O/S 568

AGRICULTURAL RESEARCH COUNCIL

WEED RESEARCH ORGANISATION

Technical Report No. 9.

The post-emergence selectivity of some newly developed herbicides

NC 6627
NC 4780
NC 4762
BH 584
BH 1455

by

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BEGBROKE HILL, KIDLINGTON, OXFORD

W.R.O. Technical Report No. 9

The post-emergence selectivity of some newly developed herbicides

(NC 6627, NC 4780, NC 4762, BH 584, BH 1455)

CONTENTS

Introduction

For many years the Evaluation Section of the Weed Research Organization has investigated the selectivity of new herbicides which are in the process of commercial development by industry. This has involved application, both pre-emergence and post-emergence, to a wide range of crop and weed species grown in pots, as a preliminary stage of this process. The objectives have been to discover selectivities additional to those pinpointed by the firm which originally discovered the herbicidal properties of the chemical; to obtain experience of the type of effects produced by the chemical; and to provide a source of information on the relative susceptibility of species which may subsequently prove useful in considering problems such as the cropping of land contaminated with the herbicide.

Essentially the main value of this experimentation is as a guide in the planning of further experiments both in pots and in the field. For this reason the results of such experiments were not written up for publication but recorded in the form of Internal Reports for the information of W.R.O. staff. However, many individuals other than W.R.O. staff were in a position to make use of the information in these Reports and a restricted distribution was started to such people. The distribution list has grown very considerably during the last few years and these Internal Reports now reach specialist weed research workers in 22 countries. The recipients regard these reports as of value to them and many requests are received for addition to the mailing list. It has been decided therefore that there is no longer any justification for retaining the status as an 'Internal Report, Not for Publication'.

Hence the reports on this type of experiment will, in future, appear in a published and readily available form as Weed Research Organization Technical Reports. The format will be based on that of the earlier Internal Reports. The present report is the first of this new series of W.R.O. Technical Reports (there have been earlier W.R.O. Technical Reports on other topics).

Attention is drawn particularly to the fact that the experiments described herein are only a preliminary guide to the relative resistance or susceptibility of the species included. Pot experiments of this sort are not a reliable guide to the dose levels needed to produce the same effects in the field. Further, the experiments are conducted on only one widely grown variety of each crop plant or on weed material from one readily available source. Large variations in response can occur between different varieties of the same crop, or between different strains or clones of weed species. In a few instances a cultivar attributed to the same species as the weed has been used for ease of propagation and there are a number of cases where a species has been included which is a crop in some circumstances and a weed in others. The pre-emergence experiments are conducted only on one soil type and the post-emergence experiments at one growth stage. These important variables can have a profound effect on response.

For the above reasons it must be emphasised that the data reported should be regarded primarily as a source of ideas for further work. The results are presented in full to enable the reader to extract information on particular species in which he may be interested, and to facilitate rapid production of the report on completion of computer processing of the data.

The Weed Research Organization only accepts herbicides for inclusion in its research programme if the chemical nature is disclosed. However in some cases this disclosure is confidential for a limited period of time. Hence there may be occasional instances in these reports where the chemical composition of a herbicide is not stated but marked as confidential. In general, recipients of these reports will find that information on this point becomes available from other sources in a relatively short period of time.

This Report is presented in such a way that it can be sub-divided into portions dealing with individual herbicides, which can then be filed separately.

Experimental Procedure

Plant growing and treatment

Plants were grown in 3.5 inch diameter plastic pots, generally in University of California no. IIC mix as a standard peat-sand potting compost. Exceptions were the soft fruit and rice which were grown in a sandy loam soil from Begbroke Hill Farm, and groundnut which was grown in John Innes no. 2 potting compost. The annual species were grown from seed and the sowing dates staggered with the intention that the majority of plants should have reached the 2- to 4-leaf stage by the time of spraying. Actual stages of growth at spraying are recorded in Table 1. For each species the number of plants in each pot at the time of spraying is constant, this being achieved by thinning. Many of the perennial species were propagated vegetatively: Agropyron repens from rhizome sections, Cynodon dactylon and Agrostis stolonifera from stolon sections, Cyperus rotundus from tubers, strawberry from runners and blackcurrant from cuttings. However Rumex crispus, Eupatorium odoratum, and all the other perennial crop species were grown from seed. The tropical species, together with maize and dwarf bean, were grown in a heated greenhouse; the remaining plants were raised outside.

The plants were sprayed using a specially built laboratory sprayer embodying a 'Teejet' fan nozzle moving at constant speed along a track above a spray bench. The application rate was equivalent to 30.9 gal/ac. Generally the herbicide was applied in the formulation supplied by the manufacturer for field testing. In the case of BH 1455 technical material was dissolved in a 4:1 mixture of acetone and water by volume. Each treatment was replicated twice on each species. The full list of treatments and doses is given in Table 2.

After spraying the plants were protected from rainfall for 24 hours and then given a heavy overhead watering to wash any residues off the foliage. The pots were then returned to their original position in the greenhouse or the open. Additional fertiliser in solution and insecticide and fungicide were applied to individual species as needed.

Assessment and processing of results

Before spraying the number of plants per pot for each species was recorded. Between 2 and 3 weeks after spraying, when control plants had reached a size where further maintenance was a problem, a final assessment was made directly onto punched cards. For annuals and seedlings a record was made of the number of survivors from each treatment. In addition their vigour was expressed on a 0 to 7 subjective scoring scale, on which 7 indicates that they were indistinguishable from the controls. Each step in the scale was defined. For the perennials established from vegetative material only a vigour score was taken and punched card recording was not used. These latter species were retained for a further period of several months to observe later effects or the degree of recovery from injury.

The punched cards were processed by the ORION computer at Rothamsted Experimental Station. The computer output was produced direct on to duplicating stencils used in the preparation of this Report. These give rise to the main diagrammatic presentation of the data, given separately for each herbicide, in the Results Section which follows. On each diagram there is an indication of species, herbicide, and dose applied (the species abbreviations used are listed in Table 1). For each species at each dose of herbicide there is a pair of figures. The upper figure of the pair gives mean plant survival as a percentage of the original number present, corrected for any control mortality. The lower figure shows mean vigour score as a percentage of control. Directly to the right of each figure is the same information presented as a horizontal histogram. Each 'x' in the histogram represents a 5% increment in the value being plotted. The single figures and histograms against the perennial species indicate vigour as a percentage of control vigour and have been added later.

In the consideration of the results arbitrary levels of vigour reduction of 15% or less compared with control in respect of crops, and vigour reduction of 85% or more as compared with control in respect of weeds have been taken to indicate responses of major interest. It should be borne in mind that certain species can be considered as both crops and weeds. A series of individual comments are made on the results for each herbicide but these are not intended to be an exhaustive survey of the results. They are provided merely to highlight a number of points of interest, but are not intended to replace careful consideration of the histograms with reference to the readers' own interests.

Table 1

Species abbreviations, varieties and stage of growth at time of spraying and assessment

Species	Abbreviation	Variety	Stage of growth when sprayed*	Stage of growth of controls when assessed*
Wheat (Triticum aestivum)		Jufy	3-3½ leaves	5-6 leaves, tillering
Barley (Hordeum vulgare)		Proctor	3-3½ leaves	up to 6 leaves, tillering
Oat (Avena sativa)		Blenda	3 leaves	5-6 leaves, tillering
Maize (Zea mays)		Inra 200	2½-3 leaves	up to 7½ leaves
Perennial ryegrass (Lolium perenne)	PRYGRS	S 23	2-2½ leaves	4-5 leaves, tillering
Cocksfoot (Dactylis glomerata)	CKFOOT	S 143	3 leaves	4-5 leaves
Timothy (Phleum pratense)	TIMTHY	S 50	3 leaves	5-6 leaves, tillering freely
Lucerne (Medicago sativa)	LUCERN	Provence	2-3 trifoliate leaves	up to 6½ trifoliate leaves
Red clover (Trifolium pratense)	RCLOVR	S 123	1½-2½ trifoliate leaves	4-5 trifoliate leaves
White clover (Trifolium repens)	WCLOVR	S 100	2½-3½ trifoliate leaves	up to 6½ trifoliate leaves
Field bean (Vicia faba)	FDBEAN	Blue Rock	5-5½ leaves (excluding primary leaf)	6½-7½ leaves
Pea (Pisum sativum)		Big Ben	7 leaves	8½ leaves
Sugar beet (Beta vulgaris)	SGBEET	Klein E	2 leaves	3½ leaves
Swede (Brassica napus)		Bangholm	1½-2 leaves	3½-4½ leaves
Kale (Brassica oleracea acephala)		Marrowstem	2-2½ leaves	3½-4½ leaves
Carrot (Daucus carota)		Chantenay Red Core	2-2½ leaves	up to 5 leaves
Parsnip (Pastinaca sativa)	PRSNIP	Hollow Crown	1-1½ leaves	up to 3½ leaves
Dwarf bean (Phaseolus vulgaris)	DWBEAN	The Prince	2 primary leaves	1½ trifoliate leaves
Lettuce (Lactuca sativa)	LETTCE	Trocadero Improved	2½-4 leaves	up to 7½ leaves
Onion (Allium cepa)		Bedfordshire Champion	2-2½ leaves	3 leaves
Cabbage (Brassica oleracea capitata)	CABBGE	Primo	1½-2 leaves	3½-4½ leaves

Species	Abbreviation	Variety	Stage of growth when sprayed*	Stage of growth of controls when assessed*
Avena fatua	A FATU		4-5 leaves	5-6 leaves beginning to tiller
Poa annua	P ANNU		5-7 leaves	4-5 leaves, tillering vigorously
Alopecurus myosuroides	A MYOS		2½-3½ leaves	up to 4 leaves, tillering freely
Tripleurospermum maritimum ssp. inodorum	T MARI		5-6 leaves	11-12 leaves
Senecio vulgaris	S VULG		4-4½ leaves	9 leaves, beginning to flower
Galium aparine	G APAR		4 whorls	6-7 whorls
Sinapis arvensis	SI ARV		3-3½ leaves	6 leaves, flowering
Raphanus raphanistrum	R RAPH	Black Spanish Radish	1½-2 leaves	3½ leaves
Papaver rhoeas	P RHOE	Shirley Poppy	4-6 leaves	up to 8½ leaves
Chenopodium album	C ALBU		6 leaves	up to 13 leaves, axillary growth beginning
Polygonum lapathifolium	P LAPA		2½ leaves	up to 7½ leaves, axillary growth beginning
Rumex crispus	R CRIS		3-4 leaves	5-6 leaves, some axillary growth
Stellaria media	S MEDE		4-10 leaves	5-6 pairs of leaves on main shoot, axillary shoots growing vigorously beginning to flower
Spergula arvensis	SP ARV		4 leaves	up to 5 whorls of leaves, flowering
Sorghum (Sorghum vulgare)	SRGHUM	SB 68	3-3½ leaves	6½ leaves
Rice (Oryza sativa)		Dickwee 328	2-2½ leaves	up to 5 leaves, tillering vigorously
Cotton (Gossypium hirsutum)		Samaru 26J	1 leaf	3½ leaves
Groundnut (Arachis hypogaea)	GRDNUT	Natal Common	1-2½ leaves	up to 6½ leaves, tillering from base
Tobacco (Nicotiana tabacum)	TOBCCO	Yellow Mammoth	2½ leaves	4½-5½ leaves
Eleusine indica	E INDI		5 leaves	7½-8½ leaves, tillering vigorously

Species	Abbreviation	Variety	Stage of growth when sprayed*	Stage of growth of controls when assessed*
Eupatorium odoratum	E ODOR		2-2½ leaves	3½ pairs of leaves
Strawberry (Fragaria sp.)	STRWBY	Cambridge Favourite	10 leaves	13-14 leaves, with long runners
Blackcurrant (Ribes nigrum)	BKCURR	Hilltop Baldwin	14 leaves	16-17 leaves, axillary shoots beginning to grow
Digitaria sanguinalis	D SANG		2½-3 leaves	up to 5½ leaves, tillering vigorously
Portulaca oleracea	P OLAC		2-2¼ leaves	6½ pairs of leaves, axillary buds shooting
Agropyron repens			3-4 leaves per shoot	up to 6 leaves per shoot, tillering
Agrostis stolonifera			5-7 leaves per shoot	up to 12 internodes per shoot, with nodes rooting
Cyperus rotundus			9 leaves per shoot	up to 16 leaves per shoot, with profuse development of new shoots
Cynodon dactylon			8½ leaves per shoot	up to 9 extended internodes per shoot

* ½-leaf is used to refer to leaves in early stages of expansion.

Table 2

Herbicide Treatments

Chemical	Accession no.	Doses (lb/ac)
NC 6627 (confidential)	163	0.33, 1.0, 3.0
NC 4780 (2-trifluoromethyl-6-chloroimidazo [4,5,6] pyridine)	164	0.11, 0.33, 1.0
NC 4762 (confidential)	167	0.5, 1.5, 4.5
BH 584 (5-chloro-2-isopropylbenzimidazole)	158	0.5 , 1.5, 4.5
BH 1455 (confidential)	159	0.66, 2.0, 6.0

Results and comments

NC 6627

(confidential)

Received: April, 1967 Accession no. 163

Manufacturer: Fisons Pest Control Ltd.,
Chesterford Park Research Station,
Nr. Saffron Walden, Essex.

Latest Technical information:
Unpublished technical information sheet (undated)

Manufacturers' suggestions for principle uses:
Pre-emergence application in maize and sorghum

Prior W.R.O. Experiments:
Initial Activity Test: G.67.13

STANDARD POST-EMERGENCE SELECTIVITY TEST

Expt. no: G.67.14 Formulation used: wettable powder 20% a.i. w/w

Doses: 0.33, 1.0, 3.0 lb/ac Spray volume: 30.9 gal/ac

Experiment treated: 11.7.67 Assessment completed: 26.7.67

Summary of results

Full results are given in the histograms overleaf and are summarised in the table below

Herbicide	Dose (lb/ac)	Crops: vigour reduced by less than 15%	Weeds: number and/or vigour reduced by more than 85%
NC 6627	3.0	strawberry	Tripleurospermum maritimum Sinapis arvensis Raphanus raphanistrum Polygonum lapathifolium Stellaria media + species below
	1.0	As above + barley maize sorghum pea	Papaver rhoeas Eupatorium odoratum Portulaca oleracea

Comments on results:

1. Although the manufacturers original suggestion was for pre-emergence application, NC 6627 appears to have a considerable activity on emerged seedling plants at the higher doses tested. The Initial Activity Test had indicated this type of response earlier but suggested that much but not all of this effect occurred as a result of uptake by the root system.

2. In general NC 6627 seemed to have a much lower activity than NC 4780.

3. The resistance of some of the graminaceous crops to this herbicide is shared by the related herbicides which are of greater activity on broad leaved species and hence NC 6627 is unlikely to be of interest in this context.

4. At 0.33 lb/ac Portulaca oleracea was the most susceptible species of any tested. At the time of spraying the plants were small, but had reached the two-leaf stage.

5. In the case of strawberry the selectivity as shown by the main series of observations two weeks after treatment was greater than with the related compounds. Up to this point no appreciable effects on strawberry foliage had been noted. However inspection of the plants $3\frac{1}{2}$ months after treatment showed that at 3 lb/ac there was some retardation of runner growth and a little faint marginal chlorosis of the leaves. At 1 lb/ac the plants were indistinguishable from controls. If this herbicide became available for pre-emergence use the possible resistance of strawberry would warrant further investigation.

TRIAL NUMBER 14

SPECIES	TREATMENTS NC 6627 0.33 LB/AC		NC 6627 1.00 LB/AC		NC 6627 3.00 LB/AC	
WHEAT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	88	xxxxxxxxxxxxxxxxxx
(1)	93	xxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	43	xxxxxxxxx
BARLEY	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(2)	86	xxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx
OAT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(3)	100	xxxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	64	xxxxxxxxxxxx
MAIZE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(4)	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx
PRYGRS	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	88	xxxxxxxxxxxxxxxxxx
(5)	93	xxxxxxxxxxxxxxxxxx	57	xxxxxxxxxx	29	xxxxx
CKFOOT	94	xxxxxxxxxxxxxxxxxx	94	xxxxxxxxxxxxxxxxxx	75	xxxxxxxxxxxxxx
(6)	93	xxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	36	xxxxxx
TIMTHY	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	63	xxxxxxxxxxxx
(7)	93	xxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	43	xxxxxxxxx
LUCERN	100	xxxxxxxxxxxxxxxxxxxx	94	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(8)	86	xxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	71	xxxxxxxxxxxxx
RCLOVR	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	88	xxxxxxxxxxxxxxxxxx
(9)	79	xxxxxxxxxxxxxxx	64	xxxxxxxxxxxx	50	xxxxxxxxxx
WCLOVR	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	31	xxxxxx
(10)	86	xxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx	29	xxxxxx
FDBEAN	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	0	
(11)	71	xxxxxxxxxxxxx	57	xxxxxxxxxx	0	
PEA	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(12)	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx
SGBEET	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	17	xxx
(13)	86	xxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	21	xxxx
SWEDE	90	xxxxxxxxxxxxxxxxxx	30	xxxxxx	0	
(14)	71	xxxxxxxxxxxxxx	14	xxx	0	

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TRIAL NUMBER 14	TREATMENTS		
SPECIES	NC 6627 0.33 LB/AC	NC 6627 1.00 LB/AC	NC 6627 3.00 LB/AC
KALE	100 xxxxxxxxxxxxxxxxxxxx	90 xxxxxxxxxxxxxxxxxx	0
(15)	71 xxxxxxxxxxxxxx	57 xxxxxxxxxxx	0
CARROT	100 xxxxxxxxxxxxxxxxxxxx	100 xxxxxxxxxxxxxxxxxxxx	0
(16)	86 xxxxxxxxxxxxxxxxx	64 xxxxxxxxxxxxx	0
PRSNIP	100 xxxxxxxxxxxxxxxxxxxx	83 xxxxxxxxxxxxxxxxx	8 xx
(17)	71 xxxxxxxxxxxxxx	57 xxxxxxxxxxx	7 x
DWBEAN	100 xxxxxxxxxxxxxxxxxxxx	100 xxxxxxxxxxxxxxxxxxxx	100 xxxxxxxxxxxxxxxxxxxx
(18)	71 xxxxxxxxxxxxxx	57 xxxxxxxxxxx	14 xxx
LETTCE	100 xxxxxxxxxxxxxxxxxxxx	0	0
(19)	64 xxxxxxxxxxxxx	0	0
ONION	92 xxxxxxxxxxxxxxxxxx	92 xxxxxxxxxxxxxxxxxx	75 xxxxxxxxxxxxxxx
(20)	86 xxxxxxxxxxxxxxxxx	71 xxxxxxxxxxxxxx	57 xxxxxxxxxxx
CABBGE	90 xxxxxxxxxxxxxxxxxx	10 xx	0
(21)	64 xxxxxxxxxxxxx	14 xxx	0
A FATU	100 xxxxxxxxxxxxxxxxxxxx	100 xxxxxxxxxxxxxxxxxxxx	100 xxxxxxxxxxxxxxxxxxxx
(22)	100 xxxxxxxxxxxxxxxxxxxx	93 xxxxxxxxxxxxxxxxxx	71 xxxxxxxxxxxxxx
P ANNU	100 xxxxxxxxxxxxxxxxxxxx	100 xxxxxxxxxxxxxxxxxxxx	38 xxxxxxxx
(23)	100 xxxxxxxxxxxxxxxxxxx	43 xxxxxxxxx	21 xxxx
A MYOS	100 xxxxxxxxxxxxxxxxxxxx	100 xxxxxxxxxxxxxxxxxxxx	29 xxxxxx
(24)	93 xxxxxxxxxxxxxxxxxx	57 xxxxxxxxxxx	21 xxxx
T MARI	94 xxxxxxxxxxxxxxxxxx	100 xxxxxxxxxxxxxxxxxxxx	13 xxx
(28)	86 xxxxxxxxxxxxxxxx	71 xxxxxxxxxxxxxx	14 xxx
S VULG	100 xxxxxxxxxxxxxxxxxxx	100 xxxxxxxxxxxxxxxxxxx	36 xxxxxxx
(29)	86 xxxxxxxxxxxxxxxxx	71 xxxxxxxxxxxxxx	36 xxxxxxx
G APAR	100 xxxxxxxxxxxxxxxxxxx	100 xxxxxxxxxxxxxxxxxxx	100 xxxxxxxxxxxxxxxxxxx
(30)	86 xxxxxxxxxxxxxxxxx	71 xxxxxxxxxxxxxx	50 xxxxxxxxxx
SI ARV	100 xxxxxxxxxxxxxxxxxxx	73 xxxxxxxxxxxxxxx	0
(31)	64 xxxxxxxxxxxxx	21 xxxx	0

TRIAL NUMBER 14

SPECIES	TREATMENTS NC 6627 0.33 LB/AC		NC 6627 1.00 LB/AC		NC 6627 3.00 LB/AC	
R RAPH	100	xxxxxxxxxxxxxxxxxxxx	90	xxxxxxxxxxxxxxxxxx	0	
(32)	86	xxxxxxxxxxxxxxxxxx	57	xxxxxxxxxxx	0	
P RHOE	75	xxxxxxxxxxxxxxx	0		0	
(33)	57	xxxxxxxxxxx	0		0	
C ALBU	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	58	xxxxxxxxxxxx
(34)	71	xxxxxxxxxxxxxx	57	xxxxxxxxxxx	21	xxxx
P LAPA	100	xxxxxxxxxxxxxxxxxxxx	94	xxxxxxxxxxxxxxxxxxx	19	xxxx
(35)	79	xxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx	14	xxx
R CRIS	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	45	xxxxxxxxx
(36)	93	xxxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	36	xxxxxxx
S MEDE	94	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	13	xxx
(37)	79	xxxxxxxxxxxxxxxx	57	xxxxxxxxxxx	14	xxx
SP ARV	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	88	xxxxxxxxxxxxxxxxx
(38)	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	50	xxxxxxxxxx
SRGHUM	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(39)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
RICE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	88	xxxxxxxxxxxxxxxxx
(40)	71	xxxxxxxxxxxxxx	57	xxxxxxxxxxx	21	xxxx
COTTON	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(41)	71	xxxxxxxxxxxxxx	43	xxxxxxxxx	29	xxxxxx
GRDNUT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(42)	79	xxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx	50	xxxxxxxxxx
TOBCCO	58	xxxxxxxxxxxx	0		0	
(44)	50	xxxxxxxxxx	0		0	
E INDI	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(45)	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx
E ODOR	100	xxxxxxxxxxxxxxxxxxxx	9	xx	0	
(47)	43	xxxxxxxxx	14	xxx	0	

TRIAL NUMBER	14	TREATMENTS					
SPECIES		NC 6627 0.33 LB/AC		NC 6627 1.00 LB/AC		NC 6627 3.00 LB/AC	
STRWBY	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	
(49)	93	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	
BKCURR	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	
(51)	93	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	
D SANG	100	xxxxxxxxxxxxxxxxxxxx	92	xxxxxxxxxxxxxxxxxx	83	xxxxxxxxxxxxxxxxx	
(52)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	43	xxxxxxxxx	
P OLAC	33	xxxxxxx	0		0		
(54)	21	xxxx	0		0		
Agrostis stolonifera	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx	
Agropyron repens	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxxx	
Cyperus rotundus	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxxx	
Cynodon dactylon	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxxx	

NC 4780

(2-trifluoromethyl-6-chloroimidazo [4,5-6] pyridine)

Received: April, 1967 Accession no. 164

Manufacturer: Fisons Pest Control Ltd.,
Chesterford Park Research Station,
Nr. Saffron Walden, Essex.

Latest Technical Information:
Unpublished technical data sheet (undated)

Manufacturers' suggestions for principle uses:
Pre-emergence application in maize and soya bean and perennial crops.

Prior W.R.O. experiments:
Initial Activity Test G.67.13

STANDARD POST-EMERGENCE SELECTIVITY TEST

Expt. no.: G.67.14 Formulation used: aqueous solution 25% a.i. w/v

Doses: 0.11, 0.33, 1.0 lb/ac Spray volume: 30.9 gal/ac

Experiment treated: 11.7.67 Assessment completed: 26.7.67

Summary of results

Full results are given in the histograms overleaf and summarised in the table below.

Herbicide	Dose (lb/ac)	Crops: vigour reduced by less than 15%	Weeds: number and/or vigour reduced by more than 85%
NC 4780	1.0	No crops tolerant	
	0.33	maize sorghum lucerne red clover pea	Tripleurospermum maritimum Senecio vulgaris Raphanus raphanistrum Papaver rhoeas Chenopodium album Polygonum lapathifolium Rumex crispus Stellaria media Spergula arvensis Galium aparine + species below
	0.11	as above + wheat barley oat perennial ryegrass cocksfoot timothy groundnut blackcurrant	Sinapis arvensis Eupatorium odoratum Portulaca oleracea

Comments on results

1) NC 4780 was the most active compound in the present experiment and also appears to be more active than chlorflurazole if comparison is made with the results for the latter compound in a similar experiment (G.65.14; Internal Report 22). A wide range of seedling weed species were controlled at 0.33 lb/ac.

2) Results of the earlier Initial Activity Test suggest that both foliar and root entry may play a part in producing the above results, with some variation between species in the relative importance of the two routes of entry.

3) The resistance of maize pre-emergence indicated by the manufacturer extends also to post-emergence application and to sorghum.

4) In general the grasses are more resistant than other species. This includes the temperate cereals (wheat, oats and barley) but the selectivity in this instance is less than with chlorflurazole.

5) The resistance of certain small-seeded legumes, particularly lucerne, seems worthy of further investigation in relation to use for weed control in the early stages of establishment of these legumes alone, or in mixture with some grasses. Red clover but not white clover is also resistant; this difference between the two clovers is not shown by the related compounds.

6) Chlorflurazole has been suggested earlier for post-emergence weed control in peas (Fisons Tech. Inf. Bull. 1966). NC 4780 appears to have greater selectivity in this situation and may be worth field investigation in this crop. It should be noted however that there was a steep dose-response relationship with NC 4780, leading to a complete kill at the top dose.

7) Groundnut showed a moderate resistance though insufficient to appear in the main table.

8) NC 4780 because of its broad-spectrum of broad-leaved weed control should be considered for possible use in perennial crops. In view of its soil activity the resistance of each crop to presence of the herbicide in the soil will need to be established. Blackcurrant cuttings showed an appreciable resistance; inspection 3½ months after treatment showed no distinguishable effect at 0.33 lb/ac but a suppression of terminal growth at 1.0 lb/ac.

TRIAL NUMBER 14

SPECIES	NC 4780 0.11 LB/AC		NC 4780 0.33 LB/AC		NC 4780 1.00 LB/AC	
WHEAT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	0	
(1)	100	xxxxxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx	0	
BARLEY	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx
(2)	93	xxxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	29	xxxxxx
OAT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	0	
(3)	93	xxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	0	
MAIZE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(4)	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
PRYGRS	94	xxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx	0	
(5)	93	xxxxxxxxxxxxxxxxxx	29	xxxxxx	0	
CKFOOT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	0	
(6)	100	xxxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	0	
TIMTHY	94	xxxxxxxxxxxxxxxxxx	25	xxxxx	0	
(7)	93	xxxxxxxxxxxxxxxxxx	36	xxxxxxx	0	
LUCERN	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	94	xxxxxxxxxxxxxxxxxx
(8)	86	xxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
RCLOVR	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	69	xxxxxxxxxxxxx
(9)	86	xxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx
WCLOVR	88	xxxxxxxxxxxxxxxxx	13	xxx	0	
(10)	57	xxxxxxxxxxx	0		0	
FDBEAN	100	xxxxxxxxxxxxxxxxxxxx	0		0	
(11)	43	xxxxxxxxx	0		0	
PEA	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	0	
(12)	93	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	0	
SGBEET	25	xxxxx	0		0	
(13)	21	xxxx	0		0	
SWEDE	10	xx	0		0	
(14)	14	xxx	0		0	

TREATMENTS

TRIAL NUMBER 14		TREATMENTS					
SPECIES		NC 4780 0.11 LB/AC		NC 4780 0.33 LB/AC		NC 4780 1.00 LB/AC	
KALE	70	xxxxxxxxxxxxxx	0		0		
(15)	71	xxxxxxxxxxxxxx	0		0		
CARROT	83	xxxxxxxxxxxxxxxx	0		0		
(16)	57	xxxxxxxxxx	0		0		
PRSNIP	8	xx	0		0		
(17)	29	xxxxxx	0		0		
DWBEAN	100	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx	25	xxxxx	
(18)	71	xxxxxxxxxxxxx	50	xxxxxxxxx	7	x	
LETTCE	0		0		0		
(19)	0		0		0		
ONION	75	xxxxxxxxxxxxxx	67	xxxxxxxxxxxx	0		
(20)	86	xxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	0		
CABBGE	10	xx	0		0		
(21)	29	xxxxxx	0		0		
A FATU	100	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx	50	xxxxxxxxx	
(22)	100	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	21	xxxx	
P ANNU	100	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxx	38	xxxxxxx	
(23)	100	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	14	xxx	
A MYOS	100	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	0		
(24)	79	xxxxxxxxxxxxxxx	57	xxxxxxxxxx	0		
T MARI	63	xxxxxxxxxxxxx	0		0		
(28)	64	xxxxxxxxxxxxx	0		0		
S VULG	82	xxxxxxxxxxxxxxxx	0		0		
(29)	50	xxxxxxxxxx	0		0		
G APAR	100	xxxxxxxxxxxxxxxxxx	8	xx	0		
(30)	71	xxxxxxxxxxxxx	29	xxxxxx	0		
SI ARV	0		0		0		
(31)	0		0		0		

CS 179

TRIAL NUMBER 14

SPECIES		TREATMENTS NC 4780 0.11 LB/AC		NC 4780 0.33 LB/AC		NC 4780 1.00 LB/AC
R RAPH	90	xxxxxxxxxxxxxxxxxx	0		0	
(32)	71	xxxxxxxxxxxxxx	0		0	
P RHOE	44	xxxxxxxxx	0		0	
(33)	43	xxxxxxxxx	0		0	
C ALBU	92	xxxxxxxxxxxxxxxxxx	8	xx	0	
(34)	64	xxxxxxxxxxxxxx	14	xxx	0	
P LAPA	94	xxxxxxxxxxxxxxxxxxx	0		0	
(35)	71	xxxxxxxxxxxxxx	0		0	
R CRIS	91	xxxxxxxxxxxxxxxxxx	0		0	
(36)	43	xxxxxxxxx	0		0	
S MEDE	31	xxxxxx	0		0	
(37)	21	xxxx	0		0	
SP ARV	94	xxxxxxxxxxxxxxxxxx	0		0	
(38)	57	xxxxxxxxxx	0		0	
SRGHUM	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(39)	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx
RICE	100	xxxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx	0	
(40)	79	xxxxxxxxxxxxxxx	29	xxxxx	0	
COTTON	100	xxxxxxxxxxxxxxxxxxx	25	xxxxx	0	
(41)	14	xxx	7	x	0	
GRDNUT	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(42)	100	xxxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	57	xxxxxxxxxx
TOBCCO	100	xxxxxxxxxxxxxxxxxxx	33	xxxxxxx	0	
(44)	79	xxxxxxxxxxxxxxx	29	xxxxxx	0	
E INDI	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(45)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx
E ODOR	9	xx	0		0	
(47)	7	x	0		0	

TRIAL NUMBER 14	TREATMENTS		
SPECIES	NC 4780 0.11 LB/AC	NC 4780 0.33 LB/AC	NC 4780 1.00 LB/AC
STRWBY	100 xxxxxxxxxxxxxxxxxxx	100 xxxxxxxxxxxxxxxxxxx	100 xxxxxxxxxxxxxxxxxxx
(49)	71 xxxxxxxxxxxxxx	71 xxxxxxxxxxxxx	43 xxxxxxxxx
BKCURR	100 xxxxxxxxxxxxxxxxxxx	100 xxxxxxxxxxxxxxxxxxx	100 xxxxxxxxxxxxxxxxxxx
(51)	86 xxxxxxxxxxxxxxxxx	79 xxxxxxxxxxxxxxx	64 xxxxxxxxxxxx
D SANG	100 xxxxxxxxxxxxxxxxxxx	100 xxxxxxxxxxxxxxxxxxx	50 xxxxxxxxxx
(52)	100 xxxxxxxxxxxxxxxxxxx	86 xxxxxxxxxxxxxxxx	43 xxxxxxxxx
P OLAC	0	0	0
(54)	0	0	0
Agrostis stolonifera	93 xxxxxxxxxxxxxxxxxx	93 xxxxxxxxxxxxxxxxxx	7 x
Agropyron repens	93 xxxxxxxxxxxxxxxxxx	86 xxxxxxxxxxxxxxxx	36 xxxxxxx
Cyperus rotundus	100 xxxxxxxxxxxxxxxxxxx	100 xxxxxxxxxxxxxxxxxxx	86 xxxxxxxxxxxxxxxx
Cynodon dactylon	100 xxxxxxxxxxxxxxxxxxx	100 xxxxxxxxxxxxxxxxxxx	93 xxxxxxxxxxxxxxxxx

NC 4762

(confidential)

Received: May, 1967 Accession no. 167

Manufacturer: Fisons Pest Control Ltd.,
Chesterford Park Research Station,
Nr. Saffron Walden, Essex.

Latest Technical Information:
Unpublished technical information sheet (undated)

Manufacturers' suggestions for principle uses:
Post-emergence applications in wheat, barley and oats and peas.

Prior W.R.O. Experiments:
Initial Activity Test G.67.13

STANDARD POST-EMERGENCE SELECTIVITY TEST

Expt. no.: G.67.14 Formulation used: aqueous solution Na salt 20% a.e. w/v

Doses: 0.5, 1.5 4.5 lb/ac Spray volume: 30.9 gal/ac

Experiment treated: 11.7.67 Assessment completed: 26.7.67

Full results are given in the histograms overleaf and summarised in the table below.

Herbicide	Dose (lb/ac)	Crops: vvigour reduced by less than 15%	Weeds: number and/or vigour reduced by more than 85%
NC 4762	4.5	oat cocksfoot	all species below
	1.5	above species + wheat barley maize perennial ryegrass timothy pea sorghum groundnut	Tripleurospermum maritimum Senecio vulgaris Galium aparine Sinapis arvensis Raphanus raphanistrum Chenopodium album Polygonum lapathifolium Rumex crispus Spergula arvensis + species below
	0.5	above species + lucerne white clover onion rice	Stellaria media Eupatorium odoratum Portulaca oleracea

Comments on results

1) NC 4762 shows activity on a wide range of species comparable with NC 4780 but requiring higher doses to do so. The earlier Initial Activity Test indicated that this activity on broad-leaved species arose largely through foliar uptake.

2) The present experiment confirms the manufacturers suggestion for selective annual broad-leaved weed control in wheat, barley and oat. The range of weed species controlled includes some of those more resistant to other herbicides.

3) In addition maize and sorghum show resistance and possible post-emergence use in maize should be investigated wherever grass weeds are not a major problem and there is a need to supersede other possible post-emergence herbicides such as atrazine + surfactant in this crop.

4) Selectivity for broad-leaved weed control in peas appears greater than with NC 4780, but higher doses are required. However some action through the soil is involved with NC 4780 whereas performance of NC 4762 should not vary with soil factors.

5) Selectivity in groundnut appears comparable with that given by NC 4780 but again higher doses are needed.

6) Very few weed species were controlled at the lowest dose of 0.5 lb/ac but a possibility for selective control of Stellaria media in onions is indicated.

7) Later observation, 3½ months after treatment, showed recovery from the initial effects on strawberry at 1.5 lb/ac.

8) In addition to normal selective use the range of seedling broad-leaved weeds controlled coupled with the lower activity through the soil pre- and post-emergence (as compared with NC 4780) suggests consideration for use as contact herbicide in situations where crop foliage is not directly or fully exposed to the spray.

TRIAL NUMBER 14

SPECIES	TREATMENTS NC 4762 0.50 LB/AC		NC 4762 1.50 LB/AC		NC 4762 4.50 LB/AC	
WHEAT	100	xxxxxxxxxxxxxxxxxxxx	88	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(1)	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx
BARLEY	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(2)	93	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
OAT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(3)	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
MAIZE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(4)	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxx
PRYGRS	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	81	xxxxxxxxxxxxxxx
(5)	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	64	xxxxxxxxxxx
CKFOOT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(6)	93	xxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
TIMTHY	100	xxxxxxxxxxxxxxxxxxxx	94	xxxxxxxxxxxxxxxxxx	88	xxxxxxxxxxxxxxxxx
(7)	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
LUCERN	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	38	xxxxxxxx
(8)	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	29	xxxxxx
RCLOVR	100	xxxxxxxxxxxxxxxxxxxx	75	xxxxxxxxxxxxxx	63	xxxxxxxxxxxx
(9)	71	xxxxxxxxxxxxx	50	xxxxxxxxxx	36	xxxxxxx
WCLOVR	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	44	xxxxxxxxx
(10)	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	36	xxxxxxx
FDBEAN	50	xxxxxxxxxx	0		0	
(11)	14	xxx	0		0	
PEA	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(12)	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx
SGBEET	50	xxxxxxxxxx	0		0	
(13)	29	xxxxxx	0		0	
SWEDE	10	xx	0		0	
(14)	14	xxx	0		0	

TRIAL NUMBER 14

SPECIES	TREATMENTS NC 4762 0.50 LB/AC		NC 4762 1.50 LB/AC		NC 4762 4.50 LB/AC	
KALE	90	xxxxxxxxxxxxxxxxx	0		0	
(15)	79	xxxxxxxxxxxxxxx	0		0	
CARROT	100	xxxxxxxxxxxxxxxxxxxx	17	xxx	0	
(16)	71	xxxxxxxxxxxxxx	36	xxxxxxx	0	
PRSNIP	75	xxxxxxxxxxxxxxx	50	xxxxxxxxxx	8	xx
(17)	64	xxxxxxxxxxxxx	29	xxxxxx	21	xxxx
DWBEAN	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(18)	71	xxxxxxxxxxxxxx	50	xxxxxxxxxx	21	xxxx
LETTCE	8	xx	0		0	
(19)	14	xxx	0		0	
ONION	92	xxxxxxxxxxxxxxxxx	75	xxxxxxxxxxxxxxx	42	xxxxxxxx
(20)	93	xxxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx	29	xxxxxx
CABBGE	80	xxxxxxxxxxxxxxxx	10	xx	0	
(21)	71	xxxxxxxxxxxxxx	29	xxxxxx	0	
A FATU	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(22)	93	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
P ANNU	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(23)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
A MYOS	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(24)	93	xxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	50	xxxxxxxxxx
T MARI	38	xxxxxxxxxxxxxxxxx	0		0	
(28)	71	xxxxxxxxxxxxxx	0		0	
S VULG	73	xxxxxxxxxxxxxxx	9	xx	0	
(29)	57	xxxxxxxxxxx	7	x	0	
G APAR	100	xxxxxxxxxxxxxxxxxxxx	17	xxx	0	
(30)	64	xxxxxxxxxxxxx	7	x	0	
SI ARV	64	xxxxxxxxxxxxx	0		0	
(31)	29	xxxxxxx	0		0	

TRIAL NUMBER 14		TREATMENTS			
SPECIES	NC 4762 0.50 LB/AC		NC 4762 1.50 LB/AC		NC 4762 4.50 LB/AC	
R RAPH	60	xxxxxxxxxxxx	10	xx	0	
(32)	57	xxxxxxxxxxx	7	x	0	
P RHOE	81	xxxxxxxxxxxxxxxx	44	xxxxxxxxx	25	xxxxx
(33)	93	xxxxxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx	29	xxxxxx
C ALPU	100	xxxxxxxxxxxxxxxxxxxx	33	xxxxxxx	0	
(34)	86	xxxxxxxxxxxxxxxxx	14	xxx	0	
P LAPA	100	xxxxxxxxxxxxxxxxxxxx	0		0	
(35)	86	xxxxxxxxxxxxxxxxx	0		0	
R CRIS	73	xxxxxxxxxxxxxx	9	xx	0	
(36)	57	xxxxxxxxxxx	14	xxx	0	
S MEDE	13	xxx	0		0	
(37)	7	x	0		0	
SP ARV	50	xxxxxxxxxx	0		0	
(38)	43	xxxxxxxxx	0		0	
SRGHUM	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(39)	86	xxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
RICE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	88	xxxxxxxxxxxxxxxxx
(40)	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	50	xxxxxxxxxx
COTTON	100	xxxxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx	0	
(41)	64	xxxxxxxxxxxx	14	xxx	0	
GRDNUT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(42)	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx
TOBCCO	0		0		0	
(44)	0		0		0	
E INDI	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(45)	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
E ODOR	0		0		0	
(47)	0		0		0	

TRIAL NUMBER 14 SPECIES	TREATMENTS NC 4762 0.50 LB/AC		NC 4762 1.50 LB/AC		NC 4762 4.50 LB/AC	
STRWBY	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(49)	71	xxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	50	xxxxxxxxxx
DKCURR	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(51)	71	xxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	57	xxxxxxxxxxx
D SANG	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	92	xxxxxxxxxxxxxxxxxx
(52)	93	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
P OLAC	0		0		0	
(54)	0		0		0	
Agrostis stolonifera	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx
Agropyron repens	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx
Cyperus rotundus	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
Cynodon dactylon	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx

BH 584

(5-chloro-2-isopropylbenzimidazole)

Received: March, 1967 Accession no: 158

Manufacturer: U.S. Borax Chemical Corporation.

Samples supplied by: Borax Consolidated Ltd.
Borax House,
Carlisle Place,
London S.W. 1.

Latest Technical Information:
Preliminary technical data sheet dated March, 1967. Technical Report no. AR-67-1

Manufacturers suggestions for principle uses:
Selective post-emergence in soyabeans

Prior W.R.O. experiments:
Initial Activity Test G.67.13

STANDARD POST-EMERGENCE SELECTIVITY TEST

Expt. no.: G.67.14 Formulation used: aqueous solution 41.5% a.i. w/v

Doses: 0.5, 1.5, 4.5 lb/ac Spray volume: 30.9 gal/ac

Experiment treated: 11.7.67 Assessment completed: 26.7.67

Summary of results

Full results are given in the histograms overleaf and summarised in the table below.

Herbicide	Dose (lb/ac)	Crops: vigour reduced by less than 15%	Weeds: number and/or vigour reduced by more than 85%
BH 584	4.5	oat strawberry	Tripleurospermum maritimum Senecio vulgaris Sinapis arvensis Raphanus raphanistrum Spergula arvensis Portulaca oleracea + species below
	1.5	crops above + wheat barley maize sorghum perennial ryegrass cocksfoot	Papaver rhoeas Stellaria media Eupatorium odoratum
	0.5		no weeds controlled

Comments on results

1) A higher dose of BH 584 was needed to produce effects comparable with NC 4762, NC 4780 and NC 6627. Symptoms caused by this herbicide were similar to those obtained with the NC compounds.

2) In general the grasses were more resistant than the broad-leaved species. The Initial Activity Test had indicated an appreciable amount of root uptake by emerged plants of both groups.

3) A wide range of seedling broad-leaved weeds were controlled at 4.5 lb/ac. However a major point of difference from the NC compounds lies in the resistance of the Polygonaceous species (R. crispus and P. lapathifolium in the present experiment; Polygonum amphibium in the Initial Activity Test).

4) The resistance of strawberry is outstanding. Reinspection of the plants $3\frac{1}{2}$ months after treatment showed them to be indistinguishable from controls at all doses.

5) The range of weeds controlled at doses selective in most cereal crops is restricted and does not indicate any advantage over some existing cereal herbicides.

6) Soyabean, the main crop in which use of this herbicide is suggested, was not included in the present experiment.

7) Data from elsewhere has suggested that some other big-seeded crops may be resistant. Big-seeded crops in the present experiment, such as groundnut, cotton and dwarf bean suffered some damage. This may have occurred because conditions favour movement to the root system and experiments elsewhere may have been under conditions more conducive to depth protection.

TRIAL NUMBER 14								
SPECIES	TREATMENTS BH 584 0.50 LB/AC		BH 584 1.50 LB/AC		BH 584 4.50 LB/AC	
WHEAT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(1)	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	64	xxxxxxxxxxxx
BARLEY	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(2)	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx
OAT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(3)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
MAIZE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(4)	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
PRYGRS	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	88	xxxxxxxxxxxxxxxxxx
(5)	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	50	xxxxxxxxxx
CKFOOT	94	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	25	xxxxx
(6)	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	36	xxxxxxx
TIMTHY	100	xxxxxxxxxxxxxxxxxxxx	94	xxxxxxxxxxxxxxxxxx	69	xxxxxxxxxxxxx
(7)	86	xxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxxx	50	xxxxxxxxx
LUCERN	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	81	xxxxxxxxxxxxxxx
(8)	71	xxxxxxxxxxxxxx	57	xxxxxxxxxx	43	xxxxxxxxx
RCLOVR	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	56	xxxxxxxxxx
(9)	71	xxxxxxxxxxxxxx	50	xxxxxxxxx	29	xxxxx
WCLOVR	100	xxxxxxxxxxxxxxxxxxxx	94	xxxxxxxxxxxxxxxxxx	38	xxxxxxxx
(10)	71	xxxxxxxxxxxxxx	50	xxxxxxxxx	29	xxxxxx
FDBEAN	100	xxxxxxxxxxxxxxxxxxxx	50	xxxxxxxxx	0	
(11)	71	xxxxxxxxxxxxxx	29	xxxxx	0	
PEA	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(12)	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	36	xxxxxxx
SGBEET	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	8	xx
(13)	79	xxxxxxxxxxxxxxxx	50	xxxxxxxxxx	14	xxx
SWEDE	100	xxxxxxxxxxxxxxxxxxxx	30	xxxxxx	0	
(14)	57	xxxxxxxxxx	21	xxxx	0	

TRIAL NUMBER 14

SPECIES	TREATMENTS DH 584 0.50 LB/AC		DH 584 1.50 LB/AC		DH 584 4.50 LB/AC	
KALE	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	10	xx
(15)	86	xxxxxxxxxxxxxxxx	50	xxxxxxxxxx	14	xxx
CARROT	100	xxxxxxxxxxxxxxxxxxx	75	xxxxxxxxxxxxxx	0	
(16)	79	xxxxxxxxxxxxxxx	43	xxxxxxxxx	0	
PRSNIP	100	xxxxxxxxxxxxxxxxxxx	67	xxxxxxxxxxxxx	0	
(17)	86	xxxxxxxxxxxxxxxx	29	xxxxxx	0	
DWDEAN	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(18)	64	xxxxxxxxxxxxx	43	xxxxxxxxx	21	xxxx
LETTCE	100	xxxxxxxxxxxxxxxxxxx	42	xxxxxxxx	0	
(19)	71	xxxxxxxxxxxxxx	14	xxx	0	
ONION	92	xxxxxxxxxxxxxxxxx	83	xxxxxxxxxxxxxxxx	67	xxxxxxxxxxxx
(20)	86	xxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	50	xxxxxxxxxx
CABBGE	100	xxxxxxxxxxxxxxxxxxx	60	xxxxxxxxxxxx	0	
(21)	86	xxxxxxxxxxxxxxxx	36	xxxxxxx	0	
A FATU	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(22)	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
P ANNU	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	69	xxxxxxxxxxxxx
(23)	93	xxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	36	xxxxxx
A MYOS	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx
(24)	93	xxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	29	xxxxx
T MARI	94	xxxxxxxxxxxxxxxxxx	31	xxxxxxxxxxxxxxx	0	
(28)	86	xxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	0	
S VULG	100	xxxxxxxxxxxxxxxxxxx	18	xxxx	0	
(29)	71	xxxxxxxxxxxxxx	21	xxxx	0	
G APAR	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	33	xxxxxxx
(30)	86	xxxxxxxxxxxxxxxx	64	xxxxxxxxxxxxx	21	xxxx
SI ARV	100	xxxxxxxxxxxxxxxxxxx	45	xxxxxxxxx	0	
(31)	57	xxxxxxxxxx	21	xxxx	0	

TRIAL NUMBER 14

SPECIES	TREATMENTS					
	DH 584 0.50 LD/AC		DH 584 1.50 LD/AC		DH 584 4.50 LD/AC	
R RAPH	100	xxxxxxxxxxxxxxxxxxxx	80	xxxxxxxxxxxxxxxx	0	
(32)	79	xxxxxxxxxxxxxxxx	36	xxxxxxx	0	
P RHOE	63	xxxxxxxxxxxx	0		0	
(33)	50	xxxxxxxxxx	0		0	
C ALBU	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	33	xxxxxxx
(34)	79	xxxxxxxxxxxxxxxx	57	xxxxxxxxxx	21	xxxx
P LAPA	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(35)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx
R CRIS	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(36)	86	xxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxxx
S MEDE	100	xxxxxxxxxxxxxxxxxxxx	25	xxxxx	0	
(37)	64	xxxxxxxxxxxxx	7	x	0	
SP ARV	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	6	x
(38)	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx	7	x
SRGHUM	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(39)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxxx
RICE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	88	xxxxxxxxxxxxxxxxx
(40)	86	xxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	43	xxxxxxxxx
COTTON	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	75	xxxxxxxxxxxxxx
(41)	79	xxxxxxxxxxxxxxx	50	xxxxxxxxx	14	xxx
GRDNUT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(42)	79	xxxxxxxxxxxxxxx	64	xxxxxxxxxxxx	43	xxxxxxxxx
TOBCCO	67	xxxxxxxxxxxx	0		0	
(44)	50	xxxxxxxxxx	0		0	
E INDI	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(45)	100	xxxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	64	xxxxxxxxxxxx
E ODOR	100	xxxxxxxxxxxxxxxxxxxx	0		0	
(47)	50	xxxxxxxxxx	0		0	

TRIAL NUMBER 14		TREATMENTS			
SPECIES	BH 584 0.50 LB/AC		BH 584 1.50 LB/AC		BH 584 4.50 LB/AC	
STRWBY	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(49)	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
BKCURR	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(51)	100	xxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
D SANG	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	92	xxxxxxxxxxxxxxxxx
(52)	93	xxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
P OLAC	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	11	xx
(54)	100	xxxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx	21	xxxx
Agrostis stolonifera	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx
Agropyron repens	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
Cyperus rotundus	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
Cynodon dactylon	100	xxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx

BH 1455

(confidential)

Received: March, 1967 Accession no. 159

Manufacturer: U.S. Borax Chemical Corporation

Samples supplied by: Borax Consolidated Limited,
Borax House,
Carlisle Place,
London S.W. 1.

Latest Technical Information:
Preliminary Technical Data Sheet dated February, 1967
Technical Report no. AR-66-5. December, 1966

Manufacturer's suggestions for principle uses:
Post-emergence against wild oats in cereals at 2-5 lb/ac.

Prior W.R.O. experiments:
None

STANDARD POST-EMERGENCE SELECTIVITY TEST

Expt. no.: G.67.14 Formulation used: (assumed 95% a.i. w/w) technical material dissolved in 80% acetone in water mixture

Doses: 0.66, 2.0, 6.0 lb/ac Spray volume: 30.9 gal/ac

Experiment treated: 11.7.67 Assessment completed: 26.7.67

Summary of results

Full results are given in the histograms overleaf.

Comments on results

1) Even at 6 lb/ac this herbicide showed little or no effect on any species, including Avena fatua.

2) The Avena fatua was at the 4- to 5-leaf stage at the time of application. This might have been too advanced a stage of growth to secure maximum effect. The original emulsifiable concentrate supplied by the manufacturer was in unsatisfactory condition and therefore technical material was dissolved in an acetone-water mixture. This dried very rapidly on application and thus may have reduced opportunity for penetration. The time interval between spraying and assessment was relatively short due to the good growing conditions prevailing at the time. In case this herbicide was very slow acting the Avena fatua pots were retained for several weeks afterwards but no symptons developed.

3) In order to elucidate whether the first two points referred to under (2) above, accounted for the lack of effect on A. fatua, a subsidiary experiment was conducted. A comparison was made of the performance of technical material dissolved in acetone-water as before with an emulsifiable concentrate made up by dissolving technical material in an aromatic solvent with emulsifier. Application was made to A. fatua at the 1½-leaf stage. Even at 6 lb/ac there was no mortality. In the case of the emulsifiable concentrate there was a considerable amount of foliar scorch attributable to the solvent (a solvent-emulsifier control was included). However 6 lb/ac in emulsion reduced the fresh weight to 54% of the appropriate control 15 days after application, whereas there was no reduction with 6 lb/ac in acetone-water. Barban at the recommended dose

of 5 oz/ac in the same experiment gave no appreciable effect; this was presumably due to the absence of competition from a crop and this experiment does not rule out the possibility that BH 1455 might perform better under competitive conditions. A field experiment conducted at W.R.O. during 1967 does not indicate this to be a likely possibility however.

TRIAL NUMBER 14

SPECIES		TREATMENTS DH 1455 0.66 LB/AC		DH 1455 2.00 LB/AC		DH 1455 6.00 LB/AC
WHEAT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(1)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
BARLEY	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(2)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
OAT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(3)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
MAIZE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(4)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
PRYGRS	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(5)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
CKFOOT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(6)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx
TIMTHY	100	xxxxxxxxxxxxxxxxxxxx	94	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(7)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
LUCERN	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(8)	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx
RCLOVR	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(9)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx
WCLOVR	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(10)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx
FDBEAN	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(11)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
PEA	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(12)	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
SGBEET	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(13)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
SWEDE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(14)	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxxx

TRIAL NUMBER 14

SPECIES		DH 1455 0.66 LB/AC		DH 1455 2.00 LB/AC		DH 1455 6.00 LB/AC
		TREATMENTS				
KALE	100	xxxxxxxxxxxxxxxxxxxx	90	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(15)	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
CARROT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(16)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
PRSNIP	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(17)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
DWBEAN	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(18)	93	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
LETTCE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(19)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
ONION	92	xxxxxxxxxxxxxxxxxx	92	xxxxxxxxxxxxxxxxxx	92	xxxxxxxxxxxxxxxxxx
(20)	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
CABBGE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	90	xxxxxxxxxxxxxxxxxx
(21)	93	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
A FATU	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(22)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
P ANNU	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(23)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
A MYOS	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(24)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	71	xxxxxxxxxxxxx
T MARI	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(28)	93	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
S VULG	100	xxxxxxxxxxxxxxxxxxxx	45	xxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(29)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
G APAR	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(30)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
SI ARV	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(31)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx

TRIAL NUMBER 14

SPECIES	TREATMENTS					
	DH 1455 0.66 LB/AC		DH 1455 2.00 LB/AC		DH 1455 6.00 LB/AC	
R RAPH	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(32)	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
P RHOE	100	xxxxxxxxxxxxxxxxxxxx	94	xxxxxxxxxxxxxxxxxx	88	xxxxxxxxxxxxxxxxx
(33)	93	xxxxxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx	79	xxxxxxxxxxxxxxx
C ALBU	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(34)	93	xxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
P LAPA	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(35)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
R CRIS	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(36)	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
S MEDE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(37)	86	xxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
SP ARV	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(38)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
SRGHUM	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(39)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
RICE	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(40)	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	86	xxxxxxxxxxxxxxxx
COTTON	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(41)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
GRDNUT	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(42)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
TOBCCO	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(44)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
E INDI	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(45)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
E ODOR	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx
(47)	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxxx

TRIAL NUMBER 14

SPECIES		TREATMENTS BH 1455 0.66 LB/AC		BH 1455 2.00 LB/AC		BH 1455 6.00 LB/AC
STNWDY	100	xxxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(49)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
BKCURR	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(51)	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
D SANG	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(52)	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
P OLAC	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
(54)	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
Agrostis stolonifera	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
Agropyron repens	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	93	xxxxxxxxxxxxxxxxxx
Cyperus rotundus	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx
Cynodon dactylon	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx	100	xxxxxxxxxxxxxxxxxxx

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1. Susceptibility of ornamental plants to simazine and other chemicals. Trees and shrubs. November, 1964. G.W. Ivens. Price - 5s. 0d.

2. 3,5-Di-iodo-4-hydroxybenzonitrile. A progress report on experimental work by the A.R.C. Weed Research Organization. May-October, 1963. K. Holly and J. Holroyd. No charge.

3. Chemical control of bracken. 1964. G.L. Hodgson. Out of print.

4. Susceptibility of ornamental plants to simazine and other chemicals. Annuals, biennials and herbaceous perennials. April, 1965. G.W. Ivens. Price - 2s. 6d.

5. A survey of the problem of aquatic weed control in England and Wales. October, 1967. T.O. Robson. Price - 5s. 0d.

6. The botany, ecology, agronomy and control of Poa trivialis L. - rough-stalked meadow-grass. November, 1966. G.P. Allen. Price - 5s. 0d.

7. Flame cultivation experiments 1965. October, 1966. G.W. Ivens. Price - 3s. 0d.

8. The development of selective herbicides for kale in the United Kingdom. 2. The methylthiotriazines. Price - 5s. 0d.

9. The post-emergence selectivity of some newly developed herbicides (NC 6627, NC 4780, NC 4762, BH 584, BH 1455). December, 1967. K. Holly and Mrs. A.K. Wilson. Price - U.K. and overseas surface mail - 4s. 3d.; overseas airmail - 10s. 0d.