CYCLOXYDIM - A NEW SELECTIVE POST-EMERGENCE HERBICIDE FOR CONTROL OF ANNUAL AND PERENNIAL GRASSES IN BROAD-LEAVED CROPS

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Summary. Cycloxydim (BAS 517, Focus®) is a new post-emergence herbicide for the selective control of annual and perennial grasses in broad-leaved crops. In Australian trials, excellent control of wild oats, *Avena fatua,* ryegrass, *Lolium rigidum*, phalaris, *Phalaris paradoxa*, barley grass, *Hordeum leporinum*, great brome, *Bromus diandrus*, wheat, *Triticum aestivum*, and barley, *Hordeum vulgare*, was achieved with rates of 100g a.i./ha and above, used with 1.0 L/ha of crop oil (Ampol DC Trate) applied when weeds were up to the early tillering stage. The addition of crop oil increased the level of control obtained with cycloxydim which showed no phytotoxic effects on field peas, faba beans or lupins.

INTRODUCTION

Cycloxydim is a new post-emergence herbicide for the selective control of annual and perennial grasses in broad-leaved crops. It was developed in the laboratories of BASF AG and is currently being tested in field trials in Australia by Hoechst Australia Limited.

The acute oral LD50 of the active ingredient for rats is 3940 mg/kg. The acute dermal LD50 is in excess of 2000 mg/kg for rats (1).

Cycloxydim is primarily absorbed through green plant tissue but there is also some uptake through the roots. Foliar penetration is very rapid and cycloxydim is translocated systemically towards the meristematic tissue. Sensitive grasses stop growing within 8 hours of application and cease competition with the crop. This is followed by yellowing of the younger leaves and by tissue disintegration. Symptoms generally become visible 4 to 5 days after application. Humid and warm weather or vigorous growing conditions accelerate the development of these symptoms while low moisture and cool temperatures slow the action. Cycloxydim has some pre-emergence activity, however, this is generally weaker than the post-emergence action and this activity only lasts for a short period because of the fast decomposition of the active ingredient (1).

Cycloxydim has given a high level of control of a range of annual grass weeds commonly occurring in broad-leaved crops in Australia. The addition of a crop oil concentrate (Ampol DC Trate) to cycloxydim increased the efficacy on these grass weeds. Tolerance of broad-leaved crops such as field peas, faba beans and lupins has been excellent. This paper gives general information on cycloxydim and reports on field trials conducted in 1988 in Australia on wild oats, *Avena fatua*, ryegrass, *Lolium rigidum*, annual phalaris, *Phalaris paradoxa*, barley grass, *Hordeum leporinum*, great brome, *Bromus diandrus,* wheat, *Triticum aestivum*, and barley, *Hordeum vulgare*. (Hoechst trial reports 1988, unpublished data).

METHODS

Seven field trials conducted in 1988 are summarized below. In all trials an EC formulation containing 200 g active ingredient per litre was used. All trials were laid out as randomized complete block design with four replicates. Plot sizes ranged from 2x10 m to 2.5x20 m. All treatments were applied using AZO propane gas powered sprayers with flat fan nozzles in a water volume of 80 - 138 L/ha. Efficacy was assessed by taking plant counts in each plot.

RESULTS AND DISCUSSION

The level of control of phalaris and ryegrass with cycloxydim at rates of 25 and 50 g/ha, both with and without crop oil at 1.5 L/ha, is shown in Table 1. Two trials are reported. The times of spraying were 77 days after sowing (NT 13/88) with phalaris at growth stages up to

early tillering, and 67 days after sowing (VH 1/88) with ryegrass at growth stages from three leaf to early tillering. Weed density was 445 plants/m^2 of phalaris and 356 plants/m^2 of ryegrass.

Table 1. Control of phalaris (NT 13/88) and ryegrass (VH 1/88) with cycloxydim, with and without the addition of crop oil.

Rate		Weed Control (%)	
Cycloxydim g a.i./ha	Crop oil L/ha	Phalaris (NT 13/88)	Ryegrass (VH 1/88)
25	-	21	0
25	1.5	44	87
50	-	14	52
50	1.5	76	99

For both phalaris and ryegrass, control with cycloxydim was increased with the addition of crop oil to the spray mixture. This has confirmed overseas results where the addition of crop oil concentrate helps the uptake of cycloxydim by plants (1).

Weed control obtained with five rates of cycloxydim on a range of species are shown in Table 2. All treatments included the addition of crop oil.

Table 2. Control of wild oats (WO), ryegrass (RG), phalaris (PH), barley grass (BG), great brome (GB), wheat (W) and barley (B) with a range of rates of cycloxydim.

Rate cycloxydim	Weed Control (%)						
g a.i./ha	WO	RG	PH	BG	GB	W	B
25	88	87	44	31	17	36	64
50	100	100	74	91	49	79	98
100	100	100	98	100	100	100	100
150	100	100	100	98	100	100	100
200	100	100	100	100	100	100	100
Trial reference	NW18/88	VH1/88	NT13/88	S17/88	VN12/88	S12/88	S15/88
Plant density/m^2	203	356	445	45	73	121	110
Weed stage at application	2 leaf to early till	2 leaf to early till	Early till	Early till	1 leaf to early till	Early till	Early till

Excellent control of all these grass species was obtained with cycloxydim at rates of 100g a.i./ha and above. These trials indicate varying susceptibility of the different grass species to cycloxydim with wild oats and ryegrass being the most susceptible. Barley, barley grass, phalaris, wheat and great brome are increasingly more tolerant to cycloxydim.

All crops showed excellent tolerance to cycloxydim. Crops tested for tolerance to cycloxydim include field peas, faba beans and lupins. (Hoechst trial reports 1988, 1989, unpublished data).

REFERENCES

1. Anon, 1988. Focus® Product Brochure. BASF AG APHB 3563 EAF-05, 88-1.0, 6-113.