1989

Herbicide residues

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EXPERIMENTAL SUMMARY

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Herbicide Residues

Trials 88SG28, 29. Pea growth following sulphonyl urea herbicide.

Trials 88SG30, 31; 88LG68, 69, 70. Medic regeneration following sulphonyl urea herbicide use.

(For site details see 1988 summary.)

Results

Trials 88LG68, 69, 70 were sown to medic in May, but nothing emerged. A seeding error is suspected. No results were obtained.

Trials 88SG28-31 were sown to peas or medic as appropriate on ..... Pea emergence was markedly varied between replicate blocks, possibly due to seeding depth. Plots were therefore not harvested as any differences would be non-significant. Plant growth was assessed visually for any retardation and/or symptoms of sulphonyl urea.

Herbicide	Rate	Timing	Visual assessment of growth cf. control plots			
			Red clay loam		Circle Valley sand	
			Peas	Medic	Peas	Medic
Logran	60 g	Pre-em.	90%	=	=	=
Logran	30 g	Pre-em.	=	=	=	=
Glean	30 g	Pre-em.	90%	=	=	90%
Glean	15 g	Pre-em.	=	=	=	=
Glean	30 g	Post-em.	90%	90%	80%	75%
Glean	15 g	Post-em.	=	=	95%	90%
Glean	7.5 g	Post-em.	=	=	=	=
Ally	10 g	Post-em.	=	90%	=	(80%)
Ally	5 g	Post-em.	=	=	=	=

Note: Lower rates of herbicide were in the trial, and showed no growth reduction. Only the highest rates showing no effect are recorded here.

Ally at 10 g is recorded as reducing medic at Circle Valley, but in reality this was due to one replicate with signs of scorch. The other replicates showed no growth retardation.

From these results and the previous trial (86SG25) it would appear that in any "normal" Western Australian season, sulphonyl urea herbicides are unlikely to carry over to the following crop at levels high enough to cause problems.

Trial work will continue however, and no firm recommendations should be given as yet.

Herbicide Resistant Weeds

Trials 88MO52; 89WH6. Control of partly resistant ryegrass by Hoegrass.

Brian Ellis, Bindi Bindi; WHRS.

88MO52 continued (see 1988 summary) and 89WH6 commenced, with Hoegrass at 750 or 1,000 mL/ha applied to ryegrass at Z11-12, Z14-15 or Z21-22.

Results

Ryegrass on 88MO52 has become more resistant, and there was much less effect from Hoegrass than in 1988 (Figure 1). There is slightly better control from the higher rate at Z11-12, but this is lost as the ryegrass ages. Wheat yield was still improved by applying the higher rate earlier (Figure 2). Spraying tillered ryegrass gave no yield increase.

Ryegrass on 89WH6 is much less resistant, and there is only a non-significant trend toward poorer control with later application (Figure 3). This is reflected in the yield data, where the lower rate is nearly as effective and the penalty for late spraying is not so severe as at 88MO52 (Figure 4).

Trial 89WH5

Wongan Hills Research Station, bulk sown Kulin wheat.

A trial developed from 88WH51 to measure the emergence patterns of ryegrass and assess the competitive potential of weekly cohorts.

Treatments

Small plots (2 m x 2 m) hand weeded for 29, 37, 44, 52, 57 or 80 days after sowing (1, 2, 3, 4, 5, 8 weeks after first emergence). Ryegrass emerging after weeding stopped were tagged to monitor seed production. Other weeds were removed from all plots each week.

Results

Ryegrass emergence was very similar to 1988, 60% in the first week, 20% in the second (Figure 5). Survival rates within each cohort were not significantly different, which is rather surprising, but the later cohorts were not able to grow well and set little seed (Figure 6). Thus they contribute little to the seed bank.

This indicates that the optimum time for herbicide application to reduce ryegrass numbers will be about two weeks after emergence, when most plants will have emerged but will still be small and easily controlled. Enough plants should emerge after spraying to minimize the development of resistance.

Trial 89WH5A. Effects of time of application of Hoegrass.

Wongan Hills Research Station, bulk sown Kulin wheat.

Treatments

Hoegrass (1 L/ha) applied 1, 2, 3, 4 or 5 weeks after first emergence, to partly resistant ryegrass.

Ryegrass was hand harvested from 3 x 0.5 m^2 quadrats per plot, and wheat was machine harvested.

Results

For all parameters measured (ryegrass numbers, ryegrass seed spikelets, ryegrass seed weight and wheat yield) the best results were obtained from the earliest spraying.

Spray time weeks after emergence	Ryegrass /m^2	Rye weight g/m^2	Spikelets /m^2	Wheat kg/ha
1	6	4.7	258	1,826
2	10	12.0	575	1,788
3	20	18.2	966	1,588
4	14	12.2	747	1,592
5	18	17.9	1,047	1,689
Unsprayed	47	42.3	2,333	1,542

Ryegrass numbers were generally low on the site, and the wheat yield data is just significant ($p = 0.034$) by regression analysis. All ryegrass data is highly significant ($p = 0.001$). See also Figure 7.

Trial 89SH51. Alternative herbicides for control of Hoegrass resistant ryegrass.

Wongan Hills Research Station, continuous cropping paddock with the most resistant ryegrass.

Treatments as listed. Hoegrass was applied to Z21 ryegrass other treatments were IBS. Ryegrass was harvested from 4 x 0.5 m^2 quadrats per plot, and wheat was machine harvested.

Treatment /ha	Ryegrass /m^2	Rye weight g/m^2	Spikelets /m^2	Wheat kg/ha
Control	46	43	2,330	1,834
Glean 15 g	8	7	394	2,112
Logran 30 g	15	7	435	2,097
Treflan 1 L	10	11	637	2,033
Stomp 1.5 L	12	18	1,007	1,925
Stomp plus 1 L	18	20	1,105	1,950
SRT 95H	12	12	555	1,996
SRT E108	24	22	1,147	1,974
SRT 115A	15	18	582	1,994
Hoegrass 1 L	18	43	1,094	1,869
lsd	6	5	280	63

The SRT are formulations of Slow Release Trifluralin designed to reduce volatalization. They were used at rates of trifluralin equivalent to 1 L/ha of Treflan.

This site was worked-up some weeks before seeding, and had a clean lupin crop in 1988. Hence the relatively low ryegrass numbers and the small yield increases from successful herbicides. Hoegrass gave some suppression without reducing numbers. Glean, Logran and Treflan gave reasonable control. The seed set is an important factor for any alternative herbicide used in a herbicide rotation programme, as a large seed set can produce an unmanageable weed population next season.

Fig. 1 Effect of Hoegrass spraying time on ryegrass survival and growth, Bindi-Bindi, 1988 & 1989

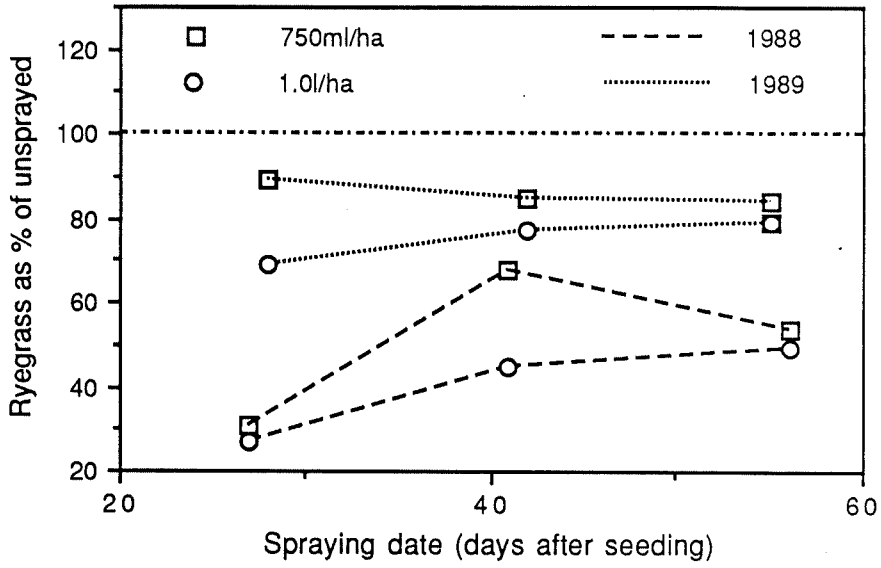

Fig. 2 Effect of Hoegrass spraying time on lupin (1988) and wheat (1989) yield at Bindi-Bindi

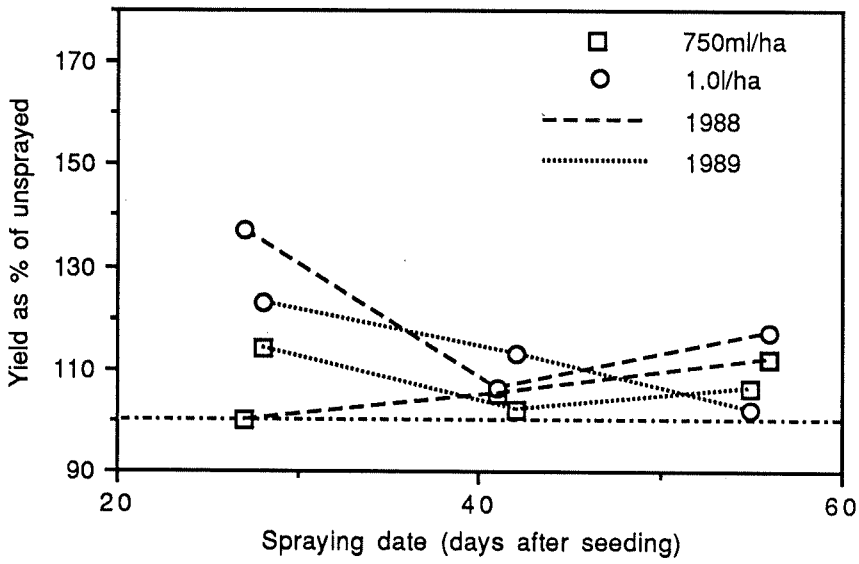

Fig.3. Effect of time and rate of Hoegrass application on ryegrass biomass at harvest - Wongan Hills

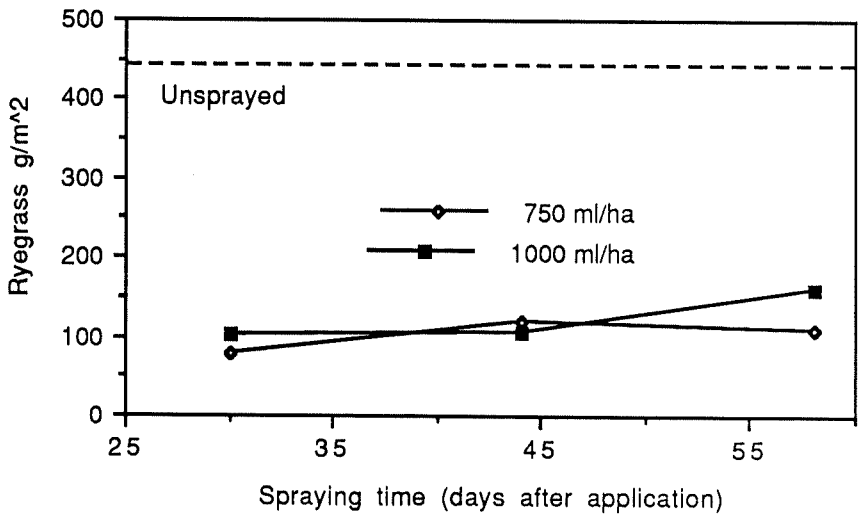

Fig. 4 Effect of time and rate of Hoegrass application on wheat yield - Wongan Hills

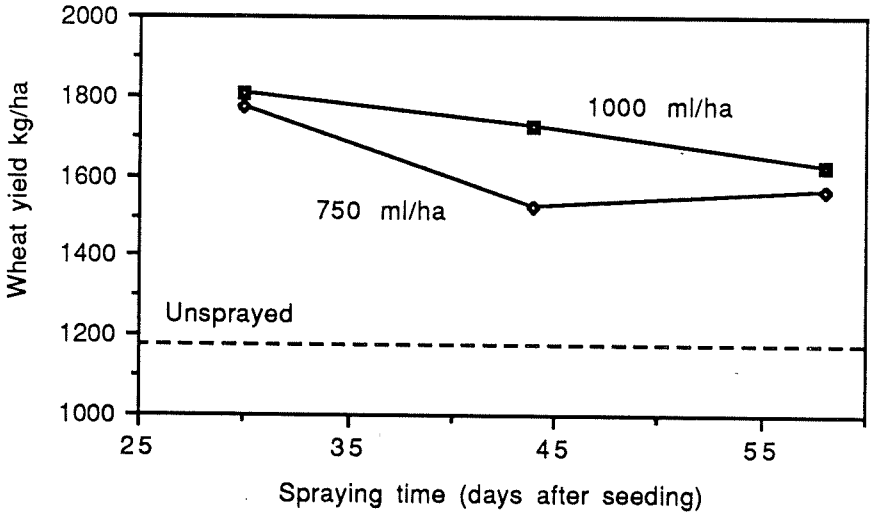

Fig 5. Weekly ryegrass emergence on plots at Wongan Hills, expressed as a % of total emergence from the plot for the year.

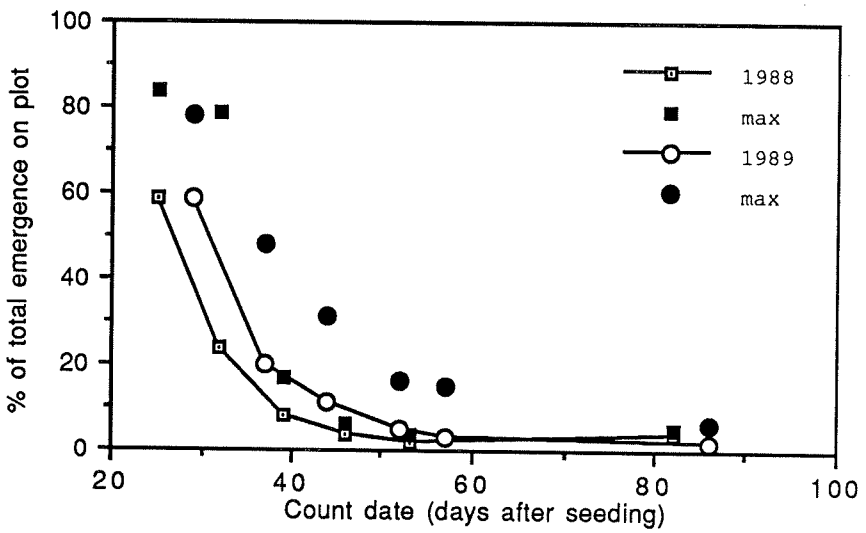

Fig 6. Survival and seedset of weekly emergences of ryegrass plants at Wongan Hills, 1989.

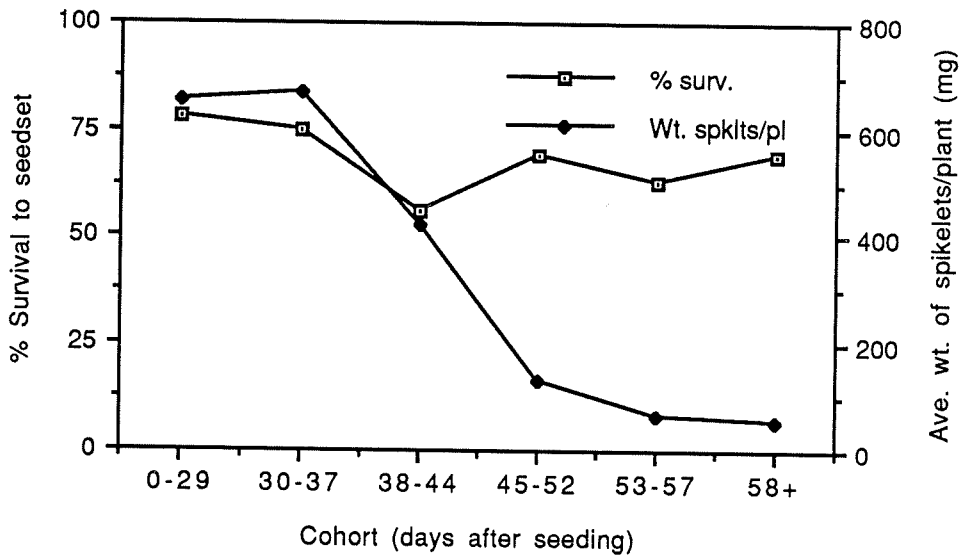

Fig. 7 Effect of time of application of diclofop-methyl (375 g/ha) on yield of wheat and on numbers of ryegrass spikelets.

Regression equations:	Probability
Log Wheat yield = 7.5 - 0.009 Spraytime	0.039
Log Spikelet no. = 6.5 + 0.107 Spraytime	0.001

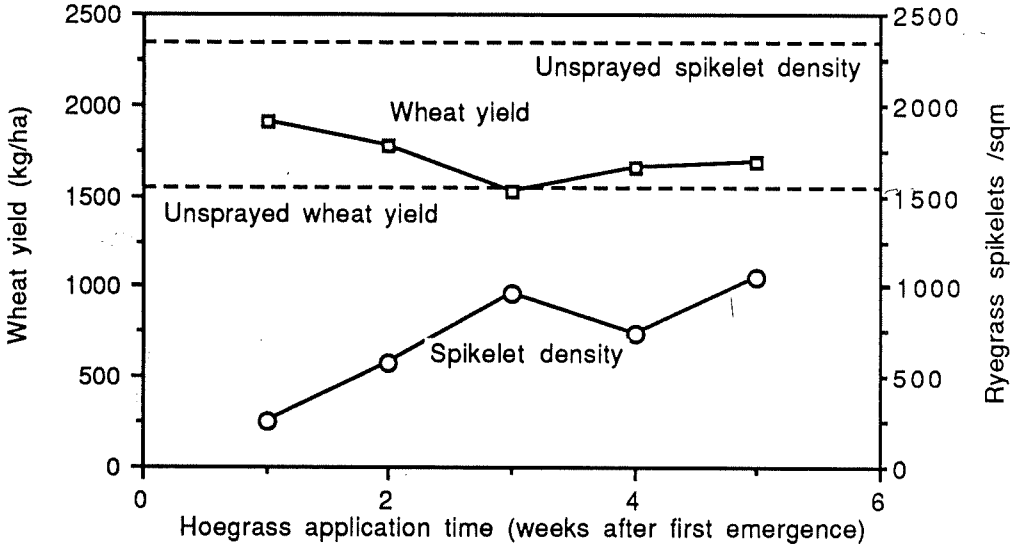

Fig. 8 Effect of various herbicides on ryegrass numbers and biomass and on wheat yield - Wongan Hills 1989