

Snakeweeds, often called turpentine weed, rockweed, matchweed, or yellow top, are widely distributed throughout most of New Mexico. Plant numbers vary widely from one location to another and from one year to the next. Snakeweed populations are cyclic over time. High numbers of plants grow vigorously when there is enough soil moisture and decrease dramatically during drought or stress. There is no well-defined pattern in the snakeweed population cycle because seedlings emerge whenever environmental conditions are best.

Snakeweeds are a significant weed problem on several million acres in central and eastern New Mexico (Figure 1). The problem is greatest on shallow soils underlain by caliche or limestone bedrock. Soils disturbed by farming or mechanical brush control practice often develop dense stands of snakeweed that dominate range sites of moderate productivity potential. Rangelands that are overgrazed or are in poor range condition usually have greater numbers of snakeweed than comparable areas in good or excellent range condition. Stands of 100,000 plants per acre are common.

## Snakeweed Description

Two species of snakeweed—broom (*Gutierrezia sarothrae*) and threadleaf (*G. microcephala*)—grow in New Mexico. Both are multibranched, lowgrowing, perennial half-shrubs with rounded canopies (Figure 2). They range in height from 6 inches to 3 feet. Plants growing in the same area are usually of a similar size. Narrow, linear leaves grow alternately on the branches, and lower leaves are shed in times of drought or maturity. The plant is winter dormant but will remain green throughout the spring and summer.

Dense clusters of small yellow flowers develop in August or September and are the only characteristic that

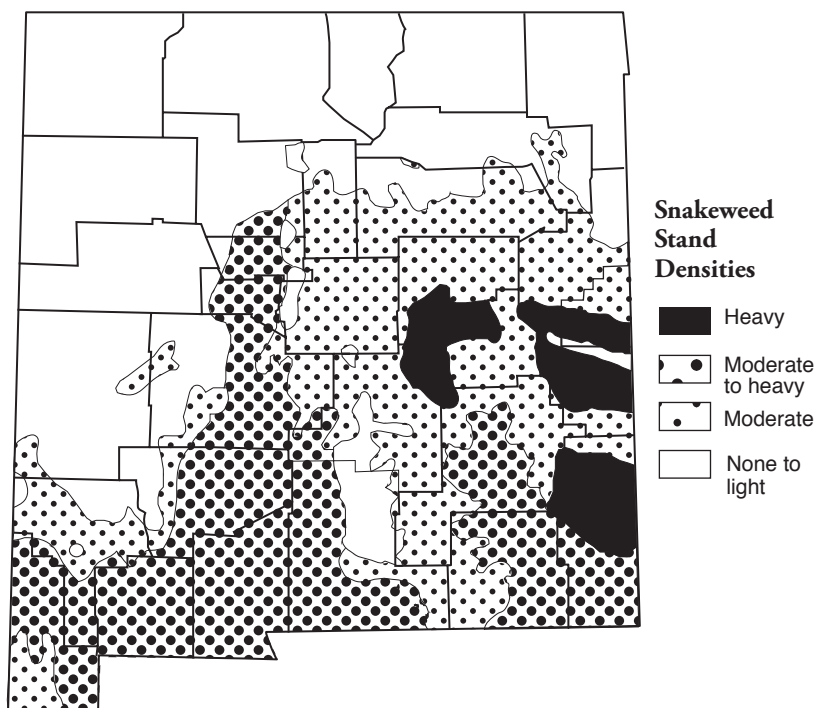


Figure 1. Distribution of perennial snakeweeds in New Mexico.

separates the two species. Broom snakeweed has three to eight central flowers and three to eight marginal flowers. Threadleaf snakeweed has only one to three central flowers and a similar number of marginal flowers. Each plant can produce up to 15,000 seeds per year. Seed germination rates are especially high when spring environmental conditions are favorable, and seedling densities can exceed 100 plants per square yard. Seedling mortality is usually high; 25–100% will die the first year, depending on available soil moisture. However, once established, a snakeweed's life expectancy is from three to 10 years.

Dense snakeweed stands cause substantial economic losses to ranchers in New Mexico and west Texas. Snakeweed has no forage value and can reduce grassland forage production by 70% or more. Snakeweed poisoning, sometimes resulting in abortion and death, can

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occur during winter or spring when short forage supplies force grazing animals to consume snakeweed. Saponins, the toxic chemicals found in snakeweed, are believed to be the main cause of cattle abortions in certain Southwestern areas.

## CONTROL AND MANAGEMENT

### Foliar Sprays

The amount of control obtained with commercial herbicide sprays for use on rangeland is largely related to growing conditions (especially soil moisture) before and at the time of treatment. Rainfall is somewhat unpredictable during most months of the year in New Mexico, except in late summer when rainfall peaks. Above normal rainfall in March or April stimulates new vegetative growth in snakeweed. When this occurs, the plant can be controlled with foliar sprays (Figure 3). However, the preferred period for snakeweed control is to spray foliar herbicides in the fall after the peak bloom. This occurs in late September, October, or November. When snakeweed is stressed because of low soil moisture, the plant should not be treated with a foliar spray.

During acceptable growing conditions, 0.25 to 0.375 lb of liquid picloram per acre effectively controls snakeweed (Table 1). The lower rate is recommended for fall application and the higher rate should be used in spring. The higher rate is also recommended when control of other weeds, such as locoweed, is desired. Adding 2,4-D to picloram does not improve snakeweed control, but may provide a broader spectrum of control for other broadleaf weeds.

Snakeweed also can be controlled with a foliar spray of dicamba alone or mixed equally with picloram (Table 1). A tank mix of 0.25 lb of dicamba and 0.25 lb of picloram per acre is effective in spring or fall. If dicamba is sprayed alone, a rate of 0.75 lb per acre should be applied. A commercial formulation, or a tank mix of 3:1 of 2,4-D and dicamba, applied at 2 lb per acre is also effective.

Apply ground broadcast sprays using at least 20 gal of spray solution (water and herbicide) per acre. Aerial broadcast application should use 2–4 gal total spray solution per acre. Use surfactants, emulsifiers, and drift control additives as recommended on labels. Proper swath width will vary with the aircraft used, and the aerial applicator should have a performance test on the aircraft.

Foliar sprays will control snakeweed present on the area being treated and will reduce the number of plants that may subsequently re-invade from seed. The treatment life of herbicides varies, but the possibility of long-term snakeweed eradication with a single application is remote, especially where a population is



**Figure 2.** Broom snakeweed (*Gutierrezia sarothrae*). Photo courtesy of Chris Allison. (Used with permission).



**Figure 3.** Broom snakeweed can be controlled with foliar herbicides.

extremely dense before treatment. It may take two or more applications over a 5- to 10-year span to achieve the long-term goal of suppressing snakeweed.

### Mechanical Methods

Snakeweed and other weed infestations can result from a mechanical treatment, such as grubbing or disking, or from past dryland farming practices. Mechanical brush control treatments designed to kill woody plants other than snakeweed or rangeland reseeding cause a high level of soil disturbance and provide an ideal seedbed for snakeweed invasion. These treatments are rarely beneficial for snakeweed control.

In native or disturbed pastures with nearby susceptible crops, herbicide applications may not be safe or practical. In these areas, an effective mechanical control method is the best alternative. Shredding or mowing areas where brush, rocks, and other obstacles do not make the treatment impractical can effectively suppress snakeweed. New stems often develop from the remaining branches when top growth is removed, which

Table 1. Herbicides Currently Labeled for Snakeweed Control, Listed by Type and in Order of Efficiency				
Type	Herbicide	Trade name	Rate (lb active ingredient/acre)	Time of application
Foliar spray	Picloram	Grazon PC	0.25–0.375	In fall or spring when adequate soil moisture is available.
	Picloram + 2,4-D	Grazon P+D	1.0	
	Dicamba	Banvel	0.75	
	Dicamba + 2,4-D	Weedmaster	2.0	

makes repeated mowing necessary. Mowing should be done when vegetative growth has reached a maximum and soils are hot and dry (June–August). Shredding before flowering or seed set eliminates an annual seed crop and reduces the number of seedlings that may re-invade on a site.

### Prescribed Fire

Prescribed burning has been used to control many rangeland weeds, but has not been employed widely for snakeweed control. Research in New Mexico reported burning broom snakeweed in October, April, and June resulted in kills of 35%, 45%, and 96%, respectively. Burning in January increased broom snakeweed 25%. A successful burn can effectively reduce the standing crop of broom snakeweed, but generally does not reduce post-burn seedling populations. Fire's effectiveness is highly dependent on the amount of fine fuel (usually grass) at the time of the burn. Often, sufficient fine fuel to carry a fire is not present when a snakeweed stand is dense; therefore, fire can be used only in selected areas.

### Forage Response and Management

High priority should be given to rangeland where snakeweed numbers and yield are high and where native desirable grasses can reestablished after control.

Removing snakeweed makes more soil moisture and nutrients available to preferred forage. The results can be dramatic. Younger stages of a snakeweed infestation should be given early attention. The greater the amount of grass species in the understory, the more satisfactory the results will be after control. Subsequent rainfall and follow-up grazing management contribute to the amount of forage response that may be expected. Because grasses growing within dense snakeweed stands often are in poor vigor, deferred grazing for one or two growing seasons after herbicide treatment is recommended. Growing season deferment allows grasses to renew vegetative growth and root development that was suppressed because of snakeweed competition. Dormant season grazing can be coupled with a growing season deferment regime for maximum range improvement. Periodic maintenance control efforts may be needed to prevent snakeweed reinfestation.

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