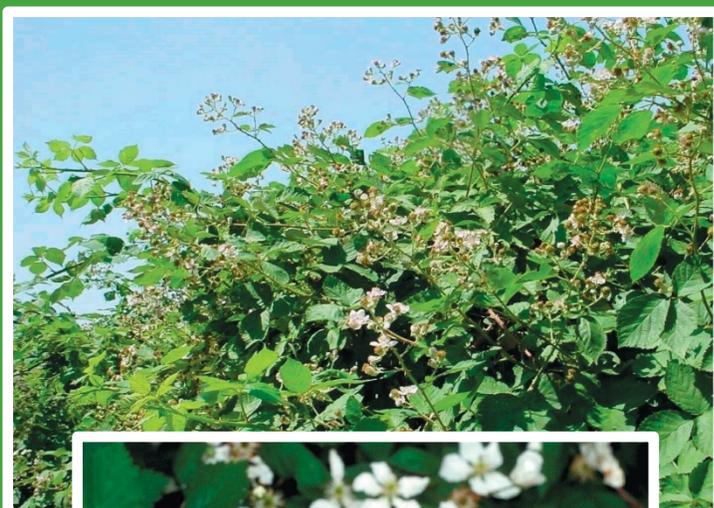


Field Guide for Managing Himalayan Blackberry in the Southwest



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Himalayan Blackberry (*Rubus armeniacus* Focke; synonyms: *R. discolor*, *R. procerus*)

Rose family (Rosaceae)

Himalayan blackberry was introduced into the U.S. in the late 1800s for cultivation and has since naturalized and spread out beyond planted areas. Oregon lists Himalayan blackberry as a noxious weed, and the California Invasive Plant Council rates this species as highly invasive. It is increasingly becoming a problem in riparian areas of the Southwest.

This field guide serves as the U.S. Forest Service's recommendations for management of Himalayan blackberry in bottomland areas 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

Himalayan blackberry (synonym: Armenian blackberry) is a vigorous, sprawling, vine-like evergreen shrub native to western Europe. It is common in the Pacific Northwest and is expanding its range throughout the western United States. It produces a sweet, edible, berry-like fruit and is both a valued cultivated plant as well as a rapidly spreading invasive weed. It easily spreads vegetatively and by seed. Himalayan blackberry can be distinguished from other blackberry species by the whitish color on the back of its compound leaf. It generally has 3 to 5 distinct leaflets (each one toothed and usually oval); arching, reddish-brown, strongly angled canes with straight or curved thorns; and large flowers and fruit.

Growth Characteristics

- Perennial, creeping evergreen shrub with prickly green to reddish-brown ribbed stems (called canes).
- Large, deep, woody root crowns. Each ball-like root crown sprouts multiple canes and readily re-sprouts when cut or burned.
- Canes grow to 15 feet tall before arching over to form trailing vines up to 40 feet long; canes ribbed

and reddish with cat claw-like thorns that have thick bases; first year canes become smooth as they age.

- Canes are biennial; first year canes grow from buds at or below the ground surface and only produce leaves. In the second year, lateral branches grow from the leaf axils of the first year canes. These second year branches produce both flowers and leaves. Canes that have not produced fruit may exist for several years before doing so. Canes that produce fruit typically die at the end of the season and become part of an intricate support for the next generation of canes. Interwoven canes form vast, seemingly impenetrable mounds referred to as "brambles."
- Leaves of first year canes are palmately compound (3 to 7 inches long) and have 5 oval leaflets with serrate leaf edges and a narrow tip. The underside of each leaflet is whitish and slightly hairy with a prickled mid-rib. Each leaf stem (called a petiole) also has prickles. Second year canes have only 3 leaflets, and each leaflet is smaller than those on the first year canes.
- White or pinkish, 5-petaled flowers develop usually from June to August during the second year. Flowers have broad petals that measure 1-inch across.
- Fruits are small drupes that grow closely together in a cluster that resembles a berry; reddish and hard, but softens and becomes black and shiny as fruit ripens in August and September. Seeds are produced every year and typically are spread in the fall. Seed remains viable in the soil for several years and requires some scarification to germinate.
- Reproduces asexually (fertilization not required) by seed and vegetatively by root or stem suckers. Cane tips can take root and produce daughter plants; trailing canes also root at nodes. Seedlings grow at a much slower rate than daughter plants.

Ecology

Impacts/Threats

Himalayan blackberry rapidly displaces native plant species and produces thickets so dense that the lack of light severely limits understory plant growth. Native vegetation growing beneath Himalayan blackberry becomes highly suppressed from shading and crowding. The dense, prickly thickets also hinder control efforts and impede access for humans, wildlife, and livestock. When growing near waterways, the species may worsen streambank erosion since its relatively shallow roots do not stabilize soils as do other, more desirable native riparian vegetation. Although Himalayan blackberry provides some low quality habitat for wildlife, it generally reduces diversity of flora and fauna species and decreases land value.

Site/Distribution

Himalayan blackberry favors lowland riparian corridors near agricultural, rural, or urbanized areas. The species may also be found along roadsides, railroad tracks, abandoned fields and other open, disturbed sites with adequate soil moisture. It does not tolerate deep shade, excessively dry soils, or extremely cold temperatures.

Himalayan blackberry is known to be present in seven Arizona counties and three counties in New Mexico. In Arizona, Himalayan blackberry typically prefers elevations lower than 6,000 feet.

Spread

Himalayan blackberry reproduces and spreads in a variety of ways. New plants start from the crown (the base of the plant), rhizomes (horizontal and underground shoots), and seed that germinates in spring and fall. It roots at cane tips and at nodes to form daughter plants (i.e., new shoots). Buried root buds also sprout new canes. Since its fruit is palatable for both humans and wildlife; the seed is easily dispersed by water, humans, birds, and small mammals. Canes, stems, roots, and seed are often spread over long distances by adhering to surfaces and undercarriages of road vehicles and road maintenance equipment.

Invasive Features

Himalayan blackberry is a strong competitor. It thrives in open areas and is often an early invader of cleared forested areas after logging. New canes are produced each year from the crown to replace those that die naturally. The species has a tough woody root crown that readily re-sprouts in response to disturbance. Flowers and fruits are produced late in the growing season which promotes seed production. Many birds and other wildlife seek out the fruit and are responsible for spreading the seed widely.

Management

A combination of control methods is most effective at achieving long-term control for Himalayan blackberry. A long-term commitment to monitoring and follow-up treatments is especially important. Complete eradication in all situations may not be possible; however, persistent control efforts coupled with managing the recovery of desirable plants can restore ecological health to a site and help deter future invasions.

Table 1 describes a four-step control process that has been used with some success to manage Himalayan blackberry in suitable areas. The four-step control process uses a combination of physical, chemical, and cultural methods that essentially control Himalayan blackberry by:

1. Preparing the site by removing aboveground portions of the plant;
2. Removing or killing the root system;
3. Planning for introduction of desirable species; and
4. Monitoring and performing follow-up treatments on newly emerged seedlings and regrowth.

Further information on physical, cultural, biological, and chemical methods that can be used to control Himalayan blackberry are described after the table. Depending on certain circumstances and scenarios, step 2 in the table can be performed before step 1. For example, herbicide may be used as a first step for controlling mature blackberry thickets to maximize root kill; at a later point of time, the standing top growth can be cut, mown, mulched, or burned to remove debris.

Table 1. Four-step control process*

Step	Site	Action	Control Type	Method Options	Timing
1	Any	Remove aboveground portion of the plant. If desirable plants are present, consider flagging them so they are not accidentally cut.	Physical	Mow using a tractor-mounted mower or scythe. Allow cut material to dry in the sun or rake and stack debris for later burning. Hand cut or slash isolated plants using brush cutters, power saws, axes, machetes, loppers, and clippers.	Mid-summer when plants begin to flower.
2	Sites with small infestations, sensitive areas, or where desirable plants are present.	Remove root crowns and roots.	Physical	For plants up to 13 feet tall, a claw mattock or Pulaski can be used to remove root crown. Then hand dig rootstock while making sure to remove every piece of root.	Right after removal of aboveground portion. Most feasible on sandy or deep loamy soils; for sizeable patches, consider using a work party.
	Sites with large infestations or where Himalayan blackberry is the only species present.	Kill top growth, root crown, and roots.	Chemical/ Physical	Apply foliar spray to mature, uncut blackberries. Spray using a broadcast application approach (ATV, tractor-mounted sprayer, or backpack sprayer). Follow up 6 months to 1 year later by removing dead top growth through mowing, shredding, or burning.	Spray when leaves are fully expanded and the foliage is dark green, either before first flower or after fruit drop. If top growth is removed by mowing, shredding, or burning before spraying, then allow canes to regrow for 1 or 2 years or at least until 18 inches tall before spraying.
3	Any	Plant or seed desired species upon site.	Cultural	If desirable species are already present on the site, removal of blackberry competition may allow natural restoration. In other instances, planting or seeding may be necessary.	If planting, do so immediately following step 2 treatment.
4	Any	Use follow-up treatments on seedlings and/or re-sprouts.	Physical	Hoe or hand grub young seedlings.	Before first year canes can root at tips or become second year canes.
			Chemical	Use spot spraying on re-sprouts.	Depends upon herbicide selected. See table 2.

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

Physical Control

For most infestations, using only physical methods will not adequately control Himalayan blackberry. Instead, consider using a combined control approach with the ultimate goal of restoring native plants.

Manual Methods

Hand pulling – For seedlings and young, isolated plants less than 3 feet tall, pull canes and shoots from the soil with gloved hands. There must be sufficient soil moisture to allow easy removal of the entire root. If the cane breaks off at the surface when hand pulling, use hoeing or digging to remove roots.

Hand hoeing – For seedlings and smaller plants (canes up to 13 feet in length), use a claw mattock or grub hoe to pry and extract the root crown and roots from the soil. Plunge hoe into the ground 3 to 5 inches away from the cane, then lever the root crown out (similar to removing a nail with the claw end of a hammer). Leave roots out to dry in the sun. For canes closer to the 13-foot length, consider cutting to a height of 6 to 8 inches before extracting roots.

Hand digging – For small infestations or individual plants growing near the base of desirable shrubs and trees, use a round-point shovel to dig out every part of the root crown and rootstock. This method is effective only if all parts of the root are removed, since any root nodes left in the soil will likely re-sprout.

Cutting – To remove aboveground portions of Himalayan blackberry, cut with hand-held tools such as brush cutters, hedge trimmers, loppers, clippers, power saws, axes, or machetes. Removal of canes will not provide control; however, cutting canes is an important component in combination with other methods.

Mechanical Methods

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

Mowing – Cutting or chopping the top growth of Himalayan blackberry will stimulate formation of

suckers from lateral roots and induce further branching and cane production. Mowing should only be done as a short-term suppression practice to be used in areas with gentle topography (slopes are not over 30 percent), few obstacles (logs, stumps, boulders, etc.), and where soils are not highly prone to erosion, compaction, or excessive moisture. Repeated mowing over multiple years may suppress growth but will not keep the top growth from rapidly returning. A tractor-mounted mower is ideal for larger populations on level terrain; a hand-held weed-eater is sufficient for smaller populations. Cut top growth early in the growing season and again when the plants are about 18 inches high. Cuttings may be raked, burned, or left as mulch onsite. Mowing is best used in combination with other methods such as (1) foliar application of a herbicide on 18-inch regrowth; (2) hand removing roots and root crowns; or (3) using a cut-stump application of herbicide to the canes at the time of mowing.

Tillage – Single cultivation by plowing, disking, or bulldozing can be counterproductive since cutting surface roots and canes stimulates new growth and may spread the infestation. Repeated deep tillage is used to keep Himalayan blackberry out of agricultural fields, but this approach is usually impractical in wildland areas. Deep plowing and root raking after mowing might be considered in certain situations depending on terrain and soil type or depth. However, soil disturbance caused by cultivation will require follow-up control and immediate reseeding of desirable plants.

Prescribed Fire

Himalayan blackberry grows back vigorously following fire, and fruit production is especially abundant after a burn. For these reasons, burning is rarely recommended as a control practice either alone or in combination with other methods. However, fire can be used as a means to dispose of cut and dried debris. In certain situations, fire might be used to provide short-term canopy reduction that will allow other control measures (such as herbicide spraying) to be made.

Cultural Control

Prevention, early detection and control, and seedling removal are critical for preventing Himalayan blackberry establishment. Vehicles, humans, and livestock should be discouraged from traveling through infested areas. If possible, weed screens should be used on irrigation water intakes in infested areas to prevent seed and cane transportation in irrigation canals.

Biological Control

Grazing

Goats and sheep readily browse new growth after mowing. However, shoots and canes will rapidly return once the animals are removed from the site. Typically, neither goats nor sheep will eat older canes; rather, they will first select nearby desirable vegetation when given a choice. It is usually necessary to use fencing to confine animals and intensify grazing.

Classical Biological Control

No biocontrol agents (insects, pathogens, etc.) for Himalayan blackberry have been approved for release in the United States due to the potential impact on commercial blackberry crops.

Chemical Control

Himalayan blackberry is particularly hardy and herbicide treatments rarely provide complete control when used alone. Some blackberry regrowth usually returns after spraying, so repeated treatments will probably be necessary for effective long-term control.

Herbicides listed in table 2 are effective against actively growing Himalayan blackberry when properly applied. Systemic herbicides such as glyphosate, metsulfuron-methyl, aminopyralid, triclopyr (amine or ester formulations), and picloram are usually mixed in combination and are effective options when applied to healthy foliage. Tebuthiuron is activated through the soil; however, caution should be used with this herbicide since it is nonselective and provides total vegetation control.

Herbicide products in table 2 have different requirements and restrictions according to the label. For use of these herbicides near water in riparian areas, aquatically

approved formulations (e.g., Rodeo[®]) and surfactants must be used. Read and understand the label prior to any application. Consult the manufacturer if you have questions or need further detail.

Glyphosate – This herbicide is nonselective as it inhibits amino acid production necessary for forming proteins within the plant. Glyphosate adheres to soil particles and becomes inactive shortly after spraying. Initial application of glyphosate is best made from September through early November (before freezing) when Himalayan blackberry is sending carbohydrates down into its roots for storage. The herbicide is recommended for small infestations that are easy to check and re-treat and also for sensitive areas where other herbicides may be restricted such as when bodies of water are nearby.

Metsulfuron – Metsulfuron products provide very consistent, effective control of blackberry; however, activity is slow and may take time to show significant control. Metsulfuron methyl is a somewhat selective systemic herbicide with rapid foliar and root absorption. Similar to glyphosate, the herbicide causes inhibition of cell division by disrupting amino acid synthesis. Plants stop growing shortly after application of this herbicide although plant death may take 4 to 6 weeks. Many established perennial grasses are resistant to this chemical once they reach the 3 to 4 leaf stage (see product label for specific information). This herbicide may also be applied near conifers without damage if the conifers are not drought-stressed. When mixed with aminocyclopyralid and imazapyr, metsulfuron methyl is very effective on large blackberry patches, but this mixture will cause damage to nearby grasses and trees. Read the label closely about cautions and use. Also, refer to the label for use of recommended surfactants, those not incorporating acetic acid. Do not apply to water; always check carefully for usage restrictions, especially when applying near different waterbody types.

Triclopyr – Triclopyr is selective for many broadleaf and woody plants and is available in either amine (Garlon[®] 3) or ester (Garlon[®] 4) formulations. Both products mimic the plant's own growth hormones to cause disruptive plant growth; at higher concentrations, it inhibits cell division

and growth. Triclopyr amine is well suited for cut-surface treatment whereas triclopyr ester is better suited for foliar spray; carefully review the label for each product. Effectiveness of both Garlon products will be greatly enhanced by tank mixing with picloram, aminopyralid, or fluroxypyr. Always check carefully for usage restrictions, especially when applying near different waterbody types. Initial application of triclopyr is best made from September through early November, but spot spraying seedlings and regrowth may be performed from mid-summer through fall.

Tebuthiuron – Tebuthiuron is formulated as a pellet (Spike® 20P) or wettable powder (Spike® 80WP). Each product provides total vegetation control. Tebuthiuron becomes active after rain as the herbicide is moved through the soil and is taken up by the roots. In the arid climate of Southwestern areas, rainfall may be insufficient at times to move the chemical throughout the soil profile which results in very slow control of blackberry plants.

Herbicide Application

Foliar-applied herbicides may be sprayed with 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. For sparse populations or as a follow-up treatment, one person or a small team can spray Himalayan blackberry using a backpack sprayer. Plants should be spot sprayed by wetting the foliage and stems without dripping. An adjustable spray nozzle attached to the hand-held wand should be part of the backpack sprayer.

Foliar spray treatment – As discussed in the online Pest Notes of University of California's Statewide IPM Program, herbicides such as glyphosate or triclopyr must be transported within the plant to the rhizomes and new growing points to control blackberries effectively during the growing season. Plants stressed from drought or grazing are in poor condition to translocate carbohydrates. Thus, chemical control of wild blackberry plants under stress is difficult and is not recommended.

Foliar herbicide application must be timed so that it coincides with the maximum rate of carbohydrate movement into the root system for storage. This will depend upon whether the plants are primarily first year

canes or a combination of both first and second-year canes. If only first-year canes are present (for example, when plants have been previously burned or mowed), the most effective time for optimal herbicide transport to the root system is in late summer. Herbicide application at this time reduces the likelihood of regrowth in subsequent years.

When a blackberry infestation consists primarily of second-year canes or a combination of first and second-year canes, apply herbicide in early fall before plants become dormant. Herbicides applied too early usually result in good kill of the top growth, but there is very little movement of the chemical into the root system. As a result, the plant regrows and must be retreated later.

Basal bark treatment – Concentrated forms of triclopyr (often mixed with commercially available seed oil for better penetration) can be applied to basal regions of blackberries with a backpack sprayer that has a solid cone, flat fan, or straight-stream spray nozzle. Thoroughly cover a 6 to 12-inch basal section of the stem with spray but not to the point of runoff. Basal bark applications can be made almost any time of the year, even after leaves have senesced (aged, dried, and fallen from the plant). In areas where people frequently harvest wild blackberry fruit, a mid-fall basal bark treatment might be desirable to avoid human contact with the chemical.

Dormant stem and leaf treatment – As an alternative to basal bark treatments, a 1 percent solution of triclopyr ester with a 3 percent crop oil concentrate mixture can be applied to dormant leaves and stems in late fall and winter. See product label for the rate to use in obtaining the desired concentration. As with other herbicide applications, spray the plant until it is thoroughly wet but not to the point of runoff. Like basal bark treatments, the timing of this technique can help prevent human contact with the herbicide during berry-picking season.

Soil-applied treatment – See table 2 for appropriate times to apply tebuthiuron to the soil surface as a pellet (Spike® 20P) or as a wettable powder (Spike® 80WP). Read the herbicide label carefully to note restrictions and limitations. Directions for various applications are provided on the labels, which include broadcast and banded applications, and individual low and high volume plant treatments.

Table 2. Herbicide recommendations

Common Chemical Name (active ingredient)	Product Example ¹	Broadcast Treatment (rate per acre)	Spot Treatment (spray solution or pellets) ²	Time of Application	Remarks
Glyphosate	Accord Roundup Pro Rodeo [others available]	4.5–6 pints	High-volume rate: Accord— 0.75–1.5 % Rodeo— 0.75–1.25% Low-volume rate: 5–10 % for both Accord and Rodeo	Late summer to early fall. Accord may be applied to green canes after leaves have dropped; Rodeo is best applied when leaves are present.	Glyphosate is nonselective. If desirable plants are nearby, take measures to shield or avoid spraying. Not active or persistent in the soil. Rodeo is registered for aquatic use. It may take up to 30 days to see results with woody plants. Very cool or cloudy weather following application could slow activity and further delay noticeable effect. Use a NIS (nonionic surfactant) with 80 percent active ingredient. Burning or mowing 40 to 60 days after spraying with glyphosate increases effective control.
Metsulfuron methyl	Escort	1–2 ounces per acre; no more than 4 ounces per year.	2–4 ounces per 100 gallons	Summer through early fall.	Foliar application during period of full leaf expansion before fall coloration.
Aminocyclopyrachlor + metsulfuron + imazapyr	Viewpoint	13–18 ounces per acre	NA	Same as above.	This herbicide combination provides nonselective control and should be used in non-crop areas. May cause temporary damage in some grass species.
Triclopyr amine	Garlon 3A Agristar Triclopyr 3A [others available]	2–3 gallons + water and NIS to make 100 gallons of prepared spray	High-volume rate: 1–3% Low-volume rate: 5–10%	Initial treatment: September to early November; follow-up in mid-summer to early November.	Selective; slightly persistent; mimics plant’s own growth hormone. May add an agriculturally labeled spray-thickening agent to reduce drift. See label for adjuvant options and usage restrictions near different bodies of water.
Aminopyralid + triclopyr	Capstone	6–9 pints	1–2%	Treat when plants are actively growing.	Do not treat blackberries in the same year after mowing, shredding, or burning. Wait 1 to 2 years before spraying regrowth and anticipate that retreatment may be required.
Aminopyralid + 2,4-D + triclopyr	mixture	2.1 pint + 2 quarts in 100 gallons of water	1–2%	Same as above.	Same as above.
Triclopyr ester	Garlon 4 Remedy Ultra [others available]	2–3 gallons + water and NIS to make 100 gallons of prepared spray	High-volume rate: 1–3% Low-volume rate: 5–10%	Initial treatment: September to early November; follow-up in mid-summer to early November.	Same as above.

Table 2. Herbicide recommendations (cont.)

Common Chemical Name (active ingredient)	Product Example ¹	Broadcast Treatment (rate per acre)	Spot Treatment (spray solution or pellets) ²	Time of Application	Remarks
Picloram + fluroxypyr	Surmount	3–4 pints	0.5–1%	Apply when leaves are fully expanded and the foliage is dark green, either before first flower or after fruit drop.	Same as above.
Tebuthiuron pellets	Spike 20P	3.75–5 pounds	NA	Fall or prior to the time when predominant portion of rainfall occurs.	Spike 20P is nonselective and provides total vegetation control. Spike 20P may be applied at rates as low as 2.5 pounds per acre on sites with shallow soils, rocky and coarse textured soils having low organic matter content, or when partial control is desired.
Tebuthiuron wettable powder	Spike 80DF	5–7.5 pounds for spot application only.	High-volume: mix 1 pound in enough water to make 10 gallons of solution. Low-volume: mix 1 pound in enough water to make 1 gallon of solution.	In areas of low annual rainfall (<15 inches per year), apply prior to the time when predominant portion of rainfall occurs.	Do not use this treatment in any areas where desirable species in close proximity to blackberry may be eliminated. A minimum of 1.5 inches of rainfall is required to activate Spike 80DF and move it to roots in the soil.

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 Himalayan blackberry.

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.

Management Strategies

Regardless of location, Himalayan blackberry usually responds well to the four-step management process outlined in table 1. Although each treatment situation is unique, following these four steps should be considered when developing a long-term management plan.

Persistence and a long-term commitment are a must for Himalayan blackberry control. In most cases, several consecutive years of field treatments will be necessary to eliminate or substantially reduce Himalayan blackberry. 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 successfully. Previously treated areas should be continuously monitored and retreated when necessary to control recovering Himalayan blackberry. Failure to perform follow-up management may result in a return of the infestation to pretreatment levels.

Adaptive Management

Himalayan blackberry is commonly found throughout the western U.S. and controlling it across broad areas may not be practical. Therefore, realistic goals and objectives should be established to manage Himalayan blackberry infestations occurring extensively throughout a given landscape. To improve long-term success in controlling Himalayan blackberry, consider using an

adaptive management approach with the overall goal of restoring desirable plant communities. The stepwise process for adaptive management involves:

1. Assessment of the overall weed problem;
2. Establishing management goals and objectives;
3. Implementation of control strategies and measures;
4. Monitoring the effectiveness of management actions;
5. Evaluating actual outcomes in relation to expected results; and
6. Adjusting practices as necessary.

Steps of this process should be repeated in sequence as part of a continuous learning cycle that improves management planning and strategy by learning from the outcomes of previous management actions. In general, an adaptive management approach is considered to be successful if:

1. Stakeholders are actively involved and remain committed to the process;
2. Monitoring and assessment are used to adjust and improve management decisions; and
3. Management goals and/or objectives for the resource are being achieved.

References and Further Information

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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/A613

For information on invasive species:

Bugwood Wiki: <http://wiki.bugwood.org>

National Invasive Species Information Center: <http://www.invasivespeciesinfo.gov/>

Invasive.org. <https://www.invasive.org/species.cfm>

UC Statewide Integrated Pest Management Program: <http://ipm.ucanr.edu/index.html>

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 the Southwestern Region's
website for invasive species:**

<http://www.fs.usda.gov/goto/r3/invasivespecies>



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