



United States Department of Agriculture

Field Guide for Managing Teasel in the Southwest



Forest
Service

Southwestern
Region

TP-R3-16-26

September 2014

Cover Photos

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Teasel (*Dipsacus fullonum* L.)

Teasel family (Dipsacaceae)

Teasel is an invasive plant that has been listed as a noxious weed in New Mexico. This field guide serves as the U.S. Forest Service's recommendations for management of teasel 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

Common teasel (synonyms: Fuller's teasel, wild teasel, Venus' basin (or cup), barber's brush) is a weedy biennial with prickly stems and a distinctive cone-shaped flower head. Teasel was introduced from Europe and is valued as a horticultural plant; it has also been used medicinally and its dried seed heads were used for wool "fleeceing." The spiny, egg-shaped seed heads of teasel are commonly used in floral arrangements. It is widespread in the Pacific Northwest and is currently becoming more common in New Mexico and Arizona. In the rosette stage, it is similar in appearance to other thistles, common burdock (*Arctium minus*), and broadleaf dock (*Rumex obtusifolius*). As teasel matures, it can be distinguished from these other plants by its wrinkled leaves.

Growth Characteristics

- Biennial or short-lived perennial (dies after it flowers for the first time).
- Rosette leaves are wrinkled, scalloped, oval shaped; older rosette leaves are often hairy.
- A flowering stalk grows when the plant has accumulated enough energy reserves in the roots, usually after growing as a rosette for at least 1 year. The erect branching stem may grow up to 7 feet tall with simple, stalkless, opposite lanceolate leaves with conspicuous veins. Upper leaves have entire margins, grow to 10" long, slightly clasp the stem, and may hold water near the leaf axil. Leaf mid-ribs

and elongated stem have downward pointing prickles.

- Flowers occur from early summer until early fall; oval-shaped flower heads with rings of small, densely packed lavender flowers. Stiff, spiny, upward pointing bracts (~2" long) extend from the end of the stem, below the flower head. Each flower usually lives only 1 day.
- Taproot during rosette stage; 2 feet deep. Fibrous roots extend from taproot (up to 1 foot wide).
- Reproduces mainly via seed; prolific seed producer (2,000 seeds per plant; viable for 2 years).

Ecology

Impacts/threats

Teasel can be an aggressive competitor allowing it to displace desirable plants and form a monoculture. Its presence reduces forage availability and contributes to decline in species diversity and range quality. In New Mexico, it has similar habitat preferences to the Sacramento Mountain thistle (*Cirsium vinaceum*) and may out-compete this endangered plant species locally.

Location

Teasel prefers open, sunny habitats; it is often common in disturbed sites, pastures, and along interstate highways. It grows in both moist and arid soils though it is most often found in mesic soil types. In New Mexico, it prefers elevations between 4,000 and 7,000 feet and has been mapped in the Lincoln National Forest in Otero County. However, distribution maps likely underestimate the presence of teasel because its large stature and prickles deter frequent specimen collection.

Spread

Teasel prolifically produces seed that remains viable in soil for at least 2 years. Usually, seeds establish near the parent plant, in spaces previously occupied by the basal rosette leaves. However, seeds may be transported by birds or via waterways, such as irrigation ditches or streams/rivers. Seeds are also spread by adhering to the undercarriages

of vehicles or mowing equipment used along interstate highways.

Invasive Features

Although teasel is not known to have allelopathic properties, it is aggressively competitive. An opening within the vegetation coupled with light soil disturbance is an invitation for invasion. Its taproot allows access to nutrients and soil moisture deeper within the soil profile. Teasel's biennial life history allows it to claim space within the plant community while it stores resources for reproduction. The stored resources result in increased seed production and greater germination success.

Management

Prevention and early detection are the best management tools for teasel. Management should focus on maintaining healthy native plant communities and managing teasel before it can produce seed. Priority should be given to monitoring for teasel and eradicating small, new, and isolated infestations that become established on otherwise healthy sites. Control and containment methods should be practiced with larger teasel infestations. Generally, the perimeter of large infestations should be treated first to prevent the infestation from spreading. For an isolated plant, the seeds will generally fall within 4 to 5 feet from the parent plant. However, as population density increases, the potential area where seed may fall expands.

Strategies to contain, reduce, or eradicate teasel populations require long-term planning, integrated management, and followup monitoring. A combination of methods and repeated treatments will improve effectiveness. The following actions should be considered when planning an approach:

- Maintain healthy plant communities to prevent or limit teasel infestations. This may involve using improved grazing management strategies to prevent excessive grazing; or reseeding areas with desirable grasses and forbs after disturbance.

- Detect, report, and map known infestations. Keep annual records of reported infestations.
- Eliminate new populations of teasel as early as possible, especially when in the seedling or rosette stage.
- Combine mechanical, cultural, and chemical methods for most effective teasel control.
- Implement a monitoring and followup treatment plan for missed plants and seedlings.
- Use certified weed-free seed and hay; use pellets for horses used in the back country.

Choice of control method(s) for teasel depends primarily on the density, degree, and location of the infestation. Land use and current site conditions (accessibility, terrain, climate, other flora and fauna present, etc.) must also be considered. Other considerations include treatment effectiveness, cost, and number of years needed to achieve control. Table 1 summarizes approaches for the most common situations involving teasel. More than one control method may be needed for each site.

Special Considerations

The Sacramento Mountain range in southern New Mexico serves as habitat for the endangered Sacramento Mountains thistle (*Cirsium vinaceum*) which is protected under the Endangered Species Act of 1973. Portions of the mountain range within Otero County are also inhabited by local populations of Wright's marsh thistle (*C. wrightii*) which is a New Mexico listed endangered species and a Federal candidate for listing. Wright's marsh thistle is also found in Eddy, Chaves, Guadalupe, and Socorro Counties in New Mexico. Both thistle species occur in wetland habitats such as spring seeps and marshy edges of streams and ponds. Information should be obtained from the U.S. Fish and Wildlife Service at (505) 346-2525 before implementing treatment of teasel in the Sacramento Mountains and the aforementioned counties that possibly could involve habitat of these endangered species.

Table 1. Management options*

Site	Physical Methods	Cultural Methods	Biological Methods	Chemical Methods
Roadsides, fence lines, noncrop areas	Mowing just after flower heads open but before seeds enlarge will prevent production of viable seed. Monitor and mow again if plants resprout and flower.	Clean mowing equipment after use. Train road crews to identify and report infestations along roads. Use weed screens on irrigation water intakes.	None available.	Use truck or tractor-mounted spraying equipment. Wash underneath vehicle after application to prevent spread.
Pasture, rangeland, or riparian corridors	Teasel rarely persists in settings where repeated cultivation is practiced. For densely infested sites, a prescribed burn in spring can prepare the site with herbicide application as a followup treatment.	Use certified weed-free seed and hay. Inspect and remove seed from clothing, animals, and vehicles before entering treated or uninfested areas. Closely manage grazing to prevent overuse. Reseed with perennial grasses after disturbance or treatment. Avoid driving vehicles and equipment through infested areas; wash if traveling through infestations was unavoidable.	See above.	Broadcast spraying via truck or ATV-mounted sprayer; backpack spraying may be more practical in areas difficult to access.
Wilderness, other natural areas, and/or small infestations	Cut or hoe roots at least 1 to 2 inches below the soil surface. Hand pull if soil conditions allow for removal of most of the taproot. Use a hand-held propane torch for seedlings and isolated plants.	In addition to the above, use pellets for horses in the back country. Post signs warning visitors to remove seeds after passing through infested areas.	See above.	Use backpack or hand-held sprayers. Broadcast spraying with ground methods may be used on thicker stands if allowed.

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

Physical Control

Physical control methods work best on seedlings, rosettes, and partially established stands of teasel. In general, the effectiveness of physical control methods can be increased by combining physical methods with chemical spraying for long-term management of teasel.

Manual Methods

Hand pulling or cutting – Hoe or dig plants at the rosette to early bolt stage, cutting the taproot 1 to 2 inches below the soil surface. When soil conditions allow it, hand pulling can be effective for smaller, less established infestations. Removal is generally easier and more effective when soil is moist and plants are beginning to bolt, but before seed set. It is very important to pull up as much of the taproot as

possible. Properly dispose of debris by burning or bagging and burying in a landfill to prevent spread. Immature seed heads may ripen if left onsite.

Mechanical Methods

Tillage – Disking or plowing infestations will disrupt and discourage growth. In an agronomic setting, teasel will not persist if cultivated repeatedly.

Mowing – If properly timed, mowing can severely reduce the amount of viable seed that is produced. Mow during bolting or when flower heads are just being produced, but before seed has matured. If performed after seed has matured, mowing will facilitate spread. Monitor the site after mowing and repeat if teasel resprouts and grows new flower stalks.

Prescribed Fire

Fire research with teasel is limited. However, broadcast burning is usually not considered a viable option because bare ground interspaces between teasel plants prevent a sustainable fire. Since the growth region of teasel is located just below the surface, fires that significantly increase belowground temperatures are more likely to kill the plant. A propane torch may be considered for individual plant treatment, especially for seedlings or plants in the rosette stage. Fire is also an acceptable way to dispose of debris.

Cultural Control

Preventing teasel introduction to an area can save time and energy required for control measures. Consider educating florists and the local public as to the potential impact of teasel introduction. Dried flower arrangements left at cemeteries are a common means of introducing teasel to a previously uninfested area. Also, consider educating land managers, road crews, and the local public on identification of teasel so that they can help prevent establishment by reporting all suspected infestations. Early detection and plant removal are critical for preventing establishment of teasel.

Biological Control

Grazing

While teasel does not withstand moderate to heavy grazing, it is not highly palatable or serve as desirable forage. Most

foraging animals (including cattle, sheep, and goats) avoid teasel and will not graze it.

Classical Biological Agents

Biological control agents are not available for teasel.

Chemical Control

Herbicides are an effective and economical way to manage teasel. However, new populations often return within a few years of spraying from seed that is still abundant in the soil. Anticipate the need to monitor and use followup herbicide applications for several years to deplete the seed bank and attain long-term control.

All herbicides recommended in table 2 will control emerged teasel when properly applied. The most commonly recommended herbicides for effective control include 2,4-D (alone or combined as a mixture), triclopyr, clopyralid, or aminopyralid. Glyphosate is nonselective and may be considered if control of other plants (especially grasses) is acceptable. Caution should be taken with all herbicides if nontarget plants—including woody species—need to be protected. Each herbicide product will have different requirements and restrictions. Thus, it is important to read the label carefully and follow all instructions and guidelines when mixing and applying any chemical. Grazing restrictions following treatment as specified on the label should always be followed.

Table 2. Herbicide recommendations

Common Chemical Name (active ingredient)	Product Example ¹	Product Example Rate per Acre (broadcast)	Backpack Sprayer Treatment Using Product Example ²	Time of Application	Remarks
2,4-D Amine ³	Many products	2–4 pints	2%	During active growth; rosette to bolt, especially late fall to early winter or spring.	Broadleaf-specific herbicide. Clover and creeping bent grass may also be impacted. Not recommended for direct application to water. Avoid spraying seedling grasses until roots are established. Limit grazing for 7 days following treatment.

Table 2. Herbicide recommendations (continued)

Common Chemical Name (active ingredient)	Product Example ¹	Product Example Rate per Acre (broadcast)	Backpack Sprayer Treatment Using Product Example ²	Time of Application	Remarks
Aminopyralid	Milestone	1/4–1/3 pint	5–10%	See above.	Broadleaf-specific herbicide; does not harm grasses. Labeled for use up to water's edge. Some grazing recommendations. Best applied as a coarse, low-pressure spray. If stand is taller than 6 feet, use a high-volume spray. Use 0.25–0.5% v/v NIS ⁴ when conditions are adverse (high heat, low relative humidity, or dusty conditions) or on mature stands; may be used in combination with 2,4-D. ³
Imazapic	Plateau	1/2–3/4 pints	0.5–1% + 1% MSO	Spring/fall on rosettes or early summer when it bolts.	Inhibits growth of most plants; more likely to kill broadleaved plants. Acceptable for use in riparian areas. Adding 2 pints per acre methylated seed oil improves effectiveness, especially on broadleaved plants.
Clopypalid	Curtail	2–3 quarts	1–3%	Spring from 6 to 10 inches growth until early bud; or fall at rosette.	Broadleaf-specific herbicide; does not harm most established grasses. Not recommended for highly permeable soils or shallow groundwater areas. Can be used on rangeland, irrigated pasture or meadow, but not applied directly to water. Wait 30 days to establish perennial grasses. May be used in combination with 2,4-D. ³ May use up to 0.5% v/v NIS. ⁴
	Transline	1/4 to 1-1/3 pints	1–3 %		
Triclopyr	Remedy	1–2 pints	2%	During active growth.	Broadleaf-specific herbicide; does not harm grasses. Uptake is by foliage and roots. Not recommended for areas with highly permeable soils or areas of shallow groundwater. Adequate soil moisture and healthy leaf material is required for optimal herbicide effectiveness.
Triclopyr + clopyralid	Redeem R&P	1.5–2 pints	1–2%	Rosette stage	See recommendations above.
Glyphosate	RoundUp, many products	4–4.8 quarts	1.5–2%	Rosette to early bud; late fall to early winter.	Non-specific herbicide; will damage any actively growing plant material it contacts. Apply during late fall or early winter or use a spot treatment or wipe method when desirable plants are present.

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 information and appropriate use with teasel.

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 liquid herbicide until a volume of 1 gallon is reached ($4 \text{ oz} \div 128 \text{ oz/gal} = 0.03$ or 3 percent).

³ 2,4-D is a restricted use pesticide in New Mexico only. A certified applicator's license is required for purchase and use.

⁴ NIS is an abbreviation for nonionic surfactant, an additive commonly recommended by herbicide labels for postemergent foliar herbicide application.

The most effective growth stage to spray teasel is at rosette stage in fall or spring. Spraying after the plant has bolted is less effective, and spraying after seed heads have formed is counterproductive. This is because seed heads will continue to mature after herbicide treatment and will likely contribute to further spread.

Herbicides may be applied in several ways including by backpack, ATV, or UTV sprayers, or conventional boom sprayers that are pulled or attached to a tractor or truck. For repeated treatments, rotation of herbicide active ingredients on a year-to-year basis should be considered to prevent development of resistance.

Reseeding an area following herbicide treatment can improve long-term control by increasing competition with teasel. In areas where reseeding is planned, glyphosate can be broadcast sprayed for site preparation. Glyphosate is most effective when applied sequentially at about 1-month intervals during the summer, coupled with a fall grass seeding. Make the first application in early summer (June or July) and the second about a month later, provided green shoots are present. Sow perennial grass seed in late autumn as a dormant seeding (i.e., grass seedlings will not emerge until the following spring).

Control Strategies

Because each treatment situation is unique, the strategy adopted for managing teasel must involve careful planning and consideration of the local site conditions. Persistence and a long-term commitment is a must for teasel control. Treated areas should be monitored periodically and measures taken to control missed plants and newly emerged seedlings. It is also important to monitor the return of desirable native plant species. Teasel prefers open sunny habitats, thus encouraging competition from grasses while maintaining litter cover will help minimize its reestablishment.

Experience with integrated methods for controlling teasel is limited. As is the case in managing most weed

infested areas, integration of techniques such as mowing and herbicide should be beneficial since the impacts of combined control measures are often cumulative. Integrating revegetation through broadcast seeding or a no-till drill to increase competitive pressure on teasel should always be considered where feasible.

Consider addressing smaller populations or isolated plants on otherwise healthy sites first. Next, the plants at the perimeter of heavily infested areas should be treated. The larger, denser cores of the infested area should be addressed in the final stage of treatment. Regardless of the strategy used, a key to successful long-term control of teasel is to encourage vigorous competition from desirable perennial plants, especially grasses.

The following strategies have been used to contain and reduce teasel populations in certain situations, but local conditions dictate the best approach.

Combined mechanical and chemical strategy – One example of a combined control strategy is to mow in early spring and follow with a herbicide treatment about 50–60 days later. If soil moisture is adequate, consider reseeding in the fall with a competitive perennial grass mixture. Always use followup monitoring and spot treat any new plants or regrowth. Grazing should be deferred for two growing seasons to favor establishment of desirable perennial grasses.

Broadcast or individual plant treatment for localized infestations – Use a handgun power sprayer to broadcast treat teasel growing in larger areas. Spray in late fall or early spring, when surrounding desirable plants are mostly dormant, but teasel is green. For smaller sparse populations, one person or a small team can spray teasel using a backpack sprayer fitted with an adjustable spray nozzle. Plants should be spot sprayed by wetting the foliage and stems without allowing dripping to occur. Consider using a 2 percent solution of triclopyr + clopyralid.

Strategy for an early infestation with grass understory present – Perform a late winter or early spring prescribed

burn to prepare a site by removing old debris and opening up the canopy to make teasel rosettes more visible. Followup with a broadleaf-specific herbicide—such as triclopyr or clopyralid—on teasel rosettes to increase competitive advantage for grasses.

Regardless of the initial strategy used, it will likely require 4–6 years of repeated control efforts to contain or eliminate teasel. Long term integrated planning and a commitment to repeated management actions is a must. Always monitor treatment areas on an annual basis and consider reseeding to encourage competition from desirable plants, especially perennial native grasses.

References and Further Information

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Suggested Web Sites

- USDA Plants Database. 2010. <http://plants.usda.gov/index.html>
- Virginia Tech Weed ID Guide: http://www.ppws.vt.edu/scott/weed_id/diws.htm

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

Herbicide labels online:

<http://www.cdms.net/LabelsMsds/LMDefault.aspx>

**For more information
or other field guides, contact:**

USDA Forest Service
Southwestern Region
Forest Health
333 Broadway Blvd., SE
Albuquerque, NM 87102

Or visit:

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

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