

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE SPECIFICATIONS**

**BRUSH MANAGEMENT**

(acre)  
CODE 314

**DEGREE OF INFESTATION BY SPECIES**

TABLE 1

*Kind of Brush	Percent Canopy Cover			Plants per acre			
	Dense	Medium	Light	Extra Heavy	Dense	Medium	Light
Broom snakeweed	Over 20	5-20	Less than 5				
Catclaw					over 200	100-199	99 or less
Cholla					over 250	130-250	129 or less
Creosotebush					over 250	130-249	129 or less
Ponderosa/Mixed Conifer**					over 800	300 – 800	300 or less
Juniper or **Pinon				Over 350	250	100-249	99 or less
Mesquite	Over 25	10-24	5-9				
Pricklypear					over 250	130-299	129 or less
Rabbitbrush	Over 35	15-34	5-14				
Sagebrush (Sand)	Over 35	20-34	5-19				
Sagebrush (Big)	Over 35	20-34	5-19				
Shinnery Oak	Over 30	15-29	5-14				
Shrub Oak	Over 30	15-29	5-14				
Tarbush					Over 300	130-299	129 or less
Saltcedar	Over 30	10-30	Less than 10				

\*\*Not applicable on forest and/or woodland sites.

\* On some ecological sites, these species may be part of the climax plant community. The lower limits of "light" should be that percentage composition which is allowed for the ecological site. (Refer to the ecological site description). Species composition lower than limit of light (above), or within range of that level described in the ecological site description shall not be treated unless justification to do so is approved by the ASTC/Technical Services.

SPECIFICATIONS  
Table 2

The following specifications for reduced rate aerial application of tebuthiuron will only be used for Big Sagebrush, Creosote and Tarbush when objectives include brush management for Wildlife. Treatment must address specific habitat deficiencies as documented on Wildlife Habitat Evaluation Guide Sheets for species of concern. Reduced rates for control of all other brush species must have ASTC/Technical Services Approval.

Plant Name: Creosotebush & Tarbush

SPECIES	METHODS	TIME	MATERIALS	TECHNIQUES OF OPERATIONS
Creosote Tarbush	Aerial	Prior to Rainy Season	Tebuthiuron	0.3 to 0.75 lb active ingredient/acre of 20P formulation on sandy loams, including fine sandy loam, very fine sandy loam, loam, silt, silt loam, loamy sand including loamy fine sand and loamy very fine sand, sand including fine sand and very fine sand. Wildlife management goals and objectives and expected percent kill of target species must be documented in brush management plan. Apply on medium to dense canopy having grassland potential.
Big Sagebrush	Aerial	Prior to Rainy Season Late summer or fall.	Tebuthiuron	0.3-0.5 lb. active ingredient/acre of 20P formulation on sandy loams including fine sandy loam, very fine sandy loam, loam, silt, silt loam, loamy sand including loamy fine sand and loamy very fine sand, sand including fine sand and very fine sand, cama silty loam, silt, sandy clay loam. Wildlife Management goals and objectives and expected percent kill of target species must be documented in brush management plan. Apply on medium to dense canopy having grassland potential.

SPECIFICATIONS

Table 2

Plant Name: Big Sagebrush

Treatment Method	Where Applicable	When Applicable	Remarks
1. <b>Mechanical.</b> Removal of top growth. This may be accomplished by shredding or beating the top growth so that all the twigs or branches are removed to within 4" or less of the ground surface. Removal of top growth will be necessary in consecutive years to complete the practice, as determined by the cooperater and the conservationist.	Limited to mature even age stands in areas with good understory vegetation and no rabbitbrush or rockbrush.	When big sage has reached full leaf, generally from May 15 to July 15.	
2. <b>Plowing.</b> Brushland plow or similar equipment. Cut in a manner to sever plants at least 4" below ground level. Any other equipment, which will ensure 90% reduction, is acceptable.	All stands where a good understory of desirable grasses does not exist and does not exist and areas relatively free of stones	Early spring or fall prior to seeding date to assure kill and firm seed bed	Seeding is required as a follow-up measure Brush reduction should be timed with range planting. Practice applications are limited to moderate slopes unless no erosion hazard exists.
3. <b>Chopping.</b> (Marden or Fleco Brush Chopper)	Stony areas where sagebrush is mature, brittle and free of young sagebrush plants and rabbitbrush.	Late winter	
4. <b>Scalping</b> Road maintainer	Very limited application no level areas mature stands.		
5. <b>Chaining.</b> In two directions (opposite) with chain at least 70#/ft. Preferably 2 or 3 chains with roller hitch speed of crawler tractor at least 3 mph.	Limited to areas of mature stands of big sagebrush with good understory of desirable vegetation and relatively level land without hummocks.	Winter and early spring before frost leaves soil	
6. <b>Aerial application</b> of pellets. Chemical: Recommended herbicides, chemical rates and mixtures will be applied according to manufacturer's label and as recommended in "Chemical Weed & Brush Control Guide For New Mexico Rangelands" 400 B-17.	Areas of mature Big Sagebrush with good understory of desirable vegetation.	Summer or fall in anticipation of rainfall.	Herbicide may kill or damage pinyon, juniper, & ponderosa pine trees scattered throughout the sagebrush, caution may need to be exercised to avoid them. DO NOT APPLY WHEN THERE IS SNOW ON THE SOIL OR SOIL IS SATURATED. Rabbitbrush will not be controlled by herbicide and may replace sagebrush after treatment.

Specification - 314 - 4

SPECIFICATIONS

Table 2

Plant Name: Broom snakeweed

Treatment Method	Where Applicable	When Applicable	Remarks
<p><b>Chemical Application by Aerial or Ground Equipment</b> Chemical rates and mixtures according to manufacturer's label and as recommended in "Chemical Weed &amp; Brush Control Guide For New Mexico Rangelands" 400 B-17.</p>	<p>On heavily infested ranges where grazing management will not reduce the infestation by plant succession in a reasonable time.</p>	<p>In fall at late to post bloom. Soil temperatures at 6 in should exceed 45 degrees F.</p>	<p>Longevity of treatment may not exceed three years.</p> <p>Reference: Broom Snakeweed Response to Herbicides." Ag. Exp. Bulletin #706 - Kirk McDaniels</p> <p>Snakeweed: "Problems and Perspectives" NMSU Bulletin #75.</p>

Plant Name: Catclaw Mimosa

Treatment Method	Where Applicable	When Applicable	Remarks
<p>1. <b>Rootplowing:</b> Reduction is achieved by cutting at least 9" below the surface. Any instrument that will accomplish this is satisfactory. Range planting is required as a follow-up measure.</p>	<p>Medium to heavy stands only</p>	<p>Anytime, preferably in the spring or early summer before the anticipated rainy, season to coordinate with seeding.</p>	<p>Low production potential limits the application of this type of treatment to areas of 13" or higher rainfall.</p>
<p>2. <b>Hand Grubbing:</b> Plants must be cut below the bud zone.</p>	<p>Light stands only</p>	<p>Anytime</p>	<p>Adapted to light stands of young plants where most of the bushes do not exceed 2" in diameter.</p>
<p>3. <b>Bulldozing:</b> The plants must be uprooted or cut off below the bud zone.</p>	<p>Light and medium stands only</p>	<p>Anytime</p>	
<p>4. <b>Chemical:</b> Recommended herbicides, chemical rates and mixtures will be applied according to manufacturer's label and as recommended in "Chemical Weed &amp; Brush Control Guide For New Mexico Rangelands" 400 B-17.</p>			

SPECIFICATIONS  
Table 2

Plant Name: Cholla cactus

Treatment Method	Where Applicable	When Applicable	Remarks
1. <b>Rootcutting, Grubbing, and Stacking:</b> Cut or in any manner sever the plants at least 3" below ground level.	Deep, rock free soils, and on areas free of light stands of pinyon- juniper. A complete total treatment should be developed on mixed brush sites.	Year long, except when soil is frozen. Best results in December & January or dry summers	Gives effective kill on all size classes. Care should be taken not to scatter broken joints. Burn dry stacks.
2. <b>Hand Grubbing:</b>	Light stands	Any time, except when ground is frozen or wet. Best results in January or December or dry summers.	Gives good kill when properly done & joints cleaned up.
3. <b>Cabling:</b> Pulling flexible cable between two power vehicles to uproot and drag from the soil. First cable of swiveled double loop to be a minimum of one inch flexible (rope core) cable, two way cabling (1 trip each in opposite directions.) Speed will not exceed 5 m.p.h.	Applicable only to Guadalupe Lincoln, Torrance, DeBaca, and Quay Counties in the CP-3 Subresource Area. Dense Stand of large uniform cholla stands in areas without woody plants. NOTE: Limited to areas where hard freezes are followed by cold, dry weather.	After first hard freeze to Jan. 31, with good soil moisture to insure plant pull without breaking off at root collar. <u>Moisture very important</u>	Scattered joints may resprout.
4. <b>Chemical:</b> Recommended herbicides, chemical rates and mixtures will be applied according to manufacturer's label and as recommended in "Chemical Weed & Brush Control Guide For New Mexico Rangelands" 400 B-17.	Light or sparse cholla stand	Prior to anticipated rainfall.	Plant kill may require two growing seasons.

Plant Name: Cactus – Prickly Pear, or Cholla

Treatment Method	Where Applicable	When Applicable	Remarks
<b>Chemical Control</b> Chemical: Recommended herbicides, chemical rates and mixtures will be applied according to manufacturer's label and as recommended in "Chemical Weed & Brush Control Guide For New Mexico Rangelands" 400 B-17.			Plant kill may require two growing seasons.

SPECIFICATIONS  
Table 2

Plant Name: Creosotebush (*Larrea divaricata*) and Tarbush (*Flourensia cernua*)

Treatment Method	Where Applicable	When Applicable	Remarks
1. <b>Discing, Rootplow:</b> Cut or in any manner sever the plants at least 4" below ground level. Rootplows should have kickers or fins not over 3' apart to bring roots to surface. Drag chain, on swivels, behind the plow increases the pull-up of plants.	Dense and medium stands where range planting is considered practical and feasible following treatment. (See Range Planting Standards and Specs).	Early part of growing season or coordinated with seeding dates when seeding done in same operation. Brush reduction should be timed with range planting.	Suitable only on soils not subject to erosion.
2. <b>Grubbing:</b> Cut in any manner to sever the plants at least 4" below ground level.	Light stands with	Year long	
3. <b>Chemical:</b> Recommended herbicides, chemical rates and mixtures will be applied according to manufacturer's label and as recommended in "Chemical Weed & Brush Control Guide For New Mexico Rangelands" 400 B-17.	Medium to dense canopy having grassland potential.	Summer or fall in anticipation of rainfall.	The cost-return benefits need careful consideration. Grass response may be slow after treatment (up to 5 years).

SPECIFICATIONS  
Table 2

Plant Name: Ponderosa Pine and Mixed conifer other than Pinon & Juniper. This practice not applicable to forest and/or woodland sites.

Treatment Method	Where Applicable	When Applicable	Remarks
<p><b>Hand Cutting, Shearing:</b> Cutting Ponderosa Pine and/or mixed conifer above the surface to leave stumps less than 3 to 6" (all green material must be removed). Moderate &amp;/or heavy stands will be stacked &amp; burned &amp;/or burned unless other considerations, such as wildlife, justify not disposing of treated trees. Justification must be documented. Chipping/shredding may be used in lieu of stacking and/or burning.</p>	Where invasion/increase of Ponderosa Pine and/or mixed conifer is occurring.	When environmental conditions are conducive to treatment method.	If chipping and/or shredding are used in lieu of stacking, avoid excess chips on ground that will inhibit plant growth.
<p><b>Hand Grubbing:</b> Seedlings less than 3 feet tall.</p>	Where invasion/increase of Ponderosa Pine and/or mixed conifer is occurring.	When environmental conditions are conducive to treatment method.	Stacking not required on hand grubbing of seedlings.
<p><b>Individual tree shredding or chipping.</b></p>	Where invasion/increase of Ponderosa Pine and/or mixed conifer is occurring.	When environmental conditions are conducive to treatment method.	
<p><b>Bulldozing or Grubbing:</b> Trees must be uprooted and pushed out of the ground. Stack in not more than 5 stacks per acre. Trees may be windrowed or chipped in lieu of stacking. Stack in windrows across the slope.</p>	Moderately deep and deep soils where slope does not exceed 10%.	Year – long except when ground is frozen 10" deep.	Note: Competing shrubs such as oak may invade site without follow-up treatment. Conservationists should encourage the harvest of wood products to minimize waste. Stacking or windrowing is not required on sites where prescribed burning is utilized as post treatment.

**Specification - 314 - 8**

SPECIFICATIONS  
Table 2

Plant Name: Ponderosa Pine and Mixed conifer other than Pinon & Juniper. This practice not applicable to forest and/or woodland sites.  
(cnntinued)

<p><b>Individual Tree Burning:</b> Use butane or propane torches. Burn when wind velocities are less than 12 miles per hour, temperatures are above 60 degrees F., and relative humidity is less than 65%.</p>	<p>Where species are on light infestation of trees only or as a follow-up treatment.</p>	<p>Winter and spring months, early morning before 10:00 am.</p>	
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Plant Name: Juniper

Treatment Method	Where Applicable	When Applicable	Remarks
<p>1. <b>Hand Cutting, Shearing:</b> Cutting one seeded or Utah Juniper above the surface to leave stumps less than 3 to 6" (all green material and scales must be removed). Above ground cutting of alligator juniper is not applicable, unless stumps are treated. Moderate &amp;/or heavy stands will be stacked &amp; burned &amp;/or burned unless other considerations, such as wildlife, justify not disposing of treated trees. Justification must be documented. Chipping may be used in lieu of stacking and/or burning.</p>	<p>Where invasion of juniper is occurring.</p>	<p>Year long</p>	<p>Alligator juniper stumps must be treated with recommended herbicide as per label. If chipping is used in lieu of stacking, avoid excess chips on ground that will inhibit plant growth.</p>
<p>2. <b>Hand Grubbing:</b> Seedlings less than 3 feet tall. Alligator and Utah Juniper must be cut below bud zone.</p>	<p>Where invasion of juniper is occurring.</p>	<p>Year long</p>	<p>Stacking not required on hand grubbing of Juniper seedlings.</p>

SPECIFICATIONS  
Table 2

Plant Name: Juniper and Pinon on Rangeland sites. This practice not applicable on forest and/or woodland sites.

Treatment Method	Where Applicable	When Applicable	Remarks
<p>3. <b>Bulldozing or Grubbing:</b> Trees must be uprooted and pushed out of the ground. Stack in not more than 3 stacks per acre or 5 stacks per acre where wildlife is a concern, and stand is medium to heavy. Trees may be windrowed or chipped in lieu of stacking. Stack in windrows across the slope.</p>	<p>Moderately deep and deep soils where slope does not exceed 10%.</p> <p>Clearing is not approved on areas with 25% or greater cover of competing shrubs or big sage.</p>	<p>Year-long except when ground is frozen 10" deep.</p>	<p>An on-site determination must be made by the FO conservationists where sandy sites occur. NOTE: Conservationists should encourage the harvest of posts and firewood in lieu of stacking and windrowing to minimize waste. Stacking or windrowing is not required if grazing use is reduced in proportion to the area covered by downed trees.</p>
<p>4. <b>Chemical:</b> Recommended herbicides, chemical rates and mixtures will be applied according to manufacturer's label and as recommended in "Chemical Weed &amp; Brush Control Guide For New Mexico Rangelands" 400 B-17.</p>	<p>Where bushy multistemmed canopy having grassland potential sites. CAUTION: Avoid areas where possible runoff may enter water used for irrigation of susceptible broadleaf species.</p>	<p>Late summer and fall in anticipation of rainfall.</p>	<p>CAUTION: Loss of desirable shrubs and perennial forbs can be anticipated.</p>
<p>5. <b>Individual Tree Burning:</b> (Nonsprouting species). Use butane or propane torches. Burn when wind velocities are less than 12 miles per hour, temperatures are above 60 degrees f., and relative humidity is less than 65%.</p>	<p>Where the species are nonsprouting types, on light infestation of trees only or as a follow-up treatment.</p>	<p>Winter and spring months, early morning before 10 a.m.</p>	
<p>6. <b>Cabling/Chaining/With Follow-up:</b> Chaining with a chain that weights enough to hold it close on the ground (70 lbs. per link or more). Cable at least 1&amp;1/8 inch. Cabling/chaining will control a minimum of 70% of target species with follow-up treatment that reflects objectives. Follow-up may include prescribed burning, chemical treatments, and/or other mechanical treatments. Trees will be stacked &amp; burned &amp;/or burned unless other considerations, such as wildlife, justify not disposing of treated trees. Justification must be documented. Chipping may be used in lieu of stacking &amp; burning. Dozer spacing will depend on chain/cable length, dozer size &amp; effectiveness in meeting minimum of 70%control of target species.</p>	<p>Where invasion of Juniper has occurred on 10% or less slopes. Chaining and/or cabling is not allowed where there is a moderate or heavy infestation of Cholla cactus or where light stands may be scattered for possible heavy infestation. Sandy soils may be treated if trees are placed in alternate wind-rows that prevent wind erosion. NOTE: The Ecological Site Description will be used as a benchmark for determination of invasion of Juniper.</p>	<p>Year round except when soils are wet. Recommendations: D-7 or equivalent tractors pulling a 180' to 250' cable/chain have worked well.</p>	<p>Note: Cabling/Chaining &amp; follow-up treatment must meet 70% minimum control of target species.</p>

Specification - 314 - 10

SPECIFICATIONS  
Table 2

Plant Name: Mesquite

Treatment Method	Where Applicable	When Applicable	Remarks
1. <b>Hand Grubbing:</b> Plant must be uprooted and cut off below the bud zone.	Light stands only	Year long	Bud zone is usually 6 to 20 inches deep.
2. <b>Mechanical Grubbing:</b> Plant must be uprooted and cut off below the bud zone.	Light and medium and heavy stands.	Year long	Bud zone is usually 6 to 20 inches deep.
3. <b>Bulldozing:</b> Plants must be uprooted and cut off below the bud zone. A second application by chemical or mechanical treatment is required where initial reduction is less than 70% canopy reduction.	Light and medium stands		Bulldozing includes any method of control that severs the root below the bud zone. 12-18" as a guide 12" (heavier soils), 18" (Sandy soils)
4. <b>Root Plowing:</b> Plants must be uprooted and cut off below the root levels minimum of 12." Range planting will be applied in conjunction with this practice.	Dense infestation poor range condition	Prior to seeding date	Follow-up method includes hand grubbing, ground spraying, chemical treatment, or plant dozing.
5. <b>Chemical Application by Aerial or Ground equipment:</b> Recommended herbicides, chemical rates and mixtures will be applied according to manufacturer's label and as recommended in "Chemical Weed & Brush Control Guide For New Mexico Rangelands" 400 B-17.	Medium to dense stands (including intermingled light stands)	As per label.	Follow-up method includes hand grubbing, ground spraying, or chemical treatment.

Plant Name: Sand sagebrush

Treatment Method	Where Applicable	When Applicable	Remarks
1. <b>Mechanical:</b> Removal of top growth. This may be accomplished by mowing, shredding or beating the top growth so that the twigs or branches are removed within 6" or less of the ground surface. Removal of top growth must be done two consecutive years to complete the practice.	In Lesser Prairie-chicken (LPC) range refer to LPC Interstate Working Group publication "Assessment & Conservation Strategy for the LPC" for further guidance.		
2. <b>Chemical:</b> Chemical rates and mixtures according to manufacturer's label and as recommended in "Chemical Weed & Brush Control Guide For New Mexico Rangelands" 400 B-17.	In Lesser Prairie-chicken (LPC) range refer to LPC Interstate Working Group publication "Assessment & Conservation Strategy for the LPC" for further guidance.	As per label	CAUTION: Grass damage may occur when applied in the growing season.

SPECIFICATIONS  
Table 2

Plant Name: Rabbitbrush

Treatment Method	Where Applicable	When Applicable	Remarks
1. <b>Rootplowing</b> , At least 6" below surface. Range planting is required as a follow-up measure	Heavy and medium stands	Prior to range planting date	Range planting specifications following control.
2. <b>Plowing</b> , Plow must cut or sever roots at least 6" below surface. Range planting is required as a follow-up measure.	Heavy and medium stands	Prior to range planting date.	Two plowings required.
3. <b>Hand Grubbing</b> , Cut or sever plants 5" below the surface.	Light stands only	Year long	
4. <b>Chemical</b> : Chemical rates and mixtures according to manufacturer's label and as recommended in "Chemical Weed & Brush Control Guide For New Mexico Rangelands" 400 B-17.		As per label	Rabbitbrush control with herbicides is generally poor and results vary by species.

Plant Name: Shinnery Oak & Shrub Oak

Treatment Method	Where Applicable	When Applicable	Remarks
<b>Chemical</b> : Recommended herbicides, Chemical rates and mixtures according to manufacturer's label and as recommended in "Chemical Weed & Brush Control Guide for New Mexico Rangelands" 400 B-17.	When in Lesser Prairie-chicken (LPC) habitat refer to LPC Interstate Working Group publication "Assessment & Conservation Strategy for the LPC" for guidance.	As per label.	CAUTION: consideration should be given to leaving clumps of shinnery on dunes where removal of the major portion of vegetation will leave sandy soils subject to wind erosion.  CAUTION: Grass damage may occur when applied in the growing season.

SPECIFICATIONS  
Table 2

Plant Name: Saltcedar (Tamarix spp.)

Treatment Method	Where Applicable	When Applicable	Remarks
<p><b>Chemical:</b> Recommended herbicides, Chemical rates and mixtures according to manufacturer's label and as recommended in "Chemical Weed &amp; Brush Control Guide for New Mexico Rangelands" 400 B-17. Larger plants may be cut and immediately treated with a cut-stump herbicide formulation.</p>	Anywhere Saltcedar has invaded.	As per label.	Note: Special care should be taken to assure that herbicides used in close proximity to open water closely adhere to label instructions.
Treatment Method	Where Applicable	When Applicable	Remarks
<p><b>Mechanical:</b> Dozing, Root plowing, root raking piling and burning. Cut or in any manner sever the plants at least 17" below ground level . Saltcedar is an active sprouter. Saltcedar must be uprooted so that root crown is no longer in contact with soil. Debris should be piled and burned. Root plows should have kickers or fins not over 3' apart to bring roots to surface. Drag chain, on swivels, behind the plow increases the pull-up of plants.</p>	Anywhere Saltcedar has invaded.	Any time of year when soil moisture conditions permit.	Note: Saltcedar should be up-rooted so that root crown is not in contact with soil.



# **Chemical Weed and Brush Control for New Mexico Rangelands**

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## PLANT INDEX

Common name of species	Page
<b>Native Weeds</b>	
Bitter sneezeweed.....	3
Broomweed (annual or common).....	3
Broom snakeweed (turpentine weed).....	3-4
Buckwheat.....	3
Camphorweed.....	3
Cocklebur.....	3
Common cattail.....	5
Crazyweed, silky (Lambert's).....	5-6
Groundsel, Threadleaf; Riddel's.....	15
Gumweed, curlycup.....	7
Horehound.....	3
Horsemint.....	3
Houndstongue.....	8
Lakeweed.....	3
Larkspur, geyer.....	9
Larkspur, tall or duncecap.....	9
Locoweed, woolly.....	5-6
Milkvetch.....	15
Milkweed, showy.....	11
Mustard.....	15
Oxeye daisy.....	11
Pinque.....	15
Poison ivy.....	11
Poison oak.....	11
Poverty sumpweed.....	11
Ragweed, common (western).....	11
Rayless goldenrod.....	12
Sunflower.....	3
Upright prairie-coneflower.....	3
Water hemlock, western.....	15
Western bitterweed.....	15
Whitepoint Locoweed.....	6

Common name of species	Page
<b>Native Shrubs and Trees</b>	
Catclaw acacia.....	5
Catclaw mimosa.....	4 - 5
Cholla.....	5
Creosotebush.....	6

Iris, Rocky Mountain.....	8
Juniper (cedar).....	8
Lotebush.....	9
Mesquite, grassland.....	10
Mesquite, mixed brush.....	10
Pricklypear.....	5
Rabbitbush.....	11
Russian olive.....	12
Sagebrush, big.....	12
Sagebrush, fringed.....	12
Sagebrush, sand.....	12
Saltcedar.....	12-13
Sand shinnery oak.....	13
Shrub oak (Gambel, wavyleaf).....	13
Skunkbrush sumac.....	13-14
Tarbush.....	14
Whitehorn acacia.....	4-5
Willows.....	15-16
Wolfberry.....	10
Yucca.....	16

Common name of species	Page
<b>Noxious Weeds and Shrubs</b>	
African rue.....	2
Bindweed, field.....	2
Black henbane.....	3
Bursage, skeletonleaf.....	4
Camelthorn.....	4
Downy brome.....	6
Dyer's wood.....	7
Goatgrass, jointed.....	7
Halogeton.....	7
Hoarycress; whitetop.....	7
Horsetail, Smooth; scouring rush.....	7- 8
Knapweed, diffuse, spotted.....	8 - 9
Knapweed, Russian.....	9
Leafy spurge.....	9
Pepperweed, perennial.....	11
Thistle, musk; scotch; Canada; bull.....	14-15
Toadflax, Dalmatian and yellow.....	6
Starthistle, yellow; malta; purple.....	14

# Chemical Weed and Brush Control for New Mexico Rangelands

Keith W. Duncan, Kirk C. McDaniel and Mark J. Renz<sup>1</sup>

Noxious woody and weedy plants inhabit much of New Mexico's rangelands. Dense stands of brush and weeds use vast quantities of water, reduce forage production and contribute to erosion. If rangelands are to reach their productive potential, noxious plants need to be managed effectively. Herbicides are effective, economical and efficient methods for controlling brush and weeds and improving and maintaining rangelands.

This circular lists current suggestions for herbicides to control woody and herbaceous weeds on rangeland. Some herbicides provide a high degree of control of certain species and a reduced degree of control of other species. However, seldom is a species eradicated. When developing a woody and herbaceous weed management program, consider all possible rangeland uses. Many woody plants and forbs are valuable sources of food and cover for wildlife and can also be important to livestock operations. A woody and herbaceous weed management program should use control methods that provide optimum benefits to both livestock and wildlife.

Herbicides are effective and safe when they are used properly (Appendix A). Misuse can result in poor woody and herbaceous weed control, increased expense, possible hazards from herbicidal drift or residues that damage or kill desirable

plants. Use the following guidelines for proper herbicide use:

- Correctly identify the plant species and evaluate the need for control.
- Consider the expected benefits and costs of herbicide and alternative control practices, as well as alternative uses of funds.
- Select and purchase the appropriate herbicide for the plant species.
- Provide and require proper safety equipment.
- Calibrate spray equipment to correctly apply the desired rate.
- Mix herbicides in a well-ventilated area, preferably outside.
- Spray under conditions that minimize drift.
- Read and follow instructions on the label.
- Keep a record of the herbicide used, time of application, weather conditions, rate of herbicide applied, date, location and applicator.

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For successful weed control, the correct quantity of herbicide mixture must be applied to a specific area. To calibrate spray equipment, see NMSU Cooperative Extension Service publications on calibrating pesticide applicators. For information about procedures for obtaining a pesticide applicator's license and other information about applying herbicides properly, contact your county Extension office.

The following suggestions for using herbicides are based upon their effectiveness under New Mexico conditions. Broadcast and individual plant treatments are presented Table 1. Individual plant treatments are best suited for controlling thin stands of brush (usually less than 150 plants/acre) and for selective control. Broadcast treatments are useful for dense stands of target weed(s).

Suggested herbicides must be registered and labeled for use by the Environmental Protection Agency. Some of the suggested herbicides are restricted-use pesticides and require an applicator's license for purchase and use. **Because the status of herbicide label clearance is subject to change, be certain to use current label for a herbicide's intended use.**

The user is always responsible for the effects of herbicide residue on livestock and crops, as well as for problems that arise from drift or other herbicide movement from the user's property to that of others.

**The label is a legal document and violation of it is a federal offense.**

Always read and follow carefully the instructions on the container label. Especially note any grazing restrictions that apply to the herbicide.

**Table 1. Herbicides for controlling undesirable brush and weeds on rangelands.**

Plant controlled	Trade name and product rate/acre	Herbicide common name and active ingredient	Spray volume per acre or individual plant	Time of application	Remarks
African Rue	Arsenal 3 pt	Imazapyr 3/4 lb	10 to 25 gal for ground broadcast.	Spray only actively growing plants.	Caution: Arsenal and Velpar L will damage or kill any other sprayed vegetation.
	OR Velpar L 2 ml/plant	Hexazinone	Individual plant treatment.	Anytime of year.	
Bindweed, Field	Banvel, 1 pt to 1 qt	Dicamba 1/2 to 1 lb	10 to 25 gal for ground broadcast application. Use surfactant as per label.	Summer fallow prior to planting and when weeds are actively growing or in late summer or fall prior to killing frost or post-bloom. Follow-up applications should be made in spring to control seedlings.	For suppression, refer to label for crop rotation restrictions.
	OR Clarity, Overdrive 4 to 8 oz	Dicamba: diflufenzopyr (5:2 mixture) 1/4 to 1/2 lb			
	OR Weedmaster 1 pt to 1 qt	OR Dicamba: 2,4-D (1:3 mixture) 1/2 to 1 lb			
	OR Tordon 22K** 1 to 2 qt	OR Picloram 1/2 to 1 lb			
	Paramount 5 to 8 oz	Quinlorac 1/4 to 3/8 lb	10 to 25 gal for ground broadcast. Add 1 to 2 pints MSO.		

\* Formulated as 4 lb active ingredient per gallon product  
 \*\* Restricted use product

**Table 1. Herbicides for controlling undesirable brush and weeds on range lands.**

Plant controlled	Trade name and product rate/acre	Herbicide common name and active ingredient	Spray volume per acre or individual plant	Time of application	Remarks
Bindweed, Field (continued)	OR Roundup* 4 to 5 qt	OR Glyphosate 4 to 5 lb		Full bloom to early seed stage.	
	OR Tank mix 1 qt Roundup + 1/2 pt Banvel, Clarity	OR Glyphosate 1 lb + dicamba 1/2 lb		Mid-to late-bloom.	
	OR Landmaster BW 3 1/5 pt	OR Glyphosate: 2,4-D (1: 1 1/4 mixture) 1 lb		Fallow or post harvest when bindweed has 10 inch runners.	
	OR 2,4-D* 2 to 3 qt	OR 2,4-D 2 to 3 lb		Bud stage or summer; follow in early August.	
Bitter sneezeweed, broomweed (annual or common), camphorweed, cocklebur, horehound, ragweed, sunflower, thistles, upright prairie coneflower, horsemint, pepperweed, buckwheat, knapweed, lakeweed, and others	2,4-D 1 pt to 1 qt	2,4-D 1/2 to 1 lb	2 to 4 gal water for aerial spray; 10 to 25 gal for ground broadcast application. Add surfactant as needed.	Spring weeds 4 to 6 inches high, before blooming, good growing conditions.	Use 2,4-D amine or low volatile ester. Do not spray near susceptible crops.
	OR Weedmaster 1 pt to 1 qt	OR Dicamba: 2,4-D (1:3 mixture) 1/2 to 1 lb			
	OR Tank mix 1/4 to 1/2 pt Banvel with 3/4 to 1 1/2 pt 2,4-D*	OR Dicamba: 1/8 to 1/4 lb + 2,4-D 3/8 to 3/4 lb			
	OR Grazon P+D 1 pt to 3 pt	OR Picloram: 2,4-D (1:2 mixture) 3/10 to 9/10 lb			
	OR Tank mix 1/4 to 3/4 pt Tordon 22K** with 1/2 to 1 1/2 pt 2,4-D	OR Picloram 1/16 to 3/16 lb + 2,4-D 1/4 to 3/4 lb			
	OR Ally, Escort 5/8 to 4/5 oz	OR Metsulfuron 3/8 to 1/2 oz			
Black Henbane	Tank mix Ally, Escort 1/2 oz + 3 qt 2,4-D	OR Metsulfuron 1/3 oz + 2,4-D 3 lb	10 to 25 gal for ground broadcast application. Use surfactant as per label.	Rosette to bloom.	Seedlings should be controlled the following year.
Broom snakeweed (perennial broomweed, turpentine weed)	Tordon 22K** 1 pt to 1 qt	Picloram 1/4 to 1/2 lb	2 to 4 gal water for aerial spray; 10 to 25 gal for ground broadcast application. Add surfactant as needed.	Fall, after full bloom, or spring when growing conditions are good.	Use drift control agent and add emulsifier to oil. Foliar sprays are recommended where broom snakeweed is the primary weed species.
	OR Tank mix 1 pt to 1 qt Tordon 22K** + 1 qt 2,4-D*	OR Picloram 1/4 to 1/2 lb + 1 lb 2,4-D			

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 \*\* Restricted use product

**Table 1. Herbicides for controlling undesirable brush and weeds on range lands.**

Plant controlled	Trade name and product rate/acre	Herbicide common name and active ingredient	Spray volume per acre or individual plant	Time of application	Remarks
Broom snakeweed (perennial broomweed, turpentine weed) (continued)	OR Grazon P+D 1 to 2 qt	OR Picloram: 2,4-D (1:4 mixture) 5/8 to 1 1/4 lb			
	OR Weedmaster 1 1/2 to 2 qt	OR Dicamba: 2,4-D (1:3 mixture) 1 1/2 to 2 lb			
	OR Ally, Escort 5/8 to 4/5 oz	OR Metsulfuron 3/8 to 1/2 oz			
	OR Spike 20P 3 3/4 to 5 lb of pellets	OR Tebuthiuron 3/4 to 1 lb	Aerial broadcast.	Anytime during year. Optimum is prior to rainy season.	Do not use on clay loam, silty clay loam, sandy clay, silty clay or clay soils.
Bursage, skeletonleaf	2,4-D* 1 1/2 to 2 qt	2,4-D 1 1/2 to 2 lb	10 to 25 gal for ground broadcast application.	Without cultivation, spring and fall.	Treat after tillage when regrowth is 4 to 6 inches
	OR Tordon 22K** 2 qt	OR Picloram 1 lb	10 to 25 gal for ground broadcast application.	Fully leaved and actively growing.	
	OR Banvel, Clarity 1 to 2 qt	OR Dicamba 1 to 2 lb	10 to 25 gal for ground broadcast application.	Late summer and fall.	
Camelthorn	Ally, Escort 3/8 oz	Metsulfuron 1/4 oz	Individual plant treatment. Mix in 100 gal water, add 8 oz silicone surfactant.	Actively growing	Retreatment may be necessary.
	Arsenal 3/4 to 1 1/2	Imazapyr	Individual plant treatment. Mix in 100 gal water, add 8 oz silicone surfactant.	Actively growing	Retreatment may be necessary.
Catclaw mimosa, whitehorn acacia	Spike 20P 3 3/4 to 5 lb pellets	Tebuthiuron 3/4 to 1 lb	Aerial broadcast.	Anytime during year. Optimum is prior to rainy season.	Use only on sandy, loamy sand, or sandy loam soils.
	OR Tank mix 2 pt Tordon 22K** with 1 pt Remedy	OR Picloram 1/2 lb* Triclopyr 1/2 lb	2-4 gal oil-in-water emulsion as aerial spray (1 pt to 1 qt diesel oil in water to make 2-4 gal). 10 to 25 gal oil-in-water emulsion for ground broadcast (1/2 to 1 gal diesel oil-in-water to make 10-25 gal).	When leaves are fully expanded. Good growing conditions.	Do not spray near susceptible crops.
	OR Reclaim 2/3 pt to 2/3 qt	OR Clopyralid 1/4 to 1/2 lb			
	OR Tank mix 1/3 to 2/3 pt Reclaim with 1/4 to 1/2 pt Remedy	OR Clopyralid 1/8 to 1/4 lb + Triclopyr 1/8 to 1/4lb			

\* Formulated as 4 lb active ingredient per gallon product  
 \*\* Restricted use product

**Table 1. Herbicides for controlling undesirable brush and weeds on range lands.**

Plant controlled	Trade name and product rate/acre	Herbicide common name and active ingredient	Spray volume per acre or individual plant	Time of application	Remarks
Catclaw mimosa, whitehorn acacia (continued)	OR Spike 20P 1/4 to 1/2 oz per 3 ft of canopy diameter or height	OR Tebuthiuron 1/20 to 1/10 oz	Individual plant treatment.	Anytime during year. Optimum is prior to rainy season.	Do not apply to frozen or snowcovered ground. Distribute uniformly under canopy.
Catclaw acacia	Spike 20P 5 to 7 1/2 lb of pellets	Tebuthiuron 1 to 1 1/2 lb	Aerial broadcast.	Anytime during year. Optimum is prior to rainy season.	Use only on coarse-textured soils.
	OR Tank mix 2 pt Tordon 22K** with 1 pt Remedy	OR Picloram 1/2 lb + Triclopyr 1/2 lb	2-4 gal oil-in-water emulsion as aerial spray (1/2 to 1 gal diesel oil-in-water to make 2-4 gal). 10-25 oil-in-water emulsion for ground broadcast (1/2 to 1 gal diesel oil-in-water to make 10-25 gal).	When leaves are fully expanded. Good growing conditions.	Do not spray near susceptible crops.
	OR Spike 20P 1/4 to 1/2 oz per 3 ft of canopy diameter or height	OR Tebuthiuron 1/20 to 1/10 oz	Individual plant treatment.	Anytime during year. Optimum is prior to rainy season	Do not apply to frozen or snow-covered ground. Distribute uniformly under canopy.
Cattail, common	2,4-D* 6 qt per 100 gal water	2,4-D 6 lb per 100 gal water	Spray to wet with handheld equipment.	Before cattail heads appear	Reapplications necessary. Use surfactant as per label.
	OR Rodeo 5 3/4 to 7 1/2 pt	OR Glyphosate 2 7/8 to 3 3/4 lb		Early to full bloom	
Cholla, pricklypear	Tordon 22K** 4 to 6 ml per 3 ft of plant width (prickly pear) or plant height (cholla)	Picloram	Individual plant treatment.	Anytime during year. Optimum is prior to rainy season.	Apply within plant area (prickly pear) or at junction of stem and ground (cholla). Do not treat more than 25% of watershed. Herbicide is very slow acting. May take 2 to 3 years to show effect.
	OR Tordon 22K** 1 qt	OR Picloram 1/2 lb	2 to 4 gal water solution as aerial spray. 10 to 25 gal water solution as ground broadcast or individual plant treatment.	Anytime air temperature is above 60°F and has not been 32°F or below during the past 24 hours. For best results, spray when cacti are in bloom.	Do not spray near susceptible crops. Spray to wet.
	OR (cholla only) Velpar L 4 to 6 ml per 3 ft of plant height	OR Hexazinone	Individual plant treatment.	Anytime of year. Optimum is prior to rainy season.	Apply diluted Velpar L to soil surface at junction of stem and ground.
Crazyweed, silky or Lambert's; whitepoint locoweed; woolly loco	Tordon 22K** 1 qt	Picloram 1/2 lb	2 to 4 gal water for aerial spray. 10 to 25 gal for ground broadcast application. Add surfactant as per label.	When plants are actively growing and before seeds mature.	To prevent livestock poisoning, avoid grazing until plants are totally dry.
	OR Tank mix 1 qt Banvel, Clarity + 1 qt 2,4-D*	OR Dicamba 1 lb + 2,4-D 1 lb			

\* Formulated as 4 lb active ingredient per gallon product  
 \*\* Restricted use product

**Table 1. Herbicides for controlling undesirable brush and weeds on range lands.**

Plant controlled	Trade name and product rate/acre	Herbicide common name and active ingredient	Spray volume per acre or individual plant	Time of application	Remarks
Crazyweed, silky or Lambert's; whitepoint locoweed; woolly loco (continued)	OR Weedmaster 1 to 2 qt	OR Dicamba: 2,4-D (1:3 mixture) 1 to 2 lb			
	OR Ally, Escort 1/2 oz	OR Metsulfuron 3/10 oz			
	OR Grazon P+D 1 to 2 qt	OR Picloram: 2,4-D (1:4 mixture) 5/8 to 1 1/4 lb			
	OR Tank mix 1 to 2 qt Tordon 22K** with 1 1/2 to 3 pt 2,4-D*	OR Picloram 1/4 to 1/2 lb + 2,4-D 3/4 to 1 1/2 lb			
Creosotebush	Spike 20P 3 3/4 to 5 lb of pellets	Tebuthiuron 3/4 to 1 lb	Aerial broadcast.	Anytime during year. Optimum is prior to rainy season.	Use 1 lb rate when soils are loam, silt or sandy clay loam.
	OR Tordon 22K** 2-4 ml per inch of stem	OR Picloram	Individual plant treatment.	Anytime of year. Optimum is prior to rainy season.	Distribute uniformly under canopy. Do not apply to frozen or snow-covered ground. Do not treat more than 25% of watershed.
	OR Velpar L 2-4 ml per 3 ft of canopy diameter	OR Hexazinone	Individual plant treatment.	Anytime of year. Optimum is prior to rainy season.	Apply undiluted Velpar L to soil surface within 3 ft of stem base. Use exact delivery handgun applicator. Do not use on clay soil. Do not apply to frozen or snow-covered ground.
	OR Spike 20P 1/4 to 1/2 oz per 3 ft of canopy diameter or height	OR Tebuthiuron	Individual plant treatment.	Anytime of year. Optimum is prior to rainy season.	Do not apply to frozen or snow-covered ground. Distribute pellets uniformly under canopy.
Dalmatian toadflax, Yellow toadflax	Telar 2 oz	Chlorsulfuron 1 1/2 oz	10-25 gal for ground broadcast. Add 0.25% v/v nonionic surfactant.	Actively growing in spring or fall.	See label.
	OR Tordon 22K** 1 to 2 qt	OR Picloram 1/2 to 1 lb		Through full bloom or to fall regrowth.	Especially effective after first killing frost.
Downy brome	Aatrex 1 to 2 pt	Atrazine 1/2 to 1 lb	10-25 gal for ground broadcast.	When desirable vegetation is dormant.	
	OR Gramoxone 26 oz	OR Paraquat 1/2 lb	Add 0.25% nonionic surfactant.		2 years successive treatments necessary.
	OR Oust 1 oz	OR Sulfometuron 3/4 oz		Late fall or winter.	See label.
	OR Roundup* 1/2 to 1 pt	OR Glyphosate 1/4 to 1/2 lb		After emergence and before seedset.	See label.
	OR Plateau 9 to 13 oz	OR Imazapic 1/7 to 1/5 lb	Add 1 qt /A MSO		See label.

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 \*\* Restricted use product

**Table 1. Herbicides for controlling undesirable brush and weeds on range lands.**

Plant controlled	Trade name and product rate/acre	Herbicide common name and active ingredient	Spray volume per acre or individual plant	Time of application	Remarks
Dyer's wood	2,4-D* 1 1/2 to 2 qt	2,4-D 1 1/2 to 2 lb	10-25 gal for ground broadcast.	Rosette stage.	Repeat treatments may be necessary.
	OR Ally, Escort 3/4 oz	OR Metsulfuron 4/10 oz	Add 0.25% v/v nonionic surfactant.	Actively growing plants.	
	OR Telar 1 oz	OR Chlorsulfuron 3/4 oz			
Goatgrass, jointed	Oust 1 3/10 oz	Sulformeturon 1 oz	10-25 gal for ground broadcast application or 2-4 gal for aerial broadcast.	Late fall or winter.	See label.
	OR Roundup 2 1/2 to 3 pt	OR Glyphosate 1 1/4 to 1 1/2 lb	Spot treatments.	When fully tillered.	For spot treatment.
Gumweed, curlycup	Ally, Escort 1 oz	Metsulfuron 3/5 oz	10 to 25 gal for ground broadcast or 2-4 gal for aerial broadcast. Add 0.25% v/v nonionic surfactant.	Early spring.	See label.
	OR 2,4-D* 2 qt	OR 2,4-D 2 lb			
	OR Tordon 22K** 1 pt	OR Picloram 1/4 lb			
	OR Grazon P+D 2 qt	OR Picloram: 2,4-D (1:2 mixture) 1 2/10 lb			
	OR Tank mix 1 pt Tordon 22K** with 1 qt 2,4-D*	OR Picloram 1/4 + 2,4-D 1 lb			
Halogeton	Ally, Escort 1 oz	Metsulfuron 6/10 oz	10-25 gal for ground broadcast. Add 0.25% v/v nonionic surfactant	Early spring with good growth.	
	OR 2,4-D* 2 qt	OR 2,4-D 2 lb			
Hoarycress, whitetop and related species	2,4-D* 2 qt	2,4-D 2 lb	10-25 gal for ground broadcast. Add 0.25% v/v nonionic surfactant	Before bud stage.	Repeat treatment may be necessary.
	OR Telar 1 oz	OR Chlorsulfuron 3/4 oz		Bud to early bloom.	See label.
	OR Ally, Escort 1 oz	OR Metsulfuron 3/5 oz		Bud to early bloom.	
Horsetail, smooth scouring rush	Telar 1 1/2 oz	Chlorsulfuron 1 1/8 oz	10-25 gal for ground broadcast. Add nonionic surfactant at 1 pt to 1 qt/100 gal spray solution.	Early spring.	See label.

\* Formulated as 4 lb active ingredient per gallon product

\*\* Restricted use product

**Table 1. Herbicides for controlling undesirable brush and weeds on range lands.**

Plant controlled	Trade name and product rate/acre	Herbicide common name and active ingredient	Spray volume per acre or individual plant	Time of application	Remarks
Horsetail, smooth scouring rush (continued)	OR Oust 1 1/2 oz	OR Sulfometuron 1 1/8 oz			
	OR MCPA (4EC) Ester 1 qt	OR 4,2-acetic acid 1 lb		Before cone heads appear.	Important to use the isoctylester formulation.
Houndstongue	2,4-D* 2 qt	2,4-D 2 lb	10-25 gal for ground broadcast. Add 0.25% v/v nonionic surfactant.	Early before bloom.	
	OR Ally, Escort 1 oz	OR Metsulfuron 3/5 oz		Before bolting.	See label.
	OR Plateau 13 oz	OR Imazapic 1/5 lb	Add MSO at 1 1/2 to 2 pt/acre.	Before bloom.	
Iris, Rocky Mountain	2,4-D* 2 qt	2,4-D 2 lb	10-25 gal for ground broadcast.	Early bloom stage.	Wet thoroughly.
Juniper (cedar)	Spike 20P 5 to 10 lb of pellets	Tebuthiuron 1 to 2 lb	Ground or aerial broadcast.	Anytime of year. Optimum is prior to rainy season.	Approved applicators. Use only on sand, loamy sand or sandy loam soils.
	OR Velpar L 4 to 6 ml per 3 ft of canopy height	OR Hexazinone	Individual plant treatment.	Anytime of year. Optimum is prior to rainy season.	Apply evenly around trees at dripline. Do not treat more than 25% of watershed. Do not apply to frozen or snow-covered ground. Treat trees under 9 ft.
	OR Tordon 22K** 4 to 6 ml per 3 ft of canopy height	OR Picloram			
Knapweed, diffuse and spotted	Tordon 22K** 1 1/2 pt	Picloram 3/8 lb	10-25 gal for ground broadcast. 3-4 gal for aerial broadcast. Add 0.25% v/v nonionic surfactant.	Rosette to mid-bolting.	
	OR Grazon P+D 2 to 3 qt	Picloram: 2,4-D (1:2 mixture) 1 1/4 to 1 7/8 lb			
	OR Tank mix 2 to 3 pt Tordon 22K** with 3 to 4 1/2 pt, 2,4-D*	OR Picloram 1/2 to 3/4 lb + 3 to 4 1/2 lb 2,4-D			
	OR 2,4-D* 2 qt	OR 2,4-D 2 lb		Early stage of flower stem elongation.	
	OR Tank mix 1 pt Banvel, Clarity with 1 qt 2,4-D*	OR Dicamba 1/2 lb + 1 lb 2,4-D	Add 0.25% v/v nonionic surfactant.	Rosette stage.	
	OR Curtail 2 to 3 qt	Clopyralid: 2,4-D (1:5 mixture) 1 1/5 to 1 4/5 lb	Add 0.25% v/v nonionic surfactant.	Rosette stage before bolting.	See label.

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 \*\* Restricted use product

**Table 1. Herbicides for controlling undesirable brush and weeds on range lands.**

Plant controlled	Trade name and product rate/acre	Herbicide common name and active ingredient	Spray volume per acre or individual plant	Time of application	Remarks
Knapweed, diffuse and spotted (continued)	OR Reclaim 1/3 to 1 1/3 pt	OR Clopyralid 1/8 to 1/2 lb			
Knapweed, Russian	Roundup* 4 4/5 qt	Glyphosate 4 4/5 lb	10-25 gal for ground broadcast.	Late bud to early flower.	Retreatment may be necessary.
	OR Tordon 22K** 1 to 2 qt	OR Picloram 1/2 to 1 lb		Early flower to frost.	
	OR Curtail 1 to 2 qt	Clopyralid: 2,4-D (1:5 mixture) 3/5 to 1 1/5 lb		Full bloom to frost.	See label.
	OR Reclaim 2/3 to 1 1/3 pt	OR Clopyralid 1/4 to 1/2 lb		Full bloom to frost.	
Larkspur, geyer	Ally, Escort 1.5 oz	Metsulfuron 9/10 oz	10-25 gal for ground broadcast. Add 0.25% v/v nonionic surfactant.	Rosette.	
	OR Tordon 22K** 1 1/2 to 2 pt	OR Picloram 3/8 to 1/2 lb		Rapidly growing.	
Larkspur, tall or duncecap	Ally, Escort 1.5 oz	Metsulfuron 9/10 oz	10-25 gal for ground broadcast. Add 0.25% v/v nonionic surfactant.	6 to 8 leaf stage; less than 8 inches tall.	
	OR Tordon 22K** 2 to 3 qt	OR Picloram 1 to 1 1/2 lb		Bud stage.	
Leafy spurge	Banvel, Clarity 2 qt	Dicamba 2 lb	10-25 gal for ground broadcast. Add 0.25% v/v nonionic surfactant.	Spring to early summer.	Retreatment is necessary.
	OR Tordon 22K** 1 to 3 pt	OR Picloram 1/2 to 1 1/2 lb			
	OR 2,4-D* 1 qt	OR 2,4-D 1 lb			
	OR Plateau 9 to 13 oz	OR Imazapic 1/7 to 1/5 lb	Add 1% v/v MSO.	Late summer through fall.	
Lotebush	Spike 20P 1/4 to 1/2 oz per 3 ft of canopy diameter or height	OR Tebuthiuron	Individual plant treatment.	Anytime of year. Optimum is prior to rainy season.	Do not apply to frozen or snow-covered ground. Distribute pellets uniformly under canopy.
	OR Velpar 1 2-4 ml per 3 ft of canopy diameter or height, or 2-4 ml per inch of stem diameter	OR Hexazinone	Individual plant treatment.	Anytime of year. Optimum is prior to rainy season.	Apply diluted Velpar L to soil surface within 3 ft of stem base. Use exact delivery handgun applicator. Do not use on clay soils. Do not apply to frozen or snow-covered ground.

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 \*\* Restricted use product

**Table 1. Herbicides for controlling undesirable brush and weeds on range lands.**

Plant controlled	Trade name and product rate/acre	Herbicide common name and active ingredient	Spray volume per acre or individual plant	Time of application	Remarks
Mesquite, grassland	Remedy 1/2 to 1 pt	Triclopyr 1/4 to 1/2 lb	2 to 4 gal oil-in-water emulsion as aerial spray (1 pt to 1 qt diesel fuel oil and water to make 2 to 4 gal/acre). 10 to 25 gal oil-in-water emulsion (1/2 to 1 gal diesel fuel oil and water to make 20 to 25 gal/acre) as ground broadcast. Add surfactant as needed.	Spring to early summer, 40 to 90 days after bud break.	Apply only when soil moisture conditions are good and plants have full leaf cover of even-aged, undamaged leaves. Do not apply when mesquite plants are stressed from drought, frost, hail, wind or insects. Do not apply near susceptible crops.
	OR Reclaim 2/3 pt to 2/3 qt	OR Clopalyrid 1/4 to 1/2 lb			
	OR Tank mix 2/3 pt to 1 pt Reclaim with 1/4 pt Remedy	OR Clopalyrid 1/8 to 1/4 lb + Triclopyr 1/8 to 1/4 lb			
	OR Tank mix 1/3 to 2/3 pt Reclaim with 1/2 to 1 pt Tordon 22K	Clopalyrid 1/8 to 1/4 lb + Picloram 1/8 to 1/4 lb			
	OR Remedy 3 pt	OR Triclopyr 1 1/2 lb per 100 gal water	Individual plant treatment.	Spring to early summer, 40 to 90 days after bud break.	Spray must cover all parts.
	OR Velpar L 4 to 6 ml per 3 ft of canopy diameter or height, or 2-4 ml per inch of stem diameter	OR Hexazinone	Individual plant treatment.	Anytime of year. Optimum is prior to rainy season.	Apply undiluted Velpar L to soil surface within 3 ft of stem base. Use exact delivery handgun applicator. Do not use on frozen or snow-covered ground.
Mesquite, mixed brush (catclaw, tarbush, whitehorn, creosote-bush, broom snake-weed, wolfberry)	Spike 20P 3 3/4 to 7 1/2 lb of pellets	Tebuthiuron 3/4 to 1 1/2 lb	Aerial broadcast.	Anytime of year. Optimum is prior to rainy season.	Low rate may be used on sand or loamy sand soils.
	OR Tank mix 1/2 to 1 pt Banvel with 1/2 to 1 pt Remedy	OR Dicamba 1/4 to 1/2 lb + Triclopyr 1/4 to 1/2 lb	2 to 4 gal oil-in-water emulsion as aerial spray (1 pt to 1 qt diesel fuel oil and water to make 2 to 4 gal/acre). 10 to 25 gal oil-on-water emulsion as ground broadcast (1/2 to 1 gal diesel fuel oil to make 20 to 25 gal/acre). Add surfactant as needed.	Spring to early summer, 40 to 90 days after bud break.	For best results, monthly precipitation should exceed the annual average from January to the spray season. Foliar sprays should be applied only where there are few associated weeds, such as broom snakeweed, shinnery oak, catclaw, etc. These nontarget species may dominate a stand after mesquite control and provide undesirable results.
Milkweed, showy and related species	Tordon 22K** 2 to 3 qt	Picloram 1 to 1 1/2 lb	10-25 gal for ground broadcast. 0.25% v/v nonionic surfactant	Bud to early bloom.	See label for grazing restrictions
	OR Banvel, Clarity 2 qt	OR Dicamba 2 lb		Emergence to bloom.	

\* Formulated as 4 lb active ingredient per gallon product

\*\* Restricted use product

**Table 1. Herbicides for controlling undesirable brush and weeds on range lands.**

Plant controlled	Trade name and product rate/acre	Herbicide common name and active ingredient	Spray volume per acre or individual plant	Time of application	Remarks
Oxeye daisy	Remedy 1 1/3 pt	Triclopyr 2/3 lb	10-25 gal for ground broadcast.	Actively growing.	Retreatment may be necessary.
	OR Tordon 22K** 1 to 2 pt	OR Picloram 1/4 to 1/2 lb			
Perennial pepperweed	Ally, Escort 1 oz	Metsulfuron 3/5 oz	10-25 gal for ground broadcast. Add 0.25% v/v nonionic surfactant.	Late bud to early flower.	See label.
	OR Telar 1 oz	OR Chlorsulfuron 7/10 oz		Late bud to early flower.	
	OR Roundup 3 to 4 qt	Glyphosate 3 to 4 lb	25-40 gal for ground broadcast.	Mow plants when bolting bud stage spray resprouting plants	Wait until all resprouts emerge before applications
	OR 2,4-D* 2 qt	OR 2,4-D* 2 lb	25-40 gal for ground broadcast.	Late bud to early flower.	Retreatments may be necessary.
Poison ivy, poison oak	Roundup* 4 to 6 qt	Glyphosate 4 to 6 lb	10-25 gal for ground broadcast.	Actively growing to full bloom.	Add 0.25% v/v nonionic surfactant.
	OR Roundup 2 gal/100 gal water	OR Glyphosate 8 lb/100 gal water	2% v/v individual plant treatment.		
	OR Garlon 3 1 to 3 gal	OR Triclopyr 3 to 9 lb	10-25 gal for ground broadcast.		
	OR Garlon 4, Remedy 1 to 2 gal	OR Triclopyr 4 to 8 lb			
	OR Garlon 3 4 qt/100 gal water	OR Triclopyr 3 lb/100 gal water	Individual plant treatment.		
	OR Garlon 4, Remedy 3 qt/100 gal water	OR Triclopyr 3 lb/100 gal water	Individual plant treatment.		
Poverty sumpweed	Banvel, Clarity 1 to 2 qt	Dicamba 1 to 2 lb	10-25 gal for ground broadcast. Add 0.25% v/v nonionic surfactant.	Actively growing.	
	OR Tordon 22K** 2 pt	OR Picloram 1/2 lb			
	OR 2,4-D* 4 to 6 qt	OR 2,4-D 4 to 6 lb			
Rabbitbush	Velpar L 4-6 ml per 3 ft of canopy diameter	Hexazinone	Individual plant treatment.	Anytime of year. Optimum is prior to rainy season.	Apply undiluted Velpar L to soil surface within 3 ft of stem base. Do not use on clay soils. Do not apply to frozen or snow-covered ground.
Ragweed, common (western)	2,4-D* 2 qt	2,4-D 2 lb	10-25 gal for ground broadcast.	Actively growing.	
Rayless goldenrod	Spike 20P 5 lb of pellets	Tebuthiuron 1 lb	Aerial broadcast.	Anytime of year. Optimum is prior to rainy season.	Do not apply to frozen or snow-covered ground.

\* Formulated as 4 lb active ingredient per gallon product

\*\* Restricted use product

**Table 1. Herbicides for controlling undesirable brush and weeds on range lands.**

Plant controlled	Trade name and product rate/acre	Herbicide common name and active ingredient	Spray volume per acre or individual plant	Time of application	Remarks
Rayless goldenrod (continued)	OR Spike 20P oz 1/4 to 1/2 per 3 ft of canopy diameter	OR Tebuthiuron	Individual plant treatment.	Anytime of year. Optimum is prior to rainy season.	Distribute pellets uniformly under canopy. Do not apply to frozen or snow-covered ground.
	OR Tordon 22K** 1 qt	OR Picloram 1/2 lb	Aerial or ground broadcast.	Fall, after blooming and before frost.	Do not spray near susceptible crops.
	OR Ally, Escort 4/5 oz	OR Metsulfuron 1/2 oz			
Russian olive (see also saltcedar)	See saltcedar	See saltcedar	See saltcedar.	See saltcedar.	See saltcedar.
Sagebrush, big	Spike 20P 2 1/2 lb of pellets	Tebuthiuron 1/2 lb	Aerial broadcast.	Anytime of year. Optimum is prior to rainy season.	Select productive sites for treatment.
Sagebrush, fringed	2,4-D* 2 qt	2,4-D 2 lb	10-25 gal for ground broadcast. 2-4 gal for aerial broadcast.	Actively growing.	Retreat for 2 more years as necessary.
	OR Spike 20P 2 1/2 to 3 3/4 lb pellets	OR Tebuthiuron 1/2 to 3/4 lb		Anytime.	
Sagebrush, sand	2,4-D* low volatile ester 1 to 2 qt	2,4-D 1 to 2 lb	2-4 gal water solution for aerial spray. 10 to 25 gal water solution for ground broadcast application. Add surfactant as needed.	May 1 to June 15 with good growing conditions.	Do not spray when plants are defoliated by late frost, drought, or other unfavorable growing conditions. Do not spray near susceptible crops.
	OR Spike 20P 2 1/2 to 3 3/4 lb of pellets	OR Tebuthiuron 1/2 to 3/4 lb	Aerial or ground broadcast.	Anytime of year. Optimum is prior to rainy season.	
Saltcedar	Arsenal 1 gal per 100 gal water	Imazapyr 2 lb per 100 gal water with 0.25% surfactant	Individual plant treatment or ground application.	August through September	Spray to wet, especially the terminal ends of all branches. Allow two full growing seasons before follow-up treatment.
	OR Tank mix 1/2 to 1 gal Arsenal with 1/2 to 1 gal Roundup*	OR Imazapyr 1 to 2 lb + Glyphosate 2 to 4 lb per 100 gal water with 0.25% surfactant			
	OR Tank mix 1/2 to 1 gal Arsenal with 1/2 to 1 gal Rodeo	OR Imazapyr 1 to 2 lb + Glyphosate 2 to 4 lb per 100 gal water with 0.25% surfactant	Individual plant treatment or ground application.		Spray to wet, especially the terminal ends of all branches. Allow two full growing seasons before follow-up treatment.
	OR Arsenal 1/2 gal	OR Imazapyr 1 lb with 0.25% surfactant	Aerial broadcast.		10-15 gal per acre total solution. Allow two full growing seasons before follow-up treatment.

\* Formulated as 4 lb active ingredient per gallon product

\*\* Restricted use product

**Table 1. Herbicides for controlling undesirable brush and weeds on range lands.**

Plant controlled	Trade name and product rate/acre	Herbicide common name and active ingredient	Spray volume per acre or individual plant	Time of application	Remarks
Saltcedar (continued)	OR Tank mix 1 to 1 1/2 qt Arsenal with 1 to 2 pt Roundup*	Imazapyr 1/2 to 3/4 lb + Glyphosate 1/2 to 1 lb with 0.25% surfactant			
	OR Tank mix 1 to 1 1/2 qt Arsenal with 1 to 1 1/2 pt Rodeo	OR Imazapyr 1/2 to 3/4 lb + Glyphosate 1/2 to 1 lb with 0.25% surfactant			
Sand shinnery oak	Spike 20P 2 1/2 to 5 lb of pellets	Tebuthiuron 1/2 to 1 lb	Aerial broadcast.	Anytime of year. Optimum is prior to rainy season.	
	OR Velpar L 2-4 ml per 33 square ft of canopy diameter	OR Hexazinone	Individual plant treatment.	Anytime of year. Optimum is prior to rainy season.	Apply undiluted Velpar L to soil surface within 3 ft of stem base or in a grid pattern. Use exact delivery handgun applicator. Do not apply to frozen or snow-covered ground.
	OR Spike 20P 1/2 oz per 22 sq ft when treating a thicket or clump	OR Tebuthiuron	Individual plant treatment.	Anytime during year, Optimum is prior to rainy season.	Distribute uniformly under canopy. Do not apply to frozen or snow-covered ground.
Shrub oak (wavy leaf, gambel oak)	Spike 20P 3 3/4 to 7 1/2 lb of pellets	Tebuthiuron 3/4 to 1 1/2 lb	Aerial broadcast.	Anytime during year. Optimum is prior to rainy season.	Distribute uniformly under canopy. Do not apply to frozen or snow-covered ground.
	OR Velpar L 2-4 ml per 33 sq ft of canopy diameter	OR Hexazinone	Individual plant treatment. Anytime during year.	Optimum is prior to rainy season.	Apply undiluted Velpar L to soil surface within 3 ft of stem base. Use exact delivery handgun applicator. Do not apply to frozen or snow-covered ground. Do not use on clay soils.
	OR Spike 20P 1/4 oz per 22 sq ft when treating a clump or thicket	OR Tebuthiuron	Individual plant treatment. Anytime during year.	Optimum is prior to rainy season.	Distribute uniformly under canopy. Do not apply to frozen or snow-covered ground.
	OR Arsenal 1 gal per 100 gal water	OR Imazapyr 2 lb per 100 gal water with 0.25% surfactant	Individual plant treatment or ground application.	Anytime during growing season when growing conditions are good.	Spray to wet.
Skunkbrush sumac	Spike 20P 3 3/4 to 5 lb of pellets	Tebuthiuron 3/4 to 1 lb	Aerial or ground broadcast. Anytime during year.	Optimum is prior to rainy season.	Distribute uniformly under canopy. Do not apply to frozen or snow-covered ground.
	OR Spike 20P 1/4 to 1/2 oz per 3 ft of canopy diameter or height	OR Tebuthiuron	Individual plant treatment.	Anytime during year, Optimum is prior to rainy season.	Distribute uniformly under canopy. Do not apply to frozen or snow-covered ground.

\* Formulated as 4 lb active ingredient per gallon product

\*\* Restricted use product

**Table 1. Herbicides for controlling undesirable brush and weeds on range lands.**

Plant controlled	Trade name and product rate/acre	Herbicide common name and active ingredient	Spray volume per acre or individual plant	Time of application	Remarks
Starthistle, yellow; malta; purple	Ally, Escort 1 oz	Metsulfuron 3/5 oz	10 to 25 gal for ground broadcast. Use surfactant as per label.	Seedling to early bud.	
	OR Remedy 3 pt	OR Triclopyr 1 1/2 lb			
	OR 2,4-D* 1 qt	OR 2,4-D 1 lb			
	OR Arsenal 1 pt	OR Imazapyr 1/4 lb			
	OR Tordon 22K** 1 pt	OR Picloram 1/4 lb			
	OR Banvel, Clarity 1 qt	OR Dicamba 1 lb			
	OR Reclaim 2/3 pt	OR Clopyralid 1/4 lb			
	OR Grazon P+D 2 qt	OR Picloram: 2,4-D (1:4 mixture) 1 1/4 lb			
Tarbush	Spike 20P 2 1/2 to 3 3/4 lb of pellets	Tebuthiuron 1/2 to 3/4 lb	Aerial broadcast.	Anytime during year. Optimum is prior to rainy season.	
	OR Tordon 22K** 2 to 4 ml per 3 ft of canopy diameter	OR Picloram	Individual plant treatment. Apply anytime during year.	Optimum is prior to rainy season.	Apply undiluted Tordon 22K to soil surface within 3 ft of stem base. Use exact delivery handgun applicator. Do not apply to frozen or snow-covered ground.
	OR Spike 20P 1/3 to 1/2 oz per 3 ft of canopy diameter	OR Tebuthiuron	Individual plant treatment.	Anytime during year. Optimum is prior to rainy season.	Distribute uniformly under canopy. Do not apply to frozen or snow-covered ground.
Thistle, musk; scotch; Canada; bull	Ally, Escort 1/2 to 1 oz	Metsulfuron 3/10 to 3/5 oz	10-25 for ground broadcast. Add 0.25% nonionic surfactant.	Rosette.	
	OR Telar 1/2 to 1 oz	OR Chlorsulfuron 3/8 to 3/4 oz			
	OR Tordon 22K** 1 to 2 pt	OR Picloram 1/4 to 1/2 lb			
	OR Curtail 1 to 2 qt	OR Clopyralid: 2,4-D (1:5 mixture) 3/5 to 1 1/5 lb			
	OR Tank mix 1 1/3 pt Remedy with 1 to 2 qt 2,4-D*	OR Triclopyr 2/3 lb + 2,4-D 1 to 2 lb			

\* Formulated as 4 lb active ingredient per gallon product  
 \*\* Restricted use product

**Table 1. Herbicides for controlling undesirable brush and weeds on range lands.**

Plant controlled	Trade name and product rate/acre	Herbicide common name and active ingredient	Spray volume per acre or individual plant	Time of application	Remarks
Threadlead groundsel, Riddel's groundsel Also: milkvetch, mustards, pingue, western bitterweed	2,4-D* 2 to 4 qt	2,4-D 2 to 4 lb	10-25 gal for ground broadcast. Add 0.25% v/v nonionic surfactant.	Actively growing, prior to bloom.	
	OR Weedmaster 1 to 2 qt	OR Dicamba: 2,4-D (1:3 mixture) 1 to 2 lb	2-4 gal for aerial broadcast.		
	OR Tank mix 1/2 to 1 pt Banvel with 1 1/2 to 3 pt 2,4-D*	OR Dicamba 1/4 to 1/2 lb + 2,4-D 3/4 to 1 1/2 lb			
	OR Banvel 1 pt	OR Dicamba 1/2 lb			
	OR Tank mix 1 to 2 pt Tordon 22K ** with 1 1/2 to 3 pt 2,4-D*	OR Picloram 1/4 to 1/2 lb + 2,4-D 3/4 to 1 1/2 lb			
	OR Grazon P+D 1 to 2 qt	OR Picloram: 2,4-D (1:4 mixture) 5/8 to 1 1/4 lb			
	OR Tordon 22K** 1 qt	OR Picloram 1/2 lb			
	OR Ally, Escort 5/8 to 4/5 oz	OR Metsulfuron 3/8 to 1/2 oz			
Water hemlock, western	2,4-D* 1 to 2 qt	2,4-D 1 to 2 lb	10 to 25 gal for ground broadcast.	Flower bud stage.	
Willows	2,4-D* 2 to 3 qt	2,4-D 2 to 3 lb	Individual plant treatment (2 to 3 lb per 100 gal of water solution).	Spring, when leaves are fully expanded. Good growing conditions.	Wet foliage thoroughly. Do not spray when plants are defoliated by late freeze, hail, insects, or other unfavorable conditions.
	OR Arsenal 1 gal	OR Imazapyr 2 lb per 100 gal water with 0.25% surfactant	Individual plant treatment.	Anytime during growing season. Good growing conditions.	Spray to wet.
	OR Tank mix 1/2 to 1 gal Arsenal with 1/2 to 1 gal Roundup*	OR Imazapyr 1 to 2 lb + Glyphosate 2 1/2 to 5 lb per 100 gal water with 0.25% surfactant			
	OR Tank mix 1/2 to 1 gal Arsenal with 1/2 to 1 gal Rodeo	OR Imazapyr 1 to 2 lb + Glyphosate 2 1/2 to 5 lb per 100 gal water with 0.25% surfactant	Individual plant treatment.	Anytime during growing season when good growing conditions exist.	Spray to wet.

\* Formulated as 4 lb active ingredient per gallon product

\*\* Restricted use product

**Table 1. Herbicides for controlling undesirable brush and weeds on range lands.**

Plant controlled	Trade name and product rate/acre	Herbicide common name and active ingredient	Spray volume per acre or individual plant	Time of application	Remarks
Willows (continued)	OR Velpar L 2-4 ml per 3 ft of canopy diameter or height, or 2-4 ml per inch of stem diameter	OR Hexazinone	Individual plant treatment.	Anytime during year. Optimum is prior to rainy season.	Apply undiluted Velpar L to soil surface within 3 ft of stem base. Use exact delivery applicator. Do not apply to frozen or snow-covered ground.
Yucca	Velpar L 4-6 ml per whorl.	Hexazinone	Individual plant treatment.	Anytime during year. Optimum is prior to rainy season.	Apply undiluted Velpar L directly to whorl.
	OR Remedy 3-4 ml per whorl	OR Tricopyr	Individual plant treatment.	Anytime during year.	Apply to every whorl. May be mixed with water or diesel.
	OR Arsenal 2-3 ml per whorl	OR Imazapyr	Individual plant treatment.	Anytime during year.	Apply to every whorl.

\* Formulated as 4 lb active ingredient per gallon product  
 \*\* Restricted use product



## Common Chemical and Product Names of Herbicides

The herbicides are identified by the accepted Weed Science Society of America common name or other common designation, the correct chemical names as re-

quired on the label, and, where practical, one or more product names. Herbicides marketed under three or more labels have been designated "several manufacturers" rather than attempting to list all the trade formulations.

**Table A1. Common Chemical and Product Names of Herbicides**

Herbicide Common Name	Chemical Name	Trade Name	Active Ingredient or Acid Equivalent
2,4-D**	(2,4-dichlorophenoxy) acetic acid	Several manufacturers	Amine salts and esters, 4 lb/gal
Atrazine	6-chloro-N-ethyl-N'-(1-methylethyl)-1,3,5-triazine-2,4-diamine	Several manufacturers	—
Chlorsulfuron	2-chloro-N-[[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino] carbonyl] benzenesulfonamide	Telar	75%
Clopyralid	3,6-dichloro-2-pyridinecarboxylic acid	Reclaim, Stinger, Transline	3 lb/gal
Clopyralid: 2,4-D (1:5)	See Clopyralid and 2,4-D	Curtail	2 3/8 lb/gal
Dicamba	3,6-dichloro-2-methoxybenzoic acid	Banvel, Clarity, overdrive	4 lb/gal
Dicamba: 2,4-D (1:3)	See dicamba and 2,4-D	Weedmaster	4 lb/gal
Diesel fuel oil	Refined petroleum fractions	Several manufacturers	—
Glyphosate	N-(phosphonomethyl) glycine	Rodeo	5 lb/gal
Glyphosate***	N-(phosphonomethyl) glycine	Several manufacturers	4 lb/gal
Glyphosate: 2,4-D (1:1 1/4)	See Glyphosate and 2,4-D	Landmaster	2 1/2 lb/gal
Hexazinone	3-cyclohexy-6-(dimethylamino)-1-methyl-1,3,5-triazine-2,4 (1H,3H)-dione	Velpar L	2 lb/gal
Imazapic	(±)-2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-5-methyl-3-pyridinecarboxylic acid	Plateau	2 lb/gal
Imazapyr	(1)-2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-pyridinecarboxylic acid	Arsenal	2 lb/gal
Metsulfuron	methyl 2-[[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)-amino] carbonyl] amino] sulfonyl] benzoate	Ally, Escort	60%
Paraquat	1,1'-dimethyl-4,4' bipyridinium ion	Several manufacturers	—
Picloram	4-amino-3,5,6-trichloro-2-pyridinecarboxylic acid	Tordon 22K**	2 lb/gal
Picloram:2,4-D (1:4)	See picloram and 2,4-D	Grazon P+D	2 1/2 lb/gal
Sulfometuron	methyl 2-[[[(4,6-dimethyl-2-pyrimidinyl) amino] carbonyl] amino] sulfonyl] benzoate]	Oust	75%
Tebuthiuron*	N-[5-(1,1-dimethylethyl)-1,3,4-thriadiazol-2-yl]-N',N-dimethylurea	Spike 20P	20%
Triclopyr	[(3,5,6-trichloro-2-pyridinyl)oxy] acetic acid	Remedy, Garlon 4EC Garlon 3A	4 lb/gal 3 lb/gal

\*Under supervision of U.S. government agencies, Spike 20P may be applied by aerial or ground equipment at lower than recommended rates if partial control is desired.

\*\*Tordon 22K is a restricted use product.

\*\*\*Glyphosate and 2,4-D are sold under several different trade names and formulations. Check the active ingredient rate on the label to determine the correct product application rate.

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**Las Cruces, NM**  
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