

241-296

9/15/2005

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

SEP 15 2005

OFFICE OF  
PREVENTION, PESTICIDES  
AND TOXIC SUBSTANCES

Mr. Jeffery Birk  
BASF Corporation  
26 Davis Drive  
P.O. Box 13528  
Research Triangle Park, NC 27709-3528

Subject: Chopper Herbicide  
EPA Registration No. 241-296  
Revised labeling submitted June 28, 2005

Dear Mr. Birk:

The amended labeling referred to above is acceptable provided that you:

1. Immediately following the product name at the top of the label, add the following list of use sites: "For control of vegetation on forestry sites".
2. In the statement "**CHOPPER** should be used only in accordance with recommendations", change "should" to "may", and change "recommendations" to "recommendations and restrictions".
3. Add the statement "See use directions for CUT STUMP TREATMENTS, TREE INJECTION TREATMENTS, FRILL OR GIRDLE TREATMENTS, THINLINE BASAL AND STEM APPLICATIONS, LOW VOLUME BASAL BARK TREATMENTS and LOW VOLUME FOLIAR APPLICATIONS" immediately after the following statement to more clearly state the use directions for this use:

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“Chopper is also recommended for the control of undesirable vegetation along non-irrigation ditchbanks and for the establishment and maintenance of wildlife openings, except in the state of California.”

4. In the AGRICULTURAL USE REQUIREMENTS box, add the following statement at the end of the first paragraph:

The requirements in this box apply to use on trees being grown for sale or other commercial use, or for commercial seed production, or for production of timber or wood products, or for research purposes.

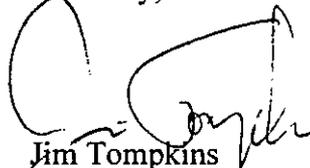
5. Submit one copy of your final labeling before you release your product for shipment.

If these conditions are not complied with, the registration will be subject to cancellation in accordance with FIFRA section 6(e). Your release of product for shipment constitutes acceptance of these conditions.

This labeling supercedes all previously accepted labeling for this product (except supplemental labeling). A stamped copy of the label is enclosed for your records.

If you have any questions about this letter, you may call Tobi Colvin-Snyder at 703-305-7801.

Sincerely,



Jim Tompkins  
Product Manager (25)  
Herbicide Branch  
Registration Division (7505C)

ACCEPTED  
with COMMENTS  
In EPA Letter Dated

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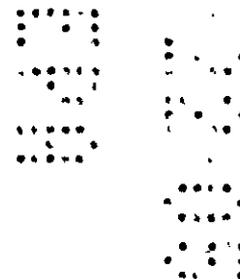
SEP 15 2005

Under the Federal Insecticide,  
Fungicide, and Rodenticide Act  
as amended, for the pesticide  
registered under EPA Reg. No.

241-296

# CHOPPER®

herbicide



<b>ACTIVE INGREDIENT:</b> Isopropylamine salt of Imazapyr (2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-pyridinecarboxylic acid)*	27.6%
<b>INERT INGREDIENTS</b>	72.4%
<b>TOTAL</b>	100.0%

\*Equivalent to 22.6% (2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-pyridinecarboxylic acid) or 2 pounds acid per gallon.

EPA Reg. No. 241-296

U.S. Patent No. 4,798,619

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 this label, find someone to explain it to you in detail.)

See Inside for **First Aid, Precautionary Statements, Directions for Use and Conditions of Sale and Warranty**

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  
Agricultural Products  
26 Davis Drive  
Research Triangle Park, NC 27709

**BASF**  
The Chemical Company

<b>FIRST AID</b>	
<b>If on skin or clothing</b>	<ul style="list-style-type: none"> <li>• Take off contaminated clothing.</li> <li>• Rinse skin immediately with plenty of water for 15-20 minutes.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
<b>If in eyes</b>	<ul style="list-style-type: none"> <li>• Hold eye open and rinse slowly and gently with water for 15-20 minutes.</li> <li>• Remove contact lenses, if present, after first 5 minutes, then continue rinsing eye.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
<b>If inhaled</b>	<ul style="list-style-type: none"> <li>• Move person to fresh air.</li> <li>• If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible.</li> <li>• Call a poison control center or doctor for further treatment advice.</li> </ul>
<b>HOT LINE NUMBER</b>	
<p>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).</p>	

**PRECAUTIONARY STATEMENTS  
HAZARDS TO HUMANS  
CAUTION!**

Harmful if inhaled or absorbed through skin. Avoid breathing spray mist. Avoid contact with skin, eyes or clothing. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

**Personal Protective Equipment (PPE):**

Some materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for category A on an EPA chemical-resistance category selection chart.

Applicators and other handlers must wear:

- long-sleeved shirt and long pants
- chemical-resistant gloves, such as barrier laminate, butyl rubber or polyethylene.
- shoes plus socks

Follow manufacturer's instructions for cleaning and maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

**USER SAFETY RECOMMENDATIONS**

Users should:

1. Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
2. Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
3. 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 **CHOPPER® herbicide** should be mixed, stored, and applied only in stainless steel, fiberglass, plastic, and plastic-lined steel containers.

**DO NOT** mix, store, or apply **CHOPPER** or spray solutions of **CHOPPER** in unlined steel (except stainless steel) containers or spray tanks.

**ENVIRONMENTAL HAZARDS**

**DO NOT** apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. **DO NOT** contaminate water when disposing of equipment washwaters or rinsate. This herbicide is phytotoxic at extremely low concentrations. Non-target plants may be adversely affected from drift.

**DIRECTIONS FOR USE**

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

**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.

For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

**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 **12 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
- chemical-resistant gloves, such as barrier laminate, butyl rubber or polyethylene.
- shoes plus socks

**NON-AGRICULTURAL 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.

Noncrop weed control is not within the scope of the Worker Protection Standard. See the **GENERAL INFORMATION** section of this label for a description of noncrop sites.

**DO NOT** enter treated areas without protective clothing until sprays have dried.

**CHOPPER** should be used only in accordance with recommendations in this leaflet label. Keep containers closed to avoid spills and contamination.

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## 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 may be disposed of on site or at an approved waste disposal facility.

**CONTAINER DISPOSAL:** FOR QUART, 1.0 GALLON, 2.5 GALLON, 15 GALLON AND 30 GALLON: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in an approved sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

**CONTAINER DISPOSAL FOR FIELD KEG, MINIBULK AND BULK:** When this container is empty, replace the cap and seal all openings that have been opened during use, and return the container to the point of purchase, or to a designated location. This container must only be refilled with the pesticide product. **DO NOT** reuse the container for any other purpose. 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. Disposal of container must be in compliance with state and local regulations.

## IMPORTANT

**DO NOT** use on food or feed crops. **DO NOT** apply to the inside of ditches used to transport irrigation water. Keep from contact with fertilizers, insecticides, fungicides, and seeds to prevent unintentional exposure of desirable vegetation to **CHOPPER® herbicide**. **DO NOT** apply or drain or flush equipment on or near sensitive desirable plants, or on areas where their roots may extend, or in locations where the chemical may be washed or moved into contact with their roots. **DO NOT** use on Christmas trees.

Thoroughly clean application equipment after use. Flush tank, pump, hoses, and boom with several changes of water after removing nozzle tips and screens (clean these parts separately).

## GENERAL INFORMATION

**CHOPPER** is an aqueous formulation that is readily mixable with water, diesel oil, or recommended seed oils and penetrating oils. For foliar applications, **CHOPPER** may be mixed with water as the spray carrier or an emulsion carrier may be prepared by mixing **CHOPPER** into water and then adding a suitable seed oil at 12 to 50%, by volume. **CHOPPER** is to be mixed with water or a penetrating oil and applied as a spray to cut stumps. **CHOPPER** should be mixed with a penetrating oil for application to the basal area of brush and trees. Adequate agitation should be maintained with all **CHOPPER** emulsion mixtures to prevent phase separation. Prior to actual tank mixing with other products, herbicides and carrier oils, compatibility testing in small containers is recommended!

**CHOPPER** is recommended for vegetation control in forestry sites. Roadsides contiguous with the treated area may be included.

**CHOPPER** is recommended for control of vegetation in forestry site preparation, in directed applications for conifer release and for mid-rotation release using understory broadcast applications.

**CHOPPER** is also recommended for the control of undesirable vegetation along non-irrigation ditch banks and for the establishment and maintenance of wildlife openings, except in the state of California.

**CHOPPER** may be applied on forestry sites that contain areas of temporary surface water caused by the collection of water between planting beds, in equipment ruts, or in other depressions created by forest management activities, except in the states of California and New York. It is permissible to treat drainage ditches, intermittent drainage, intermittently flooded low lying sites, seasonally dry flood plains, and transitional areas between upland and lowland sites when no water is present, except in the states of California and New York. Only the edge of drainage ditches can be treated for drainage ditches that contain water. It is also permissible to treat marshes, swamps, and bogs after water has receded, as well as seasonally dry flood deltas, except in the states of California and New York.

**DO NOT** make applications to natural or man-made bodies of water such as lakes, reservoirs, ponds, streams, rivers and canals.

## SYMPTOMOLOGY:

**CHOPPER** is readily absorbed through foliage, bark and roots and is translocated rapidly throughout the plant, with accumulation in meristematic regions. Treated plants stop growing soon after herbicide application. Chlorosis first appears in the youngest leaf tissue. In perennials, the herbicide is translocated into the roots, thus preventing resprouting. Chlorosis and tissue necrosis may not be apparent in some species for several weeks after application. Woody plants, brush, and trees may not display the full extent of herbicide control until several months following application.

## MANAGING OFF-TARGET MOVEMENT

The following information is provided as general guidance for managing off-target movement. Specific use recommendations for **CHOPPER** may differ depending on the application technique used and the vegetation management objective.

**Spray Drift:** Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment- and weather-related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions.

Spray drift from applying this product may result in damage to sensitive plants adjacent to the treatment area. Only apply this product when the potential for drift to these and other adjacent sensitive areas (e.g. residential areas, bodies of water, known habitat for threatened or endangered species, or non-target crops) is minimal. **DO NOT** apply when the following conditions exist that increase the likelihood of spray drift from intended targets: high or gusty winds, high temperatures, low humidity, temperature inversions.

To minimize spray drift, the applicator should be familiar with and take into account the following drift reduction advisory information. Additional information may be available from state enforcement agencies or the Cooperative Extension on the application of this product.

The best drift management strategy and most effective way to reduce drift potential are to apply large droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (see **Wind, Temperature and Humidity and Temperature Inversions**).

### Controlling Droplet Size

- **Volume** - Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- **Pressure** - **DO NOT** exceed the nozzle manufacturer's recommended pressures. For many nozzle types, lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- **Number of Nozzles** - Use the minimum number of nozzles that provide uniform coverage.
- **Nozzle Orientation** - Orienting nozzles so that the spray is released parallel to the airstream produces larger droplets than other orientations and is recommended practice. Significant deflection from the horizontal will reduce droplet size and increase drift potential.
- **Nozzle Type** - Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift. **DO NOT** use nozzles producing a mist droplet spray.

**Application Height:** Making applications at the lowest possible height (aircraft, ground driven spray boom) that is safe and practical reduces exposure of droplets to evaporation and wind.

**Swath Adjustment:** When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the application equipment (e.g.

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aircraft, ground) upwind. Swath adjustment distance should increase with increasing drift potential (higher wind, smaller droplets, etc.).

**Wind:** Drift potential is lowest between wind speeds of 3-10 mph. However, many factors, including droplet size and equipment type, determine drift potential at any given speed. Application should be avoided below 3 mph due to variable wind direction and high inversion potential. **NOTE:** Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

**Temperature and Humidity:** When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

**Temperature Inversions:** Drift potential is high during a temperature inversion. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud, which can move in unpredictable directions due to the light variable winds common during inversions. Temperature Inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

**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.

**Aerial Application Methods and Equipment:** Use 2 or more gallons of water per acre. The actual minimum spray volume per acre is determined by the spray equipment used. Use adequate spray volume to provide accurate and uniform distribution of spray particles over the treated area and to avoid spray drift.

**Managing spray drift from aerial applications:** Applicators must follow these requirements to avoid off-target drift movement: 1) boom length - the distance of the outermost nozzles on the boom must not exceed ¾ the length of the wingspan or rotor, 2) nozzle orientation - nozzles must always point backward parallel with the air stream and never be pointed downward more than 45 degrees, and 3) application height - without compromising aircraft safety, applications should be made at a height of 10 feet or less above the crop canopy or tallest plants. Applicators must follow the most restrictive use cautions to avoid drift hazards, including those found in this labeling as well as applicable state and local regulations and ordinances.

**Ground Application (Broadcast):** Use 5 or more gallons of water per acre. The actual minimum spray volume per acre is determined by the spray equipment used. Use adequate spray volume to provide accurate and uniform distribution of spray particles over the treated area and to avoid spray drift.

**CONIFER SITE PREPARATION TREATMENTS**

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

Crop Species	Rate (oz/A)
Loblolly Pine ( <i>Pinus taeda</i> )	48-80
Loblolly X Pitch Hybrid	48-80
Longleaf Pine ( <i>Pinus palustris</i> )	48-80
Shortleaf Pine ( <i>Pinus echinata</i> )	48-80
Virginia Pine ( <i>Pinus virginiana</i> )	48-80
Slash Pine ( <i>Pinus elliottii</i> )	40-64

Douglas-Fir ( <i>Pseudotsuga menziesii</i> )	24-48
Western Hemlock ( <i>Tsuga heterophylla</i> )	24-48
Coastal Redwood ( <i>Sequoia sempervirens</i> )	24-48
California Red Fir ( <i>Abies magnifica</i> )	24-40
California White Fir ( <i>Abies concolor</i> )	24-40
Jack Pine ( <i>Pinus banksiana</i> )	24-32
Lodgepole Pine ( <i>Pinus contorta</i> )	24-32
Pitch Pine ( <i>Pinus rigida</i> )	24-32
Ponderosa Pine ( <i>Pinus ponderosa</i> )	24-32
Sugar Pine ( <i>Pinus lambertiana</i> )	24-32
White Pine ( <i>Pinus strobus</i> )	24-32
Black Spruce ( <i>Picea mariana</i> )	24-32
Red Spruce ( <i>Picea rubens</i> )	24-32
White Spruce ( <i>Picea glauca</i> )	24-32

Use the recommended rate of **CHOPPER** 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, grasses 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.

For tracts to be planted with loblolly, loblolly x pitch hybrid, longleaf pine, shortleaf pine, Virginia pine and slash pine, **CHOPPER** may be applied at a rate of 64 oz per acre on areas that have little to no resprouting vegetation because of recent management activities such as harvesting, mechanical shearing, burning piling or bedding. Applications must be made after September 1.

**MIXING and APPLICATION INSTRUCTIONS for SITE PREPARATION:**

Apply the recommended rate of **CHOPPER** per acre in 5 to 20 gallons total spray carrier for helicopter applications or 5 to 40 gallons total spray carrier for mechanical or backpack ground spray applications. Enhanced brownout for burning and improved control of brush and grasses may be obtained by application of **CHOPPER** in 12 to 50% oil:water (volume:volume) emulsion carrier. Methylated or ethylated seed oils containing at least 50% esterified seed oil by volume are recommended. Mix **CHOPPER** into the water portion of the carrier thoroughly, then add the oil and mix thoroughly again to obtain a uniform emulsion. Use the higher label rates of **CHOPPER** and higher spray volumes when controlling particularly dense or multi-layered canopies of hardwood stands, or difficult to control species. Make applications during the growing season; beginning in the spring after full leaf expansion of the target weed or brush has occurred and complete applications before leaf drop in the fall.

Tank mixes may be necessary for chemical control of conifers and other species tolerant to **CHOPPER** in certain cases. 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 legume's and blackberry which are desirable for wildlife habitat.

**DO NOT** plant seedlings of black spruce (*Picea mariana*) or white spruce (*Picea glauca*) on sites that have been site prepared with a broadcast application of **CHOPPER** or into the treated zone of spot or banded site preparation applications for three months following treatment or injury may occur.

**HELICOPTER SPRAY EQUIPMENT**

All precautions should be taken to minimize or eliminate spray drift. Applications should not be made under gusty conditions. The use of controlled droplet booms and nozzle configurations is recommended.

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**HELICOPTER SPRAY EQUIPMENT (Continued)**

**IMPORTANT: DO NOT** make applications by fixed wing aircraft. Maintain adequate buffer zones. Thoroughly clean application and mixing equipment, including landing gear, immediately after use. Prolonged exposure of this product to uncoated steel (except stainless steel) surfaces may result in corrosion and failure of the exposed part.

**HARDWOOD SITE PREPARATION TREATMENTS**

For site preparation prior to planting hardwood species in the south-east and gulf coast states (Virginia to Texas), use **CHOPPER® herbicide** at a rate of 48 oz per acre and spray before the end of July. Application in an emulsion carrier with a minimum of 12% oil is recommended. **DO NOT** plant hardwood seedlings before January of the year following site preparation or injury may occur.

**DIRECTED FOLIAR APPLICATIONS FOR CONIFER RELEASE**

**CHOPPER** may be applied as a directed spray using water or oil emulsion carrier for control and suppression of labeled brush and weed species. Directed spray applications may be made using low carrier volumes (generally 10 gallons total spray per acre or less) in labeled conifer stands of all ages by targeting the unwanted vegetation and avoiding direct application to the conifer. Ensure that the maximum labeled rates per acre listed for the conifer species are not exceeded.

Use directed foliar applications of CHOPPER for release of the following conifers from hardwood competition:

Crop Species	Rate (fl. oz/Acre)
Loblolly Pine ( <i>Pinus taeda</i> )	24 - 40
Loblolly X Pitch Hybrid	24 - 40
Virginia Pine ( <i>Pinus virginiana</i> )	24 - 40
Longleaf Pine ( <i>Pinus palustris</i> )	24 - 32
Pitch Pine ( <i>Pinus rigida</i> )	24 - 32
Shortleaf Pine ( <i>Pinus echinata</i> )	24 - 32
Slash Pine ( <i>Pinus ellottii</i> )	24 - 32
White Pine ( <i>Pinus strobus</i> )	16 - 32
Lodgepole Pine ( <i>Pinus contorta</i> )	16 - 24
Douglas-Fir ( <i>Pseudotsuga menziesii</i> )	16 - 24
Jack Pine ( <i>Pinus banksiana</i> )	12 - 24
Black Spruce ( <i>Picea mariana</i> )	12 - 24
Red Spruce ( <i>Picea rubens</i> )	12 - 24
White Spruce ( <i>Picea glauca</i> )	12 - 24

For applications directed to the foliage of undesirable brush mix 2 to 10% **CHOPPER** in water. For brush species with thick leaf cuticles or difficult to control species use oil emulsion carrier containing 12 to 50%, by volume, recommended oil diluent. Apply the spray solution or emulsion to at least two-thirds of each hardwood crown using backpack sprayers or hand held equipment. **DO NOT** spray to the point of runoff and avoid spraying the conifers for best results. For low volume foliar applications to control big leaf maple a 5% by volume **CHOPPER** solution or emulsion is recommended.

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, release treatments may be made late in the growing season after formation of final conifer resting buds. To prevent possibility of conifer injury, do not apply **CHOPPER** when conifers are under stress from drought, diseases, animal or winter injury, or other stresses reducing conifer vigor.

Injury may occur to non-target or desirable hardwoods if they extend from the same root system as treated stems, or their root systems are grafted to those of the treated tree, or if their roots extend into the soil near treated trees.

**BAG AND BROADCAST APPLICATIONS FOR CONIFER RELEASE**

In Douglas-fir and Ponderosa pine stands, broadcast applications of **CHOPPER** up to 32 oz per acre 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. For improved control of brush species, particularly evergreens, add a suitable seed oil at 5 to 12 % by volume. 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.

**LATE ROTATION VEGETATION CONTROL IN WESTERN CONIFERS**

In California, the Pacific Northwest and Inland Northwest, broadcast aerial applications of **CHOPPER** up to 48 oz per acre are permissible in conifer stands that are targeted for harvesting the year following treatment. Use a minimum spray volume of 15 gallons per acre. For improved control of brush species, particularly evergreens, add a suitable seed oil at 5 to 12 % by volume. Significant conifer injury or mortality must be expected. **DO NOT** use this treatment if conifer injury or mortality cannot be tolerated.

**UNDERSTORY BROADCAST APPLICATIONS FOR MID-ROTATION RELEASE**

**CHOPPER** may be applied as a broadcast application below the conifer canopy to control understory brush and suppress trees for labeled species. Ground spray machinery or hand held equipment may be used to broadcast **CHOPPER** in water or oil emulsion carrier below the crop tree canopy in a manner as to minimize spray contact by the live crown of crop trees.

**Ensure that maximum labeled rates per acre listed for crop species below are not exceeded.**

Crop Species	Maximum Rate (fl.oz/Acre)
Loblolly Pine ( <i>Pinus taeda</i> )	64
Loblolly X Pitch Hybrid	64
Virginia Pine ( <i>Pinus virginiana</i> )	64
Longleaf Pine ( <i>Pinus palustris</i> )	32
Pitch Pine ( <i>Pinus rigida</i> )	32
Shortleaf Pine ( <i>Pinus echinata</i> )	32
Slash Pine ( <i>Pinus ellottii</i> )	32

**CUT STUMP TREATMENTS**

Mix 8.0-16.0 fluid ounces of **CHOPPER® herbicide** in one gallon of water\*, diesel oil, or a penetrating oil. **CHOPPER** herbicide may be tank-mixed with Garlon® 3A, Garlon 4, Tordon® K, Escort® or Roundup® to control labeled species. Spray or brush the **CHOPPER** solution onto the cambium area of the freshly cut stump surface. Insure that the **CHOPPER** solution thoroughly wets the cambium area (the wood next to the bark) of the stump. The use of a surfactant or penetrating agent may improve uptake through partially callused cambiums. Applications can be made anytime during the year except during periods of heavy sap flow in the spring. **DO NOT** over apply causing puddling.

\*Note: Use water as a diluent only when temperatures are sufficient to prevent freezing or add antifreeze (ethylene glycol) according to label directions to prevent freezing.

**TREE INJECTION TREATMENTS**

No Worker Protection Standard worker entry restrictions or worker notification requirements apply when this product is directly injected into agricultural plants.

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Mix 8.0-12.0 fluid ounces of **CHOPPER® herbicide** in one gallon of water\*. Using standard injection equipment, apply 1 ml. of **CHOPPER** solution at each injection site around the tree with no more than 1 inch intervals between cut edges. Insure that the injector completely penetrates the bark at each site.

\* **Note:** Use water as a diluent only when temperatures are sufficient to prevent freezing or add antifreeze (ethylene glycol) according to label directions to prevent freezing.

### **FRILL OR GIRDLE TREATMENTS**

Mix 8.0-12.0 fluid ounces of **CHOPPER** in one gallon of water\*, diesel oil, or a penetrating oil.

Using a hatchet, machete, or similar tool, make cuts through the bark and completely around the tree with no more than 2 inch intervals between cut edges. Spray or brush the **CHOPPER** solution into each cut until thoroughly wet.

\***Note:** Use water as a diluent only when temperatures are sufficient to prevent freezing or add antifreeze (ethylene glycol) according to label directions to prevent freezing.

### **THINLINE BASAL AND STEM APPLICATIONS**

**CHOPPER** may be applied as a thinline basal or arcing application to the stems of susceptible species such as big leaf maple (*Acer macrophyllum*), willow (*Salix spp.*) and Eucalyptus (*Eucalyptus spp.*) with a stem ground line diameter of 3 inches or less. Mix 24 to 48 ounces of **CHOPPER** in one gallon of diesel oil or penetrating oil. Maintain uniform mixtures with frequent agitation. Direct a thin line of the spray solution to the stems beginning a few feet from the ground and descending toward the base of the tree making a zig-zag motion. **DO NOT** over apply causing puddling.

### **LOW VOLUME BASAL BARK TREATMENTS**

Mix 8.0-12.0 fluid ounces of **CHOPPER** in one gallon of diesel oil or a penetrating oil. To control mixed brush species with up to 4 inch stem diameter at breast height, spray to wet the lower 12-18 inches of the stem with the **CHOPPER** oil mixture (include the root collar area). **DO NOT** over apply causing dripping or puddling. Maintain uniform mixtures with frequent agitation.

### **LOW VOLUME FOLIAR APPLICATIONS**

**CHOPPER** may be applied as a low volume foliar application. Mix 3-5% **CHOPPER** in water and adjuvant or in a penetrating oil. For small brush spray down on the crown to cover approximately 70% of the plant foliage. For larger brush insure coverage on as much of the crown as possible and spray at least two sides of the plant. may be tank-mixed with other labeled herbicides. Use a tank mix of 3 to 5% **CHOPPER** plus 15 to 20% Garlon 4 in basal oil to control black locust, honey locust, hackberry, elms and other species listed on manufacturer's labels. Use the higher rate of **CHOPPER** (5%) in areas containing sassafras, oak, hickory, cherry, and maples or in the southern 2/3's of the U.S. A tank-mix of 3% **CHOPPER** + Garlon 4 is effective in the Northeastern U.S.

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**SPRAY SOLUTION MIXING GUIDE FOR LOW VOLUME FOLIAR APPLICATIONS**

AMOUNT OF SPRAY SOLUTION BEING PREPARED	DESIRED CONCENTRATION (fluid volume)			
	CHOPPER		Garlon 4	
	3%	5%	15%	20%
1 gallon	3.8 oz	6.4 oz	19.2 oz	25.6 oz
3 gallons	11.5 oz	19.2 oz	57.6 oz	76.8 oz
4 gallons	15.4 oz	25.6 oz	76.8 oz	102.4 oz
5 gallons	19.2 oz	32.0 oz	96.0 oz	1.0 gallon
50 gallons	1.5 gallons	2.5 gallons	7.5 gallons	10.0 gallons
100 gallons	3.0 gallons	5.0 gallons	15.0 gallons	20.0 gallons

**INVERT EMULSIONS**

**CHOPPER® herbicide** can be applied as an invert emulsion carrier. The carrier is a thick invert water-in-oil spray emulsion designed to minimize spray drift and spray run-off, 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. **DO NOT** exceed 3 quarts/Acre of **CHOPPER**.

**WEEDS CONTROLLED**

**CHOPPER** will provide postemergence control and some residual control of the following target vegetation species. Degree of control is both species and rate dependent.

**GRASSES**

The species of annual and perennial grasses controlled by **CHOPPER** include the following:

- Annual bluegrass (*Poa annua*)
- Bahiagrass (*Paspalum notatum*)
- Barnyardgrass (*Echinochloa crus-galli*)
- Beardgrass (*Andropogon* spp.)
- Bermudagrass (*Cynodon dactylon*)
- Big bluestem (*Andropogon gerardii*)
- Broadleaf signalgrass (*Brachiaria platyphylla*)
- Canada bluegrass (*Poa compressa*)
- Cattail (*Typha* spp.)
- Cheat (*Bromus secalinus*)
- Cogongrass (*Imperata cylindrica*)<sup>1</sup>
- Crabgrass (*Digitaria* spp.)
- Crowfootgrass (*Dactyloctenium aegyptium*)
- Dallisgrass (*Paspalum dilatatum*)
- Downy brome (*Bromus tectorum*)
- Fall panicum (*Panicum dichotomiflorum*)
- Feathertop (*Pennisetum villosum*)
- Fescue (*Festuca* spp.)
- Foxtail (*Setaria* spp.)
- Giant reed (*Arundo donax*)
- Goosegrass (*Eleusine indica*)
- Guineagrass (*Panicum maximum*)
- Italian ryegrass (*Lolium multiflorum*)
- Itchgrass (*Rottboellia exaltata*)
- Johnsongrass (*Sorghum halepense*)
- Junglerice (*Echinochloa colonum*)
- Kentucky bluegrass (*Poa pratensis*)
- Lovegrass (*Eragrostis* spp.)
- Orchardgrass (*Dactylis glomerata*)
- Panicum* spp.

**GRASSES (Continued)**

- Paragrass (*Brachiaria mutica*)
- Phragmites (*Phragmites australis*)
- Prairie cordgrass (*Spartina pectinata*)
- Prairie threeawn (*Aristida oligantha*)
- Quackgrass (*Agropyron repens*)
- Reed canary grass (*Phalaris arundinacea*)
- Saltgrass (*Distichlis stricta*)
- Sand dropseed (*Sporobolus cryptandrus*)
- Sandbur (*Cenchrus* spp.)
- Smooth brome (*Bromus inermis*)
- Sprangletop (*Leptochloa* spp.)
- Timothy (*Phleum pratense*)
- Torpedograss (*Panicum repens*)
- Vaseygrass (*Paspalum urvillei*)
- Wild barley (*Hordeum* spp.)
- Wild oats (*Avena fatua*)
- Wirestem muhly (*Muhlenbergia frondosa*)
- Witchgrass (*Panicum capillare*)
- Woody cupgrass (*Eriochloa villosa*)

<sup>1</sup>Use minimum of 48 oz per acre.

**BROADLEAF WEEDS**

The species of annual and perennial broadleaf weeds controlled by **CHOPPER** include the following:

- Arrowwood (*Pluchea sericea*)
- Broom snakeweed (*Gutierrezia sarothrae*)
- Bull Thistle (*Cirsium vulgare*)
- Burclover (*Medicago* spp.)
- Burdock (*Arctium* spp.)
- Camphorweed (*Heterotheca subaxillaris*)
- Carolina geranium (*Geranium carolinianum*)
- Carpetweed (*Mullugo verticillata*)
- Chickweed, mouseear (*Cerastium vulgatum*)
- Clover (*Trifolium* spp.)
- Cocklebur (*Xanthium strumarium*)
- Common chickweed (*Stellaria media*)
- Common ragweed (*Ambrosia artemisiifolia*)
- Cudweed (*Gnaphalium* spp.)
- Dandelion (*Taraxacum officinale*)
- Desert camelthorn (*Alhagi pseudalhagi*)
- Diffuse knapweed (*Centaurea diffusa*)
- Dock (*Rumex* spp.)
- Dogfennel (*Eupatorium capillifolium*)
- Fiddleneck (*Amsinckia intermedia*)

**BROADLEAF WEEDS (Continued)**

- Filaree (*Erodium* spp.)
- Fleabane (*Erigeron* spp.)
- Giant ragweed (*Ambrosia trifida*)
- Goldenrod (*Solidago* spp.)
- Gray rabbitbrush (*Chrysothamnus nauseosus*)
- Henbit (*Lamium applexicaule*)
- Hoary vervain (*Verbena stricta*)
- Horseweed (*Coryza canadensis*)
- Indian mustard (*Brassica juncea*)
- Japanese bamboo/knotweed (*Polygonum cuspidatum*)
- Knotweed, prostrate (*Polygonum aviculare*)
- Kochia (*Kochia scoparia*)
- Lambsquarters (*Chenopodium album*)
- Little mallow (*Malva parviflora*)
- Milkweed (*Asclepias* spp.)
- Miners lettuce (*Montia perfoliata*)
- Mullein (*Verbascum* spp.)
- Nettleleaf goosefoot (*Chenopodium murale*)
- Oxeye daisy (*Chrysanthemum leucanthemum*)
- Pepperweed (*Lepidium* spp.)
- Pigweed (*Amaranthus* spp.)
- Plantain (*Plantago* spp.)
- Pokeweed (*Phytolacca americana*)
- Primrose (*Oenothera kunthiana*)
- Puncturevine (*Tribulus terrestris*)
- Purple loosestrife (*Lythrum salicaria*)
- Purslane (*Portulaca* spp.)
- Pusley, Florida (*Richardia scabra*)
- Rocket, London (*Sisymbrium irio*)
- Rush skeletonweed (*Chondrilla juncea*)
- Russian knapweed (*Centaurea repens*)
- Russian thistle (*Salsola kali*)
- Saltbush (*Atriplex* spp.)
- Shepherd's purse (*Capsella bursa-pastoris*)
- Silverleaf nightshade (*Solanum elaeagnifolium*)
- Smartweed (*Polygonum* spp.)
- Sorrell (*Rumex* spp.)
- Sowthistle (*Sonchus* spp.)
- Spurge, annual (*Euphorbia* spp.)
- Stinging nettle (*Urtica dioica*)
- Sunflower (*Helianthus* spp.)
- Sweet clover (*Melilotus* spp.)
- Tansymustard (*Descurainia pinnata*)
- Texas thistle (*Cirsium texanum*)
- Velvetleaf (*Abutilon theophrasti*)
- Western ragweed (*Ambrosia psilostachya*)
- Wild carrot (*Daucus carota*)
- Wild lettuce (*Lactuca* spp.)
- Wild parsnip (*Pastinaca sativa*)
- Wild turnip (*Brassica campestris*)
- Woollyleaf bursage (*Ambrosia grayi*)
- Yellow starthistle (*Centaurea solstitialis*)
- Yellow woodsorel (*Oxalis stricta*)

**VINES AND BRAMBLES**

The species of vines and brambles controlled by CHOPPER herbicide include the following:

- Field bindweed (*Convolvulus arvensis*)
- Hedge bindweed (*Calystegia sepium*)
- Honeysuckle (*Lonicera* spp.)<sup>1</sup>
- Morningglory (*Ipomoea* spp.)
- Poison ivy (*Rhus radicans*)
- Redvine (*Brunnichia cirrhosa*)
- Trumpet creeper (*Campsis radicans*)
- Virginia creeper (*Parthenocissus quinquefolia*)
- Wild buckwheat (*Polygonum convolvulus*)
- Wild grape (*Vitis* spp.)

**VINES AND BRAMBLES (Continued)**

- Wild rose (*Rosa* spp.)<sup>1</sup>
- Including Multiflora rose (*Rosa multiflora*)
- Macartney rose (*Rosa bracteata*)

<sup>1</sup>Use higher labeled rates.

**WOODY BRUSH AND TREES**

The species of woody brush and trees controlled by CHOPPER herbicide include the following:

- Alder (*Alnus* spp.)
- American beech (*Fagus grandifolia*)
- Ash (*Fraxinus* spp.)<sup>1</sup>
- Aspen (*Populus* spp.)
- Australian pine (*Casuarina equisetifolia*)<sup>5</sup>
- Autumn olive (*Elaeagnus umbellata*)
- Bald cypress (*Taxodium distichum*)<sup>4</sup>
- Bigleaf maple (*Acer macrophyllum*)<sup>1</sup>
- Birch (*Betula* spp.)
- Black locust (*Robinia pseudoacacia*)<sup>5</sup>
- Black oak (*Quercus kelloggii*)
- Blackgum (*Nyssa sylvatica*)<sup>2</sup>
- Boxelder (*Acer negundo*)
- Brazilian peppertree (*Schinus terebinthifolius*)
- Ceanothis (*Ceanothis* spp.)
- Cherry (*Prunus* spp.)<sup>1,2</sup>
- Chinaberry (*Melia azedarach*)
- Chinese tallow-tree (*Sapium sebiferum*)
- Chinquapin (*Castanopsis chrysophylla*)<sup>4</sup>
- Cottonwood (*Populus* spp.)
- Cypress (*Taxodium* spp.)
- Dogwood (*Cornus* spp.)<sup>1</sup>
- Elderberry (*Sambucus* spp.)<sup>5</sup>
- Elm (*Ulmus*)<sup>5</sup>
- Eucalyptus (*Eucalyptus* spp.)
- Hawthorn (*Crataegus* spp.)
- Hazel (*Corylus cornuta*)<sup>5</sup>
- Hickory (*Carya* spp.)<sup>1</sup>
- Holly (*Ilex* spp.)<sup>1,4</sup>
- Including Gallberry (*Ilex glabra*)<sup>4,5</sup>
- Tall gallberry (*Ilex coriacea*)<sup>4</sup>
- Yaupon (*Ilex vomitoria*)<sup>4</sup>
- Honeylocust (*Gleditsia triacanthos*)<sup>5</sup>
- Huckleberry (*Gaylussacia* spp.)
- Lyonia* spp.
- Including Fetterbush (*Lyonia lucida*)
- Staggerbush (*Lyonia mariana*)
- Madrone (*Arbutus menziesii*)
- Manzanita, greenleaf (*Arctostaphylos patula*)<sup>4</sup>
- Maple (*Acer* spp.)
- Melaleuca (*Melaleuca quinquenervia*)
- Mulberry (*Morus* spp.)<sup>1,3</sup>
- Oak (*Quercus* spp.)<sup>1,3</sup>
- Persimmon (*Diospyros virginiana*)<sup>2</sup>
- Poison oak (*Rhus diversiloba*)
- Popcorn-tree (*Sapium sebiferum*)
- Poplar (*Populus* spp.)<sup>2</sup>
- Privet (*Ligustrum vulgare*)
- Red alder (*Alnus rubra*)
- Red maple (*Acer rubrum*)
- Saltcedar (*Tamarix pentandra*)
- Sassafras (*Sassafras albidum*)
- Scotch broom (*Cytisus scoparius*)<sup>5</sup>
- Sourwood (*Oxydendrum arboreum*)<sup>2</sup>
- Sumac (*Rhus* spp.)
- Sweetbay magnolia (*Magnolia virginiana*)<sup>4,5</sup>
- Sweetgum (*Liquidambar styraciflua*)

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**WOODY BRUSH AND TREES (Continued)**

- Sycamore (*Platanus occidentalis*)
- Tanoak (*Lithocarpus densiflorus*)<sup>1,4,5</sup>
- TTI (*Cyrilla racemiflora*)<sup>1,4</sup>
- Tree of heaven (*Ailanthus altissima*)<sup>6</sup>
- Vaccinium spp.  
Including Blueberry (*Vaccinium* spp.)  
Sparkleberry (*Vaccinium arboreum*)
- Waxmyrtle (*Myrica californica*)<sup>4,5</sup>  
(*Myrica cerifera*)<sup>4,5</sup>
- Willow (*Salix* spp.)
- Yellow-poplar (*Liriodendron tulipifera*)<sup>1</sup>

<sup>1</sup> Use higher labeled rates.

<sup>2</sup> Best control with applications prior to formation of fall leaf color.

<sup>3</sup> The degree of control may be species dependent.

<sup>4</sup> Oil emulsion carrier is recommended.

<sup>5</sup> Tankmix with Garlon 4 as a basal or cut stump treatment.

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