

Snakeweeds (broom, *Gutierrezia sarothrae*; threadleaf, *G. microcephala*) are native perennial half-shrubs common on rangelands throughout New Mexico. Threadleaf grows primarily in the southern desert, whereas broom is more important on blue grama grasslands. During favorable rainfall periods, snakeweed populations often thrive at exceptionally high plant densities. The principal concern with snakeweed is that when it becomes dominant and forms a near monoculture on once productive grassland, it crowds out more desirable forage. Snakeweeds are rarely eaten by any large herbivore and, while snakeweed poisoning problems cannot be discounted, it is the plant's competitive nature that causes major economic hardship to livestock producers.

AERIAL BROADCAST APPLICATION

Aerial application is an effective method of applying a selective foliar-active herbicide that provides control of broom snakeweed but does not retard the growth of desired grass species. Foliar application places the spray mixture on the leaf surface, where the herbicide enters the plant and moves to the root system to kill it.

Aerial application is well suited to uneven, rough terrain. It is often the only practical method for controlling dense snakeweed populations that occur over broad areas. When snakeweed is clearly the dominant plant occupying an area, other measures, such as prescribed burning, are not practical control strategies. This is because grass growth languishes beneath dense snakeweed populations, and there is usually insufficient fine fuel to safely carry and conduct a fire.

GENERAL CONSIDERATIONS

Weather conditions at the time of spraying are extremely important for successful aerial application. Coverage is best with low wind speeds and cool temperatures. High wind speeds distort the spray pattern and increase the drift hazard. A high air temperature increases the spray solution volatility and thus reduces herbicide available to be absorbed by the plant. Optimal wind velocity is 3 to 8 mph, and air temperature should be above 50°F but below 90°F. Do not spray if a rainstorm is expected within six hours of application.

The **plant condition and growth** stage at the time of application are critical for control success. Spraying when broom



Figure 1. Broom snakeweed (*Gutierrezia sarothrae*).
Photo courtesy of Chris Allison. (Used with permission).

snakeweed is in the late- or post-bloom stage in autumn (October–November) is optimal. Do not spray broom snakeweed that has been stressed during the growing season, e.g., from drought, disease, insects, or other causes that might have resulted in plant damage.

Consider carefully the **age and life cycle** of broom snakeweed within the area that is being considered for spraying. Broom snakeweed is a short-lived perennial, meaning that plants that propagate and survive the first year will likely continue to occupy an area for four to seven years. In some areas the plants live longer. However, accurately predicting how long broom snakeweed is likely to thrive and persist on a given area is not realistic or possible. Because of the risk of broom snakeweed dying out in a given area from natural causes, the greatest economic benefits result from spraying younger plants (less than 4 years old). Spraying older plants in the later stages of the life cycle (more than 4 years old) may provide a short-term benefit, but the risk is higher.

Grass response by the end of the next growing season following snakeweed control is usually very good. Pasture management after spraying often determines the degree of grassland improvement resulting from snakeweed control. Deferring grazing for one or two growing seasons after spray-

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ing and employing complimentary dormant-season grazing during this time restores grass vigor and allows perennial grasses to thrive.

SPECIFIC GUIDELINES

Broom snakeweed control using aircraft has been a common practice in New Mexico, and several commercial aerial applicators are quite knowledgeable about the practice. When considering aerial application, it is a good idea to consult with these operators and obtain cost estimates for spraying from several reputable commercial dealers.

The proper time to foliar spray snakeweed varies from year to year because of specific weather conditions. Average to above-average summer moisture produces a prolific burst of yellow blooms on snakeweed, which is desirable before spraying. In droughty years, snakeweed will not flower and spraying is not recommended.

At the time of spraying, the **soil temperature** at a 6-inch depth should be between 70°F and 50°F. In most years, the application season and soil temperature range coincide roughly from October 1 to November 15, plus or minus 15 days.

The **phenological stage** of snakeweed is critical for determining the proper spray period. For best results, snakeweed should be in late-bloom or the post-bloom stage. Twig elongation should have stopped, and the foliage should be dark green.

HERBICIDES AND RATES OF APPLICATION

Several different herbicides and application rates may be used for snakeweed. The specific mixture may be determined by herbicide availability, cost, and land manager preference. Liquid herbicide sprays should be applied at 2 to 4 gallons total solution per acre.

Mixes with picloram alone or in combination with other herbicides have consistently provided the best snakeweed control in New Mexico. Picloram is very active on snakeweed and is the most common product used for commercial snakeweed control. Picloram is usually applied at a rate of 0.25 lb active ingredient (a.i.) per acre, which is equivalent to 1 pint of product per acre. For best results, use an oil-in-water emulsion utilizing 1 pint diesel fuel oil with an emulsifier such as Triton X-100. A surfactant and suitable drift control agent should be added to the herbicide mixture at rates specified on the herbicide label. Dicamba or 2,4-D herbicides may be mixed with picloram when a wider range of broadleaf weed control is needed.

Metsulfuron is another herbicide that provides excellent snakeweed control when applied at a rate of 0.375 oz a.i. per acre or higher. This herbicide was quite expensive in the past, but is now a generic product and more competitively priced. Metsulfuron is formulated as a 60% active dry flowable material that, when mixed in water, is sprayed as a liquid. Metsulfuron and picloram are both very active on broadleaf weeds and share the characteristic of not harming grasses.

Mixed stands of brush growing on sandy soils that have snakeweed in the composition are best controlled with tebuthiuron. Unlike the liquid foliar-active herbicides, tebuthiuron is a dry pellet formulation that dissolves and moves into the soil with rainfall, where it is absorbed by the roots. Tebuthiuron provides fair to good snakeweed control. The principal use of this herbicide is for control of woody shrubs such as creosotebush, oaks, and sagebrush. Snakeweed often occurs as a minor species in mixed brush situations and should not be considered the primary weed of concern when making a tebuthiuron application.

For more information about controlling snakeweed and other brush and weed species, contact your county Extension agent: <http://aces.nmsu.edu/county/>

Table 1. Recommended Spray Mixtures for Aerial Broadcast Application of Snakeweed

Trade name	Herbicide chemical name	Rate of product/acre	Rate of active ingredient (a.i.)/acre
Tordon 22K	Picloram	1 pint	0.25
Grazon P+D	Picloram + 2,4-D (1:4 mixture)	2 quarts	0.625
Escort, Ally	Metsulfuron	5/8 to 4/5 oz	3/8 to 1/2 oz
Spike 20P*	Tebuthiuron	2 1/2 to 3 3/4 lb of pellets	1/2 to 3/4 lb

Rows 1 and 2 provide best control under most New Mexico conditions.
*Apply only to mixed brush stands on sandy soils.

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