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# Field Guide for Managing Teasel in the Southwest

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## 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 administers 4 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. Originally introduced from Europe, teasel is valued as a horticultural plant and has also been used medicinally. The spiny, dried seed heads of teasel are used for wool "fleecing" and are commonly used in floral arrangements. In the rosette stage, it is similar in appearance to 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).
- Taproot grows during rosette stage; 2 feet deep. Fibrous roots extend from taproot (up to 1-foot wide).
- Rosette leaves are wrinkled, scalloped, oval-shaped; older rosette leaves are often hairy.
- A flowering stalk emerges when roots have sufficient energy reserves, usually after growing as a rosette for at least 1 year. The erect branching stem may grow to 7 feet tall with simple, stalkless, opposite, lanceolate leaves that have visible veins. Upper leaves grow to 10" long, have entire margins, 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.
- 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 thereby allowing it to displace desirable plants and form a monoculture. Its presence reduces forage availability and contributes to declines in species diversity and range quality. In New Mexico, it has similar habitat preferences to the Sacramento Mountains thistle (*Cirsium vinaceum*) and may out-compete this endangered plant species locally.

### *Site/Distribution*

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.

Teasel is widespread in the Pacific Northwest and is becoming more common in New Mexico and Arizona. 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.

### *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. 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. 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 highways.

### *Invasive Features*

Although teasel is not known to have allelopathic properties, it is aggressively competitive. Openings within plant communities coupled with light soil disturbance are an invitation for invasion. Its taproot provides access to nutrients and soil moisture deeper within the soil profile. Teasel's biennial life history allows it to take up 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. A combination of control methods and repeated treatments will improve effectiveness in managing infestations.

The following actions should be considered when planning a management approach:

- Maintain healthy plant communities to prevent or limit teasel infestations. This may involve improving grazing management practices to prevent excessive grazing or reseeding disturbed areas with desirable grasses and forbs.
- Use certified weed-free seed and hay; use pellets for horses used in the back country.
- 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 follow-up treatment plan for missed plants and seedlings.
- Detect, report, and map large infestations. Keep annual records of reported infestations.

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

## Special Considerations

The Sacramento Mountains 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 this 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 that may be invaded by teasel. Information should be obtained from the U.S. Fish and Wildlife Service at (505) 346-2525 before treating teasel in the Sacramento Mountains and the aforementioned counties that could possibly involve habitat of these endangered species.

## 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 herbicide spraying for long-term management of teasel.

### *Manual Methods*

**Hand-pulling or cutting** – Hoe or dig plants at the rosette to early bolt stage by 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 for burial in a landfill to prevent spread. Immature seed heads may ripen if left onsite.

**Table 1. Management options***

| Site | Physical Control | Cultural Control | Biological Control | Chemical Control |
|---|---|---|---|---|
| Roadsides, fence lines, non-crop areas | Mowing just after flower heads open but before seeds enlarge will prevent production of viable seed.<br>Monitor and mow again if plants re-sprout and flower. | Use seed, mulch, and fill materials certified to be weed-free.<br>Clean mowing equipment after use.<br>Train road crews to identify and report infestations along roads.<br>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.<br>For densely infested sites, a prescribed burn in spring can prepare the site with herbicide application as a follow-up treatment. | Use seed and forage hay certified to be weed-free; use pellets for horses in backcountry areas.<br>Inspect and remove seed from clothing, animals, and vehicles before entering treated or un-infested areas.<br>Closely manage grazing to prevent overuse. Reseed with perennial grasses after disturbance or treatment.<br>Avoid driving vehicles and equipment through infested areas; wash if traveling through infestations was unavoidable. | Same as 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.<br>Use a hand-held propane torch for seedlings and isolated plants. | In addition to the above, use feed pellets for horses in the back country.<br>Post signs warning visitors to remove seeds after passing through infested areas. | Same as above. | Use backpack or hand-held sprayers.<br>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 the land resource.

### *Mechanical Methods*

*If using machinery to manage teasel, the equipment should be cleaned after use to prevent movement of seed into un-infested areas.*

**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 production of viable seed. 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 re-sprouts and grows new flower stalks.

### *Prescribed Fire*

Research on the use of fire for teasel management is limited. Since the growth region of teasel is located just below the surface, fires that significantly increase belowground temperatures are likely to kill the plant. Thus, a propane torch may be considered for individual plant treatment of teasel, especially for seedlings or plants in the rosette stage. Fire is also acceptable for debris disposal.

Broadcast burning in well-established teasel infestations is usually not a viable option since bare-ground interspaces between teasel plants ordinarily prevent a sustainable fire. For early infestations of teasel where a grass understory is still present, a prescribed burn may be performed in late winter or early spring to remove debris and to open up the canopy to make teasel rosettes more visible. To increase competition from grasses, the prescribed burn should be followed up with a broadleaf-specific herbicide—such as triclopyr or clopyralid—applied to rosettes.

## Cultural Control

Preventing teasel introduction into an area reduces the need for control measures. Consider educating florists and the local public as to the potential impacts of teasel. Dried flower arrangements left at cemeteries are a common means of introducing teasel to a previously un-infested area. Also, consider educating land managers, road crews, and the local public to identify teasel so that they can help prevent establishment by reporting all suspected infestations. Seed and materials used for mulch, forage, or fill should be certified to be weed-free; pellets may be used for horses in backcountry areas.

## 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 Control*

There are no classical biocontrol agents (insects, pathogens, etc.) known for teasel at this time.

## Chemical Control

Herbicides are an effective and economical way to manage teasel. However, new populations often return within a few years after herbicide treatment from seed that is still abundant in the soil. Anticipate the need to monitor and use follow-up 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 include 2,4-D (alone or combined as a mixture), triclopyr, clopyralid, or aminopyralid. Glyphosate is non-selective and may be considered if impacts to other plants (especially grasses) are acceptable. To prevent development of resistance, rotation of herbicide active ingredients on a yearly basis should be considered for repeated treatments.

Each herbicide product has 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. Aquatically approved herbicide formulations and surfactants must be used in or near water. Grazing restrictions following treatment as specified on the label should always be followed.

### *Herbicide Application*

The most effective growth stage to spray teasel is the rosette stage, which can be sprayed in late fall or early spring when teasel is green but surrounding desirable plants are mostly dormant. 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 backpack or hand-held sprayers, ATV or UTV sprayers, or conventional boom sprayers that are pulled or attached to a tractor or truck. Any equipment used to spray herbicide should be calibrated. Precautionary measures should be taken during application with all herbicides if non-target plants—including woody species—need to be protected.

A power sprayer with a handgun can be used for broadcast treatment of teasel growing in relatively large areas. For smaller areas of teasel with sparse populations, one person or a team can spray teasel by using a backpack sprayer fitted with an adjustable spray

## Table 2. Herbicide recommendations

| Common Chemical Name (active ingredient) | Product Example[1] | Broadcast Treatment (rate per acre) | Spot Treatment (spray solution)[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.<br>Avoid spraying seedling grasses until roots are established. Limit grazing for 7 days following treatment. |
| Aminopyralid | Milestone | 1/4–1/3 pint | 5–10% | During active growth; rosette to bolt, especially late fall to early winter or spring. | Broadleaf-specific herbicide; does not harm grasses. Labeled for use up to water's edge. Some grazing recommendations.<br>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 broad-leaved plants. Acceptable for use in riparian areas.<br>Adding methylated seed oil at 2 pints per acre improves effectiveness. |
| Clopyralid | Curtail | 2–3 quarts | 1–3% | Spring from 6 to 10 inches growth until early bud; or fall during rosette stage. | Broadleaf-specific herbicide; does not harm most established grasses. Can be used on rangeland, irrigated pasture or meadow, but not applied directly to water. Not recommended for highly permeable soils or shallow groundwater areas.<br>Wait 30 days to establish perennial grasses. May be used in combination with 2,4-D[3]. May use NIS[4] up to 0.5% v/v. |
| | 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.<br>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 other 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.<br>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] Spray solution is the herbicide/water ratio in a spray mix that may be used for spot treatment with backpack or hand-held sprayers. The amount of product applied during an annual growing season must not exceed the maximum application rate per acre as specified by the product label – refer to the product label for the site type and application.

[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 post-emergent foliar herbicide application.

nozzle. Plants should be spot sprayed by wetting the foliage and stems without allowing dripping to occur. A 2 percent solution of triclopyr + clopyralid should be considered for spot spraying.

### Integrated Control Methods

Experience with integrated methods for controlling teasel is limited. As is the case in managing most weed-infested areas, a combination of control measures should be beneficial since impacts of integrated techniques are often cumulative. An example is a **mowing-herbicide** treatment sequence whereby infestations are mown in early spring and then treated about 50–60 days later with a broadleaf herbicide. If soil moisture is adequate, reseeding in the fall with a mixture of competitive perennial grasses should be considered. To help establish the desirable perennial grasses, grazing should be deferred for two growing seasons after treatment. Follow-up monitoring and spot treating any new teasel plants or regrowth are also necessary.

## Management Strategies

Early detection and plant removal are critical for preventing establishment of teasel. Strategies to contain, reduce, or eradicate teasel populations require integrated management and follow-up monitoring. Because each treatment situation is unique, the strategy adopted for managing teasel must involve careful planning and consideration of local site conditions.

Priority should be given to surveying for teasel and eradicating small, new, or isolated infestations. Consider addressing small populations or isolated plants on otherwise healthy sites first. Control and containment methods should be practiced with larger teasel infestations. The plants at the perimeter of heavily infested areas should be treated to prevent the infestation from spreading. The larger, denser cores of the infested area should be addressed in the final stage of treatment.

The key to successful long-term control of teasel is to encourage vigorous competition from desirable perennial plants, especially grasses. Teasel prefers open sunny habitats, thus encouraging competition from grasses while maintaining litter cover will help minimize its reestablishment. Reseeding by broadcast seeding or a no-till drill to increase competitive pressure on teasel should always be considered as an option where feasible. 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).

Persistence and a long-term commitment are a must for teasel control. Regardless of the strategy used, it will likely require 4–6 years of repeated control efforts to contain or eliminate teasel. Since it is ordinarily useless to treat an area only one time without retreatment, sufficient resources must be allocated for the area where control is attempted. After initial treatment, it is especially important that resources are also available to respray or retreat the treated area as necessary. 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, especially perennial native grasses, to encourage competition.

## References and Further Information


Caswell, H. and P. Werner. 1978. Transient Behavior and Life History Analysis of Teasel (*Dipsacus sylvestris*). Ecology 59(1):53-66. Available at http://www.jstor.org (accessed Nov. 2010)

Colorado Department of Agriculture. 2008. Common Teasel Identification and Management. Available at www. colorado.gov (accessed Nov. 2010)

DiTomaso, J.M. and E.A. Healy. 2007. Weeds of California and Other Western States. University of California Agriculture and Natural Resource Publication 3488. Pp. 685–688. Available at http://books.google.com/books (accessed Nov. 2010)

Gremaud, G. and T. Smith. 2002. Teasel Alert! Common and Cut-leaved Teasel: Two Species; One Big Problem. Available at http://mdc4.mdc.mo.gov/ Documents/173.pdf (accessed Nov. 2010)

Gucker, C.L. 2009. Dipsacus fullonum, D. laciniatus. In: Fire Effects Information System. USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available at http:// www.fs.fed.us/database/feis/ (accessed 17 Nov. 2010)

Missouri Department of Conservation. 2010. Management of Invasive Species: Cut-leaf and Common Teasel (http://mdc.mo.gov/landwater-care/plant-management/invasive-plant-management/cut-leaved-and-common-teasel (accessed17 Nov. 2010)

Ohio Perennial and Biennial Weed Guide. Available at http://www.oardc.ohio-state.edu/weedguide/ default.asp (accessed Nov. 2010)

Panke, B., R. deRegnier, and M. Renz. 2010. Invasive Plants of Wisconsin: Teasel. A Cooperative Extension Publication. Available at http://ipcm.wisc.edu/ (accessed Nov. 2010)

Watson, L. and M.J. Dallwitz. 1992 onwards. The Families of Flowering Plants: Descriptions, Illustrations, Identification, and Information Retrieval. Version: 20th May 2010. Available at http://delta-intkey.com (accessed Nov. 2010)

Weld County, Colorado. 2007. Rangeland-Pasture Recommendations for Common Teasel. Available at http://www.co.weld.co.us/assets/ DbdBbA881bdDDb40C6D6.pdf (accessed Nov. 2010)

Wisconsin Department of Natural Resources. 2004. Common Teasel Factsheet. Available at http://dnr.wi.gov/invasives/fact/teasel_com.htm (accessed Nov. 2010)

## Suggested Web Sites

For information about calibrating spray equipment:

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

Virginia Tech Weed ID Guide: http://www.ppws.vt.edu/scott/weed_id/diwsi.htm

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

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

## Or visit the Southwestern Region's website for invasive species:

*http://www.fs.usda.gov/goto/r3/invasivespecies*

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