

PROCESSORS & GROWERS RESEARCH ORGANISATION

Runner Bean (*Phaseolus coccineus*) Broad-leaved Weed Control with Fomesafen (FD 4276)

SUMMARY: Broad-leaved weed control and crop safety with pre-emergence application of fomesafen (FD 4276) at 1.0 and 2.0 l/ha, and pendimethalin (Sovereign) at 4.0 and 8.0 l/ha were evaluated in runner bean cv. Enorma grown with and without polythene cover.

FD 4276 applied pre-emergence did not control the main weed species at this site Chickweed (*Stellaria media*), Galant soldier (*Galinsoga parviflora*) and Annual Meadow-grass (*Poa annua*), but was very safe to the crop. Pendimethalin achieved excellent control at 4.0 l/ha, performing better under cover where possibly more moisture was retained, with negligible crop damage at 8.0 l/ha.

OBJECT: To evaluate two herbicides for broad-leaved weed control in runner beans grown with and without cover, fomesafen registered in France for use in green beans (*Phaseolus vulgaris*) and pendimethalin registered for peas in the UK and for which off-label approval is being sought.

TREATMENTS:Herbicides:

Material	Rate product	Application timing
0. Untreated	-	-
1. fomesafen (FD 4276)	1.0	pre-emergence
2. fomesafen (FD 4276)	2.0	pre-emergence
3. pendimethalin (Sovereign)	4.0	pre-emergence
4. pendimethalin (Sovereign)	8.0	pre-emergence

Compared with growers treatment 5, Croptex Chrome + Dacthal applied at standard recommended rate.

Crop Cover: All treatments (except 5) with and without cover. Crop covered immediately after spray applications with clear perforated polythene on the soil surface.

LAYOUT: 2 replications not randomised. Plot area a double row x 5 m, not harvested - crop destroyed.

SITE: St. Johns, Worcester; loam soil.

METHOD: Runner beans cv. Enorma were hand sown on 24th March at a depth of 6 cm, 2 seeds per stand and 82 cm apart in double rows.

Treatments applied pre-emergence of crop on 5th April with a Van der Weij plot sprayer (propane gas) using Lurmark 015 F80 nozzles at 1.9 bar pressure and water volume 200 l/ha. The runner bean seeds were chitted with a small radicle. The soil was very moist and fine. One replication was covered with plastic mulch, which was punched with holes by a steel spiked roller. After the runner beans were at simple leaf stage, the plastic sheet was cut to allow unrestricted growth and plants were then covered with a polythene cloche. The other replication was left uncovered throughout.

Assessments of crop effects were made on 3rd and 23rd May and weed species counts for 3 randomly placed quadrats of 1/3m² on 23rd May were recorded.

RESULTS:

1. Crop Effects & Scores

Treatment	Crop effects & growth stage		*Crop score
Date: 3/5	23/5		23/5
	main shoots	side shoots	
<u>Covered</u>			
0	2 simple leaves	5 trifoliolate	2 at 1 trifoliolate 10
1	"	5 trifoliolate	2 at 1 trifoliolate 10
2	"	5 trifoliolate	2 at 1 trifoliolate 10
3	" (slight delay)	3-5 trifol (simple leaf crinkled)	2 at 1½ trifoliolate 9.5
4	" "	5-6 trifol "	2 at 1½ trifoliolate 9.5
<u>Uncovered</u>			
0	not emerged & no weeds	5 trifoliolate	2 at 1 folded trifoliolate 10
1	"	"	5 trifoliolate 2 " " 10
2	"	"	5 trifoliolate 2 " " 10
3	"	"	5 trifoliolate 2 " " 8
4	"	"	5 trifol (crinkling lower leaf) 0 " " 9

* Crop Score 10 - no effect, 7 - acceptable damage, 0 - complete kill

Crop growth for treatments 0, 1 & 2 was suppressed by high weed populations.

Crop damage was negligible from FD 4276 and pendimethalin with the exception of slight leaf crinkling and very slight delay in emergence from the latter. Effects from pendimethalin were greater on the uncovered plots.

2. Weed Control

	Rate l/ha	No. Weeds Species/m ²											*Overall Score 23/5	
		Date: 23/5												
		STEME	GALPA <i>Galinsoga</i>	CHEAL	POLPE	SENVU	POAAN	CAPBU	URTUR	MAT spp.	POLAV	LAMPU	TOTAL	
<u>Covered</u>														
0. untreated	-	38	174	28	18	6	26	18	14	-	-	-	322	0
1. fomesafen	1.0	138	150	16	18	-	24	-	-	-	-	-	346	0
2. fomesafen	2.0	64	96	-	10	-	24	-	-	-	-	-	194	2
3. Stomp	4.0	-	-	-	-	2	10	-	-	-	-	-	24	9.5
4. Stomp	8.0	-	-	-	-	-	8	-	-	-	-	-	8	10
<u>Uncovered</u>														
0. untreated	-	72	124	78	2	4	4	10	-	2	-	2	292	0
1. fomesafen	1.0	16	192	32	22	-	2	-	-	-	2	2	266	3
2. fomesafen	2.0	24	80	8	14	-	2	-	-	-	-	-	128	5
3. Stomp	4.0	-	20	-	2	8	2	2	-	-	-	-	34	8
4. Stomp	8.0	-	-	-	2	6	-	-	-	-	-	-	8	9
<u>Covered</u>														
Std. Croptex														
Chrome+Dacthal	-	-	4	-	-	4	10	-	-	4	-	-	44	9

* Growers Score 10 = acceptable control, 0 = no control.

Bayer code for weed names

On 3rd May on covered plots, several weeds had emerged on the untreated and a few on treatments 1 & 2. No weeds had emerged on covered plots.

On 23rd May weeds on the untreated plots without cover were at the following growth stages:- CHEAL large plant 15 cm tall, SENVU 25 cm, POLPE large plant, GALAP 4-5 TL, SOLNI 4-5 TL and STEME flowering.

On covered plots weeds were over 20 cm tall, CHEAL 30 cm "soft" growth.

At this site the predominant weed species *Galinsoga parviflora*, *Stellaria media* and *Poa annua* were resistant to FD 4276. There was also poor control of *Chenopodium album* and *Polygonum persicaria*. FD 4276 pre-emergence gave excellent control of *Urtica urens*, *Capsella bursa pastoris* and *Senecio vulgaris*. Control of the last two species was better than with pendimethalin.

Weeds emerged earlier and in greater numbers on covered plots. FD 4276 pre-emergence gave overall poor control for covered and uncovered treatments but performed slightly better on uncovered treatment where weeds remaining were stunted. Pendimethalin achieved better control on covered plots, particularly on *Galinsoga parviflora*, it is possible that more moisture was retained here.

CONCLUSIONS: FD 4276 pre-emergence did not control the main weed species at this site. Pendimethalin achieved excellent control and performed better in the covered treatment, and caused negligible crop damage. An application has been made (by NFU) for off-label use of Sovereign for runner beans. It is suggested that further work should be carried out with this material to collect data and crop residues.

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