

CHEMICAL WEED AND BRUSH CONTROL



SUGGESTIONS FOR RANGELAND

2008 UPDATE

This publication provides an update for some of the herbicide recommendations contained in B-1466. The herbicide control recommendations contained in this update for a specific weed or brush species supercedes any information contained in the original publication.

Common, Chemical and Product Names of Herbicides*

Herbicide common name	Chemical name	Product name	Active ingredient or acid equivalent
Aminopyralid	2-pyridine carboxylic acid, 4-amino-3, 6-dichloro-2-pyridine carboxylic acid, triisopropanolammonium salt	Milestone	2 lbs./gal.
Aminopyralid 1:8, 2, 4-D	See aminopyralid and 2, 4-D	GrazonNext	3 lbs./gal.
Clopyralid	3,6-dichloro-2-pyridinecarboxylic acid	Reclaim, Pyramid R&P, Clopyralid 3	3 lbs./gal.
2,4-D	(2,4-dichlorophenoxy) acetic acid	Weedar 64, Formula 40, Hi-Dep, Weedone LV4, Esteron 99 and others	amine salts and esters of variable concentration
Dicamba	3,6-dichloro-2-methoxybenzoic acid	Banvel, Clarity, Vision	4 lbs./gal.
Dicamba:2,4-D(1:3)	See dicamba and 2,4-D	Weedmaster, Banvel + 2,4-D, RangeStar, Outlaw	4 lbs./gal.
Diesel fuel oil or kerosene	refined petroleum fractions	Several manufacturers	
Fluroxypyr	1-methylheptyl ester: ((4-amino-3,5-dichloro-6-fluoropyridin-2-yl)oxy)acetic acid	Vista	1.5 lbs./gal.
Glyphosate	N-(phosphonomethyl) glycine	Several including Rodeo**, Roundup, Roundup Ultradry, Glyphosate 417	isopropylamine salt*, concentration varies depending on the product
Hexazinone	3-cyclohexyl-6-(dimethylamino)-1-methyl-1,3,5-triazine-2,4(1H, 3H)-dione	Velpar L, Pronone Power Pellet	2 lbs./gal. (Velpar L) 75% (Pronone Power Pellet)
Imazapyr	2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-pyridinecarboxylic acid	Arsenal, Habitat**	2 lbs./gal.
Metsulfuron methyl	methyl 2[[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino]carbonyl]amino] sulfonyl] benzoate	Escort, Clean Pasture, MSM 60DF	60%
Metsulfuron:Chlorosulfuron 3:1	See Metsulfuron methyl + 2-Chloro-N-[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)aminocarbonyl] benzenesulfonamide	Cimarron Plus	48% metsulfuron 15% Chlorosulfuron
Metsulfuron:Chlorosulfuron 1:1	See metsulfuron: Chlorosulfuron	Cimarron X-Tra	30% Metsulfuron 37.5% Chlorosulfuron
Metsulfuron methyl Dicamba:2,4-D(1:3)	See metsulfuron methyl, dicamba and 2,4-D	Cimarron Max	60% (Part A) 3.87 lbs./gal. (Part B)
Picloram	4-amino-3,5,6-trichloro-2-pyridinecarboxylic acid	Tordon 22K, Triumph 22K, Picloram 22K	2 lbs./gal.
Picloram:Fluroxypyr (1:1)	See picloram and Fluroxypyr	Surmount	1.34 lbs./gal.
Picloram:2,4-D(1:4)	See Picloram and 2,4-D	Grazon P+D, Gunslinger, Picloram + D	2.5 lbs./gal.
Tebuthiuron	N-[5-(1,1-dimethylethyl)-1,3,4-thiadiazol-2-yl]-N-N'-dimethylurea	Spike 20P, Spike 80 DF	20% (Spike 20P) 80% (Spike 80 DF)
Triclopyr	{(3,5,6-trichloro-2-pyridinyl)oxy}acetic acid	Clear Pasture, Pathfinder II, Triclopyr R&P Remedy Ultra, Triclopyr 4 EC	0.75 lbs./gal. (Pathfinder II) 4 lbs./gal. (all others)
Triclopyr:Fluroxypyr (3:1)	See triclopyr and 1-methylheptyl ester:((4-amino-3,5-dichloro-6-fluoropyridin-2-yl)oxy)acetic acid	PastureGard	2.0 lbs./gal.
Triclopyr:2,4-D(1:2)	See triclopyr and 2,4-D	Crossbow	3 lbs./gal.

*Herbicides have been identified by the accepted Weed Science Society of America common name, and when practical, one or more product names.

**Aquatic label

Items in gray boxes are recent changes approved by the Rangeland Herbicide Use Committee.

Page	Weed Controlled	Herbicide (common and chemical names – page 4)	Herbicide quantity (active ingredient rate in parenthesis)		Spray volume (per acre for broadcast, as described for individual plant)	Time to apply	Remarks
			Broadcast rate per acre	Individual plant/ spot treatment			
6	African rue	Velpar L		VH** 2 ml/plant	Use an exact delivery handgun to apply undiluted herbicide to soil surface at the edge of the plant canopy.	Spring or summer.	Do not use on heavy clay or caliche soils.
		Pronone Power Pellets		1 pellet/plant			
		Spike 20 P	H 7.5 lbs (1.5 lbs.)			Late September through October (to first frost).	Applications should be made to fall regrowth that is in good growing conditions. Recommend using individual plant treatment when growing with desirable vegetation to reduce non-target damage. Arsenal is a non-selective herbicide and will kill or damage desirable vegetation if sprayed.
		Arsenal	H 1 qt. (0.5 lbs.)	VH 0.5%	10 to 25 gal./ac. for ground broadcast. Thoroughly wet foliage for individual plant treatment. Add 1 to 2 qts. surfactant per 100 gal. water.		
6	Berlander lobelia, bitter sneezeweed, (annual or common), buffalobur, camphorweed, cocklebur, croton, horehound, marshelder (sumpweed or sulfaweed), plantain (tallowweed), prairie gerardia (see remarks), ragweed, smartweed, sunflower, thistles, Western bitterweed (see remarks), Western ragweed, wild carrot and others	2,4-D amine or low volatile ester	VH 1 pt. to 1 qt. (1/2 to 1 lb.) 4 lbs./gal. product	VH 1% (4 lbs./gal product)	2 to 4 gals. water for aerial spray; 10 to 25 gals. water for ground broadcast application. Thoroughly wet foliage for individual plant treatment. Add 1 to 2 qts. surfactant per 100 gals. of water.	Spring, weed 4 to 6 inches high, good moisture conditions. Spray thistles in rosette stage.	Use 2,4-D amine in areas with 25 inches of rainfall or more. Use 2,4-D low volatile ester in drier areas where no susceptible crops are nearby. For Western bitterweed control use 2,4-D low volatile ester or amine at 1 qt/acre before plants flower and temperature (above 72 deg. F) and soil moisture favors plant growth. When three fourths of plants are blooming and/or temperature is less than 60 deg. F, use Weedmaster, 2,4-D plus Banvel, Grazon P+D, GrazonNext or 2,4-D plus Tordon 22K For prairie gerardia control, when plants are 4 to 6 inches high, use 1 ½ qts./acre of 2,4-D or the low rates of Weedmaster, Banvel plus 2,4-D, Grazon P+D, or Tordon 22K + 2,4-D. When plants are 6 to 10 inches high, use the high rates, but spray before flowering.
		Weedmaster	VH 1 pt. to 1 qt. (1/2 to 1 lb.)	VH 1%			
		Tank mix Banvel with 2,4-D amine or low volatile ester	VH ¼ to ½ pt. (1/8 to ¼ lb.) Banvel + ¾ to 1 ½ pts. (3/8 to ¾ lb.) 2,4-D	VH ¼% Banvel + ¾% 2,4-D (4 lbs./gal. product)			
		Grazon P+D	VH 1 pt. to 1 ½ qts. (0.3 to 0.9 lb.)	VH 1%			
		Tank mix Tordon 22K with 2,4-D or low volatile ester	VH ¼ to ¾ qts. (1/16 to 3/16 lb.) Tordon 22K + ½ to 1 ½ pts. (1/4 to ¾ lb.) 2,4-D	VH ¼% Tordon 22K + ½% 2,4-D (4 lbs./gal. product)			
		Cimarron Max	VH** Rate 1 to Rate 2				
		Surmount	VH 1.5 pt to 1 qt. (0.25 to 0.33 lb.)	VH 1%			Use high end of rate range for camphorweed, marshelder and smartweed.
		PastureGard	H 1 to 1.5 qt. (0.5 to 0.75 lb.)	VH 1%			Use high end of rate range for camphorweed, marshelder and smartweed. PastureGard efficacy on smartweed is marginal.
		GrazonNext	VH 2 pts. (0.75 lb.)				
		Milestone	VH 4 ozs. (0.125 lb)				Milestone provides excellent control of thistles and annual weed species in general, although at this time efficacy of this herbicide is not confirmed for all of the species in this list.

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			Broadcast rate per acre	Individual plant/ spot treatment			
7	Broomweed (annual or common), plantain (tallow weed), wild carrot	Escort or Cimarron	VH 0.1 oz.		2 to 4 gals. water for aerial spray; 10 to 25 gals. water for ground broadcast application. Add 1 to 2 qts. surfactant per 100 gal. of water.	Spring, weeds less than 4 inches tall	
		Cimarron Plus	VH 0.125 oz.				
		Cimarron X-tra	VH 0.2 oz.				
8	Broom snakeweed (perennial broomweed) (continued)	Escort or Cimarron	VH 0.6 oz.		2 to 4 gals. water for aerial spray; 10 to 25 gals water for ground broadcast application. Add 1 to 2 qts. of surfactant per 100 gals. of water.	Optimum time is in the fall, but may be applied in the spring.	
		Cimarron Plus	VH 0.75 oz.				
		Cimarron X-tra	VH 1.2 oz.				
		Cimarron Max	H to VH Rate 1 to Rate 2				
		Spike 20P	VH 3.75 lbs. of pellets (3/4 lb.)	VH 1/6 oz. of pellets (1/30 oz.) per 100 sq. ft.		Any time – optimum period is Oct. 1 to April 1, except in the Trans-Pecos where optimum period is May 1 to July 1.	Use only on sand, loamy sand, sandy loam, loam, silt loam, silt or sandy clay loam soils.
10	Lespedeza	Remedy	VH 1 to 2 pts. (1/2 to 1 lb.)		Ground broadcast 20 to 20 gals. per acre with 1 to 2 qts. Of surfactant per 100 gals. of water.	June through August under good growing conditions.	Plants need to be 12 to 18 inches tall before spraying. Use the higher rate if plants are large, approaching maturity, or if the infestation level is high. Begin application at flower bud initiation through full bloom.
		Escort or Cimarron	H 0.5 oz.				
		Cimarron Plus	H 0.7 oz.				
		Cimarron X-tra	H 1.0 oz.				
		Cimarron Max	H Rate 2				
		Surmount	VH 1.5 to 2 pt. (0.25 to 0.33 lb.)	VH 1%			
		PastureGard	VH 1.5 to 2 pt. (0.38 to 0.5 lb.)	VH 0.75%			

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			Broadcast rate per acre	Individual plant/ spot treatment			
11	Rayless goldenrod (jimmyweed)	Escort or Cimarron	VH 0.75 oz		2 to 4 gals. water for aerial spray; 10 to 25 gals. water for ground broadcast application. Add 1 to 2 qts. surfactant per 100 gal of water. Thoroughly wet foliage for individual plant treatment. Add 1 to 2 qts. surfactant per 100 gal. water.	Fall.	
		Cimarron Plus	VH 1.0 oz.				
		Cimarron X-tra	VH 1.5 oz.				
		Surmount	VH 6 pt. (1.0 lb.)	VH 2 %			
		Tordon 22K	VH 1 qt. (1/2 lb.)	VH 1%			
11	Threadleaf Groundsel	Escort or Cimarron	VH 0.4 oz.		2 to 4 gals. water for aerial spray; 10 to 25 gals water for ground broadcast application. Add 1 to 2 qts. surfactant per 100 gal of water.		
		Cimarron Plus	VH 0.5 oz.				
		Cimarron X-tra	VH 0.8 oz.				
		Cimarron Max	VH Rate 2				
12	Upright Prairie- coneflower	Escort or Cimarron	VH 0.2 oz.		2 to 4 gals. water for aerial spray; 10 to 25 gals water for ground broadcast application. Add 1 to 2 qts. surfactant per 100 gal of water.	Spring, before flower stalk development.	
		Cimarron Plus	VH 0.25 oz.				
		Cimarron X-tra	VH 0.4				
13	Baccharis (dryland willow, Roosevelt willow, seep willow or willow baccharis)	2,4-D low volatile ester	H 3 pts. To 3 qts. (1.5 to 3 lbs.) 4 lb./gal product	H 1%	4 to 5 gals. of water for aerial spray. 15 to 20 gals. water for ground broadcast. For individual plant treatment thoroughly wet the entire foliage, stems and trunks. Add 1 to 2 qts. surfactant per 100 gals. water.	Spring, when leaves are fully expanded and dark green in color.	
		Grazon P+D		H 1%	For individual plant treatment thoroughly wet the entire foliage, stems and trunks. Add 1 to 2 qts. surfactant per 100 gals. water.		
		Weedmaster		H 1%			
		Remedy		VH 1%			
		PastureGard		VH 1%			
		Surmount		VH 1%			

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Woody Plants

Page	Weed Controlled	Herbicide (common and chemical names – page 4)	Herbicide quantity (active ingredient rate in parenthesis)		Spray volume (per acre for broadcast, as described for individual plant)	Time to apply	Remarks
			Broadcast rate per acre	Individual plant/ spot treatment			
22	Mesquite (suppression and weed control)	2,4-D amine or low volatile ester	L 2 to 4 qts. (2 to 4 lbs.)	M 2% (4 lbs./gal. product)	<p>For aerial applications suggested total spray volume is 4 gal./acre. Use oil-in-water emulsion (1 to 5 oil to water ratio considered optimum), or water plus surfactant, crop oil or methylated seed oil.</p> <p>For ground broadcast applications the suggested total spray volume is 10 to 25 gal./acre. Use oil-in-water emulsion (1 to 5 oil to water ratio considered optimum), or water plus surfactant, crop oil or methylated seed oil.</p> <p>Thoroughly wet foliage for individual plant treatments. Add 1 to 2 qts. surfactant per 100 gals. of water or an oil-in-water emulsion (5% diesel + 95% water).</p>	<p>Late spring to mid-summer with mature leaves (dark green color). Optimum period of application begins when soil temperature at a depth of 12 inches reaches 75 deg. F and continues for 45 days.</p> <p>If treatment is applied prior to optimum soil temperatures, efficacy will be decreased and multiple applications over a period of years may be necessary to maintain less than 10% canopy.</p>	Treatments will control many weeds. When using oil-in-water emulsion use emulsifier. Use of a treatment with a low control rating may result in multi-stem growth that may be more difficult to control in the future.
		Grazon P+D	L 1 to 1.5 qts. (0.6 to 0.9 lbs.)				
		Weedmaster	L 1 to 1.5 qts. (1 to 1.5 lbs.)				
		Cimarron Max	L Rate 1 to Rate 2				
		Tordon 22K + 2,4-D amine or low volatile ester.	L 0.5 to 0.75 pt. (1/8 to 3/16 lb.) Tordon 22K + 1 to 1.5 qts. (1 to 1.5 lbs.) 2,4-D, 4 lbs./gal. product				
		Banvel + 2,4-D amine or low volatile ester.	L 0.5 to 0.75 pt. (1/4 to 3/8 lb.) Banvel + ¾ to 1 1/8 qts. (3/4 to 1 1/8 lbs.) 2,4-D, 4 lbs./gal. product				
		Remedy	L 1 pt. to 1 qt. (0.5 lb. to 1 lb.)	M 1%			
		Banvel	L 1 pt. to 1 qt. (0.5 lb. to 1 lb.)	M 1%			

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			Broadcast rate per acre	Individual plant/ spot treatment			
23	Mesquite	Remedy		VH 2% in diesel fuel oil	Apply to the base of the trunk from 12 to 18 inches above the soil surface. Apply until solution puddles on soil surface.	Anytime soil is dry and pulled away from the trunk.	
		Reclaim	M to H 1/3 qt. to 2/3 qt. (1/4 to ½ lb.)	VH 1%	For aerial applications suggested total spray volume is 4 gal./acre. Use oil-in-water emulsion (1 to 5 oil to water ratio considered optimum), or water plus surfactant, crop oil or methylated seed oil.	Late spring to mid-summer with mature leaves (dark green color). Optimum period of application begins when soil temperature at a depth of 12 inches reaches 75 deg. F and continues for 45 days thereafter. When Reclaim is used alone or in a tank mix the period should continue for 60 days. For optimum root kill do not spray if white flowers or bean elongation are observable, if over 25% of the leaf canopy is damaged due to insects, disease or hail, if soil temperatures are less than 75 deg. F. 1 ft. deep, or if new vegetative growth is present due to recent rains.	Use 1 pt./ac. Tordon 22K plus ½ pt./ac. Remedy, ½ pt./ac. Banvel plus ½ pt./ac. Remedy, 1 pt./ac. Tordon 22K plus ½ pt./ac. Banvel, 1 pt./ac. Tordon 22K plus 1/3 qt./ac. Reclaim and 1/3 qt./ac. Reclaim only in West Texas. Banvel and Banvel mixtures have been more effective in West Texas than in other parts of the state. Use mixtures that include ¼ pt./ac. Remedy and 1/3 pt./ac. Reclaim only in Montague, Wise, Parker, Hood, Somervell, Bosque, Coryell, Lampasas, Burnet, Blanco, Kendall, Bandera, Real, Edwards and Val Verde counties and those counties north and west of the named counties. Mixtures that include ½ pt./ac. Remedy and 2/3 pt./ac. Reclaim will give better control than mixtures with ¼ pt./ac. Remedy and 1/3 pt./ac. Reclaim. When using oil-in-water emulsion, use emulsifier added to oil for proper emulsion. Use of a treatment with a low-control rating may result in a multi-stem growth form that may be more difficult to control in the future.
		Remedy + Tordon 22K	M ½ to 1 pt. (1/4 to ½ lb.) Remedy + 1 to 2 pts. (¼ to ½ lb.) Tordon 22K	M to H ½% Remedy + ½% Tordon 22K	For ground broadcast applications the suggested total spray volume is 10 to 25 gal./acre. Use oil-in-water emulsion (1 to 5 oil to water ratio considered optimum), or water plus surfactant, crop oil or methylated seed oil.		
		Remedy + Banvel	L ½ to 1 pt. (1/4 to ½ lb.) Remedy + ½ to 1 pt. (1/4 to ½ lb.) Banvel	M ½% Remedy + ½% Banvel	Thoroughly wet foliage for individual plant treatments. Add 1 to 2 qts. surfactant per 100 gals. of water or an oil-in-water emulsion (5% diesel + 95% water).		
		Remedy + Reclaim	M to H ¼ to 1 pt. (1/8 to ½ lb.) Remedy + 1/3 to 2/3 pt. (1/8 to ¼ lb.) Reclaim	VH ½% Remedy + ½% Reclaim			
		Tordon 22K + Banvel	M 1 to 2 pts. (1/4 to ½ lb.) Tordon 22K + ½ to 1 pt. (1/4 to ½ lb.) Banvel	H ½% Remedy + ½% Banvel			
		Tordon 22K + Reclaim	M to H 1 to 2 pts. (1/4 to ½ lb.) Tordon 22K + 1/3 to 2/3 qt. (1/4 to ½ lb.) Reclaim	VH ½% Tordon 22K + ½% Reclaim			

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Page	Weed Controlled	Herbicide (common and chemical names – page 4)	Herbicide quantity (active ingredient rate in parenthesis)		Spray volume (per acre for broadcast, as described for individual plant)	Time to apply	Remarks			
			Broadcast rate per acre	Individual plant/ spot treatment						
26	Pricklypear, tasajillo	Tordon 22K	H 1 pt. to 1 qt. (1/4 lb. to ½ lb.)	VH 1%	For aerial applications suggested total spray volume is 2 to 4 gal./acre. Use oil-in-water emulsion (1 to 5 oil to water ratio considered optimum), or water plus surfactant, crop oil or methylated seed oil.	Anytime; best results have been obtained with late summer through fall applications.	Use emulsifier when adding diesel fuel oil to water. Use 1 pt./ac. Tordon 22K only on High Plains where no brush overstory is present. Late summer or fall applications, especially with Vista, will provide best results, but aerially spray in the winter or early spring if heavy overstory of woody plants is present or if damage to live oak is a concern.			
		Surmount	H 4 pt. (0.67 lb.)	VH 1%						
		Grazon P+D	H 1 gal. (2.5 lbs.)	VH 2%						
		Vista		VH 1%	For ground broadcast applications the suggested total spray volume is 10 to 25 gal./acre. Use oil-in-water emulsion (1 to 5 oil to water ratio considered optimum), or water plus surfactant, crop oil or methylated seed oil. Thoroughly wet plants for individual plant treatment adding 1 to 2 qts. surfactant per 100 gals. of spray mix.					
		Gramoxone Extra	These two treatments are deleted from B-1466.							
		Tank mix Tordon 22K with Gramoxone Extra								
29	Saltcedar	Arsenal	VH 2 qts. (1 lb.)	VH 1%	Minimum 10 gals./acre for aerial or ground broadcast sprays. Thoroughly wet foliage for individual plant treatment. Add 1 to 2 qts. surfactant per 100 gals. water.	July through September or until leaves begin to turn yellow.	When exposure to aquatic environments is possible use aquatic labels of Arsenal and Roundup (see table “Common, Chemical and Product Names of Herbicides”). Arsenal alone or in combination with Roundup will cause damage to desirable plants if contacted by the spray mix.			
		Arsenal + Roundup	VH 1 qt. (1/2 lb.) Arsenal + 1 pt. (1/2 lb.) Roundup	VH ½% Arsenal + ½% Roundup						
		Remedy		VH 25% in diesel fuel oil	Apply to lower 12 to 18 inches of trunk to wet the trunk; do not spray to point of runoff. Apply completely around the trunk.	Growing season when leaves have mature leaves.	This is commonly called the low volume basal application method. Use a hollow cone nozzle with X1 orifice.			
		Tank mix Arsenal with Rodeo (glyphosate)	This recommendation is deleted, and moved to the remarks section.							

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30	Yucca	Remedy		H 2% in diesel fuel oil	Spray the center of each individual whorl of leaves to the point of runoff.	Anytime	Complete coverage of leaves is not necessary. The crown of each plant must be thoroughly wetted with the herbicide mixture.
				H 2% in 1:5 diesel fuel oil:water emulsion		May through September.	Use emulsifier and agitate to maintain emulsion. Complete coverage of leaves is not necessary. The crown of each plant must be thoroughly wetted with the herbicide mixture.
				VH 15% in diesel fuel oil	Use an adjustable cone nozzle (X1 orifice) and spray a 2 second burst into each whorl.	Spring and summer.	Direct spray into the center of each whorl.
				H Undiluted 2 to 4 ml./plant whorl	Use an exact delivery handgun set at 2 or 4 ml. per whorl dose.		
		Pathfinder II		VH Undiluted	Use an adjustable cone nozzle (X1 orifice) and spray a 2-second burst into each whorl.		
		Cimarron Max + 2, 4-D low volatile ester	H Rate 2 Cimarron Max + 1 pt. to 1.5 pts. 2,4-D (4 lb a.i./gal. product).		Crop oil concentrate, modified seed oil or modified seed oil/organosilicone are the preferred adjuvants. For aerial applications a minimum of 4 gals./ac. total spray volume is recommended.	Spring through fall prior to frost.	A second follow-up application of Cimarron Max at Rate 1 or Rate 2 plus 2,4-D low volatile ester at 0.5 to 0.75 lbs. a.i./ac. within 2 years of the initial application may be required to control yucca seedlings and regrowth from rootstocks.
		Cimarron Plus + 2,4-D low volatile ester	H 0.675 oz. Cimarron Plus + 1 qt 2,4-D (4 lb a.i./gal product)				
New	Burrobrush	Tordon 22K		VH 1%	Thoroughly wet foliage for individual plant treatment.	April through July.	
		Grazon P+D		VH 2%			

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Revision