



## Fenugreek herbicide tolerance

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The aim of this trial was to assess weed control and fenugreek tolerance of several herbicide mixes and to screen new fenugreek varieties for tolerance to commonly used herbicides.

### Summary of trial

Post-Sowing-Pre-Emergent Spinnaker caused significant visual damage and significant yield loss in fenugreek in the very dry 2002 season. Few differences were observed among post-emergent treatments. Of the new varieties, little difference in herbicide tolerance was observed, however further work is needed in more typical growing conditions.

### Why it was conducted:

Herbicide options are limited for broadleaf weed control in fenugreek. Fenugreek (variety A150000) has shown varying levels of tolerance to Post-Sowing-Pre-Emergent (PSPE) applications of simazine or Spinnaker in commercial and experimental situations. Post-emergent (PE) herbicides of interest include Broadstrike, Butress, Spinnaker and Raptor. In addition, the tolerance of four new fenugreek varieties (Table 1) to commonly used herbicides is unknown.

This trial builds on previous work on fenugreek herbicide tolerance and investigates several PSPE and PE herbicide treatments. An additional demonstration was sown to see if there were any differences among four new fenugreek varieties for tolerance to commonly used herbicides.

**Table 1.** Fenugreek Variety Information

Commercialisation details				Variety characteristics <sup>1</sup>		
Code	Partner	Commercial Name	Year of release/ Availability	100 seed wt (g)	Sowing rate (kg/ha)	Flowering date (days after sowing)
150000	None (no restrictions)	None (current variety)	Readily available	1.2	21	95
150118	Wimmera Grain Company	Unnamed	Bulking up	2.0	35	97
150147	Wimpak	Unnamed	Bulking up	1.2	21	93
150265	The Lentil Company	Power	2002	1.7	30	98
150292	The Lentil Company	Might	2002	1.8	32	97

<sup>1</sup> Based on experimental data collected between 1997-1999

## How it was conducted:

### *Herbicides*

Two experiments were conducted addressing PSPE and PE herbicide options respectively. Each experiment was designed as a randomised complete block with four replications for each treatment. Plots were 20m long and 1.1 m wide.

The site was on barley stubble that was burnt prior to sowing. The PSPE site was sprayed with 0.8 L/ha Trifluralin 480, and incorporated by harrows on June 19 and the PE site was sprayed with 0.7 L/ha Trifluralin 480 on June 20 and incorporated by sowing. Fenugreek seed was treated with P Pickle T, inoculated with *Trigonella rhizobium* (SU277) and sown at 22 kg/ha on June 20 into a moist seedbed. Endosulfan insecticide was applied at 500 ml/ha on June 21. Volunteer barley was controlled with 75 ml/ha Verdict 520.

Table 2 summarises the application details for PSPE and PE treatments. The treatments are listed in Tables 3 and 4. Plots were assessed for crop tolerance using the EWRC scoring system. Low scores, on a scale of 1 to 9, indicate acceptable crop tolerance and high scores indicate unacceptable crop damage. All plots were harvested for grain yield with a plot harvester.

### *Variety tolerance*

Four new fenugreek varieties (Table 1) and the currently grown variety (150000) were sown in a nearest neighbour demonstration with 150000 as the control variety. The plots were 30m long. Seed was sown at rates shown in Table 1 with a target plant density of 140 plants/m<sup>2</sup> (assuming 80% germination rate). All other management was the same as for the herbicide tolerance trial except than no trifluralin was applied to the PSPE area and 0.8L/ha trifluralin was applied to the PE area. The first 16 m of each plot was intended to compare yield of the five varieties. On the remaining area, two metre wide strips of four herbicides (PSPE Simazine 1.2L/ha, Spinnaker 0.15L/ha; PE, Broadstrike 25 g/ha + 0.5% Uptake, Buttress 2L/ha) were applied across the varieties. The herbicide strips were not replicated. These were applied on the same days that the larger herbicide tolerance trial was sprayed (Table 2). The plots were scored for crop tolerance using the EWRC scoring system.

**Table 2.** Spraying details for fenugreek herbicide tolerance trials

	PSPE	PE
Date of spraying	21/6/02	12/9/02,
Crop stage	Pre-emergent	6 true leaves
Weeds	None present	Prickly lettuce (5-8cm diameter); mustard (4cm diameter); Hoary cress at bolting stage. Vetch at 12 node stage. Low population of weeds
Soil conditions	Moist, stubble burnt	Dry, bare ground
Weather	15oC, WSW 10 km /hr breeze; Overcast.	18oC, NW 5-15 km /hr breeze; Sunny , light frost in morning

## Results of the trial:

### *Herbicide options*

Weed populations were insufficient to accurately assess the efficacy of the herbicides. Only crop tolerance data was recorded (Tables 3 and 4). Spinnaker treatments caused severe stunting of plants and this became more obvious as the season progressed. The effect of simazine was less. There was an additive effect between PSPE Spinnaker and trifluralin as the PSPE Spinnaker applied without trifluralin in the herbicide screening demonstration (see variety tolerance) was hardly effected. Despite poor yields due to the dry year (182.4 mm GSR), the Spinnaker treatments yielded significantly less than the nil or simazine 1.2 L/ha treatments.

**Table 3.** Tolerance of fenugreek to PSPE herbicide treatments

PSPE Treatments	EWRC Crop Tolerance Scores				Yield t/ha	Herbicide Cost \$/ha
	5/8	12/9	8/10	11/11		
	46 DAT	84 DAT	110 DAT	144 DAT		
Nil	1.0	1.0	1.5	1.8	0.03	-
Spinnaker 0.150 L/ha	1.3	3.8	5.3	6.5	0.01	16.50
Spinnaker 0.175 L/ha	1.5	4.3	6.0	8.0	0.01	22.00
Simazine 1.2 L/ha	2.5	1.0	1.5	2.0	0.03	6.60
LSD (P<0.05)	0.85	0.5	1.6	1.7	0.01	
CV %					18.9	

EWRC crop tolerance score: 1 = no effect, 5 = unacceptable damage, 9 = complete kill. DAT= Days after treatment.

Crop tolerance scores and yields for the PE treatments are summarised in Table 4. Slight crop effects were observed for Raptor 50 g, 24DB + Raptor, and Brodal + Broadstrike. Yields were very low (less than 100 kg/ha). The 24DB + Raptor combination delayed maturity by 7-10 days and significantly reduced yield. Spinnaker applied post-emergent did not affect the crop.

**Table 4.** Tolerance of fenugreek to PE herbicide treatments

PE Treatments (L or g/ha)	EWRC Crop Tolerance Scores		Yield T/ha	Herbicide Cost \$/ha
	8/10	11/11		
	26 DAT	60 DAT		
Nil	1	1	0.07	
Broadstrike 25 g/ha + Uptake 0.5%	1	1	0.06	16
Buttress 2 L/ha	1	1	0.08	28
Broadstrike 25 g/ha + 24DB 1 L/ha	1	1	0.09	29
Spinnaker 0.125 L/ha + BS1000 0.2 %	1	1	0.10	17
Raptor 50 g/ha + Hasten 0.5 %	1.3	1.3	0.06	34
Broadstrike 25g/ha + Brodal 0.05 L/ha	1.8	1.3	0.07	23
Broadstrike 25g/ha + Simazine 1 L/ha	1	1	0.07	21
Raptor 45g/ha + Simazine 1 L/ha	1	1	0.09	35
Broadstrike 15g/ha + Raptor 25g/ha + Hasten 0.5 %	1	1	0.10	27
24DB 1L/ha + Raptor 45g/ha + Hasten 0.5 %	1.5	3	0.02	45
LSD (P<0.05)	0.4	0.3	0.03	
Cv (%)			18.1	

EWRC crop tolerance score: 1 = no effect, 5 = unacceptable damage, 9 = complete kill. DAT= Days after treatment.

EWRC score statistics are for comparing between herbicide treatments but not for comparing herbicide treatments with the Nil treatment  
Broadstrike 25 g/ha + Uptake is registered for use in fenugreek.

### *Variety tolerance*

PSPE Simazine and PSPE Spinnaker both caused slight visual effects on some varieties but differences among varieties were not significant (Table 5). The effect of PSPE Spinnaker in this demonstration was less severe than in the herbicide tolerance trial. This was most likely because trifluralin was not applied to the PSPE demonstration strips. Post-emergent Buttress and PE Broadstrike caused no visible crop effect.

**Table 5.** EWRC crop tolerance scores recorded on September 12 (84 DAT) for PSPE and October 8 (26 DAT) for PE treatments

Variety	Herbicide			
	PSPE			PE
	Spinnaker 0.150 L/ha	Simazine 1.2L/ha	Buttress 2L/ha	Broadstrike 25 g/ha + Uptake 0.5%
150000	1.3	1.3	1	1
150118	1	1	1	1
150147	1.5	1.5	1	1
150265	1	2	1	1
150292	2	1	1	1

### Commercial Practice

Despite very low yields, these results supported the results of previous years. Spinnaker applied PSPE has a narrow safety margin on fenugreek and should not be used in combination with trifluralin. Spinnaker is safer applied PE than PSPE. PSPE simazine damage was minimal in this dry season however, when winter rainfall has activated the herbicide, simazine damage has caused yield loss. Substantial losses could occur from PSPE applications of simazine or Spinnaker depending on seasonal conditions. In situations with low weed burdens, post emergent weed management is safer. Post-emergent Spinnaker, Broadstrike, Buttress and Raptor all show promise.

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