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Field Guide for Managing Sweet Resinbush in the Southwest

Forest Service

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Cover Photos

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Sweet Resinbush

(*Euryops multifidus*, synonym: *E. subcarnosus* ssp. *vulgaris)*

Sunflower family (Asteraceae), Senecioneae tribe

Sweet resinbush was introduced into southern Arizona from South Africa in the 1930s as a potential forage plant and for erosion control; however, it is currently listed as a noxious weed in Arizona. This field guide serves as the U.S. Forest Service's recommendations for management of sweet resinbush in forests, woodlands, and rangelands associated with its Southwestern Region. The Southwestern Region covers Arizona and New Mexico, which together have 11 national forests. The Region also includes four national grasslands located in northeastern New Mexico, western Oklahoma, and the Texas panhandle.

Description

Sweet resinbush (synonym: hawk's eye) is a low-growing shrub with whitish twigs and bright green linear leaves that are divided into 3 to 6 lobes at the tip. As its name implies, a sweet, yet slightly foul-smelling resin exudes from the whitish-colored woody stems. Leaves feel sticky and have tufts of hair in the leaf axils. Numerous yellow daisy-like flowers are borne singly on long peduncles along the stem. Flowers also smell sweet but are disagreeable. This invasive weed is very drought tolerant and has a tendency to form monocultures over time.

Growth Characteristics

- Perennial shrub/subshrub; typically grows to 3 feet tall, although some may grow over 5 feet.
- Bright green linear leaves are divided into 3 to 6 lobes at the tip; turkey foot-like; 1-inch long. Leaf axils have tufts of whitish hairs; may drop leaves during particularly dry seasons.
- Yellow daisy-like flowers are borne on 1- to 1.5-inch long, thread-like peduncles tucked among the green leaves along the stem. Both disk and ray flowers are yellow with partially fused phyllaries at the base. Flowers bloom in late winter or early spring; may bloom and produce seed twice in 1 year if adequate soil moisture is available.
- Reproduces mainly by seed. Fruit is achene-like with a pappus of soft, white-barbed bristles; the fine hairs readily attach to fleece, fur, and clothing. Fruit occurs in star-shaped clusters of 10.

Ecology

Impacts/Threats

Sweet resinbush is extremely efficient at claiming soil moisture, thereby making it very drought tolerant. It has the ability to invade both intact and disturbed natural areas; it can out-compete desirable rangeland grasses and forbs for soil moisture, sunlight, and nutrients. Despite being planted as potential forage, sweet resinbush may possibly be toxic to wildlife and livestock. Animals typically avoid eating resinbush, likely because of its foul smell and taste. Neither does it serve well as an erosion control agent due to its tendency to form monocultural stands interspersed with prominent patches of bare ground.

Location

Currently, sweet resinbush is known to be present only in Arizona. Ten separate populations have been identified south of the Mogollon Rim. Most populations are reportedly found nearby (within 6 to 7 miles) where it was intentionally planted in the 1930s. Elevation preference is from 2,300 to 4,900 feet. Sweet resinbush thrives in granitic soils and commonly grows in sandy loam to clay loam sites.

Spread

Reproduces from seed that is contained within fruits covered with fine barbed hairs; the hairs exude a resinous substance to aid attachment. Fleece, fur, clothing (especially socks), and vehicles readily carry seed. New plants mostly establish below or near the parent plants. However, seed is easily transported overland by water, and new populations often establish in washes and rills. Specific seed longevity is unknown, although they probably remain viable in the seed bank for at least 3 years.

Invasive Features

Sweet resinbush has moist and sticky seed hairs which may allow germination to occur at lower soil moisture levels than those levels necessary for native plants. It resprouts from axillary buds above the crown when the plant is cut or burned; its fragments can also produce a new plant. Sweet resinbush appears to impede establishment of native plants, although allelopathic effects have not yet been confirmed or refuted.

Management

Sweet resinbush is often inconspicuous within the shrub and pinyon-juniper communities it occupies, especially when not in bloom. It can penetrate a healthy rangeland plant community and, if overlooked, populations in time will later establish a monoculture. Physical control methods (including fire) can be limited because of the unsuitable terrain where it is often found. Grazing is not an option as a control measure since sweet resinbush foliage is not highly palatable or preferred. There are no classical biological controls at this time. Herbicide control is the main option for sweet resinbush control, but care is needed not to impact other desirable plants.

The following strategies should be considered to contain and reduce sweet resinbush populations:

- Detect and eradicate new plants as early as possible, especially along roadways, vehicle turnout areas, waterways, and ditches.
- Educate and involve the public in active control efforts to stretch available resources and aid in eradication of sweet resinbush.
- Hand removal by pulling, digging, or hoeing is difficult but can be an effective means of eliminating isolated populations.
- Use foliar active or soil active herbicides at recommended rates for effective control of widespread populations of sweet resinbush. Since many of the herbicides available for use on sweet resinbush are nonselective, consider using an individual plant treatment (IPT) application method to limit exposure to nontarget species.

Choice of control method(s) for sweet resinbush depends on the land use and current site conditions (accessibility, terrain, soil and air temperature, weather, density and degree of infestation, other flora and fauna present, etc.). Other considerations include treatment effectiveness, cost, and the time needed to achieve control. Table 1 summarizes some approaches for common situations involving sweet resinbush. Combining control methods and using more than one control method for each site may increase effectiveness.

Physical Control

Because of the rough terrain sweet resinbush occupies, it is often difficult to control the plant using any mechanical technique. The more practical and economical way to obtain effective long-term control is to use physical methods in combination with chemical treatments.

Manual Methods

Hand Removal – Grub, pull, dig, or hoe plants. Hand removal treatments need to ensure that plants are cut below the crown; otherwise, remove both the root and aboveground portions of the plant. Monitor for seedlings and continue hand removal of seedlings and young plants year after year until seed is depleted from the soil. Involving the public to help with control can make this method more feasible.

Mechanical Methods

Mowing – Cutting or regular mowing will suppress top growth but may stimulate regrowth and increase crown density if not done continuously.

Prescribed Fire

Using a broadscale burn in areas occupied by sweet resinbush is usually impractical because fine fuels needed to sustain a fire are often limited. Sweet resinbush will quickly regrow when fire temperatures are not hot enough to completely damage growing buds. In certain situations a planned fire might be considered when there is an abundance

Table 1. Management options*

Site	Physical Methods	Cultural Methods	Biological Methods	Chemical Methods
Roadsides	Hand extraction, digging, or hoeing can be used to target individual plants. For plants in large patches, combine suppression methods (e.g., mowing) with a chemical treatment.	Limit disturbances along roadsides. Implement requirements for vehicle operations and for reporting of infestations along roads.	None known at this time.	Use truck or tractor spraying equipment. Wash underneath to prevent spread.
Ditches and waterways	Hand extraction, digging, or hoeing can be used to target individual plants.	Limit disturbances along waterways and ditches. Increase public awareness and reporting of plant presence along ditches and roadways.	Same as above.	Use herbicide with approved aquatic labeling for use near or in water.
Rangeland	Hand extraction, digging, or hoeing can be used for smaller infestations and to target seedlings.	Inspect animals, clothing, and vehicles when moving livestock or vehicles through infested areas. Remove any seeds (including any seed-bearing mud) before entering uninfested areas.	Same as above.	When plants are widely scattered in rough terrain, consider individual plant treatment with a backpack sprayer.
Wilderness or other natural areas	Hand extraction, digging, or hoeing with followup monitoring to detect seedlings.	Post signs warning visitors to remove seeds.	Same as above.	Same as above.

* Choice of a particular management option must be in compliance with existing regulations for land resource.

of dried fine fuels such as produced when annuals thrived during a wet spring.

Cultural Control

Early detection and plant removal, especially of seedlings and young plants, are critical for preventing sweet resinbush establishment and spread. Land managers, road crews, and the local public should be educated on identification so they can report suspected populations. Vehicles, humans, and livestock should be discouraged from traveling through infested areas. Hay, straw mulch, planting seeds, and other related products should be certified to be weed free before use in areas undergoing treatment.

Biological Control

Grazing

Grazing with livestock as a means to control sweet resinbush is impractical. Sweet resinbush produces chemicals to defend itself from being grazed; cattle, sheep, and goats typically avoid eating the shrub. In addition to its foul smell, some of the chemical defense compounds may be toxic to livestock and wildlife.

Classical Biological Control

There are no biological control agents known for sweet resinbush at this time.

Chemical Control

Numerous herbicides have been investigated for sweet resinbush control in field trials conducted jointly by the

USDA Natural Resources Conservation Service (NRCS), DuPont Agricultural Chemical Co., and the University of Arizona Cooperative Extension Service. These trials have shown that metsulfuron-methyl is a promising selective, systemic herbicide option that provides effective long-term control. Hexazinone is another reliable herbicide for sweet resinbush control; however, this product is nonselective and may cause injury to nearby desirable species.

Herbicides listed in table 2 have specific requirements and restrictions; therefore, it is important to read the label carefully and follow all instructions when mixing and spraying. Foliar applied herbicides, such as metsulfuron-methyl, may be applied by backpack, ATV, or UTV sprayers. These herbicides are absorbed through the leaf surface. Soil applied, granule type herbicides such as tebuthiuron or hexazinone may be hand cast or broadcast using a powered granule broadcast applicator. The granules remain intact until they are dissolved by rainfall and the chemical is moved into the soil where it is taken up by roots. To counteract the nonselective nature of these herbicides, an individual plant treatment (IPT) method should be used to target isolated sweet resinbush plants.

Table 2. Herbicide recommendations

Common Chemical Name (active ingredient)	Product Example[1]	Product Example Rate per Acre[1] (broadcast)	Backpack Sprayer Treatment Using Product Example[2]	Time of Application	Remarks
Metsulfuron-methyl	Escort XP	1.66 ounces per acre + 0.25–0.5 percent v/v NIS	1 ounce in 100 gallons	Late summer	Selective; foliar applied. Effectively controls sweet resinbush as long as not applied to soils with pH greater than 7.9. Grasses may be damaged temporarily or discolored if applied after or immediately before very heavy rainfall, prolonged cold weather, or when wide variation in day/night temperatures exist. Add 2,4-D or MCPA when treating sweet resinbush located in wheel tracks and dry, dusty conditions exist. No grazing or haying restrictions.
Tebuthiuron	Spike 20P	10 pounds of pellets	NA	August, ideally just before a rain event.	Nonselective; will likely damage associated vegetation. Apply only on sandy or coarse soils. Consider applying following use of a physical method since best results are obtained when woody plants are less than 18 inches in height or diameter.
Hexazinone	Pronone 10G or power pellets	25 pounds per acre of granule material	Spread granules by hand or use a power granule broadcast applicator	August, ideally just before a rain event.	Nonselective; requires adequate rain to activate and carry it into the root zone. In soils with 85 percent sand or more, hexazinone may pass through the root zone too rapidly to be effective. In densely infested areas where sweet resinbush is in a monoculture, consider broadcast application. Grazing is restricted for 30 days following application.

[1] Trade names for products are provided for example purposes only, and other products with the same active ingredient(s) may be available. Individual product labels should be examined for specific mixing information and appropriate use with sweet resinbush.

[2] Herbicide/water ratio - As an example, a gallon of spray water with a 3 percent mixture is made by adding a sufficient volume of water to 4 ounces of herbicide until a volume of 1 gallon is reached (4 oz ÷ 128 oz/gal = 0.03 or 3 percent).

Additional Considerations

- **Plant condition and growth stage** at the time of herbicide application is critical for control success. Treating sweet resinbush that is healthy and robust in pre-bloom to bloom stage (early to mid-February) is optimal when using a foliar spray. Treatments made in the post-bloom stage in the fall have also been effective. Metsulfuron-methyl activity is poor when applied to plants stressed by drought, disease, insects, or other causes that have resulted in die-back, yellowing, or other evidence of plant damage.
- **Weather conditions** at the time of herbicide application are very important. Foliar-applied herbicide coverage is best with low wind speeds (3 to 8 m.p.h.). Do not spray if a rainstorm is expected within 6 hours of application. While metsulfuron-methyl is selective, it may cause temporary damage or discoloration to grasses if it is applied after prolonged cold temperatures, when there are extreme temperature variations between night and day or following very heavy rainfall.
- **Soil type and pH** should be determined before applying any herbicide. Metsulfuron-methyl is less effective in soils with pH greater than 7.9. Tebuthiuron performs best in sandy-loamy soils and is not effective in tight clays or soils high in organic matter. Hexazinone is best applied in loam to sandy-loam soils and should not be applied if soil texture exceeds 85 percent sand.
- **The plant community** associated with the sweet resinbush population should be closely evaluated before and after treating an area. Anticipate how and where nonselective herbicides may damage nearby vegetation.
- **Time required to gain initial control** may be slow, especially when soil active herbicides are applied. Followup monitoring and spot treating seedlings are important for long-term sweet resinbush control.

Control Strategies

Early detection and control of new sweet resinbush populations, especially those that are escaping near waterways and ditches, is important in slowing the spread of this noxious weed. Based on research and practical experience, hand removal or treating plants with a foliar or soil-applied herbicide are the quickest and easiest ways to stop sweet resinbush.

Consider using a combination of control practices that meet the needs of each situation. For example, application of hexazinone on Frye Mesa in Arizona was initially successful in greatly reducing sweet resinbush. Annual applications of tebuthiuron combined with hand grubbing were then made on surviving resinbush plants. Controlled burning was also used to remove plants on the mesa. Infested areas have been monitored, and grass growth has been encouraged to minimize the return of sweet resinbush. Ongoing control measures are outlined in the site plan for Frye Mesa (McReynolds 2003-04, 2005, 2006, 2008, 2010).

Although each treatment situation is unique and requires site-specific management decisions, the most crucial element for sweet resinbush control is to take early action. Always perform necessary followup control for at least 2 years after initial treatment and continue monitoring for at least 10 years.

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Suggested Web Sites

For information on invasive species:

http://www.invasive.org/weedus/index.html

For information about calibrating spray equipment:

NMSU Cooperative Extension Service Guide
A-613 Sprayer Calibration at http://aces.nmsu.edu/pubs/_a/A-613.pdf

For more information or other field guides, contact:

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Or visit:

http://www.fs.usda.gov/main/r3/forest-grasslandhealth/invasivespecies