United States Department of Agriculture

Field Guide for Managing Himalayan Blackberry in the Southwest

Forest Service

Southwestern Region

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Cover Photos

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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 within southwestern riparian areas and is known to be present in seven Arizona counties and three counties in New Mexico.

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 includes four 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 produces sweet, edible berry-like fruit and is both a valued cultivated plant as well as a rapidly spreading invasive weed. It is common in the Pacific Northwest and is expanding its range throughout the western United States. 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).
- Canes grow up 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.
- 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.
- Fruits are groups of small drupes that grow closely clustered together to resemble 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 are typically spread in the fall. Fruit ripens later, and the ripening period is longer than for native blackberries. Seed does require some scarification to germinate.
- Seedlings grow at a much slower rate than daughter plants.
- Large, deep, woody root balls. Each root crown sprouts multiple canes and readily resprouts when cut or burned.

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 flora and fauna species diversity and decreases land value.

Location

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. 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. The fruit is highly palatable for both humans and wildlife; its 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 replacing those that die naturally. The species has a tough woody root ball that readily resprouts in response to disturbance. Flowers and fruits are produced late into the growing season which allows a greater likelihood for successful seed production. Many birds and other wildlife seek out the fruit and are responsible for widely spreading seed.

Management

Table 1 describes a four-step control process that has been used with some success to manage Himalayan blackberry in suitable areas. These steps essentially consist of:

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 followup treatments on newly emerged seedlings and regrowth.

Depending on certain circumstances and settings, step 2 in the table can be performed before step 1. For example, herbicide may be used as a first step on mature blackberry thickets to maximize root kill and later the standing top growth can be cut, mown, mulched, or burned to remove debris. Steps taken in the process use a combination of physical, chemical, and cultural methods. A combination of methods is most effective at achieving long-term Himalayan blackberry control. Even with such a combined approach, it must be recognized that Himalayan blackberry control requires a long-term commitment to maintenance and followup treatments. Complete eradication in all situations may not be possible; however, persistent ongoing control efforts coupled with a commitment toward the recovery of desirable plants can restore ecological health to a site and act as a deterrent to later invasion.

Table 1. Four-step control process*

Step	Site	Action	Method Type	Method Options	Timing
1	Any	Remove aboveground portion of the plant. If desirable plants are present, consider flagging them so they are not accidently 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). Followup 6 months to 1 year later by removing dead top growth by 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 followup treatments on seedlings and/or resprouts.	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 resprouts.	Depends upon herbicide selected. See table 2.

* Choice of a particular management option must be in compliance with existing regulations for 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, it will be necessary to remove roots by hoeing or digging.

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 resprout.

Cutting – To remove aboveground portions of a Himalayan blackberry plant, 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

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 viewed 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) application of a foliar herbicide on the 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 – A single cultivation by plowing, disking, or bulldozing can be counterproductive because 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, the degree of soil disturbance caused by cultivation will require followup control and immediate reseeding of desirable vegetation.

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 will readily browse upon 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 the older canes; rather, when given a choice, they will first select nearby desirable vegetation. It is usually necessary to use fencing to confine animals and intensify grazing.

Classical Biological Control

Due to the potential impact on commercially important blackberry crops, no biological control agents for Himalayan

blackberry have been approved by the USDA for release in the United States. However, a leaf rust fungus (*Phragmidium violaceum*) has been released in Chile, Australia, and New Zealand to control undesired blackberry species. This fungus attacks leaves and infests buds, fruit, and green cane growth; however, its level of injury is often modest and it has mixed control success.

Chemical Control

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

Herbicides recommended in table 2 will control 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. The foliar applied herbicides may be sprayed in several ways including backpack, ATV or UTV sprayers, or conventional boom sprayers that are pulled or attached to a tractor or truck. For sparse populations or as a followup treatment, one person or a small team can spray Himalayan blackberry using a backpack spot spray approach. 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. Each herbicide product listed in table 2 will have different requirements and restrictions according to the label. Read and understand the label prior to any application. Consult the manufacturer if you have questions or need further detail.

Foliar Spray Treatment

As discussed in the University of California IPM Online Pest Notes, an herbicide 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. 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. In a situation where 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.

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

Glyphosate 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. This 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. For use of glyphosate near riparian areas, be sure to use an aquatically labeled formulation of glyphosate such as Rodeo.

Metsulfuron products provide very consistent, effective control of blackberry, although 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 label for specific species 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 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 products will be greatly enhanced by tank mixing with a 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.

Foliar application techniques:

- For hand-held and high volume equipment, a lower solution rate of herbicide (such as 0.75 to 1.25 percent Rodeo) is recommended to control blackberry when using a nozzle with a coarse spray setting to minimize drift. Provide complete coverage of the canopy when spraying.
- For low volume directed spray, a higher solution rate of herbicide is better (such as 5 to 10 percent Rodeo). If using a straight-stream nozzle, spray from top to bottom in a lateral zigzag motion. Apply from multiple sides if using flat-fan nozzles, cone nozzles, or hand directed mist blowers to ensure control of emerged root sprouts.

Basal Bark Treatment

Concentrated forms of triclopyr (often mixed with commercially available seed oil for better penetration) can be applied to basal regions of wild 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 labels 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

Tebuthiuron is formulated as a pellet (Spike 20P) or wettable powder (Spike 80WP). Each of these products 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. Read the herbicide label carefully to note restrictions and limitations. Directions for various application methods are provided on the labels including broadcast and banded

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
Glyphosate	Accord, Roundup Pro, Rodeo Others Available	4.5–6 pints	High-volume rate: Accord—0.75–1.5 percent Rodeo—0.75–1.25 percent Low-volume rate: 5–10 percent 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 with 80 percent active ingredient.[3] 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.
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 percent Low-volume rate: 5–10 percent	Initial treatment: September to early November; followup 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 percent	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		2.1 pint + 2 quarts in 100 gallons of water	1–2 percent	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 percent Low-volume rate: 5–10 percent	Initial treatment: Spetember to early November; followup in mid-summer to early November.	Same as above.

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
Picloram + fluroxypyr	Surmount	3–4 pints	0.5–1 percent	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. 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.	A minimum of 1.5 inches of rainfall is required to activate Spike 80DF and move it to roots in the soil. Do not use this treatment in any areas where desirable species in close proximity to blackberry may be eliminated.

[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 Himalayan blackberry.

[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/gal ÷ 128 oz/gal = 0.03 or 3 percent).

[3] NIS is an abbreviation for nonionic surfactant, an additive commonly recommended by herbicide labels for post-emergent foliar herbicide application.

applications, and individual low and high volume plant treatments.

Control 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 an effective, long-term management plan. Persistence and a long-term commitment is a must for Himalayan blackberry control; it is also important to monitor the return of desirable native plant species.

Adaptive Management

Himalayan blackberry is an introduced, naturalized species 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 strategy 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;
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 strategy may be 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 on invasive species:

http://wiki.bugwood.org
http://www.invasivespeciesinfo.gov/
http://www.invasive.org/weedus/index.html
http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7434.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

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