

# Management of Velvet mesquite in Southeastern Arizona

## Current recommendations for control with herbicides:

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### *Background on the Arizona Border Project (Border Project):*

In an effort to promote healthy rangelands and restore diverse grasslands in southeastern Arizona, a coalition of Conservation Partners was formed about 4-5 years ago. Operationally the Border Project includes both a working team and an advisory group. Partners in the project include conservationists with the USDA NRCS, BLM, Arizona State Land Department, Howard G. Buffett Foundation, and various Private members associated with conservation districts (NRCD), among others. Those working on this project have largely been active since its inception.

### *Our Background:*

In 2014, we were asked to provide guidance and to evaluate mesquite control efforts undertaken by Border Project through 2016. Our early recommendations for herbicide spraying of velvet mesquite were largely based on previous experiences we had working towards control of honey and toreyanna mesquite in Texas and New Mexico. Because research experience is limited on velvet mesquite, we suggested that the Border Project use a cautionary approach at first. There was uncertainty about optimal herbicide rates and timing of application. As recommended, the Border Project put out a series of test (experimental) plots to examine questions related to herbicide choice and optimal spray period. Thus, during the first few years much was learned about limitations and the potential for spraying velvet mesquite in this region. The principal goal from these early trials was to learn how best to achieve acceptable control results.

### *What has been learned so far:*

Spraying that has been accomplished to date by the Border Project has been made at 4 different times, Sep 2014; Jun 2015; Aug. 2015; and Jun.2016 (Table 1). We have conducted standard field evaluations (i.e. % apparent mortality, canopy reduction) of velvet mesquite control on selected sites and results are summarized, in part, in Table 1 and Table 2. Key points learned from the various spray periods included:

1. Spraying conducted in September 2014 was too late in the season and control results were poor.
2. Spraying conducted in June 2015 was during the usual prescribed window (i.e. 45 to 90 days after mesquite bud break) with above average early season rainfall. Very acceptable control results occurred from spraying (> 60%). Several areas that had been previously sprayed in Sept 2014 were resprayed in Jun. 2015 and gave results similar to those areas sprayed once.
3. Spraying in Aug 2015 gave acceptable control results (~50%). However, control results were slightly less than Jun. 2015 spraying.

4. We hesitate to conclude much from 2016 spraying because an estimate of mesquite control should not be strongly made until at least 12-24 months after spraying. Thus, it is too early to make an accurate evaluation of Jun 2016 control. We did note that early season rainfall was near or below average in 2016 and mesquite growth was not as robust as that observed in Jun 2015. We anticipate that control results may be less after spraying in 2016 than 2015.

Table 1. Summary of velvet mesquite control after spraying by the Border Project.

Arizona Border Project Mesquite Applications			
Initial Spray	Second Spray	Average	
2014 Sep	none	10	n=4
2015 Jun	none	65	n=2
2015 Aug	none	53	n=1
2016 Jun	none	53	n=1
2014 Sep	2015 Jun	66	n=5
2014 Sep	2015 Aug	57	n=4
2014 Sep	2016 Jun	90	n=1
	Average 2015-16	64	

Table 2. Comprehensive evaluations of spraying Velvet mesquite in southeastern Arizona.

	Evaluations made months after treatment								
	7 MAT	9 MAT	12 MAT	24 MAT	20-Sep-16				
Made by Kirk McDaniel and Charles Hart									
Area	Initial Appl Date	Overspray Appl Date	Lbs. a.e./acre herbicide			% Canopy Reduction	% Stem Resprouts	% App. Mortality	% App. Mortality
			Garlon	Transline	Milestone				
Christ. Plot A	2014 Sep	2015 Aug	0.25	0.5		35	100	62	56
Christ. Plot B	2014 Sep	2015 Aug	0.375	0.375		20	100	53	33
Christ. Plot Buffers	2015 Aug		0.25	0.5	0.11			53	
Christ. Plot C	2014 Sep	2015 Aug	0.375	0.375	0.11	35	100	67	58
Commercial	2014 Sep	2015 Aug	0.25	0.5	0.11	65	90	82	
Draw 03	2014 Sep	2015 Jun	0.25	0.5	0.11				44
Draw 04 Upland	2014 Sep		0.25	0.5	0.11				11
Draw 07	2014 Sep	2015 Jun	0.25	0.5	0.11	75	94		40
Draw 11	2014 Sep	2015 Jun	0.25	0.5	0.11				94
Draw 15	2014 Sep	2016 Jun	0.25	0.5	0.11				90
Draw 15	2016 Jun		0.5	0.5	0.11			53	
Draw 25	2014 Sep		0.25	0.5	0.11	92	82	10	
Draw 30	2014 Sep		0.25	0.5	0.11	66	93	10	
Ladd Overpass	2014 Sep		0.5	0.5	0.11	96	67		10
Ladd Overpass	2015 Jun		0.5	0.5	0.11			65	
Ladd Overpass	2015 Jun		0.5	0.5	0.11			65	
Ladd Overpass Lg	2014 Sep	2015 Jun	0.5	0.5	0.11			74	61
Ladd Overpass Sm	2014 Sep	2015 Jun	0.5	0.5	0.11				93

Red indicates treatments that were oversprayed.

## Our Current Recommendation:

### Environmental Conditions:

The proper time to foliar spray mesquite varies from year to year because of specific **weather conditions**. The amount of winter and spring moisture before spraying is particularly important in determining if or when to treat. Not spraying because of stressed (drought) or poor plant condition should always be an important consideration. The **soil temperature** at a 12 to 18 inch depth should be between 80 and 86 F at spraying for best results. The **foliage growth** on velvet mesquite is critical when determining the proper spray period. For best results, twig elongation should have stopped, and the foliage should have changed from a light pea-green to a dark uniform green color with vigorous and healthful foliage growth.

- Research suggest that rainfall conditions that produce uniform and healthy foliage at the time of spraying is a must for satisfactory mesquite control.
  - ▶ Closely follow rainfall pattern and soil moisture prior to spraying (Jan to June)
  - ▶ and, observe the effect soil moisture has on mesquite foliage growth. In New Mexico it has been noted that average to above average rainfall from Jan – June is needed for consistent desired growth and subsequent control from spraying.
- The preferred spray window is 45 to 90 days after mesquite bud break. In Arizona, this often occurs earlier than the traditional spray window in Texas or New Mexico.
- Later season spraying (Aug.) may be considered with restrictions (see attached Sendero 2(ee) label recommendation for Arizona.
- Expect 50-60% root mortality of velvet mesquite after one application within the proper application window.

### Specification for the proper rate and mixing:

Sendero + Remedy Ultra @ 0.61 + 0.5 lbs a.e./ ac  
(Product rate of 28oz Sendero + 16oz Remedy Ultra)

Add a good quality MSO or non-ionic surfactant at label rates

Drift retardant may be added as needed/desired.

*Note: 28oz of Sendero herbicide is equivalent to a tank mix of 0.5 lbs Transline plus 0.11 lbs Milestone, which was used prior to Sendero being labeled and available in Arizona.*

### Aerial broadcast application

Weather conditions at the time of spraying are extremely important to successful aerial application. Coverage is best with low wind speeds and moderate to high relative humidity. High wind speeds distort the spray pattern and increase the drift hazard; high air temperature should not exceed 90 F. Do not spray if a rain storm is expected within 6 hours after application.

*Recommendations going forward:*

Experience is the best learning tool for spraying mesquite and we anticipate that even with what has been learned by the Border Project so far that adjustments to any recommendation for spraying in Arizona may change in the future. Mesquite control guides that are closely followed have been written for Texas and New Mexico but to our knowledge, no similar guidelines are available for Arizona. How mesquite should be sprayed in these 3 states is similar but there are important differences that should be considered and geared to the local environment, i.e. such as differences in mesquite variety, plant growth requirements, local climate, etc. An example of contents in guidelines written and followed in part by land management agencies in NM and Texas is given below. A similar guide specifically written for Arizona would probably be helpful to land management agencies in the state.

New Mexico publications can be downloaded at: [weeds.nmsu.edu](http://weeds.nmsu.edu)

- [Brush and Weed Control on New Mexico Ranges](#)
- [Chemical Weed and Brush Control for New Mexico Rangelands](#)
- [Mesquite Control: Aerial Treatments](#)
- [Mesquite Control: Individual Treatments](#)

Texas publications can be downloaded at: [essmextension.tamu.edu](http://essmextension.tamu.edu)

Herbicide information and fact sheets can be downloaded at: [rangeandpasture.com](http://rangeandpasture.com)

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# Product Bulletin



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## Sendero®

EPA Reg. No. 62719-645

2(ee) Recommendation†

For Distribution and Use in the State of Arizona

### Application Timing for Velvet Mesquite

#### ATTENTION

† This recommendation is permitted under FIFRA 2(ee) and has not been submitted to or approved by the EPA.

- It as a violation of Federal law to use this product in a manner inconsistent with its labeling.
- Read and follow all applicable directions for use, precautions and limitations on the product label attached to the container for Sendero® herbicide.

Velvet mesquite (*Prosopis velutina*) is a multi-stem shrub common in Arizona. This variety of mesquite grows in a more harsh arid environment than other varieties of mesquite resulting in special care needed when deciding application timing.

**Timing and Factors in Control:** The herbicidal response of mesquite is strongly influenced by foliage condition, stage of growth and environmental conditions. For best results, apply when new growth foliage has turned from light to dark green, when the soil temperature is above 75°F at a depth of 12 to 18 inches, and soil moisture is adequate for plant growth. On velvet mesquite, application of Sendero at 28 fluid oz pr/A + Remedy Ultra at 8 to 16 fluid oz pr/A may be made beyond 60 days after the 75°F minimum soil temperature at the 12- to 18-inch depth has been reached if the following conditions exist:

- Winter and spring rainfall is below average, followed by average to above normal summer rainfall, resulting in late season, robust leaf development
- Velvet mesquite foliage at the time of spraying needs to be robust, healthy, & dark green
- Foliage health should be evaluated at least 1 week prior to application

**General Information:** Similar to other arid land plants, mesquite responds quickly to available soil moisture from later season rains (July or August). Thus, in certain early season drought years with late summer rains there is an opportunity for spraying. This occurs when summer rains provide sufficient soil moisture that allows mesquite foliage to recover from drought and develop healthy and robust leaf growth. After a major rain event mesquite will grow new, light green foliage that will later (2 to 3 weeks) mature to a uniform dark green color suitable for spraying. Indicators of mesquite foliage suitable for spraying includes a uniform dark green color and leaf growth that is near normal. Foliage must not be damaged from drought stress, insects or animal feeding, or other weather related causes (especially hail damage).

Follow all applicable use directions, precautions, and limitations on the label for Sendero.

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