1980

Weed control in pastures and cereals

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DEPARTMENT OF AGRICULTURE

Western Australia

SUMMARY OF EXPERIMENTAL RESULTS 1980

WEED CONTROL IN PASTURES AND CEREALS

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Research Officer
PLANT RESEARCH DIVISION

617

80NO37 Post sowing - pre emergence applications of chemicals for soursob control in cereals

Property J. Miller - Beverley

Crop Gamenya wheat - sown 25/6/80

Weed Soursob - Midstyled Tetraploid form

Date of Spraying: 30/6/80 at 58 L/ha of mixture

Plant Counts: 29/8/80

Treatments	Rate/ha	% Reduction of Soursob	% Yield Increase	Net Returns* $/hectare
1. Diuron	1.23L	39	36	216.12
2.	1.54	26	48	234.04
3.	1.92	48	24	192.54
4.	2.40	52	41	217.71
5.	3.00	66	19	178.23
6. Linuron	1.23 kg	47	39	206.21
7.	1.54	41	20	169.56
8.	1.92	41	51	213.68
9.	2.40	47	46	196.97
10.	3.0	62	53	197.83
11. Sencor T	0.61 kg	4	34	209.18
12.	0.77	23	21	183.08
13.	0.96	11	14	170.30
14.	12.0	34	5	151.35
15.	1.50	41	10	154.34
16. DPX-4189	32 g	92	105	
17.	40	94	53	
18.	50	98	66	
19.	61	96	67	
20.	75	98	93	
21. Unsprayed		0	0	164.0232

* Net returns based on $150/tonne less cost of chemical.

80NO39 Chemical control of soursob in cereals using herbicide combinations

Property J. Miller, Beverley

Crop Gamenya wheat, sown 25/6/80

Weed Soursob Midstyled tetraploid

Date of Spraying 21/7/80 at 60 L/ha of mixture. Crop at 2 to 2.5 leaves

Plant counts 29/8/80

Treatments	Rate/ha	% Reduction of Soursob	% Yield Increase	Net Returns $/hectare
1. Diuron + Linuron	0.82L + 1.40 kg	72	22	200.58
2.	1.02 + 1.23	70	21	200.57
3.	1.28 + 1.04	67	22	204.36
4.	1.6 + 0.8	73	8	180.40
5.	2.0 + 0.5	65	17	200.42
6. DPX-4189 + Diuron	21 g + 1.40 L	96	33	
7.	26 + 1.25	99	44	
8.	32 + 1.05	96	23	
9.	40 + 0.8	97	34	
10.	50 + 0.5	98	17	
11. Sencor T + Linuron +	0.41kg + 0.34kg + 0.98kgL	57	-1	167.96
12. + Diuron	0.51 + 0.43 + 0.72	69	11	188.72
13.	0.64 + 0.54 + 0.4	68	12	188.20
14. Sencor T + Linuron	0.8 kg + 0.67 kg	64	39	236.28
15.	1.0 + 0.5	51	27	213.18
16. Unsprayed		0	0	188.53

619

80NO38 Post-emergent chemical control of Soursob in cereal crops

Property J. Miller - Beverley

Crop Gamenya wheat, sown 25/6/80

Weed Soursob - Midstyled Tetraploid

Date of Spraying 21/7/80 at 60 L/ha of mixture. Crop at 2 to 2.5 leaves

Plant Counts 29/8/80

Treatments	Rate/ha	% Reduction of Soursob	% Yield Increase	Net Returns $/hectare
1. Dosanex	1.64 kg	54	32	236.73
2.	2.05	44	31	231.82*
3.	2.56	43	60	282.72
4.	3.20	62	32	255.19
5.	4.0	53	60	262.07
6. DPX-4189	32 g	82	54	
7.	40 g	81	50	
8.	50 g	83	32	
9.	61 g	89	44	
10.	75 g	91	19	
11. Diuron	1.02 L	45	28	235.56
12.	1.28	60	9	198.27
13.	1.60	46	54	281.30
14.	2.0	59	20	215.00*
15.	2.5	58	20	212.11
16. Linuron	1.02 kg	50	9	187.44
17.	1.28	51	6	177.18
18.	1.60	65	21	199.76
19.	2.0	63	38	224.76*
20.	2.5	62	41	221.55
21. Sencor T	0.61 kg	61	36	245.80
22.	0.77	55	27	226.05*
23.	0.96	60	4	179.38
24.	1.20	63	16	197.83
25.	1.50	73	-9	145.48
26. Unsprayed		0	0	188.53

* Recommended or suggested rate of application

80NO38 Post emergent chemical control of soursob in cereal crops

Property N. Hansen - Northam

Crop Warimba wheat sown on 4/6/80

Weed Soursob - Short styled Pentaploid

Date of Spraying 26/6/80 at 60 L/ha of mixture. Crop at 2 leaf stage.

Plant counts 21/8/80

Treatments	Rate/ha	% Reduction of Soursob	% Yield Increase	Net Returns $/hectare
1. Diuron	1.02 L	29	3	77.72
2.	1.28	53	-5	69.77
3.	1.60	47	-22	54.18
4.	2.0	75	0	69.75
5.	2.5	68	-13	56.39
6. Linuron	1.02 kg	47	17	76.77
7.	1.28	43	4	61.62
8.	1.60	55	9	59.98
9.	2.0	78	27	67.52
10.	2.5	73	12	46.50
11. DPX-4189	32 g	95	39	
12.	40	98	42	
13.	50	98	77	
14.	61	99	57	
15.	75	99	61	
16. Sencor T	0.61 kg	41	-13	59.91
17.	0.77	25	3	70.09
18.	0.96	25	3	66.79
19.	1.20	56	-15	48.02
20.	1.50	44	-29	31.46
21. Unsprayed		0	0	81.05

621

80NO39 Chemical control of soursob in cereals using herbicide combinations

Property N. Hansen - Northam

Crop Warimba wheat sown on 4/6/80

Weed Soursob - Short styled Pentaploid

Date of Spraying 26/6/80 at 60 L/ha of mixture. Crop at 2 leaf stage.

Plant counts 21/8/80

Treatments	Rate/ha	% Reduction of Soursob	% Yield Increase	Net Returns $/hectare
1. Diuron + Linuron	0.82L + 1.4kg	78	-8	47.02
2.	1.02 + 1.25	76	-21	38.10
3.	1.28 + 1.05	67	-20	40.83
4.	1.6 + 0.8	73	-9	52.41
5.	2.0 + 0.5	73	-1	62.11
6. DPX-4189+Diuron	21 g + 1.06 L	99	40	
7.	26 + 0.94	98	55	
8.	32 + 0.74	100	35	
9.	40 + 0.6	100	41	
10.	50 + 0.38	99	33	
11. Sencor T+Linuron	0.41kg + 1.41kg	65	-19	31.65
12.	0.51 + 1.25	71	-11	42.96
13.	0.64 + 1.05	65	-7	47.56
14.	0.8 + 0.8	37	-23	35.91
15.	1.0 + 0.5	70	-3	54.37
16. Unsprayed		0	0	83.10

80NO38 Post emergent control of soursob in cereal crops

Property B.L. Riley - Trayning

Crop Halberd wheat - sown 6/6/80

Weed Soursob midstyled Tetraploid

Date of Spraying 2/7/80 at 60 L/ha of mixture. Crop at 2.5 leaves

Plant Counts 27/8/80

Treatments	Rate/ha	% Reduction of Soursob
1. Diuron	1.02L	33
2.	1.28	26
3.	1.6	44
4.	2.0	39
5.	2.5	63
6. Linuron	1.02 kg	59
7.	1.28	53
8.	1.6	47
9.	2.0	54
10.	2.5	77
11. DPX-4189	32g	80
12.	40	72
13.	50	20
14.	61	78
15.	75	78
16. Sencor T	0.61kg	11
17.	0.77	34
18.	0.96	63
19.	1.20	52
20.	1.50	67
21. Unsprayed		0

623

80NO39	Chemical control of soursob in cereal crops usiing herbicide combinations
Property	B.L. Riley - Trayning
Crop	Halberd wheat - sown 6/6/80
Weed	Soursob midstyled Tetraploid
Date of Spraying	2/7/80 at 60 L/ha of mixture. Crop at 2.5 leaves
Plant Counts	27/8/80

Treatments	Rate/ha	% Reduction of Soursob
1. Diuron + Linuron	0.82 L + 1.4 kg	73
2.	1.02 + 1.25	94
3.	1.28 + 1.05	57
4.	1.6 + 0.8	83
5.	2.0 + 0.5	72
6. DPX-4189 + Diuron	21 g + 1.41 L	96
7.	26 + 1.25	98
8.	32 + 1.05	98
9.	40 + 0.8	98
10.	50 + 0.5	99
11. Sencor T + Linuron	0.41 kg + 1.4 kg	79
12.	0.51 + 1.25	61
13.	0.64 + 1.05	73
14.	0.8 + 0.8	62
15.	1.0 + 0.5	38
16. Unsprayed		0

Comments

The dry conditions during the growing season depressed yields at all sites. The site at Trayning was not harvested.

Apart from the experimental herbicide DPX-4189 no other commercial chemical treatments controlled soursob at rates that would be economical and safe to apply to the crops. Adding diuron to DPX-4189 improved the control of soursob at all sites. Slight improvement in control of soursob was also obtained by mixing diuron and linuron. Combining a relatively cheap herbicide with a more expensive one may be one way to reduce the cost of controlling soursob in cereals.

At the Beverley site where seasonal conditions were better than the others most chemical treatments resulted in economical returns despite poor soursob control. The pre-emergence applications of DPX-4189 gave better than 90 per cent weed control and yield increases of over 50 per cent.

At Northern DPX-4189 alone or in combination with diuron were the only treatments to give good control of soursob and substantial crop yield increases.

This season DPX will be tested at rates below 30 g/ha for pre and post emergent treatments.

78NO40 Cape Tulip. Testing factors to break dormancy of cormils

Property D. Moir - Beverley

Experimental Details Factorial Experiment

1) Burning vs non burning of stubble or pasture

2) Systems

a) continuous cropping
b) double cropping
c) alternating crop and pasture
d) continuous pasture

3) Depth of planting of cormils

a) 12 mm
b) 25 mm
c) 50 mm
d) 100 mm

Experiment to run for 5 years.

Cormils emergence in 1980 expressed as a percentage of cormils sprouted since commencement of experiment.

	% Sprouted Cormils Depth of Sprouting Cormils			
	12 mm	25 mm	50 mm	100 mm
Croping 1980	5	44	3	1
Pasture 1980	0	0	0	0

Comments

No dry matter present at break of season so burning treatments ineffective. Sprouting confined to top 50 mm of soil.

625

79NO37 Cape Tulip control in pastures using 2,4-D amine and 2,4-DB.

Property C. Doncon, Beverley

Weed Two leaf Cape Tulip (Homeria miniata)

Date of Spraying 20/7/79 using 40 L/ha mixture

Rates of Chemical used 2,4-D amine (50%) 0.5, 0.75, 1.0, 1.5 and 2.0 L/ha
2,4-DB (40%) 1.0, 1.5, 2.0, 2.5, 3.0

Assessments Cape Tulip and clover counts 8/5/80

Treatments	Rate L/ha	Plant Counts/M^2		Cost of chemical treatment $/ha
		Clover	Cape Tulip	
1. 2,4-D amine	0.5	932	64	1.17
2.	0.75	1032	120	1.76
3.	1.0	1304	86	2.34
4.	1.5	958	154	3.51
5.	2.0	1192	58	4.68
6. 2,4-DB	1.0	1166	140	4.13
7.	1.5	1202	144	6.20
8.	2.0	1132	142	8.26
9.	2.5	958	202	10.33
10.	3.0	1014	106	12.39
11. Unsprayed		950	872	

Comments

None of the rates of 2,4-D amine or 2,4-DB used seriously retarded emergence of subterranean clover.

Significant reductions of Cape Tulip resulted from both 2,4-D and 2,4-DB applications. With the nil effect on clover the treatments could be repeated yearly without damaging the clover population. This work is being repeated at several sites, and on both species of Cape Tulip, i.e. one leaf (Homeria collina) and Two leaf (Homeria miniata).

626

Effect of time of spraying on Cape Tulip cormil development

Location Forrestfield, APB centre

Cormils of Two leaf Cape Tulip (Homeria miniata) were collected during summer of 1978/79. Sprouted cormils were transplanted after break of season into pots (1979). The herbicide 2,4-D amine at the rates 0, 0.25, 0.50, 0.75 and 1.0 L/ha were applied at three times; 8/8/79, 4/9/79 and 14/9/79. Plants were allowed to mature and remain in the pots over summer. After break of 1980 season pots were artificially watered during the winter.

Rate of sprouting from new corms was measured at two times during the growing season. At the end of the growing season leaf measuremnts, corm and cormil production were taken.

Effect of different rates of 2,4-D amine on growth of Cape Tulip the year after application

1. Emergence - total plants/60 original cormils

Rate of 2,4-D amine	23/4/80	13/6/80
0.25 L/ha	34	47
0.50 L/ha	9	26
0.75 L/ha	6	28
1.0 L/ha	3	16
Unsprayed	41	43

2. Corm and cormil production (1980)/60 original cormils

2,4-D amine	Corms	Cormils	Leaf Cormils
0.25	60	111	6
0.50	30	10	0
0.75	37	0	0
1.00	21	0	0
Unsprayed	47	438	17

3. Leaf growth - length mm/plant

2,4-D amine	13/6/80	23/10/80
0.25	49	315
0.50	33	129
0.75	26	134
1.00	19	92
Unsprayed	64	280

627

Comments

Rates above 0.5 L/ha of 2,4-D amine retard the emergence of tulip and the leaf growth the year after treament. Although corm production doesn't appear to be affected there is a large reduction in formation of the smaller cormils with the lower rates of 2,4-D and complete inhibition of cormil production at rates of 0.75 and 1.0 L/ha. This may be of importance in the field as rates of 2,4-D amine at 1.0 L/ha don't appear to cause significant damage to subterranean clovers in the pasture (79NO37) and therefore may be used to supress cormil formation in paddock infestations.

80ME33 Weed control in cereals

Property Breakell, Bencubbin

Crop Gamenya wheat, sown 12/6/80

Weeds Capeweed (Arctotheca calendula), doublegee (Emex australis), Matricaria (Pentzia suffruticosa)

Date of Spraying 19/6/80 at 60 L/ha of mixture (pre-emergency)

Treatments	Rate/ha	Plant Counts/m^2 Cape weed	Double gee	Matricaria	Crop Yield kg/ha	Net Returns $/ha*
1. Diuron	0.6lL/ha	0	2.0	0	1650	244.05
2.	0.78	0	1.2	1.2	1277	187.14
3.	0.96	0	0	0	1402	204.80
4.	1.20	0	1.2	0	1725	251.97
5.	1.5	0	0	0	1563	225.97
6. Linuron	0.6lkg/ha	0	1.2	0	1697	243.67
7.	0.78	0	0	0	1473	207.16
8.	0.96	0	1.2	0	1596	222.40
9.	1.20	0	0	0	1686	231.65
10.	1.50	0	1.2	2.6	1401	183.59
11. DPX-4187	22g/ha	0	0	5.2	1669	
12.	27	2.60	0	2.6	1479	
13.	33	0	0	0	1589	
14.	40	0	0	0	1746	
15.	50	0	0	0	1521	
16. Unsprayed		6.32	4.96	142.64	1351	202.65

* Net returns based on price of wheat at $150/tonne less chemical costs.

Counts taken 18/8/80 for 80ME33, 34 and 35.

629

80ME34 Weed control in cereals

Property Breakell, Bencubbin

Crop Gamenya wheat, sown 12/6/80

Weeds Capeweed (Arctotheca calendula), doublegee (Emex australis), Matricaria (Pentzia suffruticosa)

Date of Spraying 28/7/80 at 60 L/ha. Crop at 3-4 tillers

Treatments	Rate/ha	Plant Counts/m^2 Capeweed	Doublegee	Matricaria	Crop Yield kg/ha	Net Returns $/ha*
1. Diuron	0.41l/ha	4	2.6	54.2	1232	182.48
2.	0.51	1.2	1.2	52.6	1234	182.22
3.	0.64	0.6	0.6	16	1211	178.03
4.	0.8	0	0.6	6.6	1243	181.93
5.	1.0	0	0	13.2	1091	158.00
6. Linuron	0.41kg/ha	0.6	2.6	66.6	1089	156.09
7.	0.51	0	0	57.2	1159	164.82
8.	0.64	0.6	1.2	57.2	1331	188.32
9.	0.8	0	0	8.6	1245	172.58
10.	1.0	0	0	6	1557	215.84
11. DPX-4189	21g/ha	2.6	5.2	152	1217	
12.	26	2	7.2	165	1085	
13.	32	0	6.6	179	1196	
14.	40	8	6.6	123	1364	
15.	50	2.6	4.6	252	959	
16. Bromoxynil	0.61L/ha	4	2.6	10.6	1466	214.61
17.	0.77	0.6	4	17.2	1393	202.27
18.	0.96	0	4	10.6	1326	190.57
19.	1.20	0.6	0.6	0.6	1376	195.99
20.	1.50	0	0	0	1301	182.14
21. Unsprayed		4.08	7.28	222.2	1103	165.45

80ME35 Weed control in cereals

Property Breakell, Bencubbin

Crop Wheat, Gamenya, sown 12/6/80

Weeds Capeweed (Arctotheca calendula), doublegee (Emex australis), Matricaria (Pentzia suffruticosa)

Date of Spraying 28/7/80 at 60 L/ha. Crop at 3-4 tillers

Treatments	Rate/ha	Plant Counts/m^2 Cape weed	Double gee	Matricaria	Crop Yield kg/ha	Net Returns $/ha*
1. Diuron+Bromoxynil	0.41L+0.8L	0	0	0.6	966	135.49
2.	0.51 + 0.74	0	0.6	0	1089	151.05
3.	0.64 + 0.68	0.6	0	0.6	960	134.48
4.	0.8 + 0.6	0	0	0	951	132.92
5.	1.0 + 0.5	0	0	0	757	103.56
6. Diuron+Linuron	0.4L+1.0kg	0	0	0.6	854	108.07
7.	0.51 + 0.86	0	0	0	940	122.89
8.	0.64 + 0.7	0	0.6	0	815	106.23
9.	0.8 + 0.5	0	0	1.2	911	123.28
10.	1.0 + 0.25	0	0	2.6	855	118.17
11.Linuron+Bromoxynil	0.41kg+0.8L	0	0.6	2.6	969	131.15
12.	0.51 + 0.74	0	0	0	949	126.90
13.	0.64 + 0.68	0	0	0.6	1144	151.37
14.	0.8 + 0.6	0.6	0	0	941	121.77
15.	1.0 + 0.5	0	0	1.2	864	107.55
16. Unsprayed		6.25	4.52	176.8	901	135.15

Comments

Although moisture supply was adequate at beginning of crop growth, the very dry finish retarded growth of crops and weeds.

Pre-emergence applications gave good control of all weeds, and resulted in cereal yield increases large enough to offset the chemical cost.

Post emergence applications of single herbicides except Bromoxynil did not give good control of all weeds particularly Matricaria when low rates of the herbicides applied. DPX-4189 did not give good control any of the three weeds present. The low rate of Bromoxynil (600 ml/ha) was particularly effective in reducing the matricaria infestation, and give worthwhile returns from the treatment.

The post-emergent herbicide mixtures gave good control of all weeds but were either too expensive or phytotoxic to the wheat to give worthwhile yield increases hence returns.

631

78NO39 — Doveweed seed viability, changes with depth and time of storage in the soil.

Property — J. Hill, Beverley

Date of Commencing Experiment — May 1978

Experiment Detail — Seeds of Doveweed (Eremocarpus setigerus) a summer growing annual were planted at four depths 12 mm, 25 mm, 50 mm and 100 mm. At the end of summer samples of seed recovered and germination tested. Experiment to continue for five years.

Percentage germination and hardseededness of Doveweed seeds stored at various depths.

Depth	Germination %		Hard Seeds		Dead Seeds	
	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2
12 mm	12	5	50	43	38	52
25 mm	5.5	3	55	53.5	39.5	43.5
50 mm	30	7.5	35.5	44.5	34.5	48
100 mm	58	43.5	12.5	16.5	29.5	40

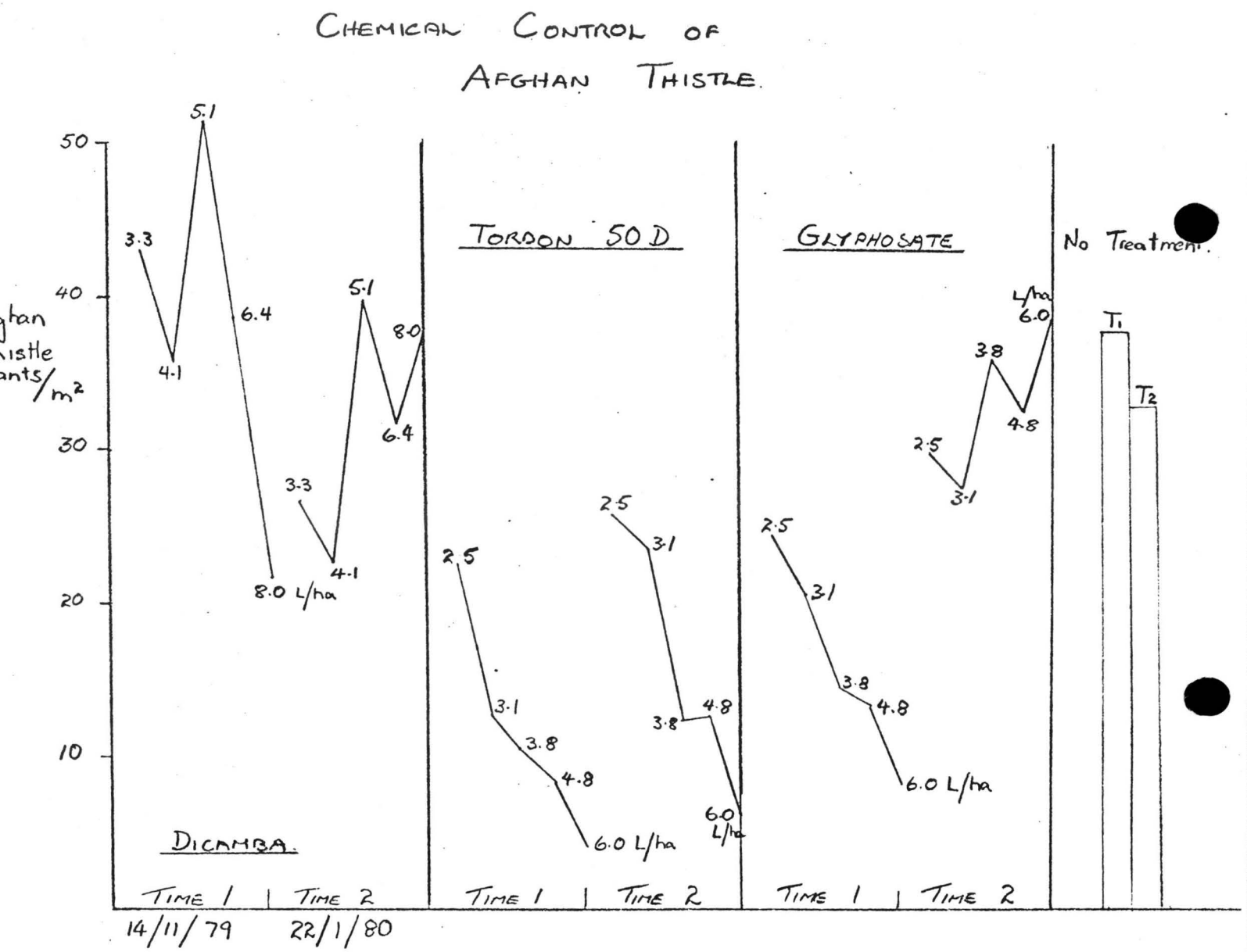
Comments

Germination increases with depth. Viability of seeds is declining with age.

80KA6 Chemical control of Afghan Thistle

Property N. Horne, Wagin

Exp. Details Afghan Thistle (Solanum hoplopetalum) a spiney perennial plant making most growth during summer was treated at two times during the summer with the chemicals dicamba, glyphosate and Tordon 50D. Plant counts were taken 12 months after treatment.



633

Comments

Dicamba, a previous recommendation was ineffective at both times of application.

Conditions at time of spraying may be critical for performance of both Tordon and glyphosate. Around first time of application significant rainfall was recorded and Afghan thistle plants were growing vigorously. At the second time of spraying conditions were very dry and hot (on the day of spraying the maximum temperature was 43°C). The glyphosate did not give good control of the weed at this time and it has been suggested that two factors may have influenced the results. Firstly the Afghan was probably suffering from moisture stress, and secondly and probably the most important was that after a long dry spell the plants were probably covered with dust which would have inhibited the glyphosate activity.

Tordon which also has residual properties gave good results at both times of spraying because there was heavy rains within three weeks of treating the Afghan thistle. Continual dry conditions after spraying would have decreased the Tordon's effectiveness because the chemical would have been broken down by the ultraviolet light.

Trials are continuing to test the effectiveness of Tordon when applied during the winter months.

Acknowledgements

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