

For the control of undesirable vegetation growing within specified aquatic sites, forestry sites, pasture/rangeland, and nonagricultural lands; and for the establishment and maintenance of wildlife openings, release of unimproved Bermudagrass and Bahiagrass, bareground weed control, and for use under certain paved surfaces

#### **Active Ingredient:**

isopropylamine salt of imazapyr: (2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-	
oxo-1 <i>H</i> -imidazol-2-yl]-3-pyridinecarboxylic acid)*	53.1%
Other Ingredients:	46.9%
Total:	100.0%
*Equivalent to 43.3% 2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-pyridinecarboxylic acid or 4 po acid per gallon	unds

#### EPA Reg. No. 241-299

EPA Est. No.

# KEEP OUT OF REACH OF CHILDREN CAUTION/PRECAUCIÓN

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

See inside booklet for complete First Aid, Precautionary Statements, Directions For Use, Conditions of Sale and Warranty, and state-specific crop and/or use site restrictions.

In case of an emergency endangering life or property involving this product, call day or night 1-800-832-HELP (4357).

**Net Contents:** 

BASF Corporation 26 Davis Drive Research Triangle Park, NC 27709



FIRST AID		
If swallowed	<ul> <li>Call a poison control center or doctor immediately for treatment advice.</li> <li>Have person sip a glass of water if able to swallow.</li> <li>DO NOT induce vomiting unless told to by a poison control center or doctor.</li> <li>DO NOT give anything by mouth to an unconscious person.</li> </ul>	
If on skin or clothing	<ul> <li>Take off contaminated clothing.</li> <li>Rinse skin immediately with plenty of water for 15 to 20 minutes.</li> <li>Call a poison control center or doctor for treatment advice.</li> </ul>	
If inhaled	<ul> <li>Move person to fresh air.</li> <li>If person is not breathing, call 911 or an ambulance; then give artificial respiration, preferably by mouth to mouth, if possible.</li> <li>Call a poison control center or doctor for further treatment advice.</li> </ul>	
If in eyes	<ul> <li>Hold eyes open and rinse slowly and gently with water for 15 to 20 minutes.</li> <li>Remove contact lenses, if present, after first 5 minutes; then continue rinsing eyes.</li> <li>Call a poison control center or doctor for treatment advice.</li> </ul>	
	HOTLINE NUMBER	

Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact BASF Corporation for emergency medical treatment information: 1-800-832-HELP (4357).

## **Precautionary Statements**

## Hazards to Humans and Domestic Animals

**CAUTION.** Harmful if swallowed. Avoid contact with skin, eyes, or clothing. Avoid breathing spray mist.

## Personal Protective Equipment (PPE)

Some materials that are chemically resistant to this product are barrier laminate, butyl rubber, or polyethylene. If you want more options, follow the instructions for **Category A** on an EPA chemical-resistance category selection chart.

## Mixers, loaders, applicators, and other handlers must wear:

- Long-sleeved shirt and long pants
- Shoes plus socks
- Chemical-resistant gloves for all mixers and loaders, plus applicators using handheld equipment

Follow manufacturer's instructions for cleaning and maintaining PPE. If no such instructions are given for washables, use detergent and hot water. Keep and wash PPE separately from other laundry. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. **DO NOT** reuse them.

## **Engineering Controls**

Pilots must use an enclosed cockpit that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(6)].

#### USER SAFETY RECOMMENDATIONS

#### Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

## **Physical and Chemical Hazards**

Spray solutions of **Arsenal® herbicide Applicators Concentrate** must be mixed, stored and applied only in stainless steel, fiberglass, plastic and plastic-lined steel containers.

Thoroughly clean application equipment, including landing gear, immediately after use of this product. Prolonged exposure of this product to uncoated steel (except stainless steel) surfaces may result in corrosion and failure of the exposed part. The maintenance of an organic coating (paint) may prevent corrosion.

## **Environmental Hazards**

This product is toxic to plants. Drift and runoff may be hazardous to plants in water adjacent to treated areas. **DO NOT** apply to water except as specified in this label. Treatment of aquatic weeds may result in oxygen depletion or loss due to decomposition of dead plants. This oxygen loss may cause the suffocation of some aquatic organisms. **DO NOT** treat more than 1/2 of the surface area of the water in a single operation and wait at least 10 to 14 days between treatments. Begin treatment along the shore and proceed outward in bands to allow aquatic organisms to move into untreated areas. **DO NOT** contaminate water when disposing of equipment washwaters or rinsate. This pesticide is toxic to vascular plants and must be used strictly in accordance with the drift precautions on the label.

## **Directions For Use**

It is a violation of federal law to use this product in a manner inconsistent with its labeling.

**Arsenal® herbicide Applicators Concentrate** must be used only in accordance with the instructions on the leaflet label attached to the container. Keep containers closed to avoid spills and contamination.

**DO NOT** apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application.

## AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

**DO NOT** enter or allow worker entry into treated areas during the restricted-entry interval (REI) of **48 hours**.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls
- Shoes plus socks
- Chemical-resistant gloves made of any waterproof
   material
- Protective eyewear

## NONAGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard (WPS) for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

**DO NOT** enter or allow others to enter treated areas until sprays have dried.

## STORAGE AND DISPOSAL

**DO NOT** contaminate water, food or feed by storage or disposal.

## **Pesticide Storage**

DO NOT store below 10° F.

## **Pesticide Disposal**

Wastes resulting from the use of this product must be disposed of on-site or at an approved waste disposal facility.

## **Container Handling**

Nonrefillable Container. DO NOT reuse or refill this container. Triple rinse or pressure rinse container (or equivalent) promptly after emptying; then offer for recycling, if available, or reconditioning, if appropriate, or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures approved by state and local authorities.

Triple rinse containers small enough to shake

**(capacity \leq 5 gallons) as follows:** Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank, or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times.

### Triple rinse containers too large to shake

(capacity > 5 gallons) as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank, or store rinsate for later use or disposal. Repeat this procedure two more times.

**Pressure rinse as follows:** Empty the remaining contents into application equipment or mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank, or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container and rinse at about 40 PSI for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

**Refillable Container.** Refill this container with pesticide only. **DO NOT** reuse this container for any other purpose. Triple rinsing the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller.

## STORAGE AND DISPOSAL (continued)

## Container Handling (continued)

**Triple rinse as follows:** To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10% full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

When this container is empty, replace the cap and seal all openings that have been opened during use; return the container to the point of purchase or to a designated location. This container must only be refilled with a pesticide product. Prior to refilling, inspect carefully for damage such as cracks, punctures, abrasions, worn-out threads and closure devices. Check for leaks after refilling and before transport. **DO NOT** transport if this container is damaged or leaking. If the container is damaged, or leaking, or obsolete and not returned to the point of purchase or to a designated location, triple rinse emptied container and offer for recycling, if available, or dispose of container in compliance with state and local regulations.

## In Case of Emergency

In case of large-scale spillage regarding this product, call:

- CHEMTREC 1-800-424-9300
- BASF Corporation 1-800-832-HELP (4357)

In case of medical emergency regarding this product, call:

- Your local doctor for immediate treatment
- Your local poison control center (hospital)
- BASF Corporation 1-800-832-HELP (4357)

## Steps to be taken in case material is released or spilled:

- Dike and contain the spill with inert material (sand, earth, etc.) and transfer liquid and solid diking material to separate containers for disposal.
- Remove contaminated clothing and wash affected skin areas with soap and water.
- Wash clothing before reuse.
- Keep the spill out of all sewers and open bodies of water.

### **Product Information**

**Arsenal® herbicide Applicators Concentrate** is an aqueous solution to be mixed with water and a surfactant and applied as a spray solution to control undesirable vegetation growing within specified aquatic sites, forestry sites, pasture/rangeland and nonagricultural lands. Aquatic sites consist of standing and flowing water, estuarine/marine, wetland, and riparian areas. Nonagricultural lands include private, public and military lands as follows: uncultivated nonagricultural areas (including airports, highway, railroad and utility rights-of-way, sewage disposal areas, etc.); uncultivated agricultural areas - noncrop producing (including farmyards, fuel storage areas, fence rows, nonirrigation ditchbanks, barrier strips, etc.); industrial sites - outdoor (including lumberyards, pipeline and tank farms, etc.); and natural areas (including wildlife management areas, wildlife openings, wildlife habitats, recreation areas, campgrounds, trailheads, and trails). **Arsenal herbicide Applicators Concentrate** may also be used for the release of unimproved Bermudagrass and Bahiagrass, for bareground weed control, and for use under certain paved surfaces.

## Herbicidal Activity

Arsenal herbicide Applicators Concentrate will control most annual and perennial grass and broadleaf weeds in addition to many brush and vine species with some residual control of undesirable species that germinate above the waterline. Arsenal herbicide Applicators Concentrate is readily absorbed through emergent leaves and stems and is translocated rapidly throughout the plant with accumulation in the meristematic regions. For maximum activity, weeds should be growing vigorously at the time of application, and the spray solution should include a surfactant (see Adjuvants section for specific use directions). Treated plants stop growing soon after spray application. Chlorosis appears first in the newest leaves, and necrosis spreads from this point. In perennials, the herbicide is translocated into, and kills, underground or submerged storage organs, which prevents regrowth. Chlorosis and tissue necrosis may not be apparent in some plant species until 2 or more weeks after application. Complete kill of plants may not occur for several weeks. Arsenal herbicide Applicators Concentrate applications are rainfast 1 hour after treatment.

## Product Use Precautions and Restrictions

Applications may be made for the control of undesirable vegetation growing within specified aquatic sites, forestry sites, pasture/rangeland and nonagricultural lands. Aquatic sites consist of standing and flowing water; estuarine/marine, wetland, and riparian areas; for control of most annual and perennial grass weeds, broadleaf weeds, vines and brambles, and hardwood brush and trees for forestry site preparation and release of conifers from woody and herbaceous competition. **Arsenal herbicide Applicators Concentrate** may be used for selective woody

Applicators Concentrate may be used for selective woody and herbaceous weed control in natural regeneration of certain conifers (see **Conifer Release Treatment**).

Nonagricultural lands include private, public and military lands as follows: uncultivated nonagricultural areas (including airports, highway, railroad and utility rights-of-way, sewage disposal areas, etc.); uncultivated agricultural areas noncrop producing (including farmyards, fuel storage areas, fence rows, nonirrigation ditchbanks, barrier strips, etc.); industrial sites - outdoor (including lumberyards, pipeline and tank farms, etc.); and natural areas (including wildlife management areas, wildlife openings, wildlife habitats, recreation areas, campgrounds, trailheads, and trails).

## **Restrictions and Limitations**

- DO NOT use on food crops.
- **DO NOT** apply this product within 1/2 mile upstream of an active potable water intake in flowing water (i.e. river, stream, etc.) or within 1/2 mile of an active potable water intake in a standing body of water, such as a lake, pond, or reservoir.
- DO NOT apply to water used for irrigation except as described in **Product Use Precautions and Restrictions** section of this label.
- Keep from contact with fertilizers, insecticides, fungicides and seeds.
- **DO NOT** drain or flush equipment on or near desirable trees or other plants, or on areas where their roots may extend, or in locations where the treated soil may be washed or moved into contact with their roots.
- **DO NOT** use on lawns, walks, driveways, tennis courts, or similar areas.
- **DO NOT** side trim desirable vegetation with this product unless severe injury and plant death can be tolerated. Prevent drift of spray to desirable plants.
- Clean application equipment after using this product by thoroughly flushing with water.

## **Nonagricultural Lands and Forestry Sites**

• DO NOT apply more than 1.5 lbs acid equivalent (ae) imazapyr (equivalent to 48 fl ozs of **Arsenal® herbicide Applicators Concentrate**) per acre per year.

## **Pasture/Rangeland Sites**

- For spot treatment only.
- **DO NOT** treat more than 1/10 of the available area to be grazed or cut for hay.
- **DO NOT** apply more than 0.75 lb ae imazapyr (equivalent to 24 fl ozs of **Arsenal herbicide Applicators Concentrate**) per acre per year.

## **Aquatic Sites**

- DO NOT apply more than 1.5 lbs ae imazapyr (equivalent to 48 fl ozs of **Arsenal herbicide Applicators Concentrate**) per acre per year.
- Public waters Application of Arsenal herbicide Applicators Concentrate to water can only be made by federal or state agencies, such as Water Management District personnel, municipal officials, and the U.S. Army Corps of Engineers, or those applicators who are licensed or certified as aquatic pest control applicators and are authorized by the state or local government. Treatment to other than non-native invasive species is limited to only those plants that have been determined to be a nuisance by a federal or state government entity.
- **Permitting** Consult local state fish and game agency and water control authorities before applying this product to public water. Permits may be required to treat such water.

- **Private waters** Applications may be made to private waters that are still, such as ponds, lakes, and drainage ditches where there is minimal or no outflow to public waters.
- Aerial application Aerial application to aquatic sites is restricted to helicopter only.
- Irrigation water Application to water used for irrigation that results in Arsenal herbicide Applicators
   Concentrate residue greater than 1.0 ppb MUST NOT be used for irrigation purposes for 120 days after application or until Arsenal herbicide Applicators Concentrate residue levels are determined by laboratory analysis or other appropriate means of analysis to be 1.0 ppb or less. When applications are made within 500 feet of an active irrigation intake, DO NOT irrigate for at least 24 hours following application to allow for dissipation.

## **Recreational Use of Water in Treatment Area**

There are no restrictions on the use of water in the treatment area for recreational purposes, including swimming and fishing.

## Livestock Use of Water in/from Treatment Area

There are no restrictions on livestock consumption of water from the treatment area.

#### Precautions for Potable Water Intakes DO NOT apply Arsenal herbicide Applicators

**Concentrate** directly to water within 1/2 mile upstream of an active potable water intake in flowing water (i.e. river, stream, etc.) or within 1/2 mile of an active potable water intake in a standing body of water such as a lake, pond, or reservoir. To make aquatic applications around and within 1/2 mile of active potable water intakes, the water intake **must** be turned off during application and for a minimum of 48 hours after the application. These aquatic applications may be made only in the cases where there are alternative water sources or holding ponds that would permit the turning off of an active potable water intake for a minimum period of 48 hours after the applications.

**NOTE:** Existing potable water intakes that are no longer in use, such as those replaced by connections to wells or a municipal water system, are not considered to be active potable water intakes. This restriction does not apply to intermittent, inadvertent overspray of water in terrestrial use sites.

## **Quiescent or Slow-moving Waters**

In lakes and reservoirs, **DO NOT** apply **Arsenal herbicide Applicators Concentrate** within one (1) mile of an active irrigation water intake during the irrigation season. Applications less than one (1) mile from an active irrigation water intake may be made during the off-season, provided that the irrigation intake will remain inactive for a minimum of 120 days after application or until **Arsenal herbicide Applicators Concentrate** residue levels are determined by

**Applicators Concentrate** residue levels are determined by laboratory analysis or other appropriate means of analysis to be 1.0 ppb or less.

## Precautions for Avoiding Injury to Nontarget Plants

Untreated desirable plants can be affected by root uptake of **Arsenal® herbicide Applicators Concentrate** from treated soil. Injury or loss of desirable plants may result if **Arsenal herbicide Applicators Concentrate** is applied on or near desirable plants, on areas where their roots extend, or in locations where the treated soil may be washed or moved into contact with their roots. When making application along shorelines where desirable plants may be present, use caution to avoid spray contact with their foliage or spray application to the soil in which they are rooted. Shoreline plants that have roots which extend into the water in an area where **Arsenal herbicide Applicators Concentrate** has been applied generally will not be adversely affected by uptake of the herbicide from the water.

If treated vegetation is to be removed from the application site, **DO NOT** use the vegetative matter as mulch or compost on or around desirable species.

## **Managing Off-target Movement**

## **Aerial Application**

- Applicators are required to use a coarse or coarser droplet size (ASABE S572) or, if specifically using a spinning atomizer nozzle, applicators are required to use a volume mean diameter (VMD) of 385 microns or greater for release heights below 10 feet. Applicators are required to use a very coarse or coarser droplet size or, if specifically using a spinning atomizer nozzle, applicators are required to use a VMD of 475 microns or greater for release heights above 10 feet. Applicators must consider the effects of nozzle orientation and flight speed when determining droplet size.
- Applicators are required to use upwind swath displacement.
- The boom length must not exceed 60% of the wingspan or 90% of the rotor blade diameter to reduce spray drift.
- Applications with wind speeds less than 3 mph and with wind speeds greater than 10 mph are prohibited.
- Applications into temperature inversions are prohibited.

## **Ground Boom Application**

- Applicators are required to use a nozzle height below 4 feet above the ground or plant canopy and coarse or coarser droplet size (ASABE S572) or, if specifically using a spinning atomizer nozzle, applicators are required to use a volume mean diameter (VMD) of 385 microns or greater.
- Applications with wind speeds greater than 10 mph are prohibited.
- Applications into temperature inversions are prohibited.

## Wind Erosion

Avoid treating powdery, dry or light sandy soils when conditions are favorable for wind erosion. Under these conditions, the soil surface should first be settled by rainfall or irrigation.

#### **Adjuvants**

Postemergence applications of **Arsenal herbicide Applicators Concentrate** require the addition of a spray adjuvant. When making aquatic applications, only spray adjuvants approved or appropriate for aquatic use must be utilized.

## **Nonionic Surfactant**

Use a nonionic surfactant (NIS) at the rate of 0.25% volume/volume (v/v) or higher (see manufacturer's label) of the spray solution (0.25% v/v is equivalent to 1 quart in 100 gallons). For best results, select a nonionic surfactant with an HLB (hydrophilic to lipophilic balance) ratio between 12 and 17 with at least 70% surfactant in the formulated product. Alcohols, fatty acids, oils, ethylene glycol or diethylene glycol should not be considered as surfactants to meet the above requirements.

# Methylated Seed Oil or Vegetable Oil Concentrate

Instead of a surfactant, a methylated seed oil (MSO) or vegetable-based seed oil concentrate may be used at the rate of 1.5 to 2 pints per acre. When using spray volumes greater than 30 gallons per acre, methylated seed oil or vegetable-based seed oil concentrates should be mixed at a rate of 1% of the total spray volume, or alternatively use a nonionic surfactant as described above. Research indicates that these oils may aid in **Arsenal herbicide Applicators Concentrate** deposition and uptake by plants under moisture or temperature stress.

## Silicone-based Surfactant

See manufacturer's label for specific rates. Silicone-based surfactants may reduce the surface tension of the spray droplet allowing greater spreading on the leaf surface as compared to conventional nonionic surfactants. However, some silicone-based surfactants may dry too quickly, limiting herbicide uptake.

## Invert Emulsions

**Arsenal herbicide Applicators Concentrate** can be applied as an invert emulsion. The spray solution results in an invert (water-in-oil) spray emulsion designed to minimize spray drift and spray runoff, resulting in more herbicide on the target foliage. The spray emulsion may be formed in a single tank (batch mixing) or injected (in-line mixing). Consult the invert chemical label for proper mixing directions.

## Other

An antifoaming agent, spray pattern indicator, or driftreducing agent may be applied at the product labeled rate if necessary or desired.

#### **Tank Mixes**

## **Arsenal® herbicide Applicators Concentrate** may be tank mixed with other herbicides.

Consult manufacturer's labels for specific rate restrictions and weeds controlled. Always follow the more restrictive label restrictions and precautions for all products used when making an application involving tank mixes.

#### **Application Methods**

Arsenal herbicide Applicators Concentrate may be selectively applied using low-volume directed application techniques or may be broadcast-applied using ground equipment, watercraft, or aircraft. Aerial applications to aquatic sites must be made by helicopter. In addition, Arsenal herbicide Applicators Concentrate may also be applied using cut-stump, cut-stem, and frill or girdle treatment techniques within nonagricultural lands, pasture/rangeland, and aquatic sites (see Aerial Application and Ground Application sections for additional details).

#### **Aerial Application**

All precautions must be taken to minimize or eliminate spray drift. Both fixed-wing aircraft and helicopters can be used to apply **Arsenal herbicide Applicators Concentrate** on nonagricultural lands, but only helicopters can be used for aquatic applications. **DO NOT** make applications by fixedwing aircraft or helicopter unless appropriate buffer zones can be maintained to prevent spray drift out of the target area, or when treating open tracts of land, spray drift as a result of fixed-wing aircraft application can be tolerated. Aerial equipment designed to minimize spray drift, such as a helicopter equipped with a **Microfoil™ boom**,

Thru-Valve<sup>™</sup> boom, or raindrop nozzles, must be used and calibrated. Except when applying with a **Microfoil** boom, a drift control agent may be added at the specified label rate. **DO NOT** side trim with **Arsenal herbicide Applicators Concentrate** unless death of treated tree can be tolerated.

Uniformly apply the specified amount of **Arsenal herbicide Applicators Concentrate** in 2 to 30 gallons of water per acre. A foam-reducing agent may be added at the specified label rate, if needed.

Thoroughly clean application equipment, including landing gear, immediately after use of this product. Prolonged exposure of this product to uncoated steel (except stainless steel) surfaces may result in corrosion and failure of the exposed part. The maintenance of an organic coating (paint) may prevent corrosion.

#### **Ground Application**

#### Foliar Application

#### Low-volume Foliar Application

Use equipment calibrated to deliver 5 to 20 gallons of spray solution per acre. To prepare the spray solution, thoroughly mix in water 0.25% to 2.50% **Arsenal herbicide Applicators Concentrate** plus surfactant (see the **Adjuvants** section of this label for specific use directions). A foam-reducing agent may be applied at the specified label rate, if needed. For control of difficult species (see **Aquatic Weeds Controlled** section and the **Terrestrial Weeds Controlled** section for relative susceptibility of weed species), use the higher concentrations of herbicide and/or spray volumes, but **DO NOT** apply more than 3 pints of **Arsenal herbicide Applicators Concentrate** per acre in aquatic sites and nonagricultural lands and 1.5 pints per acre in pasture/rangeland. Excessive wetting of foliage is not necessary.

For low-volume foliar application, select proper nozzles to avoid overapplication. Proper application is critical to ensure desirable results. Best results are achieved when the spray covers the crown and approximately 70 percent of the plant. The use of an even, flat-fan tip with a spray angle of 40 degrees or less will aid in proper deposition.

Appropriate tip sizes include 4004E or 1504E. For a straightstream and cone pattern, adjustable cone nozzles, such as 5500 X3 or 5500 X4, may be used. Attaching a rollover valve onto a Spraying Systems Model 30 gunjet or other similar spray gun allows for the use of both flat-fan and cone tips on the same gun.

Moisten, but **DO NOT** drench target vegetation causing spray solution to run off.

**Low-volume Foliar Application with Backpack.** For lowgrowing species, spray down on the crown, covering crown and penetrating approximately 70% of the plant.

For target species 4 to 8 feet tall, swipe the sides of target vegetation by directing spray to at least 2 sides of the plant in smooth vertical motions from the crown to the bottom. Make sure to cover the crown whenever possible.

For target species over 8 feet tall, lace sides of the target vegetation by directing spray to at least 2 sides of the target in smooth zigzag motions from crown to bottom.

#### Low-volume Foliar Application with Hydraulic Handgun Application Equipment. Use the same technique as described above for Low-volume Foliar Application with Backpack.

For broadcast applications, simulate a gentle rain near the top of target vegetation allowing spray to contact the crown and penetrate the target foliage without falling to the understory. Herbicide spray solution that contacts the understory may result in severe injury or death of plants in the understory.

## **High-volume Foliar Application**

For optimum performance when spraying medium-density to high-density vegetation, use equipment calibrated to deliver up to 100 gallons of spray solution per acre (GPA). Spray solutions exceeding 100 GPA may result in excessive spray runoff, causing increased ground cover injury and injury to desirable species. To prepare the spray solution, thoroughly mix Arsenal® herbicide Applicators Concentrate in water and add a surfactant (see Adjuvants section for specific use directions and rates for surfactants). A foam-reducing agent may be added at the specified label rate, if needed. For control of difficult species (see Aquatic Weeds Controlled chart and the Terrestrial Weeds Controlled section for relative susceptibility of weed species), use the higher concentrations of herbicide and/or spray volumes, but DO NOT apply more than 3 pints of Arsenal herbicide Applicators **Concentrate** per acre in aquatic sites and nonagricultural lands and 1.5 pints per acre in pasture/rangeland. Uniformly cover the foliage of the vegetation to be controlled, but **DO NOT** apply to runoff. Excessive wetting of foliage is not necessary.

## **Side Trimming**

DO NOT side trim with Arsenal herbicide Applicators Concentrate unless severe injury or death of the treated tree can be tolerated. Arsenal herbicide Applicators Concentrate is readily translocated and can result in death of the entire tree.

## **Cut-surface Treatment**

Arsenal herbicide Applicators Concentrate may be used to control undesirable woody vegetation by applying the Arsenal herbicide Applicators Concentrate solution to the cambium area of freshly cut stump surfaces or to fresh cuts on the stem of the target woody vegetation. Applications can be made at any time of the year except during periods of heavy sap flow in the spring. DO NOT overapply solution causing runoff from the cut surface.

Injury may occur to desirable woody plants if the shoots extend from the same root system or their root systems are grafted to those of the treated tree.

# Cut-surface Application with Dilute and Concentrate Solutions

**Arsenal herbicide Applicators Concentrate** may be mixed as either a concentrate or dilute solution. The dilute solution may be used for applications to the cut surface of the stump or to cuts on the stem of the target woody vegetation. Concentrate solutions may be used for applications to cuts on the stem. Use of the concentrate solution permits application to fewer cuts on the stem, especially for largediameter trees. Follow the application instructions for proper application techniques for each type of solution.

• To prepare a dilute solution, mix 4 to 6 fluid ounces of **Arsenal herbicide Applicators Concentrate** with 1 gallon of water. A surfactant or penetrating agent may improve uptake through partially callused cambiums.

• To prepare a concentrate solution, mix 1 quart of **Arsenal herbicide Applicators Concentrate** with no more than 1 pint of water.

## Cut-stump Treatment

**Dilute Solution.** Spray or brush the solution onto the cambium area of the freshly cut stump surface. Ensure that the solution thoroughly wets the entire cambium area (the wood next to the bark of the stump).

## Cut-stem Treatment (injection, hack-and-squirt)

**Dilute Solution.** Using standard injection equipment, apply 1 milliliter of solution at each injection site around the tree with no more than 1-inch intervals between cut edges. Ensure that the injector completely penetrates the bark at each injection site.

**Concentrate Solution.** Using standard injection equipment, apply 1 milliliter of solution at each injection site. Make at least 1 injection cut for every 3 inches of diameter at breast height (DBH) on the target tree. For example, a 3-inch DBH tree will receive 1 injection cut, and a 6-inch DBH tree will receive 2 injection cuts. On trees requiring more than 1 injection site, place the injection cuts at approximately equal intervals around the tree.

## Frill or Girdle Treatment

Using a hatchet, machete, or chainsaw, make cuts through the bark and completely around the tree to expose the cambium. The cut should angle downward extending into the cambium enough to expose at least 2 growth rings. Using a spray applicator or brush, apply a 12.5% to 50.0% solution of **Arsenal herbicide Applicators Concentrate** into each cut until thoroughly wet. Avoid applying so much herbicide that runoff to the ground or water occurs.

#### **Forestry Use**

#### **Site Preparation Treatment**

**Arsenal® herbicide Applicators Concentrate** may be used to control labeled grass weeds, broadleaf weeds, vines and brambles, and woody brush and trees on forest sites in advance of regeneration for the following conifer crop species:

Common Name	Scientific Name	Rate (fl ozs/A)
Loblolly pine	Pinus taeda	
Loblolly X pitch hybrid		
Longleaf pine	Pinus palustris	24 to 40
Shortleaf pine	Pinus echinata	
Virginia pine	Pinus virginiana	
Slash pine	Pinus elliottii	20 to 32
Coastal redwood	Sequoia sempervirens	
Douglas fir	Pseudotsuga menziesii	12 to 24
Western hemlock	Tsuga heterophylla	
California red fir	Abies magnifica	12 to 20
California white fir	Abies concolor	
Jack pine	Pinus banksiana	
Lodgepole pine	Pinus contorta	
Pitch pine	Pinus rigida	
Ponderosa pine	Pinus ponderosa	
Sugar pine	Pinus lambertiana	12 to 16
White pine	Pinus strobus	
Black spruce	Picea mariana	
Red spruce	Picea rubens	
White spruce	Picea glauca	

#### Use the label rate of Arsenal herbicide Applicators

**Concentrate** per acre applied as a broadcast foliar spray for long-term control of labeled woody plants and residual control of herbaceous weeds. Within 4 to 6 weeks of treatment, grass and other herbaceous weeds will be controlled and may provide fuel to facilitate a site preparation burn, if desired, to control conifers or other species tolerant to the herbicide.

Apply the label rate of **Arsenal herbicide Applicators Concentrate** per acre in 5 to 30 gallons total spray solution for helicopter applications or 5 to 100 gallons total spray solution for mechanical ground spray and backpack applications. Use a minimum of 1/2 percent by volume nonionic surfactant (NIS). Use the higher label rates of **Arsenal herbicide Applicators Concentrate** and higher spray volumes when controlling particularly dense or multilayered canopies of hardwood stands, or difficult-to-control species.

In certain cases, tank mixes may be necessary for chemical control of conifers and other species tolerant to

**Arsenal herbicide Applicators Concentrate**. Observe all precautions and restrictions on the product labels. Always follow the most restrictive label. Combinations with other

products labeled for forest site preparation may kill certain plants such as legumes and blackberry, which are desirable for wildlife habitat.

Where quick initial brownout (deadening of foliage) is desired for burning, apply a tank mixture of 16 fl ozs to 32 fl ozs **Arsenal herbicide Applicators Concentrate** with 16 ozs to 64 ozs glyphosate or 16 ozs to 48 ozs triclopyr ester per acre. For control of seedling pines, apply 16 fl ozs to 32 fl ozs **Arsenal herbicide Applicators Concentrate** with 3 to 4 quarts glyphosate. For site preparation, rates less than 24 fl ozs **Arsenal herbicide Applicators Concentrate** will provide suppression of hardwood brush and trees; some resprouting may occur.

**DO NOT** plant seedlings of black spruce (*Picea mariana*) or white spruce (*Picea glauca*) on sites that have been broadcast-treated with **Arsenal herbicide Applicators Concentrate** or into the treated zone of spot or banded applications for three months following application or injury may occur.

#### **Herbaceous Weed Control**

selective weeding in the following coniters:		
Common Name	Scientific Name	Rate (fl ozs/A)
Loblolly pine	Pinus taeda	
Loblolly X pitch hybrid		6 to 10
Virginia pine	Pinus virginiana	
Longleaf pine <sup>1</sup>	Pinus palustris	
Slash pine <sup>1</sup>	Pinus elliottii	4 to 6
Douglas fir <sup>1</sup>	Pseudotsuga menziesii	

Use **Arsenal herbicide Applicators Concentrate** for selective weeding in the following conifers:

<sup>1</sup>Use of surfactant is not recommended.

**Arsenal herbicide Applicators Concentrate** may be applied as a broadcast treatment, banded over tree rows, or as a directed spray for release of young conifers from herbaceous weeds. To prevent possibility of conifer injury,

**DO NOT** apply **Arsenal herbicide Applicators Concentrate** when conifers are under stress from drought, disease, animal or winter injury, planting shock, or other stresses reducing conifer vigor. Broadcast applications may be made by helicopter, ground, or backpack sprayer. For difficult-to-control weeds, use the higher labeled rates. Where herbaceous weeds have overtopped conifer seedlings, a nonionic surfactant may be added to improve weed control (except for slash pine, long-leaf pine, and Douglas fir), at a rate not to exceed 1/4 percent of spray solution volume. Some minor conifer growth inhibition may be observed when herbaceous weed control treatments are made during periods of active conifer growth.

Arsenal herbicide Applicators Concentrate may also be applied using backpack or handheld sprayers to control herbaceous weeds around individual conifer seedlings. Mix 0.4 fl oz to 0.6 fl oz Arsenal herbicide Applicators Concentrate and 0.2 oz nonionic surfactant per gallon of water. Direct the spray to the weeds and minimize the amount applied to conifer foliage for best conifer tolerance. Ensure that maximum labeled rates per acre for previously listed crop species are not exceeded.

**Arsenal® herbicide Applicators Concentrate** may be tank mixed with sulfometuron to broaden the spectrum of weeds controlled. For loblolly pine, apply 4 fl ozs to 6 fl ozs **Arsenal herbicide Applicators Concentrate** plus 1 oz to 2 ozs sulfometuron per acre. The application of **Arsenal herbicide Applicators Concentrate** plus sulfometuron on other conifer species may cause growth suppression.

### **Conifer Release Treatment**

**Arsenal herbicide Applicators Concentrate** may be applied as a broadcast or directed spray application for suppression of labeled brush, tree, and herbaceous weed species. Directed spray applications may be made with lowvolume applications in conifer stands of all ages by targeting the unwanted vegetation and avoiding direct application to the conifer. Ensure that maximum labeled rates per acre listed for the following crop species are not exceeded.

## Broadcast Applications for release of the following conifers from hardwood competition:

Common Name	Scientific Name	Rate (fl ozs/A)	
Loblolly pine <sup>3</sup>	Pinus taeda		
Loblolly X pitch hybrid <sup>3</sup>		12 to 20	
Virginia pine <sup>3</sup>	Pinus virginiana		
Longleaf pine	Pinus palustris		
Pitch pine	Pinus rigida	12 to 16	
Shortleaf pine	Pinus echinata		
Slash pine	Pinus elliottii		
White pine <sup>1</sup>	Pinus strobus	8 to 16	
California red fir	Abies magnifica		
California white fir	Abies concolor	8 to 12	
Lodgepole pine <sup>2</sup>	Pinus contorta	01012	
Douglas fir <sup>2</sup>	Pseudotsuga menziesii		
Jack pine <sup>2</sup>	Pinus banksiana		
Black spruce <sup>2</sup>	Picea mariana	6 to 12	
Red spruce <sup>2</sup>	Picea rubens		
White spruce <sup>2</sup>	Picea glauca		

<sup>1</sup> **DO NOT** make applications to white pine stands younger than three years old. To minimize potential white pine injury, release treatments should not be made prior to July 15.

- <sup>2</sup> Applications should be made after formation of final conifer resting buds in the fall or height growth inhibition may occur.
- <sup>3</sup> **Mid-rotation release:** For broadcast applications below the pine canopy in established stands of loblolly pine, loblolly X pitch hybrid, and Virginia pine, use 16 fl ozs to 32 fl ozs product per acre. For mid-rotation release of other species, use rates listed in chart above.

For slash pine and longleaf pine, broadcast release treatments over the top of pines for the purpose of woody plant control must be made after August 15 and only in stands 2 through 5 years old. For applications over the top of slash pine and longleaf pine, DO NOT add surfactant and use lower labeled rates on sandy soils.

Apply the label rate of **Arsenal herbicide Applicators Concentrate** per acre when making broadcast applications with helicopter or ground spray equipment. Refer to mixing and application instructions for proper spray volumes. A nonionic surfactant may be added at no more than 1/4 percent by volume.

Use the higher label rates of **Arsenal herbicide Applicators Concentrate** when controlling particularly dense stands or difficult-to-control species.

Some minor conifer growth inhibition may be observed when release treatments are made during periods of active conifer growth. To minimize potential conifer height growth inhibition, **DO NOT** make broadcast applications to conifer stands except loblolly pine before the end of the second growing season. To minimize potential conifer height growth inhibition, broadcast release treatments may be made late in the growing season. To prevent possibility of conifer injury,

**DO NOT** apply **Arsenal herbicide Applicators Concentrate** when conifers are under stress from drought, disease, animal or winter injury, or other stresses reducing conifer vigor.

**Arsenal herbicide Applicators Concentrate** may be used to release loblolly pine seedlings during the first growing season following planting or for one-year-old natural loblolly pine regeneration. For one-year-old loblolly pine release, apply 12 fl ozs to 20 fl ozs/A of **Arsenal herbicide Applicators Concentrate** after July 15. Rates below 16 fl ozs/A are intended for hardwood growth suppression; some hardwood resprouting should be expected.

## Spot Treatment of Undesirable Hardwood Vegetation

Arsenal herbicide Applicators Concentrate may be used as a directed foliar or cut-stem application to control undesirable brush and hardwoods in the management of stands of all ages for the conifer species listed in the broadcast application section above. Refer to mixing and application instructions in the directed foliar or cut-stem sections above for proper use rates, equipment, and application techniques. **DO NOT** exceed maximum labeled rates per acre listed for crop species. Cut-stem applications may be used for spot treatment of undesirable hardwoods in Ponderosa pine stands using 12 fl ozs or less of product per acre.

Avoid direct application to desired plant species or injury may occur. Injury may occur to nontarget or desirable hardwoods or conifers if they extend from the same root system, or their root systems are grafted to those of the treated tree, or their roots extend into the treated zone.

## Late Rotation Vegetation Control in Western Conifer

In California, the Pacific Northwest and Inland Northwest, broadcast aerial applications of **Arsenal herbicide Applicators Concentrate** up to 24 fl ozs/A are permissible in conifer stands that are targeted for harvesting the year following treatment. Use minimum spray volume of 15 gallons per acre. Significant conifer injury or mortality must be expected. **DO NOT** use this treatment if conifer injury or mortality cannot be tolerated.

# Bag and Spray Application for Conifer Release

In Douglas fir and Ponderosa pine stands, broadcast applications of **Arsenal® herbicide Applicators Concentrate** up to 16 fl ozs/A are permissible when the trees are covered by bags prior to the application. The bags must prevent the spray mix from contacting the conifer foliage. On sites with coarse textured soils (e.g. decomposed granite, pumice, sandy or rocky sites) or low levels of soil organic matter (generally 5% or less), significant conifer growth inhibition and mortality is possible. **DO NOT** use this treatment on these types of sites if conifer growth inhibition and mortality cannot be tolerated.

## **Nonagricultural Land Use**

Arsenal herbicide Applicators Concentrate may be used for woody and herbaceous weed control in nonagricultural lands including private, public and military lands as follows: uncultivated nonagricultural areas (including airports, highway, railroad and utility rights-of-way, sewage disposal areas, etc.); uncultivated agricultural areas - noncrop producing (including farmyards, fuel storage areas, fence rows, nonirrigation ditchbanks, barrier strips, etc.); industrial sites outdoor (including lumberyards, pipeline and tank farms, etc.); and natural areas (including wildlife management areas, wildlife openings, wildlife habitats, recreation areas, campgrounds, trailheads, and trails).

Applications to nonagricultural lands are not applicable to treatment of commercial timber or other plants being grown for sale or other commercial use, or for commercial seed production, or for research purposes.

## **Brush Control**

Use the specified rate of **Arsenal herbicide Applicators Concentrate** with the preferred application technique for the control of undesirable brush.

Tank Mixes and Application Rates for Low-volume
Foliar Brush Control*

Target Vegetation	Arsenal herbicide Applicators Concentrate Rate (by volume)	Tank Mix
Mixed hardwoods without elm, locust, or pine	0.50 to 0.75%	Surfactant
Mixed hardwoods containing elm, locust, and pine	0.25 to 0.50%	Accord <sup>®</sup> at 2% to 3% by volume plus surfactant
Mixed hardwoods with locust and pine but no elm	0.25 to 0.50%	Krenite® at 2% to 5% by volume plus surfactant
Mixed hardwoods with locust and elm but no pine 0.25 to 0.50% Escort® at 2 ozs/A or 2.3 grams/gal plus surfactant		
*Tank mixes with 2,4-D or products containing 2,4-D have resulted in reduced <b>Arsenal herbicide Applicators</b> <b>Concentrate</b> efficacy.		

#### Backpack and Handheld Spray Mixing Guide

% Solution	Product per gallon of mix (fl ozs)	Product per 4-gallon backpack (fl ozs)
0.25%	0.3	1.3
0.5%	0.6	2.6
1.0%	1.3	5.1
2.0%	2.6	10.2
3.0%	3.8	15.4
5.0%	6.4	25.6

#### **Measuring Chart**

=	1 gallon
=	1 pint
=	1 gallon
=	1 gallon
=	1 quart
	= = = =

# Selective Control of Undesirable Weeds in Unimproved Bermudagrass and Bahiagrass

**Arsenal® herbicide Applicators Concentrate** may be used on unimproved Bermudagrass and Bahiagrass turf such as roadsides, utility rights-of-way, and other nonagricultural lands. The application of **Arsenal herbicide Applicators Concentrate** on established common and

Applicators Concentrate on established common and coastal Bermudagrass and Bahiagrass provides control of labeled broadleaf and grass weeds. Competition from these weeds is eliminated, releasing the Bermudagrass and Bahiagrass. Treatment of Bermudagrass with **Arsenal** herbicide Applicators Concentrate results in a compacted growth habit and seedhead inhibition.

Uniformly apply with properly calibrated ground equipment using at least 10 gallons of water per acre.

Temporary yellowing of grass may occur when treatment is made after growth commences.

- **DO NOT** add surfactant in excess of the specified rate (1 fl oz per 25 gallons of spray solution).
- **DO NOT APPLY** to grass during its first growing season.
- **DO NOT APPLY** to grass that is under stress from drought, disease, insects, or other causes.

## **Dosage Rate and Timing**

Bermudagrass. Apply Arsenal herbicide Applicators Concentrate at 3 fl ozs to 6 fl ozs per acre when the Bermudagrass is dormant. Apply Arsenal herbicide Applicators Concentrate at 3 fl ozs to 4 fl ozs per acre after the Bermudagrass has reached full greenup. Applications made during greenup will delay greenup. Include a surfactant in the spray solution.

For additional preemergence control of annual grass and small-seeded broadleaf weeds, add **Pendulum<sup>®</sup> AquaCap<sup>™</sup> herbicide** at the rate of 3.1 to 6.3 pints per acre. Consult the **Pendulum AquaCap** label for weeds controlled and for other use directions and precautions.

For control of Johnsongrass in Bermudagrass turf, apply Arsenal herbicide Applicators Concentrate at 4 fl ozs per acre, plus Roundup<sup>®</sup> herbicide at 12 ozs per acre, plus surfactant. For additional control of broadleaves and vines, Garlon<sup>®</sup> 3A herbicide may be added to the above mix at the rate of 1 to 2 pints per acre. Observe all precautions and restrictions on the Garlon 3A and Roundup labels.

**Bahiagrass.** Apply **Arsenal herbicide Applicators Concentrate** at 2 fl ozs to 4 fl ozs per acre when the Bahiagrass is dormant or after the grass has initiated greenup but has not exceeded 25% greenup. Include a surfactant in the spray solution (see **Adjuvants** section for specific use directions for surfactants).

## Weeds Controlled in Unimproved Bermudagrass and Bahiagrass

Common Name	Scientific Name
Bedstraw*	Galium spp.
Bishopweed*	Ptilimnium capillaceum
Buttercup*	Ranunculus parviflorus
Carolina geranium	Geranium carolinianum
Fescue	<i>Festuca</i> spp.
Foxtail	Setaria spp.
Little barley	Hordeum pusillum
Seedling Johnsongrass	Sorghum halepense
White clover	Trifolium repens
Wild carrot	Daucus carota
Yellow woodsorrel	Oxalis stricta

\*Use not permitted in California unless otherwise directed by supplemental labeling.

## Grass Growth and Seedhead Suppression

**Arsenal herbicide Applicators Concentrate** may be used to suppress growth and seedhead development of certain turfgrass in unimproved areas. When **Arsenal herbicide Applicators Concentrate** is applied to desirable turf, it may result in temporary turf damage and/or discoloration. Effects to the desirable turf may vary with environmental conditions. For optimum performance, application should be made prior to culm elongation. Applications may be made before or after mowing. If applied prior to mowing, allow at least 3 days of active growth before mowing. If applied following a mowing, allow sufficient time for the grasses to recover before applying this product or injury may be amplified.

**DO NOT APPLY** to turf under stress (drought, cold, insect damaged, etc.) or severe injury or death may occur.

**Bermudagrass.** Apply **Arsenal herbicide Applicators Concentrate** at 3 fl ozs to 4 fl ozs per acre from early greenup to prior to seedhead initiation. **DO NOT** add a surfactant for this application.

Cool-season Unimproved Turf. Apply Arsenal herbicide Applicators Concentrate at 1 fl ozs per acre plus 0.25% nonionic surfactant. For increased suppression, Arsenal herbicide Applicators Concentrate may be tank mixed with such products as Campaign® herbicide (24 ozs per acre) or Embark® growth regulator (8 ozs per acre). Tank mixes may increase injury to desired turf. Consult each product label for labeled turf species and other use directions and precautions. Tank mixes with 2,4-D or products containing 2,4-D may decrease the effectiveness of Arsenal herbicide Applicators Concentrate.

# Total Vegetation Control where Bare Ground is Desired

**Arsenal® herbicide Applicators Concentrate** is an effective herbicide for preemergence or postemergence control of many annual and perennial broadleaf and grass weeds where bare ground is desired. **Arsenal herbicide Applicators Concentrate** is particularly effective on hard-

to-control perennial grasses. **Arsenal herbicide** 

**Applicators Concentrate** at 0.75 to 3 pints per acre can be used alone or in tank mix with herbicides approved for use in bare ground. The degree and duration of control are dependent on the rate of **Arsenal herbicide Applicators Concentrate** used, tank mix partner, the volume of carrier, soil texture, rainfall, and other conditions.

Consult manufacturer's labels for specific rates and weeds controlled. Always follow the more restrictive label restrictions and precautions for all products used when making an application involving tank mixes.

#### Applications of Arsenal herbicide Applicators

**Concentrate** may be made any time of the year. Use equipment calibrated to deliver desired gallons per acre spray volume and uniformly distribute the spray pattern over the treated area.

Postemergence Application. Always use a spray adjuvant (see Adjuvants section of this label) when making a postemergence application. For optimum performance on tough-to-control annual grass weeds, apply at a total volume of 100 gallons per acre or less. For quicker burndown or brownout of target weeds, Arsenal herbicide Applicators Concentrate may be tank mixed with Roundup<sup>®</sup> herbicide. Tank mixes with 2,4-D or products containing 2,4-D may reduce the performance of Arsenal herbicide Applicators Concentrate. Always follow the more restrictive label restrictions and precautions for all products used when tank mixing.

#### Spot Treatment. Arsenal herbicide Applicators

**Concentrate** may be used as a follow-up treatment to control escapes or weed encroachment in a bareground situation. To prepare the spray solution, thoroughly mix in each gallon of water 0.25% to 2.5% **Arsenal herbicide Applicators Concentrate** plus an adjuvant. For increased

burndown, include **Roundup** as a tank mixture. For added residual weed control or to increase the weed spectrum, add **Pendulum<sup>®</sup> AquaCap<sup>™</sup> herbicide**, **Overdrive<sup>®</sup> herbicide**, or diuron. Always follow the more restrictive label restrictions and precautions for all products used when tank mixing.

## Control of Undesirable Weeds under Paved Surfaces

Arsenal herbicide Applicators Concentrate can be used under asphalt, pond liners and other paved areas, **ONLY** in industrial sites or where the pavement has a suitable barrier along the perimeter that prevents encroachment of roots of desirable plants.

Use Arsenal herbicide Applicators Concentrate only where the area to be treated has been prepared according to good construction practices. If rhizomes, stolons, tubers or other vegetative plant parts are present in the site, remove them by scalping with a grader blade to a depth sufficient to ensure their complete removal.

Follow **Arsenal herbicide Applicators Concentrate** applications with paving as soon as possible. **DO NOT** apply where the chemical may contact the roots of desirable trees or other plants.

This product is not to be used under pavement on residential properties, such as driveways or parking lots, or for use in recreational areas, such as under bike or jogging paths, golf cart paths, or tennis courts, or where landscape plantings could be anticipated.

Injury or death of desirable plants may result if this product is applied where roots are present or where roots may extend into the treated area. Roots of trees and shrubs may extend a considerable distance beyond the branch extremities (drip line).

Apply to the soil surface only when final grade is established. **DO NOT** move soil following **Arsenal herbicide Applicators Concentrate application**.

Apply **Arsenal herbicide Applicators Concentrate** in sufficient water (at least 100 gals per acre) to ensure thorough and uniform wetting of the soil surface, including the shoulder areas. Add **Arsenal herbicide Applicators Concentrate** at a rate of 3 pints per acre (0.5 fluid ounce per 1000 square feet) to clean water in the spray tank during the filling operation. Agitate before spraying.

If the soil is not moist prior to treatment, incorporation of **Arsenal herbicide Applicators Concentrate** is needed for herbicide activation. Incorporate **Arsenal herbicide Applicators Concentrate** into the soil to a depth of 4 to 6 inches using a rototiller or disc. Rainfall or irrigation of 1 inch will also provide uniform incorporation. **DO NOT** allow treated soil to wash or move into untreated areas.

## Spot Treatment and Crack-and-crevice Treatment

Use **Arsenal herbicide Applicators Concentrate** as an initial or follow-up treatment to control weed escapes or weed encroachment in a bareground situation, including cracks and crevices in paved surfaces such as roadways, runways, and parking areas.

## Grass Pasture and Rangeland Spot Treatment Weed Control

For the control of undesirable vegetation in grass pasture and rangeland, **Arsenal herbicide Applicators** 

**Concentrate** may be applied as a spot treatment at a rate of 1 to 24 fluid ounces of product per treated acre using any of the described ground application methods. Spot applications to grass pasture and rangeland may not exceed more than 1/10 of the area to be grazed or cut for hay. See appropriate sections of this label for specific use directions for the application method and vegetation control desired. **DO NOT** apply more than 24 fluid ounces per acre per year.

## **Grazing and Haying Restrictions**

- There are no grazing restrictions following **Arsenal**<sup>®</sup> herbicide Applicators Concentrate application.
- DO NOT cut forage grass for hay for 7 days after Arsenal herbicide Applicators Concentrate application.

## **Rangeland Use Instructions**

**Arsenal herbicide Applicators Concentrate** may be applied to rangeland for the control of undesirable vegetation to achieve one or more of the following vegetation management objectives:

- Control of undesirable (nonnative, invasive and noxious) plant species
- Control of undesirable vegetation to aid in the establishment of desirable rangeland plant species
- Control of undesirable vegetation to aid in the establishment of desirable rangeland vegetation following a fire
- Control of undesirable vegetation to reduce wildfire fuel
- Release of existing desirable rangeland plant communities from the competitive pressure of undesirable plant species
- Control of undesirable vegetation for wildlife habitat improvement

To ensure the protection of threatened and endangered plants when applying **Arsenal herbicide Applicators Concentrate** to rangeland:

- Federal agencies must follow NEPA regulations to ensure protection of threatened and endangered plants.
- State agencies must work with the Fish and Wildlife Service or the Service's designated state conservation agency to ensure protection of threatened and endangered plants.
- Other organizations or individuals must operate under a habitat conservation plan if threatened or endangered plants are known to be present on the land to be treated.

See the appropriate section(s) of this label for specific use directions for the desired rangeland vegetation management objective.

Arsenal herbicide Applicators Concentrate must only be applied to a given rangeland acre as specific weed problems arise. Long-term control of undesirable weed species ultimately depends on the successful use of land management practices that promote the growth and sustainability of desirable rangeland plant species.

## **Rotational Crop Instructions**

Rotational crops may be planted 12 months after applying **Arsenal herbicide Applicators Concentrate** at the specified pasture and rangeland rate. Following 12 months after an **Arsenal herbicide Applicators Concentrate** application and before planting any crop, a successful field bioassay must be completed. The field bioassay consists of a test strip of the intended rotational crop planted in the previously treated area in the grass pasture/rangeland and grown to maturity. The test strip should include low areas and knolls and include variations in soil type and pH within the treated area. If no crop injury is evident in the test strip, the intended rotational crop may be planted the following year.

Use of **Arsenal herbicide Applicators Concentrate** in accordance with label directions is expected to result in normal growth of rotational crops in most situations; however, various environmental and agronomic factors make it impossible to eliminate all risks associated with the use of this product and, therefore, rotational crop injury is always possible.

## **Aquatic Weed Control**

Arsenal herbicide Applicators Concentrate may be applied for the control of floating and emergent undesirable vegetation (see the Aquatic Weeds Controlled and the Terrestrial Weeds Controlled section) in or near bodies of water that may be flowing, nonflowing, or transient. Arsenal herbicide Applicators Concentrate may be applied to aquatic sites that include lakes, rivers, streams, ponds, seeps, drainage ditches, canals, reservoirs, swamps, bogs, marshes, estuaries, bays, brackish water, transitional areas between terrestrial and aquatic sites, riparian sites, and seasonal wet areas. See Product Use Precautions and Restrictions section of this label for precautions, restrictions, and instructions on aquatic uses.

Read and observe the following directions if aquatic sites are present in nonagricultural lands and are part of the intended treatment area.

Arsenal herbicide Applicators Concentrate must be applied to the emergent foliage of the target vegetation and has little-to-no activity on submerged aquatic vegetation. Arsenal herbicide Applicators Concentrate concentrations resulting from direct application to water are not expected to be of sufficient concentration nor duration to provide control of target vegetation. Application should be made in such a way as to maximize spray interception by the target vegetation while minimizing the amount of overspray that enters the water.

Arsenal herbicide Applicators Concentrate does not control plants that are completely submerged or have a majority of their foliage under water.

**Arsenal herbicide Applicators Concentrate** may be applied with surface or helicopter application equipment in a minimum of 2 gallons of water per acre. When applying by helicopter, follow directions under the **Aerial Application** section of this label; otherwise, refer to the **Ground Application** section when using surface equipment.

Applications to moving bodies of water should be made while traveling upstream to prevent concentration of this herbicide in water. **DO NOT** apply to bodies of water or portions of bodies of water where emergent and/or floating weeds do not exist. When application is to be made to target vegetation that covers a large percentage of the surface area of impounded water, treating the area in strips may avoid oxygen depletion due to decaying vegetation. Oxygen depletion may result in the suffocation of some sensitive aquatic organisms. If oxygen depletion is a concern, treat no more than 1/2 of the surface area of the water in a single operation and wait at least 10 to 14 days between treatments. Begin treatment along the shore and proceed outward in bands to allow aquatic organisms to move into untreated areas.

Avoid washoff of sprayed foliage by spray boat or recreational boat backwash for 1 hour after application.

Apply **Arsenal® herbicide Applicators Concentrate** at 1 to 3 pints per acre depending on species present and weed density. **DO NOT** exceed the maximum label rate of 3 pints per acre (1.5 lbs ae/A) per year. Use the higher labeled rates for heavy weed pressure. Consult the **Aquatic Weeds Controlled** section and the **Terrestrial Weeds Controlled** section of this label for specific rates.

Arsenal herbicide Applicators Concentrate may be applied as a draw-down treatment in areas described above. Apply Arsenal herbicide Applicators Concentrate to weeds after water has been drained and allow 14 days before reintroduction of water.

## **Aquatic Weeds Controlled**

Arsenal<sup>®</sup> herbicide Applicators Concentrate will control the following target species as specified in the Use Rates and Application Directions column of the table. Rates are expressed in terms of product volume for broadcast applications and as a % solution for directed applications including spot treatments. For % solution applications, DO NOT apply more than the equivalent of 3 pints of Arsenal herbicide Applicators Concentrate per acre.

Common Name	Scientific Name	Use Rates and Application Directions
Floating		
*Floating heart	<i>Nymphodes</i> spp.	1 to 2 pints/A (0.25 to 0.50% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Frogbit	Limnobium spongia	0.5 to 1.0 pint/A (0.25% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Spatterdock	Nuphar luteum	Apply a tank mix of 1 to 2 pints/A <b>Arsenal herbicide</b> <b>Applicators Concentrate</b> + 4 to 6 pints/A glyphosate (0.25% <b>Arsenal herbicide Applicators Concentrate</b> + 1.5% glyphosate) in 100 GPA water for best control. Ensure 100% coverage of actively growing emergent foliage.
*Water hyacinth	Eichhornia crassipes	0.5 to 1.0 pint/A (0.25% solution) applied in 100 GPA water to actively growing foliage.
*Water lettuce	Pistia stratiotes	0.5 to 1.0 pint/A (0.25% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
Emerged		
*Alligatorweed	Alternanthera philoxeroides	0.5 to 2.0 pints/A (0.25% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Arrowhead, duck-potato	<i>Sagittaria</i> spp.	0.5 to 1.0 pint/A (0.25% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Bacopa, lemon	<i>Bacopa</i> spp.	0.5 to 1.0 pint/A (0.25% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Parrot feather	Myriophyllum aquaticum	Must be foliage above water for sufficient <b>Arsenal</b> <b>herbicide Applicators Concentrate</b> uptake. Apply 1 to 2 pints/A to actively growing emergent foliage.
*Pennywort	Hydrocotyle spp.	0.5 to 1.0 pint/A (0.25% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Pickerelweed	Pontederia cordata	1.0 to 1.5 pints/A (0.5% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Taro, wild Dasheen Elephant's ear Coco yam	Colocasia esculentum	2 to 3 pints/A (0.75% solution) applied in 100 GPA with a high quality sticker adjuvant. Ensure good coverage of actively growing emergent foliage.

\*Use not permitted in California unless otherwise directed by supplemental labeling.

## Aquatic Weeds Controlled (continued)

Common Name	Scientific Name	Use Rates and Application Directions
Emerged (continued)		
*Water chestnut	Trappa natans	2 to 3 pints/A (0.75% solution) applied in 100 GPA with a high quality sticker adjuvant. Ensure good coverage of actively growing emergent foliage.
*Water lily	Nymphaea odorata	1.0 to 1.5 pints/A (0.5% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Water primrose	Ludwigia uruguayensis	2 to 3 pints/A (0.75% solution). Ensure 100% coverage of actively growing emergent foliage.
Terrestrial/Marginal		
*Soda apple, Aquatic nightshade	Solanum tampicense	1 pint/A applied to foliage
*Bamboo, Japanese	Phyllostachys spp.	1.5 to 2.0 pints/A applied to the foliage when plant is actively growing; before setting seedhead. More foliage will result in greater herbicide uptake, resulting in greater root kill.
Beach, vitex	Vitex rotundifolia	2.5% solution + 1% MSO foliar spray. 8.5% solution stem injection (hack and squirt)
Brazilian pepper Christmasberry	Schinus terebinthifolius	1 to 2 pints/A applied to foliage
Cattail	<i>Typha</i> spp.	1 to 2 pints/A (0.5% solution) applied to actively growing green foliage after full leaf elongation. Lower rates will control cattail in the North; higher rates are needed in the South.
Chinese tallow tree	Sapium sebiferum	8 to 12 fl ozs/A applied to foliage
Cogongrass	Imperata cylindrica	Burn foliage, till area; then fall-spray 1 quart/A <b>Arsenal®</b> herbicide Applicators Concentrate + MSO applied to new growth.
Cordgrass, prairie	Spartina spp.	2 to 3 pints/A applied to actively growing foliage
*Cutgrass	Zizaniopsis miliacea	2 to 3 pints/A applied to actively growing foliage
*Elephant grass Napier grass	Pennisetum purpureum	1.5 pints/A applied to actively growing foliage
*Flowering rush	Butomus umbellatus L.	1.0 to 1.5 pints/A applied to actively growing foliage
Giant reed Wild cane	Arundo donax	2 to 3 pints/A applied in spring to actively growing foliage
*Golden bamboo	Phyllostachys aurea	1.5 to 2.0 pints/A applied to foliage when plant is actively growing; before setting seedhead. More foliage will result in greater herbicide uptake, resulting in greater root kill.
Junglerice	Echinochloa colonum	1.5 to 2.0 pints/A applied to actively growing foliage
Knapweed	Centaurea spp.	Russian knapweed: 1.0 to 1.5 pints + 1 quart/A MSO fall- applied after senescence begins
Knotweed, Japanese	Polygonum cuspidatum Fallopia japonica	1.5 to 2.0 pints/A applied postemergence to actively grow- ing foliage

\*Use not permitted in California unless otherwise directed by supplemental labeling.

Common Name	Scientific Name	Use Rates and Application Directions
Terrestrial/Marginal (con	tinued)	
Melaleuca Paperbark tree	Melaleuca quinquenervia	For established stands, apply 3 pints/A Arsenal® herbicide Applicators Concentrate + 6 pints/A glyphosate + spray adjuvant. For best results, use 4 quarts/A methylated seed oil as an adjuvant.
		<b>For ground foliar application</b> , uniformly apply to ensure 100% coverage.
		For broadcast foliar control, apply aerially in a minimum of 2 passes at 10 gallons/A applied cross treatment.
		For spot treatment, use a 12.5% Arsenal herbicide Applicators Concentrate + 12.5% solution of glyphosate + 1.25% MSO in water applied as a frill or stump treatment.
*Nutgrass Kili'p'opu	Cyperus rotundus	1 pint <b>Arsenal herbicide Applicators Concentrate</b> + 1 quart/A MSO applied early postemergence
*Nutsedge	<i>Cyperus</i> spp.	1.0 to 1.5 pints postemergence to foliage or preemergence incorporated, nonincorporated, preemergence applications will not control.
Phragmites Common reed	Phragmites australis	2 to 3 pints/A applied to actively growing green foliage after full leaf elongation. Ensure 100% coverage. If stand has a substantial amount of old stem tissue, mow or burn, allow to regrow to approximately 5 feet tall before treatment. Lower rates will control phragmites in the North; higher rates are needed in the South.
*Poison hemlock	Conium maculatum	1 pint <b>Arsenal herbicide Applicators Concentrate</b> + 1 quart/A MSO applied preemergence to early postemer- gence to rosette prior to flowering
Purple loosestrife	Lythrum salicaria	0.5 pint/A applied to actively growing foliage
Reed canarygrass	Phalaris arundinacea	1.5 to 2.0 pints/A applied to actively growing foliage
Rose, swamp	Rosa palustris	1.0 to 1.5 pints/A applied to actively growing foliage
Russian olive	Elaeagnus angustifolia	1 to 2 pints/A or a 0.5% solution applied to foliage
Saltcedar Tamarisk	Tamarix spp.	Aerial apply 1 quart <b>Arsenal herbicide Applicators</b> <b>Concentrate</b> + 0.25% v/v NIS applied to actively growing foliage during flowering. For spot spraying, use 0.5% solu- tion of <b>Arsenal herbicide Applicators Concentrate</b> + 0.25% v/v NIS and spray to wet foliage. After application, wait at least 2 years before disturbing treated saltcedar. Earlier disturbance can reduce overall control.
Smartweed	Polygonum spp.	1 pint/A applied early postemergence
Sumac	Rhus spp.	1.0 to 1.5 pints/A applied to foliage
Swamp morningglory Water spinach Kangkong	lpomoea aquatica	0.5 to 1.0 pint/A <b>Arsenal herbicide Applicators</b> <b>Concentrate</b> + 1 quart/A MSO applied early post- emergence

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## Aquatic Weeds Controlled (continued)

Common Name	Scientific Name	Use Rates and Application Directions
Terrestrial/Marginal (d	continued)	
Torpedo grass	Panicum repens	2 pints/A (0.50 to 0.75% solution); ensure good coverage to actively growing foliage.
*White top Hoary cress	Cardaria draba	0.5 to 1.0 pint/A applied in spring to foliage during flowering
Willow	<i>Salix</i> spp.	1.0 to 1.5 pints/A <b>Arsenal® herbicide Applicators</b> <b>Concentrate</b> applied to actively growing foliage. Ensure good coverage.

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## **Terrestrial Weeds Controlled**

In terrestrial sites, **Arsenal® herbicide Applicators Concentrate** will provide preemergence or postemergence control with residual control of the following target vegetation species at the rates listed. Residual control refers to control of newly germinating seedlings in both annuals and perennials. In general, annual weeds may be controlled by preemergence or postemergence applications of **Arsenal herbicide Applicators Concentrate**. For established biennials and perennials, postemergence applications of **Arsenal** herbicide **Applicators Concentrate will provide the best** control.

The rates shown below pertain to broadcast applications and indicate the relative sensitivity of these weeds. The relative sensitivity should be referenced when preparing low-volume spray solutions (see **Low-volume Foliar Application** sections of **Ground Application**); low-volume applications may provide control of the target species with less **Arsenal herbicide Applicators Concentrate** per acre than is shown for the broadcast treatments. Use **Arsenal herbicide Applicators Concentrate** only in accordance with the specific use directions on this label and the leaflet label.

The relative sensitivity of the species listed following can also be used to determine the relative risk of causing nontarget plant injury if any of the species listed following are considered to be desirable within the area to be treated.

**Resistant Biotypes.** Naturally occurring biotypes (a plant within a given species that has a slightly different but distinct genetic makeup from other plants of the same species) of some weeds listed on this label may not be effectively controlled. If naturally occurring, resistant biotypes are present in an area, **Arsenal herbicide Applicators Concentrate** should be tank mixed or applied sequentially with an appropriate registered herbicide having a different mode of action to ensure control.

Grass Weeds		
Common Name	Scientific Name	Growth Habit <sup>2</sup>
Ар	oly 1.0 to 1.5 pts/A1	
Annual bluegrass	Poa annua	А
Broadleaf signalgrass	Brachiaria platyphylla	А
Canada bluegrass	Poa compressa	Р
Downy brome	Bromus tectorum	А
Fescue	Festuca spp.	A/P
Foxtail	Setaria spp.	А
Italian ryegrass	Lolium multiflorum	А
Johnsongrass <sup>4</sup>	Sorghum halepense	Р
Kentucky bluegrass	Poa pratensis	Р
Napier grass⁵	Pennisetum purpureum	Р
Orchardgrass	Dactylis glomerata	Р
Paragrass	Brachiaria mutica	Р
Quackgrass	Agropyron repens	Р

Grass Weeds (continued)

Growth

Common Name	Scientific Name	Habit <sup>2</sup>
Apply	1.0 to 1.5 pts/A <sup>1</sup> (continued)	
Sandbur	<i>Cenchrus</i> spp.	А
Smooth brome	Bromus inermis	Р
Vaseygrass	Paspalum urvillei	Р
Wild oats	Avena fatua	А
Witchgrass	Panicum capillare	А

Ар	ply 1.5 to 2.0 pts/A <sup>1</sup>	
Barnyardgrass	Echinochloa crus-galli	А
Beardgrass	Andropogon spp.	Р
Bluegrass, annual	Poa annua	А
Bulrush⁵	Scirpus validus	Р
Cogongrass	Imperata cylindrica	Р
Cheat	Bromus secalinus	А
Crabgrass	<i>Digitaria</i> spp.	А
Crowfootgrass	Dactyloctenium aegyptium	А
Fall panicum	Panicum dichotomiflorum	А
Goosegrass	Eleusine indica	А
Itchgrass	Rottboellia exaltata	А
Lovegrass <sup>4</sup>	<i>Eragrostis</i> spp.	Р
Maidencane⁵	Panicum hemitomon	А
Panicum, browntop	Panicum fasciculatum	А
Panicum, Texas	Panicum texanum	А
Prairie threeawn	Aristida oligantha	Р
Sandbur, field	Cenchrus incertus	А
Signalgrass	Brachiaria platyphylla	А
Wild barley	Hordeum spp.	А
Woolly cupgrass	Eriochloa villosa	А

#### Apply 2 to 3 pts/A<sup>1</sup>

Paspalum notatum	Р
Cynodon dactylon	Р
Andropogon gerardii	Р
Paspalum dilatatum	Р
Pennisetum villosum	Р
Panicum maximum	Р
Distichlis stricta	Р
Sporobolus cryptandrus	Р
Leptochloa spp.	А
Phleum pratense	Р
Muhlenbergia frondosa	Р
	Cynodon dactylon Andropogon gerardii Paspalum dilatatum Pennisetum villosum Panicum maximum Distichlis stricta Sporobolus cryptandrus Leptochloa spp. Phleum pratense

<sup>1</sup>Use higher rates where heavy or well-established infestations occur.

<sup>2</sup>Growth Habit: A = Annual, B = Biennial, P = Perennial

<sup>3</sup>Use a minimum of 75 GPA.

<sup>4</sup>Use higher labeled rates.

<sup>5</sup>Use not permitted in California unless otherwise directed by supplemental labeling.

Common Name	Scientific Name	Growth Habit <sup>2</sup>
Ар	ply 1.0 to 1.5 pts/A <sup>1</sup>	
Burdock	Arctium spp.	В
Carolina geranium	Geranium carolinianum	А
Carpetweed	Mollugo verticillata	А
Clover	Trifolium spp.	A/P
Common chickweed	Stellaria media	А
Common ragweed	Ambrosia artemisiifolia	А
Dandelion	Taraxacum officinale	Р
Dogfennel	Eupatorium capillifolium	А
Filaree	Erodium spp.	А
Fleabane	Erigeron spp.	А
Hoary vervain	Verbena stricta	Р
Indian mustard	Brassica juncea	А
Kochia	Kochia scoparia	А
Lambsquarters	Chenopodium album	А
Lespedeza <sup>3</sup>	Lespedeza spp.	Р
Miner's lettuce	Montia perfoliata	А
Mullein	Verbascum spp.	В
Nettleleaf goosefoot	Chenopodium murale	А
Oxeye daisy	Chrysanthemum leucanthemum	Р
Pepperweed	Lepidium spp.	А
Pigweed	Amaranthus spp.	А
Puncturevine	Tribulus terrestris	А
Russian thistle	Salsola kali	А
Smartweed	Polygonum spp.	A/P
Sorrell	Rumex spp.	Р
Sunflower	Helianthus spp.	А
Sweet clover	Melilotus spp.	A/B
Tansymustard	Descurainia pinnata	А
Western ragweed	Ambrosia psilostachya	Р
Wild carrot	Daucus carota	В
Wild lettuce	Lactuca spp.	A/B
Wild parsnip	Pastinaca sativa	В
Wild turnip	Brassica campestris	В
Woollyleaf bursage	Franseria tomentosa	Р
Yellow woodsorrel	Oxalis stricta	Р

#### Apply 1.5 to 2.0 pts/A<sup>1</sup>

Ab	ply 1.5 to 2.0 pts/A	
Broom snakeweed <sup>4</sup>	Gutierrezia sarothrae	Р
Bull thistle	Cirsium vulgare	В
Burclover	Medicago spp.	А
Chickweed, mouseea	r Cerastium vulgatum	А
Clover, hop	Trifolium procumbens	А
Cocklebur	Xanthium strumarium	А
Cudweed	Gnaphalium spp.	А
Desert camelthorn	Alhagi pseudalhagi	Р
Dock	Rumex spp.	Р
Fiddleneck	Amsinckia intermedia	А
Goldenrod	<i>Solidago</i> spp.	Р
Henbit	Lamium amplexicaule	А
Knotweed, prostrate	Polygonum aviculare	A/P

Growth **Scientific Name Common Name** Habit<sup>2</sup> Apply 1.5 to 2.0 pts/A<sup>1</sup> (continued) Pokeweed Phytolacca americana Ρ Purslane Portulaca spp. А Pusley, Florida Richardia scabra А Rocket, London Α Sisymbrium irio Rush skeletonweed<sup>4</sup> Chondrilla juncea В Saltbush Atriplex spp. А Shepherdspurse Capsella bursa-pastoris А А Spurge, annual Euphorbia spp. Ρ Stinging nettle<sup>4</sup> Urtica dioica Velvetleaf Abutilon theophrasti А Yellow starthistle Centaurea solstitialis А

Broadleaf Weeds (continued)

#### Apply 2 to 3 pts/A<sup>1</sup>

Arrowwood	Pluchea sericea	А
Canada thistle	Cirsium arvense	Р
Giant ragweed	Ambrosia trifida	А
Gray rabbitbrush	Chrysothamnus nauseosus	Р
Little mallow	Malva parviflora	В
Milkweed	Asclepias spp.	Р
Primrose	Oenothera kunthiana	Р
Silverleaf nightshade	Solanum elaeagnifolium	Р
Sowthistle	Sonchus spp.	А
Texas thistle	Cirsium texanum	Р

<sup>1</sup>Use higher rates where heavy or well-established infestations occur.

<sup>2</sup>Growth Habit: A = Annual, B = Biennial, P = Perennial

<sup>3</sup>Use not permitted in California unless otherwise directed by supplemental labeling.

<sup>4</sup> For best results, early postemergence applications are required.

Common Name	es and Brambles Scientific Name	Growth Habit <sup>2</sup>
	Apply 0.5 pt/A	
Field bindweed	Convolvulus arvensis	Р
Hedge bindweed	Calystegia sepium	А
Ар	ply 1.0 to 1.5 pts/A <sup>1</sup>	
Wild buckwheat	Polygonum convolvulus	Р
Ар	ply 1.5 to 2.0 pts/A <sup>1</sup>	
Greenbriar	Smilax spp.	Р
Honeysuckle <sup>3</sup>	Lonicera spp.	Р
Morningglory	<i>Ipomoea</i> spp.	A/P
Poison ivy	Rhus radicans	Р
Redvine	Brunnichia cirrhosa	Р
Wild rose <sup>3</sup>	Rosa spp.	Р
including:		
Multiflora rose	Rosa multiflora	Р
Macartney rose	Rosa bracteata	Р
ŀ	Apply 2 to 3 pts/A <sup>1</sup>	
Trumpetcreeper	Campsis radicans	Р
Virginia creeper	Parthenocissus quinquef	olia P
<sup>1</sup> Use higher rate where <sup>2</sup> Growth Habit: A = Ann <sup>3</sup> Use higher labeled rate	_	
<sup>1</sup> Use higher rate where <sup>2</sup> Growth Habit: A = Anr <sup>3</sup> Use higher labeled rate	heavy or well-established infe iual, B = Biennial, P = Perenn es. Brush Species	stations oc ial Growth
<sup>1</sup> Use higher rate where <sup>2</sup> Growth Habit: A = Anr <sup>3</sup> Use higher labeled rate <b>Common Name</b>	heavy or well-established infe iual, B = Biennial, P = Perenn es. Brush Species Scientific Name	stations oc ial
<sup>2</sup> Growth Habit: A = Anr <sup>3</sup> Use higher labeled rate Common Name	heavy or well-established infe iual, B = Biennial, P = Perenn es. Brush Species Scientific Name Apply 1 to 2 pts/A <sup>1</sup>	stations oc ial Growth Habit <sup>2</sup>
<sup>1</sup> Use higher rate where <sup>2</sup> Growth Habit: A = Ann <sup>3</sup> Use higher labeled rate <b>Common Name</b> Brazilian peppertree	heavy or well-established infe ual, B = Biennial, P = Perenn es. Brush Species Scientific Name Apply 1 to 2 pts/A <sup>1</sup> Schinus terebinthifolius	Growth Habit <sup>2</sup>
<sup>1</sup> Use higher rate where <sup>2</sup> Growth Habit: A = Ann <sup>3</sup> Use higher labeled rate <b>Common Name</b> Brazilian peppertree Chinese tallow tree	heavy or well-established infe iual, B = Biennial, P = Perenn es. Brush Species Scientific Name Apply 1 to 2 pts/A <sup>1</sup>	stations oc ial Growth Habit <sup>2</sup>
<sup>1</sup> Use higher rate where <sup>2</sup> Growth Habit: A = Ann <sup>3</sup> Use higher labeled rate <b>Common Name</b> Brazilian peppertree Chinese tallow tree Popcorn tree	heavy or well-established infe iual, B = Biennial, P = Perenn es. Brush Species Scientific Name Apply 1 to 2 pts/A <sup>1</sup> Schinus terebinthifolius Sapium sebiferum	Growth Habit <sup>2</sup>
<sup>1</sup> Use higher rate where <sup>2</sup> Growth Habit: A = Ann <sup>3</sup> Use higher labeled rate <b>Common Name</b> Brazilian peppertree Chinese tallow tree Popcorn tree Russian olive	heavy or well-established infe ual, B = Biennial, P = Perenn as. Brush Species Scientific Name Apply 1 to 2 pts/A <sup>1</sup> Schinus terebinthifolius Sapium sebiferum Elaeagnus angustifolia	Growth Habit <sup>2</sup>
<sup>1</sup> Use higher rate where <sup>2</sup> Growth Habit: A = Ann <sup>3</sup> Use higher labeled rate <b>Common Name</b> <b>B</b> razilian peppertree Chinese tallow tree Popcorn tree Russian olive Sumac	heavy or well-established infe ual, B = Biennial, P = Perenn es. Brush Species Scientific Name Apply 1 to 2 pts/A <sup>1</sup> Schinus terebinthifolius Sapium sebiferum Elaeagnus angustifolia Rhus spp.	Growth Habit <sup>2</sup>
<sup>1</sup> Use higher rate where <sup>2</sup> Growth Habit: A = Ann <sup>3</sup> Use higher labeled rate <b>Common Name</b> <b>B</b> razilian peppertree Chinese tallow tree Popcorn tree Russian olive Sumac	heavy or well-established infe ual, B = Biennial, P = Perenn as. Brush Species Scientific Name Apply 1 to 2 pts/A <sup>1</sup> Schinus terebinthifolius Sapium sebiferum Elaeagnus angustifolia	Growth Habit <sup>2</sup>
<sup>1</sup> Use higher rate where <sup>2</sup> Growth Habit: A = Ann <sup>3</sup> Use higher labeled rate <b>Common Name</b> Brazilian peppertree Chinese tallow tree Popcorn tree Russian olive Sumac Willow	heavy or well-established infe ual, B = Biennial, P = Perenn es. Brush Species Scientific Name Apply 1 to 2 pts/A <sup>1</sup> Schinus terebinthifolius Sapium sebiferum Elaeagnus angustifolia Rhus spp. Salix spp. Apply 2 to 3 pts/A <sup>1</sup>	Growth Habit <sup>2</sup> P P P P
<sup>1</sup> Use higher rate where <sup>2</sup> Growth Habit: A = Ann <sup>3</sup> Use higher labeled rate <b>Common Name</b> <b>B</b> razilian peppertree Chinese tallow tree Popcorn tree Russian olive Sumac Willow Alder	heavy or well-established infe ual, B = Biennial, P = Perenn es. Brush Species Scientific Name Apply 1 to 2 pts/A <sup>1</sup> Schinus terebinthifolius Sapium sebiferum Elaeagnus angustifolia Rhus spp. Salix spp. Apply 2 to 3 pts/A <sup>1</sup> Alnus spp.	Growth Habit <sup>2</sup> P P P P P
<sup>1</sup> Use higher rate where <sup>2</sup> Growth Habit: A = Ann <sup>3</sup> Use higher labeled rate <sup>3</sup> Use higher labeled rate <b>Common Name</b> <b>B</b> razilian peppertree Chinese tallow tree Popcorn tree Russian olive Sumac Willow <b>A</b> lder American beech	heavy or well-established infe ual, B = Biennial, P = Perenn es. Brush Species Scientific Name Apply 1 to 2 pts/A <sup>1</sup> Schinus terebinthifolius Sapium sebiferum Elaeagnus angustifolia Rhus spp. Salix spp. Salix spp. Apply 2 to 3 pts/A <sup>1</sup> Alnus spp. Fagus grandifolia	Growth Habit <sup>2</sup> P P P P P P P
<sup>1</sup> Use higher rate where <sup>2</sup> Growth Habit: A = Ann <sup>3</sup> Use higher labeled rate <b>Common Name</b> <b>B</b> razilian peppertree Chinese tallow tree Popcorn tree Russian olive Sumac Willow <b>A</b> lder American beech Ash <sup>3</sup>	heavy or well-established infe ual, B = Biennial, P = Perenn es. Brush Species Scientific Name Apply 1 to 2 pts/A <sup>1</sup> Schinus terebinthifolius Sapium sebiferum Elaeagnus angustifolia Rhus spp. Salix spp. Salix spp. Apply 2 to 3 pts/A <sup>1</sup> Alnus spp. Fagus grandifolia Fraxinus spp.	Growth Habit <sup>2</sup> P P P P P P P P
<sup>1</sup> Use higher rate where <sup>2</sup> Growth Habit: A = Ann <sup>3</sup> Use higher labeled rate <b>Common Name</b> <b>B</b> razilian peppertree Chinese tallow tree Popcorn tree Russian olive Sumac Willow <b>A</b> lder American beech Ash <sup>3</sup> Aspen	heavy or well-established infe ual, B = Biennial, P = Perenn s. Brush Species Scientific Name Apply 1 to 2 pts/A <sup>1</sup> Schinus terebinthifolius Sapium sebiferum Elaeagnus angustifolia Rhus spp. Salix spp. Salix spp. Fagus grandifolia Fraxinus spp. Populus spp.	Growth Habit <sup>2</sup> P P P P P P P P
<sup>1</sup> Use higher rate where <sup>2</sup> Growth Habit: A = Ann <sup>3</sup> Use higher labeled rate <b>Common Name</b> <b>B</b> razilian peppertree Chinese tallow tree Popcorn tree Russian olive Sumac Willow <b>A</b> lder American beech Ash <sup>3</sup> Aspen Autumn olive	heavy or well-established infe ual, B = Biennial, P = Perenn s. Brush Species Scientific Name Apply 1 to 2 pts/A <sup>1</sup> Schinus terebinthifolius Sapium sebiferum Elaeagnus angustifolia Rhus spp. Salix spp. Salix spp. Apply 2 to 3 pts/A <sup>1</sup> Alnus spp. Fagus grandifolia Fraxinus spp. Populus spp. Elaeagnus umbellata	Growth Habit <sup>2</sup> P P P P P P P P P P
<sup>1</sup> Use higher rate where <sup>2</sup> Growth Habit: A = Ann <sup>3</sup> Use higher labeled rate <b>Common Name</b> <b>B</b> razilian peppertree Chinese tallow tree Popcorn tree Russian olive Sumac Willow <b>A</b> lder Ander Anerican beech Ash <sup>3</sup> Aspen Autumn olive Bald cypress	heavy or well-established infer ual, B = Biennial, P = Perenn es. Brush Species Scientific Name Apply 1 to 2 pts/A <sup>1</sup> Schinus terebinthifolius Sapium sebiferum Elaeagnus angustifolia Rhus spp. Salix spp. Salix spp. Fagus grandifolia Fraxinus spp. Populus spp. Elaeagnus umbellata Taxodium distichum	Growth Habit <sup>2</sup> P P P P P P P P P P P P P
<sup>1</sup> Use higher rate where <sup>2</sup> Growth Habit: A = Ann <sup>3</sup> Use higher labeled rate <b>Common Name</b> <b>B</b> razilian peppertree Chinese tallow tree Popcorn tree Russian olive Sumac Willow <b>A</b> lder Anerican beech Ash <sup>3</sup> Aspen Autumn olive Bald cypress Bigleaf maple	heavy or well-established infer ual, B = Biennial, P = Perenn es. Brush Species Scientific Name Apply 1 to 2 pts/A <sup>1</sup> Schinus terebinthifolius Sapium sebiferum Elaeagnus angustifolia Rhus spp. Salix spp. Salix spp. Apply 2 to 3 pts/A <sup>1</sup> Alnus spp. Fagus grandifolia Fraxinus spp. Populus spp. Elaeagnus umbellata Taxodium distichum Acer macrophyllum	Browth Habit <sup>2</sup> P P P P P P P P P P P P P P P P P P P
<sup>1</sup> Use higher rate where <sup>2</sup> Growth Habit: A = Ann <sup>3</sup> Use higher labeled rate <b>Common Name</b> <b>B</b> razilian peppertree Chinese tallow tree Popcorn tree Russian olive Sumac Willow <b>A</b> lder American beech Ash <sup>3</sup> Aspen Autumn olive Bald cypress Bigleaf maple Birch <sup>3</sup>	heavy or well-established infe ual, B = Biennial, P = Perenn s. Brush Species Scientific Name Apply 1 to 2 pts/A <sup>1</sup> Schinus terebinthifolius Sapium sebiferum Elaeagnus angustifolia Rhus spp. Salix spp. Salix spp. Fagus grandifolia Fraxinus spp. Populus spp. Elaeagnus umbellata Taxodium distichum Acer macrophyllum Betula spp.	P P P P P P P P P P P P P P P P P P P
<sup>1</sup> Use higher rate where <sup>2</sup> Growth Habit: A = Ann <sup>3</sup> Use higher labeled rate <sup>3</sup> Use higher labeled rate <b>Common Name</b> Brazilian peppertree Chinese tallow tree Popcorn tree Russian olive Sumac Willow <b>A</b> lder Ander American beech Ash <sup>3</sup> Aspen Autumn olive Bald cypress Bigleaf maple Birch <sup>3</sup> Black gum <sup>4</sup>	heavy or well-established infe ual, B = Biennial, P = Perenn s. Brush Species Scientific Name Apply 1 to 2 pts/A <sup>1</sup> Schinus terebinthifolius Sapium sebiferum Elaeagnus angustifolia Rhus spp. Salix spp. Salix spp. Salix spp. Fagus grandifolia Fraxinus spp. Fagus grandifolia Fraxinus spp. Elaeagnus umbellata Taxodium distichum Acer macrophyllum Betula spp. Nyssa sylvatica	Growth Habit <sup>2</sup> P P P P P P P P P P P P P P P P P P P
<sup>1</sup> Use higher rate where <sup>2</sup> Growth Habit: A = Ann <sup>3</sup> Use higher labeled rate <sup>3</sup> Use higher labeled rate <b>Common Name</b> <b>B</b> razilian peppertree Chinese tallow tree Popcorn tree Russian olive Sumac Willow <b>A</b> lder American beech Ash <sup>3</sup> Aspen Autumn olive Bald cypress Bigleaf maple Birch <sup>3</sup> Black gum <sup>4</sup> Black locust <sup>5</sup>	heavy or well-established infe ual, B = Biennial, P = Perenn s. Brush Species Scientific Name Apply 1 to 2 pts/A <sup>1</sup> Schinus terebinthifolius Sapium sebiferum Elaeagnus angustifolia Rhus spp. Salix spp. Salix spp. Apply 2 to 3 pts/A <sup>1</sup> Alnus spp. Fagus grandifolia Fraxinus spp. Populus spp. Elaeagnus umbellata Taxodium distichum Acer macrophyllum Betula spp. Nyssa sylvatica Robinia pseudoacacia	Growth Habit <sup>2</sup> P P P P P P P P P P P P P P P P P P P
<sup>1</sup> Use higher rate where <sup>2</sup> Growth Habit: A = Ann <sup>3</sup> Use higher labeled rate <b>Common Name</b> <b>B</b> razilian peppertree Chinese tallow tree Popcorn tree Russian olive Sumac Willow <b>A</b> lder American beech Ash <sup>3</sup> Aspen Autumn olive Bald cypress Bigleaf maple Birch <sup>3</sup>	heavy or well-established infe ual, B = Biennial, P = Perenn s. Brush Species Scientific Name Apply 1 to 2 pts/A <sup>1</sup> Schinus terebinthifolius Sapium sebiferum Elaeagnus angustifolia Rhus spp. Salix spp. Salix spp. Salix spp. Fagus grandifolia Fraxinus spp. Fagus grandifolia Fraxinus spp. Elaeagnus umbellata Taxodium distichum Acer macrophyllum Betula spp. Nyssa sylvatica	P P P P P P P P P P P P P P P P P P P

Acer negundo

Ceanothis spp.

Melia azedarach

Prunus spp.

Boxelder

Cherry<sup>3, 4</sup>

Ceanothis

Chinaberry

Brush Species (continued)

Common Name	Scientific Name	Growth Habit <sup>2</sup>
Арр	ly 2 to 3 pts/A <sup>1</sup> (continued)	
Chinquapin	Castanopsis chrysophylla	Р
Cottonwood	Populus trichocarpa P. deltoides	Р
Cypress	Taxodium spp.	Р
Dogwood <sup>3</sup>	Cornus spp.	Р
Elm <sup>6</sup>	Ulmus spp.	Р
Eucalyptus	Eucalyptus spp.	Р
Hawthorn	Crataegus spp.	Р
Hickory <sup>3</sup>	Carya spp.	Р
Honeylocust <sup>5</sup>	Gleditsia triacanthos	Р
Huckleberry	Gaylussacia spp.	Р
Lyonia spp.		
including:		
Fetterbush	Lyonia lucida	
Staggerbush	Lyonia mariana	Р
Madrone	Arbutus menziesii	Р
Maple	Acer spp.	Р
Melaleuca	Melaleuca quinquenervia	Р
Mulberry <sup>3, 7</sup>	Morus spp.	Р
Oak <sup>®</sup>	Quercus spp.	Р
Persimmon <sup>4</sup>	Diospyros virginiana	Р
Pine <sup>5,10</sup>	Pinus spp.	Р
Poison oak	Rhus diversiloba	Р
Poplar	Populus spp.	Р
Privet	Ligustrum vulgare	Р
Red alder	Alnus rubra	Р
Red maple	Acer rubrum	Р
Saltcedar	Tamarix pentandra	Р
Sassafras	Sassafras albidum	Р
Sourwood <sup>4</sup>	Oxydendrum arboreum	Р
Sweetgum	Liquidambar styraciflua	Р
Sycamore	Platanus occidentalis	Р
Tanoak <sup>3</sup>	Lithocarpus densiflorus	Р
Titi <sup>9</sup>	Cyrilla racemiflora	Р
Tree of heaven	Ailanthus altissima	Р
Vaccinium spp.		
including:		
Blueberry	Vaccinium spp.	
Sparkleberry	Vaccinium arboreum	Р
Water willow <sup>10</sup>	Justicis americana	Р
Yellow poplar <sup>3</sup>	Liriodendron tulipifera	Р

<sup>1</sup>Use the higher rates where heavy or well-established infestations occur.

<sup>2</sup>Growth Habit: A = Annual, B = Biennial, P = Perennial

<sup>3</sup>Use higher labeled rates.

<sup>4</sup>Best control with applications prior to formation of fall leaf color

<sup>5</sup> Tank mix with glyphosate or triclopyr

<sup>6</sup> Tank mix with with glyphosate

<sup>7</sup> Degree of control may be species dependent.

<sup>8</sup> For water oak (*Quercus nigra*), laurel oak (*Q. laurifloria*), willow oak (*Q. phellos*) and live oak (*Q. virginiana*), use higher labeled rates.

<sup>9</sup> Suppression only

<sup>10</sup> Use not permitted in California unless otherwise directed by supplemental labeling.

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