

1981

Summary of experimental results field trials 1981

P A. Rutherford

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DEPARTMENT OF AGRICULTURE
WESTERN AUSTRALIA
SUMMARY OF EXPERIMENTAL RESULTS
FIELD TRIALS 1981

P.A. Rutherford
Research Officer
Weed Agronomy Branch

80NA46) : Weed control on roaded catchments
80NA45) : Demonstration catchment, Karlgarin, (80NA46)
Property : B. White, South Kweda, (80NA45)
Site : Roaded catchments, heavily infested with winter annual
grasses and broad-leaved weed.
Plot size : 30 m x 3 m : 1 replicate
Application : Each treatment applied with experimental logarithmic
sprayer. Initial rate of application 20 kg/ha reducing to
1 kg/ha over 30 metres.
Volume : 1000 l/ha : no wetting agent added
Dates : Treatments applied 1/5/80 - just pre-emergent
assessments : 1/9/80, 31/8/81
Assessment : Distance (metres) from starting point of plot to position
of unsatisfactory weed control, converted to rate (kg/ha)
at that position from log. graph of the plot with distance.

		Lowest rate (kg/ha) giving adequate weed control			
No.	Herbicide	Kweda		Karlgarin	
		After 1 year	2 years	After 1 year	2 years
1	Atrazine	1.0	7.9	1.0	7.4
2	Diuron	1.9	4.7	3.2	7.0
3	Bromacil	1.0	1.0	1.0	1.8
4	Velpar	1.0	2.2	2.6	17.8
5	Ustilan	1.0	1.0	1.0	11.3
6	Sprayseed	0	0	0	0

Comments

1. After two years at Kweda, Bromacil and Ustilan are still maintaining complete weed control. Velpar is still reasonably effective. Atrazine and Diuron are beginning to break down.
2. After two years at Karlgarin, Bromacil is still proving effective; atrazine and diuron are beginning to lose effectiveness. Velpar and Ustilan are both poor, an unexplicable result.
3. The trial will be monitored for one more year.

79TS27 : Chemical firebreaks on deep white sand
 Property : Alexander Morrison National Park - Coorow
 Site : Deep white sand on a firebreak adjoining farm
 Plot size : 3 m x 3 m : 2 replicates
 Volumes : 500 l/ha, applied with experimental land lead equipment
 Wetting agent : Added to all treatments at 1:400
 Species present : Wild oats, annual ryegrass, annual brome and silver
 grasses, capeweed, sub-clover
 Dates : Treatment applied : 3/7/79
 Assessments : 29/10/79
 6/11/80) Mean of two
 18/6/81) observers
 Ratings : 0-10 0 = No control of weeds
 10 = complete control = bare ground

No	Herbicide	R/ha	Ratings		
			After 1 year	After 2 years	After 3 years
1	Vorox AA (amitrole + atrazine)	5 litre	8.5	0	0
2		10 litre	9.0	0	0
3		20 litre	9.5	3.5	0
4	Exit (amitrole + atrazine + diuron)	4 kg	8.5	0.5	0
5		8 kg	9.0	1.0	0.5
6		16 kg	9.5	2.25	2.0
7	Sterasoil (amitrole + diuron)	3 kg	4.5	0	0
8		6 kg	8.5	3.0	3.0
9		12 kg	9.0	4.75	4.0
10	Hyvar x (bromacil)	5 kg	9.5	9.0	7.25
11		10 kg	10.0	9.5	8.5
12		20 kg	10.0	10.0	8.5
13	Krovar (bromacil + diuron)	5 kg	10.0	9.0	8.5
14		10 kg	10.0	9.75	8.25
15		20 kg	10.0	10.0	8.75
16	Velpar (hexazinone)	2.5 kg	10.0	7.75	6.5
17		5 kg	10.0	8.0	7.75
18		10 kg	10.0	9.5	8.25

No	Herbicide	R/ha	Ratings		
			After 1 year	After 2 years	After 3 years
19	Ustilan (ethiadiruron)	4 kg	9.5	9.25	8.0
20		8 kg	10.0	10.0	9.0
21		16 kg	10.0	10.0	8.5
22	VEL 5026 (buthadiazol)	4 kg	9.5	4.75	4.5
23		8 kg	10.0	8.0	7.5
24		16 kg	10.0	9.0	7.75
25	Sprayseed	4 litre	2.25	0	0
26	Control	Nil	0	0	0

Comments

1. The short-term residual herbicides (Tr 1-9) were effective only for the 1979 growing season. Not surprisingly, their persistence has not been great enough to give effective weed control into the second and third years.
2. The long-term residual herbicides (Tr 10-24) are still effectively controlling winter annual weeds after three years, although some break down is occurring.
3. After three years, differences between rates of application of the long-term residual herbicides are not marked, except with VEL 5026.
4. The trial will be rated for one more year.

80A46 : Chemical firebreak evaluation - long term
 Property : Avondale Research Station
 Site : Small paddock adjoining homestead
 Plot size : 2.5 m x 2.5 m : 4 replicates
 Volumes : 200 l/ha, applied with experimental hand lead equipment
 No wetting agent added
 Species present : Brome -, Barley -, Silver - and Annual rye-grasses, Wild
 oats, Erodium spp., Capeweed and Flatweed
 Dates : Treatments applied : 11/6/80 - weeds 10 cm length
 11/6/81 when sprayed
 Assessment : 9/9/80 - plants counts on 1 m²
 3/9/81

Mean Plant counts/m²

Rate/ha (litres)		atrazine			diuron		
1980	1981	grasses	broadleaved	total	grasses	broadleaved	total
Nil	Nil	6.25	3.75	10.0	7.75	12.5	20.25
2	Nil	2.75	5.0	7.75	32.0	2.0	34.0
2	2	2.75	0.25	3.0	4.0	0.5	4.5
4	Nil	0.25	3.75	4.0	7.75	3.0	10.75
4	2	0	0.5	0.5	8.25	0	8.25
4	4	2.38	3.13	5.51	1.88	3.0	4.88
6	Nil	1.75	12.5	13.25	1.5	0.25	1.75
6	4	0.13	0	0.13	0	0	0
6	6	0	0	0	0.63	0.13	0.76
8	Nil	2.0	8.0	10.0	3.25	0.25	3.50
8	4	0.88	0	0.88	1.63	0	1.63
8	6	0.25	0	0.25	0.63	0	0.63
8	8	0	0	0	0.13	0	0.13

Atrazine total plant count means

1980	Nil	1981				Mean
		2	4	6	8	
Nil	10.0	-	-	-	-	10.0
2	7.75	3.0	-	-	-	5.38
4	4.0	0.5	5.51	-	-	3.34
6	13.25	-	0.13	0	-	4.46
8	10.0	-	0.88	0.25	0	2.78
Mean	9.0	1.75	2.17	0.13	0	

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Diuron total plant count

1980	Nil	2	1981 rates/ha		8	Mean
			4	6		
Nil	20.25	-	-	-	-	20.25
2	34.0	4.5	-	-	-	19.25
4	10.75	8.25	4.88	-	-	7.96
6	1.75	-	0	0.76	-	0.84
8	3.50	-	1.63	0.63	0.13	1.47
Mean	14.05	6.38	2.17	0.70	0.13	

Comments

1. Atrazine: There appears to be no carry over of atrazine from 1980, at any rate of application. With the 1981 applications, excellent control of weeds has been achieved with 6 litres/hectare, although a large reduction in weed numbers was attained with 2 and 4 litres/hectare.
2. Diuron: There appears to have been a carry-over of Diuron from 1980 at 6 and 8 litres/hectare. At these rates, the addition of up to 4 litres/hectare has reduced weed numbers to very low levels. Where only 2 or 4 litres/hectare were applied in 1980, subsequent application of up to 4 litres/hectare appears insufficient to achieve satisfactory weed control.
3. The trial will be continued in 1982 with further retreatments at lower rates.

80NA50 : Chemical firebreak evaluation - long term
 Property : D. Corke, Yealering
 Site : Firebreak in paddock adjoining road - coarse white sand over clay
 Plot size : 2.5 m x 2.5 m : 4 replicates
 Volumes : 200 l/ha, applied with experimental hand lead equipment no wetting agent added
 Species present : Brome -, barley -, and annual rye grasses - wild oats Capeweed, wireweed, sub-clover, and comspurry
 Dates : Treatments applied : 2/5/80 : weeds barely emerged
 Assessment : 10/6/81
 : 8/7/80) plant counts on 1 m²
 : 8/9/81) plot

Mean Plant counts/m²

Rate/ha (litres)		atrazine			diuron		
1980	1981	grasses	broadleaved	total	grasses	broadleaved	total
Nil	Nil	36.75	7.75	44.5	28.75	8.5	37.25
2	Nil	12.0	9.25	21.25	23.75	4.5	28.25
2	2	0.75	1.75	2.50	11.75	1.0	12.75
4	Nil	18.75	15.25	34.00	9.25	9.0	18.25
4	4	1.0	3.0	4.0	9.50	1.0	10.50
4	4	0.25	1.13	1.38	3.63	0.5	4.13
6	Nil	17.5	7.0	24.50	11.0	5.0	16.0
6	4	0.13	0.63	0.76	3.38	0.5	3.88
6	6	0	0.63	0.63	1.38	0	1.38
8	Nil	11.25	8.5	19.75	6.75	2.0	8.75
8	4	0.38	0.13	0.51	1.13	0.13	1.26
8	6	0.13	0.13	0.26	1.0	0.13	1.13
8	8	0	0.13	0.13	0.38	0	0.38

Atrazine total plant count means

1981 rates/ha

		Nil	2	4	6	8	Mean
1980	Nil	44.5	-	-	-	-	44.5
	2	21.25	2.5	-	-	-	11.88
Rates/ha	4	34.0	4.0	1.38	-	-	13.13
	6	24.5	-	0.76	0.63	-	8.63
	8	19.75	-	0.51	0.26	0.13	5.16
Means	28.8	3.25	0.88	0.45	0.13		

Diuron total plant count

1981 rates/ha

		Nil	2	4	6	8	Mean
1980	Nil	37.25	-	-	-	-	37.25
Rates/ha	2	28.25	12.75	-	-	-	20.50
	4	18.25	10.50	4.13	-	-	10.96
	6	16.0	-	3.88	1.38	-	7.09
	8	8.75	-	1.26	1.13	0.38	2.88
	Mean	21.70	11.63	3.09	1.26	0.38	

Comments

1. Atrazine: There is no evidence of carry-over of atrazine from 1980 spraying. Excellent control of weeds has been obtained with 4 litres of atrazine in 1981, the same minimum rate obtained in 1980.
2. Diuron: Plant counts indicate that diuron residues from 1980 were still controlling weeds in 1981, particularly at higher rates. At these 1980 rates, 4 litres of diuron in 1981 maintained excellent control of weeds.
3. The trial will be continued in 1982 with further retreatments at lower rates.

79NO36 : Residual herbicides for annual weed control - long term cost evaluation

Property : Chitabin siding (12 km north-east Northam)

Site : Unused land adjoining rail track

Plot size : 3 m x 3 m applied with experimental hand-lead equipment.

Volumes : 500 litres/hectare water, no wetting agent.

Species present : Wild oats, brome grasses, fescues, native clovers, French catchfly.

Dates : Treatments applied : 11/7/79
Assessments : 2/9/80, 30/12/81

Assessment by ratings on a skewed 1-6 scale as follows:

Rating	1	2	3	4	5	6
% control	0-25	25-50	50-75	75-98	98-100	100

Comments

1. Satisfactory control (Score of 4.5 and upwards) of annual weeds for two seasons (1979 and 1980 winters) was achieved for \$50 per hectare (the lowest rate) with Krovar, Hyvar-X, Ustilan, VEL 5026, Erbotan and Velpar. Steriweed and K.O. Total were much less effective.
2. After three seasons, all herbicides have lost effectiveness. Only Ustilan and Erbotan were still effective at the \$100 per hectare rate. Krovar and Hyvar-X required \$200 per hectare to maintain effectiveness and VEL 5026 required \$300 per hectare. Velpar, Steriweed and K.O. Total became ineffective.
3. No assessment was possible in 1979 due to fire which burnt the site.

Herbicide kg per hectare	Visual ratings on 3 reps after 1 year	Mean	Visual ratings on 3 reps after 2 years	Mean
Krovar 3.6	6 6 6	6.0	1 2 2	1.7
7.2	6 6 6	6.0	3 3 3	3.0
14.4	5 6 6	5.7	4 6 4	4.0
21.6	6 6 6	6.0	6 5 4	5.0
Hyvar-X 2.2	5 6 6	5.7	2 3 2	2.3
4.4	6 6 6	6.0	2 3 3	2.7
8.8	6 6 6	6.0	5 5 4	4.7
13.2	6 6 6	6.0	5 5 4	4.7
Velpar 1.1	3 5 6	4.7	2 2 2	2.0
2.2	5 5 6	5.3	3 2 2	2.3
4.4	6 5 6	5.7	3 3 4	3.3
6.6	6 6 6	6.0	4 4 4	4.0
Ustilan 2.0	5 6 5	5.3	3 4 4	3.7
4.0	6 6 6	6.0	6 4 4	4.7
8.0	5 6 6	5.7	5 6 6	5.7
12.0	6 6 6	6.0	6 6 6	6.0
VEL 5026 2.0	5 5 6	5.3	2 3 2	2.3
4.0	5 6 6	5.7	4 3 4	3.7
8.0	6 6 6	6.0	3 4 4	3.7
12.0	6 6 6	6.0	5 5 4	4.7
Erbotan 1.4	5 5 -	5.0	4 2 1	2.7
2.8	5 6 6	5.7	5 6 4	5.0
5.6	6 6 6	6.0	5 3 4	4.0
8.4	6 6 6	6.0	5 6 6	5.0
Steriweed 4.0	4 4 -	4.0	1 2 1	1.3
8.0	5 6 5	5.3	1 3 2	2.0
16.0	5 5 6	5.3	4 3 4	3.7
24.0	6 6 6	6.0	4 4 3	3.7
K.O. Total 27.0	1 1 1	1.0	1 3 1	1.7
54.0	1 1 1	1.0	1 1 1	1.0
108.0	1 1 1	1.0	1 2 1	1.3
162.0	1 1 1	1.0	1 1 1	1.0
Control (NIL)	1 1 1	1.0	1 1 1	1.0

Table of means : 1980 results

	50	100	200	300
		\$/ha		
Krovar	6.0	6.0	5.7	6.0
Hyvar	5.7	6.0	6.0	6.0
Velpar	4.7	5.3	5.7	6.0
Ustilan	5.32	6.0	5.7	6.0
VEL 5026	5.3	5.7	6.0	6.0
Erbotan	5.0	5.7	6.0	6.0
Steriweed	4.0	5.3	5.3	6.0
K.O. Total	1.0	1.0	1.0	1.0

Table of means : 1981 results

	50	100	200	300
		\$/ha		
Krovar	1.7	3.0	4.7	5.0
Hyvar	2.3	2.7	4.7	4.7
Velpar	2.0	2.3	5.3	4.0
Ustilan	3.7	4.7	5.7	6.0
VEL 5026	2.3	3.7	3.7	4.7
Erbotan	2.7	5.0	4.0	5.7
Steriwood	1.3	2.0	3.7	3.7
K.O. Total	1.7	1.0	1.3	1.0

81MO41)
 81Pe12) : Long-term weed control on Railway Track
 Sites : Rail-track and ballast
 Muchea : blue metal ballast
 Piawaning : gravel ballast.
 Plot size : 3 replications: 100 m x 6 m with 20 m buffers
 Application : Treatments were applied by commercial track-spraying
 equipment owned by Maxwell, Robinson and Phelps Pty Ltd.

Liquid Herbicides - 6 metre boom spray with flat fan nozzles to give double overlap at track height, water volume of application 140 l/ha at 400 kpa pressure.

Granules - twin-nozzle applicator developed by DuPont Australia.

Species present : Muchea : W.A. blue lupin, wild oats, Flatweed, Annual grasses
 Piawaning : wild oats, Wimmera Ryegrass, Capeweed, Annual grasses

Dates :
 Treatments applied : Muchea Piawaning
 Assessments : 23/4/81 24/4/81
 27/12/82 29/10/81

Assessment by visual ratings on a skewed 1-6 scale:

Rating	1	2	3	4	5	6
% control	0-25	25-50	50-75	75-98	98-100	100

Comments

1. Weed control at Piawaning was generally better than at Muchea, probably reflecting the lower rainfall at Piawaning and the ballast material.
2. Equivalent rates of Velpar L and Velpar 20 G contain the same active amount of hexazinone herbicide. At Muchea, the liquid was more effective than the granule at lower rates, but inferior at the highest rate. At Piawaning there appears to be no difference.
3. Dybar 10/10 G is a Diuron + Bromacil + Hexazinone mixture in granule form and was unsatisfactory at Muchea, but not much different to the Velpar L and 20 G at Piawaning.
4. All other products (except atrazine) were affective in controlling annual weeds for one season. A response to rate of application was more apparent at Muchea.
5. Atrazine was ineffective at Muchea due to the predominance of W.A. Blue Lupin which atrazine will not control.
6. The two trials will be continued for at least two more seasons.

Herbicide	Rate/ha	Visual ratings on 3 reps after 1 year			
		Muchea	Mean	Piawaning	Mean
Velpar L	4 litres	1 1 5	2.3	1 3 5	3.0
	8	4 1 4	3.0	5 4 6	5.0
	16	4 1 5	3.3	6 5 6	5.7
Velpar 20 G	5 kg	1 1 3	1.7	4 3 2	3.0
	10	1 1 2	1.3	6 4 4	4.7
	20	6 1 5	4.0	6 6 6	6.0
Dybar 10/10 G	5 kg	1 1 1	1.0	3 4 6	4.3
	10	1 1 3	1.7	4 6 6	5.3
	20	3 1 2	2.0	5 6 6	5.7
Krovar	5 kg	5 1 4	3.3	6 6 6	6.0
	10	5 5 4	4.7	5 6 6	5.7
	15	6 6 5	5.7	6 6 6	6.0
Ustilan	5 kg	5 1 5	3.7	6 6 6	6.0
	10	5 3 6	4.7	6 6 6	6.0
	15	6 5 6	5.7	6 6 6	6.0
Vel 5026	5 kg	2 1 5	2.7	6 5 5	5.3
	10	4 4 6	4.7	6 5 6	5.7
	15	6 4 6	5.3	6 6 6	6.0
Diuron Flowable	8 litres	5 1 4	3.3	5 6 6	5.7
	16	3 4 5	4.0	6 6 6	6.0
	24	2 5 5	4.0	6 6 6	6.0
Residone	5 kg	4 5 2	3.7	6 6 6	6.0
	10	4 5 6	5.0	6 6 6	6.0
	15	6 5 6	5.7	6 6 6	6.0
Atrazine Flowable	4 litres	1 1 4	2.0	5 5 4	5.3
	8	1 1 3	1.7	5 6 6	5.7
Control	Nil	1 1 1	1.0	1 1 1	1.0

79KU1 : Control of annual weeds on road shoulders
 Site : Methods 1-3 : Great Northern Highway - 100 km south
 Kununurra
 Method 4 : Duncan Highway - 30 km east of Kununurra
 Application : Mechanical treatments - MRD road machinery
 Herbicide treatments - experimental boom equipment, water
 volume 250 litres/ha
 Plot sizes : 20 m x 2.4 m with 5 m buffer on both sides of road 3 reps
 Treatments : Method 1 : Graded + sprayed pre emergent + watered +
 compacted
 Method 2 : Graded + sprayed pre emergent + compacted
 Method 3 : Ungraded + sprayed pre emergent
 Method 4 : Ungraded + sprayed post emergent
 Within each method a number of herbicide treatments were
 applied. The three rates each of Gesaprim, Vorox and
 Diuron were based on equal cost levels at \$25, \$50 and
 \$100 per hectare. The rates of the herbicides Hyvar-X,
 Velpar and Ustilan were based on equal cost levels of
 \$100, \$200 and \$400 per hectare.
 Dates : Application : Methods 1-3 : 20-22/11/79
 Method 4 : 17/2/80
 Assessment : 9-10/3/81
 Weed species : Predominantly cane grass (annual Sorghum spp.)

Comments

1. Within the lower cost herbicides, diuron was more effective than both atrazine and Vorox.
2. Within the higher cost herbicides, Ustilan was more effective than Hyvar-X and Velpar.
3. At a same cost of \$100 per hectare, the highest rate of Diuron was more effective than the lowest rates of Hyvar-X, and Velpar. Ustilan at the lowest rate was as effective as the highest rate of Diuron.
4. The most consistently effective herbicide was Ustilan.
5. There appears to be little difference between the methods overall. However, atrazine was more effective with Method 1 and least with Method 4.

Herbicide	Rate/ha	Visual Ratings for 3 reps plus means															
		Method 1			Method 2			Method 3			Method 4						
		Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean					
Gesaprim (atrazine)	7.4 kg	6	3	3	4.0	0	1	3	1.3	2	0	3	1.7	0	0	2	0.7
	14.8	3	6	4	4.3	3	4	3	3.3	2	2	2	2.0	2	0	2	1.3
	29.6	5	4	6	5.0	0	3	3	2.0	3	2	2	2.3	0	0	0	0
Vorox AA	7.5 kg	-	-	-	-	-	-	-	-	-	-	-	-	0	0	2	0.7
	15.0	-	-	-	-	-	-	-	-	-	-	-	-	0	2	0	0.7
	30.0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0
Diuron	7.3 kg	4	3	3	3.3	2	6	5	4.3	3	4	1	2.7	2	2	3	2.3
	14.6	5	6	5	5.3	3	5	6	4.7	3	4	4	3.6	3	4	3	3.3
	29.2	6	6	6	6.0	4	4	6	4.7	3	6	5	4.7	6	6	6	6.0
Hyvar-X (bromacil)	4.9 kg	4	5	0	3.0	2	2	3	2.3	2	0	2	1.3	5	4	2	3.7
	9.8	4	3	4	3.7	2	2	4	2.7	4	1	1	2.0	6	5	5	5.3
	19.6	6	6	5	5.7	5	5	4	4.7	3	3	6	4.0	6	6	6	6.0
Velpar (Hexazinone)	2.3 kg	5	6	2	4.3	0	3	6	3.0	5	2	2	3.0	5	5	6	5.3
	4.6	6	5	0	3.7	3	6	6	5.0	5	3	5	4.3	5	6	6	5.7
	9.2	6	5	5	5.7	4	5	6	5.0	5	5	6	5.3	5	6	6	5.7
Ustilan (ethidimurion)	4.1 kg	6	6	6	6.0	5	6	5	5.3	4	4	5	4.3	6	6	6	6.0
	8.2	6	6	5	5.7	4	6	6	5.3	5	4	5	4.7	6	6	6	6.0
	16.4	6	6	6	6.0	6	6	6	6.0	6	6	6	6.0	6	6	6	6.0
Roundup	6 litres	-	-	-	-	-	-	-	-	-	-	-	-	0	2	0	0.7
Control	Nil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Visual Rating Scale

- 1 : 0-25% control
- 2 : 25-50%
- 3 : 50-75%
- 4 : 75-98%
- 5 : 98-100%
- 6 : 100%