

Table 2. Commonly Used Rangeland Herbicides, Including When and How to Use Them

Chemical Name/Product Name <sup>1</sup>	Price <sup>2*</sup>	Registered for use on California rangelands <sup>3</sup>	Requirements to Purchase/Spray Herbicide <sup>3</sup>	Preemergent/Postemergent <sup>1</sup>	Best time to spray <sup>4</sup>	Targeted Plants <sup>4</sup>
Triclopyr (Garlon 3A/Garlon 4 Ultra, Remedy Ultra, Pathfinder II)	\$70/gallon	Yes	Operator ID #	Postemergent	Spray after all of the weed seed has germinated, but before the plants get big.	Kills broadleaves, but not grasses  Kills clovers <sup>5</sup>
Aminopyralid (Milestone)	\$300/gallon	Yes	Operator ID #	Preemergent and postemergent	January - March	Kills thistles and legumes, and some other broadleaves, but not grasses  Kills clovers <sup>5</sup>
Glyphosate (Roundup, Accord XRT II, and others)	\$21/gallon	Yes	Operator ID #	Postemergent	Spray after all of the weed seed has germinated, but before the plants get big.	Kills any green vegetation. Tree leaves can be sprayed, but it will not be effective if sprayed on tree trunks.

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Chlorsulfuron (Telar)	\$21/ounce	Yes	Operator ID #	Preemergent, can also be used as postemergent	Spray around the time of the first rains, a little before or a little after the first rains is fine. Spray before seedlings get big.	Check label for plants affected. This herbicide is species specific. Although, it is generally safe on grasses <sup>1</sup> .  Kills clovers <sup>5</sup>
Clopyralid (Transline)	\$170/gallon	Yes	Operator ID #	Postemergent	Spray after all of the weed seed has germinated, but before the plants get big.	Kills thistles and legumes, but not grasses  Kills clovers <sup>5</sup>
2, 4-D (DMA4 IVM, Weedar 64 and many others)	2, 4-D Amine - \$13/gallon 2, 4-D Ester - \$19/gallon	Yes	Restricted materials permit and applicator certificate	Postemergent	Spray after all of the weed seed has germinated, but before the plants get big.	Kills broadleaves, but not grasses  Kills clovers <sup>5</sup>

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Chemical Name/Product Name <sup>1</sup>	Grazing/Pet Restrictions <sup>5</sup>
Triclopyr (Garlon 3A/Garlon 4 Ultra, Remedy Ultra, Pathfinder II)	<p>"Grazing green forage: There are no grazing restrictions for livestock or dairy animals on treated areas...Haying (harvesting of dried forage): Do not harvest hay for 14 days after application...Slaughter Restrictions: During the season of application, withdraw livestock from grazing treated grass at least 3 days before slaughter...Livestock Use of Water from Treatment Area: There are no restrictions on livestock consumption of water from the treatment area."</p> <p><b>Herbicide Label:</b> <a href="https://s3-us-west-1.amazonaws.com/www.agrian.com/pdfs/Garlon_3A_Label1i.pdf">https://s3-us-west-1.amazonaws.com/www.agrian.com/pdfs/Garlon_3A_Label1i.pdf</a></p>
Aminopyralid (Milestone)	<p>"Grazing and Haying Restrictions: There are no restrictions on grazing or grass hay harvest following application of Milestone at labeled rates. Cutting hay too soon after spraying weeds will reduce weed control. Wait 14 days after herbicide application to cut grass hay to allow herbicide to work. Do not transfer grazing animals from areas treated with Milestone to areas where sensitive broadleaf crops occur without first allowing 3 days of grazing on an untreated pasture. Otherwise, urine and manure may contain enough aminopyralid to cause injury to sensitive broadleaf plants...For applications on rangeland and permanent grass pastures (not harvested for hay) and non-cropland areas, do not enter or allow worker entry into treated areas until sprays have dried...Grazing Poisonous Plants: Herbicide application may increase palatability of certain poisonous plants. Do not graze treated areas until poisonous plants are dry and no longer palatable to livestock...Hay from grass treated with Milestone within the preceding 18-months can only be used on the farm or ranch where the product is applied unless allowed by supplemental labeling." Check label for specific restrictions on moving hay, or using hay for silage, etc.</p> <p><b>Herbicide Label:</b> <a href="https://s3-us-west-1.amazonaws.com/www.agrian.com/pdfs/Milestone_Label1h.pdf">https://s3-us-west-1.amazonaws.com/www.agrian.com/pdfs/Milestone_Label1h.pdf</a></p>
Glyphosate (Roundup, Accord XRT II, and others)	<p>"DOMESTIC ANIMALS: This product is considered to be relatively nontoxic to dogs and other domestic animals; however, ingestion of this product or large amounts of freshly sprayed vegetation may result in temporary gastrointestinal irritation (vomiting, diarrhea, colic, etc.). If such symptoms are observed, provide the animal with plenty of fluids to prevent dehydration. Call a veterinarian if symptoms persist for more than 24 hours...Do not feed or graze turfgrass grown for seed or sod production for 8 weeks following application...If application rates total 4.5 pints per acre or less, no waiting period between treatment and feeding or livestock grazing is required. If the rate is greater than 4.5 pints per acre, remove domestic livestock before application and wait 8 weeks after application before grazing or harvesting."</p> <p><b>Herbicide Label:</b> <a href="https://s3-us-west-1.amazonaws.com/www.agrian.com/pdfs/Roundup_Custom_Label2.pdf">https://s3-us-west-1.amazonaws.com/www.agrian.com/pdfs/Roundup_Custom_Label2.pdf</a></p>

Chemical Name/Product Name <sup>1</sup>	Grazing/Pet Restrictions <sup>5</sup>
Chlorsulfuron (Telar)	<p>"There are no grazing or hay harvest restrictions for any livestock, including lactating animals, with application rates up to 1 1/3 ounces/acre of TELAR® XP. No enclosure is required for any animals. Do not apply more than 1 1/3 ounces/acre of TELAR® XP per acre per year. No enclosure is required for any animals."</p> <p><b>Herbicide Label:</b> <a href="https://s3-us-west-1.amazonaws.com/www.agrian.com/pdfs/DuPont_Telar_XP_Herbicide_Label5a.pdf">https://s3-us-west-1.amazonaws.com/www.agrian.com/pdfs/DuPont_Telar_XP_Herbicide_Label5a.pdf</a></p>
Clopyralid (Transline)	<p>"Grazing/Haying: There are no restrictions on grazing or hay harvest following application of Transline at labeled rates except for exported grass hay from California, Nevada, Washington and Oregon (see instructions in the Range and Permanent Grass Pasture section)...Do not transfer livestock from treated grazing areas, or from feeding of treated hay, to sensitive broadleaf crop areas without first allowing 3 days of grazing on an untreated pasture (or feeding of untreated hay). If livestock are transferred within less than 3 days of grazing untreated pasture or eating untreated hay, urine and manure may contain enough clopyralid to cause injury to sensitive broadleaf plants...For applications to fallow cropland, rangeland, pasture, and non-crop areas, do not enter treated areas until sprays have dried. For early entry to treated areas, wear eye protection, chemical-resistant gloves made of any waterproof material, long-sleeved shirt, long pants, shoes and socks."</p> <p><b>Herbicide Label:</b> <a href="https://s3-us-west-1.amazonaws.com/www.agrian.com/pdfs/Transline1v_Label.pdf">https://s3-us-west-1.amazonaws.com/www.agrian.com/pdfs/Transline1v_Label.pdf</a></p>
2, 4-D (DMA4 IVM, Weedar 64 and many others)	<p>"For grazed areas, the maximum use rate is 4.21 pints of DMA 4 IVM (2 lb of acid equivalent) per acre per application...Preharvest Interval: Do not apply within 7 days of cutting forage for hay... If grass is to be cut for hay, Agricultural Use Requirements for the Worker Protection Standard are applicable."</p> <p><b>Herbicide Label:</b> <a href="https://s3-us-west-1.amazonaws.com/www.agrian.com/pdfs/DMA_4_IVM_Label1d.pdf">https://s3-us-west-1.amazonaws.com/www.agrian.com/pdfs/DMA_4_IVM_Label1d.pdf</a></p>

Table 2. Commonly Used Rangeland Herbicides, Including When and How to Use Them was updated by Devii Rao, drorao@ucanr.edu on 8/1/2017.

\*Note: Price is not listed per acre, but per gallon or ounce. Some products may be very expensive per gallon/ounce, but are used in small quantities, so are less expensive overall than products that appear to be lower cost per gallon/ounce. The opposite is also true.

### References

<sup>1</sup>DiTomaso, J.M., G.B. Kyser et al. 2013. Weed Control in Natural Areas in the Western United States. Weed Research and Information Center, University of California.

<sup>2</sup>Ferrell, J. A. and B. A. Sellers. Approximate Herbicide Pricing. University of Florida IFAS Extension. Publication #SS-AGR-16, <http://edis.ifas.ufl.edu/wg056>, last accessed 4/26/2017.

<sup>3</sup>Griffin, K. 2017. Personal communication, 4/17/2017. Griffin is a Biologist/Inspector with San Benito County Agricultural Commissioner's Office.

<sup>4</sup>Kyser, G. 2017. Personal communication, 4/14/2017. Kyser is UC Cooperative Extension Specialist in Weed Science at UC Davis.

<sup>5</sup>Agrian. Website can be used to look up Herbicide Specimen Labels, <https://home.agrian.com/>, last accessed 4/26/2017.

**Disclaimer:** To simplify information, trade names of products have been used. No endorsement of named products is intended, nor is criticism implied of similar products not mentioned. The herbicide label should be followed precisely at all times, as well as any other regulations regarding the use and application of pesticides. Failure to follow the label can result in reduced effectiveness, personal injury, environmental damages and/or inefficient use of resources. Not following the label instructions and regulations is illegal. Pesticide registrations change frequently and you are responsible for making sure the pesticide you are using is still registered.