxx+	115	xxxxxxxxxxxxxxxxxxx+	102	xxxxxxxxxxxxxxxxxx
(97)	93	xxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	64	xxxxxxxxxxxx

DPX-M6316

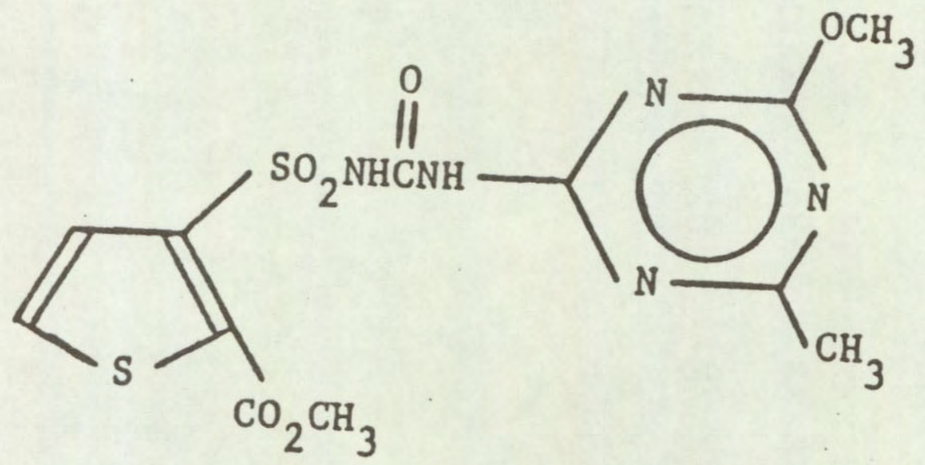
Code number DPX-M6316

Trade name Harmony

Common name thiameturon-methyl

Chemical name Methyl 3-(3-(4-methoxy-6-methyl-1,3,5-triazin-2-yl) ureidosulphonyl) thiophene-2-carboxylate

Structure



Source

Du Pont (UK) Ltd.,
Wedgwood Way,
Stevenage,
Herts, SG1 4QN

Information available and suggested uses

Post-emergence in cereals c. 0.06 kg/ha.

Formulation used 75% a.i. water dispersible granules

Spray volume 372 l/ha

RESULTS

Full results are given in the histograms on pages 24-26 and potential selectivities are summarised in the following table.

DPX-M6316

Dose (kg ai/ha)	Crops: Vigour reduced by less than 15%	Weeds: number or vigour reduced by 70% or more
0.20	maize + safemer sorghum + safener cowpea soyabean jute teff	Bromus pectinatus Oryza barthii Euphorbia heterophylla plus species below
0.05	plus crops above millet sorghum groundnut kenaf mungbean	specie below
0.0125	plus crops above tomato pigeon pea lentil	Amaranthus retroflexus

Comments on results

The manufacturer's suggested use for DPX-M6316 is for post-emergence applications in cereals. When applied pre-emergence the cereals maize and sorghum (both with safener) and teff were tolerant of the larger dose of 0.20 kg ai/ha, but the more sensitive millet and sorghum without safener tolerated only 0.05 kg ai/ha.

However, the range of weed species controlled by DPX-M6316 even at the highestdose of 0.20 kg ai/ha is very small, including only the annual grasses, Bromus pectinatus and Oryza barthii, and the broad-leaved weed Euphorbia heterophylla. Amaranthus retroflexus is the only weed to be controlled at the two lower doses. In view of this limited activity, probably due to rapid loss of activity in the soil, there is not likely to be much interest in its use as a pre-emergence treatment on tropical species.

TRIAL NUMBER 535

DPX M6316

SPECIES	0.0125 kg/ha		0.0500 kg/ha		0.2000 kg/ha	
MILLET	100	xxxxxxxxxxxxxxxxxxx	83	xxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(57)	93	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
MAIZE+S	92	xxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(58)	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxxx
MAIZE	106	xxxxxxxxxxxxxxxxxxx+	106	xxxxxxxxxxxxxxxxxxx+	97	xxxxxxxxxxxxxxxxxx
(59)	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
SORG+S	95	xxxxxxxxxxxxxxxxxx	102	xxxxxxxxxxxxxxxxxxx	109	xxxxxxxxxxxxxxxxxxx+
(60)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
SORGHUM	104	xxxxxxxxxxxxxxxxxxx+	98	xxxxxxxxxxxxxxxxxxx	104	xxxxxxxxxxxxxxxxxxx+
(61)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx
TOMATO	102	xxxxxxxxxxxxxxxxxxx	110	xxxxxxxxxxxxxxxxxxx+	88	xxxxxxxxxxxxxxxxx
(62)	93	xxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	21	xxxx
PIGEON P	95	xxxxxxxxxxxxxxxxxx	0		0	
(63)	93	xxxxxxxxxxxxxxxxxx	0		0	
COWPEA	88	xxxxxxxxxxxxxxxxx	97	xxxxxxxxxxxxxxxxxx	106	xxxxxxxxxxxxxxxxxxx+
(64)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
CHICKPEA	68	xxxxxxxxxxxxxx	55	xxxxxxxxxx	14	xxx
(65)	71	xxxxxxxxxxxxxx	43	xxxxxxxxx	29	xxxxxx
GRNDNUT	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(66)	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx
SOYABEAN	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	91	xxxxxxxxxxxxxxxxxx
(67)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
COTTON	72	xxxxxxxxxxxxxx	72	xxxxxxxxxxxxxx	52	xxxxxxxxxx
(68)	71	xxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	64	xxxxxxxxxxxx
JUTE	94	xxxxxxxxxxxxxxxxxx	80	xxxxxxxxxxxxxxxx	98	xxxxxxxxxxxxxxxxxxx
(69)	93	xxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx

TRIAL NUMBER 535

DPX M6316

SPECIES	0.0125 kg/ha		0.0500 kg/ha		0.2000 kg/ha	
KENAF	102	xxxxxxxxxxxxxxxxxxx	121	xxxxxxxxxxxxxxxxxxx+	96	xxxxxxxxxxxxxxxxxx
(70)	86	xxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	50	xxxxxxxxxx
SESAMUM	86	xxxxxxxxxxxxxxxxx	27	xxxxx	23	xxxxx
(72)	71	xxxxxxxxxxxxxx	50	xxxxxxxxxx	14	xxx
RICE	93	xxxxxxxxxxxxxxxxxx	87	xxxxxxxxxxxxxxxxx	87	xxxxxxxxxxxxxxxxx
(74)	71	xxxxxxxxxxxxxx	64	xxxxxxxxxxxxx	50	xxxxxxxxxx
ELEU IND	119	xxxxxxxxxxxxxxxxxxx+	111	xxxxxxxxxxxxxxxxxxx+	89	xxxxxxxxxxxxxxxxx
(76)	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
ECH CRUS	89	xxxxxxxxxxxxxxxxx	112	xxxxxxxxxxxxxxxxxxx+	92	xxxxxxxxxxxxxxxxx
(77)	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
ROT COCH	69	xxxxxxxxxxxxxx	94	xxxxxxxxxxxxxxxxx	69	xxxxxxxxxxxxxx
(78)	100	xxxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
DIG SANG	106	xxxxxxxxxxxxxxxxxxx+	103	xxxxxxxxxxxxxxxxxxx+	112	xxxxxxxxxxxxxxxxxxx+
(79)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx
AMAR HYB	22	xxxx	0		0	
(80)	50	xxxxxxxxxx	0		0	
BROM PEC	112	xxxxxxxxxxxxxxxxxxx+	75	xxxxxxxxxxxxxx	11	xx
(84)	93	xxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	29	xxxxxx
SNO POL	94	xxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	64	xxxxxxxxxxxx
(85)	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx
PHAL MIN	93	xxxxxxxxxxxxxxxxxx	97	xxxxxxxxxxxxxxxxx	72	xxxxxxxxxxxxx
(86)	86	xxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	64	xxxxxxxxxxxx
CYP ROTU	117	xxxxxxxxxxxxxxxxxxx+	109	xxxxxxxxxxxxxxxxxxx+	109	xxxxxxxxxxxxxxxxxxx+
(88)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
LENTIL	91	xxxxxxxxxxxxxxxxx	91	xxxxxxxxxxxxxxxxx	59	xxxxxxxxxxx
(92)	86	xxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx	43	xxxxxxxxx

TRIAL NUMBER 535

DPX M6316

SPECIES	0.0125 kg/ha		0.0500 kg/ha		0.2000 kg/ha	
MUNGB	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	92	xxxxxxxxxxxxxxxxx
(93)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
TEFF	113	xxxxxxxxxxxxxxxxxxx+	104	xxxxxxxxxxxxxxxxxxx+	109	xxxxxxxxxxxxxxxxxxx+
(94)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
COMMEL	100	xxxxxxxxxxxxxxxxxxx	114	xxxxxxxxxxxxxxxxxxx+	93	xxxxxxxxxxxxxxxxxx
(95)	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx
EUPHOR	95	xxxxxxxxxxxxxxxxxx	95	xxxxxxxxxxxxxxxxxx	15	xxx
(96)	100	xxxxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx	50	xxxxxxxxxx
ORY BATH	109	xxxxxxxxxxxxxxxxxxx+	89	xxxxxxxxxxxxxxxxx	19	xxxx
(97)	93	xxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	43	xxxxxxxxx

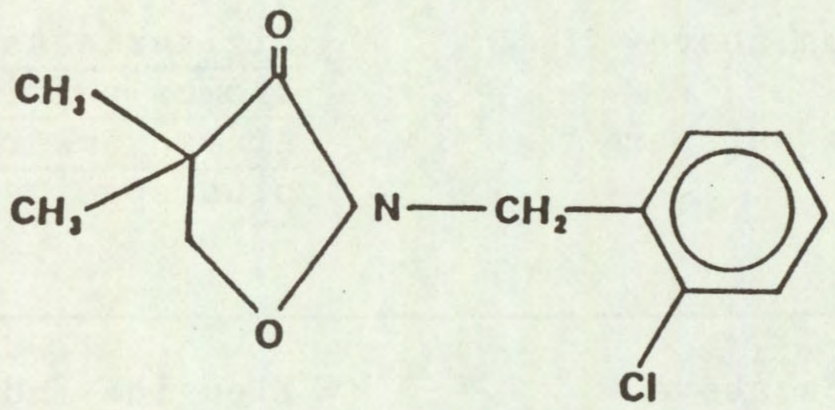
FMC 57020

Code number FMC 57020 Trade name Command

Common name Clomazone (proposed)

Chemical name 2-(2-chlorophenyl)methyl-4,4-dimethyl-3-isoxazolidinone

Structure



Source

FMC Corporation
Avenue Louise 523 Box 1
1050 Brussels
Belgium

Information available and suggested uses

Pre-emergence or pre-plant incorporated in soyabeans for control of many broad-leaved and grass weed species. Doses 0.56 to 1.4 kg ai/ha depending on soil type. Trials in potatoes, tobacco, cotton, beans, established alfalfa and in fallow land is also recommended.

Formulation used 50% ai emulsifiable concentrate

Spray volume 372 l/ha (pre-emergence selectivity)

RESULTS

Full results are given in the histogram on pages 29-31 and potential selectivities are summarized in the following table:

FMC 57020

Dose (kg ai/ha)	Crops: vigour reduced by less than 15%	Weeds: number or vigour reduced by 70% or more
0.20	maize + safener pigeon pea groundnut soyabean kenaf	species below
0.10	plus crops above maize sorghum + safener cowpea jute	Digitaria sanguinalis Bromus pectinatus Amaranthus retroflexus plus species below
0.05	plus crops above sorghum	Eleusine indica Echinochloa crus-galli Snowdenia polystachya

Comments on results

A limited range of annual grasses and the broad-leaved weed Amaranthus retroflexus were well controlled by the top and intermediate doses of 0.10 and 0.20 kg ai/ha of FMC 57020. A good range of crops including maize ± safener, sorghum ± safener, some large-seeded legumes, kenaf and jute were also tolerant giving selectivity at both these doses. However, a number of important weeds including Rottboellia cochinchinensis and several broad-leaved species were not controlled. The range of selectivities achieved in this experiment are of particular interest in kenaf, jute and pigeon pea. Cotton and tobacco did not tolerate even the lowest dose of 0.05 kg ai/ha.

There was a small but consistent effect of safener, on both maize and sorghum and at the higher doses of herbicide recommended by the manufacturer this may increase the range of weeds controlled in maize to include some of the more difficult- to-control annual grasses and a wider range of broad-leaved weeds as suggested by the manufacturers.

TRIAL NUMBER 535

FMC 57020

SPECIES		0.0500 kg/ha		0.1000 kg/ha		0.2000 kg/ha
MILLET	50	xxxxxxxxxx	58	xxxxxxxxxxx	25	xxxxx
(57)	64	xxxxxxxxxxxx	64	xxxxxxxxxxxx	50	xxxxxxxxx
MAIZE+S	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(58)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
MAIZE	106	xxxxxxxxxxxxxxxxxxx+	106	xxxxxxxxxxxxxxxxxxx+	106	xxxxxxxxxxxxxxxxxxx+
(59)	100	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
SORG+S	89	xxxxxxxxxxxxxxxxx	109	xxxxxxxxxxxxxxxxxx+	102	xxxxxxxxxxxxxxxxxx
(60)	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx
SORGHUM	78	xxxxxxxxxxxxxxx	85	xxxxxxxxxxxxxxxx	98	xxxxxxxxxxxxxxxxxx
(61)	86	xxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	57	xxxxxxxxxx
TOMATO	95	xxxxxxxxxxxxxxxxx	102	xxxxxxxxxxxxxxxxxx	117	xxxxxxxxxxxxxxxxxx+
(62)	64	xxxxxxxxxxxx	43	xxxxxxxxx	29	xxxxxx
PIGEON P	63	xxxxxxxxxxxx	87	xxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
(63)	86	xxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxx
COWPEA	79	xxxxxxxxxxxxxxx	97	xxxxxxxxxxxxxxxxx	88	xxxxxxxxxxxxxxxx
(64)	93	xxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
CHICKPEA	136	xxxxxxxxxxxxxxxxxx+	95	xxxxxxxxxxxxxxxxx	82	xxxxxxxxxxxxxxx
(65)	64	xxxxxxxxxxxx	57	xxxxxxxxxx	29	xxxxxx
GRNDNUT	100	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx
(66)	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
SOYABEAN	109	xxxxxxxxxxxxxxxxxx+	109	xxxxxxxxxxxxxxxxxx+	100	xxxxxxxxxxxxxxxxxx
(67)	100	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx
COTTON	103	xxxxxxxxxxxxxxxxxx+	72	xxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxx
(68)	71	xxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx
JUTE	73	xxxxxxxxxxxxxx	101	xxxxxxxxxxxxxxxxx	66	xxxxxxxxxxxx
(69)	100	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx

TRIAL NUMBER 535

FMC 57020

SPECIES		0.0500 kg/ha		0.1000 kg/ha		0.2000 kg/ha
KENAF	89	xxxxxxxxxxxxxxxxxx	96	xxxxxxxxxxxxxxxxxxx	89	xxxxxxxxxxxxxxxxxx
(70)	93	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx
SESAMUM	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	36	xxxxxxx
(72)	79	xxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx	43	xxxxxxxxx
RICE	127	xxxxxxxxxxxxxxxxxxx+	120	xxxxxxxxxxxxxxxxxxx+	100	xxxxxxxxxxxxxxxxxxx
(74)	79	xxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	50	xxxxxxxxxx
ELEU IND	0		0		0	
(76)	0		0		0	
ECH CRUS	37	xxxxxxx	0		0	
(77)	29	xxxxxx	0		0	
ROT COCH	77	xxxxxxxxxxxxxxx	111	xxxxxxxxxxxxxxxxxxx+	60	xxxxxxxxxxx
(78)	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
DIG SANG	33	xxxxxxx	9	xx	3	x
(79)	43	xxxxxxxxx	21	xxxx	14	xxx
AMAR HYB	44	xxxxxxxxx	0		0	
(80)	57	xxxxxxxxxxx	0		0	
BROM PEC	91	xxxxxxxxxxxxxxxxx	59	xxxxxxxxxxxx	16	xxx
(84)	50	xxxxxxxxxx	29	xxxxxx	21	xxxx
SNO POL	0		0		0	
(85)	0		0		0	
PHAL MIN	93	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx	48	xxxxxxxxxx
(86)	71	xxxxxxxxxxxxxx	57	xxxxxxxxxx	36	xxxxxxx
CYP ROTU	100	xxxxxxxxxxxxxxxxxxx	113	xxxxxxxxxxxxxxxxxxx+	109	xxxxxxxxxxxxxxxxxxx+
(88)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
LENTIL	91	xxxxxxxxxxxxxxxxx	72	xxxxxxxxxxxxxx	98	xxxxxxxxxxxxxxxxxxx
(92)	79	xxxxxxxxxxxxxxxx	57	xxxxxxxxxx	57	xxxxxxxxxx

TRIAL NUMBER 535

FMC 57020

SPECIES		0.0500 kg/ha		0.1000 kg/ha		0.2000 kg/ha
MUNGB	83	xxxxxxxxxxxxxxxxx	92	xxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx
(93)	71	xxxxxxxxxxxxxx	64	xxxxxxxxxxxxx	50	xxxxxxxxxx
TEFF	0		0		0	
(94)	0		0		0	
COMMEL	100	xxxxxxxxxxxxxxxxxxx	107	xxxxxxxxxxxxxxxxxxx+	86	xxxxxxxxxxxxxxxxx
(95)	79	xxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxxx	43	xxxxxxxxx
EUPHOR	139	xxxxxxxxxxxxxxxxxxx+	198	xxxxxxxxxxxxxxxxxxx+	139	xxxxxxxxxxxxxxxxxxx+
(96)	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
ORY BATH	96	xxxxxxxxxxxxxxxxxx	102	xxxxxxxxxxxxxxxxxx	121	xxxxxxxxxxxxxxxxxx+
(97)	86	xxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx

AC KNOWLEDGEMENTS

We are grateful to Mrs S. Barrett for processing the experimental data. 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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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)
Millet (*Pennisetum americanum*)	MILLET (57)	Ex Bornu	10	0.5	5-7 leaves
Maize + safener (*Zea mays*)	MAIZE + S (58)	LG 11	6	2	5-6 leaves
Maize (*Zea mays*)	MAIZE (59)	LG 11	6	2	5-6 leaves
Sorghum + safener (*Sorghum bicolor*)	SORG + S (60)	TUB 22	8	1	4-6 leaves
Sorghum (*Sorghum bicolor*)	SORG (61)	TUB 22	8	1	5-6 leaves
Tomato (*Lycopersicon esculentum*)	TOMATO (62)	Moneymaker	8	0.5	3-5 leaves
Pigeon pea (*Cajanus cajan*)	PIGEON P (63)	ICRISAT	6	1	1-3 trifoliates
Cowpea (*Vigna unguiculata*)	COWPEA (64)	Blackeye (TRS)	6	1	2 trifoliates
Chickpea (*Cicer arietinum*)	CHICKPEA (65)	ILC 482	6	1	11-13 leaves
Groundnut (*Arachis hypogaea*)	GROUNDNUT (66)	NC 6	4	2	5-6 leaves
Soyabean (*Glycine max*)	SOYABEAN (67)	Amsoy	6	1	2-3 trifoliates
Cotton (*Gossypium hirsutum*)	COTTON (68)	Coker 315	6	1	2-4 leaves
Jute (*Corchorus capsularis*)	JUTE (69)	India	15	0.5	4-7 leaves
Kenaf (*Hibiscus cannabinus*)	KENAF (70)	Sudan	10	0.5	3-4 leaves
Sesamum (*Sesamum indicum*)	SESAMUM (72)	Sudan	15	0.5	3-4 leaves

APPENDIX 1 continued

	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)
Rice (Oryza sativa)	RICE (74)	IR 36	10	1	4-6 leaves
Eleusine indica	ELEU IND (76)	Zimbabwe 1980	20	0.5	4-7 leaves
Echinochloa crus-galli	ECH CRUS (77)	South Africa	20	0.5	5-6 leaves
Rottbellia cochinchinensis (= R. exaltata)	ROTT COCH (78)	Zimbabwe 1978	15	0.5	4-6 leaves
Digitaria sanguinalis	DIG SANG (79)	USA	20	0.25	4-7 leaves
Amaranthus retroflexus	AMAR RET (80)	India	20	0.25	9-13 leaves
Bromus pectinatus	BROM PEC (84)	Tanzania 1981	12	0.5	4-5 leaves
Snowdenia polystachya	SNO POL (85)	Ethiopia 1980	30	0.25	4-6 leaves
Phalaris minor	PHAL MIN (86)	WRO 1979	29	0.25	4-6 leaves
Cyperus rotundus	CYP ROTU (88)	WRO clone 1 (Zimbabwe)	5	2	8-15 leaves
Lentil (Lens culinaris)	LENTIL (92)	Syrian local	8	1	8-10 leaves
Mungbean (Phaseolus aureus)	MUNGB (93)	CES-ID-21	6	1	2 trifoliates
Teff (Eragrostis tef)	TEFF (94)	Ethiopia 1981	20	0.25	6-7 leaves
Commelina diffusa	COMMEL (95)	USA	8	1	6-7 leaves
Euphorbia heterophylla	EUPHOR (96)	Brazil 1980	20	0.5	5-7 leaves
Oryza barthii	ORY BATH (97)	Senegal 1981	10	1	3-4 leaves

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11. Raising plants for herbicide evaluation; a comparison of compost types. July 1968. I E Henson. Price - £0.25

*12. Studies on the regeneration of perennial weeds in the glasshouse; I. Temperate species. May 1969. I E Henson. Price - £0.25

13. Changes in the germination capacity of three Polygonum species following low temperature moist storage. June 1969. I E Henson. Price - £0.25

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15. Methods of analysis for herbicide residues. February 1977. (second edition). Price - £5.75

16. Report on a joint survey of the presence of wild oat seeds in cereal seed drills in the United Kingdom during spring 1970. November 1970. J G Elliott and P J Attwood. Price - £0.25

17. The pre-emergence selectivity of some newly developed herbicides, Orga 3045 (in comparison with dalapon), haloxydine (PP 493), HZ 52.112, pronamide (RH 315) and R 12001. January 1971. W G Richardson, C Parker and K Holly. Price - £0.25

18. A survey from the roadside of the state of post-harvest operations in Oxfordshire in 1971. November 1971. A Phillipson. Price - £0.25

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* 20. A survey of cereal husbandry and weed control in three regions of England. July 1972. A Phillipson, T W Cox and J G Elliott. Price - £0.35

21. An automatic punching counter. November 1972. R C Simmons. Price - £0.30

22. The pre-emergence selectivity of some newly developed herbicides: bentazon, BAS 3730H, metflurazone, SAN 9789, HER 52.123, U 27,267. December 1972. W G Richardson and M L Dean. Price - £0.25

23. A survey of the presence of wild oats and blackgrass in parts of the United Kingdom during summer 1972. A Phillipson. Price - £0.25

24. The conduct of field experiments at the Weed Research Organization. February 1973. J G Elliott, J Holroyd and T O Robson. Price - £1.25

25. The pre-emergence selectivity of some recently developed herbicides: lenacil, RU 12068, metribuzin, cyprazine, EMD-IT 5914 and benthiocarb. August 1973. W G Richardson and M L Dean. Price - £1.75.

26. The post-emergence selectivity of some recently developed herbicides: bentazon, EMD-IT 6412, cyprazine, metribuzin, chlornitrofen, glyphosate, MC 4379, chlorfenprop-methyl. October 1973. W G Richardson and M L Dean. Price - £3.31

27. Selectivity of benzene sulphonyl carbamate herbicides between various pasture grasses and clover. October 1973. A M Blair. Price - £1.05

28. The post-emergence selectivity of eight herbicides between pasture grasses: RP 17623, HOE 701, BAS 3790, metoxuron, RU 12068, cyprazine, MC 4379, metribuzin. October 1973. A M Blair. Price - £1.00

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30. Herbicides for the control of the broad-leaved dock (Rumex obtusifolius L.). November 1973. A M Blair and J Holroyd. Price - £1.06

31. Factors affecting the selectivity of six soil acting herbicides against Cyperus rotundus. February 1974. M L Dean and C Parker. Price - £1.10

32. The activity and post-emergence selectivity of some recently developed herbicides: oxadiazon, U-29,722, U-27,658, metflurazone, norflurazone, AC 50-191, AC 84,777 and iprymidam. June 1974. W G Richardson and M L Dean. Price - £3.62

33. A permanent automatic weather station using digital integrators. September 1974. R C Simmons. Price £0.63.

34. The activity and pre-emergence selectivity of some recently developed herbicides: trifluralin, isopropalin, oryzalin, dinitramine, bifenox and perfluidone. November 1974. W G Richardson and M L Dean. Price - £2.50

35. A survey of aquatic weed control methods used by Internal Drainage Boards, 1973. January 1975. T O Robson. Price - £1.39

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37. Studies on Imperata cylindrica (L.) Beauv. and Eupatorium odoratum L. October 1975. G W Ivens. Price - £1.75

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