

CASCADE™ AMINE

Contains Dimethylamine Salt of 2,4-D*

For selective control of many broadleaf weeds in certain crops, orchard floors, fallow cropland, forests, grass pastures, rangeland, Conservation Reserve Program acres, ornamental turf (including turf grown for sod or seed), non-cropland and aquatic areas. Also for Control of Trees by injection.

Active Ingredient

2,4-Dichlorophenoxyacetic acid, dimethylamine salt* 47.2%

Inert Ingredients 52.8%

Total 100.0%

2,4-dichlorophenoxyacetic acid** - 39.2% - 3.8 lb/gal

* Salts are the least volatile forms of 2,4-D and do not release enough vapors from treated areas to reduce yield of adjacent susceptible crops.

Keep Out of Reach of Children DANGER PELIGRO

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.)

Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. Refer to the label booklet under "Agricultural Use Requirements" in the Directions for Use section for information about this standard.

Refer to inside of label booklet for additional precautionary information including Personal Protective Equipment (PPE), User Safety Recommendations and Directions for Use, including Storage and Disposal.

Notice: **Read the entire label. Use only according to label directions.** Before buying or using this product, read "**CONDITION OF SALE AND LIMITATION OF WARRANTY AND LIABILITY**" Inside label booklet.

Agricultural Chemical: Do not ship or store with food, feeds, drugs or clothing.

EPA Reg. No. 89168-7-91395



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Precautionary Statements Hazards to Humans and Domestic Animals

DANGER

Corrosive. Causes irreversible eye damage. Harmful if swallowed, inhaled or absorbed through the skin. Do not get in eyes, on skin, or on clothing. Avoid breathing vapor or spray mist.

Personal Protective Equipment (PPE)

Some materials that are chemical-resistant to this product are made of any waterproof material. If you want more options, follow the instructions for category A on an EPA chemical resistance category selections chart.

All mixers, loader, applicator, flaggers, and other handlers must wear:

- Eye protection (goggles, face shield or safety glasses)
- Long-sleeved shirt and long pants,
- Shoes plus socks, plus
- Chemical-resistant gloves (except for applicators using groundboom equipment, pilots and flaggers), and
- Chemical-resistant apron when mixing or loading, cleaning up spills or equipment, or otherwise exposed to the concentrate.

See Engineering Controls for Additional Requirements.

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry. After each day of use, clothing or PPE must not be reused until it has been cleaned.

Engineering Controls Statements

When handlers use enclosed cabs or aircraft in a manner that meets the requirements listed in the Worker Protections Standard (WPS) for agricultural pesticides [40 CFR 170.240 (d) (4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

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

For containers of 5 gallons or more: A mechanical system (such as probe and pump or spigot) must be used for transferring the contents of this container. If the contents of a non-refillable pesticide container are emptied, the probe must be rinsed before removal. If the mechanical system is used in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240 (d) (4)], the handler PPE requirements may be reduced or modified as specified in the WPS.

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. If pesticide gets on skin, wash immediately with soap and water.
- 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.

First Aid

If in eyes: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

If on skin or clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

If swallowed: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person.

If inhaled: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment.

Note to Physician: Probable mucosal damage may contraindicate the use of gastric lavage.

Environmental Hazards

This product is toxic to fish and aquatic invertebrates. For terrestrial uses: Do not apply directly to water, to areas where surface water is present, or to intertidal area below the mean high water mark. Drift or runoff may be hazardous to aquatic organisms in water adjacent to treated areas, and non-target plants. Do not contaminate water when disposing of equipment wash waters or rinsate.

This chemical has properties and characteristics associated with chemicals detected in groundwater. The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination. Application around a cistern or well may result in contamination of drinking water or groundwater.

Fish breathe dissolved oxygen in the water and decaying weeds also use oxygen. For aquatic uses: When treating continuous, dense weed masses, it may be appropriate to treat only part of the infestation at a time. For example, apply the product in lanes separated by untreated strips that can be treated after vegetation in treated lanes has disintegrated. During the growing season, weeds decompose in a 2 to 3 week period following treatment. Begin treatment along the shore and proceed outwards in bands to allow fish to move into untreated areas. Waters having limited and less dense weed infestations may not require partial treatments.

Mixing and Loading: Most cases of groundwater contamination involving phenoxy herbicides such as 2,4-D have been associated with mixing/loading and disposal sites. Caution should be exercised when handling 2,4-D pesticides at such sites to prevent contamination of groundwater supplies. Use of closed systems for mixing and transferring this pesticide will reduce the probability of spills. Placement of the mixing/loading equipment on an impervious pad to contain spills will help prevent groundwater contamination.

Directions for Use

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Read all Directions for Use carefully before applying. 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 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, and
- Protective eyewear

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 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.

Entry Restrictions for Non-WPS Uses: When this product is applied to rangeland and established pastures not harvested for hay or seed; non-cropland areas, when applied by tree injection method only in forest sites, and when applied in aquatic areas, do not allow people (other than applicator) or pets on treatment area during application. Do not enter into treated areas until sprays have dried.

Storage and Disposal

Do not contaminate water, food, or feed by storage or disposal.

Storage: Keep container tightly closed when not in use. If exposed to subfreezing temperatures, the product should be warmed to at least 40°F and mixed thoroughly before using.

Pesticide Disposal: Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law and may contaminate groundwater. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste Representative at the nearest EPA Regional Office for guidance.

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 or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

Triple rinse as follows:

Containers 5 gallons or less: 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 ¼ 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. Once cleaned, offer for recycling or reconditioning if appropriate.

Containers larger than 5 gallons: Empty the remaining contents into application equipment or a mix tank. Fill the container ¼ full with water. Replace and tighten closures. Tip container on its side and roll back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip 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 a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times.

Pressure rinse as follows (all sizes): Empty the remaining contents into a 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.

General: Consult federal, state, or local disposal authorities for approved alternative procedures.

Product Information

CASCADE AMINE herbicide is intended for selective control of many broadleaf weeds in certain crops (cereal grains, corn, grain sorghum, soybeans and sugarcane), orchard boors (pome fruit, including apples and pears, stone fruit, nut orchards and pistachios), fallow cropland, forests, grass pastures, rangeland, Conservation Reserve Program acres, ornamental turf (including turf grown for sod or seed), non-cropland and aquatic areas.

Apply CASCADE AMINE as a water or oil-water spray during warm weather when target weeds or woody plants are actively growing. Application under drought conditions will often give poor results. Use low spray pressure to minimize drift. Generally, the lower dosages specified this label will be satisfactory for young, succulent growth of susceptible weed species. For less susceptible species and under conditions where control is more difficult, use higher specified rates. Deep-rooted perennial weeds such as Canada thistle and field bindweed and many woody plants usually require repeated applications for satisfactory control. Consult your State Agricultural Experiment stations or Extension Service Weed Specialists for recommendations from this label that best fit local conditions.

Product Use Precautions and Restrictions

Be sure that use of CASCADE AMINE conforms to all application regulations.

Chemigation: Do not apply this product through any type of irrigation system.

Excessive amounts of 2,4-D in the soil may temporarily inhibit seed germination of plant growth.

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.

Spray Drift Management

A variety of factors including weather conditions (e.g., wind direction, wind speed, temperature, relative humidity) and method of application (e.g., ground, aerial, airstblast) can influence pesticide drift. The applicator must evaluate all factors and make appropriate adjustments when applying this product.

Droplet Size

When applying sprays that contain 2,4-D as the sole active ingredient, or when applying sprays that contain 2,4-D mixed with active ingredients that require a Coarse or coarser spray, apply only as a Coarse or coarser spray (ASAE standard 572) or a volume mean diameter of 385 microns or greater for spinning atomizer nozzles.

When applying sprays that contain 2,4-D mixed with other active ingredients that require a Medium or more fine spray, apply only as a Medium or coarser spray (ASAE standard 572) or a volume mean diameter of 300 microns or greater for spinning atomizer nozzles.

Wind Speed

Do not apply at wind speeds greater than 15 mph. Only apply this product if the wind direction favors on-target deposition and there are not sensitive areas (including, but not limited to, residential areas, bodies of water, known habitat for nontarget species, nontarget crops) within 250 feet downwind. If applying a Medium spray, leave one swath unsprayed at the downwind edge of the treated field.

Temperature Inversions

If applying at wind speeds less than 3 mph, the applicator must determine if: a) conditions of temperature inversion exist, or b) stable atmospheric conditions exist at or below nozzle height. Do not make applications into areas of temperature inversions or stable atmospheric conditions.

Susceptible Plants

Do not apply under circumstances where spray drift may occur to food, forage, or other plantings that might be damaged or crops thereof rendered unfit for sale, use or consumption. Susceptible crops include, but are not limited to, cotton, okra, flowers, fruit trees, grapes (in growing stage), fruit trees (foliage), soybeans (vegetative stage), ornamentals, sunflowers, tomatoes, beans, and other vegetables, or tobacco. Small amounts of spray drift that may not be visible may injure susceptible broadleaf plants.

Other State and Local Requirements

Applicators must follow all state and local pesticide drift requirements regarding application of 2,4-D herbicides. Where states have more stringent regulations, they must be observed.

Equipment

All aerial and ground application equipment must be properly maintained and calibrated using appropriate carriers or surrogates.

Aerial Application

The boom length must not exceed 75% of the wingspan or 90% of the rotor blade diameter.

Release spray at the lowest height consistent with efficacy and flight safety. Do not release spray at a height greater than 10 feet above the crop canopy unless a greater height is required for aircraft safety. This requirement does not apply to forestry or rights-of-way applications.

When applications are made with a crosswind, the swath will be displaced downwind. The applicator must compensate for this by adjusting the path of the aircraft upwind.

Ground Boom Application

Do not apply with a nozzle height greater than 4 feet above the crop canopy.

Mixing

Mix CASCADE AMINE Herbicide only with water, unless otherwise directed on this label. Add about half the water to the mixing tank, then add the CASCADE AMINE with agitation, and finally the rest of the water with continuing agitation.

Note: Adding oil, wetting agent, or other surfactant to the spray mixture may increase effectiveness on weeds, but also may reduce selectivity to crops resulting in crop damage.

Tank Mixing: When tank mixing, read and follow the label of each tank mix product used for precautionary statements, directions for use, weeds controlled, and geographic and other restrictions. Use in accordance with the most restrictive of label limitations and precautions. No label dosages should be exceeded. Do not tank mix this product with any product containing a label prohibition against tank mixing with 2,4-D.

Tank Mix Compatibility Testing: A jar test is recommended prior to tank mixing to ensure compatibility of this product and other pesticides. Use a clear glass quart jar with lid and mix the tank mix ingredients in their relative proportions. Invert the jar containing the mixture several times and observe the mixture for approximately 1/2 hour. If the mixture balls-up, forms flakes, sludges, jells, oily films or layers, or other precipitates, it is not compatible and the tank mix combination should not be used.

Mixing with Liquid Nitrogen Fertilizer

This product may be combined with liquid nitrogen fertilizer suitable for foliar application to accomplish broadleaf weed control and fertilization of corn, small grains or pastures in a single operation. Use CASCADE AMINE in accordance with directions for these crops provided in this label. Use liquid fertilizer at rates recommended by the supplier or Extension Service Specialist. Test for mixing compatibility as describe above before mixing in spray tank. A compatibility aid such as Unite or Complex may be needed in some situations. Compatibility is best with liquid fertilizer solutions containing only nitrogen. Mixing with N-P-K solutions may not be satisfactory, even with the addition of a compatibility aid. Pre-mixing 1 part CASCADE AMINE with up to 4 parts water may help in situations when mixing difficulty occurs.

Fill the tank about half full with the liquid fertilizer, then add the required amount of CASCADE AMINE with agitation. Maintain agitation and complete filling the tank with liquid fertilizer. Apply immediately and continue agitation in spray tank during application. **Do not store the spray mixture.** Application during very cold weather (near freezing) is not advisable.

Sprayer Clean-Out

To avoid injury to desirable plants, equipment used to apply this product should be thoroughly cleaned before re-use or applying other chemicals.

1. Rinse and flush application equipment thoroughly after use at least three times with water. Dispose of all rinse water by application to treatment area or apply to non-cropland area away from water supplies.
2. During the second rinse, add 1 qt of household ammonia for every 25 gallons of water. Circulate the solution through the entire system so that all internal surfaces are contacted (15-20 min). Let the solution stand for several hours, preferably overnight.
3. Flush the solution out of the spray tank through the boom.
4. Rinse the system twice with clean water, recirculating and draining each time.
5. Remove nozzles and screens and clean separately.
6. If equipment is to be used to apply another pesticide or agricultural chemical to a 2,4-D susceptible crop, additional steps may be required to remove all traces of 2,4-D, including cleaning of disassembled parts and replacement of hoses or other fittings that may contain absorbed 2,4-D.

Application

Apply with calibrated air or ground equipment using sufficient spray volume to provide adequate coverage of target weeds or as otherwise directed in specific use directions. For broadcast application, use a spray volume of 3 or more gallons per acre by air and 10 or more gallons per acre for ground equipment. Where states have regulations which specify minimum spray volumes, they should be observed. In general, spray volume should be increased as crop canopy, height and weed density increase in order to obtain adequate spray coverage. **Do not apply less than 3 gallons total**

spray volume per acre.

Rate Ranges and Application Timing

Generally, the lower dosages given will be satisfactory for young, succulent growth of sensitive weed species. For less sensitive species and under conditions where control is more difficult, the higher dosages will be needed. Apply CASCADE AMINE during warm weather when weeds are young and actively growing.

Spot Treatments

To prevent misapplication, spot treatments should be applied with a calibrated boom or with hand sprayers using a fixed spray volume per 1,000 sq ft as indicated below.

Hand-Held Sprayers: Hand-held sprayers may be used for spot applications of CASCADE AMINE. Care should be taken to apply the spray uniformly and at a rate equivalent to a broadcast application. Application rates in the table are based on the application rate for an area of 1,000 sq ft. Mix the amount of CASCADE AMINE (fl oz or ml) corresponding to the desired broadcast rate in 1 to 3 gallons of spray. To calculate the amount of CASCADE AMINE IVM required for larger areas, multiply the table value (fl oz or ml) by the thousands of sq ft to be treated. An area of 1000 sq ft is approximately 10.5 X 10.5 yards (strides) in size.

Rate Conversion Table for Spot Treatment

Label Broadcast Rate (pt/acre)							
1/2	2/3	3/4	1	2	3	4	8
Equivalent Amount of CASCADE AMINE per 1000 sq ft							
1/5 fl oz ¹ (5.5 ml)	1/4 fl oz (7.3 ml)	1/3 fl oz (8.3 ml)	3/8 fl oz (11 ml)	3/4 fl oz (22 ml)	1 fl oz (33 ml)	1 1/2 fl oz (44 ml)	3 fl oz (88 ml)

¹ Conversion factors: 1 fl oz = 29.6 (30) ml

Band Application: CASCADE AMINE may be applied as a band treatment. Use the formulas below to determine the appropriate rate and volume per treated acre.

$$\frac{\text{Band width in inches}}{\text{Row width in inches}} \times \text{Broadcast rate per acre} = \text{Band rate per treated acre}$$

$$\frac{\text{Band width in inches}}{\text{Row width in inches}} \times \text{Broadcast volume per acre} = \text{Band volume per treated acre}$$

Weeds Controlled

Annual or Biennial Weeds

Beggarticks ¹

Bittercress, smallflowered

bitterweed

broomweed, common ¹

burdock, common

buttercup, smallflowered ¹

carpetweed

cinquefoil, common

cinquefoil, rough

cocklebur, common

coffee weed

copperleaf, Virginia

croton, Texas

croton, woolly

flixweed

galinsoga

geranium, Carolina

hemp, wild

horseweed, (mare's tail)

jewelweed

jimsonweed

knotweed ¹

kochia

lambsquarters, common

lettuce, prickly ¹

lettuce, wild

lupines

mallow, little ¹

mallow, Venice ¹

marshelder

morningglory, annual

morningglory, ivy

morningglory, woolly

mousetail

mustards (except blue mustard)

parsnip, wild

Pennycress, field

Pepperweed ¹

pigweeds (Amaranthus spp.) ¹

poorjoe

primrose, common

purslane, common

pusley, Florida

radish, wild

ragweed, common

ragweed, giant

rape, wild

rocket, yellow

salsify, common ¹

salsify, western ¹

shepherdspurse

sicklepod

smartweed (annual species) ¹

sneezeweed, bitter

sowthistle, annual

sowthistle, spiny

spanishneedles

sunflower

sweetclover

sansymustard

thistle, bull

thistle, musk ¹

thistle, Russian (tumbleweed) ¹

velvetleaf

vetches

Perennial Weeds

alfalfa ¹

artichoke, Jerusalem ¹

aster, many-flower ¹

Austrian fieldcress ¹

bindweed (hedge, field and European) ¹

blue lettuce

blueweed, Texas

broomweed

bullnettle ¹

carrot, wild ¹

catnip

chicory

clover, red ¹

coffee weed

cress, hoary ¹

dandelion ¹

docks ¹

dogbanes ¹

eveningprimrose, cutleaf

garlic, wild ¹

goldenrod

hawkweed, orange ¹

healal

ironweed, western

ivy, ground ¹

Jerusalem-artichoke

loco, bigbend

nettles (including stinging) ¹

onion, wild ¹

pennywort

plantains

ragwort, tansy ¹

sowthistle, perennial

thistle, Canada ¹

vervains ¹

waterplantain

wormwood

¹ These weeds are only partially controlled and may require repeated applications and/or use of higher specified rates of this product even under ideal conditions of application.

Specific Use Directions

Agricultural Use Requirements for Crops: For the following crop uses, follow PPE and Re-entry instructions in the "Agricultural Use Requirements" section of this label.

Cereal Grains

(Wheat, Barley, Millet, Oats, and Rye)

Crop/Application Timing	CASCADE AMINE (pt/acre)	Specific Use Directions
Spring post-emergence (wheat, barley, millet, rye) (oats) Pre-harvest (dough stage) (all cereals)	2/3 – 1 1/3 1/2 -1	Apply when weeds are small and actively growing. Use the lower rate in the rate range for small rapidly growing annual or biennial weeds and a higher rate for perennial weeds or for annual or biennial weeds in advanced growth stages or when growing conditions are less than ideal. Postemergence: Apply after crop begins to tiller, but before boot stage of growth (usually 4 to 8 inches tall). Preharvest: Apply using air or ground equipment when crop is in dough stage of grain development to control or suppress weeds that might interfere with harvest.

Precautions:

- Up to 2.5 pt/acre may be applied postemergence to wheat, barley, rye and millet. However, there is greater risk of crop injury at rates greater than 1 1/3 pt/acre and such rates should be used only when the need for weed control justifies additional risk to the crop.
- Do not apply CASCADE AMINE at the crop seedling stage of growth prior to tillering or from early boot through milk stage of grain development.** Consult state agricultural experiment station or extension service weed specialists for recommendations or suggestions to fit local conditions.
- Do not apply if crop is underseeded with legumes.

Restrictions:

- Preharvest interval:** Do not harvest for grain for 14 days after application or allow grazing or harvest as forage within 7 days after application.
- Do not apply more than 3.5 pt/acre of CASCADE AMINE (1.75 lb acid equivalent) per crop cycle.

Corn (Field Corn, Popcorn and Sweet Corn)

Application Timing/ Stage of Growth	CASCADE AMINE (pt/acre)	Specific Use Directions
Preplant (Burndown) Preemergence (Field corn, popcorn, and sweet corn)	1 to 2	Use high rate in rate range for less susceptible weed or cover crops, weeds in advanced stages of development, or unless favorable growth conditions. Preplant: Apply 7 to 14 days before planting corn to control emerged broadleaf weed seedling or existing cover crops. Preemergence: Apply any time after planting, but before corn emerges to control broadleaf weed seedlings or existing cover crops. Note: Limited to 1 application per crop cycle.
Postemergence (Field corn, popcorn, and sweet corn) Annual broadleaf weeds Crop up to 8 inches tall Crop 8 inches tall to tasseling (directed spray only) Perennial broadleaf weeds	1/2 to 1 1 1	Apply when weeds are small and corn is less than 8 inches tall (to top of crop canopy). If corn is more than 8 inches tall, use drop nozzles and directed sprays to keep spray off foliage. Treat perennial weeds when they are in bud to bloom stage. Do not apply from tasseling to hard dough stage. Note: Limited to 1 application per crop cycle.
Preharvest (Field corn and popcorn only)	up to 3	Apply after corn is in hard dough (or denting) stage. Do not apply preharvest to sweet corn. Note: Limited to 1 application per crop cycle.

Precautions:

- Preplant or preemergence applications to light sandy soils is not recommended.
- Corn hybrids vary in tolerance to 2,4-D. Some are easily injured. Apply only to varieties known to be tolerant to 2,4-D. Consult the seed company or your Agricultural Experiment Station or Extension Service Weed Specialist for this information.
- **Note:** Corn treated with 2,4-D may exhibit stem brittleness for 8 - 10 days following application. During this period, the crop is more susceptible to stem breakage from cultivation or wind.

Restrictions (Field Corn and Popcorn):

- **Preharvest interval:** Do not harvest for grain or fodder within 7 days after application.
- Do not apply more than 6.0 pt/acre of CASCADE AMINE (3 lb acid equivalent) per crop cycle.
- Limited to 1 preplant or preemergence application, 1 postemergence application and 1 pre-harvest application

Restrictions (Sweet Corn):

- **Preharvest interval:** Do not harvest ears within 45 days after application.
- Do not make a postemergence application any less than 21 days after a prior application.
- Do not apply more than 3.0 pt/acre of CASCADE AMINE (1.5 lb acid equivalent) per crop cycle.
- Limited to 1 preplant or preemergence application and 1 postemergence application.

Fallow Land and Crop Stubble

Fallowland is idle land, postharvest to crops or between crops.

Type of Weeds	Cascade Amine (pt/acre)	Specific Use Directions
Annual broadleaf weeds	1 to 2	Use a lower rate in the rate range when weeds are small (2 to 3 inches tall) and actively growing. Use a higher in the rate range when weeds are larger and under less favorable growth conditions.
Biennial broadleaf weeds	2 to 4	Apply when musk thistles or other biennial species are in the seedling to rosette stage and before development of flower stalks. The lower rate can be used in the spring during the rosette stage. Use the highest rate in the fall or after flower stalks have developed.
Perennial broadleaf weeds	2 to 4	Apply when perennial weeds are in bud to early bloom stage or while in good vegetative growth.
Wild garlic and onion in crop stubble	4	Apply to new regrowth of wild garlic or onion which occurs in the fall after harvest of small grains, corn or grain sorghum.

Precautions:

- For best weed control results, do not cultivate for at least 2 weeks after application or until top growth is dead.

Restrictions:

- **Preharvest interval:** Do not cut forage for hay within 7 days of application.
- Do not apply within 30 days of a previous application.
- Do not apply more than 4.0 pt/acre of CASCADE AMINE (2.0 lb acid equivalent) per year.
- Limited to 2 applications per year.

Planting in Treated Areas

Labeled Crops: Within 29 days after an application of this product, plant only those crops listed on this or other registered 2,4-D labels. Follow more stringent limitations, if any, provided in directions for specific crops. Labeled crops may be at risk of crop injury or loss if planted soon after application, especially during the first 14 days. Degradation factors described below should be considered in weighing this risk.

Other Crops: All other crops may be planted 30 or more days after application without concern for illegal residues in the planted crop. However, under certain conditions, there may be a risk of injury to susceptible crops. Degradation factors described below should be considered in weighing this risk. Under normal conditions, any crop may be planted without risk of injury if at least 90 days of soil temperatures above freezing have elapsed since application.

Degradation Factors: When planting into treated areas, the risk of crop injury is less if lower rates of product were applied and conditions following application have included warm, moist soil conditions that favor rapid breakdown of 2,4-D. Risk is greater if higher rates of product were applied and soil temperatures have been cold and/or soils have been excessively wet or dry in the days following application. Consult your local agricultural extension service or information about susceptible crops and typical conditions in your area.

Orchard Floors
(Pome Fruit such as Apples and Pears, Stone Fruit, Nut Orchards and Pistachios)

Application Timing	Cascade Amine (pt/acre)	Specific Use Directions
Postemergence annual and biennial weeds perennial weeds	1 - 2 up to 4	For application to orchard floors, use coarse, low pressure sprays and sufficient water for thorough coverage of weeds. Apply to annual weeds when small and actively growing. Apply to perennial weeds from bud to bloom stage.

Precautions

- To avoid tree injury, do not allow spray drift to contact foliage, fruit, stems, trunks or trees or exposed roots.
- Do not apply when orchards are blooming.
- Do not make orchard floor applications in areas with light sandy soils.
- Avoid application immediately before irrigation and withhold irrigation for 2 days before and 3 days after application.
- Newly established trees or young orchards are more susceptible to 2,4-D injury. Apply only to orchards that have been established for at least one year and are in vigorous growth condition.

Restrictions:

• **Preharvest Intervals:**

Apples and Pears: Do not harvest for 14 days after application.

Stone Fruit: Do not harvest for 40 days after application.

Nut Orchards and Pistachios: Do not harvest for 60 days after application.

- Do not cut forage or hay within 7 days after application.
- Do not make more than 2 applications per year and allow at least 75 days between applications.
- Do not apply more than 8.0 pt/acre of CASCADE AMINE (4.0 lb acid equivalent) per use season.

Rice (Not for Use in California)

Application Timing	Cascade Amine (pt/acre)	Specific Use Directions
Preplant	1 to 2	Apply 2 to 4 weeks before planting rice to control emerged broadleaf weeds.
Postemergence	1 to 2 ¹	Apply when rice is in late tillering stage and at the time of first joint development (first to second green ring)

¹ Up to 3 pt/acre may be applied postemergence for difficult weed control situations. However, there is greater risk of crop injury at rates greater than 2 pt/acre and such rates should be used only when the need for weed control justifies additional risk to the crop.

Precautions:

- Do not apply at early seedling stage or after rice internodes exceed one-half inch or panicle initiation.
- Some rice varieties under certain conditions or stages of growth may be injured by 2,4-D. Before applying, consult local university or agricultural extension service specialists regarding for local treatment recommendations for various rice varieties.

Restrictions:

- **Preharvest interval:** Do not apply within 60 days of harvest
- Do not apply more than 1.5 lb acid equivalent (3 pt of CASCADE AMINE) per crop cycle.

Sorghum [Grain Sorghum (Milo) and Forage Sorghum]

Application Timing/Stage of growth	Cascade Amine	Specific Use Directions
Postemergence¹ Crop 6 – 8 inches tall Crop 8 – 15 inches tall (directed spray only)	1/2 to 1 3/4 to 1	Apply when sorghum is 6 to 15 inches tall. If sorghum is more than 8 inches tall (to top of crop canopy), use drop nozzles and apply as a directed spray to keep spray off foliage.

Precautions:

- **Note:** Temporary crop injury can be expected under conditions of high soil moisture and high air temperatures. If it is necessary to apply CASCADE AMINE Herbicide under these conditions, use no more than 2/3 pint per acre.
- **Do not apply during boot, or later stages of growth.**
- Sorghum hybrids vary in tolerance to 2,4-D. Some are easily injured. Apply only to varieties known to be tolerant to 2,4-D. Consult the seed company or your agricultural experiment station or extension service weed specialist for this information.

Restrictions:

- **Preharvest Interval:** Do not harvest grain for 30 days after application.
- Do not permit meat or dairy animals to consume treated crop as fodder or forage within 30 days after application.
- Do not apply more than 2.0 pt/acre of CASCADE AMINE (1.0 lb acid equivalent) per use season.
- Limited to 1 application per crop cycle.

Soybeans (Preplant Burndown Only)

Application Timing	CASCADE AMINE (pt/acre)	Specific Use Directions
Preplant (Burndown)	3/4 to 1	Apply not less than 15 days before planting soybeans, when weeds are small and actively growing. Use the higher rate on larger weeds and when perennials are present. See Precautions and Restrictions below.
	1 to 2	Apply not less than 30 days before planting soybeans, when weeds are small and actively growing. Use the higher rate on larger weeds and when perennials are present. See Precautions and Restrictions below.

Crop oil concentrates, agricultural surfactants and fluid fertilizers approved for use on growing crops may be added to spray mixtures of CASCADE AMINE to increase the herbicidal effectiveness on certain weeds.

Read and follow all directions and precautions on this label and on the label of each product added to the spray mixture. Refer to the "Mixing" section for instructions for tank mixing and compatibility testing.

Precautions and Restrictions:

- **Important Notice:** Unacceptable injury to soybeans planted in treated fields may occur. Whether or not soybean injury occurs and the extent of such injury will depend on weather (temperature and rainfall) from herbicide application until soybean emergence and agronomic factor; such as the amount of weed vegetation and previous crop residue present at the time of application. Injury is more likely under cool rainy conditions and where there is less weed vegetation and crop residue present.
- Do not disturb treated soil through tillage between application and planting of soybeans.
- Do not use on sandy soils with less than 1.0% organic matter.
- In treated fields, plant soybean seed as deep as practical, but not less than 1.0 inch deep. Adjust the planter, if necessary, to ensure that planted seed is adequately covered.
- Do not make more than one application per season regardless of the application rate used.
- Do not allow livestock grazing or harvest hay, forage, or fodder from treated fields. Livestock should be restricted from feeding/grazing of treated cover crops.
- **Do not apply CASCADE AMINE as a preplant application in soybeans unless you are prepared to accept the results of soybean injury, including possible stand loss and/or yield reduction.**
- During the growing season following application, do not replant treated fields with crops other than those labeled for use with CASCADE AMINE.
- Do not apply more than 2 pt/acre of CASCADE AMINE (1.0 lb acid equivalent) per use season.

Sugarcane

Application Timing/ Stage of Growth	CASCADE AMINE (pt/acre)	Specific Use Directions
Preemergence Postemergence	2 to 4	Consult your agricultural experiment station or extension service weed specialist local recommendations. Preemergence: Apply before cane emerges to actively growing weeds. Postemergence: Apply after cane emerges through canopy closure. Use higher rate for perennial weeds and difficult-to-control species.

Restrictions:

- Do not apply more than 4.0 pt/acre of CASCADE AMINE (2.0 lb acid equivalent) per crop cycle.
- Limited to 1 application per crop cycle.

Forestry, Rangeland, Established Pasture, and Non-cropland, Uses

Agricultural Use Requirements for Forest Use (Except Tree Injection Use): For use in forests, follow PPE and Reentry instructions in the "Agricultural Use Requirements" section under the "Directions for Use" heading of this label.

Agricultural Use Requirements for Rangeland, pasture, Forest (Tree Injections Only) and Non-cropland Areas: When this product is applied to rangeland and established pastures not harvested for hay or seed; non-cropland areas, and when applied by tree injection in forest sites, follow reentry requirements given in the "Non-Agricultural Use Requirements" section under the "Directions for Use" heading of this label.

Forestry Uses

Forest site preparation, forest roadsides, brush control, established conifer release (including Christmas trees and reforestation areas)

Treatment Site Method of Application	CASCADE AMINE	Specific Use Directions
Annual Weeds Biennial and perennial broadleaf weeds and susceptible woody plants	2 to 4 pt/acre 4 to 8 pt/acre	Apply when weeds are small and growing actively before the bud stage. Apply when biennial and perennial species are in the seedling to rosette stage and before flower stalks appear. For difficult to control perennial broadleaf weeds and woody species, use up to 1 gallon CASCADE AMINE Herbicide and 1 to 4 qt. Garlon® 3A herbicide per acre. For conifer release, make application in early spring before budbreak of conifers when weeds are small and actively growing.
Spot Treatment to control broadleaf weeds	See Instructions for "Spot Treatment"	Note: To control broadleaf weeds in small areas with a hand sprayer, use an application rate equivalent to the specific broadleaf rate and spray to thoroughly wet all foliage. See rate conversion table and instructions for "Spot Treatment" and use of hand-held sprayers under "Application".
Conifer Release: Species such as white pine, ponderosa pine, jack pine, red pine, black spruce, white spruce, red spruce, and balsam fir	1 1/2 to 3 qt/acre	To control competing hardwood species such as alder, aspen, birch, hazel, and willow, apply from mid to late summer when growth of conifer trees has hardened off and woody plants are still actively growing. Apply with ground or air equipment, using sufficient spray volume to ensure complete coverage. Because this treatment may cause occasional conifer injury, do not apply if such injury cannot be tolerated.
Directed Spray: Conifer plantations including pine	4 qt/100 gal	Apply when brush or weeds are actively growing by directing the spray so as to avoid contact with conifer foliage and injurious amounts of spray. Apply in oil, oil-water, or water carrier in a spray volume of 10 to 100 gallons per acre.
Basal Spray (May also be used in rangeland, pastures, and noncropland)	8 qt/100 gal or 2.6 fl oz/gal of water	Thoroughly wet the base and root collar of all stems until the spray begins to accumulate around the root collar at the ground line. Wetting stems with the mixture may also aid in control.
Surface of Cut Stumps (May also be used in rangeland, pastures, and noncropland)		Apply as soon as possible after cutting trees. Thoroughly soak the entire stump with the 2,4-D mixture including cut surface, bark and exposed roots.
Frill and Girdle (May also be used in rangeland, pastures, and noncropland)		Cut frills (overlapping V-shaped notches cut downward through the bark in a continuous ring around the base of the tree) using an axe or other suitable tool. Treat freshly cut frills with as much of the 2,4-D mixture as they will hold.
Tree Injection Application (May also be used in rangeland, pastures, and noncropland)	(1 to 2 ml per injection site)	To control unwanted hardwood trees such as elm, hickory, oak, and sweetgum in forests and other non-crop areas, apply by injecting at a rate of 1 ml of undiluted CASCADE AMINE per inch of trunk diameter at breast height (DBH) as measured approximately 4 1/2 ft above the ground. For hard to control species such as ash, maple, and dogwood use 2 ml of undiluted CASCADE AMINE per injection site or double the number of 1 ml injections. Make applications as close to the root collar as possible and the injection bit must penetrate the inner bark. Applications may be made throughout the year, but for best results apply between May 15 and October 15. Maples should not be treated during the spring sap flow. Note: No Worker Protection Standard worker entry restrictions or worker notification requirements apply when this product is directly injected into agricultural plants.

Precautions and Restrictions:

- Do not allow sprays to contact conifer shoot growth (current year's new growth) or injury may occur.
- Do not apply to nursery seed beds.
- For conifer release, do not use on plantations where pine or larch are among the desired species.
- For broadcast applications, do not apply more than 8.0 pt/acre of CASCADE AMINE (4.0 lb acid equivalent) per 12 month period.

Rangeland, Established Grass Pastures (Including Perennial Grasslands Not In Agricultural Production Such As Conservation Reserve Program Acres)

Target Weeds or Woody Plants	Cascade Amine (pt/acre)	Specific Use Directions
Annual broadleaf weeds Biennial and perennial broadleaf weeds	2 2 to 4	For best results, apply when weeds are small and growing actively before the bud stage. Apply when musk thistles or other biennial species are in the seedling to rosette stage and before flower stalks appear. Refer to the "Weeds Controlled" section for a listing of susceptible weed species and weeds that may be only partially controlled and require repeat applications and/or use of higher specified rates, even under ideal conditions of application
Spot Treatment to control broadleaf weeds	See instructions for "Spot Treatment"	Note: To control broadleaf weeds in small areas with a hand sprayer, use an application rate equivalent to the broadcast rate specified for this treatment site and spray to thoroughly wet all foliage. See rate conversion table and instructions for "Spot Treatment" and use of hand-held sprayers under "Application". Restrictions: Limited to 4 pts/acre CASCADE AMINE (2.0 lb acid equivalent) per year.
Tree Injection Application		See instructions for tree injection application in "Forestry Uses" section.
Wild garlic and wild onion	4	Make three applications (fall-spring-fall or spring-fall-spring) starting in late fall or early spring.
Broadleaf weed control in newly sprigged coastal bermudagrass	2 to 4	Applications may be made either preemergence or postemergence. Follow "Specific Use Directions" for annual, biennial and perennial broadleaf weed control, above.
Sand shinnery oak Sand sagebrush	2	Sand shinnery oak: Apply by aircraft between May 15 and June 15. Sand sagebrush: Apply by ground or aircraft when foliage is fully expanded and plants are actively growing. Use a 1:4 oil-water emulsion as carrier and a spray volume of 3 to 5 gallons per acre.
Big sagebrush Rabbitbrush	4	Apply by ground or aircraft when foliage is fully expanded and plants are actively growing. Use a 1:4 oil-water emulsion as carrier and a spray volume of 3 to 5 gallons per acre. Retreatment may be needed.
Chamise, manzanita, buckbrush, coastal sage, coyotebrush, and chaparral species.	4	Apply by ground or aircraft when foliage is fully expanded and plants are actively growing. Use water or 1:4 oil-water emulsion as carrier and a spray volume of 5 to 10 gallons per acre. Retreatment may be needed.
Southern wild rose Broadcast application Spot treatment	up to 4 1 gal/100 gal of spray	Broadcast: Apply in a spray volume of 5 or more gallons per acre by aircraft or 10 or more gallons per acre by ground equipment. Spot treatment: Apply when foliage is well developed. Thorough coverage is required. Use 1 gallon of CASCADE AMINE plus 4 to 8 fluid ounces of an agricultural surfactant per 100 gallons of water. Two or more treatments may be required. Do not exceed 4 pt per acre per application.

Precautions and Restrictions:

- If grass is to be cut for hay, Agricultural use Requirements for the Worker Protection Standard are applicable.
- Do not use on bentgrass, alfalfa, clover, or other legumes.
- Do not use on newly seeded areas until grass is well established.

- Do not use from early boot to milk stage where grass seed production is desired.
- Do not apply within 30 days of a previous application.
- Do not harvest forage for hay within 7 days of application.
- The maximum use rate is 4 pt/acre of CASCADE AMINE (2.0 lb acid equivalent) per application.
- Do not apply more than 8 pt/acre of CASCADE AMINE (4.0 lb acid equivalent) per year.
- Limited to 2 applications per year.

Non-Cropland Areas

Such as fencerows, hedgerows, roadsides, drainage ditches, rights-of way, utility power lines, railroads, airports, and other non-crop areas

Treatment Site Method of Application	CASCADE AMINE (pt/acre)	Specific Use Directions
Annual broadleaf weeds Biennial and perennial broadleaf weeds and susceptible woody plants	2 to 4 4 to 8	Apply when annual weeds are small and growing actively before the bud stage. Biennial and perennial weeds should be rosette to bud stage, but not flowering at the time of application. For difficult to control perennial broadleaf weeds and woody species, tank mix up to 1 gallon CASCADE AMINE plus 1 to 4 qt Garlon® 3A herbicide per acre. For ground application: (High volume) apply a total of 100 to 400 gal per acre; (low volume) apply a total of 10 to 100 gal per acre. For helicopter: Apply a total of 5 to 30 gal per acre spray volume.
Spot Treatment to control broadleaf weeds	See Instructions for "Spot Treatment"	Note: To control broadleaf weeds in small areas with a hand sprayer, use an application rate equivalent to the broadcast rate specified for this treatment site and spray to thoroughly wet all foliage. See rate conversion table and instructions "Spot Treatment" and use of hand-held sprayers under "Application".
Tree Injection Application		See instructions for tree injection application in "Forestry Uses" section.
Southern wild rose Broadcast application Spot treatment	up to 4 1 gal/100 gal of spray	Broadcast: Apply in a spray volume of 5 or more gallons per acre by aircraft or 10 or more gallons per acre by ground equipment. Apply when foliage is well developed. Thorough coverage is required. Use 1 gallon of CASCADE AMINE plus 4 to 8 fluid ounces of an agricultural surfactant per 100 gallons of water. Two or more treatments may be required.

Precautions and Restrictions:

- Do not apply to newly seeded areas until grass is well established.
- Bentgrass, St Augustine, clover, legumes and dichondra may be severely injured or killed by this treatment
- Do not apply more than 8 pt/acre of CASCADE AMINE (4.0 lb acid equivalent) per use season.
- **Annual, biennial and perennial broadleaf weeds:** Limited to 2 per year. Do not apply more than 4 pt /acre CASCADE AMINE (2.0 lb acid equivalent) per year.
- **Woody Plants:** Limited to 1 application per year. Do not apply more than 8 pt/acre CASCADE AMINE (4.0 lb acid equivalent) per year.
- Do not reapply to a treated area within 30 days of a previous application.
- If grazing of meat or dairy animals or hay harvest is desired in non-crop areas, do not apply more than 4.0 pt/acre of CASCADE AMINE (2 lb acid equivalent) and refer to the Rangeland and Established Grass Pastures section for applicable precautions and restrictions.
- Applications to non-cropland areas 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.

Turf Uses

Grasses Grown for Seed or Sod Farms

Agricultural Use Requirements: When used in grass grown for seed or sod farms, follow PPE and reentry instructions in the "Agricultural Use Requirements" section of this label.

Treatment Site (Application Timing)	CASCADE AMINE (pt/acre)	Specific Use Directions
Grasses Grown for Seed (Postemergence Use) Seedling grass (five-leaf stage or later) Well-established grasses	3/4 to 1 1 to 4	Apply when weeds are small and actively growing. For best results, apply when soil moisture is adequate for active weed growth. Do not apply to newly seeded grasses until well established (five-leaf stage or later) and then use a maximum of 1 pt/acre. Cool season grasses are tolerant of higher rates. Do not apply to grass in the early boot through milk stage if seed production is desired.
Sod Farms (Postemergence)	2 to 4	When grass is well established, higher rates of up to 4 pints/acre may be applied for control of hard-to-kill annual or perennial weeds. Deep-rooted perennials such as bindweed and Canada thistle may require repeat applications. Avoid mowing sod farms for 1 to 2 days before or after application. Delay irrigation until the day following application.

Precautions and Restrictions:

- Do not use on creeping grasses such as bent except as a spot treatment
- Do not use on injury-sensitive southern grasses such as St. Augustinegrass.
- Do not use on dichondra or other herbaceous ground covers. Legumes may be damaged or killed.
- Do not reapply to a treated area within 21 days of a previous application.
- Reseeding:** Delay reseeding at least 30 days following application. Preferably, with spring application, reseed in the fall and with fall application, reseed in the spring.
- Do not graze or cut forage for hay within 7 days after application.
- Do not apply more than 8 pt/acre of CASCADE AMINE (4 lb acid equivalent) per year.
- Limited to 2 applications per year.

Ornamental Turf (Excluding Grasses Grown For Seed or Sod Farms)

(Includes lawns, golf courses, cemeteries and parks, airfields, roadsides, vacant lots, drainage ditch banks)

Use Requirements for Ornamental Turf Areas: When this product is applied to ornamental turf areas, follow PPE and reentry instructions in the "Non-agricultural Use Requirements" section of this label.

Treatment Site (Application Timing)	CASCADE AMINE (pt/acre)	Specific Use Directions
Ornamental Turf (Postemergence) Seedling grass (five-leaf stage or later) Well-established grasses Biennial and perennial broadleaf weeds	3/4 to 1 2 to 3 3	Apply when weeds are small and actively growing. For best results, apply when soil moisture is adequate for active weed growth. Deep-rooted perennial weeds such as bindweed and Canada thistle may require repeat applications. Do not apply to newly seeded grasses until well established (five-leaf stage or later) and then use a maximum of 1 pt/acre. Cool season grasses are tolerant of higher rates.

Precautions and Restrictions:

- Do not use on creeping grasses such as bent except as a spot treatment.
- Do not use on injury-sensitive southern grasses such as St. Augustinegrass.
- Do not use on dichondra or other herbaceous ground covers. Legumes may be damaged or killed.
- Do not reapply within 21 days of a previous application.
- Reseeding:** Delay reseeding at least 30 days following application. Preferably, with spring application, reseed in the fall and with fall application, reseed in the spring.
- Do not apply more than 2 broadcast applications per year per treatment site (does not include spot treatments).
- Do not apply more than 3 pt/acre CASCADE AMINE (1.5 lb. acid equivalent) per application.
- Do not apply more than 6 pt/acre CASCADE AMINE (3.0 lb. acid equivalent) per year.

Aquatic Uses

Control of Weeds and Brush on Banks of Irrigation Canals and Ditches

Ditchbank Application: Postemergence

Target Plants	CASCADE AMINE (pt/acre)	Specific Use Directions
Annual Weeds	2 to 4	Apply using low pressure spray (10 to 40 psi) in a spray volume of 20 to 100 gallons per acre using power operated spray equipment. Apply when wind speed is low, 5 mph or less. Apply working upstream to avoid accidental concentration of spray into water. Cross-stream spraying to opposite banks is not permitted and avoid boom spraying over water surface. When spraying shoreline weeds, allow no more than 2 foot overspray onto water surface with an average of less than 1 foot of overspray to prevent significant water contamination. Apply when weeds are small and growing actively before the bud stage. Apply when biennial and perennial species are in the seedling to rosette stage and before flower stalks appear. For hard-to-control weeds, a repeat application after 30 days at the same rate may be needed. For woody species and patches of perennial weeds, mix 1 gallon of CASCADE AMINE per 64 to 150 gallons of total spray. Wet foliage by applying about 3 to 4 gallons of spray per 1000 sq ft (10.5 X 10.5 steps)

Restrictions:

- Limited to 2 applications per season.
- Maximum of 4 pt/acre CASCADE AMINE (2.0 lbs acid equivalent) per application.
- Minimum of 30 days between applications.
- Spot treatment permitted.
- Do not use on small canals with a flow rate less than 10 cubic feet per second (CFS) where water will be used for drinking purposes.

CFS may be estimated by using the formula below.

The approximate velocity needed for the calculation can be determined by observing the length of time that it takes a floating object to travel a defined distance. Divide the distance (ft.) by the time (sec.) to estimate velocity (ft. per sec.). Repeat 3 times and use the average to calculate CFS. Average Width (ft.) x Average Depth (ft.) x Average Velocity (ft. per sec.) = CFS

For ditchbank weeds:

- Do not allow boom spray to be directed onto water surface.
- Do not spray across stream to opposite bank.

For shoreline weeds:

- Allow no more than 2 foot overspray onto water.

Aquatic Weed Control in Ponds, Lakes, Reservoirs, Marshes, Bayous, Drainage Ditches, Canals, Rivers and Streams that are Quiescent or Slow Moving, Including Programs of the Tennessee Valley Authority

Notice to Applicants: Before application, coordination and approval of local and state authorities may be required, either by letter or agreement or issuance of special permits for such use.

Floating and Emergent Weeds: Including Water hyacinth (*Eichornia crassipe*)

Apply to emergent aquatic weeds in ponds, lakes, reservoirs, marshes, bayous, drainage ditches, non-irrigation canals, rivers, and streams that are quiescent or slow moving. Coordination and approval of local and state authorities may be required, either by letter of agreement or issuance of special permits for aquatic applications.

Restrictions:

- Maximum of 4.0 lbs acid equivalent per surface acre per application.
- Limited to 2 applications per season.
- Minimum of 21 days between applications.
- Spot treatments are permitted.

Application Rate: 2 to 4 qt/acre.

Specific Use Directions

Application Timing: Spray weed mass only. Apply when water hyacinth plants are actively growing. Repeat application as necessary to kill regrowth and plants missed in previous operation. Use 4 qt/acre rate when plants are mature or when weed mass is dense.

Surface Application: Use power operated sprayers with boom or spray gun mounted on boat, tractor or truck. Thorough wetting of foliage is essential for maximum control. Use 100 to 400 gallons of spray mixture per acre. Special precautions such as use of low pressure, large nozzles and spray thickening agents should be taken to avoid spray drift to susceptible crops. Follow label directions for use of any drift control agent.

Aerial Application: Use drift control spray equipment or thickening agent mixed in the spray mixture. Apply 1 gallon of CASCADE AMINE per acre using standard boom systems using a minimum spray volume of 5 gallons per acre. For Microfoil® drift control spray systems, apply CASCADE AMINE in a total spray volume of 12 to 15 gallons per acre.

Submerged Aquatic Weeds: Including Eurasian Water Milfoil (*Myriophyllum spicatum*)

Restrictions:

- Maximum of 10.8 lbs acid equivalent per acre-foot per application.
- Limited to 2 applications per season.
- Do not apply within 21 days of previous application.
- When treating moving bodies of water, applications must be made while traveling upstream to prevent concentration of 2,4-D downstream from the application.

Apply to aquatic weeds in ponds, lakes, reservoirs, marshes, bayous, drainage ditches, nonirrigation canals, rivers, and streams that are quiescent or slow moving.

Coordination and approval of local and state authorities may be required, either by letter of agreement or issuance of special permits for such use.

Treatment Site	Maximum Application Rate ¹	Specific Use Directions
Aquatic Weed Control in Ponds, Lakes, Reservoirs, Marshes, Bayous, Drainage Ditches, Canals, Rivers and Streams that are Quiescent or Slow Moving, Including Programs of the Tennessee Valley Authority	10.8 lb acid equivalent per acre foot	<p>Application Timing: For best results, apply in spring or early summer when aquatic weeds appear. Check for weed growth in areas heavily infested the previous year. A second application may be needed when weeds show signs of recovery, but no later than mid-August in most areas.</p> <p>Subsurface Application: Apply CASCADE AMINE undiluted directly to the water through a boat mounted distribution system. Shoreline areas should be treated by subsurface injection application by boat to avoid aerial drift.</p> <p>Surface Application: Use power operated boat mounted boom sprayer. If rate is less than 5 gallons per acre, dilute to a minimum spray volume of 5 gallons per surface acre.</p> <p>Aerial Application: Use drift control spray equipment or thickening agents mixed with sprays to reduce drift. Apply through standard boom systems in a minimum spray volume of 5 gallons per surface acre. For Microfoil® drift control spray systems, apply CASCADE AMINE in a total spray volume of 12 to 15 gallons per acre.</p> <p>Apply to attain a concentration of 2 to 4 ppm (see table below).</p>

¹ CASCADE AMINE contains 3.8 lb acid equivalent per gallon of product.

Table 1. Amount of 2,4-D to Apply for a Target Subsurface Concentration

Surface Area	Average Depth	For typical conditions – 2 ppm 2,4-D ae/acre-foot	For difficult conditions* - 4 ppm 2,4-D ae/acre-foot
1 acre	1 ft	5.4 lbs	10.8 lbs
	2 ft.	10.8	21.6
	3 ft	16.2	32.4
	4 ft	21.6	43.2
	5 ft	27.0	54.0

* Examples include spot treatment of pioneer colonies of Eurasian Water Milfoil and certain difficult to control aquatic species.

Table 2. Drinking Water Setback Distance for Submersed Weed Applications

Application Rate and Minimum Setback Distance (feet) From Functioning Potable Water

1 ppm*	2 ppm*	3 ppm*	4 ppm*
600	1200	1800	2400

* ppm acid equivalent target water concentration

Table 3. Sampling for Drinking Water Analysis After 2,4-D Application for Submersed Weed Applications

Minimum Days After Application Before Initial Water Sampling at the Functioning Potable Water Intake

1 ppm*	2 ppm*	3 ppm*	4 ppm*
5	10	10	14

* ppm acid equivalent target water concentration

Water Use**1. Water for irrigation or sprays:**

- A. If treated water is intended to be used only for crops or non-crop areas that are labeled for direct treatment with 2,4-D such as pastures, turf, or cereal grains, the treated water may be used to irrigate and/or mix sprays from these sites at any time after the 2,4-D aquatic application. Due to potential phytotoxicity considerations, the following restrictions are applicable: If treated water is intended to be used to irrigate or mix sprays for plants grown in commercial nurseries and greenhouses; and other plants or crops that are not labeled for direct treatment with 2,4-D, the water must not be used unless one of the following restrictions has been observed:
- A setback distance from functional water intake(s) of greater than or equal to 600 ft. was used for the application, or,
 - A waiting period of 7 days from the time of application has elapsed, or,
 - An approved assay indicates that the 2,4-D concentration is 100 ppb (0.1 ppm) or less at the water intake. Wait at least 3 days after application before initial sampling at water intake.

2. Drinking water (potable water):

- A. Consult with appropriate state or local water authorities before applying this product to public waters. State or local agencies may require permits. The potable water use restrictions on this label are to ensure that consumption of water by the public is allowed only when the concentration of 2,4-D in the water is less than the MCL (Maximum Contaminant Level) of 70 ppb. Applicators should consider the unique characteristics of the treated waters to assure that 2,4-D concentrations in potable water do not exceed 70 ppb at the time of consumption.
- B. For floating and emergent weed applications, the drinking water setback distance from functioning potable water intakes is greater than or equal to 600 ft.
- C. If no setback distance of greater than or equal to 600 ft. is used for application, applicators or the authorizing organization must provide a drinking water notification prior to a 2,4-D application to the party responsible for public water supply or to individual private water uses. Notification to the party responsible for a public water supply or to individual private water users must be done in a manner to assure that the party is aware of the water use restrictions when this product is applied to potable water.

The following is an example of a notification via posting, but other methods of notification which convey the above restrictions may be used and may be required in some cases under state or local law or as a condition of a permit.

Example:

Posting notification should be located every 250 feet including the shoreline of the treated area and up to 250 feet of shoreline past the application site to include immediate public access points. Posting must include the day and time of application. Posting may be removed if analysis of a sample collected at the intake 3 or more days following application shows that the concentration in the water is less than 70 ppb (100 ppb for irrigation or sprays), or after 7 days following application, whichever occurs first.

Text of notification: Wait 7 days before diverting functioning surface water intakes from the treated aquatic site to use as drinking water, irrigation, or sprays, unless water at functioning drinking water intakes is tested at least 3 days after application and is demonstrated by assay to contain not more than 70 ppb 2,4-D (100 ppb for irrigation or sprays). Application Date: _____ Time: _____

- D. Following each application of this product, treated water must not be used for drinking water unless one of the following restrictions has been observed:
- A setback distance from functional water intake(s) of greater than or equal to 600 ft. was used for the application, or,
 - A waiting period of at least 7 days from the time of application has elapsed, or,
 - An approved assay indicates that the 2,4-D concentration is 70 ppb (0.07 ppm) or less at the water intake. Sampling for drinking water analysis should occur no sooner than 3 days after 2,4-D application. Analysis of samples must be completed by a laboratory that is certified under the Safe Drinking Water Act to perform drinking water analysis using a currently approved version of analytical Method Number 515, 555, other methods for 2,4-D as may be listed in Title 40 CFR, Part 141.24, or Method Number 4015 (immunoassay of 2,4-D) from U.S. EPA Test Methods for Evaluating Solid Waste SW-846.
- E. Note: Existing potable water intakes that are no longer in use, such as those replaced by a connection to a municipal water system or a potable water well, are not considered to be functioning potable water intakes.
- F. Drinking water setback distances do not apply to terrestrial applications of 2,4-D adjacent to water bodies with potable water intakes.

Precautions and Restrictions for Aquatic Use:

- Do not treat areas that are not infested with aquatic weeds.
- Wind Speed:** Do not apply when wind speed is at or above 10 mph when making ground or surface applications. Do not aerially apply when wind speed is greater than 5 mph. Wind speed restrictions do not apply for subsurface applications used in submerged aquatic weed control programs.
- Dissolved Oxygen Ratio:** Fish require oxygen dissolved in water for life processes and a favorable water-oxygen ratio must be maintained. Decaying weeds use up dissolved oxygen in water. Fish kill resulting from decaying plant material can be prevented by: (1) treating the entire area when the weed mass is sparse and the rate of decomposition will not be sufficient to disturb the water-oxygen ratio; or (2) If application is delayed until there is a dense weed mass, at no more than one-half of a lake or pond at one time. For large bodies of weed-infested water, apply product in lanes, leaving buffers strips at least 100 feet wide which can be treated in 4 to 5 weeks or when vegetation in treated lanes has decomposed. During the growing season, decomposition of treated strips will usually occur in 2 to 3 weeks.

CONDITION OF SALE AND LIMITATION OF WARRANTY AND LIABILITY

NOTICE: Read the entire Directions for Use and Conditions of Sale and Limitation of Warranty and Liability before buying or using this product. If the terms are not acceptable, return the product at once, unopened, and the purchase price will be refunded.

The Directions for Use of this product must be followed carefully. It is impossible to eliminate all risks inherently associated with the use of this product. Ineffectiveness or other unintended consequences may result because of such factors as manner of use or application, weather, presence of other materials or other influencing factors in the use of the product, which are beyond the control of ALTITUDE CROP INNOVATIONS, LLC or Seller. To the extent consistent with applicable law, all such risks shall be assumed by Buyer and User, and Buyer and User agree to hold ALTITUDE CROP INNOVATIONS, LLC and Seller harmless for any claims relating to such factors.

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