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EMD-IT 6412 is confidential (E Merck or CelaMerck), MC 4379 is bifenox

POST-EMERGENCE SELECTIVITY TEST

SPECIES	METRIBUZIN 0.07 KG/HA		METRIBUZIN 0.29 KG/HA		METRIBUZIN 1.15 KG/HA	
COTTON (66)	100	xxxxxxxxxxxxxxxxxxx	75	xxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
	14	xxx	14	xxx	14	xxx
JUTE (67)	0		8	xx	0	
	0		7	x	0	
KENAF (68)	100	xxxxxxxxxxxxxxxxxxx	75	xxxxxxxxxxxxxxx	75	xxxxxxxxxxxxxxx
	14	xxx	14	xxx	14	xxx
TOBACCO (69)	0		0		0	
	0		0		0	
SESAMUM (70)	0		0		0	
	0		0		0	
ELEU IND (74)	38	xxxxxxxx	0		0	
	29	xxxxxx	0		0	
ECH CRUS (75)	44	xxxxxxxxx	0		0	
	43	xxxxxxxxx	0		0	
ROT EXAI (76)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
	100	xxxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	57	xxxxxxxxxx
DIG SANG (77)	0		0		0	
	0		0		0	
AMAR RET (78)	0		0		0	
	0		0		0	
PORT OLE (79)	8	xx	0		8	xx
	7	x	0		7	x

POST-EMERGENCE SELECTIVITY TEST

SPECIES		METRIBUZIN 0.7 KG/HA		METRIBUZIN 0.29 KG/HA		METRIBUZIN 1.15 KG/HA
CYN DACT	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	29	xxxxxx
(82)	79	xxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	21	xxxx
CYP ESCU	100	xxxxxxxxxxxxxxxxxxxx	109	xxxxxxxxxxxxxxxxxxxx +	82	xxxxxxxxxxxxxxxx
(85)	64	xxxxxxxxxxxxx	57	xxxxxxxxxxx	43	xxxxxxxxx
CYP ROTU	81	xxxxxxxxxxxxxxxxx	62	xxxxxxxxxxxxx	71	xxxxxxxxxxxxxx
(86)	100	xxxxxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxxx	57	xxxxxxxxxxx
OXAL LAT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(87)	71	xxxxxxxxxxxxxx	36	xxxxxxx	21	xxxx

CHLORNITROFEN
(proposed common name)

Code number: MO 338 Trade name: MO

Chemical name: 2,4,6-trichlorophenyl-4-nitrophenyl ether

Source: Mitsui Toatsu Chemicals Inc
2-5 Kasumigaseki 3-Chome
Chiyada-ku
Tokyo
Japan

Information available and suggested uses:

Manufacturer's literature received in 1972 details use at 2.0 to 3.0 kg/ha as a pre-emergence treatment in upland and paddy rice for control of the majority of grass and broad-leaved weed species. Use following seeding of burdock and carrot at 2.5 to 3.0 kg/ha or Japanese radish at 2.0 to 2.5 kg/ha is also suggested. Cabbage and Chinese cabbage can be treated at 2.5 to 3.0 kg/ha immediately following transplanting.

Formulation used: 20% w/v a.i. emulsifiable concentrate

Spray volume: for selectivity experiment 396 l/ha (35.2 gal/ac)
for initial activity test 398 l/ha (35.4 gal/ac)

RESULTS

TABLE OF SELECTIVITIES

RATE kg ai/ha	CROPS: vigour reduced by less than 15%	WEEDS: number or vigour reduced by more than 70%
9.20	carrot	Avena fatua Poa annua Senecio vulgaris Agrostis stolonifera Echinochloa crus-galli Rottboellia exaltata Cynodon dactylon + species below
2.30	species above only	Poa trivialis Chenopodium album Stellaria media Eleusine indica Digitaria sanguinalis Oxalis latifolia + species below
0.58	species above + perennial ryegrass cabbage parsnip maize sorghum rice soyabean	Polygonum lapathifolium Rumex crispus Galium aparine Spergula arvensis Veronica persica Amaranthus retroflexus Portulaca oleracea

Comments on results

General

Initial Activity Test results showed a high level of foliar scorch from which plants often recovered suggesting little or no translocated effect. Pre-emergence applications were more effective than post-emergence treatments on perennial ryegrass and a surface film was more active than incorporation. These results suggested uptake through the emerging shoot.

Carrot proved outstandingly tolerant in the post-emergence experiment. A large number of grass and broad-leaved weeds were controlled at rates from 0.58 to 9.20 kg/ha. At the latter rate some of the more difficult weeds, such as Avena fatua and Rottboellia exaltata were controlled as well as some perennial species.

Symptoms

Moderate to severe scorch was apparent on the majority of species 24 hours after treatment. Symptoms were especially noted on younger foliage and grass species. Stunting and leaf capture developed at later stages and where death occurred the foliage was first lost. These symptoms are typical of other nitrophenyl ether herbicides e.g. nitrofen and fluorodifen.

Temperate weeds and crops

Five broad-leaved weeds were controlled at 0.58 kg/ha, the most notable being Galium aparine and Veronica persica. Rumex crispus and Polygonum lapathifolium were also controlled at this dose but Polygonum aviculare was resistant at all rates. Several other weeds were controlled at higher doses including Avena fatua and the perennial Agrostis stolonifera. Tripleurospermum maritimum, Raphanus raphanistrum and Agropyron repens were resistant.

Carrot showed outstanding tolerance, being unaffected at 9.20 kg/ha. Perennial ryegrass, parsnip and cabbage were tolerant at 0.58 kg/ha. Several weeds important in carrot were selectively controlled, including some which have proved a problem in recent years such as Galium aparine, Poa annua and Avena fatua.

Tropical weeds and crops

A range of tropical broad-leaved and grass weed species were controlled by this compound. Amaranthus retroflexus and Portulaca oleracea were most susceptible being completely killed at 0.58 kg/ha. Eleusine indica and Digitaria sanguinalis recovered from this dose but were controlled at 2.30 kg/ha. Echinochloa crus-galli and Rottboellia exaltata proved the most resistant of the annual weeds requiring 9.20 kg/ha for control. Oxalis latifolia was susceptible at 2.30 kg/ha and little change was evident in plant state one month later. This result compares with that obtained previously with the related nitrofen (Dean and Parker, 1971). Cynodon dactylon was severely affected at 9.20 kg/ha and 6 weeks after treatment one replicate was dead, but plants in the remaining pot recovered after a further month. Neither of the Cyperus spp. were severely affected.

Tropical crop species were only found to be tolerant at 0.58 kg/ha. The three cereal crops, maize, sorghum and rice were resistant at this dose. Soyabean was the only tolerant broad-leaved crop. All tolerant crops showed some herbicide symptoms initially and levels of resistance were not outstanding. Broad-leaved crops, especially the smaller seeded ones, were particularly susceptible.

Only Amaranthus retroflexus and Portulaca oleracea were selectively controlled in maize, sorghum, rice and soyabean.

Possible uses and further testing

The selective control of several important weeds in carrot found in this experiment is worth further investigation. Although several weeds were controlled in this crop, which have proved resistant to other treatments, disadvantages may well be encountered where such species as Tripleurospermum maritimum, Polygonum aviculare or cruciferous spp. are a problem. From the present results this compound offers no advantage in tropical crops as a post-emergence treatment, though its action on Oxalis latifolia might prove to be of some interest.

INITIAL ACTIVITY TEST

CHLORNITROFEN

		0.43 kg/ha (S 0.38 kg/ha)	1.73 kg/ha (S 1.50 kg/ha)	6.90 kg/ha (S 6.00 kg/ha)
DWARF BEAN	F	xxxxxxxxxxxxxxx xxxxxxxx	xxxxxxxxxxxxxxx xxxxxx	xxxxxxxxxxxxxxx xxxx
	S	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx
	P	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx	xxxxxxxxxxxxx xxxxxxxxxxxxxxxx
	I	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx
KALE	F	xxxxxxxxxxxxxxx xxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxx
	S	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx
	P	xxxxxxxxxx xxxxxxxxxxxxxx	xxxxxxxxxxxxxx xxxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx +
	I	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx +	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx +	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx +
POLYGONUM AMPHIBIUM	F	xxxxxxxxxxxxxxx xxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxx	xxxxxxxxxxxxxxx xxxxxx
	S	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx
	P	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxxx
	I	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx	xxxxxxxxxxxxxx xxxxxxxxxxxx
PERENNIAL RYEGRASS	F	xxxxxxxxxxxxxxx xxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxx	xxxxxxxxxxxxxxx xxxxx
	S	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxx	xxxxxxxxxxxxxxx xxxxx
	P	xxxxxxxxx xxxxxxxxxx	x x	o o
	I	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx	xxxxxxxxxxx xxxxxxxxxxxxx	xxxxxxx xxxxxxxxxx
AVENA FATUA	F	xxxxxxxxxxxxxxx xxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxx
	S	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxx
	P	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx +	xxxxxxxxxxx xxxxxxxxxx	xxxxxx xxxxxxxxx
	I	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx	xxxxxxxxxxx xxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxx
AGROPYRON REPENS	F	xxxxxxxxxxxxxxx xxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxx	xxxxxxxxxxxxxxx xxxxxx
	S	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxx
	P	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx
	I	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx	xxxxxxxxxxxxxx xxxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxxxxx

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

SPECIES	CHLORNITROFEN 0.58 KG/HA		CHLORNITROFEN 2.30 KG/HA		CHLORNITROFEN 9.20 KG/HA	
WHEAT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	70	xxxxxxxxxxxxxx
(1)	79	xxxxxxxxxxxxxxxx	57	xxxxxxxxxxx	43	xxxxxxxxx
BARLEY	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	90	xxxxxxxxxxxxxxxxxx
(2)	71	xxxxxxxxxxxxxxx	57	xxxxxxxxxxx	43	xxxxxxxxx
OAT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	30	xxxxxx
(3)	71	xxxxxxxxxxxxxx	57	xxxxxxxxxxx	14	xxx
PER RYGR	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	56	xxxxxxxxxxx
(4)	86	xxxxxxxxxxxxxxxxx	57	xxxxxxxxxxx	36	xxxxxxx
ONION	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(8)	71	xxxxxxxxxxxxxx	57	xxxxxxxxxxx	43	xxxxxxxxx
DWF BEAN	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(9)	43	xxxxxxxxx	29	xxxxxx	29	xxxxxx
FLD BEAN	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(10)	64	xxxxxxxxxxxxx	57	xxxxxxxxxxx	57	xxxxxxxxxxx
PEA	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(11)	64	xxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	57	xxxxxxxxxxx
W CLOVER	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(12)	71	xxxxxxxxxxxxxx	57	xxxxxxxxxxx	50	xxxxxxxxxx
KALE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	70	xxxxxxxxxxxxxx
(15)	71	xxxxxxxxxxxxxx	64	xxxxxxxxxxxxx	50	xxxxxxxxxx
CABBAGE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(16)	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	50	xxxxxxxxxx
SWEDE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(17)	64	xxxxxxxxxxxxx	57	xxxxxxxxxxx	50	xxxxxxxxxx
CARROT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(18)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx

SPECIES	CHLORNITROFEN 0.58 KG/HA		CHLORNITROFEN 2.30 KG/HA		CHLORNITROFEN 9.20 KG/HA	
PARSNIP	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(19)	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	57	xxxxxxxxxxx
LETTUCE	100	xxxxxxxxxxxxxxxxxxx	83	xxxxxxxxxxxxxxxxx	92	xxxxxxxxxxxxxxxxxx
(20)	64	xxxxxxxxxxxxx	43	xxxxxxxxx	43	xxxxxxxxx
SUG BEET	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(21)	71	xxxxxxxxxxxxxx	50	xxxxxxxxxx	43	xxxxxxxxx
AVE FATU	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	25	xxxxx
(26)	64	xxxxxxxxxxxxx	64	xxxxxxxxxxxxx	36	xxxxxxx
ALO MYOS	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	75	xxxxxxxxxxxxxxx
(27)	71	xxxxxxxxxxxxxx	57	xxxxxxxxxxx	36	xxxxxxx
POA ANN	100	xxxxxxxxxxxxxxxxxxx	44	xxxxxxxxx	0	
(28)	71	xxxxxxxxxxxxxx	43	xxxxxxxxx	0	
POA TRIV	69	xxxxxxxxxxxxxx	13	xxx	0	
(29)	50	xxxxxxxxxx	29	xxxxxx	0	
SIN ARV	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx
(30)	86	xxxxxxxxxxxxxxxxx	57	xxxxxxxxxxx	43	xxxxxxxxx
RAPH RAP	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(31)	57	xxxxxxxxxxx	57	xxxxxxxxxxx	57	xxxxxxxxxxx
TRIP MAR	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(33)	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx
SEN VULG	75	xxxxxxxxxxxxxxx	63	xxxxxxxxxxxxx	0	
(34)	57	xxxxxxxxxxx	50	xxxxxxxxxx	0	
POL LAPA	20	xxxx	0		0	
(35)	21	xxxx	0		0	
POL AVIC	100	xxxxxxxxxxxxxxxxxxx	88	xxxxxxxxxxxxxxxxx	38	xxxxxxxx
(36)	71	xxxxxxxxxxxxxx	57	xxxxxxxxxxx	50	xxxxxxxxxx

SPECIES	CHLORNITROFEN 0.58 KG/HA		CHLORNITROFEN 2.30 KG/HA		CHLORNITROFEN 9.20 KG/HA	
RUM CRIS	0		0		0	
(37)	0		0		0	
GAL APAR	100	xxxxxxxxxxxxxxxxxxxx	63	xxxxxxxxxxxxx	75	xxxxxxxxxxxxxxx
(38)	29	xxxxxx	21	xxxx	14	xxx
CHEN ALB	100	xxxxxxxxxxxxxxxxxxxx	80	xxxxxxxxxxxxxxxx	30	xxxxxx
(39)	36	xxxxxxx	14	xxx	14	xxx
STEL MED	100	xxxxxxxxxxxxxxxxxxxx	25	xxxxx	17	xxx
(40)	57	xxxxxxxxxxx	29	xxxxxx	7	x
SPER ARV	8	xx	0		0	
(41)	14	xxx	0		0	
VER PERS	0		0		0	
(42)	0		0		0	
AG REPEN	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(47)	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	50	xxxxxxxxxx
AG STOLO	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	17	xxx
(48)	79	xxxxxxxxxxxxxxxx	57	xxxxxxxxxx	21	xxxx
MAIZE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	25	xxxxx
(58)	86	xxxxxxxxxxxxxxxxx	50	xxxxxxxxxx	7	x
SORGHUM	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	17	xxx
(59)	86	xxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx	21	xxxx
RICE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(60)	86	xxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx
GRNDNUT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(64)	64	xxxxxxxxxxxxx	50	xxxxxxxxxx	50	xxxxxxxxxx
SOYABEAN	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(65)	86	xxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx	50	xxxxxxxxxx

POST-EMERGENCE SELECTIVITY TEST

SPECIES	CHLORNITROFEN 0.58 KG/HA		CHLORNITROFEN 2.30 KG/HA		CHLORNITROFEN 9.20 KG/HA	
COTTON	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(66)	14	xxx	14	xxx	14	xxx
JUTE	58	xxxxxxxxxxxx	33	xxxxxxx	25	xxxxx
(67)	14	xxx	14	xxx	14	xxx
KENAF	100	xxxxxxxxxxxxxxxxxxx	75	xxxxxxxxxxxxxxx	63	xxxxxxxxxxxx
(68)	14	xxx	14	xxx	14	xxx
TOBACCO	10	xx	0		0	
(69)	7	x	0		0	
SESAMUM	0		0		0	
(70)	0		0		0	
ELEU IND	100	xxxxxxxxxxxxxxxxxxx	63	xxxxxxxxxxxxx	0	
(74)	71	xxxxxxxxxxxxxx	29	xxxxxx	0	
ECH CRUS	100	xxxxxxxxxxxxxxxxxxx	67	xxxxxxxxxxxxx	0	
(75)	79	xxxxxxxxxxxxxxx	50	xxxxxxxxxx	0	
ROT EXAL	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	13	xxx
(76)	57	xxxxxxxxxx	50	xxxxxxxxxx	14	xxx
DIG SANG	100	xxxxxxxxxxxxxxxxxxx	42	xxxxxxxx	0	
(77)	79	xxxxxxxxxxxxxxx	21	xxxx	0	
AMAR RET	60	xxxxxxxxxxxx	10	xx	0	
(78)	14	xxx	7	x	0	
PORT OLE	17	xxx	25	xxxxx	8	xx
(79)	7	x	14	xxx	7	x

POST-EMERGENCE SELECTIVITY TEST

SPECIES		CHLORNITROFEN 0.58 KG/HA		CHLORNITROFEN 2.30 KG/HA		CHLORNITROFEN 9.20 KG/HA
CYN DACT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	29	xxxxxx
(82)	71	xxxxxxxxxxxxxx	64	xxxxxxxxxxxxx	21	xxxx
CYP ESCU	91	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	91	xxxxxxxxxxxxxxxxxx
(85)	79	xxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx
CYP ROTU	76	xxxxxxxxxxxxxxx	76	xxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx
(86)	86	xxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxxx
OXAL LAT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	75	xxxxxxxxxxxxxxx
(87)	71	xxxxxxxxxxxxxx	21	xxxx	7	x

GLYPHOSATE

Code number: MON 0573

Trade name: Roundup

Chemical name: N-(phosphonomethyl)glycine

Source: Monsanto Chemical Company
Monsanto House
10-18 Victoria Street
London SW1 HON2

Information available and suggested uses:

Manufacturer's literature from 1971 and the publications of Baird et al (1971) and Baird and Begemann (1972) report control of annual and perennial weed species in woody perennial crops and control of perennial weeds prior to or following culture of annual crops. 1.7-2.2 kg/ha is suggested with up to 3.4-4.5 kg/ha for more resistant species.

Use in minimal cultivation, total weed control and other similar situations is also suggested as there is no soil activity.

Formulation used: 60% w/v a.i. water soluble concentrate (MON 0468) used in conjuction with surfactant MON 0011 at a final concentration of 1% v/v.

Spray volume: for selectivity experiment 396 l/ha (35.2 gal/ac)
for initial activity test 398 l/ha (35.4 gal/ac)

RESULTS

TABLE OF SELECTIVITIES

RATE kg ai/ha	CROPS: vigour reduced by less than 15%	WEEDS: number or vigour reduced by more than 70%
1.15 and 0.29	None	None listed as no crops tolerant
0.07	field bean carrot cotton kenaf	Poa annua Senecio vulgaris Spergula arvensis Rottboellia exaltata Digitaria sanguinalis Amaranthus retroflexus

Comments on results

General

Initial Activity Test results showed a high level of foliar activity while soil treatments were without effect. Foliar symptoms were slow to develop but the effects produced suggested a very high level of translocation. Agropyron repens and dwarf bean were particularly susceptible.

Post-emergence selectivity test results also revealed a high level of foliar activity in both broad-leaved and grass species. Annual and perennial species were equally susceptible but crop tolerance was very limited.

Symptoms

Symptoms were slow to develop depending on dose and species response. Susceptible foliage became chlorotic before death. Where doses were sub-optimal profuse axillary sprouting frequently occurred although the shoots tended to be chlorotic and stunted. Stunting was frequent at sub-optimal doses and a high degree of translocation was apparent in perennial species. Slight scorch was evident on leaves present at spraying but this was due to the surfactant used. Some pink colouration of the foliage was also apparent in the grasses. Later germinating plants showed no symptoms and there was no outstanding dose response.

Temperate weeds and crops

Although Poa annua, Senecio vulgaris and Spergula arvensis were the only weeds controlled at 0.07 kg/ha all species, except Galium aparine, were either controlled or reduced by at least 50% at 0.29 kg/ha. The perennial grasses Agropyron repens and Agrostis stolonifera were susceptible at 0.29 kg/ha and severely reduced at 0.07 kg/ha initially. Six weeks after treatment both species were recovering from this lower dose but were still severely affected or dying at 0.29 kg/ha. Both foliage and rhizomes were dead at 1.15 kg/ha. Galium aparine was controlled at 1.15 kg/ha, at this later assessment, while treatments at 0.29 kg/ha were recovering, as a result of axillary bud proliferation. [In a further experiment well established Agrostis gigantea was controlled at 0.75-1.50 kg/ha but higher rates (1.5-3.0 kg/ha) were necessary for control of Agropyron repens and Agrostis stolonifera. Broad-leaved perennial species were susceptible at similar rates but Pteridium aquilinum and Rumex acetosella proved more resistant].

Field bean and carrot were the only temperate crop species to exhibit any degree of tolerance and then only at 0.07 kg/ha. Carrot however was only reduced by 36% at 0.29 kg/ha and Kasasian (1973) has reported tolerance of broad beans at 0.30 kg/ha.

Despite the fact that Poa annua, Senecio vulgaris and Spergula arvensis were controlled in field bean and carrot, margins of selectivity were low.

Tropical weeds and crops

With the exception of the two Cyperus spp. all weeds tested were eventually controlled at 0.29 kg/ha. Eleusine indica and Portulaca oleracea proved somewhat more resistant but one month after assessment the majority of plants were controlled at this rate. Digitaria sanguinalis, Amaranthus retroflexus and surprisingly Rottboellia exaltata exhibited greater susceptibility and were controlled at only 0.07 kg/ha. Both Cyperus spp. were recovering from 1.15 kg/ha 10 weeks after treatment. Cynodon dactylon was susceptible at 1.15 kg/ha at this time and the majority of shoots were dead at 0.29 kg/ha although a few were showing signs of recovery. Rhizome pieces were rotten or deteriorating in most

cases. Oxalis latifolia still exhibited symptoms at 0.07 kg/ha 6 weeks after treatment. At higher rates control was achieved and the majority of bulbs were rotten although occasional foliage was emerging at 0.29 kg/ha.

Crop tolerance was limited to cotton and kenaf at only 0.07 kg/ha. Both species exhibited minor chlorotic symptoms at this dose but six weeks after treatment new healthy foliage was developing. Some resistance was also apparent at 0.29 kg/ha, especially with kenaf, and although symptoms were more severe, recovery was evident six weeks after treatment.

Rottboellia exaltata, Digitaria sanguinalis and Amaranthus retroflexus were all selectively controlled in cotton and kenaf at 0.07 kg/ha.

Possible uses and further testing

Lack of selectivity limits the use of this compound but the obvious situations for use are in total weed control, cleaning up, especially of perennial species, before and after arable crops and in perennial woody plantations where directed application could be used.

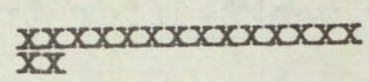
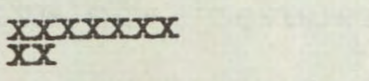
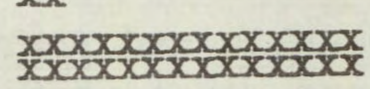
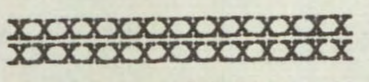
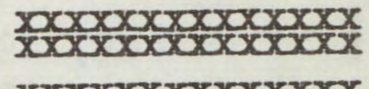
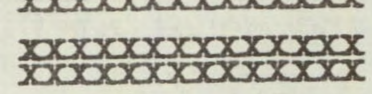
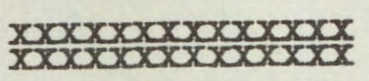
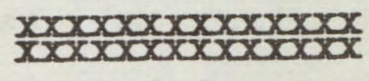
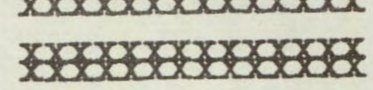
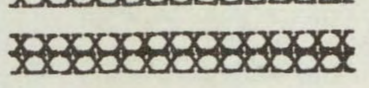
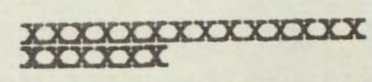
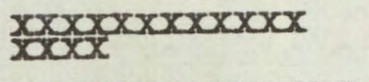
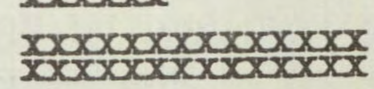
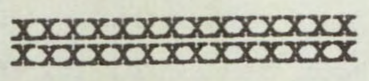
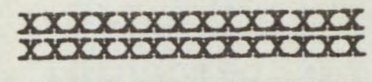
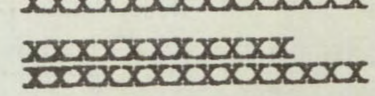
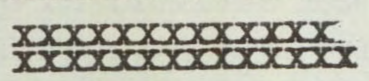
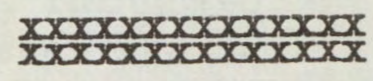
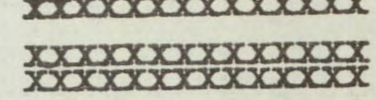
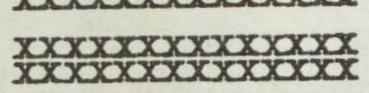
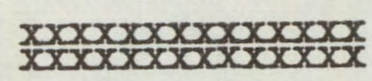
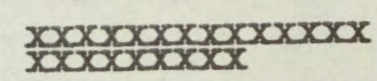
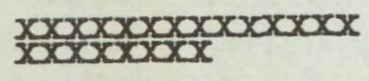
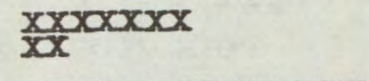
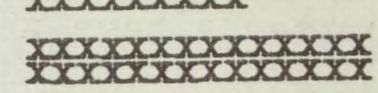
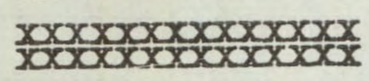
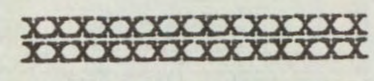
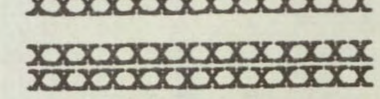
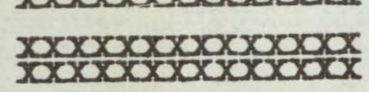
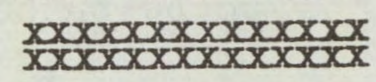
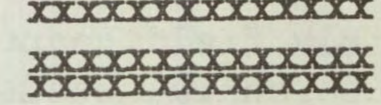
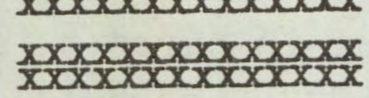
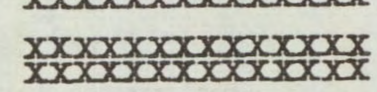
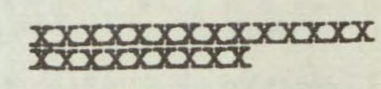
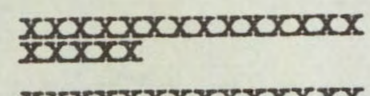
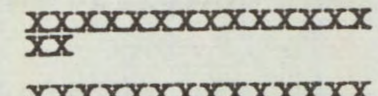
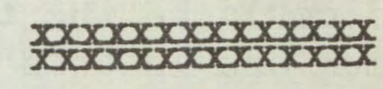
The tolerance of cotton and kenaf could possibly be exploited, using directed inter-row sprays. Some tolerance in young tea has also been reported (Kasasian, pers. comm.). Despite the relative resistance of Cyperus spp. in this test, subsequent experiments have shown this weed to be susceptible at higher doses.

Further testing in carrots, and possibly field beans as a contact pre-emergence treatment, especially where perennial weeds are problems would seem suitable.

A minor disadvantage of this compound could be the time taken for symptoms and activity to reach their maximum and in some situations a quick 'knock-down' effect may be a useful attribute. To this end the work of Suwannamek and Parker (pers. comm.) using a combination of ammonium salts, in particular ammonium sulphate, with glyphosate have proved beneficial against C. rotundus. Similar enhancement of effect has been found by Richardson (unpublished data) on well established Pteridium aquilinum and Rumex acetosella.

INITIAL ACTIVITY TEST

GLYPHOSATE

		0.23 kg/ha (S 0.2 kg/ha)	1.15 kg/ha (S 1.0 kg/ha)	5.75 kg/ha (S 5.0 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

SPECIES	GLYPHOSATE 0.07 KG/HA		GLYPHOSATE 0.29 KG/HA		GLYPHOSATE 1.15 KG/ HA	
WHEAT	90	xxxxxxxxxxxxxxxxxx	40	xxxxxxxx	0	
(1)	36	xxxxxxx	14	xxx	0	
BARLEY	100	xxxxxxxxxxxxxxxxxxxx	0		0	
(2)	36	xxxxxxx	0		0	
OAT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(3)	57	xxxxxxxxxxx	14	xxx	14	xxx
PER RYGR	100	xxxxxxxxxxxxxxxxxxxx	81	xxxxxxxxxxxxxxxx	50	xxxxxxxxxx
(4)	43	xxxxxxxxx	29	xxxxxx	14	xxx
ONION	100	xxxxxxxxxxxxxxxxxxxx	80	xxxxxxxxxxxxxxxx	80	xxxxxxxxxxxxxxxx
(8)	71	xxxxxxxxxxxxxx	50	xxxxxxxxxx	43	xxxxxxxxx
DWF BEAN	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(9)	50	xxxxxxxxxx	36	xxxxxxx	29	xxxxxx
FLD BEAN	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(10)	86	xxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx	57	xxxxxxxxxx
PEA	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx
(11)	57	xxxxxxxxxxx	43	xxxxxxxxx	21	xxxx
W CLOVER	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	75	xxxxxxxxxxxxxx
(12)	57	xxxxxxxxxxx	50	xxxxxxxxxx	36	xxxxxxx
KALE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(15)	57	xxxxxxxxxxx	43	xxxxxxxxx	29	xxxxxx
CABBAGE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	80	xxxxxxxxxxxxxxx
(16)	57	xxxxxxxxxxx	43	xxxxxxxxx	29	xxxxxx
SWEDE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	88	xxxxxxxxxxxxxxxxx
(17)	50	xxxxxxxxxx	43	xxxxxxxxx	21	xxxx
CARROT	100	xxxxxxxxxxxxxxxxxxxx	60	xxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(18)	86	xxxxxxxxxxxxxxxxx	57	xxxxxxxxxxx	43	xxxxxxxxx

SPECIES		GLYPHOSATE 0.07 KG/HA		GLYPHOSATE 0.29 KG/HA		GLYPHOSATE 1.15 KG/HA
PARSNIP	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	88	xxxxxxxxxxxxxxxxxx
(19)	64	xxxxxxxxxxxxx	50	xxxxxxxxxx	36	xxxxxxx
LETTUCE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	58	xxxxxxxxxxxx
(20)	57	xxxxxxxxxxx	43	xxxxxxxxx	29	xxxxxx
SUG BEET	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(21)	64	xxxxxxxxxxxxx	57	xxxxxxxxxxx	43	xxxxxxxxx
AVE FATU	100	xxxxxxxxxxxxxxxxxxxx	38	xxxxxxxx	0	
(26)	36	xxxxxxx	21	xxxx	0	
ALO MYOS	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(27)	50	xxxxxxxxxx	29	xxxxxx	14	xxx
POA ANN	75	xxxxxxxxxxxxxx	63	xxxxxxxxxxxxx	44	xxxxxxxxx
(28)	29	xxxxxx	21	xxxx	14	xxx
POA TRIV	44	xxxxxxxxx	19	xxxx	0	
(29)	36	xxxxxxx	7	x	0	
SIN ARV	100	xxxxxxxxxxxxxxxxxxxx	75	xxxxxxxxxxxxxx	92	xxxxxxxxxxxxxxxxxx
(30)	71	xxxxxxxxxxxxxx	50	xxxxxxxxxx	36	xxxxxxx
RAPH RAP	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(31)	57	xxxxxxxxxxx	50	xxxxxxxxxx	36	xxxxxxx
TRIP MAR	100	xxxxxxxxxxxxxxxxxxxx	42	xxxxxxxx	33	xxxxxxx
(33)	36	xxxxxxx	21	xxxx	14	xxx
SEN VULG	50	xxxxxxxxxx	50	xxxxxxxxxx	13	xxx
(34)	21	xxxx	14	xxx	7	x
POL LAPA	100	xxxxxxxxxxxxxxxxxxxx	90	xxxxxxxxxxxxxxxxxx	80	xxxxxxxxxxxxxxxx
(35)	64	xxxxxxxxxxxxx	43	xxxxxxxxx	29	xxxxxx
POL AVIC	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	31	xxxxxx
(36)	50	xxxxxxxxxx	36	xxxxxxx	7	x

POST-EMERGENCE SELECTIVITY TEST

SPECIES	GLYPHOSATE 0.07 KG/HA		GLYPHOSATE 0.29 KG/HA		GLYPHOSATE 1.15 KG/HA	
RUM CRIS	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(37)	71	xxxxxxxxxxxxxx	50	xxxxxxxxxx	36	xxxxxxx
GAL APAR	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(38)	71	xxxxxxxxxxxxxx	57	xxxxxxxxxxx	36	xxxxxxx
CHEN ALB	90	xxxxxxxxxxxxxxxxx	20	xxxx	0	
(39)	36	xxxxxxx	14	xxx	0	
STEL MED	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(40)	50	xxxxxxxxxx	36	xxxxxxx	29	xxxxxx
SPER ARV	42	xxxxxxxx	0		0	
(41)	21	xxxx	0		0	
VER PERS	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	75	xxxxxxxxxxxxxxx
(42)	57	xxxxxxxxxxx	43	xxxxxxxxx	29	xxxxxx
AG REPEN	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(47)	50	xxxxxxxxxx	29	xxxxxx	29	xxxxxx
AG STOLO	83	xxxxxxxxxxxxxxxxx	33	xxxxxxx	0	
(48)	50	xxxxxxxxxx	29	xxxxxx	0	
MAIZE	100	xxxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx	0	
(58)	50	xxxxxxxxxx	14	xxx	0	
SORGHUM	50	xxxxxxxxxx	17	xxx	0	
(59)	21	xxxx	14	xxx	0	
RICE	88	xxxxxxxxxxxxxxxxx	75	xxxxxxxxxxxxxxx	38	xxxxxxxx
(60)	57	xxxxxxxxxxx	29	xxxxxx	21	xxxx
GRNDNUT	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(64)	71	xxxxxxxxxxxxxx	64	xxxxxxxxxxxxx	57	xxxxxxxxxxx
SOYABEAN	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	75	xxxxxxxxxxxxxx
(65)	57	xxxxxxxxxxx	50	xxxxxxxxxx	29	xxxxxx

POST-EMERGENCE SELECTIVITY TEST

SPECIES	GLYPHOSATE 0.07 KG/HA		GLYPHOSATE 0.29 KG/HA		GLYPHOSATE 1.15 KG/HA	
COTTON	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(66)	93	xxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	50	xxxxxxxxxx
JUTE	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx
(67)	64	xxxxxxxxxxxx	57	xxxxxxxxxx	14	xxx
KENAF	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(68)	86	xxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	50	xxxxxxxxxx
TOBACCO	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(69)	57	xxxxxxxxxx	43	xxxxxxxxx	29	xxxxxx
SESAMUM	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	94	xxxxxxxxxxxxxxxxxx
(70)	57	xxxxxxxxxx	43	xxxxxxxxx	29	xxxxxx
ELEU IND	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	63	xxxxxxxxxxxx
(74)	50	xxxxxxxxxx	36	xxxxxxx	29	xxxxxx
ECH CRUS	100	xxxxxxxxxxxxxxxxxxx	56	xxxxxxxxxx	22	xxxx
(75)	43	xxxxxxxxx	29	xxxxxx	14	xxx
ROT EXAL	100	xxxxxxxxxxxxxxxxxxx	63	xxxxxxxxxxxx	25	xxxxx
(76)	29	xxxxxx	29	xxxxxx	29	xxxxxx
DIG SANG	67	xxxxxxxxxxxx	0		0	
(77)	21	xxxx	0		0	
AMAR RET	80	xxxxxxxxxxxxxxxx	70	xxxxxxxxxxxxx	40	xxxxxxxx
(78)	14	xxx	14	xxx	14	xxx
PORT OLE	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	67	xxxxxxxxxxxx
(79)	43	xxxxxxxxx	43	xxxxxxxxx	21	xxxx

POST-EMERGENCE SELECTIVITY TEST

SPECIES	GLYPHOSATE 0.07 KG/HA		GLYPHOSATE 0.29 KG/HA		GLYPHOSATE 1.15 KG/HA	
CYN DACT	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	14	xxx
(82)	57	xxxxxxxxxxx	29	xxxxxx	14	xxx
CYP ESCU	218	xxxxxxxxxxxxxxxxxxxx +	91	xxxxxxxxxxxxxxxxx	82	xxxxxxxxxxxxxxx
(85)	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	57	xxxxxxxxxxx
CYP ROTU	114	xxxxxxxxxxxxxxxxxxx +	76	xxxxxxxxxxxxxxx	67	xxxxxxxxxxxxx
(86)	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	57	xxxxxxxxxxx
OXAL LAT	100	xxxxxxxxxxxxxxxxxxxx	75	xxxxxxxxxxxxxxx	0	
(87)	57	xxxxxxxxxxx	21	xxxx	0	

MC 4379

Code number: MC 4379 Trade name: Modown

Chemical name: Methyl-5-(2',4'-dichlorophenoxy)-2-nitrobenzoate

Source: Mobil Chemical Co
P O Box 240
Edison
New Jersey 08817
USA

Information available and suggested uses:

Manufacturer's information from 1973 reports control of some grasses and resistant broad-leaved weeds in soyabeans, maize, rice, sorghum, other small grains, safflower and sunflower. Rates of application pre-emergence range from 1.12-2.24 kg ai/ha and 0.28-2.24 kg ai/ha post-emergence. Applications to rice and small grain crops can be overall but directed spraying is necessary in other crops. Combination with other herbicides, which are predominantly grass killers, has improved the weed control spectrum.

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

Spray volume: for selectivity experiment 396 l/ha (35.2 gal/ac)
for initial activity test 392 l/ha (34.9 gal/ac)

RESULTS

TABLE OF SELECTIVITIES

RATE kg ai/ha	CROPS: vigour reduced by less than 15%	WEEDS: number or vigour reduced by more than 70%
5.18 and 1.73	None	None listed as no crops tolerant
0.58	oat perennial ryegrass sorghum rice	Sinapis arvensis Raphanus raphanistrum Senecio vulgaris Polygonum lapathifolium Polygonum aviculare Rumex crispus Galium aparine Chenopodium album Spergula arvensis Veronica persica Amaranthus retroflexus Portulaca oleracea

Comments on results

General

Foliar application of this compound was more active than the post-emergence soil drench in the Initial Activity Test. Broad-leaved species showed greater susceptibility than grass species by all means of application. Severe initial scorch was evident on all species within 24 hours of spraying but was only lethal at the highest dose. Pre-emergence incorporation generally reduced activity compared with a soil-surface application.

The greater susceptibility of broad-leaved species was again evident in the post-emergence selectivity experiment especially with small seeded species. Effects on perennial species were not outstanding. Few crop species were tolerant at 0.58 kg/ha, although many broad-leaved weeds were controlled at this rate.

Symptoms

Depending on dose, moderate to severe herbicide scorch was apparent very soon after application. With susceptible broad-leaved species foliage was partially or totally killed. Where buds received spray death occurred, but where they were protected some development did occur, albeit stunted. At lower doses plant recovery was slow and stunting was evident. Mono-cotyledons were not so severely affected but stunting and some leaf capture causing malformation did occur.

Temperate weeds and crops

Broad-leaved weeds were very susceptible with ten of the twelve species tested being controlled at 0.58 kg/ha. All cruciferous and poly-gonaceous weeds were controlled, the susceptibility of Polygonum aviculare being particularly noteworthy. Most important of the other weeds con-trolled were Galium aparine, Veronica persica and Spergula arvensis. Although Tripleurospermum maritimum and Stellaria media were not adequately controlled at 0.58 kg/ha their vigour was reduced by 50 and 57% respectively. All grass weeds were resistant at this dose.

Oat and perennial ryegrass were tolerant at 0.58 kg/ha and reduced in vigour by only 29% at 1.73 kg/ha. All the cereals were affected initially at the higher doses by contact scorch action, but main shoots were not damaged and plants made a good recovery. The fresh weights of oat and wheat, taken 6 weeks after treatment at 5.18 kg/ha, were 84% of control while barley fresh weight was 82% of control at 1.73 kg/ha.

Many broad-leaved weeds were selectively controlled in oat and perennial ryegrass at 0.58 kg/ha. [This compares with a recent pre-emergence experiment where crop tolerances were greater but broad-leaved weed control was less efficient. Stellaria media was resistant at 7.50 kg/ha. Convolvulus arvensis was controlled at this rate but in a further experiment established plants recovered from 6.60 kg/ha after an efficient foliage kill].

Tropical weeds and crops

The tropical broad-leaved Amaranthus retroflexus and Portulaca oleracea were both killed at 0.58 kg/ha. Most annual grasses were con-trolled at 5.18 kg/ha but Rottboellia exaltata was still resistant.

Oxalis latifolia was well controlled at the initial assessment but one month later, recovery was apparent at all rates of application, albeit slow. MC 4379 produced little significant effect on Cyperus rotundus and moderate to severe foliage scorch was soon followed by healthy regrowth. Cyperus esculentus was much more sensitive and although 9 weeks after treatment recovery was apparent at 1.73 kg/ha, no further development had occurred at 5.18 kg/ha and foliage was gradually dying. Cynodon dactylon was susceptible at 5.18 kg/ha and although some rhizome pieces did rot at this dose there was recovery 9 weeks after treatment.

No broad-leaved crops showed any tolerance. Maize exhibited marginal tolerance (reduced by 21% of control) at 0.58 kg/ha while sorghum and rice showed definite resistance. Herbicide scorch was apparent on leaves present at spraying but new foliage was not affected. Although plants recovered from 1.73 kg/ha adverse effects were still visible 5 weeks after treatment.

Only Amaranthus retroflexus and Portulaca oleracea were selectively controlled in sorghum and rice at 0.58 kg/ha by MC 4379.

Possible uses and further testing

Excellent temperate broad-leaved weed control may be expected giving some potential in certain situations as a contact pre-emergence herbicide. Further testing in cereals may be worthwhile in view of the results obtained in this test. The degree of recovery shown by the cereals from initial contact scorch suggests that the solvent and/or wetting agent used in the formulation of the herbicide may be responsible rather than the herbicide itself and that a modified formulation might lead to better selectivity. Although the complete lack of grass and perennial weed control is a disadvantage if compatibility with grass weed herbicides is as good as suggested by the manufacturers, then further experimentation with such mixtures would be worthwhile. The specificity for Convolvulus arvensis shown in two other tests is of great interest.

Activity on Oxalis latifolia was impressive initially and may well be worth further investigation. Tolerance in rice and sorghum was not outstanding and at rates which the crops could resist only small seeded broad-leaved weeds were controlled.

INITIAL ACTIVITY TEST

MC 4379

		0.76 kg/ha (S 0.67 kg/ha)	2.28 kg/ha (S 2.00 kg/ha)	6.84 kg/ha (S 6.00 kg/ha)
DWARF BEAN	F	xxxxxxxxxxxxxxx xxxxxxx	xxxxxxxxxxxxxxx xxxxx	xxxxxxxxxxxxxxx xxx
	S	xxxxxxxxxxxxxxx xxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxx
	P	xxxxxxxxxxxx xxxxxxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxxxxx	xxxxxxxxxxxxxxx xxxxxxx
	I	xxxxxxxxxxxxxx xxxxxxxxxx	xxxxxxxxxxxx xxxxxxxxx	xxxxxxxxxxxxx xxxxxx
KALE	F	xxxxxxxxxxxxxx xxxxxx	xxxxxxxx xxxxx	x xx
	S	xxxxxxxxxxxxxx xxxxxxxxxx	xxxxxxxxxxxxxx xxxxxxx	xxxxxxxxxxxxxx xxxxxx
	P	xxxxxx xxxxxxx	xxxx xxxxxx	o o
	I	xxxxxxxxxxxxxx xxxxxxxxxxx	xxxxxxxxxx xxxxxxxxxx	xxxxxx xxxxx
POLYGONUM AMPHIBIUM	F	xxxxxxxxxxxxxx xxxxxxx	xxxxxxxxxx xxxxx	xxxxx xxx
	S	xxxxxxxxxxxxxx xxxxxxxxxxxx	xxxxxxxxxxx xxxxxxxxxx	xxxxxxxxxxxxx xxxxxxxxx
	P	xxxxxxxxxxxxx + xxxxxxxxxxxxx	xxxxxxxxxx xxxxxxxxxx	xxxxxxxxxx xxxxxxxxxx
	I	xxxxxxxxxxxxx + xxxxxxxxxxxxx	xxxxxxxxxx xxxxxxxxxxxx	xxxxxxxxxxx xxxxxxxxx
PERENNIAL RYEGRASS	F	xxxxxxxxxxxxx xxxxxxxxxx	xxxxxxxxxxxxx xxxxxxxxxx	xxxxxxxxxxxxx xxxxxxxxx
	S	xxxxxxxxxxxxx xxxxxxxxxxx	xxxxxxxxxxxxx xxxxxxxxxxx	xxxxxxxxxxxxx xxxxxxxxx
	P	xxxxxxxxxxxxx xxxxxxxxxxx	xxxxxxxxx xxxxxxxxx	xxx xxxxxxxx
	I	xxxxxxxxxxxxx + xxxxxxxxxxxx	xxxxxxxxxxxxx xxxxxxxxxxx	xxxxxxxxxxxxx xxxxxxxxx
AVENA FATUA	F	xxxxxxxxxxxxx xxxxxxxxxxx	xxxxxxxxxxxxx xxxxxxxxxxx	xxxxxxxxxxxxx xxxxxxxxx
	S	xxxxxxxxxxxxx xxxxxxxxxxx	xxxxxxxxxxxxx xxxxxxxxxxx	xxxxxxxxxxxxx xxxxxxxxx
	P	xxxxxxxxxxxxx xxxxxxxxxxxx	xxxxxxxxxx xxxxxxxxxxxx	xxxxxxxxxxxxx R xxxxxxxxxxxxx R
	I	xxxxxxxxxxxx xxxxxxxxxxxx	xxxxxxxxxx xxxxxxxxxxxx	xxxxxxxxxxxxx + xxxxxxxxxxxxx
AGROPYRON REPENS	F	xxxxxxxxxxxxx xxxxxxxxxxx	xxxxxxxxxxxxx xxxxxxxxxxx	xxxxxxxxxxxxx xxxxxxxxxx
	S	xxxxxxxxxxxxx xxxxxxxxxxx	xxxxxxxxxxxxx xxxxxxxxxxx	xxxxxxxxxxxxx xxxxxxxxx
	P	xxxxxxxxxxxxx + xxxxxxxxxxxxx	xxxxxxxxxxxx R xxxxxxxxxxxx R	xxxxxxxxxx xxxxxxxxxxx
	I	xxxxxxxxxxxxx xxxxxxxxxxxxx	xxxxxxxxxxxxx + xxxxxxxxxxxxx	xxxxxxxxxxxxx + xxxxxxxxxxxxx

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

POST-EMERGENCE SELECTIVITY TEST

SPECIES	MC4379 0.58 KG/HA		MC4379 1.73 KG/HA		MC4379 5.18 KG/HA	
WHEAT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(1)	79	xxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx	57	xxxxxxxxxxx
BARLEY	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	60	xxxxxxxxxxxx
(2)	79	xxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	36	xxxxxxx
OAT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(3)	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	57	xxxxxxxxxxx
PER RYGR	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(4)	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	64	xxxxxxxxxxxx
ONION	80	xxxxxxxxxxxxxxxx	60	xxxxxxxxxxxx	0	
(8)	43	xxxxxxxxx	57	xxxxxxxxxxx	0	
DWF BEAN	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(9)	29	xxxxxx	29	xxxxxx	21	xxxx
FLD BEAN	100	xxxxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx	25	xxxxx
(10)	36	xxxxxxx	7	x	14	xxx
PEA	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(11)	43	xxxxxxxxx	43	xxxxxxxxx	29	xxxxxx
W CLOVER	56	xxxxxxxxxxx	0		0	
(12)	29	xxxxxx	0		0	
KALE	50	xxxxxxxxxx	50	xxxxxxxxxx	0	
(15)	36	xxxxxxx	21	xxxx	0	
CABBAGE	80	xxxxxxxxxxxxxxxx	50	xxxxxxxxxx	0	
(16)	36	xxxxxxx	21	xxxx	0	
SWEDE	25	xxxxx	0		0	
(17)	14	xxx	0		0	
CARROT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	90	xxxxxxxxxxxxxxxxx
(18)	50	xxxxxxxxxx	36	xxxxxxx	29	xxxxxx

POST-EMERGENCE SELECTIVITY TEST

SPECIES	MC4379 0.58 KG/HA		MC4379 1.73 KG/HA		MC4379 5.18 KG/HA	
PARSNIP	38	xxxxxxxx	0		0	
(19)	43	xxxxxxxxx	0		0	
LETTUCE	0		0		0	
(20)	0		0		0	
SUG BEET	19	xxxx	0		0	
(21)	36	xxxxxxx	0		0	
AVE FATU	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(26)	86	xxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	64	xxxxxxxxxxxx
ALO MYOS	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(27)	71	xxxxxxxxxxxxx	64	xxxxxxxxxxxx	43	xxxxxxxxx
POA ANN	100	xxxxxxxxxxxxxxxxxxx	94	xxxxxxxxxxxxxxxxxx	31	xxxxxx
(28)	71	xxxxxxxxxxxxx	64	xxxxxxxxxxxx	29	xxxxxx
POA TRIV	81	xxxxxxxxxxxxxxx	38	xxxxxxxx	0	
(29)	64	xxxxxxxxxxxx	36	xxxxxxx	0	
SIN ARV	0		0		0	
(30)	0		0		0	
RAPH RAP	50	xxxxxxxxxx	10	xx	0	
(31)	14	xxx	7	x	0	
TRIP MAR	92	xxxxxxxxxxxxxxxxx	42	xxxxxxxx	0	
(33)	50	xxxxxxxxxx	43	xxxxxxxxx	0	
SEN VULG	0		0		0	
(34)	0		0		0	
POL LAPA	0		0		0	
(35)	0		0		0	
POL AVIC	31	xxxxxx	6	x	0	
(36)	29	xxxxxx	14	xxx	0	

POST-EMERGENCE SELECTIVITY TEST

SPECIES	MC4379 0.58 KG/HA		MC4379 1.73 KG/HA		MC4379 5.18 KG/HA	
RUM CRIS	11	xx	0		0	
(37)	14	xxx	0		0	
GAL APAR	63	xxxxxxxxxxxxx	13	xxx	0	
(38)	21	xxxx	7	x	0	
CHEN ALB	20	xxxx	0		0	
(39)	14	xxx	0		0	
STEL MED	50	xxxxxxxxxx	0		0	
(40)	43	xxxxxxxxx	0		0	
SPER ARV	0		0		0	
(41)	0		0		0	
VER PERS	0		0		0	
(42)	0		0		0	
AG REPEN	100	xxxxxxxxxxxxxxxxxxxx	83	xxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(47)	79	xxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	64	xxxxxxxxxxxx
AG STOLO	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(48)	86	xxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	57	xxxxxxxxxx
MAIZE	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx	75	xxxxxxxxxxxxxx
(58)	79	xxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	36	xxxxxxx
SORGHUM	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(59)	86	xxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	57	xxxxxxxxxx
RICE	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(60)	86	xxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx
GRNDNUT	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(64)	64	xxxxxxxxxxxx	43	xxxxxxxxx	43	xxxxxxxxx
SOYABEAN	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(65)	57	xxxxxxxxxxx	43	xxxxxxxxx	36	xxxxxxx

POST-EMERGENCE SELECTIVITY TEST

SPECIES		MC4379 0.58 KG/HA		MC4379 1.73 KG/HA		MC4379 5.18 KG/HA
COTTON	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(66)	14	xxx	14	xxx	14	xxx
JUTE	33	xxxxxxx	0		0	
(67)	7	x	0		0	
KENAF	63	xxxxxxxxxxxxx	50	xxxxxxxxxx	25	xxxxx
(68)	14	xxx	14	xxx	14	xxx
TOBACCO	0		0		0	
(69)	0		0		0	
SESAMUM	0		0		0	
(70)	0		0		0	
ELEU IND	100	xxxxxxxxxxxxxxxxxxx	88	xxxxxxxxxxxxxxxxx	13	xxx
(74)	57	xxxxxxxxxxx	43	xxxxxxxxx	29	xxxxxx
ECH CRUS	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	33	xxxxxxx
(75)	79	xxxxxxxxxxxxxxx	43	xxxxxxxxx	29	xxxxxx
ROT EXAL	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(76)	71	xxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	50	xxxxxxxxxx
DIG SANG	100	xxxxxxxxxxxxxxxxxxx	67	xxxxxxxxxxxxx	33	xxxxxxx
(77)	71	xxxxxxxxxxxxxx	43	xxxxxxxxx	29	xxxxxx
AMAR RET	0		0		0	
(78)	0		0		0	
PORT OLE	0		0		0	
(79)	0		0		0	

POST-EMERGENCE SELECTIVITY TEST

SPECIES		MC4379 0.58 KG/HA		MC4379 1.73 KG/HA		MC4379 5.18 KG/HA
CYN DACT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	29	xxxxxx
(82)	79	xxxxxxxxxxxxxxxx	57	xxxxxxxxxxx	14	xxx
CYP ESCU	100	xxxxxxxxxxxxxxxxxxxx	109	xxxxxxxxxxxxxxxxxxxx +	73	xxxxxxxxxxxxxx
(85)	57	xxxxxxxxxxx	50	xxxxxxxxxx	36	xxxxxxx
CYP ROTU	100	xxxxxxxxxxxxxxxxxxxx	81	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
(86)	71	xxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	57	xxxxxxxxxx
OXAL LAT	50	xxxxxxxxxx	75	xxxxxxxxxxxxxx	0	
(89)	36	xxxxxxx	14	xxx	0	

CHLORFENPROP-METHYL

Code number: Bayer 70533 **Trade name:** Bidisin

Chemical name: Methyl 2-chloro-3-(4-chlorophenyl)propionate

Source:
Bayer Agrochem Ltd
Eastern Way
Bury St Edmunds
Suffolk

Information available and suggested uses:

Introduced in 1967 and subsequently recommended for the control of wild oats post-emergence in spring barley and spring wheat when the weed is at the 2-3 leaf stage and before tillering. Timing and method of application are important factors in degree of control. The compound is compatible with hormone weed killers for improved control spectrum in cereals. Trials for control of *A. fatua* have also been reported in the manufacturer's literature from 1973 in winter wheat and barley, oats, sugar beet, carrots, peas, field beans and established ryegrass.

Formulation used: 80% w/v a.i. emulsifiable concentrate (Bayer 6370)
[IAT 53% w/v a.i. emulsifiable concentrate (Bayer 5710)]

Spray volume: for selectivity experiment 396 l/ha (35.2 gal/ac)
for initial activity test 347 l/ha (30.9 gal/ac)

RESULTS

TABLE OF SELECTIVITIES

RATE kg ai/ha	CROPS: vigour reduced by less than 15%	WEEDS: number or vigour reduced by more than 70%
9.20	perennial ryegrass onion	*Rumex crispus* *Spergula arvensis* *Veronica persica* + species below
4.60	species above + wheat barley oat carrot sorghum rice	*Avena fatua* *Sinapis arvensis* *Senecio vulgaris* *Chenopodium album* + species below
2.30	species above + pea sugar beet maize	*Amaranthus retroflexus* *Portulaca oleracea*

Comments on results

General

Initial Activity Test results showed foliar activity on dwarf bean, kale and to a lesser extent on Avena fatua. Soil activity was also found on these species and was of the same order on A. fatua but lower on the other species.

Avena fatua proved to be more sensitive in the post-emergence experiment and a number of broad-leaved species were also well controlled. Cereal species were generally tolerant and some temperate broad-leaved crops also exhibited resistance. Perennial ryegrass and onion were outstandingly resistant as were many grass and perennial weed species.

Symptoms

Contact scorch symptoms were evident 24 hours after treatment on Avena fatua and susceptible broad-leaved species. The main shoot of A. fatua was either completely killed or severely inhibited as were the buds of susceptible broad-leaved species.

Temperate weeds and crops

A high specificity for Avena fatua was evident with plants being killed at 4.60 kg/ha. This contrasts with the results of the Initial Activity Test where, although activity was found, control was not achieved. However a different source of Avena fatua seeds were used in the second test, suggesting that different varieties of wild oat show varying susceptibility to chlorfenprop-methyl. (Soil and environmental conditions, growth stage at spraying and volume rates were similar in the two tests reported here). The work of Hack (1971) and Stryckers et al (1972) has indicated varietal differences in response. Other temperate annual and perennial grass-weeds were resistant even at 9.20 kg/ha but certain broad-leaved species were controlled. Galium aparine and Polygonum aviculare however, were particularly resistant.

The cereals, wheat, barley and oat were tolerant at 4.60 kg/ha and were reduced in vigour only slightly at 9.20 kg/ha. Perennial ryegrass and onion were outstandingly tolerant at 9.20 kg/ha, while carrot withstood 4.60 kg/ha. Pea and sugar beet showed resistance at 2.30 kg/ha only.

The most interesting selectivity occurred with the control of Avena fatua in cereals, but its control in onions and carrots could also prove useful. The potential for control of the six broad-leaved weeds in onions was very striking.

Tropical weeds and crops

All tropical annual grass weeds showed moderate to considerable resistance even at 9.20 kg/ha. The broad-leaved species Amaranthus retroflexus and Portulaca oleracea were, however, controlled at only 2.30 kg/ha. Only minor effects were visible on the perennial Cyperus spp., Cynodon dactylon and Oxalis latifolia at 9.20 kg/ha and recovery was soon apparent.

The tropical cereals, sorghum and rice, were tolerant at 4.60 kg/ha and were only reduced by 21% of control at 9.20 kg/ha. Maize proved somewhat more susceptible being tolerant at 2.30 kg/ha but reduced by 21% at 4.60 kg/ha. All species exhibited minor scorch symptoms, however, even at lower doses. The smaller seeded broad-leaved crops were all susceptible but soyabean and groundnut were more resistant showing only slight reduction at 2.30 kg/ha. The latter species was also reduced by only 29% of control at 4.60 kg/ha. Scorch was again evident but recovery was apparent 6 weeks after treatment of these species.

Amaranthus retroflexus and Portulaca oleracea were the only weeds selectively controlled in sorghum and rice at 4.60 kg/ha and maize at 2.30 kg/ha.

Possible uses and further testing

The most striking feature of chlorfenprop-methyl is the selectivity which can exist between Avena fatua and the cereals under certain conditions, which has formed the basis of the manufacturer's development of the herbicide. A higher dose is needed for the control of A. fatua than with other post-emergence wild oat herbicides but it may have a wider safety margin in all three temperate cereals. No other herbicide has shown the selectivity between A. fatua and cultivated oats which appeared in the present experiment. Chlorfenprop-methyl also exhibits a much faster activity than other post-emergence wild oat herbicides. The selectivity in onion would also appear to warrant further investigation and although the broad-leaved weed control spectrum is not so good as with pyrazon or ioxynil which are currently used in this crop it could find use in situations where A. fatua is a problem. A mixture might also enhance the spectrum of chlorfenprop-methyl. This compound would, however, appear to have little application in the tropical situation due to its lack of activity on the annual grass weed species.

INITIAL ACTIVITY TEST

CHLORFENPROP-METHYL

		0.56 kg/ha	2.24 kg/ha	8.96 kg/ha
DWARF BEAN	F	xxxxxxxx	xxxxxx	xxx
	S	xxxxxxxxxxxx	xxxxxxxxxxxx	xxxxxxxxx
	P	xxxxxxxxxxxx	xxxxxxxxxxxx	xxxxxxxxxxx
	I	xxxxxxxxx	xxxxxxxx	xxxxxxxx
KALE	F	xxxxxxxxx	xxxxxxx	xxx
	S	xxxxxxxxxxxx	xxxxxxxxxxxx	xxxxxxxxxxx
	P	xxxxxxxxxxxx	xxxxxxxxxxxx	xxxxxxxxx
	I	xxxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx
POLYGONUM AMPHIBIUM	F	xxxxxxxxxxxx	xxxxxxxxx	xxxxxxxxx
	S	xxxxxxxxxxxx	xxxxxxxxxxxx	xxxxxxxxxxx
	P	xxxxxxxxxxxx	xxxxxxxxxxxx	xxxxxxxxxxx
	I	xxxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxx
PERENNIAL RYEGRASS	F	xxxxxxxxxxxx	xxxxxxxxxxxx	xxxxxxxxxxx
	S	xxxxxxxxxxxx	xxxxxxxxxxxx	xxxxxxxxxxxx
	P	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx
	I	xxxxxxxxxxxx	xxxxxxxxxxxx	xxxxxxxxxxxx
AVENA FATUA	F	xxxxxxxxxxx	xxxxxxxxx	xxxxx
	S	xxxxxxxxxxxx	xxxxxxxxxxxx	xxxxxxx
	P	xxxxxxxxxx	xxxxxxxxx	xxxxxxx
	I	xxxxxxxxxxx	xxxxxxxxx	xxxxxxxx
AGROPYRON REPENS	F	xxxxxxxxxxxx	xxxxxxxxxxxx	xxxxxxxxxxxx
	S	xxxxxxxxxxxx	xxxxxxxxxxxx	xxxxxxxxxxxx
	P	xxxxxxxxxxxx	xxxxxxxxxxxx	xxxxxxxxxxxx
	I	xxxxxxxxxxxx	xxxxxxxxxxxx	xxxxxxxxxxxx

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

(NB These histograms are for vigour only - no numbers available)

POST-EMERGENCE SELECTIVITY TEST

SPECIES	CHLORFENPROP-METHYL 2.30 KG/HA		CHLORFENPROP-METHYL 4.60 KG/HA		CHLORFENPROP-METHYL 9.20 KG/HA	
WHEAT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(1)	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
BARLEY	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(2)	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
OAT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(3)	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx
PER RYGR	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(4)	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
ONION	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	80	xxxxxxxxxxxxxxx
(8)	71	xxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
DWF BEAN	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(9)	64	xxxxxxxxxxxxx	43	xxxxxxxxx	36	xxxxxxx
FLD BEAN	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	25	xxxxx
(10)	57	xxxxxxxxxxx	36	xxxxxxx	14	xxx
PEA	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(11)	100	xxxxxxxxxxxxxxxxxxxx	57	xxxxxxxxxxx	43	xxxxxxxxx
W CLOVER	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	94	xxxxxxxxxxxxxxxxxxx
(12)	71	xxxxxxxxxxxxxx	64	xxxxxxxxxxxxx	43	xxxxxxxxx
KALE	100	xxxxxxxxxxxxxxxxxxxx	80	xxxxxxxxxxxxxxxx	60	xxxxxxxxxxx
(15)	64	xxxxxxxxxxxxx	36	xxxxxxx	29	xxxxxx
CABBAGE	100	xxxxxxxxxxxxxxxxxxxx	80	xxxxxxxxxxxxxxxx	10	xx
(16)	79	xxxxxxxxxxxxxxxx	50	xxxxxxxxxx	21	xxxx
SWEDE	100	xxxxxxxxxxxxxxxxxxxx	38	xxxxxxxx	13	xxx
(17)	71	xxxxxxxxxxxxxx	36	xxxxxxx	21	xxxx
CARROT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	40	xxxxxxxx
(18)	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	43	xxxxxxxxx

POST-EMERGENCE SELECTIVITY TEST

SPECIES		CHLORFENPROP-METHYL 2.30 KG/HA		CHLORFENPROP-METHYL 4.60 KG/HA		CHLORFENPROP-METHYL 9.20 KG/HA
PARSNIP	100	xxxxxxxxxxxxxxxxxxxx	88	xxxxxxxxxxxxxxxxxx	0	
(19)	79	xxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx	0	
LETTUCE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	58	xxxxxxxxxxxx
(20)	71	xxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	50	xxxxxxxxxx
SUG BEET	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(21)	100	xxxxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	57	xxxxxxxxxxx
AVE FATU	100	xxxxxxxxxxxxxxxxxxxx	38	xxxxxxxx	25	xxxxx
(26)	86	xxxxxxxxxxxxxxxx	29	xxxxxx	7	x
ALO MYOS	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(27)	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx
POA ANN	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(28)	100	xxxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	64	xxxxxxxxxxxx
POA TRIV	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(29)	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx
SIN ARV	100	xxxxxxxxxxxxxxxxxxxx	8	xx	0	
(30)	93	xxxxxxxxxxxxxxxxxx	21	xxxx	0	
RAPH RAP	100	xxxxxxxxxxxxxxxxxxxx	90	xxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx
(31)	79	xxxxxxxxxxxxxxx	57	xxxxxxxxxxx	50	xxxxxxxxxx
TRIP MAR	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	42	xxxxxxxx
(33)	93	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	36	xxxxxxx
SEN VULG	100	xxxxxxxxxxxxxxxxxxxx	25	xxxxx	0	
(34)	71	xxxxxxxxxxxxxx	50	xxxxxxxxxx	0	
POL LAPA	100	xxxxxxxxxxxxxxxxxxxx	90	xxxxxxxxxxxxxxxxx	60	xxxxxxxxxxxx
(35)	86	xxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx	50	xxxxxxxxxx
POL AVIC	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	63	xxxxxxxxxxxxx
(36)	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	64	xxxxxxxxxxxxx

SPECIES		CHLORFENPROP-METHYL 2.30 KG/HA		CHLORFENPROP-METHYL 4.60 KG/HA		CHLORFENPROP-METHYL 9.20 KG/HA
RUM CRIS	100	xxxxxxxxxxxxxxxxxxxx	78	xxxxxxxxxxxxxxxx	0	
(37)	79	xxxxxxxxxxxxxxx	43	xxxxxxxxx	0	
GAL APAR	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(38)	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx
CHEN ALB	50	xxxxxxxxxx	0		0	
(39)	57	xxxxxxxxxxx	0		0	
STEL MED	100	xxxxxxxxxxxxxxxxxxxx	92	xxxxxxxxxxxxxxxxx	50	xxxxxxxxxx
(40)	86	xxxxxxxxxxxxxxxxx	57	xxxxxxxxxxx	43	xxxxxxxxx
SPER ARV	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	0	
(41)	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	0	
VER PERS	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	0	
(42)	71	xxxxxxxxxxxxx	57	xxxxxxxxxxx	0	
AG REPEN	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(47)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
AG STOLO	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(48)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
MAIZE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(58)	93	xxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	64	xxxxxxxxxxxx
SORGHUM	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(59)	86	xxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxxx
RICE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(60)	86	xxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxxx
GRNDNUT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(64)	79	xxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	50	xxxxxxxxxx
SOYABEAN	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(65)	79	xxxxxxxxxxxxxxxx	57	xxxxxxxxxxx	29	xxxxxx

SPECIES		CHLORFENPROP-METHYL 2.30 KG/HA		CHLORFENPROP-METHYL 4.60 KG/HA		CHLORFENPROP-METHYL 9.20 KG/HA
COTTON	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx
(66)	36	xxxxxxx	21	xxxx	14	xxx
JUTE	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	92	xxxxxxxxxxxxxxxxxx
(67)	64	xxxxxxxxxxxxx	43	xxxxxxxxx	14	xxx
KENAF	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(68)	57	xxxxxxxxxxx	29	xxxxxx	21	xxxx
TOBACCO	70	xxxxxxxxxxxxxx	20	xxxx	0	
(69)	64	xxxxxxxxxxxxx	36	xxxxxxx	0	
SESAMUM	50	xxxxxxxxxx	31	xxxxxx	31	xxxxxx
(70)	36	xxxxxxx	14	xxx	14	xxx
ELEU IND	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(74)	86	xxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	43	xxxxxxxxx
ECH CRUS	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(75)	86	xxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx
ROT EXAL	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(76)	86	xxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx
DIG SANG	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	92	xxxxxxxxxxxxxxxxx
(77)	86	xxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	57	xxxxxxxxxx
AMAR RET	100	xxxxxxxxxxxxxxxxxxx	40	xxxxxxxx	10	xx
(78)	21	xxxx	7	x	7	x
PORT OLE	75	xxxxxxxxxxxxxxx	33	xxxxxxx	0	
(79)	29	xxxxxx	21	xxxx	0	

POST-EMERGENCE SELECTIVITY TEST

SPECIES		CHLORFENPROP-METHYL 2.30 KG/HA		CHLORFENPROP-METHYL 4.60 KG/HA		CHLORFENPROP-METHYL 9.20 KG/HA	
CYN DACT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	
(82)	86	xxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	
CYP ESCU	145	xxxxxxxxxxxxxxxxxxxx	+ 118	xxxxxxxxxxxxxxxxxxxx	+ 118	xxxxxxxxxxxxxxxxxxxx	+
(85)	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	
CYP ROTU	105	xxxxxxxxxxxxxxxxxxxx	+ 105	xxxxxxxxxxxxxxxxxxxx	+ 124	xxxxxxxxxxxxxxxxxxxx	+
(86)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	
OXAL LAT	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	
(87)	86	xxxxxxxxxxxxxxxxx	57	xxxxxxxxxxx	64	xxxxxxxxxxxxx	

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