Reprinted with permission from: GPC-14 Annual Report: Leafy Spurge Control in the Great Plains. 1982. pp. 75-96.

Published by: Great Plains Agricultural Council.

Evaluation of original treatments, retreatments, and combinations on leafy spurge live shoot regrowth

T. D. WHITSON, R. E. VORE, and H. P. ALLEY

Wyoming Agriculture Experiment Station, Laramie, WY 82071, SR 1188

Efficacy data is needed on original/retreatment combinations for control of leafy spurge.

Original dicamba and picloram treatments were applied May 15, 1980, to leafy spurge in the pre-bud to full-flower growth stage. Retreatments were made June 10, 1981 (fall 2,4-D August 28, 1981). Liquid formulations were applied with a truck mounted sprayer using 29 gpa water carrier; granules were applied with a hand operated centrifugal broadcaster. Plots were 21.5 by 258 feet and were arranged in a completely random design with one replication. Soil was a sandy loam (55.4% sand, 32.2% silt, 12.4% clay, 0.6% organic matter with a pH of 7.8).

Shoot counts were taken May 19, 1981, and revealed treatments of dicamba 5% granular at 8.0 lb ai/A resulted in 12% higher shoot control than the liquid formulation at the same rate. Dicamba 5% granular at the 8.0 lb ai/A rate gave a 16% higher shoot control than either formulation at 6.0 lb ai/A. Picloram comparisons of liquid and granular formulations at the 1.0 lb ai/A rate showed an 11% higher shoot control for the liquid formulation. The two picloram formulations at the 2.0 lb ai/A rate were equal in their effectiveness. All retreatments of 2,4-D, picloram and dicamba were either equal to the original treatments or increased the shoot control. Original treatments and retreatments with picloram attained a higher percent control than Banvel or 2,4-D as original or retreatment combinations. There was no apparent damage to the grass in the experimental area. However, more prostrate grass growth was noted in the treatment areas than in the check. Also grasses were green longer in the growing season in treatment areas than in the check.

Evaluation of original treatments, retreatments, and combinations effect leafy spurge live shoot regrowth.

	Percent Shoot Control					
	Retreatment lb ai/A					
Original lb ai/A	2,4-D Amine 2.0	picloram (K salt) 0.5	dicamba 4L 2.0	Check	picloram (K salt) 1.0	2,4-D Amine (S & F) 2.0
dicamba 5G 6.0	76	93	80	68	99	91
dicamba 5C 8.0	96	97	96	84	100	97
picloram 2K (2% pellet) 1.0	100	100	98	88	100	99
picloram 2K (2% pellet) 2.0	100	100	100	100	100	100
dicamba 4L 6.0	68	83	78	68	100	91
dicamba 4L 8.0	83	98	96	72	100	95
picloram (K salt) 1.0	99	100	99	99	100	100
picloram (K salt) 2.0	100	100	100	99	100	100
Check	0	92	13		100	0

Original treatments made May 15, 1980; retreatments June 10, 1981 (Fall 2,4-D August 28, 1981); evaluated May 18, 1982.

UNIVERSITY OF WYOMING
WEED SCIENCE

CROP OR WEED Leafy spurge (Euphorbia esula L.)
EXPERIMENT Live shoot regrowth evaluations
LOCATION Driskill ranch - Crook County

APPLICATION METHOD mechanical VOL/A 29 GAL [XX] FULL COVERAGE [ ] BAND _____ INCHES
PLOT SIZE 21.5 x 21.5 ft REPLICATIONS 2
DESIGN split block
EQUIPMENT truck sprayer NOZZLE TeeJet HSS 8004 PSI 40
PREPLANT DATE _____ HOUR _____
SURFACE SOIL MOISTURE _____ IN SUBSOIL MOISTURE _____ IN
SURFACE SOIL CONDITION - CLODS _____ SURFACE PLANT MATERIAL _____
POSTEMERGENCE DATE 6/10 and 8/28, 1981 HOUR _____
SURFACE SOIL MOISTURE _____ IN SUBSOIL MOISTURE _____ IN
CROP STAGE/HEIGHT _____ CROP CONDITION _____
WEEDS STAGE/HEIGHT seedling to full flower/4-16 in

INCORPORATION DATE _____ IMPLEMENT _____
HOURS AFTER HERBICIDE APPLICATION _____ DEPTH _____ IN
WEATHER AIR TEMP. _____ F RELATIVE HUMIDITY _____ % WIND 0-3 MPH SW
SKY partly cloudy SOIL TEMP.: SURFACE _____ F 1" _____ F 2" _____ F 4" _____ F
SOIL TEXTURE sandy loam SAND 55.4% SILT 32.2% CLAY 12.4 % O.M. 0.6% PH 7.8
CROP PLANTING DATE _____ VARIETY _____ ROW WIDTH _____ IN
SEED DEPTH _____ IN SOIL MOISTURE FOR SEED _____ TILTH/CLOD SIZE _____ IN
SEEDBED PREPARATION _____ STUBBLE OR TRASH _____
POST-PLANTING TILLAGE _____
IRRIGATION _____
PREVIOUS CROP rangeland PREVIOUS PESTICIDES none
EVALUATIONS DATE/DATA May 18, 1982/shoot counts
HARVEST DATE/DATA _____
FACTORS AFFECTING THE EXPERIMENT

Experimental site located on first alluvial bench of the Belle Fourche River. 6.09 inches of precipitation from time of application until September 23, 1980.

CROP RESPONSE

No apparent damage to grass; however, the first and second years after treatment, grasses were prostrate.

WEED CONTROL

Percent control is based on reduction of live shoots per square foot as compared to the check. Original treatments of Tordon 22K at 1.0 and 2.0 lb/A and Tordon 2K at 2.0 lb/A maintained 99% to 100% shoot control, two years after application. All retreatments maintained or improved control for all original treatments. Spring and fall retreatment with 2,4-D amine at 2.0 lb/A was only slightly more effective than only a spring retreatment of 2,4-D amine at 2.0 lb/A.

Table 1. Evaluations of original treatment effect on leafy spurge live shoot regrowth one and two years following treatment. Copp Ranch, Johnson County, 1982.

	Rate	Percent Control	
Treatment[1]	lb ai/A	1981	1982
Banvel 5G	6.0	76	0
Banvel 5C	8.0	70	0
Tordon 2K	1.0	99	31
Tordon 2K	2.0	99	73
Check			
shoots/sq ft		10.9	17.7

[1]Original treatment made May 29, 1980; evaluated June 12, 1981 and May 12, 1982.

UNIVERSITY OF WYOMING
WEED SCIENCE

CROP OR WEED Leafy spurge (Euphorbia esula L.)
EXPERIMENT Live shoot regrowth evaluations
LOCATION Hallam ranch - Fremont County

APPLICATION METHOD mechanical, hand VOL/A 25 GAL [XX] FULL COVERAGE
PLOT SIZE 21.5 x 258 ft REPLICATIONS 2 [ ] BAND _____ INCHES
DESIGN split block
EQUIPMENT truck sprayer, fertilizer spreader NOZZLE TeeJet HSS 8004 PSI 40
PREPLANT DATE _____ HOUR _____
SURFACE SOIL MOISTURE _____ IN SUBSOIL MOISTURE _____ IN
SURFACE SOIL CONDITION - CLODS _____ SURFACE PLANT MATERIAL _____
POSTEMERGENCE DATE May 23, 1980 HOUR 5:00 - 6:30 p.m. MDT
SURFACE SOIL MOISTURE dry IN SUBSOIL MOISTURE wet IN
CROP STAGE/HEIGHT grass green CROP CONDITION _____
WEEDS STAGE/HEIGHT bud to full flower/4-18 in.

WEATHER AIR TEMP. 63 F RELATIVE HUMIDITY 79 % WIND 4-6 MPH NW
SKY partly cloudy SOIL TEMP.: SURFACE 62 F 1" 63 F 2" 64 F 4" 65 F
POSTEMERGENCE DATE September 14, 1980 HOUR 8:30 - 9:30 a.m. MDT
SURFACE SOIL MOISTURE dry IN SUBSOIL MOISTURE dry IN
CROP STAGE/HEIGHT grass green/6-8 in. CROP CONDITION moderate
WEEDS STAGE/HEIGHT mature/14-16 in.

INCORPORATION DATE _____ IMPLEMENT _____
HOURS AFTER HERBICIDE APPLICATION _____ DEPTH _____ IN
WEATHER AIR TEMP. 64 F RELATIVE HUMIDITY 50 % WIND 1-3 MPH E
SKY clear SOIL TEMP.: SURFACE 62 F 1" 64 F 2" 60 F 4" 60 F
SOIL TEXTURE sandy loam SAND 72.4% SILT 15.2 % CLAY 12.4% O.M. 1.3 % PH 7.6
CROP PLANTING DATE _____ VARIETY _____ ROW WIDTH _____ IN
SEED DEPTH _____ IN SOIL MOISTURE FOR SEED _____ TILTH/CLOD SIZE _____ IN
SEEDBED PREPARATION _____ STUBBLE OR TRASH _____
POST-PLANTING TILLAGE _____
IRRIGATION _____
PREVIOUS CROP grass hay PREVIOUS PESTICIDES none
EVALUATIONS DATE/DATA May 24, 1982/shoot counts
HARVEST DATE/DATA _____
FACTORS AFFECTING THE EXPERIMENT

Experimental site located on shallow soil over sandstone ridge. Very dry in 1980, only 0.80 inch of precipitation from June 20 to September 14. Heavy dew at time of fall application.

CROP RESPONSE

Little apparent grass cover noted May, 1980, when plots were established. By September, 1981, grass was 20 to 24 inches high and still green in treatment areas. Good grass cover maintained through 1982.

WEED CONTROL

Original/retreatment combinations containing Tordon 22K at 0.5 and 1.0 lb/A retreatment maintained 99% of 100% top growth control. Spring and fall retreatment with 2,4-D amine at 2.0 lb/A appears to provide only slightly better control than the spring retreatment alone. Original spring treatments maintained slightly better control than original fall treatments, two years after application.

Table 1. Evaluation of spring vs. fall original/retreatment combinations as affecting leafy spurge live shoot regrowth. Hallam Ranch. Fremont County. 1982.

		Percent Shoot Control[2]					
		Retreatment lb ai/A[2]					
Original[1] lb ai/A		Banvel 4L 2.0	Tordon 22K 0.5	2,4-D Amine (S & F) 2.0	Check	Tordon 22K 1.0	2,4-D Amine 2.0
(Spring)							
Banvel 4L	6.0	94	100	88	64	100	80
Banvel 4L	8.0	88	100	99	81	99	
Banvel 5G	6.0	89	100	87	73	100	99
Banvel 5G	8.0	92	100	100	89	100	93
Tordon 22K	1.0	97	100	99	48	100	100
Tordon 22K	2.0	100	100	100	100	100	100
Tordon 2K	1.0	98	100	93	79	100	100
Tordon 2K	2.0	100	100	100	100	100	100
Check.	---	92	100	93	0	100	55
shoots/sq ft					18.3		
(Fall)							
Banvel 4L	6.0	76	100	90	57	100	82
Banvel 4L	8.0	87	100	90	44		89
Banvel 5G	6.0	99	100	97	52	100	98
Banvel 5G	8.0	99	100	98	85	100	97
Tordon 22K	1.0	99	100	99	90	100	96
Tordon 22K	2.0	100	100	100	99	100	99
Tordon 2K	1.0	100	100	100	100	100	100
Tordon 2K	2.0	100	100	100	100	100	100
Check	---	70	100	23	0		0
shoots/sq ft					23.6		

[1]Original treatments made May 23 and September 14, 1980; retreatments made May 29 and September 12, 1981.
[2]Shoot counts May 24, 1982.

UNIVERSITY OF WYOMING
WEED SCIENCE

CROP OR WEED Leafy spurge (Euphorbia esula L.)
EXPERIMENT Shoot and root control evaluations
LOCATION Driskill ranch - Crook County

APPLICATION METHOD hand VOL/A _____ GAL [XX] FULL COVERAGE
PLOT SIZE 21.5 x 258 ft REPLICATIONS 2 [ ] BAND _____ INCHES
DESIGN complete random
EQUIPMENT fertilizer spreader NOZZLE _____ PSI _____
PREPLANT DATE _____ HOUR _____
SURFACE SOIL MOISTURE _____ IN SUBSOIL MOISTURE _____ IN
SURFACE SOIL CONDITION - CLODS _____ SURFACE PLANT MATERIAL _____
POSTEMERGENCE DATE May 15, 1980 HOUR 9:00 - 11:00 a.m. MDT
SURFACE SOIL MOISTURE dry to 1 IN SUBSOIL MOISTURE intermediate IN
CROP STAGE/HEIGHT _____ CROP CONDITION _____
WEEDS STAGE/HEIGHT bud to full flower/4-14 in

INCORPORATION DATE _____ IMPLEMENT _____
HOURS AFTER HERBICIDE APPLICATION _____ DEPTH _____ IN
WEATHER AIR TEMP. 67 F RELATIVE HUMIDITY 42% WIND 0-2 MPH N
SKY party cloudy SOIL TEMP.: SURFACE 65 F 1" 62 F 2" 55 F 4" 52 F
SOIL TEXTURE sandy loam SAND 55.4% SILT 32.2% CLAY 12.4% O.M. 0.6% pH 7.8
CROP PLANTING DATE _____ VARIETY _____ ROW WIDTH _____ IN
SEED DEPTH _____ IN SOIL MOISTURE FOR SEED _____ TILTH/CLOD SIZE _____ IN
SEEDBED PREPARATION _____ STUBBLE OR TRASH _____
POST-PLANTING TILLAGE _____
IRRIGATION _____
PREVIOUS CROP rangeland PREVIOUS PESTICIDES none
EVALUATIONS DATE/DATA May 19, 1981/shoot counts; May 20, 1981/root samples
HARVEST DATE/DATA _____
FACTORS AFFECTING THE EXPERIMENT

Experimental site located on first alluvial bench of the Belle Fourche River. 6.09 inches of precipitation from time of application until September 23, 1980.

CROP RESPONSE

No apparent damage to grass; however, more prostrate and green later in treatment areas than in check area.

WEED CONTROL

Root weight was highest in the top 8 inches of soil and decreased with depth. Tordon 2K reduced the total root weight in comparison with the check. Banvel 5G treatment areas had a greater root weight than did the check.

Table 1. Effect of original treatments on leafy spurge live shoot regrowth and root weight. Driskill Ranch. Crook County. 1981.

Treatment[1]	Rate lb ai/A	% Control[2]		Root Dry Wt (g/cu. ft.) Soil Depth (inches)			
		Shoot	Root	0-8	8-16	16-24	Total
Banvel 5G	6.0	80	0	53.0	18.0	16.5	87.5
Banvel 5G	8.0	99	0	25.1	11.2	15.9	52.2
Tordon 2K	1.0	99	4	23.8	11.5	9.7	45.0
Tordon 2K	2.0	100	9	25.2	9.8	7.5	42.5
Check	---	---	---	27.3	10.0	9.4	46.7

[1]Treatments made May 15, 1980.

[2]Shoot counts May 19, 1981; root samples May 20, 1981.

UNIVERSITY OF WYOMING
WEED SCIENCE

CROP OR WEED Leafy spurge (Euphorbia esula L.)
EXPERIMENT Shoot and root control evaluations
LOCATION Hallam ranch - Fremont County

APPLICATION METHOD hand VOL/A _____ GAL [XX] FULL COVERAGE
PLOT SIZE 21.5 x 258 ft REPLICATIONS 2 [ ] BAND _____ INCHES
DESIGN _____
EQUIPMENT fertilizer spreader NOZZLE _____ PSI _____
PREPLANT DATE _____ HOUR _____
SURFACE SOIL MOISTURE _____ IN SUBSOIL MOISTURE _____ IN
SURFACE SOIL CONDITION - CLODS _____ SURFACE PLANT MATERIAL _____
POSTEMERGENCE DATE May 15, 1980 HOUR 5:00 - 6:30 p.m. MDT
SURFACE SOIL MOISTURE dry IN SUBSOIL MOISTURE dry IN
CROP STAGE/HEIGHT grass green/6-8 in CROP CONDITION moderate
WEEDS STAGE/HEIGHT bud to full flower/4-18 in

INCORPORATION DATE _____ IMPLEMENT _____
HOURS AFTER HERBICIDE APPLICATION _____ DEPTH _____ IN
WEATHER AIR TEMP. 63 F RELATIVE HUMIDITY 79 % WIND 4-6 MPH NW
SKY clear SOIL TEMP.: SURFACE 62 F 1" 64 F 2" 60 F 4" 60 F
SOIL TEXTURE sandy loam SAND 72.4% SILT 15.2% CLAY 12.4 % O.M. 1.3% PH 7.6
CROP PLANTING DATE _____ VARIETY _____ ROW WIDTH _____ IN
SEED DEPTH _____ IN SOIL MOISTURE FOR SEED _____ TILTH/CLOD SIZE _____ IN
SEEDBED PREPARATION _____ STUBBLE OR TRASH _____
POST-PLANTING TILLAGE _____
IRRIGATION _____
PREVIOUS CROP grass hay PREVIOUS PESTICIDES none
EVALUATIONS DATE/DATA May 23, 1981/shoot counts; May 24, 1981/root samples
HARVEST DATE/DATA _____

FACTORS AFFECTING THE EXPERIMENT

Experimental site located on shallow soil over sandstone ridge. Very dry in 1980, only 0.80 inch of precipitation from June 20 to September 14.

CROP RESPONSE

Little apparent grass cover noted May, 1980 when plots were established. By September, 1981, grass was 20 to 24 inches high and still green in treatment areas.

WEED CONTROL

Root weight was highest in the top 8 inches of soil and decreased with depth. Tordon 2K at 2.0 lb/A was the only treatment that reduced root weight as compared with the check, however only 5%.

Table. 1. Effect of original treatments on leafy spurge live shoot regrowth and root weight. Hallam Ranch. Fremont County. 1981.

Treatment		Rate lb ai/A	% Control[2]		Root Dry Wt (g/cu. ft.) Soil Depth (inches)			
			Shoot	Root	0-8	8-16	16-24	Total
Banvel	5G	6.0	92	0	47.9	18.7	9.7	76.3
Banvel	5G	8.0	95	0	57.0	18.9	15.5	91.4
Tordon	2K	1.0	93	0	43.0	21.6	14.0	78.6
Tordon	2K	2.0	95	5	43.5	16.7	10.3	70.5
Check		—	—	—	47.6	15.0	11.8	74.4

[1]Treatments made May 15, 1980.
[2]Shoot counts May 23, 1981; root samples May 24, 1981.

UNIVERSITY OF WYOMING
WEED SCIENCE

CROP OR WEED Leafy spurge (Euphorbia esula L.)
EXPERIMENT Live shoot and root evaluations
LOCATION Copps ranch - Johnson County

APPLICATION METHOD hand VOL/A _____ GAL [XX] FULL COVERAGE
PLOT SIZE 80 x 100 ft REPLICATIONS 1 [ ] BAND _____ INCHES
DESIGN block
EQUIPMENT fertilizer spreader NOZZLE _____ PSI _____
PREPLANT DATE _____ HOUR _____
SURFACE SOIL MOISTURE _____ IN SUBSOIL MOISTURE _____ IN
SURFACE SOIL CONDITION - CLODS _____ SURFACE PLANT MATERIAL _____
POSTEMERGENCE DATE May 29, 1980 HOUR 1:00 - 3:00 p.m. MDT
SURFACE SOIL MOISTURE damp IN SUBSOIL MOISTURE intermediate IN
CROP STAGE/HEIGHT _____ CROP CONDITION _____
WEEDS STAGE/HEIGHT pre-bud to full flower/4-24 in

INCORPORATION DATE _____ IMPLEMENT _____
HOURS AFTER HERBICIDE APPLICATION _____ DEPTH _____ IN
WEATHER AIR TEMP. 57 F RELATIVE HUMIDITY 100% WIND 0-4 MPH N
SKY cloudy SOIL TEMP.: SURFACE 64 F 1" 63 F 2" 63 F 4" 61 F
SOIL TEXTURE silty loam SAND 31.4% SILT 62.2% CLAY 6.4% O.M. 2.8% PH 7.6
CROP PLANTING DATE _____ VARIETY _____ ROW WIDTH _____ IN
SEED DEPTH _____ IN SOIL MOISTURE FOR SEED _____ TILTH/CLOD SIZE _____ IN
SEEDBED PREPARATION _____ STUBBLE OR TRASH _____
POST-PLANTING TILLAGE _____
IRRIGATION _____
PREVIOUS CROP rangeland PREVIOUS PESTICIDES none
EVALUATIONS DATE/DATA June 2, 1981/shoot counts; June 3, 1981/root samples
HARVEST DATE/DATA _____

FACTORS AFFECTING THE EXPERIMENT

Light rain during application. 4.80 inches of precipitation from time of application until September 30, 1980. Experimental site located in basin of a draw on deep soil.

CROP RESPONSE

No grass damage observed.

WEED CONTROL

Root weight was highest in the top 8 inches of soil and decreased with depth. All treatments reduced root weight, with the maximum root control reaching 18%.

Table 1. Effect of original treatments on leafy spurge live shoot regrowth and root weight. Copps Ranch. Johnson County. 1981.

Treatment[1]	Rate lb ai/A	% Control[2] Shoot	% Control[2] Root	Root Dry Wt (g/cu. ft.) Soil Depth (inches) 0-8	8-16	16-24	Total
Banvel 5G	6.0	76	17	68.8	22.0	14.4	105.2
Banvel 5G	8.0	70	14	82.8	14.1	12.1	109.0
Tordon 2K	1.0	99	12	72.6	22.2	17.0	111.8
Tordon 2K	2.0	99	18	61.0	23.0	19.0	103.0
Check	--	--	--	87.1	23.7	15.7	126.5

[1]Treatments made May 29, 1980.

[2]Shoot counts June 2, 1981; root samples June 3, 1981.

UNIVERSITY OF WYOMING
WEED SCIENCE

CROP OR WEED Leafy spurge (Euphorbia esula L.)
EXPERIMENT Forage production measurements
LOCATION Driskill ranch - Crook County

APPLICATION METHOD mechanical, hand VOL/A _____ GAL [XX] FULL COVERAGE [ ] BAND _____ INCHES
PLOT SIZE 11 x 22 ft REPLICATIONS _____
DESIGN split block
EQUIPMENT J.D. Tractor sprayer, fert. spreader NOZZLE TeeJet Hss 8004 PSI 40
PREPLANT DATE _____ HOUR _____
SURFACE SOIL MOISTURE _____ IN SUBSOIL MOISTURE _____ IN
SURFACE SOIL CONDITION - CLODS _____ SURFACE PLANT MATERIAL _____
POSTEMERGENCE DATE May 25, 1978 HOUR _____
SURFACE SOIL MOISTURE intermediate IN SUBSOIL MOISTURE intermediate IN
CROP STAGE/HEIGHT green grass CROP CONDITION _____
WEEDS STAGE/HEIGHT bud to full flower

INCORPORATION DATE _____ IMPLEMENT _____
HOURS AFTER HERBICIDE APPLICATION _____ DEPTH _____ IN
WEATHER AIR TEMP. _____ F RELATIVE HUMIDITY _____ % WIND _____ MPH _____
SKY _____ SOIL TEMP.: SURFACE _____ F 1" _____ F 2" _____ F 4" _____ F
SOIL TEXTURE sandy loam SAND 65.4% SILT 23.2% CLAY 1.4 % O.M. 1.5% pH 7.7
CROP PLANTING DATE _____ VARIETY _____ ROW WIDTH _____ IN
SEED DEPTH _____ IN SOIL MOISTURE FOR SEED _____ TILTH/CLOD SIZE _____ IN
SEEDBED PREPARATION _____ STUBBLE OR TRASH _____
POST-PLANTING TILLAGE _____
IRRIGATION _____
PREVIOUS CROP rangeland PREVIOUS PESTICIDES none
EVALUATIONS DATE/DATA Jun 30, 1979; Jul 29, 1980; Jul 24, 1981; Jul 20, 1982.
HARVEST DATE/DATA _____
FACTORS AFFECTING THE EXPERIMENT

Moisture conditions limiting in 1979, favorable in 1980 and 1981.

CROP RESPONSE

Total forage production is greater in treatment areas as compared to the untreated check. High rates of Tordon and Banvel suppressed production for two years after treatment, compared to the check. Prostrate growth was noted in these areas during this time. Average production is highest in these areas, four years after treatment.

WEED CONTROL

Table 1. Forage production measured from plots treated with Tordon 22K, Tordon 212 and Banvel 4L as compared to the untreated check. Driskill Ranch. Crook County. 1982.

Treatments[1]	Rate lb ai/A	Air Dry Forage (Pounds/A)[2]				
		1979	1980	1981	1982	Average
Tordon 22K	2.0	1,098	1,010	1,832	2,200	1,535
Tordon 2K	2.0	992	601	2,278	2,506	1,594
Tordon 212[3]	2.0 + 4.0	1,054	520	1,776	2,622	1,493
Tordon 22K	1.0	896	558	1,337	2,400	1,298
Tordon 2K	1.0	981	786	1,552	1,867	1,296
Tordon 212	1.0 + 2.0	1,240	1,160	850	896	1,036
Tordon 22K	0.5	1,111	947	818	1,298	1,044
Banvel 4L	4.0	1,137	665	708	1,324	958
Banvel 4L	8.0	917	471	862	1,356	902
Tordon 2K	0.5	1,005	621	620	890	784
Tordon 212	0.5 + 1.0	930	616	676	564	696
Check	---	535	416	402	652	501

[1]Treatments made May 25, 1978.

[2]Harvested July 30, 1979, July 29, 1980, July 24, 1981 and July 1982.

[3]Tordon 212 (Dow's mixture of 1.0 lb picolinic acid + 2.0 lb 2,4-D/gal).

UNIVERSITY OF WYOMING
WEED SCIENCE

CROP OR WEED Leafy spurge (Euphorbia esula L.)
EXPERIMENT Forage production measurements
LOCATION Copps Ranch - Johnson County

APPLICATION METHOD hand VOL/A _____ GAL [XX] FULL COVERAGE
PLOT SIZE 80 x 100 ft REPLICATIONS 1 [ ] BAND _____ INCHES
DESIGN block
EQUIPMENT fertilizer spreader NOZZLE _____ PSI _____
PREPLANT DATE _____ HOUR _____
SURFACE SOIL MOISTURE _____ IN SUBSOIL MOISTURE _____ IN
SURFACE SOIL CONDITION - CLODS _____ SURFACE PLANT MATERIAL _____
POSTEMERGENCE DATE May 29, 1980 HOUR 1:00 - 3:00 p.m. MDT
SURFACE SOIL MOISTURE damp IN SUBSOIL MOISTURE intermediate IN
CROP STAGE/HEIGHT _____ CROP CONDITION _____
WEEDS STAGE/HEIGHT pre-bud to full flower/4-24 in

INCORPORATION DATE _____ IMPLEMENT _____
HOURS AFTER HERBICIDE APPLICATION _____ DEPTH _____ IN
WEATHER AIR TEMP. 57 F RELATIVE HUMIDITY 100 % WIND 0-4 MPH N
SKY cloudy SOIL TEMP.: SURFACE 64 F 1" 63 F 2" 61 F 4" 61 F
SOIL TEXTURE silty loam SAND 31.4% SILT 62.2% CLAY 6.4 % O.M. 2.8 % PH 7.6
CROP PLANTING DATE _____ VARIETY _____ ROW WIDTH _____ IN
SEED DEPTH _____ IN SOIL MOISTURE FOR SEED _____ TILTH/CLOD SIZE _____ IN
SEEDBED PREPARATION _____ STUBBLE OR TRASH _____
POST-PLANTING TILLAGE _____
IRRIGATION _____
PREVIOUS CROP rangeland PREVIOUS PESTICIDES none
EVALUATIONS DATE/DATA _____
HARVEST DATE/DATA clipped May 21, 1981 and August 9, 1982
FACTORS AFFECTING THE EXPERIMENT

4.80 inches of precipitation from May 29, 1980 to September 30, 1980. Experimental site located in basin of draw on deep soil.

CROP RESPONSE

In 1981, areas receiving treatment of Banvel 5G at 8.0 lb/A and Tordon 2K at 1.0 and 2.0 lb/A had forage suppression. In 1982, these areas were producing forage quantities greater than in the check. Average forage production in the Tordon treatment areas was greater than in the check while Banvel treatment areas produced the same as the check.

WEED CONTROL

Table 1. Forage production measured from plots treated with Banvel and Tordon as compared to an untreated leafy spurge infestation. Copps Ranch. Johnson County, 1982.

Treatment[1]	Rate lb ai/A	Air Dry Forage (lb/A)[2]		
		1981	1982	Average
Banvel 5G	6.0	1082	1409	1246
Banvel 5G	8.0	802	1617	1210
Tordon 2K	1.0	861	2982	1922
Tordon 2K	2.0	753	3344	2048
Check		970	1540	1255

[1]Treatments made May 29, 1980.

[2]Forage clipped May 21, 1981 and August 9, 1982.

UNIVERSITY OF WYOMING
WEED SCIENCE

CROP OR WEED Herbicide Residual
EXPERIMENT Persistence of picloram and dicamba
LOCATION Copps ranch - Johnson County

APPLICATION METHOD hand VOL/A _____ GAL [XX] FULL COVERAGE
PLOT SIZE 80 x 100 ft REPLICATIONS 1 [ ] BAND _____ INCHES
DESIGN block
EQUIPMENT fertilizer spreader NOZZLE _____ PSI _____
PREPLANT DATE _____ HOUR _____
SURFACE SOIL MOISTURE _____ IN SUBSOIL MOISTURE _____ IN
SURFACE SOIL CONDITION - CLODS _____ SURFACE PLANT MATERIAL _____
POSTEMERGENCE DATE May 29, 1980 HOUR 1:00 - 3:00 p.m. MDT
SURFACE SOIL MOISTURE damp IN SUBSOIL MOISTURE intermediate IN
CROP STAGE/HEIGHT _____ CROP CONDITION _____
WEEDS STAGE/HEIGHT _____

INCORPORATION DATE _____ IMPLEMENT _____
HOURS AFTER HERBICIDE APPLICATION _____ DEPTH _____ IN
WEATHER AIR TEMP. 57 F RELATIVE HUMIDITY 100 % WIND 0-4 MPH N
SKY cloudy SOIL TEMP.: SURFACE 64 F 1" 63 F 2" 63 F 4" 61 F
SOIL TEXTURE loam SAND 39.2% SILT 38.0% CLAY 22.8% O.M. 2.9 % pH 7.6
CROP PLANTING DATE _____ VARIETY _____ ROW WIDTH _____ IN
SEED DEPTH _____ IN SOIL MOISTURE FOR SEED _____ TILTH/CLOD SIZE _____ IN
SEEDBED PREPARATION _____ STUBBLE OR TRASH _____
POST-PLANTING TILLAGE _____
IRRIGATION _____
PREVIOUS CROP _____ PREVIOUS PESTICIDES _____
EVALUATIONS DATE/DATA 26, 54, 116, 370 days after application: core sampled
HARVEST DATE/DATA _____

FACTORS AFFECTING THE EXPERIMENT

Total precipitation 9.9 inches from 5/29/80 to 9/23/80. Light sprinkle at time of application. Plots located on deep soil in draw bottom.

RESULTS

Concentration of picloram remained relatively stable through the first year after application. Dicamba concentration declined after one year.

Table 1. Tordon and Banvel concentration at three soil depths. Copps Ranch. Johnson County. 1980.

Treatment	Rate lb ai/A	Days After Treatment	Sample Depth (inches)			
			0 8	8-16	16-24	Total
			(ppm)			
Tordon 2K	1.0	26	0.117	T[2]	T	0.121
		54	0.301	0.017	0.009	0.327
		117	0.062	0.016	T	0.080
		370	0.035	0.068	0.031	0.134
Tordon 2K	2.0	26	0.541	0.059	T	0.602
		54	1.010	0.148	0.018	1.176
		117	0.547	0.070	0.017	0.634
		370	0.375	0.103	0.020	0.458
Banvel 5G	6.0	26	0.521	0.005	T	0.527
		54	1.030	0.005	0.008	1.043
		117	0.424	0.145	0.004	0.573
		370	T	0.007	0.010	6.018
Banvel 5G	8.0	26	1.000	0.009	0.007	1.016
		54	0.319	T	T	0.321
		117	0.504	0.042	0.009	0.555
		370	0.007	T	T	0.009
	Soil Texture		L[3]	L		
	Sand (%)		39.2	37.2	37.2	
	Silt (%)		38.0	40.0	42.0	
	Clay (%)		22.8	22.8	20.8	
	Organic Matter (%)		2.9	2.6	1.5	
	pH (paste)		7.6	7.5	7.5	

[1]Treatments made May 29, 1980.

[2]T = Trace: Banvel 5G, less than 0.002 ppm; Tordon 2K, less than 0.003 ppm.

[3]L = loam.

UNIVERSITY OF WYOMING
WEED SCIENCE

CROP OR WEED Herbicide Residual
EXPERIMENT Persistence of picloram and dicamba
LOCATION Hallam ranch - Fremont County

APPLICATION METHOD hand VOL/A _____ GAL [XX] FULL COVERAGE
PLOT SIZE 21.5 x 258 ft REPLICATIONS 2 [ ] BAND _____ INCHES
DESIGN Complete random
EQUIPMENT Fertilizer spreader NOZZLE _____ PSI _____
PREPLANT DATE _____ HOUR _____
SURFACE SOIL MOISTURE _____ IN SUBSOIL MOISTURE _____ IN
SURFACE SOIL CONDITION - CLODS _____ SURFACE PLANT MATERIAL _____
POSTEMERGENCE DATE May 23, 1980 HOUR 5:00 - 6:30 p.m. MDT
SURFACE SOIL MOISTURE dry IN SUBSOIL MOISTURE wet IN
CROP STAGE/HEIGHT _____ CROP CONDITION _____
WEEDS STAGE/HEIGHT _____

INCORPORATION DATE _____ IMPLEMENT _____
HOURS AFTER HERBICIDE APPLICATION _____ DEPTH _____ IN
WEATHER AIR TEMP. 63 F RELATIVE HUMIDITY 79 % WIND 4-6 MPH NW
SKY partly cloudy SOIL TEMP.: SURFACE 62 F 1" 63 F 2" 64 F 4" 65 F
SOIL TEXTURE _____ SAND ___ % SILT ___ % CLAY ___ % O.M. ___ % pH ___
CROP PLANTING DATE _____ VARIETY _____ ROW WIDTH _____ IN
SEED DEPTH _____ IN SOIL MOISTURE FOR SEED _____ TILTH/CLOD SIZE _____ IN
SEEDBED PREPARATION _____ STUBBLE OR TRASH _____
POST-PLANTING TILLAGE _____
IRRIGATION _____
PREVIOUS CROP grass forage PREVIOUS PESTICIDES none
EVALUATIONS DATE/DATA 28, 54, 114 and 371 days after treatment: core sampled
HARVEST DATE/DATA _____
FACTORS AFFECTING THE EXPERIMENT

Total precipitation 0.82 inch from 5/23 to 9/14 (6/20-0.15";7/15-0.40"; 8/11-0.57"; 9/14-0.82"). Plots located on shallow soil above sandstone layer.

RESULTS

Concentration of picloram and dicamba declines approximately 50% and 60%, respectively, one year after application.

Table 1. Tordon and Banvel concentration at three soil depths. Hallam Ranch. Fremont County. 1980.

Treatment[1]	Rate lb ai/A	Days After Treatment	Sample Depth (inches) 0-8	8-16	16-24	Total
			(ppm)			
Tordon 2K	1.0	28	0.201	0.049	0.005	0.255
		54	0.173	0.036	0,006	0.215
		114	0.146	0.015	0 004	0.205
		371	0.020	0.040	0.052	0.112
Tordon 2K	2.0	28	0.106	0.024	0.604	0.134
		54	0.490	0.051	0.021	0.562
		114	0.167	0.012	0.007	0.186
		371	0.029	0.037	0.022	0.088
Banvel 5G	6.0	28	1.020	0.057	0.032	1.109
		54	2.080	0.046	0.003	2.129
		114	2.610	0.047	0.009	2.666
		371	0.281	0.030	0.037	0.348
Banvel 5G	8.0	28	1.720	0.306	0.028	2.054
		54	2.500	0.434	0.016	2.950
		114	2.620	0.118	0.053	2.791
		371	0.341	0.250	T	0.592
	Soil Texture		SL[2]	SL	L	
	Sand (%)		55.2	55.2	47.2	
	Silt (%)		30.6	31.6	39.6	
	Clay (%)		14.2	13.2	13.2	
	Organic Matter (%)		2.2	1.1	0.0	
	pH (paste)		7.3	7.5	7.7	

[1]Treatments made May 23, 1980.

[2]SL = sandy loam; L = loam.

UNIVERSITY OF WYOMING
WEED SCIENCE

354

CROP OR WEED Herbicide Residual
EXPERIMENT Persistence of Tordon 2K and Banvel 5G
LOCATION Driskill Ranch - Crook County

APPLICATION METHOD hand VOL/A _____ GAL [XX] FULL COVERAGE [ ] BAND _____ INCHES
PLOT SIZE 21.5 x 258 ft REPLICATIONS 2
DESIGN complete random
EQUIPMENT fertilizer spreader NOZZLE _____ PSI _____
PREPLANT DATE _____ HOUR _____
SURFACE SOIL MOISTURE _____ IN SUBSOIL MOISTURE _____ IN
SURFACE SOIL CONDITION - CLODS _____ SURFACE PLANT MATERIAL _____
POSTEMERGENCE DATE May 15, 1980 HOUR 9:00 to 11:00 a.m.
SURFACE SOIL MOISTURE dry to 1 IN SUBSOIL MOISTURE intermediate IN
CROP STAGE/HEIGHT _____ CROP CONDITION _____
WEEDS STAGE/HEIGHT _____

INCORPORATION DATE _____ IMPLEMENT _____
HOURS AFTER HERBICIDE APPLICATION _____ DEPTH _____ IN
WEATHER AIR TEMP. 67 F RELATIVE HUMIDITY 42 % WIND N MPH 0-2
SKY partly cloudy SOIL TEMP.: SURFACE 65 F 1" 62 F 2" 55 F 4" 52 F
SOIL TEXTURE _____ SAND ___ % SILT ___ % CLAY ___ % O.M. ___ % PH ___
CROP PLANTING DATE _____ VARIETY _____ ROW WIDTH _____ IN
SEED DEPTH _____ IN SOIL MOISTURE FOR SEED _____ TILTH/CLOD SIZE _____ IN
SEEDBED PREPARATION _____ STUBBLE OR TRASH _____
POST-PLANTING TILLAGE _____
IRRIGATION _____
PREVIOUS CROP rangeland PREVIOUS PESTICIDES none
EVALUATIONS DATE/DATA 28, 57, 113 and 371 days after treatment: core sampled
HARVEST DATE/DATA _____
FACTORS AFFECTING THE EXPERIMENT

Total precipitation 6.09 inches from 5/15 to 9/23 (6/12-1.45"; 7/11-2.90" 7/31-3.48"; 9/5-5.44"; 9/23-6.09").

RESULTS

Concentration of Tordon 2K was relatively stable throughout the first year after application. Banvel 5G concentrations, one year after the chemical application, were to decline.

Table 1. Tordon and Banvel concentration at three soil depths. Driskill Ranch. Crook County. 1980.

Treatment[1]	Rate lb ai/A	Days After Treatment	Sample Depth (inches) 0-8	8-16	16-24	Total
			(ppm)			
Tordon 2K	1.0	28	0.374	0.039	0.024	0.437
		57	0.320	0.107	0.026	0.453
		113	0.398	0.019	T[2]	0.419
		371	0.442	0.005	0.020	0.467
Tordon 2K	2.0	28	0.807	0.122	0.051	0.980
		57	0.608	0.119	0.055	0.782
		113	0.670	0.059	0.014	0.743
		371	0.585	0.004	0.058	0.647
Banvel 5G	6.0	28	1.480	0.086	0.014	1.580
		57	0.854	0.015	0.009	0.878
		113	0.068	0.005	T	0.074
		371	0.030	0.878	T	0.909
Banvel 5G	8.0	28	1.500	0.022	0.084	1.606
		57	1.630	0.126	0.047	1.803
		113	1.340	0.086	0.03:3	1.459
		371	0.076	0.009	T	0.086
	Soil Texture		SL[3]	SL	SL	
	Sand (%)		75.2	79.2	75.2	
	Silt (%)		13.6	10.6	14.6	
	Clay (%)		11.2	10.2	10.2	
	Organic Matter (%)		3.1	0.8	0.6	
	pH (paste)		7.7	7.8	7.8	

[1]Treatments made May 15, 1980.

[2]T = Trace: dicamba, less than 0.002 ppm; picloram, less than 0.003 ppm.

[3]SL = silty loam.