1982

Sorrel, Dicamba Soil Residual Effects, Glean, Veldt Grass, Declared weeds Blackberry, Pattersons Curse, Penny Royal

J Moore

DEPARTMENT OF AGRICULTURE

WESTERN AUSTRALIA

EXPERIMENTAL SUMMARY

1981

Sorrel

Dicamba Soil Residual Effects

Glean

Veldt Grass

Declared weeds - Blackberry
Pattersons Curse
Penny Royal

JOHN MOORE
Research Officer
Weed Agronomy Section
ALBANY

March 1982

Sorrel Control in Cereals

81A191 490.60 S/Ex

Locality N. Bungey - Borden

Aim 1) To compare Tordon 242, Tordon 50-D and Dicamba for sorrel (*Rumex acetocella*) control and cereal tolerance.

Treatments

	Date of Spraying	Growth Stage	Temp	Wind	Cloud	Spray Output
ET	13/8/81	(Early tillering) 4 - 8 leaf	5°C	10 K.W.	100%	126 l/ha
LT	24/9/81	(Late tillering) noding	12°C	0	0	126

Comments

Spraying at the early tillering stage gave far better control of sorrel than spraying at the noding stage.

Tordon 242 and 50-D gave no significantly better control than dicamba at recommended rates at the early time of spraying.

At the late time of spraying dicamba failed completely.

Generally, sorrel control was poor ranging from 0 to 60% control at the early spraying time.

No yield increase due to sorrel control was observed.

No consistant yield decrease in wheat due to herbicide was observed on quadrats cut from sorrel free areas of the plots.

TREATMENT			SORREL		Wheat Yield kg/ha	% Yield decrease	% Yield loss due to chemical only
Chemical	Rate l/ha	Time	Crowns $1M^2$	% cover			
242	.75	ET	130	6.2	33.64	8	17
"	1.0	"	175	12.8	31.7	13	11
"	2.0	"	84	6.3	30.82	16	0
50-D	.4	"	206	16.4	32.06	12	34
"	.525	"	165	12.7	29.85	18	14
"	1.05	"	109	8.5	23.94	34	26
Dic	1.0	"	118	8.2	36.36	0	0
Nil		"	216	15.8	36.45	0	-8
242	.75	LT	164	14.4	29.28	20	29
"	1.0	"	210	17.5	30.68	16	20
"	2.0	"	68	6.0	32.98	10	10
50-D	.4	"	169	12.5	29.79	18	16
"	.525	"	168	12.3	36.16	1	-10
"	1.05	"	142	10.6	29.29	20	11
Dic	1.0	"	201	22.6	29.17	20	3
Nil		"	251	20.6	36.45	0	8

242 = Tordon 242 (26.5 g.a.i./l picloram + 420 g.a.i./l MCPA K salt)

50-D = Tordon 50-D (50 g.a.i./l picloram + 200 g.a.i./l 2,4-D both as triisopropanolamine.

Dic = Dicamba 200 g.a.i./l

ET = early tillering

LT = late tillering

Sorrel/Pasture Response to NPK and Lime

80 Ka 39

Location K. Davies, Borden

Object To measure sorrel and pasture growth under a range of NPK and lime rates.

Treatments Applied autumn 1980 and 1981.
P = 300 kg/ha super
N = 360 kg/ha Agran 34-0
K = 100 kg/ha Muriate of Potash
Lime = 2.5 tonnes/ha agricultural lime
Cropped to wheat 1980.

Results

	Dry Weight kg/ha	
	Sorrel	Pasture
N_K	162	4145
PK	199	3444
NP	72.6	4379
NPK	120.5	3985
NPK + lime	142.7	4170
Nil	209	3112

Comments Pasture was predominantly brome grass with some clover.

The main pasture response was due to N.

Sorrel responded to K or was inversely correlated with pasture production.

DICAMBA SOIL RESIDUAL EFFECTS ON CLOVERS, LINSEED AND RAPE

80 D 7

LOCALITY: Denmark Research Station

SOIL TYPE: Gravel loam

EXPERIMENTAL DESIGN: Split plot, one plot log sprayed with dicamba adjacent plot unsprayed

TREATMENTS:

Date of spraying	Date of seeding	Days between seeding and spraying	Planting method
4/6/81	5/6/81	1	Hand broadcast and cultivation
	12/6/81	8	" "
	19/6/81	15	Cone seeder
	26/6/81	22	" "
4/6/81 + 3/7/81	3/7/81	0	" "
	10/7/81	7	" "
	16/7/81	13	" "

VARIETIES: Clover - Larissa, Trikalla, Esperance

Linseed - Glenelg

Rape - Wesreo

% DECREASE IN PLANT DENSITY

Variety	Dicamba Rate (l/ha)	Time of Seeding (Days after spraying) O(LS)	1	8	15	21
Esperance	1 -1.5	52	-14	-19	-30	-18
	1.5-2	68	6	-14	-11	-10
	2 -2.8	77	40	6	29	0
	2.8-4	93	82	48	-26	-130
Larissa	1 -1.5	46	13	33	-32	-2
	1.5-2	73	-28	54*	2	-20
	2 -2.8	76	33	0	-27	-14
	2.8-4	98	30	11	0	3
Trikkala	1 -1.5	50	3		-45	-25
	1.5-2	43	27		-9	-27
	2 -2.8	52	34		4	-114
	2.8-4	67	70		-10	-34
Linseed (Glenelg)	1 -1.5	-49	-27	61	-32	-39
	1.5-2	-52	6	-27	8	-2
	2 -2.8	1	-10	-25	-9	-4
	2.8-4	41	31	4	2	-48
Rape	1 -1.5	7	-24	5	-87	-2
	1.5-2	39	-75	-17	-25	-12
	2 -2.8	45	23	-2	4	18
	2.8-4	24	14	-11	-5	-12

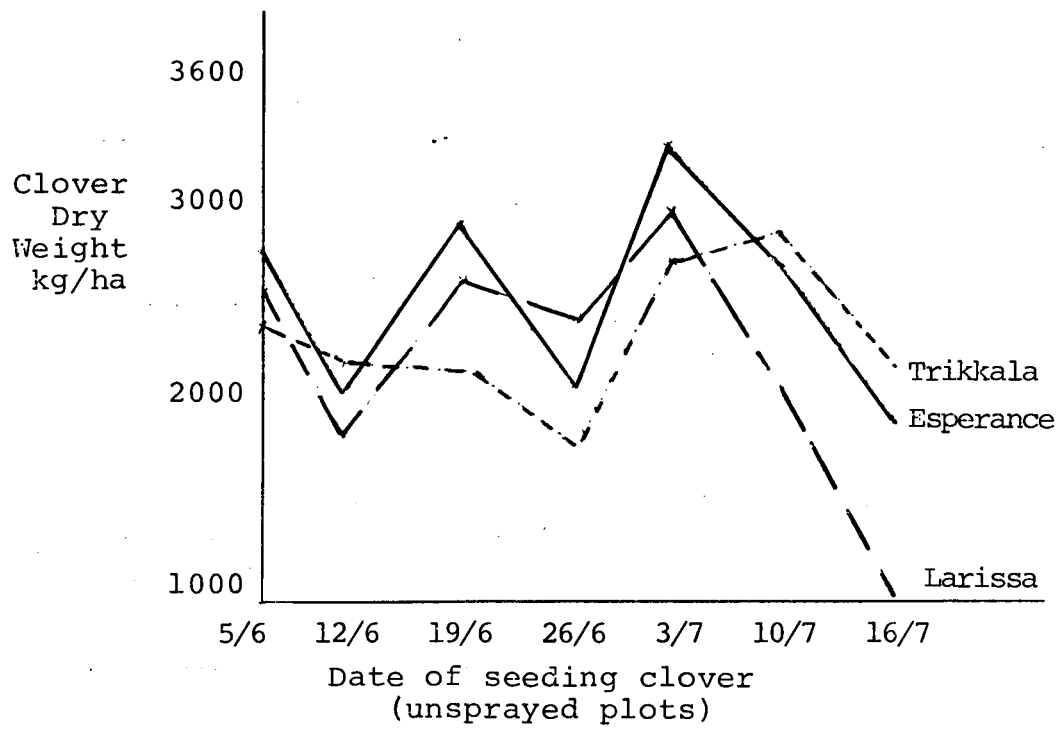
* Variable plot
LS Late sown

RESULTS: Clover Dry Weight (kg/ha) 12/1/82
(Average of two times of sowing)

Variety	Dicamba Rate (l/ha)	Time of seeding (Days after spraying) 0	7	14	21
Esperance	0	1807	1666	893	1052
	4 -2.5	1126	1117	1009	763
	0	1444	837	1397	1355
	2.5-1.6	1015	1417	671	1184
	0	1417	891	1276	750
	1.6-1	1357	580	1116	1096
Larissa	0	1406	852	1210	1397
	4 -2.5	439	1076	1558	895
	0	1405	771	972	785
	2.5-1.6	700	1133	1060	1034
	0	1221	1168	838	1257
	1.6-1	1095	1426	1036	1417
Trikkala	0	1705	1528	873	543
	4 -2.5	1028	1440	1114	434
	0	1196	1147	580	921
	2.5-1.6	1664	824	1174	831
	0	1223	960	1687	1011
	1.6-1	986	1669	1516	1113

Time of seeding 80 D 7

Time of Seeding	Esperance	Larissa	Trikkala	Glenelg	Rape
5/6/81	2668	2418	2389	1221	492
12/6/81	1977	1864	2140	1334	1111
19/6/81	2726	2506	2136	1494	576
26/6/81	1972	2292	1650	1420	688
3/7/81	3256	2957	2632	1948	720
10/7/81	2528	1990	2705		
16/7/81	1682	1026	1997		



Rape Grain yield kg/ha

Dicamba Rate l/ha	Time of Seeding (Days after Spraying) 1	8	15	22
0	540	791	555	884
1 - 1.6	364	370	298	218
% Decrease	33%	54%	46%	75%
0	538	1289	659	540
1.6- 2.5	552	551	666	893
% Decrease	-3%	61%	-1%	-65%
0	741	1153	513	641
2.5 - 4	536	2295	533	1269
% Decrease	28%	-99%	-4%	-98%

Linseed Grain Yield kg/ha

Dicamba Rate l/ha	Time of Seeding (Days from Spraying) 1	15	21	7
0	1540	1368	1396	
1 - 1.6	1544	1280	2104	
% Decrease	0	7%	-24%	
0	1670	1368	2214	
1.6- 2.5	1304	1260	2348	
% Decrease	22%	8%	-6%	
0	2656	2188	2476	
2.5- 4	2048	1946	942	
% Decrease	23%	11%	62%	
0	1221	1494	1420	1334
1 - 4	1361	1088	1580	1721
% Decrease	-11%	27%	-11%	-29%

COMMENTS:

When clover is seeded directly after spraying with dicamba substantial reductions in plant density may occur. Total dry matter production is not as severely affected. Dicamba caused no consistant reduction in plant density or dry matter production when applied 7 or more days before seeding, even at rates 2 - 3 times normal use rates of 1 - 1.5 l/ha.

Linseed and Rape were more tolerant of soil dicamba than the clovers. This trial supports results of previous trials indicating that pre sowing dicamba at normal rates presents no undue hazard to the crop.

GLEAN ON DIRECT DRILLED WHEAT OATS AND BARLEY

81 AL 91

AIM: To determine the efficacy and phytotoxicity of Glean in wheat oats and barley when applied by several difference methods.

TREATMENTS

PPIS	-	Glean pre-plant incorporated by sowing	) Spray seed
PoPSA	-	Glean post plant surface applied	) 1L/ha applied
PoPIH	-	Glean post plant incorporated by harrows	) 8 days
Tillering	-	Glean applied at tillering stage	) pre planting
G8PP	-	Glean alone applied 8 days pre plant	
SS8PP	-	Spray seed alone applied 8 days pre plant	
RLL/G 8PP	-	Tank mix of 500 ml /ha Round Up with a variable amount of Glean (6-30 g/ha) applied 8 days pre plant.	
SS/G 8PP	-	Tank mix of O spray seed plus 30 gms Glean log sprayed to 800ml/ha spray seed plus 6g/ha Glean 8 days pre plant.	

Seeding

Cone seed on 24/7/81 with wheat 50 kg/ha barley 45kg/ha and oats 40 kg/ha. 100 kg/ha Agras drilled with seed.

Spraying

8 days pre plant treatments applied 16/7/81. Pasture was grazed heavily continuously from the break of the season to early July. Dicamba/2,4-D 1L/ha was applied in early May for dock control.

At the "tillering" time of spraying growth stages were:

Tincurrin	2-3 tillers	3-6 leaves/tiller	35cm tall
Egret	1-2 tillers	5-6 leaves/tiller	25cm tall
Barley	3-13 tillers	4-5 leaves/tiller	30cm tall
Oats	4-8 tillers (vast noding)	4-5 leaves/tiller	45cm tall
Grasses	Starting to set seed.		

All chemical applied in 120 - 150 l/ha water.

RESULTS: 1 Efficacy Plant counts/m^2 October 81

Treatment	Weed Glean g /ha	Silver Grass					Brome Grass					Barley Grass					Rye Grass				
		25	18	13	10	7	25	18	13	10	7	25	18	13	10	7	25	18	13	10	7
PPIS		8	17	43	48	17	4	10	15	18	31	2.3	2.7	6.9	6	3	2	1	.6	2.3	3.6
PoPSA		14	28	18	14	31	9	10	9	6	5	2.2	2.2	2	3.9	3.4	0	0	.2	.9	2
PoPIH		0	28	15	55	75	9.5	6	7.4	12	16	1.7	12	2.6	3.5	.3	.8	17	.4	23	27
Tillering		13	16	29	54	87	4	4	5.8	6.8	9	.8	1.3	6.4	2.7	3.4	4.8	4.6	4.5	6	10
Ru/G 8PP		344	296	263	238	258	92	103	105	146	95	45	56	69	27	51	0	9	22	11	13
G 8 PP		380	383	323	373	412	199	137	141	145	154	8.5	74	51	80	70	0	.5	.5	3.5	10
SS/G 8PP																					
SS ml /ha		150	380	550	675	725	150	380	550	675	725	150	380	550	675	725	150	380	550	675	725
Glean g/ha		25	18	13	10	7	25	18	13	10	7	25	18	13	10	7	25	18	13	10	7
		260	141	54	45	25	124	43	26	25	14	69	16	7	6	3	3	1.4	3.4	3.3	5.2
SS 8PP				- 47 -					- 12 -					- 2.6 -					- 8.5 -		

SL9

EFFICACY OBSERVATIONS

Guildford Grass, Toad rush, Spergula, Clovers and docks were present on the trial and scattered variable infestations survived the spray seed 1 l/ha treatment. The following refers to the effect of Glean on these weeds:

1. Guildford Grass (*Romulea rosea*)

   Rates greater than 15g/ha Glean applied PoPSA or PoPIH gave control. PPIS and post emergent applications gave no apparent control.

2. Toad rush (*Juncus bufonus*)

   Rates greater than 15 g/ha were required for control. PoPSA was the best application method followed by PoPIH then PPIS. Post emergent applications gave no apparent control.

3. Spurry (*Spergula arvensis*)

   All rates above 6 g/ha PoPSA or PoPIH gave complete control. Rates above 10 g/ha were required when applied PPIS. Post emergent application gave no apparent control.

4. Docks (*Rumex pulcher*)

   No dock survived the PoPSA treatment. Odd docks survived up to 7 g/ha for PPIS or 15 g/ha for PoPIH or 25 g/ha for post emergent treatment.

5. Clovers

   No clover survived the PoPSA treatment. Odd clover plants survived upto 10g/ha for PPIS and 15 g/ha for PoPIH and post emergent applications.

EFFICACY COMMENTS:

For direct drilled crops PoPSA or PoPIH generally gave better grass control than pre planting or post emergent applications. The notable exception was annual ryegrass where PoPIH gave erratic control. Considering the importance of this weed in crops, the post planting surface applied method of applying Glean would have to be preferred.

Spray seed 1 l/ha gave excellent control of all weeds at this site.

This site provided little evidence of Spray.Seed/Glean mixtures or Round Up/Glean mixtures being viable alternatives to Spray.Seed alone.

Glean alone pre planting was useless on brome grass and silver grass but at high rates may control barley grass and annual ryegrass.

2) Phytotoxicity

Tincurrin Wheat	Glean g/ha	Grain Yield kg/ha 30 → 18	18 → 10	10 → 6	Cereal plants/m² Nov 81 30 → 18	18 → 10	10 → 6
PPIS		201	160	136	68	71	73
PoPSA		215	306	277	63	61	50
PoPIH		240	199	115	59	66	56
Tillering		172	316	308	64	63	67
RU/G 8PP		82	68	116	36	29	39
G 8PP		0	0	0	26	52	15
SS/G 8PP							
SS ml /ha		0 → 400	400 → 650	650 → 800	0 → 400	400 → 650	650 → 800
Glean g/ha		30 → 18	18 → 10	10 → 6	30 → 18	18 → 10	10 → 6
		167	326	242	50	84	62
SS 8PP			- 211 -			- 62 -	
Barley							
PPIS		329	386	329	54	31	40
PoPSA		211	199	331	52	54	65
PoPIH		231	228	289	67	66	78
Tillering		421	553	441	55	43	57
RU/G 8pp		2	35	81	33	24	28
G 8PP		12	16	29	32	21	38
SS/G 8PP							
SS ml /ha		0 → 400	400 → 650	650 → 800	0 → 400	400 → 650	650 → 800
Glean g/ha		30 → 18	18 → 10	10 → 6	30 → 18	18 → 10	10 → 6
		172	128	279	68	71	47

Egret Wheat	Glean g/ha	Grain Yield kg/ha			Cereal plants/m^2 Nov 81		
		30 → 18	18 → 10	10 → 6	30 →18	18 → 10	10 → 6
PPIS		125	187	262	74	77	82
PoPSA		160	183	291	64	74	62
PoPIH		220	272	172	76	70	59
Tillering		99	189	288	62	63	74
SS/G 8PP							
SS ml /ha		0 → 400	400 → 650	650 → 800	0 → 400	400 → 650	650 → 800
Glean/ha		30 → 18	18 → 10	10 → 6	30 → 18	18 → 10	10 → 6
		89	219	251	67	73	65
Oats							
PPIS		246	135	156	80	70	52
PoPSA		224	217	255	65	52	48
PoPIH		187	279	256	66	64	53
Tillering		465	422	604	68	56	60
SS/G 8PP							
SS ml /ha		0 → 400	400 → 650	650 → 800	0 → 400	400 → 650	650 → 800
Glean g/ha		30 → 18	18 → 10	10 → 6	30 → 18	18 → 10	10 → 6
		225	375	557	47	63	70

PHYTOXICITY COMMENTS

1. Tincurrin

No apparent plant mortality due to Glean.

Rates from 18 - 30 g/ha Glean PPSA or at tillering reduced yield by 26% and 45% respectively.

PoPSA and tillering treatments with less than 18 g/ha Glean yielded twice as heavily as PPIS or PPIH.

2. Egret

No apparent plant mortality due to Glean.

All treatments apart from PoPIH showed a steady decline in yield, as the rate of Glean was increased. Yields were 29%, 38%, 35% less in the 18 - 10 g/ha area than in the 10 - 6 g/ha area of the plots for PPIS PoPSA and Tillering treatments respectively.

Egret appears to be far more sensitive to Glean than **Tincurrin** wheat.

3. Barley

No apparent plant mortality due to Glean.

PoPSA and PoPIH applications showed a steady decline in yield with increasing rate of Glean. PPIS did not show this rate response, but yielded 26% less than the tillering time of application plots.

3. Oats

Application of Glean at the time of seeding reduced yields by more than 50%. At the tillering stage yields were reduced as the rate of Glean increased. Low rates (<10g/ha) appear to be safe if applied 8 days pre planting.

GENERAL COMMENTS

1. Tincurrin Wheat

PoPSA or Post Emergent application gave the best yields coupled with good weed control. Where ryegrass is likely to be the major weed PoPSA is preferred. Rates should not exceed 18 g/ha and overlapping or spraying out headlands should be avoided.

2. Egret Wheat

Egret appear to be relatively sensitive to Glean. PoPIH was the best tolerated application method, but ryegrass control was erratic.

3. Barley

Barley was tolerant of Glean up to 30 g/ha applied at tillering. PPIS was the safest alternative but yielded 26% less.

4. Oats

Application at tillering was the safest method tested for Glean. Rates above 10 g/ha reduce yield.

John Moore
RESEARCH OFFICER
February 18, 1982

Grass Control in Veldt Grass

81 A1 39

Locality	F. Ford Woogenellup
Object	To control annual ryegrass (Lolium rigidum) in perennial veldt grass (Ehrharta calycina).
Treatments	Log sprayed on 8/7/81 in 221 l water/ha. Veldt grass 10 - 15 cm tall. Ryegrass 2 leaf - tillering.
Comments	Ryegrass in Hoegrass plots still dying.at time of assessments - no visual affect of Hoegrass on veldt grass. Yields of veldt grass taken but not processed yet

556

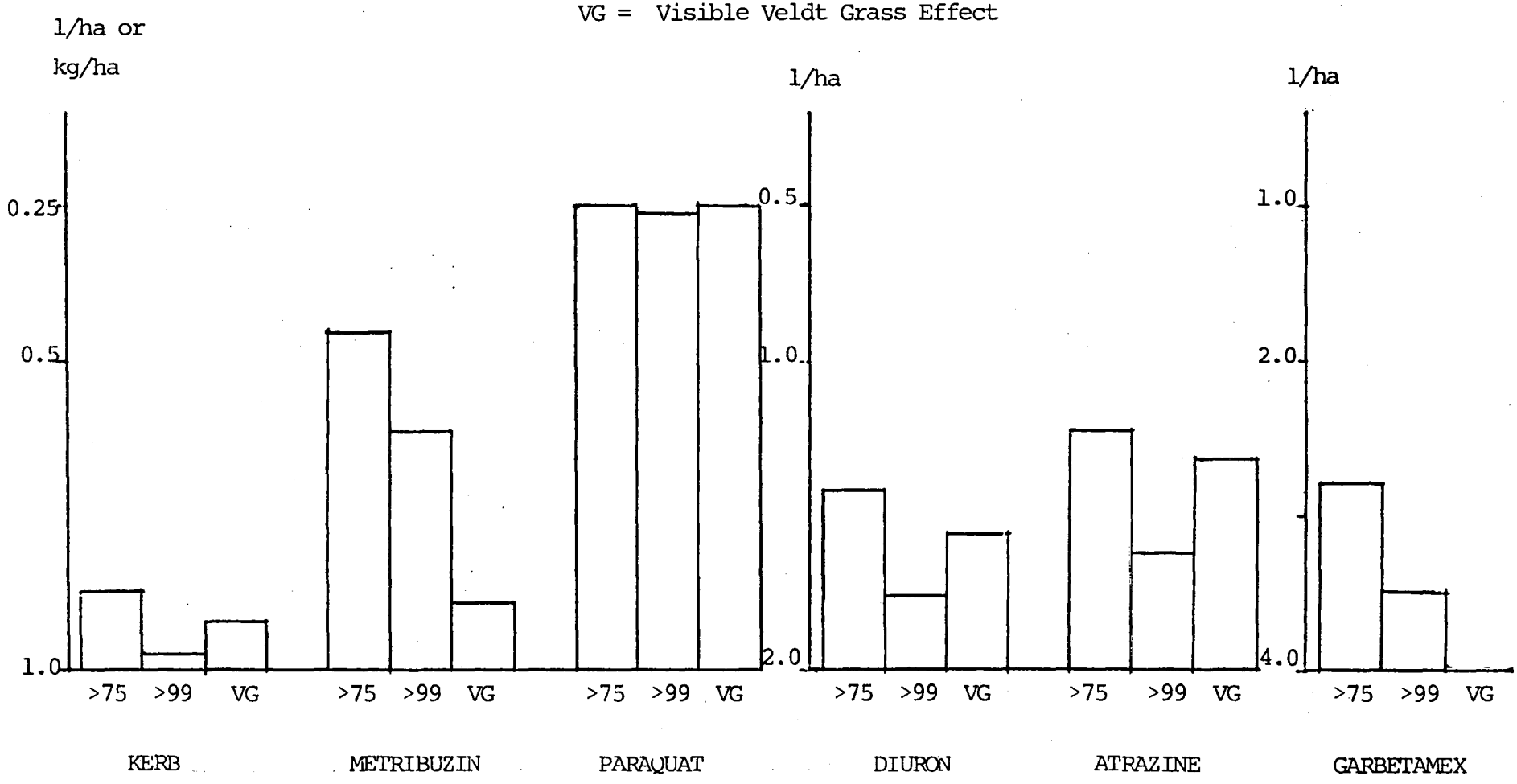
81A139

Ratings 6/8/81

>75 = >75% Annual Ryegrass Control

>99 = >99% " " "

VG = Visible Veldt Grass Effect



RM 217 on Rape

Locality J. Erickson Tenterden

Aim To test the phytotoxicity of RM 217 on grasses and rape.

Treatments Applied 31/7/81 in 117 l/ha water by boom spray temp - 10°C wind 16 - 20 kgp N-NW. 50% cloud cover. Gravel loam soil.

Plant growth stage at spraying - rape - 5 leaf, 10 cm ; Ryegrass 3 - 5 leaf; Guildford grass - 2 leaf, 5 - 10 cm ; Clover - 3 leaf.

Chemical	Rate per hectare	Ryegrass Rating % kill 9/10/81	Yield t/ha	% Yield increase
RM 217	347	7.5	.765	3.4
"	694	72.5	.765	3.4
"	1388	97.5	.790	6.8
"	2777	100.0	.843	13.9
Hoegrass	1000	80.0	.871	17.7
Nil	0	0	.740	0

Observations

RM 217 did not reduce Guildford grass infestation.
Patchy infestations of clover capeweed, sorrel, dock and cotula were not apparently affected by treatment.
11 days after spraying there was no visula phytotoxicity on rape.
Ryegrass was still green on RM 217 plots with some plants with curled leaves 11 days after spraying.

Blackberry Control - Herbicide Evaluation

81 A1 101

Aim To compare the efficacy of M4021± picloram with 2,4,5-T amine and glyphosate on blackberry (Rubus fruticosis agg.).

Locality
1) McDonald - Bornholm - Karri loam
2) Tweddle - Albany - Sand over clay

Treatments All treatments sprayed using a "Sprayrite" brush pistol.

Weather Conditions

	March		April	
	McDonald	Tweddle	McDonald	Tweddle
Wind Km/hr	0	0	5 - 8	5 - 10
Cloud Cover %	100	90	25	40
Temperature °C	22	25	24	21
Relative Humidity %	70	50	65	70
Date	4/3/81	5/3/81	8/4/81	8/4/81

Treatment Key	Time of Application	Herbicide	Rate gai/100L	Dilution Ratio
March,M,100	4/3/81	M4021	100	1:480
March,M,200	"	"	200	1:240
March,M,300	"	"	300	1:160
March,M+P,100+50	"	M4021 plus Picloram	100 + 50	1:480 + 1:400 Tank mix
March,G,360	"	Glyphosate	360	1:100
March,T,250	"	2,4,5-T Amine plus Summer Spraying Oil	250 + 100	1:80 + 1:100 Tank mix
March,Nil	"	Nil	0	0
April,M,100	8/4/81	M4021	100	1:480
April,M,200	"	"	200	1:240
April,M,300	"	"	300	1:160
April,M+P,100+50	"	M4021 plus Picloram	100 + 50	1:480 + 1:400 Tank mix
April,G,360	"	Glyphosate	360	1:100
April,T,250	"	2,4,5-T Amine plus Summer Spraying Oil	250 + 100	1:80 + 1:100 Tank mix
April Nil	"	Nil	0	0

M4021 = Triclopyr Butoxy Ester (Low volatile ester)
= "Garlon 480"

Glyphosate = "Round Up"

Results

Treatment	Regrowth Ratings			
	Sept 81		Nov 81	
	from canes	from roots	from canes	from roots
March,M,100	0	2.1	0	1
March,M,200	0	1.8	0	1.5
March,M,300	0	0.8	0	1.5
March,M+P,100+50	0	1	0	.5
March,G,360	2.8	0.2	0*	2
March,T,250	.8	1.2	2	2
March,nil	4.8	0.5	5	3
April,M,100	0	1	0	0
April,M,200	0	1.8	0	3
April,M,300	0	.4	0	1.5
April,M+P,100+50	0	.1	0	2
April,G,360	2	0	0*	2
April,T,250	0.5	1.8	0	3
April,nil	5	0.5	5	1

* some regrowth severely herbicide affected.

Scale - 0 = no regrowth 5 = maximum regrowth

Comments

1. All rates of M4021 gave excellent control of top growth.

2. Regrowth from the roots was a problem in nearly all treatment. Further work is required to overcome this problem.

3. Glyphosate treated bushes are still dying.

Conclusion

M4021 performed better than the current recommendation of 2,4,5-T Amine but did not give total kills of the infestation.

Rainfast Herbicides for Patterson's Curse

Location — Scotsdale Road, Denmark

Aim — To determine the effect of rain on the efficacy of 10 herbicides ± 2,4,D on Pattersons Curse (Echium plantagineum).

Treatments — Applied by log boom sprayer on 9/7/81 in approx 250 l water/ha.
Heavy rain fell immediately after application.
Herbicides applied in 250 l/ha water.

Growth Stages — 9/7/81
Pattersons Curse - rossette 5 - 10 cm wide.
Clover - runners 5 - 10 cm .
Dock - rossette 7 - 12 cm .
Sheep Thistle - rossette 7 - 15 cm .

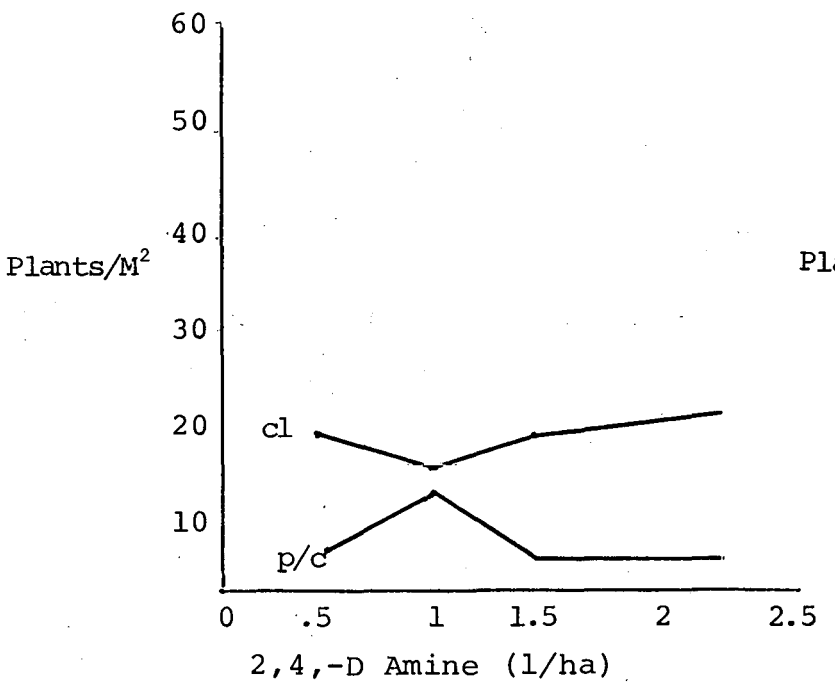
Results

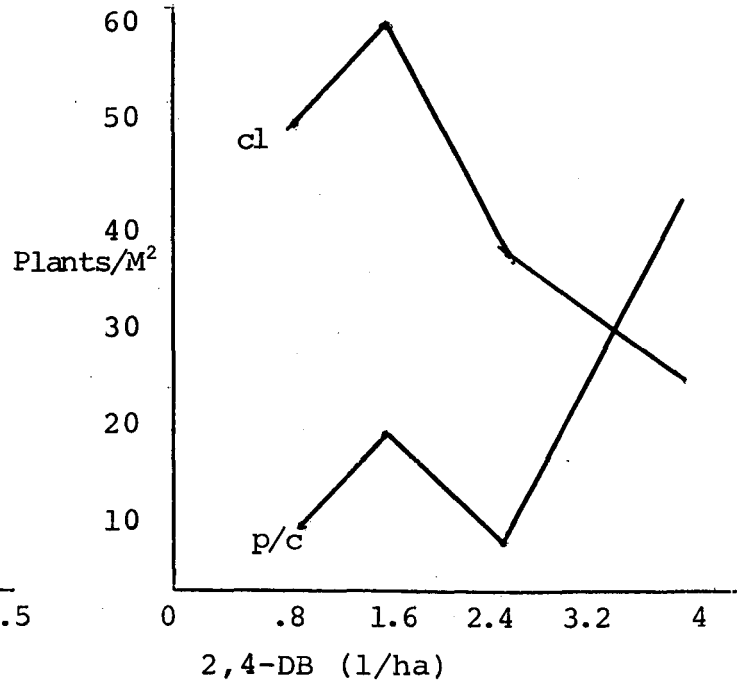
Herbicide Effect on Pattersons Curse and Clover

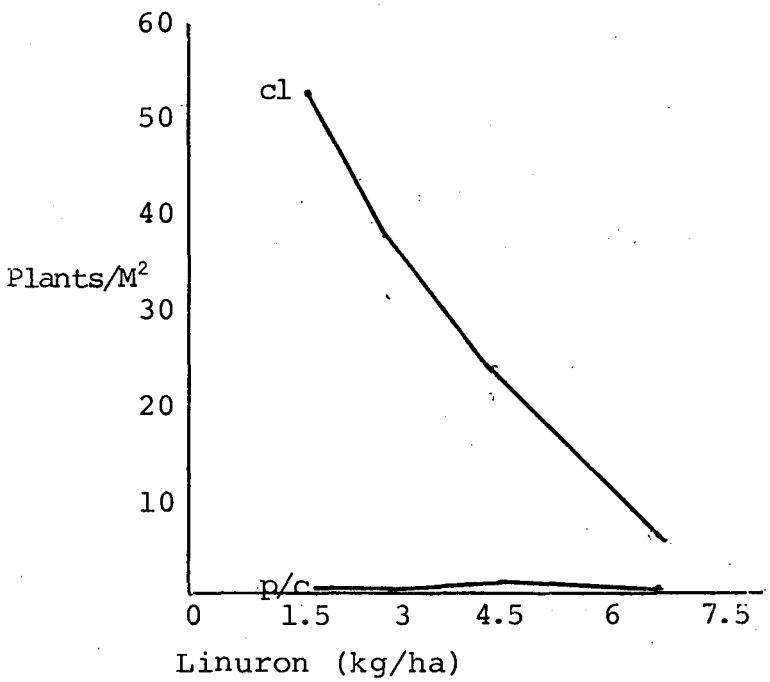
Herbicide	Rate of herbicide to achieve (1/ha or kg/ha) (26/11/81) 100% control P. curse	95% control P. curse	No visual effect on clover
2,4-D Amine	2.5	2.5	>2.5
2,4-DB	>4	4	>4
MCPA	>4	>4	>4
Linuron	1.8	<1.5	2.4
Diuron	1.5	1.5	1.3
Atrazine	>2	2	1.1
Tribunil	>2	>2	>2
Igran	.75	.6	1.1
Brominil	>2.5	2.5	>2.5
Asulox	4.4	4	>5

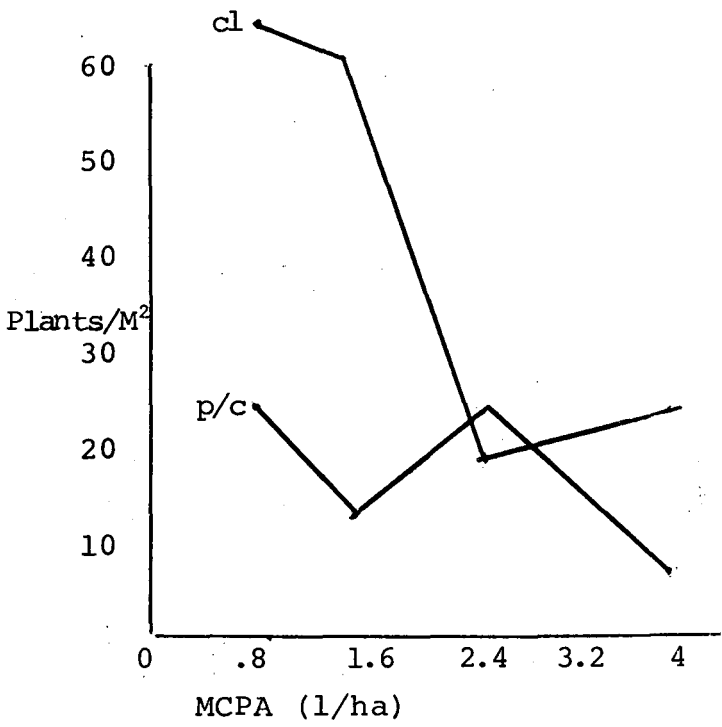
Herbicide Effect on Other Species Present on Trial

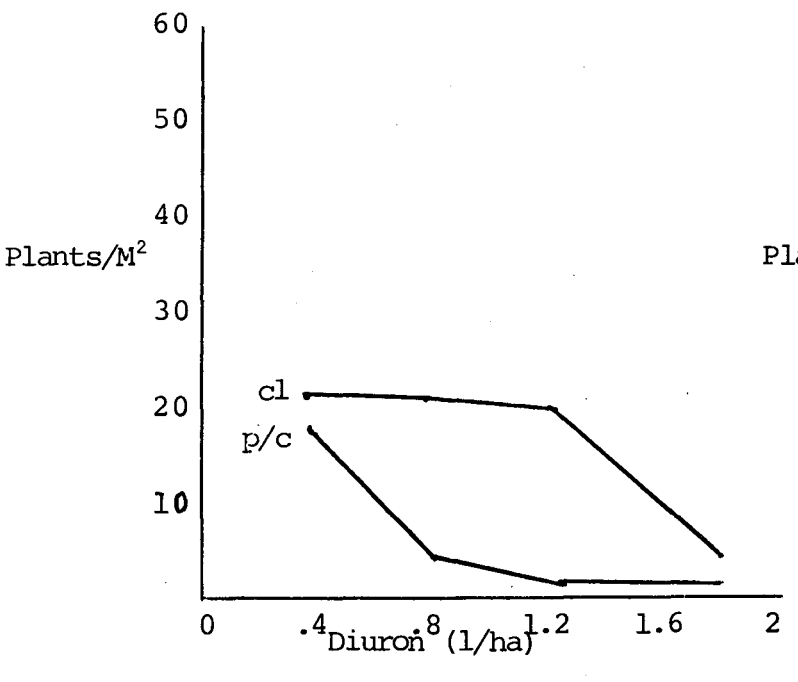
Herbicide	Rate of herbicide (1/ha or kg/ha) To achieve 100% control of 1) Dock	2) Sheep Thistle
2,4-D Amine	2	2.3
2,4-DB	2.7	2.8
MCPA	-	2.5
Linuron	>7.2	4.4
Diuron	>2	1.3
Atrazine	1.8	>2
Tribunil	>2	>2
Igran	>2	>2
Brominil	1.8	>2.5
Asulox	1.5	4.2

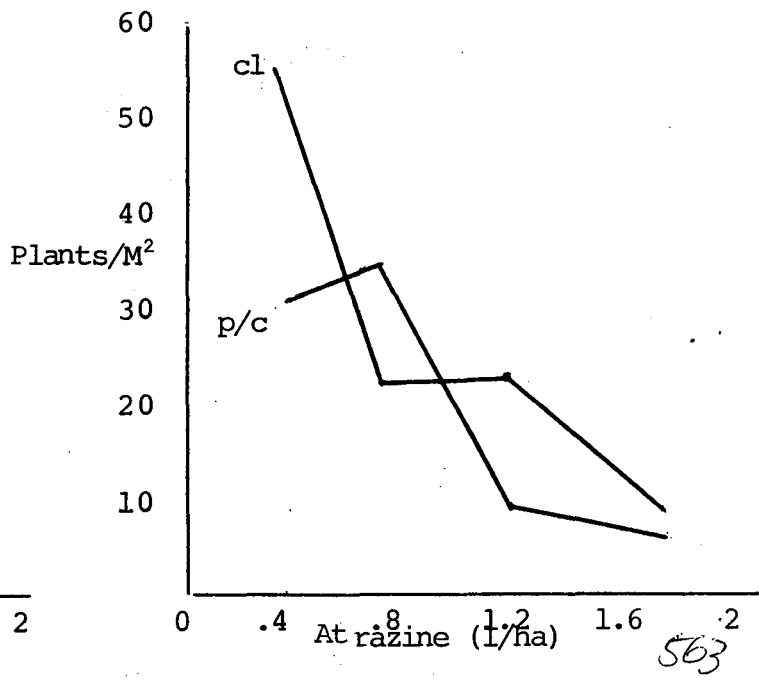

60
50
40
30
20
10
Plants/M²
cl
p/c
0
.5
1
1.5
2
2.5
2,4,-D Amine (l/ha)

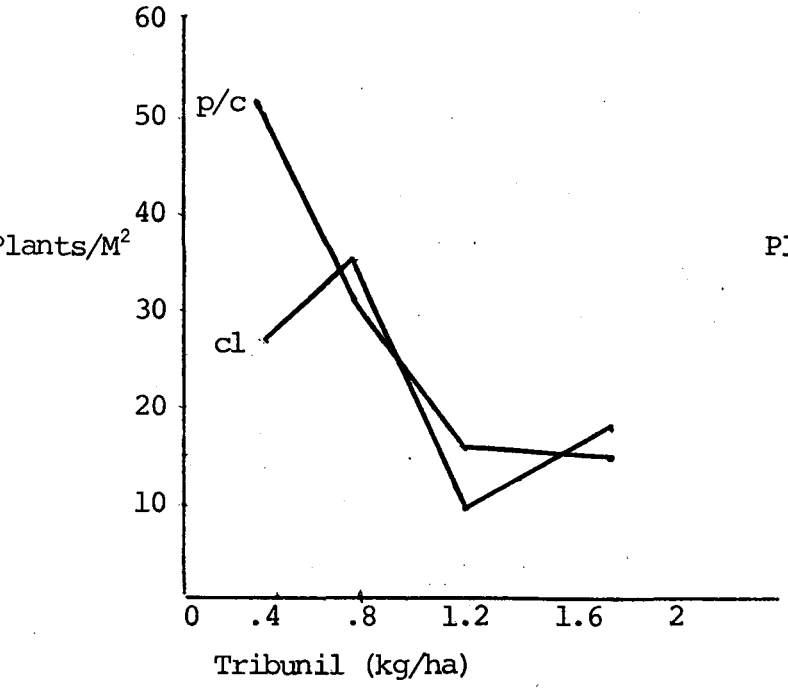

60
50
40
30
20
10
Plants/M²
cl
p/c
0
.8
1.6
2.4
3.2
4
2,4-DB (l/ha)

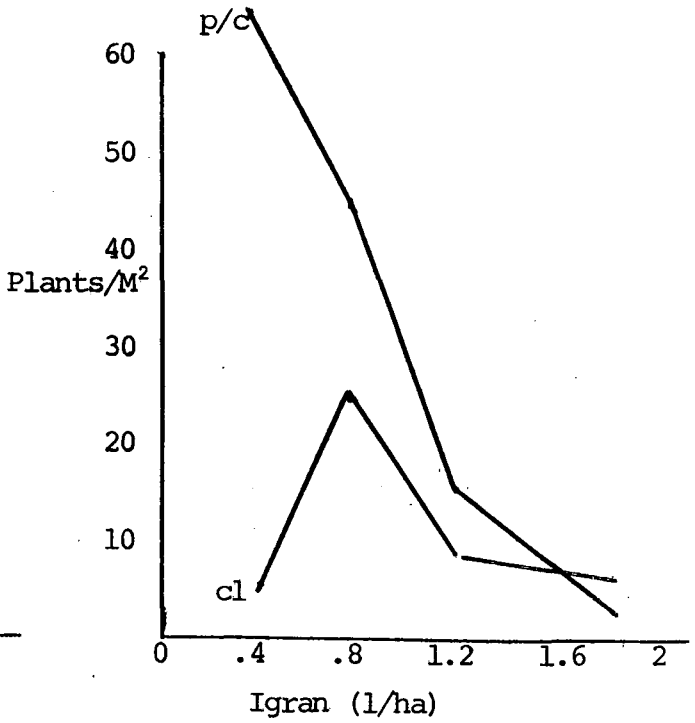

60
50
40
30
20
10
Plants/M²
cl
p/c
0
1.5
3
4.5
6
7.5
Linuron (kg/ha)

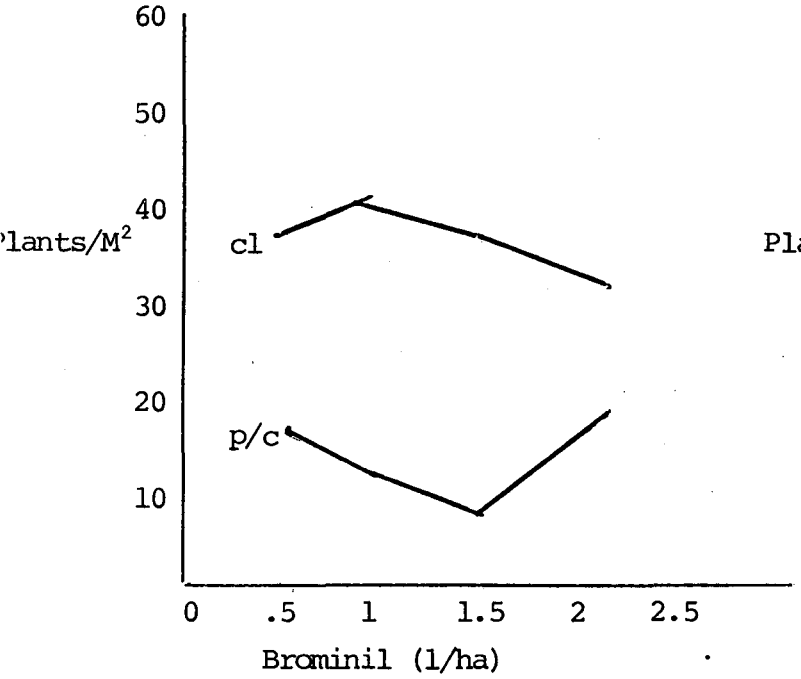

cl
60
50
40
30
20
10
Plants/M²
p/c
0
.8
1.6
2.4
3.2
4
MCPA (l/ha)

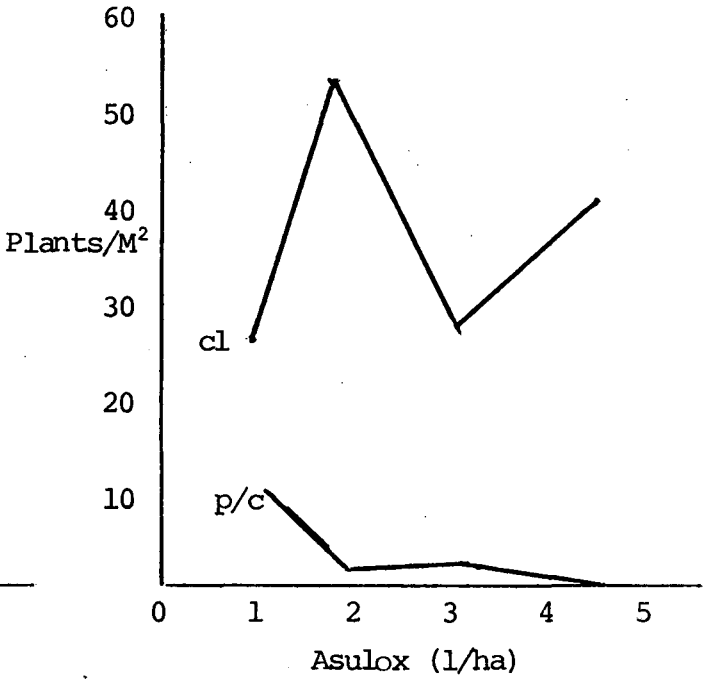

60
50
40
30
20
10
Plants/M²
cl
p/c
0
.4
.8
1.2
1.6
2
Diuron (l/ha)


60
50
40
30
20
10
Plants/M²
cl
p/c
0
.4
.8
1.2
1.6
2
Atrazine (l/ha)









cl = Clover
p/c = Paterson's curse

PENNY ROYAL CONTROL WITH HERBICIDES

AIM: TO COMPARE ROUND UP AND 2,4,5-T AMINE FOR THE CONTROL OF PENNY ROYAL

SPRAYED: 22/1/80 i.e. 2 years ago
with Round up 3, 6 and 9 l/ha
and 2,4,5-T 6, 12 and 24 l/ha

COST OF CHEMICAL:

2,4,5-T Amine	6 l/ha	=	$12.90
	12 l/ha	=	$25.80
	24 l/ha	=	$51.60
Round Up	3 l/ha	=	$48.36
	6 l/ha	=	$96.72
	9 l/ha	=	$145.08

*Prices courtesy P & F Supplies and Frederickstown Traders

- x - x - x - x - x - x -

AIM: TO COMPARE SOIL RESIDUAL HERBICIDES AND MIXTURES WITH THE NON RESIDUAL HERBICIDES 2,4,5-T and ROUND UP, AT A RANGE OF RATES AND TIMES OF APPLICATIONS

HERBICIDES TESTED:
Round up
2,4,5-T Amine
2,4,5-T/Diuron
2,4,5-T/Atrazrine
2,4,5-T/Picloram "Tordon 105"
"Sencor" or "Lexone"

TIMES OF APPLICATION
Pre flowering - December
Flowering - February
Post Flowering March

RATES OF APPLICATION log sprayed - 5 times normal rate down to ½ normal rate.

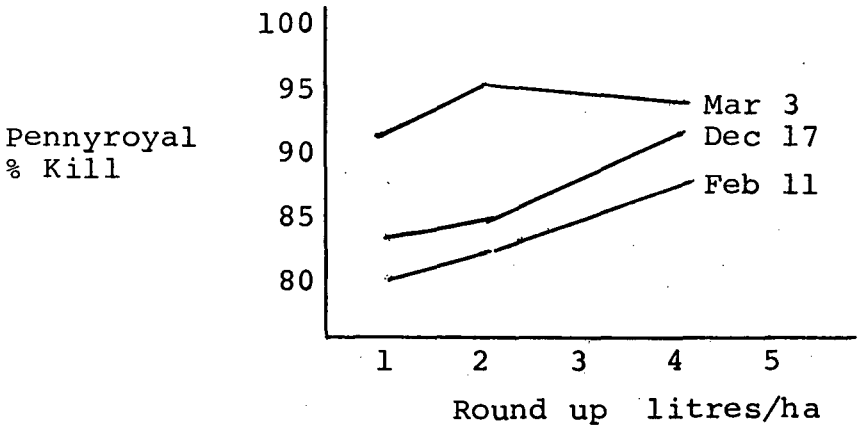
RESULTS

Conditions were very dry during the Jan/early February period and consequently the Pennyroyal was drought stressed at the flowering time of spraying (February). Rain in late February early March revived the Pennyroyal and it was growing well for the March treatments.

1. ROUND UP

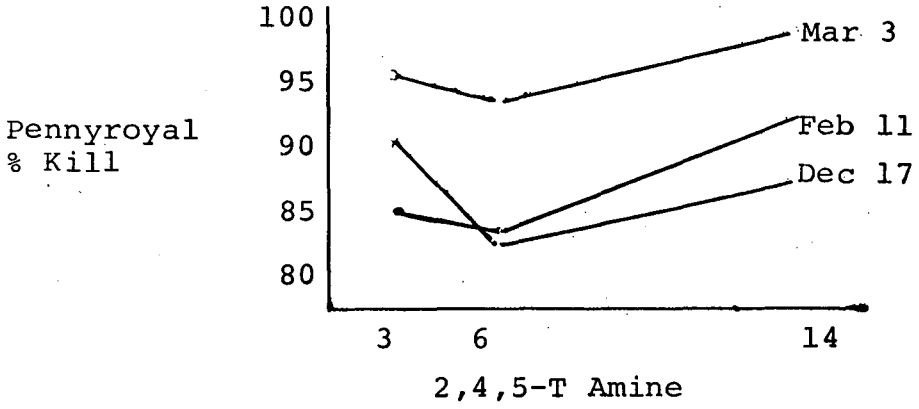
The best control was achieved with late spraying. Earlier times of spraying were quite rate responsive and the stress affected plants in February were more tolerant than healthy plants sprayed either earlier or later (see below)

Pennyroyal control with Round up:



2. 2,4,5-T AMINE

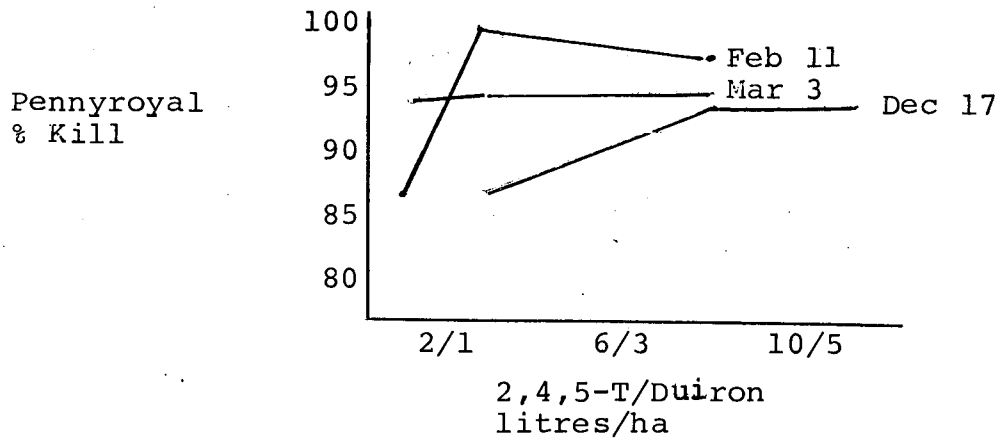
As with Round up best control was achieved with late spraying. The observed control was not rate responsive apart from the February application time when the weed was drought stressed.



3. 2,4,5-T/DUIRON

This was the best herbicide tested. It showed the greatest activity on drought stressed plants and good efficacy at low cost rates (particularly with late spraying).

Penny Royal control with 2,4,5-T/Duiron



2,4,5-T/Atrazine

This performed similarly to straight 2,4,5-T Amine.

Tordon 105

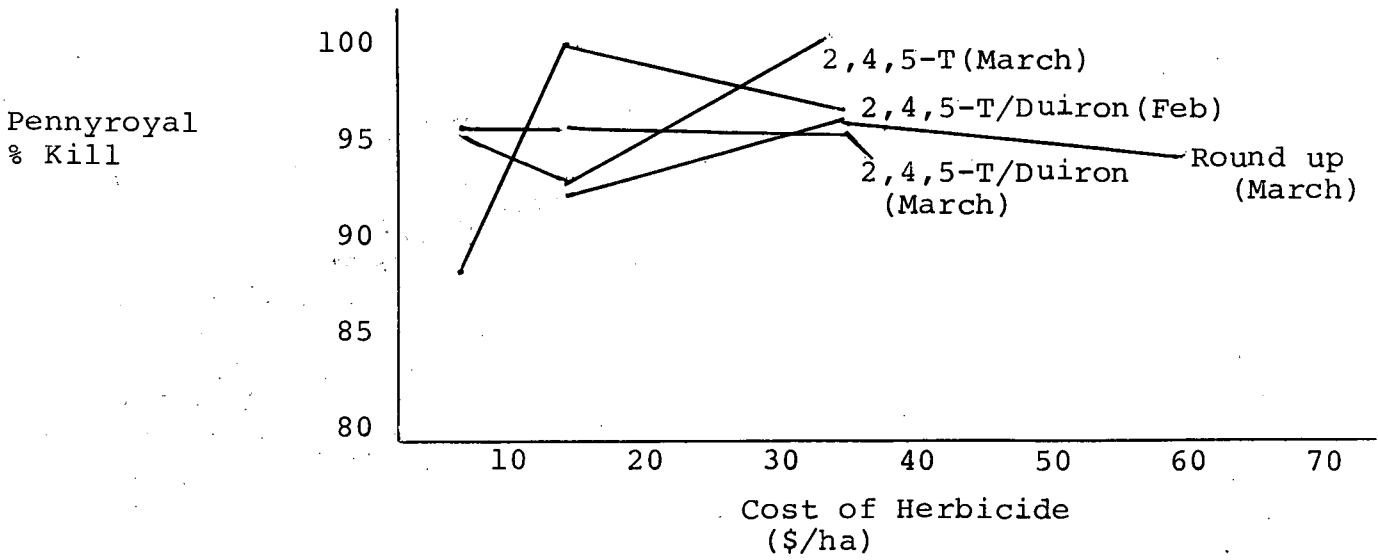
Pasture damage, poor kills of Pennyroyal and cost made this treatment undesirable.

Sencor

High cost and only moderate Pennyroyal control

HERBICIDE ECONOMIC COMPARISONS

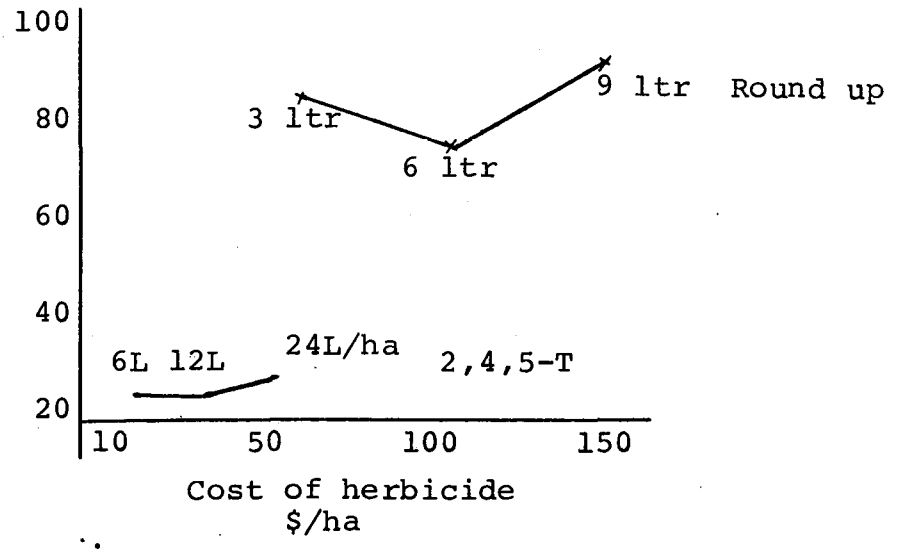
% Kill of Pennyroyal 10 mths after spraying



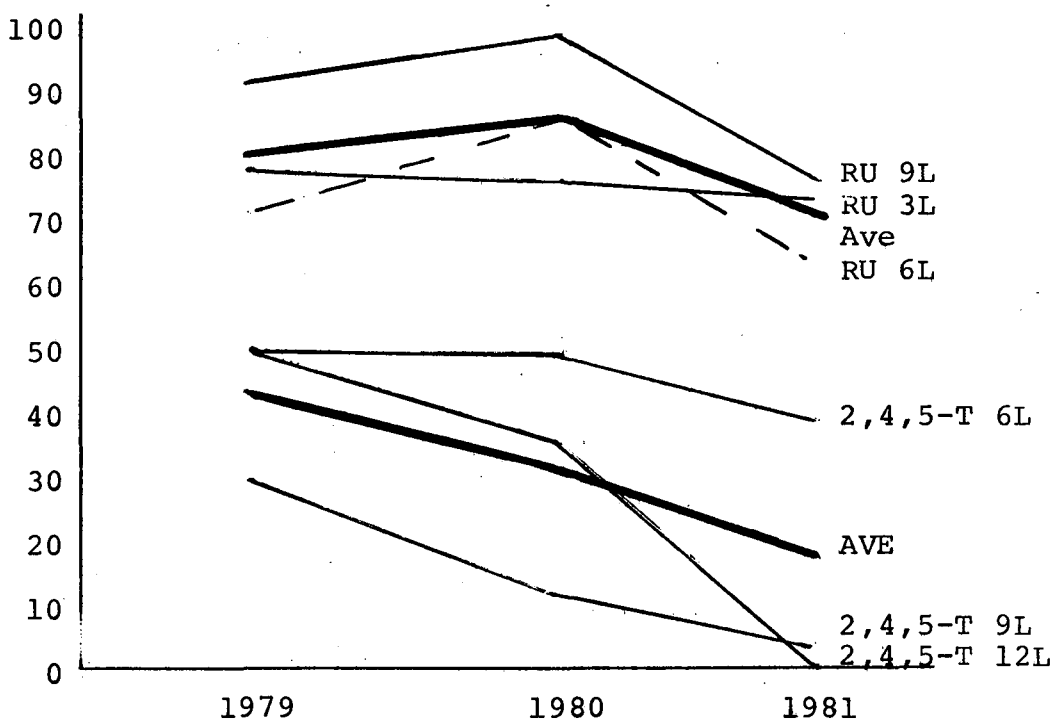
The graph above indicates that for between $10 - $15/ha ($4 - $6/ac) about 95% of Pennyroyal can be controlled without affecting pasture

production noticeably. It also shows that initially 2,4,5-T and its mixture with duiron is superior to Round up. However, in the longer term Round up is far superior to 2,4,5-T Amine. Figures from this trial and a screening trial on D. Wells' property below show how Pennyroyal comes back after 2,4,5-T treatment much more quickly than after "Round up". The reasons for this are unknown at present.

Pennyroyal Control 22 months after spraying:



Pennyroyal Control by Time
(D. WElls - Screening trial)



I have no relevant data on how 2,4,5-T/Duiron will perform with time. This trial in future years may supply some of the answers.

CONCLUSIONS

This trial has confirmed the field observation that 2,4,5-T whilst giving good initial control of Pennyroyal, fails after a number of years. Round up has a far longer term effect. This can only be attributed to a more complete initial kill as both herbicides are essentially non residual.

Further work needs to be conducted on Round up in combination with soil residual chemicals or multiple applications to overcome the problem of reinfestation from seed reserves.

TRIAL Penny Royal Demo Trial (Williams)

Treatment	Rating of Penny royal 23.10.81	
	Grazed	Ungrazed
Round up 3L/ha Feb 80	24/80	2/80
1¼L/ha Feb 80	32/80	1/80
2,4,5-T amine 8L/ha Feb 80	20/80	3/80
Control	38/80	64/80
Plough/rotary hoe	40/80	
Plough/scarify	43/80	
Plough	51/80	
Control	54/80	

SEED DORMANCY

A portion of Pennyroyal seed requires some time to mature before it will germinate. Typically only 50% of seed well germinate straight after seed set. After twelve months maturation about 80% will germinate. Thus even under ideal conditions 20% of Pennyroyal seed has some form of dormancy. See Table below:

The effect of storage time on Pennyroyal germination:

(seed harvested February 1980)

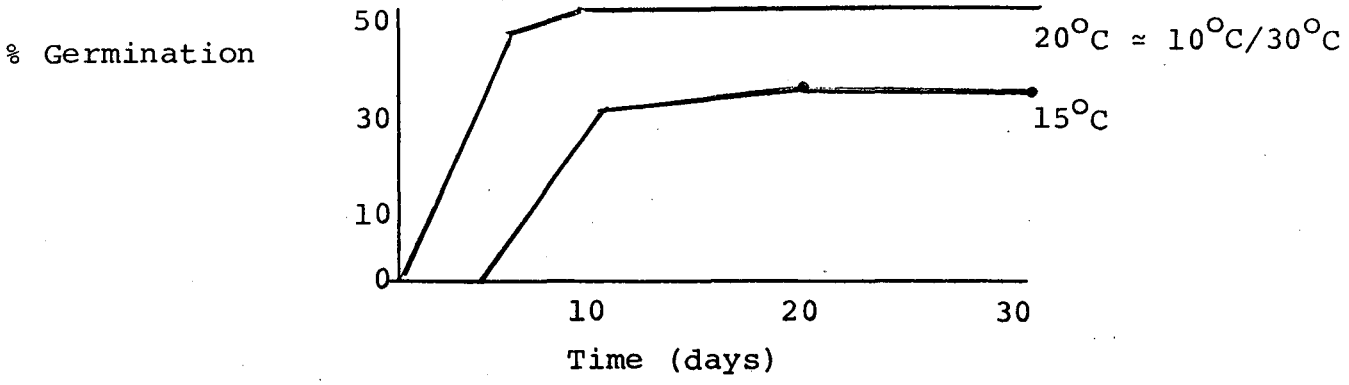
Time	% Germination
March 80	50
May	67
June	59
July	65
August	64
Sept	65
Oct	87
Nov	80
Dec	81
Feb 81	84
Mar	83
April	86
May	80

PENNY ROYAL SEED STUDIES

Effects of Temperature

Pennyroyal seed germination is dependent on temperature. The following graph shows that germination is quicker and more seed germinates at higher temperatures. The average summer temperature in Denmark is 18°C and the average maximum temperature for the hottest month is 23°C.

The effect of temperature on Pennyroyal germination



SEED SIZE

Very small round seed - 14,000/gram

c.f. Clover 200/gram

PASSAGE THROUGH GUT

Pennyroyal seed was fed to guinea pigs and sheep. No seed germinated in the faeces.

Pennyroyal seed viability after passage through gut

Locality	Albany D.O. Animal House
Treatments	Ewe and guinea pig starved for 24 hours pre treatment. Ewe drenched with 14 000 (1 g) of pennyroyal seed then fed. Guinea pig fed a 1 400 (0.1 g) seed enclosed in a gelatin capsule. Feaces of both animals collected every 12 hours for 72 hours; dusted with Captan and placed on moist filter paper in petri dishes.
Results	No pennyroyal seed had germinated 2 weeks after faecal collection. Untreated seed had 80% germination within one week.