1988

Herbicide residues

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EXPERIMENTAL SUMMARY

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Herbicide Residues

Trial 86SG25 suggested that legumes could be successfully grown on alkaline soil 1 year after the use of Glean, rather than the 2 year recropping interval stipulated on the label. A series of trials was begun to more fully research the safe plant back period.

88SG28,29 Pea growth following sulphonyl urea herbicide use.
88SG30,31; 88LG68,69,70 Medic regeneration following the use of the herbicide Glean.

All trials contain the same treatments:

Logran at 13, 17.5, 22, 26, 52 g/ha Pre-plant.
Glean at 7.5, 10, 12.5, 15, 30 g/ha Pre-plant and post-emergence.
Ally at 3, 5, 10 g/ha Post-emergence.
Plus Controls.

88SG28,30. Red clay, pH 7.5-8.0.
88SG29,31. Loamy sand, pH 6.5-7.4.
88LG68. Loamy sand, pH 7.5.
88LG69. Loamy sand pH 7.0-7.8.
88LG70. Loamy sand pH 6.0-7.5.

These trials were commenced this year, but no results will be obtained until the herbicide treated areas are sown in 1989.

Herbicide Resistant Weeds

88PE74 Crane's ryegrass reponse to Hoegrass

A pot trial designed to establish an accurate response curve for ryegrass known to be resistant to Hoegrass. Hoegrass at rates of 0, 1, 2, 4, 6, 9, 12, 16, 20, 25, 32 L/ha was applied to ryegrass seedlings at Z12-14 growth stage.

Results

All rates of ryegrass from 1 L/ha upwards killed about 25% of ryegrass plants, with no significant differences between rates. Surviving plants were not reduced in height or vigour and showed no symptoms of Hoegrass injury. At the highest rates some sign of xylene damage (from the formulation) was evident. No LD_{50} was obtained as no rate killed plants or reduced growth by 50% (Figure 1).

88MO51 Timing of applications of Sertin to Hoegrass resistant ryegrass

A long term trial wherein Sertin will be applied annually to ryegrass that has demonstrated the ability to develop resistance, at different rates (250, 500, 1,000 mL/ha) and different timings (21, 28, 35, 42, 49 days after seeding) to establish if any particular rate or timing enhances or retards the development of resistance. This year no measurements were taken, but levels of resistance will be assessed in ryegrass survivors in future years.

88MO52 Control of partly resistant ryegrass by Hoegrass

In a situation where ryegrass is suppressed rather than killed by Hoegrass, an ecnomic yield response can still be obtained from the herbicide. Ultimately however, continued use will lead to total resistance. This is a long term trial wherein Hoegrass at 750 or 1,000 mL/ha will be applied annually in-crop to Z11-12, Z14-15 or Z21-22 ryegrass to establish the degree of ryegrass control, yield response, and shift in resistance levels.

Results

Ryegrass numbers at harvest were minimized by early spraying (Figure 2). This was not reflected in early counts, where any mortality was compensated by later germinations. Lupin yield was not affected by either rate or time of spraying - a surprising result but indicating that ryegrass had little competitive ability this season at this site, where moisture was plentiful and nitrogen competition was not a factor (Figure 3).

Ryegrass seed from these plots has yet to be tested for resistance.

88WH51 Competitive effects of various cohorts of ryegrass

A field trial to obtain data on the emergence patterns of ryegrass, to measure the competitive potential of successive germinations of ryegrass, and to compare the effects of different spraying times on yield.

Site

Wongan Loamy Sand, WHRS bulk sown Kulin wheat.

Treatments

Small plots (1 m x 1 m) hand weeded for 25, 32, 39, 46, 53 or 82 days after sowing, or sprayed with Hoegrass 25, 32, 46 or 53 days after sowing, plus controls. Other weeds were removed weekly. Ryegrass counts taken over the full plot and wheat harvested from the centre .5 m x .5 m.

Results

Some 90% of ryegrass emerged by 5 weeks after sowing (Figure 4). Survival of ryegrass to maturity was low even for early germinators, and acceptably low for those emerging more than 5 w.a.s. (Figure 5). Hoegrass significantly reduced ryegrass survival but there was no difference between times of application (Figure 6). Taken together, these results would indicate that to optimize ryegrass control (i.e. to both remove competition and minimize seed set) Hoegrass would have been best applied 4-5 weeks after seeding. The small number of late germinating ryegrass (Figures 4 & 5) would serve to minimize the development of resistance.

Wheat yield showed the usual response to weed removal (Figure 7) but yields were very variable. The 1 m^2 plots proved too small to overcome seeding variation.

A repeat of this trial is necessary before any firmer conclusions can be drawn.

Herbicide Mixtures

88PE37 Herbicidal effects of Roundup/Sprayseed mixtures

A pot trial designed to test a farmer grapevine rumour that a small admixture of Sprayseed could improve the performance of Roundup.

Treatments

Roundup at 0, 200, 400, 600 and 800 mL/ha with added Sprayseed at 0, 20 or 40 mL/ha.

Test plants

Clover (hard to kill; broadleaf).
Wheat (easy to kill; grass).

Results

See Figure 8.

Sprayseed at 20 and 40 mL/ha retarded growth of both species.

Wheat was severely affected by 200 mL/ha Roundup and the effect was enhanced by Sprayseed addition.

Clover was not completely killed even by 800 mL/ha of Roundup, and Sprayseed reduced the effect.

The addition of Sprayseed may appear to enhance the performance of Roundup by increasing its effect upon grasses but these are easier to kill and Roundup alone will perform satisfactorily. The control of the harder to kill broadleaf weeds will be reduced however and the overall result will be lessened. It is concluded that such a herbicidal mixture to be of practical benefit.

88PE38 Herbicidal effects of Fusilade/Sertin mixtures

Sertin has often been tank mixed with Fusilade to overcome Fusilade's relative weakness against ryegrass. This pot trial evaluates the performance of this mixtures and other grass herbicides against the main grass weeds.

Treatments

Fusilade 250 mL/ha.
Sertin 500 mL/ha.
Fusilade 187 mL/ha + Sertin 125 mL/ha.
Fusilade 125 mL/ha + Sertin 240 mL/ha.
Fusilade 52 mL/ha + Sertin 375 mL/ha.
Verdict 635 mL/ha.
Assure 500 mL/ha.
Hoegrass 1,000 mL/ha.

Test plants

Brome grass.
Barley grass.
Rye grass.
Oats.

Treated at Z13-14 growth stage, visually evaluated weekly.

Results

The treatments were ranked for both speed of action and final efficacy, as follows:

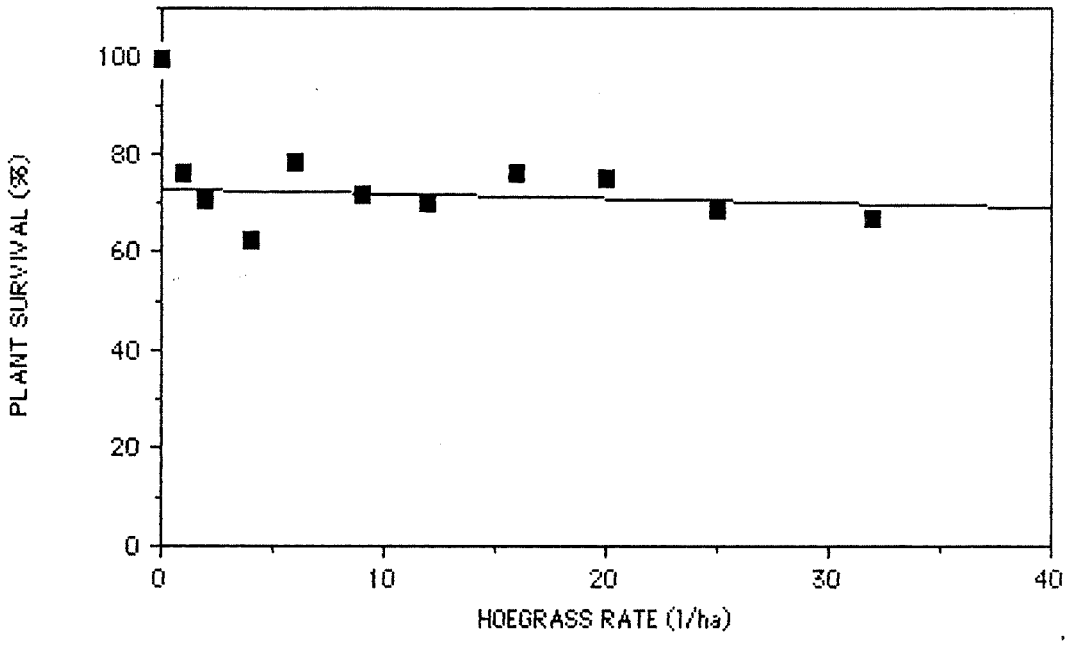
	Barley grass		Brome grass		Rye grass		Oats	
	Sp	Ef	Sp	Ef	Sp	Ef	Sp	Ef
Assure	+	+	+	+	o	o	-	o
Verdict	+	+	o	o	o	o	+	o
Fusilade	-	o	-	-	-	-	o	o
F187 + S	-	o	o	o	o	o	o	o
F125 + S	-	o	-	o	o	o	o	o
F 62 + S	-	-	-	-	o	o	o	o
Sertin	No test		No test		+	o	No test	
Hoegrass	No test		No test		o	o	o	o

\+ Indicates faster or more effective control.
\- Indicates slower or less complete control than the average herbicide (o).

It should be noted that all herbicides gave a result that would be commercially very acceptable. The trial will be repeated at lower rates to give a more exact ranking of products.

FIG. 1. CRANE'S RYEGRASS RESPONSE TO HOEGRASS

a) PLANT SURVIVAL



b) PLANT SIZE

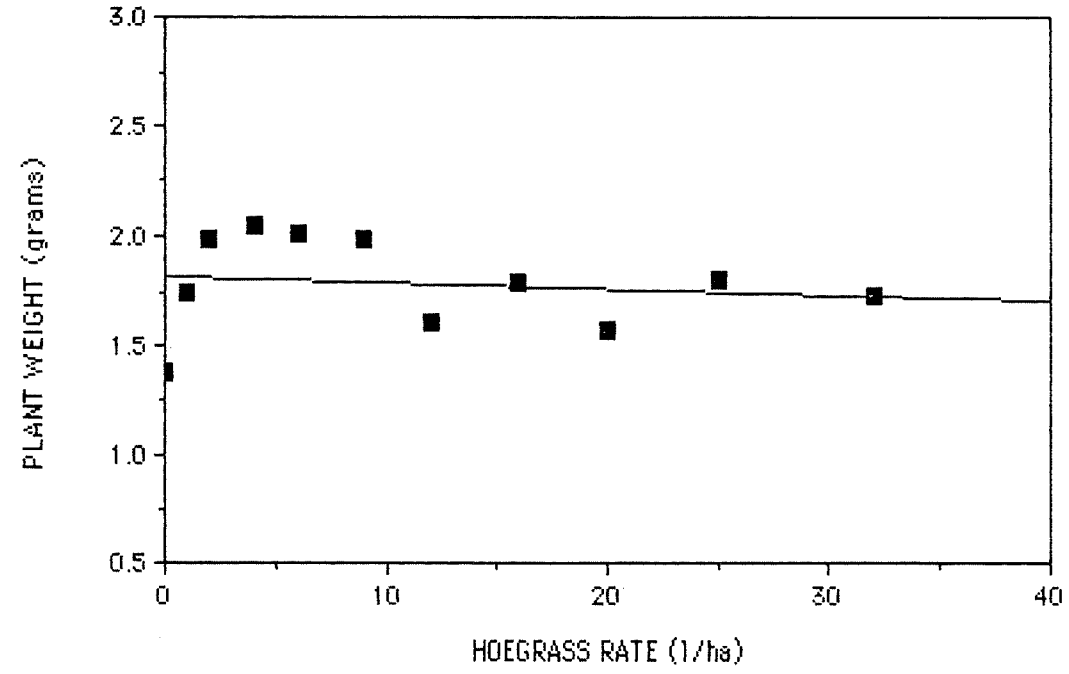


FIG. 2. EFFECT OF TIME AND RATE OF HOEGRASS APPLICATION ON RYEGRASS NUMBERS AT HARVEST

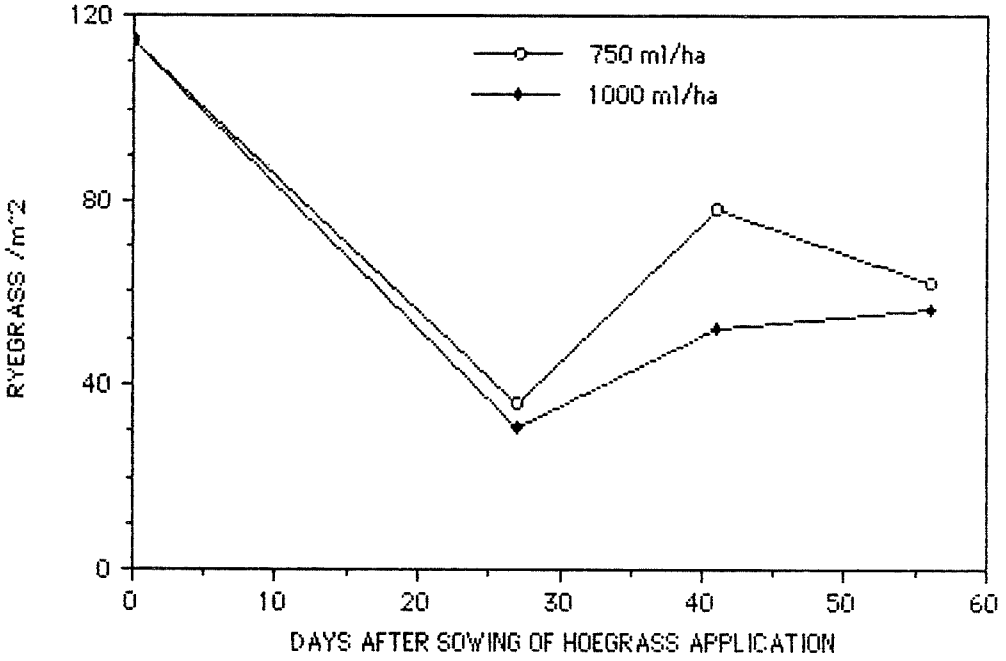


FIG. 3. EFFECT OF TIME AND RATE OF HOEGRASS APPLICATION ON LUPIN YIELD

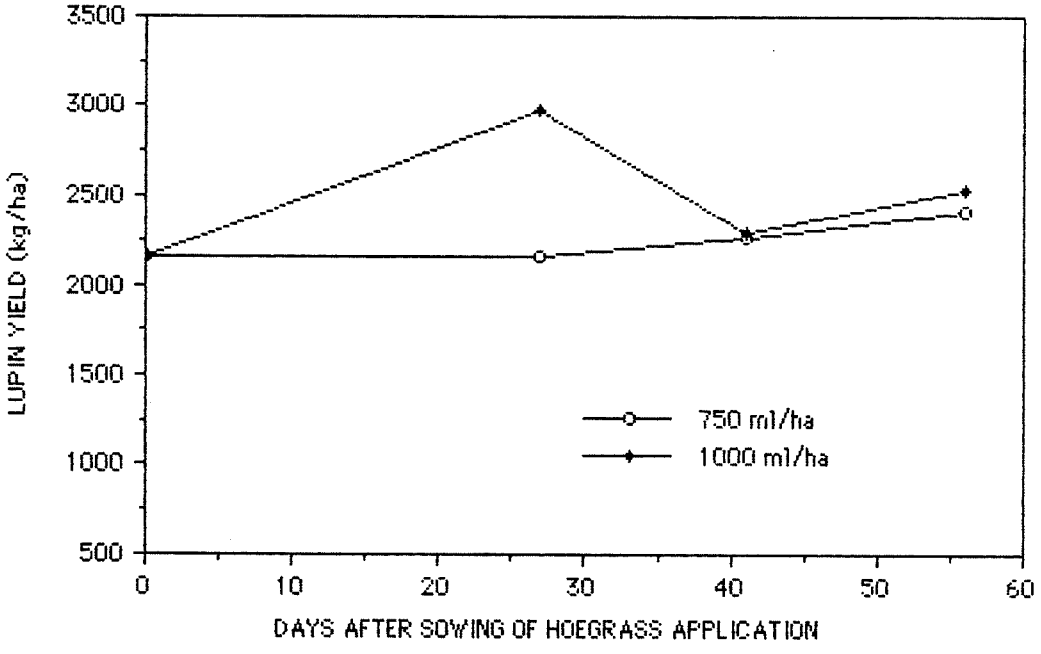


FIG.4 RATE OF RYEGRASS EMERGENCE AFTER SEEDING

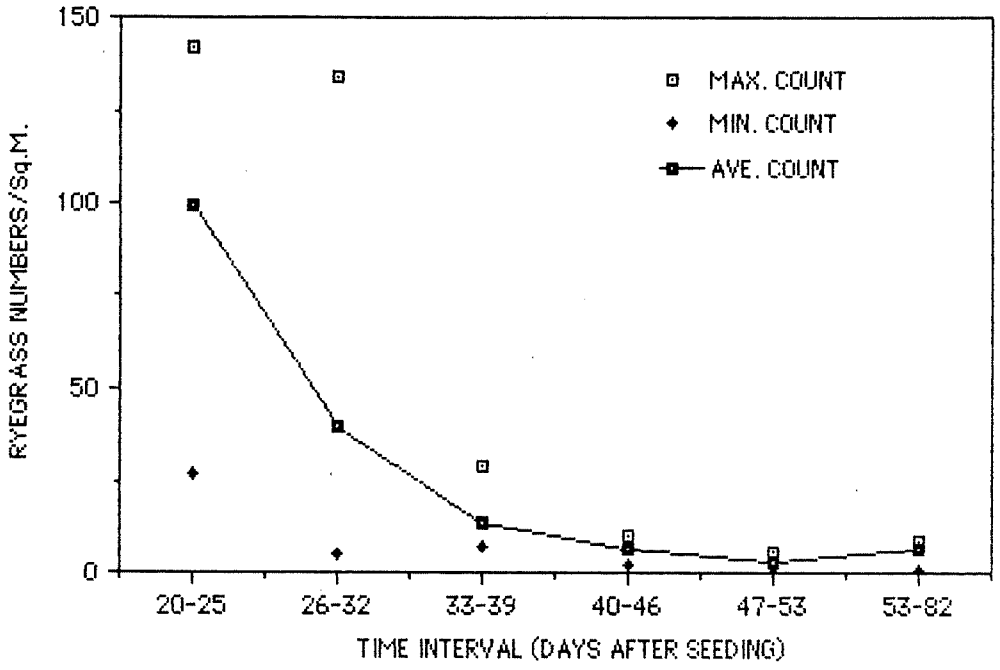


FIG. 5 EFFECT OF WEEDING TIME ON RYEGRASS NUMBERS 100 DAYS AFTER SEEDING

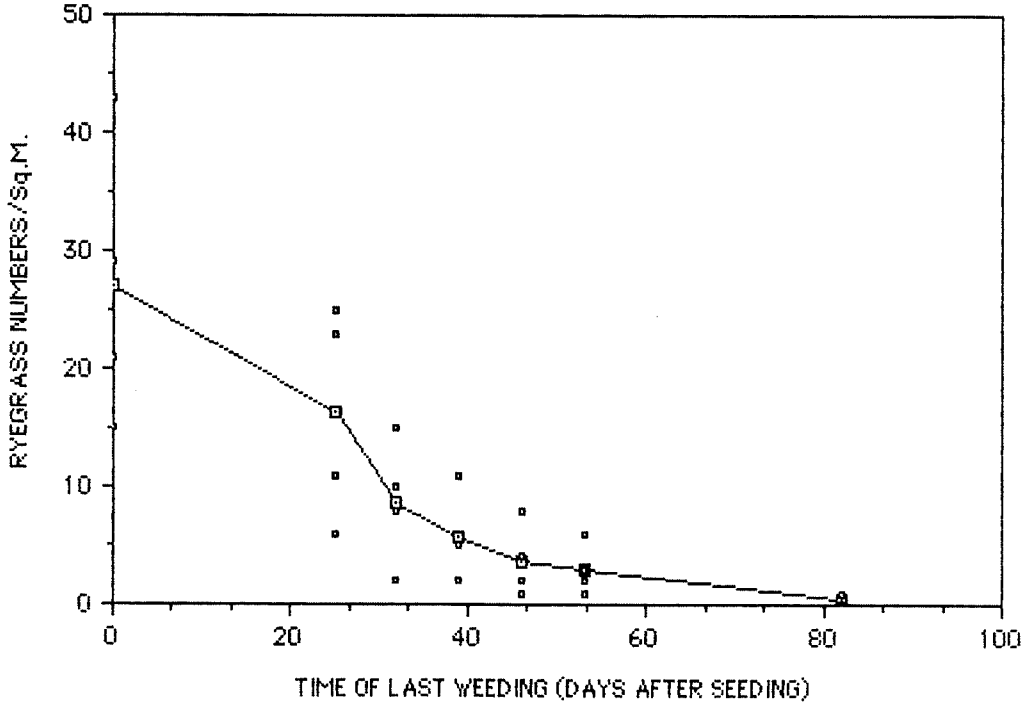


FIG. 6 EFFECT OF TIME OF SPRAYING ON RYEGRASS SURVIVAL

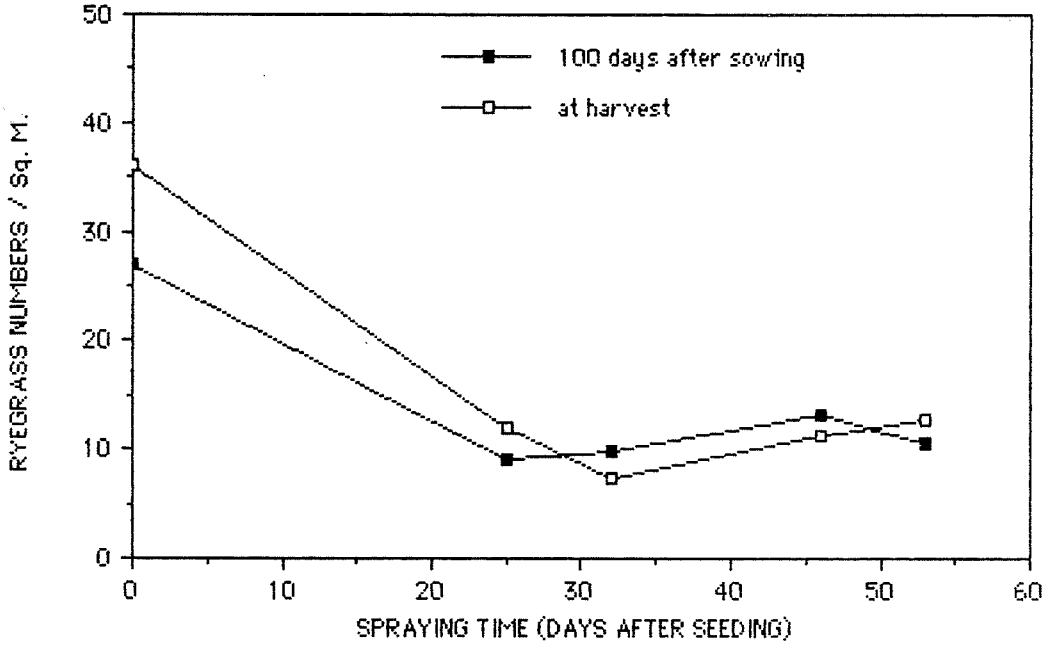


FIG.7 WHEAT YIELD RESPONSE TO WEEDING AFTER SOWING

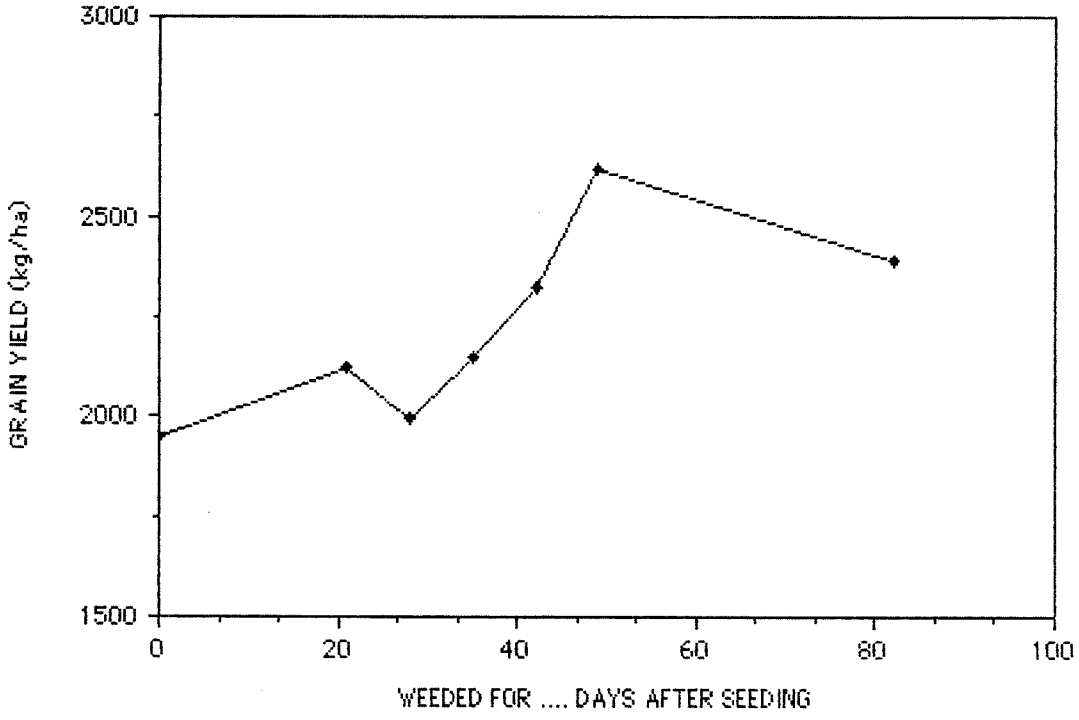
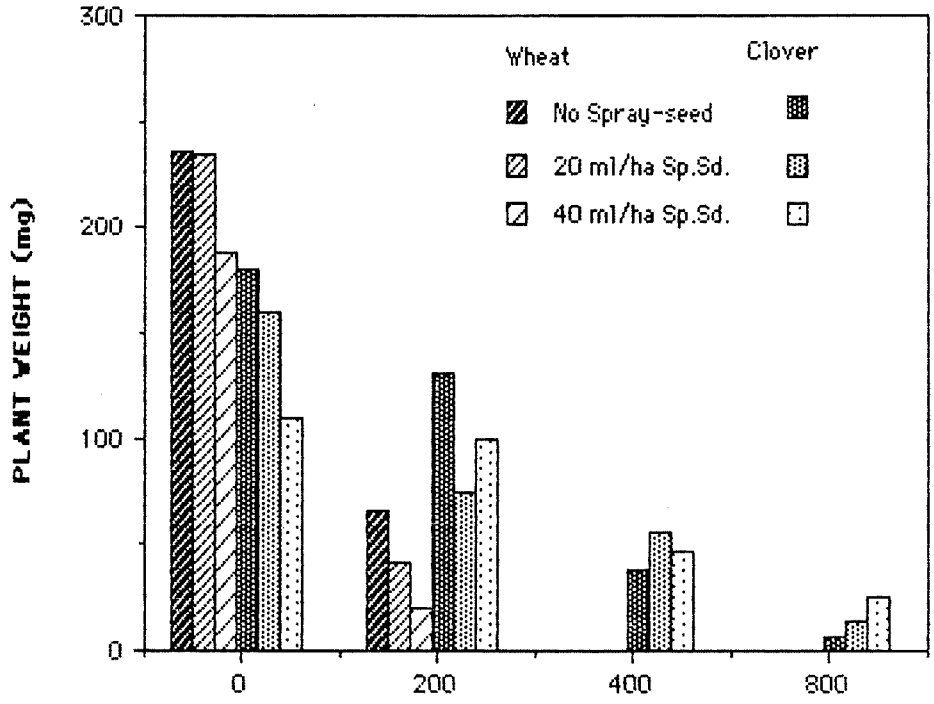


FIG.8 PLANT RESPONSE TO ROUNDUP/ SPRAYSEED MIXTURES

a) GROWTH



b) MORTALITY