



2-12-2008  
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

1/35

12 FEB 2008

OFFICE OF  
PREVENTION, PESTICIDES  
AND TOXIC SUBSTANCES

Jane Rothwell  
Makhteshim-Agan of North America Inc.  
4515 Falls of Neuse Road, Suite 300  
Raleigh, NC 27609

Dear Ms. Rothwell

Subject: Adding New Uses  
Maia Arrow 2EC Herbicide  
EPA Registration No. 66222-60  
Your Submission Dated January 15, 2008

The amendment referred to above, submitted in connection with registration under section 3(c)(7)(A) of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), is acceptable provided that you:

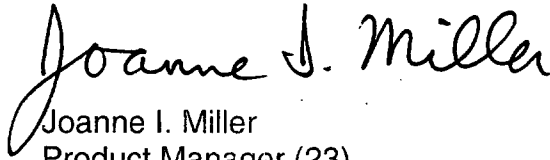
1. Submit/cite all data required for registration/reregistration of your product under FIFRA section 3(c)(5) or 4(a) when the Agency requires all registrants of similar products to submit such data.
2. Make the labeling changes listed below before you release the product for shipment bearing the amended labeling:
  - a. In the table starting on page 7 clarify the Preharvest Interval by footnoting each "(# Days)" in the table and the description of Preharvest Interval and moving the descriptive text from before the table to the end. Otherwise, reinstate the column as it appears on the cited me-too product.
  - b. In the Legume Vegetables, Edible Podded and Sweet Potato, Yam and other tuberous and corm vegetables crop listings in the table on page 10 and 13 either spell out the complete name of the sub-species or indent the sub-species partial name as it appears on the cited me-too product.
3. Submit one (1) copy of your final printed labeling before you release the 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 for shipment of the product bearing the amended labeling constitutes acceptance of these conditions.

2/35

A stamped copy of the label is enclosed for your records.

If you have any questions concerning this letter, please contact Mr. James Stone at 703-305-7391.

Sincerely yours,



Joanne I. Miller  
Product Manager (23)  
Herbicide Branch  
Registration Division (7505P)

Enclosure



# ARROW 2 EC HERBICIDE

ACCEPTED  
with COMMENTS  
in EPA Letter Dated

12 FEB 2008

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

66222-60

### ACTIVE INGREDIENT

Clethodim: (E)-2-[1-[(3-chloro-2-propenyl)oxy]imino]propyl]- ..... 26.4%

5-[2-(ethylthio)propyl]-3-hydroxy-2-cyclohexen-1-one

OTHER INGREDIENTS: ..... 73.6%

TOTAL 100.0%

Contains petroleum distillate.  
Contains 2.0 lbs. clethodim per gallon.

Contains clethodim, the active ingredient used in Select® herbicide and Prism® herbicide  
MANA Arrow 2EC Herbicide is not manufactured or distributed by Valent U.S.A. Corporation

EPA Reg. No. 66222-60

EPA Est. No. [REDACTED]

### Manufactured for:

Makhteshim Agan of North America, Inc.  
4515 Falls of Neuse Rd., Suite 300  
Raleigh, NC 27609

NET CONTENTS: 1 GALLON

## KEEP OUT OF REACH OF CHILDREN CAUTION

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.)

### FIRST AID

- |                                |  |
|--------------------------------|--|
| <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 the first 5 minutes, then continue rinsing eye.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>                  |
| <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 SWALLOWED:</b>           | <ul style="list-style-type: none"> <li>• Immediately call a poison control center or doctor.</li> <li>• Do not induce vomiting unless told to do so by a poison control center or doctor.</li> <li>• Do not give any liquid to the person.</li> <li>• Do not give anything by mouth to an unconscious person.</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>                  |

Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact PROSAR at 1-877-250-9291 for emergency medical treatment information.

**NOTE TO PHYSICIAN:** Ingestion of this product or subsequent vomiting can result in aspiration of light hydrocarbon liquid, which can cause pneumonitis. Contains petroleum distillate.

### PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS CAUTION

Harmful if swallowed. Causes moderate eye irritation. Avoid contact with eyes, skin, or clothing.

### 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 G 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 or Viton ≥14 mils

- Shoes plus socks

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/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:**

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

**ENVIRONMENTAL HAZARDS**

Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not apply where runoff is likely to occur. Do not apply where weather conditions favor drift from areas treated. Do not contaminate water when disposing of equipment washwater or rinsate.

The use of this product may pose a hazard to the federally designated endangered species of Solano Grass and Wild Rice. Use of this product is prohibited in the following areas where the species are known to exist:

Solano Grass:	Solano County, California: the vernal lakes area bounded by the Union Pacific Railroad and Hastings Road to the north, Highway 113 to the east, Highway 12 to the south, and Travis Air Force Base to the west.
Wild Rice:	Hays County, Texas

**PHYSICAL OR CHEMICAL HAZARDS**

Do not use or store near heat or open flame.

**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 24 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 or Viton  $\geq$  14 mils
- 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 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. Keep unprotected persons out of operating areas, or vicinity where there may be drift. Do not enter treated area without protective clothing until sprays have dried.

**TANK MIXES**

NOTICE: Tank mixing or use of this product with any other product which is not specifically and expressly authorized by the label shall be the exclusive risk of user, applicator, and/or application advisor. Read and follow the entire label of each product to be used in the tank mix with this product.

**GENERAL INFORMATION**

**FOR USE ON:** Alfalfa, Asparagus, Bean and Pea (dry shelled)<sup>1</sup>, Bean and Pea (succulent)<sup>2</sup>, Broccoli, Cabbage, Canola\*, Carrot, Cauliflower (and other Head and Stem Brassica Vegetables)<sup>3</sup>, Celery, Clover (grown in Idaho, Oregon, and Washington only), Conifers, Cotton, Cranberry, Cucumber, Eggplants (and other Fruiting Vegetables)<sup>4</sup>, Fallow Land (and other non-producing agricultural areas), Flax\*, Garden Beet, Garlic, Herbs<sup>5</sup>, Hops, Horseradish (and other Root Vegetables)<sup>6</sup>, Legume Vegetables (edible podded)<sup>7</sup>, Lettuce Head and Leaf (and other leafy greens)<sup>8</sup>, Melons (including Cantaloupes and Watermelons)<sup>9</sup>, Mint, Mustard Greens (and other Leafy Brassica Greens)<sup>10</sup>, Mustard Seed\*, Non-Bearing Food Crops, and Non-crop or Non-planted Areas, Onions (dry bulbs and green), Ornamentals, Peanuts (including perennial), Peppers (bell and

non-bell), Potato, Radish, Rhubarb (and other Leaf Petioles)<sup>11</sup>, Safflower, Sesame, Shallots (dry bulbs and green), Squash (including Pumpkins)<sup>9</sup>, Soybeans, Strawberry, Sugarbeets, Sunflower, Sweet Potato, Tomato and Yam (and other Tuberous and Corn Vegetables)<sup>12</sup>

**\*Not for use in California unless accompanied by supplemental labeling allowing use in California**

<sup>1</sup> Other Dry Shelled Bean and Pea Crops approved for use with MANA Arrow 2EC Herbicide include: Bean (Lupinus spp.), grain, sweet, white and white sweet; Bean (Phaseolus spp.), field, kidney, lima (dry), navy, pinto and tepary; Bean (Vigna spp.), adzuki bean, black-eyed pea, catjang, cowpea, crowder pea, moth bean, mung bean, rice bean, Southern pea, urd bean, broad (dry), chickpea (garbanzo), guar, lablab bean and lentil; Pea (Pisum spp.), field and pigeon

<sup>2</sup> Other Succulent Bean and Pea Crops approved for use with MANA Arrow 2EC Herbicide includes: Bean (Lupinus spp.), grain, sweet, white and white sweet; Bean (Phaseolus spp.), field, kidney, lima (dry), navy, pinto and tepary; Bean (Vigna spp.), adzuki bean, black-eyed pea, catjang, cowpea, crowder pea, moth bean, mung bean, rice bean, Southern pea, urd bean, broad (dry), chickpea (garbanzo), guar, lablab bean and lentil; Pea (Pisum spp.), field and pigeon

<sup>3</sup> Other Head and Stem Brassica Vegetables approved for use with MANA Arrow 2EC Herbicide include: Chinese broccoli; Brussels sprouts; Chinese (Napa) cabbage; Chinese mustard; cavalo broccolo; and kohlrabi.

<sup>4</sup> Other Fruiting Vegetables (except Tomato) approved for use with MANA Arrow 2EC Herbicide include: eggplant, groundcherry, pepino, peppers (all) and tomatillo.

<sup>5</sup> Other Herb Crops approved for use with MANA Arrow 2EC Herbicide include: angelica, balm, basil, borage, burnet, camomile, catnip, chervil (dried), chive, Chinese chive, clary, coriander (leaf), costmary, culantro (leaf), curry (leaf), dill (dillweed), horehound, hyssop, lavender, lovage (leaf), marigold, marjoram, (origanum spp.), nasturtium, parsley (dried), pennyroyal, rosemary, rue, sage and savory, summer and winter.

<sup>6</sup> Other Root Vegetables approved for use with MANA Arrow 2EC Herbicide include: burdock, edible; celeriac; chervil, turnip-rooted; chicory; ginseng; parsley, turnip-rooted; parsnip; radish, oriental; rutabaga; salsify; salsify, black; salsify, Spanish; skirret, and turnip

<sup>7</sup> Other Edible Podded Legume Vegetable crops approved for use with MANA Arrow 2EC Herbicide include: Bean (Phaseolus spp.), runner, snap and wax; Bean (Vigna spp.), asparagus, Chinese longbean, moth, yardlong, jackbean; Pea (Pisum spp.), dwarf, edible-pod, snow, sugar snap, pigeon and sword bean.

<sup>8</sup> Other Leafy Greens crops approved for use with MANA Arrow 2EC include: amaranth (Chinese spinach, leafy amaranth and tampala), arugula (roquette), chervil, chrysanthemum (edible-leaved and garland), corn salad, cress (garden, yellow rock and winter), dandelion, dock (sorrel), endive (esacarole), lettuce (head and leaf), orach, parsley, purslane (garden and winter), radicchio (red chicory), spinach (New Zealand) and Vine (Indian and malabar).

<sup>9</sup> Other Curburbit Crops approved for use with MANA Arrow 2EC include: chayote (fruit), Chinese Wax Gourd, Citron Melon, Edible Gourd, Gherkin and Muskmelons (all) including Honeydew Melon.

<sup>10</sup> Other Leafy Brassica Greens approved for use with MANA Arrow 2EC Herbicide include: broccoli raab, Chinese (bok choy) cabbage, collards, kale, mizuna, mustard greens, mustard spinach, rape greens and tumip greens.

<sup>11</sup> Other leaf petiole crops approved for use with MANA Arrow 2EC Herbicide include: cardoon, celuce, Chinese celery, Florence fennel, and Swiss chard.

<sup>12</sup> Other tuber and corn vegetables approved for use with MANA Arrow 2EC Herbicide include: arracacha, MANA Arrowroot, Chinese artichoke, Jerusalem artichoke, edible burdock, edible canna, bitter and sweet cassava, chayote (root), chufa, dasheen (taro), ginger, leren, tanager, turmeric, and bean yam.

MANA Arrow 2 EC Herbicide is not recommended for use on vegetable crops being grown for seed production unless specific use directions are provided.

MANA Arrow 2 EC Herbicide is a selective postemergence herbicide for control of annual and perennial grasses. MANA Arrow 2 EC Herbicide does not control sedges or broadleaf weeds.

Repeated use of MANA Arrow 2 EC Herbicide (or similar postemergence grass herbicide with the same mode of action) may lead to the selection of naturally occurring biotypes that are resistant to these products in some grass species.

If poor performance occurs and cannot be attributed to adverse weather or application conditions, a resistant biotype may be present. This is most likely to occur in fields where other control strategies such as crop rotation, mechanical removal, and other classes of herbicides are not used from year to year.

Do not allow MANA Arrow 2 EC Herbicide to come in contact with desirable grass crops such as corn, rice, sorghum, small grains, or turf, as these and other grass crops will be injured or killed. Minor leaf spotting may occur on treated plants under certain environmental conditions. New foliage is not affected.

**Control symptoms**

Treated grass weeds show a reduction in vigor and growth. Early chlorosis/necrosis of younger plant tissue is followed by a progressive collapse of the remaining foliage. Symptoms will generally be observed in 7 to 14 days after application depending on grass species treated and environmental conditions.

**APPLICATION INFORMATION**

**Timing of Applications**

Apply MANA Arrow 2 EC Herbicide postemergence to actively growing grasses according to rate table recommendations. Applications made to grass plants stressed by insufficient moisture or hot or cold temperatures or to grass plants exceeding recommended growth stages may result in unsatisfactory control. Do not apply under these conditions.

In arid regions where irrigation is used to supplement limited rainfall, MANA Arrow 2 EC Herbicide should be applied as soon as possible after an irrigation (within 7 days). In arid regions, a second application of MANA Arrow 2 EC Herbicide will generally provide more effective control of perennial grass weeds than a single application. Make second application to actively growing grass 2 to 3 weeks after emergence of new growth.

Cultivation of treated grasses 7 days prior to or within 7 days after application of MANA Arrow 2 EC Herbicide may reduce weed control. DO NOT APPLY MANA Arrow 2 EC Herbicide if rainfall is expected within one hour since control may be reduced.

**ADDITION OF ADJUVANT OR CROP OIL CONCENTRATE**

CROP	ADJUVANT RECOMMENDATIONS
Alfalfa, Cotton, Dry Shelled Beans and Pea, Edible Podded Legume Vegetables, Peanuts (including perennial), Potato, Soybeans, Succulent Bean & Pea, Sugar Beets, Sunflowers	Always use a crop oil concentrate* at 1.0 qt./A by ground or 1% v/v (but not less than 1 pt./A) in the finished spray volume by air.  1 to 2 qts./A of liquid fertilizer (10-34-0, 28%N or 32%N), or an equivalent amount (2.5 to 4.0 lbs./A) of spray grade ammonium sulfate (AMS) may be added to MANA Arrow 2 EC Herbicide applications in addition to the recommended rate of crop oil concentrate. The addition of AMS has shown improved grass control for difficult to control species including: quackgrass, Rhizome johnsongrass, red rice, wild oats, volunteer cereals, and volunteer corn.
Asparagus, Canola, Carrots, Clover, Cranberries, Cucurbits, Flax, Fruiting Vegetables (except tomato), Garden Beets, Garlic, Head and Stem Brassica Vegetables, Herbs, Hops, Leaf Petioles, Leafy Brassica Greens, Leafy Greens, Mint, Mustard Seed, Onions (dry bulbs and green), Root Vegetables, Safflower, Sesame, Shallots (dry bulbs and green), Strawberries, Sweet Potatoes (Yams and other tuberous and corn vegetables except potato)	Always use a crop oil concentrate at 1% v/v in the finished spray volume unless tank mix instructions indicate otherwise.  Addition of liquid fertilizer is not recommended for these crops.
Non-Bearing Food Crops, Ornamental Plants	Add a non-ionic surfactant containing at least 80% active ingredient at the rate of 1 pt. per 50 gals. (0.25% v/v). Use of crop oil concentrate is not recommended since it may injure flowers and foliage.
Conifer Trees, Fallow Land (and other non-producing agricultural areas), and Non-Crop or Non-Planted Areas	Always use a crop oil concentrate containing at least 15% emulsifier at 1% v/v (but not less than 1 pt./A) in the finished spray volume.

\*Acceptable crop oil concentrates would be those which contain a minimum of 80% oils and 15% emulsifier. A crop oil concentrate must contain either a petroleum or vegetable oil base and must meet all the following criteria: be non-phytotoxic, contain only EPA-exempt ingredients, provide good mixing quality, and be successful in local experience. Highly refined vegetable oils have proven more satisfactory than unrefined vegetable oils.

**Ground Application**

Use of sufficient spray volumes and pressure is essential to ensure complete coverage. Use a minimum of 5 gals. and a maximum of 40 gals. of spray solution per acre. Under the following conditions a minimum of 10 gals. per acre is required: ultra narrow row cotton, narrow row soybeans, broadleaf herbicide tank mixes, perennial grasses, volunteer corn, drought or stress conditions, heavy grass pressure, or when grasses are at or near maximum height. Failure to use a minimum of 10 gals. per acre under these conditions can result in poor coverage and reduced grass control requiring repeat applications. Spray pressures should reflect a minimum of 30 psi and a maximum of 60 psi at the nozzle. Do not use flood nozzles.

Applications to onions (dry bulbs and green), garlic, or shallots (dry bulbs and green) should be made in a minimum of 20 gals. of spray solution per acre.

**Air application**

Use a minimum of 3 gals. of spray solution per acre unless directed in this label. Increase spray volumes up to 10 gals. as grass or crop foliage becomes dense.

For onions (dry bulbs and green), garlic, or shallots (dry bulbs and green): When applying by air do not exceed 8 fl. oz./A in a single application. In California, air applications to onions, garlic, or shallots should be made in a minimum of 20 gals. of spray solution per acre.

In states other than California, air application to onions, garlic, or shallot should be made in a minimum of 10 gals. of spray solution per acre.

**Note:** Crop injury may occur when MANA Arrow 2 EC Herbicide is applied to onions, garlic, or shallots with aerial equipment.

**Spot Treatment**

When using hand sprayers or high volume sprayers utilizing hand guns, mix ¼% to ½% (0.33 oz. to 0.65 oz. per gal.) MANA Arrow 2EC Herbicide and treat to wet vegetation while not allowing runoff of spray solution. For uses requiring crop oil

concentrate, include crop oil concentrate at 1% (1.3 oz. per gal.) by volume. For uses requiring non-ionic surfactant, include non-ionic surfactant at ¼% (0.33 oz. per gal.) by volume.

**Note: If MANA Arrow 2 EC Herbicide is applied as a spot treatment, care should be taken to not exceed the maximum rate allowed on a "per acre" basis or crop injury may occur.**

**CHEMIGATION  
ONIONS (Dry Bulbs and Green) AND GARLIC  
SPRINKLER IRRIGATION APPLICATION**

Do not apply MANA Arrow 2EC Herbicide by chemigation in the states of Idaho, Montana, Oregon, and Washington.

This product may be applied to onions and garlic by sprinkler irrigation systems including center pivot, lateral move, end tow, side (wheel) roll, travelers, big gun, solid set, or hand move. Do not apply by chemigation to any other crop or to this crop using any other type of irrigation system.

Apply MANA Arrow 2 EC Herbicide at the high rate recommended for annual grasses (16 fl. oz./A) when the grass height is at the low end of the range (application to larger grasses may not provide adequate control). Add a crop oil concentrate containing at least 15% emulsifier at 1 quart per acre.

Apply MANA Arrow 2 EC Herbicide in 0.1 to 0.2 acre-inch of water either at the end of a regular irrigation set or as a separate application not associated with a regular irrigation using the least amount of water that provides proper distribution and coverage. Application of more than label recommended quantities of irrigation water per acre may result in decreased product performance by removing the chemical from the zone of effectiveness. Use a metering device to inject the MANA Arrow 2 EC Herbicide into the irrigation water at a constant flow. Constant agitation must be maintained in the chemical supply tank during the entire period of herbicide application. Inject the product with a positive displacement pump into the main line ahead of a right angle turn to ensure adequate mixing. Allow time for all lines to flush the herbicide through all nozzles before turning off irrigation water. To ensure the lines are flushed and free of remaining herbicide, a dye indicator may be injected into the lines to mark the end of the application period.

It is not recommended that MANA Arrow 2 EC Herbicide be applied through an irrigation system connected to a public water system. Public water system means a system for the provision to the public of piped water for human consumption if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year.

**Use Precautions**

1. Apply this product only through sprinkler irrigation systems including center pivot, lateral move, end tow, side (wheel) roll, travelers, big gun, solid set, or hand move. Do not apply this product through any other type of irrigation system.
2. Crop injury, lack of effectiveness, or illegal pesticide residues in the crop may result from non-uniform distribution of treated water.
3. If you have any questions about calibration, you should contact State Extension Service specialists, equipment manufacturers, or other experts.
4. Do not connect an irrigation system (including greenhouse systems) used for pesticide application to a public water system unless the label-prescribed safety devices for public water supplies are in place.
5. A person knowledgeable of the chemigation system and responsible for its operation or under supervision of the responsible person shall shut the system down and make necessary adjustments should the need arise.
6. The system must contain a functional check valve, vacuum relief valve, and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow.
7. The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
8. The pesticide injection pipeline must also contain a functional, normally closed solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.
9. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.
10. The irrigation line or water pump must include a functional pressure switch which will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.
11. Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.
12. Do not apply when wind speed favors drift beyond the area intended for treatment.

**RESTRICTIONS AND LIMITATIONS  
GENERAL**

Do not apply if rain is expected within 1 hour of application as control may be unsatisfactory.

Do not apply a postemergence broadleaf herbicide within one day following application of MANA Arrow 2 EC Herbicide or reduced grass control may result.

MANA Arrow 2 EC Herbicide is not recommended for use on vegetable crops being grown for seed production unless specific use directions are provided.

For canola, do not apply more than 6 fl. oz. of MAMA MANA Arrow 2EC Herbicide (0.08 lb.ai) per acre per season. For clover, flax, mustard seed and radish crops, do not apply more than 16 fl. oz. of MANA Arrow 2EC Herbicide (0.25 lb. ai) per acre per season. For all other crops, do not apply more than 32 fl. oz. of MAMA MANA Arrow 2EC Herbicide (0.50 lb. ai) per acre per season.

Application on Long Island, New York is restricted to no more than 16 fl. oz. of MANA Arrow 2 EC Herbicide (0.25 lb.ai) per acre per season.

Do not apply more than 8 fl. oz./A of MANA Arrow 2 EC Herbicide **per application** to the following crops: asparagus, brassica vegetables, (head and stem), bean (succulent), carrots, cranberry, cucurbits, flax, fruiting vegetables, (except tomato), garden beet, green onion, herbs, hops, leafy petioles, leafy brassica greens, leafy greens, legume vegetables (edible podded), non-bearing food crops, pea (dry shelled), pea (succulent), root vegetables, safflower, sesame and strawberry.

Do not apply more than 6 fl. oz /A of MANA Arrow 2 EC Herbicide per application to canola, or mustard seed. For all other crops, do not apply more than 16 fl. oz. of MANA Arrow 2EC (0.25 lb a.i.) per acre per application. **Exceeding these recommendations may result in unacceptable crop injury.**

Do not apply under conditions of stress. Applying MANA Arrow 2 EC Herbicide under conditions that do not promote active grass growth will reduce herbicide effectiveness. These conditions include drought, excessive water, extremes in temperature, low humidity, and grasses either partially controlled or stunted from prior pesticide applications. Grasses under these kinds of stressful conditions will not absorb and translocate MANA Arrow 2 EC Herbicide effectively and will be less susceptible to herbicide activity.

Best perennial grass control can be obtained if rhizomes or stolons are cut up by preplant tillage practices (discing, plowing, etc.) to stimulate maximum emergence of grass shoots. Cultural practices, such as continuous no-tillage in which the perennial grass rhizomes or stolons are not cut up, results in a very staggered, non-uniform weed emergence. Due to this non-uniform weed emergence, no fewer than two MANA Arrow 2 EC Herbicide applications per season per year are recommended at the appropriate weed-growth stage rate under continuous no-till conditions.

Grass crops such as corn, rice, sorghum, small grains, or turf, etc. are highly sensitive to MANA Arrow 2 EC Herbicide.

While all the vegetable crops on this label have been tested and are tolerant to MANA Arrow 2 EC Herbicide, not all specialty varieties of these crops have been tested. It is advised that, before applying MANA Arrow 2 EC Herbicide to specialty varieties of vegetable crops on this label, crop tolerance be investigated first using a small section of the field. It is possible that injury symptoms can occur. Symptoms may appear as leaf speckling or stunting.

Always read and follow the restrictions and limitations for all products whether used alone or in a tank mix. The most restrictive labeling of any product used applies in tank mixtures, including all crop rotational and other crop restrictions.

Tank mixes of MANA Arrow 2 EC Herbicide and broadleaf herbicides may result in reduced grass control. If grass regrowth occurs, an additional application of MANA Arrow 2 EC Herbicide may be necessary.

**AVOID SPRAY DRIFT**

Do not allow spray from ground or aerial equipment to drift onto adjacent land or crops. When drift may be a problem, do everything possible to reduce spray drift, including:

- Do not spray if wind speeds are or become excessive. Do not spray if wind speed is 10 MPH or greater. If sensitive crops or plants are downwind, extreme caution must be used under all conditions. Do not spray if winds are gusty.
- Use extreme caution when conditions are favorable for drift (high temperatures, drought, low relative humidity), especially when sensitive plants are located nearby.
- Do not apply when a temperature inversion exists. If inversion conditions are suspected, consult with local weather services before making an application.
- Further reductions in drift can be obtained by:
  1. Using large droplet size sprays. Do not use nozzles that produce small droplets. Orient nozzles downward and slightly backward as needed to reduce drift for ground applications.
  2. Orienting nozzles straight back with the wind stream, using straight stream orifices for aerial applications. Use the lowest number of nozzles practical with the largest possible orifice size to obtain the minimum 3 GPA volume. Application height and boom length should be set according to manufacturer's instructions to minimize drift.
  3. Increasing the volume of spray mixture (for example a minimum of 10 GPA for ground applications) by using higher flow rate nozzles. Using lower pressure with the appropriate nozzle to obtain higher volumes will also reduce drift.
  4. Applying as close to target plants as practical while maintaining a good spray pattern for adequate coverage.

**Do not apply under conditions involving possible drift to food, forage, or other planting that might be damaged or the crops thereof rendered unfit for sale, use, or consumption.**

**PREHARVEST INTERVAL**

The required days to wait between the last application and harvest are given in ( ) after each crop name.



9/35

**CROP-SPECIFIC RESTRICTIONS AND LIMITATIONS FOR MANA ARROW 2 EC HERBICIDE**

CROPS <sup>(1)</sup>	USE RATES PER ACRE	CROP OIL CONCENTRATE RATES PER ACRE <sup>(2)</sup>	SPECIAL USE INSTRUCTIONS
<b>Alfalfa (including: Sainfoin, Holy Clover, Birdsfoot Trefoil) <sup>(3)</sup></b> (15 days before grazing, feeding or harvesting (cutting) for forage or hay)	6-16 fl. oz. <sup>(4)</sup>	1 qt. by ground or 1.0% v/v (but not less than 1 pt./A) by air <sup>(5)</sup>	Refer to tank mix partners for feeding, grazing and harvesting restrictions. <sup>(5,6)</sup>  The addition of AMS has shown improved grass control for difficult to control species including quackgrass, rhizome johnsongrass, red rice, wild oats, volunteer cereals, and volunteer corn.
<b>Asparagus (1 day)</b>	6-8 fl. oz.	1% v/v in the finished spray volume	Do not apply more than 8 fl. oz./A in a single application. For repeat applications make on a minimum of a 14 day interval.
<b>Beans, Dry Shelled including: (30 days)</b>  Bean (Lupinus spp.) Grain, Sweet, White, White Sweet  Bean (Phaseolus spp.) Field, Kidney, Lima (dry), Navy, Pinto, Tepary  Bean (Vigna spp.) Adzuki Bean, Black-eyed pea, Catjang Cowpea, Crowder pea, Moth Bean, Mung Bean, Rice bean, Southern Pea, Urd Bean, Broad (dry), Chickpea (garbanzo) Guar, Lablab Bean, Lentil	6-16 fl. oz.	1 qt. by ground or 1.0% v/v (but not less than 1 pt./A) by air <sup>(5)</sup>	Refer to appropriate Table for reduced rate recommendations for the control of small annual grasses.  Do not apply more than 16 fl. oz. per acre per application. For repeat applications make on a minimum of a 14 day interval.  The addition of AMS has shown improved grass control for difficult to control species including quackgrass, rhizome johnsongrass, red rice, wild oats, volunteer cereals, and volunteer corn.
<b>Bean, Succulent Including: (21 days)</b> Bean (Phaseolus spp.) Broad bean (succulent) Lima bean (green), Bean (Vigna spp.), Black-eyed pea, Cowpea, Southern pea	6-8 fl. oz.	1 qt. by ground or 1 % v/v (but not less than 1 pt./A) by air. <sup>(5)</sup>	Refer to appropriate Table for reduced rate recommendations for the control of small annual grasses. Do not apply more than one (1) application per acre per season. The addition of AMS has shown improved grass control for difficult to control species including: quackgrass, rhizome Johnsongrass, red rice, wild oats, volunteer cereals and volunteer corn.
<b>Beet, Garden (30 days)</b>	6-8 fl. oz.	1% v/v in the finished spray volume	Do not apply more than 8 fl. oz /A in a single application.  For repeat applications make on a minimum of a 14-day interval.
<b>Canola (70 days)</b>	4- 6 fl. oz.	1% v/v in the finished spray volume	Do not apply after crop has begun bolting. Crop injury may occur when MANA Arrow 2 EC Herbicide is applied during the bloom period.  Do not apply more than 6 fl. oz of MANA Arrow 2 EC Herbicide (0.08 lb. ai) per acre in a season. Do not exceed 6 fl. oz/A in a season.
<b>Carrot (30 days)</b>	6-8 fl. oz.	1% v/v in the finished spray volume	Do not apply more than 8 fl. oz/A in a single application.  For repeat applications make on a minimum of a 14-day interval.

<b>PREHARVEST INTERVAL</b>			
The required days to wait between the last application and harvest are given in ( ) after each crop name.			
<b>CROPS <sup>(1)</sup></b>	<b>USE RATES PER ACRE</b>	<b>CROP OIL CONCENTRATE RATES PER ACRE <sup>(2)</sup></b>	<b>SPECIAL USE INSTRUCTIONS</b>
<b>Clover (Idaho, Oregon, and Washington only)</b> (15 days before grazing, feeding, or harvesting (cutting) for forage or hay)	6-16 fl. Oz.	1% v/v in the finished spray volume	For use on clover grown in the states of Idaho, Oregon, and Washington only. Do not exceed 16 fl. Oz. of MANA Arrow 2 EC Herbicide (0.25 lb. ai) per acre in a season.
<b>Cotton</b> (60 days)	6-16 fl. Oz.	1 qt. by ground or 1.0% v/v (but not less than 1 pt./A) by air <sup>(5)</sup>	Do not graze treated fields or feed treated forage or hay to livestock.  The addition of AMS has shown improved grass control for difficult to control species including quackgrass, rhizome johnsongrass, red rice, wild oats, volunteer cereals, and volunteer corn.
<b>Cranberry</b> (30 days)	6-8 fl. Oz.	1% v/v in the finished spray volume	Do not apply more than 8 fl. Oz./A in a single application.  For repeat applications make on a minimum of a 14-day interval. Do not apply between the "hook" stage and full fruit set.
<b>Cucurbits including:</b> (14 days) Chayote(fruit), Chinese Wax Gourd, Citron Melon, Cucumber, Gherkin, Gourd,(Edible), Muskmelons (all) including: Cantaloupes, Honeydew Melon Pumpkin, Squash (all), Watermelon	6-8 fl. Oz.	1% v/v in the finished spray volume	Do not apply more than 8 fl. oz/A in a single application.  For repeat applications make on a minimum of a 14-day interval.
<b>Fallow Land, Conifer Trees (and other non-producing agricultural areas)</b>  <b>Non-Crop or Non-Planted Areas</b>	6-16 fl. Oz.	1% v/v (but not less than 1 pt./A) in the finished spray volume using a crop oil concentrate containing at least 15% emulsifier.	Do not plant any crop for 30 days after application unless MANA Arrow is registered for use in that crop.
<b>Flax</b> (60 days)	6-8 fl. Oz.	1% v/v in the finished spray volume	Apply prior to bloom. Crop injury may occur when MANA Arrow 2 EC Herbicide is applied during the bloom period.  Do not apply more than 8 fl. oz of MANA Arrow 2 EC Herbicide per acre in a season. Do not exceed 16 fl. oz per acre in a season.
<b>Fruiting Vegetables (except Tomato) including</b> (20 days): Eggplant, Groundcherry, Pepino, Peppers (all), Tomatillo)	6-8 fl. oz.	1% v/v in the finished spray volume	Do not apply more than 8 fl. oz./A in a single application.  For repeat applications make on a minimum of a 14-day interval.
<b>Head and Stem Brassica Vegetables</b> including (30 days): Broccoli, Cabbage, Cauliflower, Brussels Sprouts	6-8 fl. oz.	1% v/v in the finished spray volume	Do not apply more than 8 fl. oz./A in a single application.  For repeat applications make on a minimum of a 14-day interval.

11/35

<b>PREHARVEST INTERVAL</b>			
The required days to wait between the last application and harvest are given in ( ) after each crop name.			
<b>CROPS <sup>(1)</sup></b>	<b>USE RATES PER ACRE</b>	<b>CROP OIL CONCENTRATE RATES PER ACRE <sup>(2)</sup></b>	<b>SPECIAL USE INSTRUCTIONS</b>
<b>Herbs including: (14 days)</b> Angelica, Balm, Basil, Borage, Burnet, Camomile, Catnip, Chervil (dried), Chive, Chive, (Chinese), Clary, Coriander (leaf), costmary, Culantro (leaf), Curry (leaf), Dill (dillweed), Horehound, Hyssop, Lavender, Lovage (leaf), Marigold, Marjoram ( <i>Origanum</i> spp.), Nasturtium, Parsley (dried), Pennyroyal, Rosemary, Rue, Sage, Savory, Summer and Winter	6-8 fl. oz.	1% v/v in the finished spray volume	MANA Arrow 2EC has not been tested on all herbs, and herb varieties. It is the responsibility of the user to test MANA Arrow 2EC on a small portion of the crop to be treated before treating the entire field.  Crop tolerance should be verified to MANA Arrow 2EC on a small area of the herb crop, at the desired MANA Arrow 2EC rate and with the same crop oil concentrate that will be used on the herb field. If no crop response is evident seven (7) days after treatment, MANA Arrow 2EC may be used on the entire field at the rate tested and with the same crop oil used in the tolerance test.  Do not apply more than 8 fl. oz. per acre in a single application.  For repeat applications, make on a minimum of a 14 day interval.
<b>Hops (21 days)</b>	6-8 fl. oz.	1% v/v in the finished spray volume	Do not apply more than 8 fl. oz./A in a single application. For repeat applications make on a minimum of a 14-day interval.
<b>Leaf Petioles including: (30 days)</b> Cardoon, Celery, Celtuce, Chinese Celery, Fennel, Florence (finochio), Rhubarb, Swiss Chard)	6-8 fl. oz.	1% v/v in the finished spray volume	Do not apply more than 8 fl. oz./A in a single application.  For repeat applications make on a minimum of a 14-day interval.
<b>Leafy Brassica Greens including: (14 days)</b> Broccoli Raab; Cabbage, Chinese (bok choy); Collards; Kale; Mizuna; Mustard Greens; Mustard Spinach; Rape Green; Turnip Greens	6-8 fl. oz.	1% v/v in the finished spray volume	Do not apply more than 8 fl. oz./A in a single application.  For repeat applications make on a minimum of a 14-day interval.

PREHARVEST INTERVAL			
The required days to wait between the last application and harvest are given in ( ) after each crop name			
CROPS <sup>(1)</sup>	USE RATES PER ACRE	CROP OIL CONCENTRATE RATES PER ACRE <sup>(2)</sup>	SPECIAL USE INSTRUCTIONS
<b>Leafy Greens including: (14 days)</b> Amaranth: Chinese Spinach, Leafy Amaranth, Tampala Arugula (roquette); Chervil, Chrysanthemum, (edible leaved). Chrysanthemum, Garland; Corn Salad; Cress: Garden, Upland (yellow rock and winter); Dandelion; Dock (sorrel); Endive (escarole); Lettuce, Head and Leaf; Orach; Parsley; Purslane: Garden, Winter; Radicchio (red chicory); Spinach: New Zealand, Vine (Indian and malabar)	6-8 fl. oz.	1% v/v in the finished spray volume	Do not apply more than 8 fl. oz. per acre in a single application. For repeat applications, make on a minimum of a 14 day interval.
<b>Legume Vegetables, Edible Podded including: (21 days)</b> Bean (Phaseolus spp.): Runner, Snap, Wax Bean (Vigna spp.): Asparagus, Chinese Longbean, Moth, Yardlong, Jackbean Pea (Pisum spp.): Dwarf, Edible-pod, Snow, Sugar Snap, Pigeon, Sword Bean	6-8 fl. oz.	1 qt. by ground or 1% v/v (but not less than 1 pt. per acre) by air <sup>(5)</sup>	Do not apply more than 8 fl. oz. per acre in a single application. Do not apply more one application per acre per season. For peas, apply before bloom, but no later than 21 days before harvest. Refer to appropriate Table for reduced rate recommendations for the control of small annual grasses. The addition of AMS has shown improved grass control for difficult to control species including: Quackgrass, rhizome johnsongrass, red rice, wild oats, volunteer cereals, and volunteer corn.
<b>Mint (21 days)</b>	6-16 fl. oz. <sup>(4)</sup>	1 qt. by ground or 1.0% v/v (but not less than 1 pt. per acre by air)	Do not apply more than 16 fl. oz./A in a single application. For repeat applications make on a minimum of a 14-day interval.
<b>Mustard Seed (75 days)</b>	4-6 fl. oz.	1% v/v in the finished spray volume	Do not apply after crop has begun bolting. Crop injury may occur when MANA Arrow 2 EC Herbicide is applied during the bloom period.  Do not apply more than 6 fl. oz. of MANA Arrow 2 EC Herbicide (0.08 lb. ai) per acre in a single application. Do not exceed 16 fl. oz. per acre in a season.
<b>Onions (Dry Bulbs Only), Garlic, Shallots (Dry Bulbs Only) (45 days)</b>	6-16 fl. oz. <sup>(7), (8)</sup>	1% v/v in the finished spray volume	Minimum of 20 gals./A spray volume by ground in entire U.S. Minimum of 20 gals./A spray volume by air in California <sup>(9)</sup> In states other than California, air applications to onions, garlic or shallots should be made in a minimum of 10 gals. per acre.

<b>PREHARVEST INTERVAL</b>			
The required days to wait between the last application and harvest are given in ( ) after each crop name			
<b>CROPS</b> <sup>(1)</sup>	<b>USE RATES PER ACRE</b>	<b>CROP OIL CONCENTRATE RATES PER ACRE</b> <sup>(2)</sup>	<b>SPECIAL USE INSTRUCTIONS</b>
<b>Onions, Green</b> including Leeks, - Scallions, or Spring Onions, Japanese Bunching Onions, Green Shallots, Green Eschalots (14 days)	6-8 fl. oz.	1% v/v in the finished spray volume	Do not apply more than 8 fl. oz./A in a single application.  For repeat applications make on a minimum of a 14-day interval.
<b>Ornamentals</b>	6-16 fl. oz.	Use of crop oil concentrate is not recommended since it may injure flowers and foliage. See Special use Instructions	Add a non-ionic surfactant containing at least 80% active ingredient at the rate of 1 pt. per 50 gals. (0.25%v/v).  Sugar maples cannot be tapped for syrup within one year of MANA Arrow 2 EC Herbicide application. Do not apply more than 8 fl. oz. per acre in a single application to non-bearing food crops.
<b>Non-Bearing Food Crops</b>	6-8 fl. oz. <sup>(8)</sup>		
<b>Pea, Dry Shelled</b> including: (30 days) Pea ( <i>Pisum spp.</i> ) Field, Pigeon	6-8 fl. oz.	1 qt. by ground or 1% v/v (but not less than 1 pt. per acre) by air. <sup>(5)</sup>	Do not apply more than 8 fl. oz. per acre per application. Do not apply more than one (1) application per acre per season. Apply before bloom but not later than 30 days prior to harvest. <sup>(10)</sup> Refer to the appropriate Table for reduced rate recommendations for the control of small annual grasses. The addition of AMS has shown improved grass control for difficult to control species including: quackgrass, rhizome johnsongrass, red rice, wild oats, volunteer cereals, and volunteer corn.
<b>Pea, Succulent</b> including: (21 days) Pea ( <i>Pisum spp.</i> ) English pea, Garden pea, Green pea, Pigeon pea	6-8 fl. oz.	1 qt. by ground or 1% v/v (but not less than 1 pt. per acre) by air. <sup>(5)</sup>	Do not apply more than 8 fl. oz. per acre per application. Do not apply more than one (1) application per acre per season. Apply before bloom but not later than 21 days prior to harvest. <sup>(10)</sup> Refer to appropriate Table for reduced rate recommendations for the control of small annual grasses. The addition of AMS has shown improved grass control for difficult to control species including: quackgrass, rhizome johnsongrass, red rice, wild oats, volunteer cereals and volunteer corn.
<b>Peanuts (including Perennial)</b> (40 days)	6-16 fl. oz.	1 qt. by ground or 1.0% v/v (but not less than 1 pt./A) by air <sup>(5)</sup>	The addition of AMS has shown improved grass control for difficult to control species including quackgrass, rhizome johnsongrass, red rice, wild oats, volunteer cereals, and volunteer corn.
<b>Potato</b> (30 days)	6-16 fl. oz.	1 qt. by ground or 1.0% v/v (but not less than 1 pt./A) by air <sup>(5)</sup>	The addition of AMS has shown improved grass control for difficult to control species including quackgrass, rhizome johnsongrass, red rice, wild oats, volunteer cereals, and volunteer corn.

14/35

PREHARVEST INTERVAL			
The required days to wait between the last application and harvest are given in ( ) after each crop name			
CROPS <sup>(1)</sup>	USE RATES PER ACRE	CROP OIL CONCENTRATE RATES PER ACRE <sup>(2)</sup>	SPECIAL USE INSTRUCTIONS
Radish (15 days)	6-8 fl. oz.	1% v/v in the finished spray volume	Do not apply more than 8 fl. oz./A in a single application.  Do not apply more than 16 fl. oz. (0.25 lb. ai) per acre in a season.  For repeat applications make on a minimum of a 14-day interval.
Root Vegetables (except Radish) including: (30 days) Chicory, Ginseng, Horseradish, Turnip	6-8 fl. oz.	1% v/v in the finished spray volume	Do not apply more than 8 fl. oz./A in a single application.  For repeat applications make on a minimum of a 14-day interval.
Safflower (70 days)	6-8 fl. oz.	1% v/v in the finished spray volume	Do not apply more than 8 fl. oz. per acre in a single application. For repeat applications make on a minimum of a 14 day interval.
Sesame (14 days)	6-8 fl. oz.	1% v/v in the finished spray volume	Do not apply during flowering. Do not apply more than 8 fl. oz. per acre in a single application. For repeat applications make on a minimum of a 14 day interval.
Soybean (60 days)	6-16 fl. oz.	1 qt. by ground or 1.0% v/v (but not less than 1 pt./A) by air <sup>(5)</sup>	Do not graze treated fields or feed treated forage or hay to livestock.  Refer to appropriate Table for reduced rate recommendations for the control of small annual grasses.  The addition of AMS has shown improved grass control for difficult to control species including quackgrass, rhizome johnsongrass, red rice, wild oats, volunteer cereals, and volunteer corn.
Strawberry (4 days)	6-8 fl. oz.	1% v/v in the finished spray volume	Do not apply more than 8 fl. oz./A in a single application.  For repeat applications make on a minimum of a 14-day interval.
Sugar Beet (40 days)	6-16 fl. oz.	1 qt. by ground or 1.0% v/v (but not less than 1 pt./A) by air <sup>(5)</sup>	Refer to appropriate table for reduced rate recommendations for the control of small annual grasses.  The addition of AMS has shown improved grass control for difficult to control species including quackgrass, rhizome johnsongrass, red rice, wild oats, volunteer cereals, and volunteer corn.
Sunflower (70 days)	6-16 fl. oz.	1 qt. by ground or 1.0% v/v (but not less than 1 pt./A) by air <sup>(5)</sup>	The addition of AMS has shown improved grass control for difficult to control species including quackgrass, rhizome johnsongrass, red rice, wild oats, volunteer cereals, and volunteer corn.

PREHARVEST INTERVAL			
The required days to wait between the last application and harvest are given in ( ) after each crop name			
CROPS <sup>(1)</sup>	USE RATES PER ACRE	CROP OIL CONCENTRATE RATES PER ACRE <sup>(2)</sup>	SPECIAL USE INSTRUCTIONS
Sweet Potato, Yam, and other tuberous and corn vegetables (except potato) including: (30 days) Artichoke (Chinese, Jerusalem), Cassava (Bitter, Sweet), Ginger	6-16 fl. oz.	1% v/v in the finished spray volume	The addition of AMS has shown improved grass control for difficult to control species including: Quackgrass, rhizome johnsongrass, red rice, wild oats, volunteer cereals and volunteer corn.
Tomato (20 days)	6-16 fl. oz.	1% v/v in the finished spray volume	For repeat applications make on a minimum of a 14 day interval.

N/A= Not Applicable

- (1) MANA Arrow 2 EC Herbicide is not recommended for use on vegetable crops being grown for seed production unless specific use directions are provided.
- (2) Acceptable crop oil concentrates would be those which contain a minimum of 80% oils and 15% emulsifier. A crop oil concentrate must contain either a petroleum or vegetable oil base and must meet all the following criteria: be non-phytotoxic, contain only EPA-exempt ingredients, provide good mixing quality, and be successful in local experience. Highly refined vegetable oils have proven more satisfactory than unrefined vegetable oils. See the ADDITION OF ADJUVANT AND CROP OIL CONCENTRATE section for further information.
- (3) MANA Arrow 2 EC Herbicide may be applied to seedling or established alfalfa grown for seed, hay, silage, green chop, or direct grazing.
- (4) For weed control in established alfalfa and mint, the minimum use rate is 10 fl. oz per acre.
- (5) 1 to 2 qts./A of liquid fertilizer (10-34-0, 28%N or 32%N), or an equivalent amount (2.5 to 4.0 lbs./A) of spray grade ammonium sulfate (AMS) may be added to MANA Arrow 2EC Herbicide applications in addition to the recommended rate of crop oil concentrate.
- (6) Do not apply MANA Arrow 2EC Herbicide and 2,4-DB as a tank mix to alfalfa unless the 60 day feeding, grazing, and harvesting restriction on the 2,4-DB label can be observed.
- (7) For repeat applications to garlic or shallots, do not exceed 8 fl. oz./A in a single application. For air applications to onions, garlic, or shallots, do not exceed 8 fl. oz./A in a single application. For garlic and shallots, do not exceed 2 applications per season. In California for air applications to onions, do not exceed 2 applications per season.
- (8) If MANA Arrow 2EC Herbicide is applied as a spot treatment to onions, garlic, shallots, or non-bearing food crops, care should be taken to not exceed the maximum rate allowed on a PER ACRE basis or crop injury may occur.
- (9) In California, do not apply MANA Arrow 2EC Herbicide to onions, garlic, or shallots until crop has at least two full leaves. In California, 14-day spray intervals are recommended between the application of MANA Arrow 2EC Herbicide and Liquid Nitrogen or other herbicide applications. Injury to crop may occur when shorter intervals are observed.
- (10) Applications of MANA Arrow 2EC Herbicide to peas during the bloom period could result in severe crop injury, including loss of yield and delayed maturity.

**IMPORTANT:** Plant tolerance to MANA Arrow 2EC Herbicide at labeled rates has been found to be acceptable for the indicated genera and species listed below. Due to variability within species, crop growth stage, environmental conditions, and application techniques, it is recommended that the user determine if herbicide can be used safely on a few plants prior to widespread application. Neither the seller nor the manufacturer of MANA Arrow 2EC Herbicide have investigated the safety factor to plants not listed on the label.

**NON-BEARING FOOD CROPS**

**MANA ARROW 2EC HERBICIDE SHOULD NOT BE APPLIED TO NON-BEARING FRUIT OR NUT CROPS WHICH ARE GROWN FOR ROOT STOCK.**

Crop injury to non-bearing fruit and nut crops can occur if MANA Arrow 2 EC Herbicide is improperly applied. MANA Arrow 2 EC Herbicide should not be applied directly over the top of these plant types. Instead, spray should be directed at the base of the plant where grassy weeds are growing near the ground.

Non-bearing fruit and nut crops are plants which will not bear fruit or nuts for at least one year following MANA Arrow 2 EC Herbicide application.

COMMON NAME	SCIENTIFIC NAME
Apples	<i>Malus spp.</i>
Berries	<i>Vaccinium spp.</i>
	<i>Rubus spp.</i>
Cherry, Sweet	<i>Prunus avium</i>

Citrus Fruits	Citrus spp.
Grapes	Vitis spp.
Olives	Olea spp.
Peach	Prunus persica
Pears	Pyrus communis
Prunes	Prunus spp.
Stone Fruits	Prunus spp.
Strawberries	Fragaria spp.
<b>Tree Nuts:</b>	
Almonds	Prunus triloba
Filbert	Corylus maxima
Pecan	Carya illinoensis
Pistachio	Pistacia vera
Walnut	Juglans spp.

**CONIFER TREES**

MANA Arrow 2EC Herbicide can be used to control labeled grasses in Christmas tree farms, conifer nurseries, and conifer plantations (but not in forests).

COMMON NAME	SCIENTIFIC NAME
Arborvitae, American	Thuja occidentalis
Cedars	Cedrus spp.
Cypress	Taxodium spp.
Douglas Fir	Pseudotsuga menziesii
Firs	Abies spp.
Hemlock, Canadian	Tsuga canadensis
Hemlock, Western	Tsuga heterophylla
Pines	Pinus spp.
Spruces	Picea spp.
Yew	Taxus spp.

**NON-CROP OR NON-PLANTED AREAS**

The following areas are considered non-crop or non-planted areas: rights-of-way including railroads, highways, roads, dividers, medians, pipelines, public utility lines, pumping stations, transformer stations and substations, around airports, electric utilities, commercial buildings, manufacturing plants, storage yards, rail yards, fence lines, parkways, and post-harvest croplands, also beneath greenhouse benches and around golf courses.

**RECOMMENDATIONS FOR ANNUAL GRASSES  
(EXCEPT IN ESTABLISHED ALFALFA AND MINT)**

- Apply only to actively growing grasses at recommended weed heights.
- Apply when the first grass weed species in a mixed grass weed population reaches the recommended growth stage for treatment.
- Use the high rate under heavy grass pressure and/or when grasses are at maximum height.
- Do not apply more than 8 fl. oz./A of MANA Arrow 2EC Herbicide per application to the following crops: asparagus, carrot, cranberry, cucurbits, flax, fruiting vegetables, (except tomato), garden beets, green onion, head and stem brassica vegetables, herbs, hops, leaf petioles, leafy brassica greens, leafy greens, non-bearing food crops, root vegetables, safflower, sesame and strawberry. Do not apply more than 6 fl. oz. per acre of MANA 2EC Herbicide per application to canola or mustard seed.

GRASS SPECIES	SCIENTIFIC NAME	WEED HEIGHT* INCHES	RATE FL. OZ./ACRE	HIGH RATE <sup>(1)</sup>
BARNYARDGRASS	Echinochloa crus-galli	2 to 8	6	8
BROADLEAF SIGNALGRASS	Brachiaria platyphylla	2 to 6	6	8
BROME				
California	Bromus carinatus	2 to 6	6	8
Cheat	Bromus secalinus	2 to 6	6	8
Downy	Bromus tectorum	2 to 6	6	8
Ripgut	Bromus diandrus	2 to 6	6	8
CANARYGRASS	Phalaris canariensis	1 to 4	6	8
CRABGRASS				
Hairy	Digitaria adscendens	2 to 6**	6	8
Large	Digitaria sanguinalis	2 to 6**	6	8
Smooth	Digitaria ischaemum	2 to 6**	6	8
Southern	Digitaria ciliaris	2 to 6**	6	8
CROWFOOTGRASS	Dactyloctenium aegyptium	2 to 6**	6	8
FALL PANICUM	Panicum dichotomiflorum	2 to 8	6	8



GRASS SPECIES	SCIENTIFIC NAME	WEED HEIGHT* INCHES	RATE FL. OZ./ACRE	HIGH RATE <sup>(1)</sup>
FIELD SANDBUR	<i>Cenchrus incertus</i>	2 to 6	6	8
FOXTAIL				
Giant	<i>Setaria faberi</i>	2 to 12	6	8
Green	<i>Setaria viridis</i>	2 to 8	6	8
Yellow	<i>Setaria glauca</i>	2 to 8	6	8
GOOSEGRASS	<i>Eleusine indica</i>	2 to 6**	6	8
ITCHGRASS	<i>Rottboellia cochinchinensis</i>	2 to 6	6	8
JUNGLERICE	<i>Echinochloa colona</i>	2 to 6	6	8
LOVEGRASS (Stinkgrass)	<i>Eragrostis cilianensis</i>	2 to 6	6	8
RABBITSFOOTGRASS	<i>Polypogon monspeliensis</i>	1 to 4	6	8
RED RICE	<i>Oryza sativa</i>	1 to 3	6	8
RYEGRASS				
Hardy	<i>Lolium remotum</i>	2 to 6	6	8
Italian	<i>Lolium multiflorum</i>	2 to 6	6	8
SEEDLING JOHNSONGRASS	<i>Sorghum halepense</i>	4 to 10	6	8
SHATTERCANE	<i>Sorghum bicolor</i>	6 to 18	6	8
SOUTHWESTERN CUPGRASS	<i>Eriochloa gracilis</i>	2 to 6	6	8
SPRANGLETOP				
Amazon	<i>Leptochloa panicoides</i>	2 to 6	6	8
Bearded	<i>Leptochloa fascicularis</i>	2 to 6	6	8
Mexican	<i>Leptochloa uninervia</i>	2 to 6	6	8
Red	<i>Leptochloa filiformis</i>	2 to 6	6	8
TEXAS PANICUM	<i>Panicum texanum</i>	2 to 6	6	8
VOLUNTEER CEREALS <sup>(2)</sup>				
Barley	<i>Hordeum vulgare</i>	2 to 6	6	8
Oats	<i>Avena sativa</i>	2 to 6	6	8
Rye	<i>Secale cereale</i>	2 to 6	6	8
Wheat	<i>Triticum aestivum</i>	2 to 6	6	8
VOLUNTEER CORN <sup>(3)</sup>	<i>Zea mays</i>	4 to 12	4	6
VOLUNTEER CORN <sup>(3)</sup>	<i>Zea mays</i>	12 to 24	6	8
VOLUNTEER CORN S.R. <sup>(4)</sup>	<i>Zea mays</i>	4 to 12	8 suppression only	
VOLUNTEER GRAIN SORGHUM	<i>Sorghum bicolor</i>	8 to 12	6	8
WILD OATS	<i>Avena fatua</i>	2 to 6	6	8
WILD PROSO MILLET	<i>Panicum miliaceum</i>	2 to 10	6	8
WITCHGRASS	<i>Panicum capillare</i>	2 to 8	6	8
WOOLLY CUPGRASS	<i>Eriochloa villosa</i>	2 to 8	6	8

\*Generally occurs between 3-leaf stage and tillering

\*\*Length of lateral growth

(1) Rates higher than 8 fl. oz./A may be applied in certain geographic areas, cropping situations, or environmental conditions where experience has shown that higher rates are needed for satisfactory control of annual grasses. In these situations, rates from 8 to 16 fl. oz./A may be applied. Do not apply more than 8 fl. oz./A of MANA Arrow 2EC Herbicide per application to the following crops: asparagus, carrot, cranberry, cucurbits, flax, fruiting vegetables (except tomato), garden beet, green onion, head and stem brassica vegetables, herbs, hops, leaf petioles, leafy brassica greens, leafy greens, non-bearing food crops, root vegetables, safflower, sesame and strawberry. Do not apply more than 6 fl. oz. per acre of MANA Arrow 2EC Herbicide to canola or mustard seed.

(2) When a cereal grain crop (such as wheat) is interseeded for crop establishment or is planted as wind breaks to aid crop establishment, the minimum MANA Arrow 2 EC Herbicide use rate for control is 8 fl. oz./A.

(3) Includes Roundup Ready®, Liberty Link®, and IMI-CORN® VOLUNTEER CORN.

(4) Sethoxydim-resistant volunteer corn.

**RECOMMENDATIONS FOR ANNUAL & PERENNIAL GRASS CONTROL  
IN ESTABLISHED ALFALFA AND MINT WITH MANA ARROW 2EC HERBICIDE**

GRASS SPECIES	WEED STAGE	RATE FL. OZ. ACRE	HIGH RATE
Annual & Perennial Grasses Listed in Grass Table	See Table	10	16
<p><b>Mowing:</b> The best control of annual grasses can be achieved by applying MANA Arrow 2EC before grass weeds are mowed. Once a grass is mowed it becomes tougher to control as much of the available leaf surface has been removed. In areas without a killing frost, some annuals can over-winter after having been mowed multiple times. These grasses form large crowns and may contain many viable buds. These grasses, even though they may be an annual grass, may require repeated applications of MANA Arrow 2EC for partial or complete control.</p> <p><b>Irrigated Alfalfa and Mint:</b> Irrigation practices can be very critical to the successful use of MANA Arrow 2EC in established alfalfa and mint and may be necessary to initiate active growth of the weeds prior to application. Generally applications 2 to 4</p>			

days after an irrigation are most effective. Irrigation made shortly after application (2 days) can be effective, but more consistent grass control occurs when the irrigation is made before the application.

Aerial Application: Apply MANA Arrow 2EC Herbicide in a minimum of 10 GPA in established alfalfa and mint when applying by air.

**Annual Grass Control:** Apply MANA Arrow 2 EC Herbicide at the grass sizes indicated in the Recommendation for Annual Grass Table and rates indicated. If a grass has been cut, apply MANA Arrow 2 EC Herbicide after active growth has resumed and regrowth has reached the minimum height and before it reaches the maximum height indicated. Apply before the alfalfa/mint canopy covers the grasses and interferes with the spray coverage. Some annual grasses are spring- and summer-germinating plants, while others are fall-germinating plants, and the time they are actively growing and most susceptible to MANA Arrow 2EC may vary from region to region.

Also some annuals germinate over an extended period of time, and because control of small grasses is desired, applications after each weed flush may be required. As a general rule, spray spring- and summer-germinating grasses as early in the season as possible, after initial green-up. Spray fall-germinating weeds in the fall soon after they begin growing but before any damage is done due to frost. Late fall applications may be less effective due to environmental conditions such as frost, slower plant growth, or the onset of flowering.

**Perennial Grass Control:** MANA Arrow 2EC effectively controls perennial grasses such as bermudagrass, johnsongrass, quackgrass, wirestem muhly, tall fescue, foxtail barley, and orchardgrass. Due in part to lack of tillage, perennial grasses are more difficult to control in a perennial crop such as established alfalfa or mint. A program of repeated applications is usually necessary for best results. The best way to control perennial grasses is to do so in the year of stand establishment before rhizomes and stolons become large and difficult to kill.

Use the high rate under heavy grass pressure and/or when grasses are at or near maximum height. Always add a crop oil concentrate at 1 qt./A by ground or 1% v/v (but not less than 1 pt./A) to the finished spray volume by air.

**RECOMMENDATIONS FOR ANNUAL BLUEGRASS CONTROL WITH MANA ARROW 2 EC HERBICIDE**

GRASS SPECIES	WEED STAGE	RATE FL. OZ. ACRE	HIGH RATE
ANNUAL BLUEGRASS ( <i>Poa annua</i> )	to 4-leaf	6*	16

Apply under favorable soil moisture and humidity which exists within a few days after rainfall or within 7 days after irrigation. Grass needs to be actively growing at time of application(s).  
 Apply at weed stage indicated on the label, as reduced control can be expected with more mature annual bluegrass.  
 Use the high rate under heavy grass pressure and/or when annual bluegrass is more mature.  
 Always add a crop oil concentrate at 1 qt./A by ground to the finished spray volume.

\* Use a minimum of 10 fl. oz. per acre to control annual bluegrass in seedling and established alfalfa and mint.

**DIRECTIONS FOR REDUCED RATE TO CONTROL SMALL ANNUAL GRASSES IN CANOLA, DRY SHELLLED BEAN AND PEA (INCLUDING SOYBEAN), EDIBLE PODED LEGUME VEGETABLES, FLAX, MUSTARD SEED, SUCCULENT BEAN AND PEA AND SUGAR BEET  
 (REDUCED RATE RECOMMENDATIONS NOT FOR USE IN CALIFORNIA)**

- Apply only to actively growing grasses at recommended weed heights.
- Apply when the first grass weed species in a mixed grass weed population reaches the recommended growth stage for treatment.
- Regrowth by tillering may occur if application is made when plants are stressed by lack of moisture, excessive moisture, low or high temperatures, and/or under very low humidity.

GRASS SPECIES	SCIENTIFIC NAME	WEED HEIGHT (INCHES)	RATE FL. OZ./ACRE <sup>(1)</sup>
BARNYARDGRASS	<i>Echinochloa crus-galli</i>	1 to 4	4
BROADLEAF SIGNALGRASS	<i>Brachiaria platyphylla</i>	1 to 4	5
CRABGRASS			
Large	<i>Digitaria sanguinalis</i>	1 to 3*	4
Large	<i>Digitaria sanguinalis</i>	1 to 4*	5
Smooth	<i>Digitaria ischaemum</i>	1 to 3*	4
Smooth	<i>Digitaria ischaemum</i>	1 to 4*	5
Southern	<i>Digitaria ciliaris</i>	1 to 4*	5
FALL PANICUM	<i>Panicum dichotomiflorum</i>	1 to 4	4
FOXTAIL			
Giant	<i>Setaria faberi</i>	1 to 4	4
Green	<i>Setaria viridis</i>	1 to 4	4
Millet	<i>Setaria italica</i>	1 to 4	5
Yellow	<i>Setaria glauca</i>	1 to 4	4
SEEDLING JOHNSONGRASS	<i>Sorghum halepense</i>	1 to 6	5
SHATTERCANE	<i>Sorghum bicolor</i>	4 to 10	4
TEXAS PANICUM	<i>Panicum texanum</i>	1 to 4	5
VOLUNTEER CEREALS			
Barley	<i>Hordeum vulgare</i>	1 to 4	5
Oats	<i>Avena sativa</i>	1 to 4	5

19/35

GRASS SPECIES	SCIENTIFIC NAME	WEED HEIGHT (INCHES)	RATE FL. OZ./ACRE <sup>(1)</sup>
Wheat	<i>Triticum aestivum</i>	1 to 4	5
VOLUNTEER CORN**	<i>Zea mays</i>	4 to 12	4
WILD PROSO MILLET	<i>Panicum miliaceum</i>	1 to 6	4
WILD OATS	<i>Avena fatua</i>	1 to 4	5

\*Length of lateral growth

\*\*Not S. R. Corn

<sup>(1)</sup> Always add a crop oil concentrate at 1 qt./A by ground application to the finished spray volume.

**RECOMMENDATIONS FOR PERENNIAL GRASSES**

- Apply only to actively growing grasses at recommended weed heights.
- Apply when the first grass weed species in a mixed grass weed population reaches the recommended growth stage for treatment.
- Use the high rate under heavy grass pressure and/or when grasses are at a maximum height.
- Do not apply more than 8 fl. oz./A of MANA Arrow 2EC Herbicide per application to the following crops: asparagus, carrot, cranberry, cucurbits, flax, fruiting vegetables (except tomato), garden beet, green onion, head & stem brassica vegetables, herbs, hops, leaf petioles, leafy brassica greens, leafy greens, nonbearing food crops, root vegetables, safflower, sesame and strawberry. Do not apply more than 6 fl. oz. per acre of MANA 2EC Herbicide per application to canola or mustard seed.

GRASS SPECIES	WEED HEIGHT (INCHES)	RATE FL. OZ./ACRE	HIGH RATE
<b>Bermudagrass (<i>Cynodon dactylon</i>)</b>			
First Application	3 (or up to 6" runners)	8	16
Repeat Application(s) (if regrowth occurs)	3 (or up to 6" runners)	8	16
<b>Fescue, tall (<i>Festuca arundinacea</i>)</b>			
First Application	4 to 8	8	16
Repeat Application(s) (if regrowth occurs)	4 to 8	8	16
<b>Foxtail Barley (<i>Hordeum jubatum</i>)</b>			
First Application	2 to 6	8	16
Repeat Application(s) (if regrowth occurs)	2 to 6	8	16
<b>Orchardgrass (<i>Dactylis glomerata</i>)</b>			
First Application	4 to 8	8	16
Repeat Application(s) (if regrowth occurs)	4 to 8	8	16
<b>Quackgrass* (<i>Elytrigia repens</i>)</b>			
First Application	4 to 12	8	16
Repeat Application(s) (if regrowth occurs)	4 to 12	8	16
<b>Rhizome Johnsongrass (<i>Sorghum halepense</i>)</b>			
First Application	12 to 24	8	16
Repeat Application(s) (if regrowth occurs)	6 to 18	6	8
<b>Wirestem Muhly (<i>Muhlenbergia frondosa</i>)</b>			
First Application	4 to 8	8	16
Repeat Application(s) (if regrowth occurs)	4 to 8	8	16
<b>Perennial Bluegrass* ([Roughstalk (<i>Poa trivialis</i>)] [Kentucky (<i>Poa prantensis</i>)])</b>			
First Application	2 to 4	8	16
Repeat Application(s) (if regrowth occurs)	2 to 4	8	16
<b>Bentgrass* (<i>Agrostis</i> spp.)</b>			
First Application	2 to 4	-	16
Repeat Application(s) (if regrowth occurs)	2 to 4	-	16

\*Control of quackgrass and perennial bluegrass and bentgrass with MANA Arrow 2EC Herbicide may be enhanced by adding AMS at 2.5 to 4.0 lbs./A.

**TANK MIXES  
GENERAL INFORMATION**

The labels for each of the herbicides recommended for tank mixing with MANA Arrow 2EC Herbicide are unique to the characteristics of those products and contain restrictions and limitations that may be more restrictive than the MANA Arrow 2 EC Herbicide label in certain considerations. Those concerns may include, but are not limited to:

1. Geographic restrictions-all products are not registered for use in all areas and rates may vary from one region of labeled use to another;
2. Crop rotation restrictions;
3. Applicator certification requirements;
4. Worker safety rules (e.g. protective clothing, reentry time, posting);
5. Soil type or soil characteristics (e.g. pH, OM);
6. Maximum dosage or number of applications per season;

- 7. Rain free period required; or
- 8. Application timing (e.g. pre-harvest interval)
- 9. Do not exceed the total season rates.

**THE MOST RESTRICTIVE LABELING OF ANY PRODUCT USED IN A TANK MIX MUST BE FOLLOWED.**

**TANK MIX APPLICATION OF MANA ARROW 2 EC HERBICIDE AND BROADLEAF HERBICIDES FOR CONTROL OF GRASSES AND BROADLEAF WEEDS**

- Apply only to actively growing grass and broadleaf weeds at recommended height or growth stage listed on each label.
- Apply when the first grass or broadleaf weed species in a mixed population reaches the recommended height or growth stage for treatment.
- Apply under favorable soil moisture and humidity, that exist a few days after rainfall or within seven days after irrigation.
- Always add the appropriate adjuvant to the spray mix at the rate recommended for each specific tank mix combination.
- Tank mix applications may sometimes result in reduced grass control and possible increases in crop injury as compared to either product used alone. If regrowth occurs, or an additional flush of new grass emerges, make a second application of MANA Arrow 2 EC Herbicide, as specified in the respective size and rate tables.
- Do not tank mix MANA Arrow 2 EC Herbicide when broadleaf weeds are tall and/or dense enough to prevent proper grass coverage.

**MIXING INSTRUCTIONS**

1. Fill clean spray tank 1/2 to 3/4 of desired level with clean water.
  2. While agitating, add the correct amount of MANA Arrow 2EC. Agitation should create a rippling or rolling action of the water surface.
  3. If tank mixing, MANA Arrow 2EC with other labeled herbicides, add water soluble bags first, followed by dry formulations, flowables, emulsifiable concentrates, and then solutions. Prepare no more spray mixture than is required for the immediate spray operations.
  4. Add any required adjuvants (crop oil concentrates, non-ionic surfactant and/or nitrogen solution).
  5. Fill spray tank to desired level with water. Agitation should continue until all spray solution has been applied.
- Failure to agitate the spray solution may result in improper mixing of the herbicides and unsatisfactory weed control. Mixing and compatibility qualities should be verified by a jar test.

**INFORMATION ON ANTAGONISM**

Tank mixes of MANA Arrow 2 EC Herbicide with postemergence broadleaf herbicides have shown some reduction or failure to control certain grass species, which would have otherwise been controlled when MANA Arrow 2 EC Herbicide is applied alone. Activity of the postemergence broadleaf herbicide in the tank mix is not affected.

**ALFALFA**

Table 1. MANA ARROW 2EC HERBICIDE TANK MIXES WITH BROADLEAF HERBICIDES FOR ALFALFA (Refer to the recommendation tables above for specific grasses and growth stages.)

PRODUCT <sup>(2)</sup>	APPLICATION RATES/ ACRE <sup>(1)</sup>		CROP OIL CONCENTRATE <sup>(3)</sup> (V/V)	
	ANNUAL GRASSES	PERENNIAL GRASSES	GROUND	AIR
MANA Arrow 2EC + 2,4-DB <sup>(4)</sup>	10 to 16 fl. oz. + Refer to 2,4-DB label	10 to 16 fl. oz. + Refer to 2,4-DB label	1%	1%
MANA Arrow 2EC + Pursuit DG <sup>(5)</sup> Or Pursuit <sup>(5)</sup>	10 TO 16 fl. oz. + 1.08 to 2.16 oz. or 3 to 6 fl. oz.	-	1%	1%
MANA Arrow 2EC + Buctril® 2L <sup>(6)(7)</sup>	10 to 16 fl. oz. + 1.0 to 1.5 pts.	-	0.5%	0.5%

<sup>(1)</sup> If grass regrowth occurs or an additional flush of new grass emerges, make a second application of MANA Arrow 2EC Herbicide alone (without a tank mix herbicide), according to the appropriate size and rate recommendations.

<sup>(2)</sup> Broadleaf weed control may be reduced when grass populations are tall or dense enough to intercept the spray pattern and prevent them from receiving complete coverage. Tank mixing is not recommended in these situations.

<sup>(3)</sup> Always use a crop oil concentrate at the listed rate (but not less than 1 pt./A) in the finished spray volume.

<sup>(4)</sup> MANA Arrow 2EC Herbicide plus 2,4-DB may increase the severity of crop injury when tank mixed. Alfalfa plants will generally outgrow this temporary crop injury within a few weeks.

<sup>(5)</sup> Before using this tank mix, read and understand the Pursuit or Pursuit DG labels for geographical restrictions and restrictions regarding alfalfa growth stage and type. Failure to do so can result in crop injury to alfalfa. Do not feed, graze, or harvest alfalfa for 30 days following an application of Pursuit to alfalfa.

<sup>(6)</sup> In the states of Washington, Oregon, Idaho, Montana, Wyoming, Colorado, Utah, Nevada and the western halves of North Dakota, South Dakota, Nebraska, and Kansas: The MANA Arrow 2EC plus Buctril tank mix must be applied in the fall or spring to seedling alfalfa when the majority of the field has a minimum of 2 trifoliates. Unacceptable crop injury may occur to alfalfa seedlings less than the 2 trifoliolate leaf stage. MANA Arrow 2EC plus Buctril applications made when temperatures are expected to exceed 80° F at (and 3 days following) application can result in unacceptable crop injury. In the states not listed above, apply in the fall or spring to seedling alfalfa when the majority of the field has a minimum of 4 trifoliolate leaves. When alfalfa stand is uneven and conditions favor leaf burn, unacceptable crop injury may occur to alfalfa in the 2 trifoliolate or smaller

24/35

stage of growth. MANA Arrow 2EC Herbicide plus Buctril applications made when temperatures are expected to exceed 70°F at (and 3 days following) application can result in unacceptable crop injury. Crop leaf burn can occur following MANA Arrow 2EC Herbicide plus Buctril application. Warm, humid conditions may enhance leaf burn. New crop growth will not be affected.  
 (7) Do not apply when alfalfa is under moisture, temperature, insect or disease stress or has been stressed by other pesticide carryover or application.

**CANOLA**

**Table 2. REDUCED RATE MANA ARROW 2EC HERBICIDE TANK MIXES WITH BROADLEAF HERBICIDES FOR CANOLA**

(Refer to the recommendation tables above for specific grasses and growth stages).

PRODUCT	APPLICATION RATES/ ACRE		AMMONIUM SULFATE	
	ANNUAL GRASSES (1)	PERENNIAL GRASSES	GROUND	AIR
MANA Arrow 2EC (2) + Liberty (3)	4 to 5 fl. oz. + 34 fl. oz.	-	3.0 lbs.	3.0 lbs.

(1) Annual grasses and sizes controlled with these tank mixtures are those that are identified in the DIRECTIONS FOR REDUCED RATE TO CONTROL SMALL ANNUAL GRASSES TABLE.

(2) Do not apply MANA Arrow 2EC Herbicide tank mix during or after bolting or flowering or crop injury may occur.

(3) For use only on LibertLink® canola.

**COTTON**

**Table 3. MANA Arrow 2 EC HERBICIDE TANK MIXED WITH COBRA® HERBICIDE AND MSMA APPLIED POST DIRECTED TO COTTON**

PRODUCT(2)	APPLICATION RATES/ACRE(1)		CROP OIL CONC.(3) V/V GROUND	COMMENTS
	ANNUAL GRASSES	PERENNIAL GRASSES		
MANA Arrow 2 EC(4) + Cobra Herbicide + MSMA (4.0 lbs./gal.) Or MSMA (6.6 lbs./gal.)	6 to 8 fl. oz.	8 to 16 fl. oz.	1%	Reduce broadcast rate in proportion to the band area actually treated.
	See Cobra label for rates to control broadleaf weeds and height limitations for cotton. Refer to the MANA Arrow 2 EC Herbicide label for weed height and species controlled.			
	See MSMA label for rates to control broadleaf weeds and height limitations for cotton. Refer to the MANA Arrow 2 EC Herbicide label for weed height and species controlled.			

(1) If grass regrowth occurs or an additional flush of new grass emerges, make a second application of MANA Arrow 2 EC Herbicide alone (without a tank mix herbicide), according to the appropriate size and rate recommendations.

(2) Broadleaf weed control may be reduced when grass populations are tall enough or dense enough to intercept the spray pattern and prevent them from receiving complete coverage. Tank mixing is not recommended in these situations.

(3) Always use a crop oil concentrate at the listed rate (but not less than 1 pt./A) in the finished spray volume.

(4) If at the time of application, grass height is so tall that post-directed applications cannot get good coverage over the top of the grassy weeds, then poor control may result and a second (non-post directed) application of MANA Arrow 2 EC Herbicide may be necessary.

**Table 4. MANA Arrow 2 EC HERBICIDE TANK MIXED WITH BUCTRIL® 4 EC HERBICIDE TO CONTROL EMERGED WEEDS IN BXN COTTON AS A BROADCAST APPLICATION**

PRODUCT (2)	APPLICATION RATES/ACRE (1)		CROP OIL CONC. PER ACRE (3)	COMMENTS (7)
	ANNUAL GRASSES			
MANA Arrow 2 EC + Buctril 4 EC Herbicide(4,5,6)	8 to 16 fl. oz.		1 qt./A	See charts for grasses controlled.
	See Buctril 4 EC Herbicide label for rates to control broadleaf weeds and height limitations for cotton.			

(1) If grass regrowth occurs or an additional flush of new grass emerges, make a second application of MANA Arrow 2 EC Herbicide at the recommended rate with the appropriate amount of crop oil concentrate in a non-Buctril tank mix.

(2) Broadleaf weed control may be reduced when grass populations are tall enough or dense enough to intercept the spray pattern and prevent them from receiving complete coverage.

(3) Always add a crop oil concentrate at 1 qt./A by ground in the finished spray solution.

(4) Applications of Buctril 4 EC can be made only to cotton that has been genetically modified for crop tolerance to postemergence over-the-top applications of bromoxynil.

(5) Do not apply the MANA Arrow 2EC plus Buctril tank mix within 75 days of harvest.

(6) Do not exceed two applications of Buctril before cotton is 12 inches tall and one application after 12 inches tall.

(7) Use a minimum of 10 gals. of spray solution per acre.

22/35

**Table 5. MANA ARROW 2EC HERBICIDE TANK MIXED WITH GLYPHOSATE TO CONTROL EMERGED GRASSES IN COTTON AS A BROADCAST APPLICATION.**

PRODUCT	APPLICATION RATE/ACRE <sup>(1)</sup>		ADJUVANT		COMMENTS
	ANNUAL GRASSES	PERENNIAL GRASSES	Glyphosate formulation with built in adjuvant	Glyphosate formulation without built in adjuvant	
MANA Arrow 2EC + Glyphosate	6 to 8 fl. oz.  See glyphosate label for rates to control broadleaf weeds and height limitations for cotton	8 to 16 fl. oz.  See glyphosate label for rates to control broadleaf weeds and height limitations for cotton	Non-ionic surfactant @ 0.125 to 0.25% v/v plus ammonium sulfate @ 8.5 to 17 lbs. per 100 gals. of carrier	Crop oil concentrate @ 1 pt. /A plus ammonium sulfate @ 8.5 to 17 lbs. per 100 gals. of carrier	See charts for grasses controlled. Use a minimum of 10 gals. of spray solution per acre.

(1) If grass regrowth occurs or an additional flush of new grass emerges, make a second application of MANA Arrow 2EC at the recommended rate with the appropriate amount of crop oil concentrate.

**DRY SHELLED AND SUCCULENT BEANS**

**Table 6. MANA ARROW 2EC TANK MIXES WITH BROADLEAF HERBICIDES FOR DRY SHELLED AND SUCCULENT BEANS (Refer to the recommendations tables above for specific grasses and growth stages).**

PRODUCT <sup>(2)</sup>	APPLICATION RATES PER/ACRE <sup>(1)</sup>		CROP OIL CONCENTRATE <sup>(3)</sup> (V/V)	
	ANNUAL GRASSES	PERENNIAL GRASSES	GROUND	AIR
MANA Arrow 2EC + Basagran®	8 to 10 fl. oz. + 1.0 to 2.0 pts.	10 to 16 fl. oz. + 1 to 2 pts.	1%	1%

(1) If grass regrowth occurs or an additional flush of new grass emerges, make a second application of MANA Arrow 2EC alone (without a tank mix herbicide), according to the appropriate size and rate recommendations.

(2) Broadleaf weed control may be reduced when grass populations are tall enough or dense enough to intercept the spray pattern and prevent them from receiving complete coverage. Tank mixing is not recommended in these situations.

(3) Always use a crop oil concentrate at the listed rate (but not less than 1 pt/A) in the finished spray volume.

**FLAX**

**Table 7. REDUCED RATE MANA ARROW 2EC TANK MIXES WITH BROADLEAF HERBICIDES FOR FLAX. (Refer to the recommended tables above for specific grasses and growth stages).**

PRODUCT	APPLICATION RATES PER/ACRE		CROP OIL CONCENTRATE	
	ANNUAL GRASSES <sup>(1)</sup>	PERENNIAL GRASSES	GROUND	AIR
MANA Arrow 2EC + Bronate Advanced™ <sup>(2,3)</sup>	4 to 5 fl. oz. + 11.4 fl. oz.	-	1 pt.	1 pt.
MANA Arrow 2EC + Bronate® <sup>(2,3)</sup>	4 to 5 fl. oz. + 0.9 pt.	-	1 pt.	1 pt.
MANA Arrow 2EC + Buctril <sup>(2,3)</sup>	4 to 5 fl. oz. + 1.0 pt.	-	1 pt.	1 pt.
MANA Arrow 2EC + Rhonox® <sup>(2,3)</sup>	4 to 5 fl. oz. + 0.25 to 0.5 pt.	-	1 pt.	1 pt.

(1) Annual grasses and sizes controlled with these tank mixtures are those that are identified in the DIRECTIONS FOR REDUCED RATE TO CONTROL SMALL ANNUAL GRASSES Table.

(2) Do not apply MANA Arrow 2EC tank mix during or after the bud stage or to ornamental flax or crop injury may occur.

(3) Do not apply tank mixes if temperatures are expected to exceed 85°F at (or 3 days following) application or crop injury may occur.

23/39

**Table 8. MANA ARROW 2 EC HERBICIDE TANK MIXES <sup>(3)</sup> TO CONTROL ANNUAL GRASSES WHEN USED AS A BURNDOWN IN NO-TILL SOYBEANS**

PRODUCT	PRODUCT ACRE RATE <sup>(1)</sup>	GRASS HEIGHT	CROP OIL CONC. <sup>(2)</sup>	28%N OR 32%N QTS./A OR 2.5 TO 4.0 LBS. AMS
MANA Arrow 2 EC Herbicide + 2,4-D Ester* <sup>(3)</sup>	3 fl.oz.	Foxtail 1 to 3" Fall Panicum 1 to 3"	1 qt./A	1 to 2 qts./A or 2.5 to 4.0 lbs. AMS
	4 fl. oz.	Foxtail 1 to 4" Fall Panicum 1 to 4"	1 qt./A	1 to 2 qts./A or 2.5 to 4.0 lbs. AMS
	6 to 8 fl. oz. + 0.5 lb. a.i.	(See Grass Chart for grasses claimed)	1 qt./A	1 to 2 qts./A or 2.5 to 4.0 lbs. AMS

\*2,4-D Ester should not be used where drift-sensitive crops may be grown.

<sup>(1)</sup> If regrowth occurs or an additional flush of new grass emerges, make a second application of MANA Arrow 2 EC Herbicide according to the appropriate size and rate recommendations.

<sup>(2)</sup> Always use a crop oil concentrate at the listed rate in the finished spray volume.

<sup>(3)</sup> The following products can be tank mixed with MANA Arrow 2 EC Herbicide plus 2,4-D Ester: Valor <sup>®</sup>, Authority <sup>®</sup>, Broadleaf, Canopy XL <sup>®</sup>, Dual 8 E <sup>®</sup>, Dual II <sup>®</sup>, Dual Magnum <sup>®</sup>, Prowl <sup>®</sup>, Sencor <sup>®</sup>, and Sencor plus the Dual products and Turbo <sup>®</sup>.

**Table 9. MANA Arrow 2 EC HERBICIDE TANK MIXES WITH BROADLEAF HERBICIDES FOR SOYBEANS (REFER TO THE RECOMMENDATION TABLES ABOVE FOR SPECIFIC GRASSES AND GROWTH STAGES)**

PRODUCT <sup>(2)</sup>	APPLICATION RATES/ACRE <sup>(1)</sup>			
	ANNUAL GRASSES	PERENNIAL GRASSES	CROP OIL CONC. <sup>(3)</sup> (V/V)	
			GROUND	AIR
MANA Arrow 2EC + Cobra <sup>®</sup> Herbicide	6 to 8 fl. oz. + 12.5 fl. oz.	8 to 16 fl. oz. + 12.5 fl. oz.	0.5 to 1%	1%
MANA Arrow 2EC + Basagran <sup>®</sup> 4 SL	8 to 10 fl. oz. + 1 to 2 pts.	10 to 16 fl. oz. + 1 to 2 pts.	1%	1%
MANA Arrow 2EC + Glyphosate (For use on Roundup Ready soybean only)	6 to 8 fl. oz. + 0.75 to 3.0 lb. a.i.	8 to 16 fl. oz. + 0.75 to 3.0 lb. a.i.	0.5 to 1% <sup>(4)</sup>	1% <sup>(4)</sup>
MANA Arrow 2EC + Ultra Blazer <sup>®</sup>	6 to 8 fl. oz. + 1 to 1.5 pts.	6 to 8 fl. oz. + 1 to 1.5 pts.	0.5 to 1%	1%
MANA Arrow 2EC + Flexstar <sup>®</sup> HL Herbicide <sup>(6)</sup>	6 to 8 fl. oz. Refer to the Flexstar HL Herbicide label for specific application rates	8 to 16 fl. oz. Refer to the Flexstar HL Herbicide label for specific application rates	1%	1%
MANA Arrow 2EC + Classic <sup>®</sup> 25 DG	8 to 10 fl. oz. + 0.5 to 0.75 oz.	10 to 16 fl. oz. + 0.5 to 0.75 oz.	1%	1%
MANA Arrow 2 EC <sup>(4)</sup> + Pursuit <sup>®</sup> 70 DG	6 to 8 fl. oz. + 1.44 fl. oz.	8 to 16 fl. oz. + 1.44 fl. oz.	1%	1%
MANA Arrow 2 EC <sup>(5)</sup> + Cobra Herbicide + Classic 25 DG	8 to 10 fl. oz. + 6 to 8 fl. oz. + 0.5 to 0.75 oz.	-	0.5%	1%
MANA Arrow 2 EC <sup>(5)</sup> + Cobra Herbicide + Basagran 4 SL	8 to 10 fl. oz. + 6 to 10 fl. oz. + 1 to 1.5 pts.	-	0.5%	1%
MANA Arrow 2 EC <sup>(5)</sup> + Cobra Herbicide + Pursuit 70 DG	8 to 10 fl. oz. + 6 to 10 fl. oz. + 1.44 fl. oz.	-	0.5%	1%

24/35

PRODUCT <sup>(2)</sup>	APPLICATION RATES/ACRE <sup>(1)</sup>			
	ANNUAL GRASSES	PERENNIAL GRASSES	CROP OIL CONC. <sup>(3)</sup> (V/V)	1%
			GROUND	AIR
MANA Arrow 2 EC <sup>(5)</sup> + Cobra Herbicide + Resource Herbicide	6 to 8 fl. oz. + 6 fl. oz. + 4 fl. oz.	-	0.5%	1%
MANA Arrow 2 EC <sup>(5)</sup> + FirstRate <sup>®</sup>	6 to 8 fl. oz. + 0.3 oz.	8 to 16 fl. oz. + 0.3 oz.	1%	-
MANA Arrow 2 EC <sup>(5)</sup> + Cobra Herbicide + FirstRate	6 to 8 fl. oz. + 6 to 8 fl. oz. + 0.3 oz.	8 to 16 fl. oz. + 6 to 8 fl. oz. + 0.3 oz.	1%	-
MANA Arrow 2 EC <sup>(5)</sup> + Raptor <sup>®</sup> (1 AS)	6 to 8 fl. oz. + 4 to 5 fl. oz.	-	1%	-
MANA Arrow 2 EC <sup>(5)</sup> + Cobra Herbicide + Raptor (1 AS)	6 to 8 fl. oz. + 6 to 8 fl. oz. + 4 to 5 fl. oz.	-	1%	-
MANA Arrow 2 EC <sup>(5)</sup> + Synchrony <sup>®</sup> STS <sup>™</sup>	6 to 8 fl. oz. <sup>(7)</sup> + 0.5 oz./A	-	1 qt./A	-
MANA Arrow 2 EC <sup>(5)</sup> + Cobra Herbicide + Synchrony STS	6 to 8 fl. oz. <sup>(7)</sup> + 4 to 8 fl. oz. + 0.5 oz.	-	1 pt./A	-
MANA Arrow 2 EC <sup>(5)</sup> + Resource Herbicide	6 to 8 fl. oz. + 4 to 12 fl. oz.	-	1 qt./A	-
MANA Arrow 2 EC <sup>(5)</sup> + Frontrow <sup>™</sup>	8 to 10 fl. oz. + Refer to Frontrow label for use rates	-	1%	-
MANA Arrow 2EC + Firstrate + Flexstar HL <sup>(5)</sup>	6 to 8 fl. oz. + 0.3 oz. + Refer to the Flexstar HL label for specific application rates.	8 to 16 fl. oz. + 0.3 oz. + Refer to the Flexstar HL label for specific application rates	1%	-

(1) If grass regrowth occurs or an additional flush of new grass emerges, make a second application of MANA Arrow 2 EC alone (without a tank mix herbicide) according to the appropriate size and rate recommendations.

(2) Broadleaf weed control may be reduced when grass populations are tall enough or dense enough to intercept the spray pattern and prevent them from receiving complete coverage. Tank mixing is not recommended in these situations.

(3) Always use a crop oil concentrate at the listed rate (but not less than 1 pt./A) in the finished spray volume.

(4) The addition of 2.5 lb. of ammonium sulfate is required when product is tank mixed with glyphosate. If the glyphosate formulation has a stand alone built in adjuvant, add 0.125% V/V non-ionic surfactant in place of crop oil concentrate. If the glyphosate formulation does not have a built adjuvant system, add 0.5 to 1.0 % crop oil concentrate for ground application and 1.0% V/V for aerial application.

(5) The addition of 1 to 2 qts. per acre of liquid fertilizer (10-34-0, 28%N, or 32%N) is recommended when MANA Arrow 2EC is tank mixed with Pursuit, Resource, Storm, Firstrate, Synchrony, Raptor, Frontrow, Cobra plus Classic, Cobra plus Basagran, Cobra plus Pursuit, Cobra plus Firstrate, Cobra plus Synchrony, and Cobra plus Raptor. An equivalent amount (2.5 to 4.0 lbs/acre) of spray grade ammonium sulfate (AMS) may be added in place of liquid fertilizer. Fertilizer adjuvants are to added in addition to the crop oil concentrate.

(6) Refer to Flexstar HL label for geographic and rotational restrictions.

(7) Annual grasses and sizes controlled with these tank mixtures are those which are identified in the DIRECTIONS FOR REDUCED RATE ITO CONTROL SMALL ANNUAL GRASSES table.



29/35

**Table 10. REDUCED RATE MANA ARROW 2EC TANK MIXES WITH BROADLEAF HERBICIDES FOR SOYBEAN (Refer to table for reduced rate use in canola, dry shelled bean & pea, edible podded legume vegetables, flax, mustard seed, soybean, succulent bean & pea and sugar beet recommendations for small annual grasses for specific grasses and growth stages)**

PRODUCT	APPLICATION RATES/ACRE <sup>(1)</sup>		CROP OIL CONCENTRATE <sup>(3,4)</sup> (V/V)	
	ANNUAL GRASSES <sup>(2)</sup>	PERENNIAL GRASSES	GROUND	AIR
MANA Arrow 2EC + Firstrate	4 to 8 fl. oz. + 0.3 oz.	-	1%	1%
MANA Arrow 2EC + Pursuit 70 DG	4 to 6 fl. oz. + 1.44 oz.	-	1%	1%

<sup>(1)</sup> If grass regrowth occurs or an additional flush of new grass emerges, make a second application of MANA Arrow 2EC alone (without a tank mix herbicide), according to the appropriate size and rate recommendations.

<sup>(2)</sup> Annual grasses and sizes controlled with these tank mixtures are those that are identified in the DIRECTIONS FOR REDUCED RATE TO CONTROL SMALL ANNUAL GRASSES Table.

<sup>(3)</sup> Always use a crop oil concentrate at the listed rate (but not less than 1 pt. per acre) in the finished spray volume.

<sup>(4)</sup> The addition of 1 to 2 qts. per acre of liquid fertilizer (10-34-0, 28% N, or 32%N) is required when MANA Arrow 2EC is tank mixed at reduced rates. An equivalent amount (2.5 to 4.0 lbs./A) of spray grade ammonium sulfate (AMS) may be added in place of liquid fertilizer. Fertilizer adjuvants are to be added in addition to the crop oil concentrate.

**PEANUT (INCLUDING PERENNIAL)**

**Table 11. MANA ARROW 2EC TANK MIXES WITH BROADLEAF HERBICIDES FOR PEANUT (Refer to the recommendation tables above for specific grasses and growth stages.)**

PRODUCT <sup>(2)</sup>	APPLICATION RATES/ACRE <sup>(1)</sup>		CROP OIL CONCENTRATE <sup>(3)</sup> (V/V)	
	ANNUAL GRASSES	PERENNIAL GRASSES	GROUND	AIR
MANA Arrow 2EC + Basagran	8 to 10 fl. oz. + 1.0 to 2.0 pts.	-	1%	1%
MANA Arrow 2EC + Ultra Blazer	8 to 10 fl. oz. + 0.5 to 1.5 pts.	-	1%	1%
MANA Arrow 2EC + Storm	8 to 10 fl. oz. + 1.5 pts.	-	1%	1%

<sup>(1)</sup> If grass regrowth occurs or an additional flush of new grass emerges, make a second application of MANA Arrow 2EC alone (without a tank mix herbicide), according to the appropriate size and rate recommendations.

<sup>(2)</sup> Broadleaf weed control may be reduced when grass populations are tall or dense enough to intercept the spray pattern and prevent them from receiving complete coverage. Tank mixing is not recommended in these situations.

<sup>(3)</sup> Always use a crop oil concentrate at the listed rate (but not less than 1 pt./A) in the finished spray volume.

**RECOMMENDATIONS FOR GRASS SUPPRESSION FOR HARVEST EFFICIENCY IN PEANUT (INCLUDING PERENNIAL) WITH MANA ARROW 2EC**

GRASS SPECIES	WEED STAGE	RATE FL. OZ. / ACRE	
		LOW RATE	HIGH RATE
Annual and perennial grasses that exceed height claimed for control on height charts "RECOMMENDATIONS FOR ANNUAL GRASSES AND RECOMMENDATIONS FOR PERENNIAL GRASSES"	Up to and including grasses in the seed head stage.	16	32

Do not apply as part of a tank mix when applying MANA Arrow 2EC for grass suppression. Add a crop oil concentrate at 1 qt./A by ground to the finished spray volume.

**Table 12. MANA ARROW 2 EC HERBICIDE TANK MIXED WITH STINGER® HERBICIDE APPLIED TO SUGAR BEETS**  
(Refer to the recommendation tables above for specific grasses and growth stages)

PRODUCT <sup>(2)</sup>	APPLICATION RATES/ACRE <sup>(1)</sup>		CROP OIL CONC. <sup>(3)</sup>	
	ANNUAL GRASSES	PERENNIAL GRASSES	GROUND	AIR
MANA Arrow 2 EC + Stinger Herbicide	6 to 8 fl. oz.	8 to 16 fl. oz.	1% v/v	
See Stinger Herbicide label for rates.				

- (1) If grass regrowth occurs or an additional flush of new grass emerges, make a second application of MANA Arrow 2 EC alone (without a tank mix herbicide) according to the appropriate size and rate recommendations.
- (2) Broadleaf weed control may be reduced when grass populations are tall enough or dense enough to intercept the spray pattern and prevent them from receiving complete coverage. Tank mixing is not recommended in these situations.
- (3) Always use a crop oil concentrate at the listed rate (but not less than 1 pt./A) in the finished spray volume.

**Table 13. MANA Arrow 2 EC HERBICIDE TANK MIXED WITH BETAMIX® OR BETANEX® APPLIED TO SUGAR BEETS**

PRODUCT <sup>(2)</sup>	WEEDS CONTROLLED		WEED HEIGHT	APPLICATION RATE/ACRE <sup>(1)</sup>
	Common Name	Scientific Name		
MANA Arrow 2 EC <sup>(3)</sup> + Betamix or Betanex	Barnyardgrass	<i>Echinochloa crus-galli</i>	1 to 3"	8 fl. oz.
	Foxtail	<i>Setaria</i> spp.	1 to 3"	
	Foxtail Millet	<i>Setaria italica</i>	1 to 3"	
	Wild Oat	<i>Avena fatua</i>	1 to 3"	
	Wild Proso Millet	<i>Panicum miliaceum</i>	1 to 3"	
			See Betamix label for rates to control broadleaf weeds. <b>No additives are recommended in the tank mix.</b>	
			See Betanex label for rates to control broadleaf weeds. <b>No additives are recommended in the tank mix.</b>	

- (1) Do not use crop oil concentrate. No additives are recommended in the tank mix.
- (2) Broadleaf weed control may be reduced when grass populations are tall enough or dense enough to intercept the spray pattern and prevent them from receiving complete coverage. Tank mixing is not recommended in these situations.
- (3) If grass regrowth occurs or an additional flush of new grass emerges, make a second application of MANA Arrow 2 EC Herbicide at full label rate with appropriate rate of crop oil concentrate.

**Table 14. MANA Arrow 2EC PLUS BETANEX OR BETAMIX TANK MIX FOR THREE SEQUENTIAL APPLICATIONS FOR ANNUAL GRASS CONTROL (MICRO-RATE APPLICATION).**

PRODUCT	APPLICATION RATES/ACRE <sup>(1)</sup>		METHYLATED SEED OIL <sup>(2)</sup> (V/V)	
	ANNUAL GRASSES	GRASSES CONTROLLED (inches)	GROUND	AIR
MANA Arrow 2EC + Betanex or Betamix	2 to 3 fl. oz. + 8 to 12 fl. oz. <sup>(3)</sup> or 8 to 12 fl. oz. <sup>(3)</sup>	Green Foxtail (1-2) Yellow Foxtail (1-2) Barnyardgrass (1-2) Wild Oat (1-2) Volunteer Cereals (1-2)	1.5%	1.5%

- (1) Broadleaf weed control may be reduced when grass populations are tall or dense enough to intercept the spray pattern and prevent them from receiving complete coverage. Tank mixing is not recommended in these situations.
- (2) Always use a methylated seed oil at the listed rate (but not less than 1 pt./A) in the finished spray volume.
- (3) Use 8 fl. oz./A rate when sugar beet are in the cotyledon to 4 leaf stage. Rate can be increased up to 12 fl. oz./A when the smallest sugar beet plants in the field are in the 4 true leaf stage.

**Directions for Use for Micro-Rate Applications to Sugar Beet**  
**General Information**

Multiple micro-rate applications of MANA Arrow 2EC in tank mixtures with reduced rates of Betanex or Betamix and methylated seed oils may be applied by air or ground equipment to sugar beet to control early germinating annual grasses listed above. The rate of Betanex or Betamix must not exceed 0.12 lb. a.i./A (broadcast application) when in combination with these spray adjuvants. Note that maximum rate allowed varies depending on crop growth stage. The use of wetting agents or spray adjuvants with conventional rates (0.73 to 1.22 lb. a.i./A) or multiple low rate (0.24 to 0.73 lb. a.i./A) applications of Betanex or Betamix is prohibited on the Betanex and Betamix master label. Favorable climatic conditions (good conditions for plant growth and development) are essential for adequate weed control. All use precautions and restrictions on the Betanex and Betamix master labels must be followed.

27/35

**Directions for Using Micro-Rate Multiple Applications of MANA Arrow 2EC Tank Mixes**

Apply MANA Arrow 2EC in broadcast applications only at a rate of 2 to 3 fl. oz/A in tank mixture with either Betanex or Betamix following the directions for use on the tank mix partner label. A minimum of three sequential applications of 2 fl. oz./A or a minimum of 2 sequential applications of 3 fl. oz/A should be utilized for MANA Arrow 2EC tank mixtures. A minimum of 3 sequential applications of Betamix or Betanex should be used. Accurate timing is essential; make initial application immediately after weeds emerge, and make repeat applications on 5 to 7 days intervals. If weed control is not adequate due to climatic conditions, spray coverage or other factors, return to conventional application rates of MANA Arrow 2EC (6 to 8 fl. oz/A) and add rates of Betanex or Betamix as directed on their label. When using conventional rates of Betanex or Betamix in tank mixtures with MANA Arrow 2EC, a spray adjuvant is not recommended.

**Use Precautions for Micro-Rate Applications: (See MANA Arrow 2EC, Betanex, and Betamix master label for further use precautions.)**

Not all weeds will be adequately controlled, even with favorable climatic conditions. Conventional rates of MANA Arrow 2EC, Betanex, or Betamix and/or hand labor may be required if multiple micro-rate applications do not adequately control weeds. Plugging of spray nozzles may be encountered due to the potential for formation of a precipitate in the spray solution that is often associated with micro-rate applications. Maktheshim Agan of North America, Inc. will not be responsible for any nozzle plugging that may occur with the use of multiple micro-rate applications. Methylated seed oils must not be added if the Betanex or Betamix rate exceeds 0.12 lb a.i./A broadcast, as the addition of methylated seed oils could increase the possibility of crop injury at dosage rates greater than 0.12 lb a.i./A.

**GROUND APPLICATION**

Use of sufficient spray volumes and pressure is essential to ensure complete coverage. Use a minimum of 10 gals. and a maximum of 20 gals. of spray solution per acre. Spray pressures should reflect a minimum of 30 psi and a maximum of 60 psi at the nozzle. Do not use flood nozzles.

**AERIAL APPLICATION**

Use of sufficient spray volumes is essential to ensure complete coverage. Use a minimum of 5 gals. and a maximum of 15 gals. of spray solution per acre.

**Table 15. TANK MIX APPLICATION OF MANA ARROW 2EC AND FUNGICIDES FOR CONTROL OF GRASS WEEDS AND DISEASES IN SUGAR BEET.**

PRODUCT <sup>(2)</sup>	APPLICATION RATES/ACRE <sup>(1)</sup>		CROP OIL CONCENTRATE <sup>(3)</sup> (V/V)
	Annual Grasses	Perennial Grasses	
MANA Arrow 2EC + Eminent®	6 to 8 fl. oz. + 13 fl. oz.	8 to 16 fl. oz. + 13 fl. oz.	1%

<sup>(1)</sup> If grass regrowth occurs, or an additional flush of new grass emerges, make a second application of MANA Arrow 2EC alone (without a tank mix fungicide) according to the appropriate size and rate recommendations.

<sup>(2)</sup> Refer to MANA Arrow 2EC and fungicide label for rates and weeds and diseases controlled.

<sup>(3)</sup> Always use a crop oil concentrate at the listed rate (but not less than 1 pt/A) in the finished spray volume.

**Table 16. TANK MIX APPLICATION OF MANA ARROW 2 EC HERBICIDE AND INSECTICIDES FOR CONTROL OF GRASS WEEDS AND INSECTS IN ALFALFA, COTTON, MINT, PEANUT (INCLUDING PERENNIAL), SOYBEANS, AND SUNFLOWER**

PRODUCT <sup>(2)</sup>	APPLICATION RATES/ACRE <sup>(1)</sup>		CROP OIL CONC. <sup>(3)</sup> V/V	CROP					
	ANNUAL GRASSES	PERENNIAL GRASSES		Alfalfa <sup>(4)</sup>	Cotton	Mint <sup>(4,5)</sup>	Peanut	Soybean	Sunflower
MANA Arrow 2 EC + Orthene <sup>®</sup> 75 S Or  Orthene 97	6 to 8 fl. oz. + 0.33 to 1.33 lbs.  0.25 to 1.0 lb	8 to 16 fl. oz. + 0.33 to 1.33 lbs.  0.25 to 1.0 lb.	1%		X	X	X		
MANA Arrow 2 EC + Orthene 90 S <sup>(6)</sup>	6 to 8 fl. oz. + 0.25 to 1 lb.	8 to 16 fl. oz. + 0.25 to 1 lb.	1%		X	X	X	X	
MANA Arrow 2 EC + Danitol <sup>®</sup> 2.4 EC	6 to 8 fl. oz. + 10 ½ to 16 fl. oz.	8 to 16 fl. oz. + 10 ¾ to 16 fl. oz.	1%		X		X		
MANA Arrow 2EC + Asana XL <sup>®</sup>	6 to 8 fl. oz. + Refer to Asana XL label	8 to 16 fl. oz. + Refer to Asana XL label	1%						X
MANA Arrow 2EC + Warrior <sup>®</sup>	6 to 8 fl. oz. + Refer to Warrior label	8 to 16 fl. oz. + Refer to Warrior label	1%						X
MANA Arrow 2EC + Warrior	10 to 16 fl. oz. <sup>(7)</sup> + Refer to Warrior label	10 to 16 fl. oz. + Refer to Warrior label	1%	X					
MANA Arrow 2EC + Baythroid <sup>®</sup>	10 to 16 fl. oz. <sup>(7)</sup> + Refer to Baythroid label	10 to 16 fl. oz. + Refer to Baythroid label	1%	X					
MANA Arrow 2EC + Dimethoate <sup>®</sup>	10 to 16 fl. oz. <sup>(7)</sup> + Refer to Dimethoate label	10 to 16 fl. oz. + Refer to Dimethoate label	1%	X					
MANA Arrow 2EC + Lorsban <sup>®</sup>	10 to 16 fl. oz. <sup>(7)</sup> + Refer to Lorsban label	10 to 16 fl. oz. + Refer to Lorsban label	1 to 2 pt. <sup>(8)</sup>	X					
MANA Arrow 2EC + Pounce <sup>®</sup>	10 to 16 fl. oz. <sup>(7)</sup> + Refer to Pounce label	10 to 16 fl. oz. + Refer to Pounce label	1%	X					

<sup>(1)</sup> If grass regrowth occurs, or an additional flush of new grass emerges, make a second application of MANA Arrow 2 EC Herbicide alone (without a tank mix insecticide) according to the appropriate size and rate recommendations.

- (2) Refer to the MANA Arrow 2 EC Herbicide and insecticide label for rates, weeds, and insects controlled.
- (3) Always use a crop oil concentrate at the listed rate (but not less than 1 pt./A) in the finished spray volume.
- (4) Certain insecticides may cause temporary phytotoxic symptoms on alfalfa and mint foliage. Refer to the insecticide label for further information. It is suggested that prior to using any of these insecticide/herbicide tank mixtures, that a small area of the field be treated first and observations for crop injury be made prior to treating the whole field.
- (5) The MANA Arrow 2EC rate should be 6 to 8 fl. oz. /A for annual grass control in baby mint, minimum of 8 fl. oz./A for annual grass control in established mint and 8 to 16 fl. oz./A for perennial grass control. Crop oil concentrate should be added at the rate of 1.0 to 2.0 pts/A.
- (6) Insecticide tank mix use with Orthene 90S in soybeans is permitted only in a state having an approved Section 24(c) registration for Orthene 90S use in soybeans.
- (7) The MANA Arrow 2EC rate should be 6 to 8 fl. oz. /A for annual grass control in seedling alfalfa.
- (8) For the MANA Arrow 2EC plus Lorsban tank mix, reduce the adjuvant rate down to 1.0 pt. /A when the Lorsban rate is 1.0 pt /A or higher.

**Table 17. RECOMMENDATIONS FOR ROUNDUP READY® VOLUNTEER CORN CONTROL IN ROUNDUP READY SOYBEANS WITH MANA ARROW 2 EC HERBICIDE TANK MIX**

Roundup Ready Volunteer Corn Height (inches)	MANA ARROW 2EC Rate fl. oz. / A	Glyphosate <sup>(1)</sup> rate for formulations <u>with</u> built in adjuvant	Adjuvant
< 12	4	1.0 to 2.0 lb. ai./A (Approximately equivalent to 22 to 44 fl. oz./A of Roundup Weather Max)	Non-ionic surfactant @ 0.125 to 0.25% v/v plus ammonium sulfate @ 8.5 to 17 lbs. per 100 gals. / of carrier
12 to 18	5		
18 to 24	6		
Roundup Ready Volunteer Corn Height (inches)	MANA ARROW 2EC Rate fl. oz. / A	Glyphosate <sup>(1)</sup> rate for formulations <u>without</u> built in adjuvant	Adjuvant
< 12	4	Up to 2.0 lb. ai./A (Equivalent to 32 to 64 fl. oz./A of Roundup Original)	Crop oil concentrate @ 1 pt./A plus ammonium sulfate @ 8.5 to 17 lbs. per 100 gals. of carrier
12 to 18	5		
18 to 24	6		

(1) Glyphosate formulation must be labeled for use on Roundup Ready soybean.

**THE MOST RESTRICTIVE LABELING OF ANY PRODUCT USED IN A TANK MIX MUST BE FOLLOWED.**

- Apply only to actively growing grass and broadleaf weeds at recommended height or growth stage listed on each label.
- Apply under favorable soil moisture and humidity which exist a few days after rainfall or within seven days after irrigation.
- Tank mix applications may sometimes result in reduced grass control. If regrowth occurs or an additional flush of new grass emerges, make a second application of MANA Arrow 2 EC Herbicide as specified in the respective size and rate tables.
- Do not tank mix MANA Arrow 2 EC Herbicide when broadleaf weeds are tall and/or dense enough to prevent proper grass coverage.
- This tank mix may be applied postemergence to Roundup Ready soybeans up through the full flowering stage. Do not apply less than 60 days before harvest.
- Avoid contact with foliage, green stems, or fruit crops, or any desirable plants and trees, other than soybeans with the Roundup Ready gene as severe injury or destruction will result.
- Do not allow the MANA Arrow 2EC plus Roundup to mist, drip, drift, or splash onto desirable vegetation as minute quantities of the tank mix can cause severe damage or destruction to the crops, plants, or other areas on which treatment was not intended. The likelihood of injury occurring from drift of this product is greatest when winds are gusty or in excess of 5 miles per hour. Even under lesser wind velocities, avoid conditions that allow spray drift to occur such as combinations of spray pressure and nozzle type that will result in fine particles (mist) that are likely to drift.

**FALLOW LAND  
DIRECTIONS FOR USE**

MANA Arrow 2 EC Herbicide may be used to control annual and perennial grasses in land that has been left fallow the previous year and other non-producing agricultural areas. Apply MANA Arrow 2 EC Herbicide at 6 to 8 fl. oz./A for annual grasses and 8 to 16 fl. oz./A for perennial grasses. When both grass and broadleaf weeds are the target pest, MANA Arrow 2 EC Herbicide may be tank mixed with 2,4-D Ester or Banvel SGF Herbicide for broad spectrum control. When both annual and perennial grasses occur in the same field, use a minimum of 8 fl. oz./A MANA Arrow 2 EC Herbicide.

**GENERAL INFORMATION**

- Use a minimum spray volume of 5 gals./A for aerial applications and 15 gals./A for ground applications.
- Apply only to actively growing grasses when the first grass reaches the recommended weed height as specified by the RECOMMENDATIONS FOR ANNUAL AND PERENNIAL GRASSES section of this label.
- Annual grasses which emerge after the MANA Arrow 2 EC Herbicide application will not be controlled and a second application may be necessary.
- The control of perennial grasses may require more than one application in non-tilled areas.
- Do not plant any crop for 30 days after application unless MANA Arrow 2EC is registered for use in that crop.

- Do not apply to grasses that have tillered, formed seedheads, or exceeded recommended growth stage.
- Do not use flood jet nozzles.
- Do not apply to drought-stressed grasses.
- Do not mow area for two weeks prior to or after the MANA Arrow 2 EC Herbicide application.

**MANA ARROW 2 EC HERBICIDE IN TANK MIXES TO CONTROL ANNUAL AND PERENNIAL GRASSES IN FALLOW LAND**

PRODUCT	APPLICATION RATES/ACRE <sup>(1)</sup>		CROP OIL CONCENTRATE <sup>(2)</sup>	
	ANNUAL GRASSES	PERENNIAL GRASSES	GROUND	AIR
MANA Arrow 2 EC + 2,4-D Ester or Banvel SGF	6 to 8 fl. oz. + 0.5 lb per acre or See Banvel SGF label for rates.	8 to 16 fl. oz.	1% v/v	

<sup>(1)</sup> Refer to MANA Arrow 2 EC Herbicide label for weed height and species control. Review Banvel SGF Herbicide and 2,4-D labels for crop restrictions, use rates, and weeds controlled.

<sup>(2)</sup> Always use a crop oil concentrate or methylated seed oil containing at least 15% emulsifier at the listed rate (but not less than 1 pt./A) in the finished spray volume.

RECOMMENDATIONS FOR GRASS SUPPRESSION IN NON-CROP AREAS WITH MANA ARROW 2EC			
GRASS SPECIES	WEED STAGE	RATE FL. OZ. /ACRE	HIGH RATE
Annual and perennial grasses that exceed height claimed for control on height chart above.	Up to and including grasses in the seed head stage.	12	16

Do not apply as part of a tank mix when applying MANA Arrow 2EC for grass suppression. Add a crop oil concentrate at 1 qt./A. by ground to the finished spray volume.

**MANA ARROW 2 EC HERBICIDE FOR THE CONTROL AND/OR SUPPRESSION OF TALL FESCUE IN NATIVE PRAIRIE WARM-SEASON GRASS RESTORATION PROJECTS**

PRODUCT	PRODUCT RATE	GRASS WEEDS CONTROLLED/SUPPRESSED		WEED STAGE
		COMMON NAME	SCIENTIFIC NAME	
MANA Arrow 2 EC	10 to 12 fl. oz./A	Tall Fescue	<i>Festuca arundinacea</i>	4 to 6 in. (40 to 60% green-up)

**Adjuvant:** MANA Arrow 2 EC Herbicide must be applied with crop oil concentrate at 1 qt./A, plus a spray grade ammonium sulfate at 2.5 to 4 lbs./A. **Recommended Mixing Order:** Thoroughly mix spray grade ammonium sulfate in water, add MANA Arrow 2 EC Herbicide, then add crop oil concentrate.

**SPECIAL APPLICATION INSTRUCTIONS/PRECAUTIONS**

- Burn or mow fields a minimum of 3 weeks prior to application to remove excess crop residue. Apply in the spring, at 40 to 60% tall fescue green-up, prior to emergence of warm-season grasses. Do not mow area for 2 weeks after the MANA Arrow 2 EC Herbicide application.
- Apply in a minimum of 15 to 20 gals. of water per acre at a spray pressure of 40 to 60 psi at the nozzle. Apply using flat fan or hollow cone nozzles. Do not use flood jet nozzles.
- Apply only to fields that have warm-season grasses established for two years. Applications of MANA Arrow 2 EC Herbicide to emerged warm-season grasses may cause injury. Do not apply to warm-season grasses grown for seed.
- Do not graze treated fields or feed treated forage and/or hay to livestock.
- Do not plant any crop for 30 days after application unless MANA Arrow is registered for use in that crop.

**NOTE:** MANA Arrow 2 EC Herbicide applications are most effective if applied when average nighttime temperatures are consistently greater than or equal to 47 degrees Fahrenheit.

**MANA ARROW 2 EC HERBICIDE FOR THE SUPPRESSION OF TALL FESCUE SEED-HEADS IN NON-PRODUCING AGRICULTURAL AREAS**

PRODUCT	PRODUCT RATE	SUPPRESSION	APPLICATION TIMING
MANA Arrow 2 EC	1½ to 2 fl. oz./A	Tall Fescue Seed-Heads ( <i>Festuca arundinacea</i> )	(50 to 90% Tall Fescue green-up)

**Adjuvant:** MANA Arrow 2 EC Herbicide must be applied with crop oil concentrate at 1 qt./A plus a spray grade ammonium sulfate at 2.5 to 4 lbs./A. **Recommended Mixing Order:** Thoroughly mix spray grade ammonium sulfate in water, add MANA Arrow 2 EC Herbicide, then add crop oil concentrate.

**SPECIAL APPLICATION INSTRUCTIONS/PRECAUTIONS**

Apply at 50 to 90% tall fescue green-up.  
Use the higher MANA Arrow 2 EC Herbicide rate if less tall fescue green matter is present.  
Do not mow area for 2 weeks after the MANA Arrow 2 EC Herbicide application.  
Apply in a minimum of 15 to 20 gals. of water per acre at a spray pressure of 40 to 60 psi at the nozzle. Apply using flat fan or hollow cone nozzles. Do not use flood nozzles.

2,4-D Ester may be added to this tank mix for broadleaf control (see 2,4-D Ester label for weeds controlled). Do not graze treated fields or feed treated forage and/or hay to livestock. Do not plant any crop for 30 days after application, unless MANA Arrow is registered for use in that crop.

**DIRECTIONS FOR USE IN ORNAMENTALS**

For ornamental plant uses, MANA Arrow 2 EC Herbicide can be used to control labeled grass weeds in greenhouses, lathhouses, shadehouses, and around outdoor ornamentals, including nurseries, parks, roadside plantings, and structure landscapes.

**IMPORTANT:** MANA Arrow 2 EC Herbicide successfully controls weeds in newly transplanted and established non-grassy ornamentals. Plant tolerance to MANA Arrow 2 EC Herbicide at labeled rates has been found to be acceptable for the indicated genera and species listed below. Due to variability within species, crop growth stage, environmental conditions, and application techniques, it is recommended that the user determine if herbicide can be used safely on a few plants prior to widespread application. Neither the seller nor the manufacturer of MANA Arrow 2 EC Herbicide has investigated the safety factor to ornamental plants not listed on the label.

The following plants have shown a tolerance for MANA Arrow 2 EC Herbicide applications:

**ORNAMENTAL TREES**

COMMON NAME	SCIENTIFIC NAME
ALDER, RED	<i>Alnus oregona</i>
ASH	<i>Fraxinus</i> spp.
BASSWOOD	<i>Tilia</i> spp.
BIRCH, EUROPEAN WHITE	<i>Betula pendula</i>
BIRCH, RIVER	<i>Betula nigra</i>
BIRCH, WHITE	<i>Betula papyrifera</i>
CRABAPPLE, FLOWERING	<i>Malus halliana</i>
DOGWOOD, FLOWERING	<i>Cornus florida</i>
GOLDEN CHAIN TREE	<i>Laburnum anagyroides</i>
MAPLES	<i>Acer</i> spp.
MULBERRY, WHITE	<i>Morus alba</i>
OAKS	<i>Quercus</i> spp.
OLIVE, WILD	<i>Elaeagnus angustifolia</i>
REDBUD, EASTERN	<i>Cercis canadensis</i>
SWEET GUM, AMERICAN	<i>Liquidambar styraciflua</i>

**GARDEN FLOWERS AND PLANTS**

AGERATUM	<i>Ageratum</i> spp.
ALYSSUM*, SWEET	<i>Lobularia maritima</i>
ASPARAGUS FERN	<i>Asparagus setaceus</i>
BLEEDING HEART	<i>Dicentra spectabilis</i>
CAST IRON PLANT	<i>Aspidistra elatior</i>
CHRYSANTHEMUM	<i>Chrysanthemum</i> spp.
CINQUEFOIL	<i>Potentilla</i> spp.
COLEUS	<i>Coleus</i> spp.
CORALBELLS	<i>Heuchera sanguinea</i>
CRANESBILL	<i>Geranium</i> spp.
DAHLIA	<i>Dahlia</i> spp.
DAISY, AFRICAN	<i>Osteospermum fruticosum</i>
DAYLILY	<i>Hemerocallis</i> spp.
DUSTY MILLER	<i>Senecio cineraria</i>
EUONYMUS	<i>Euonymus</i> spp.
GAZANIA	<i>Gazania</i> spp.
GERANIUM, HOUSE	<i>Pelargonium hortorum</i>
HEATHER, FALSE	<i>Cuphea hyssopifolia</i>
HOSTA	<i>Hosta fortunei</i>
IRIS	<i>Iris</i> spp.
JASMINE TOBACCO	<i>Nicotiana glauca</i>
LOOSESTRIFE	<i>Lythrum salicaria</i>
MARIGOLD	<i>Tagetes</i> spp.
PARTRIDGEBERRY	<i>Mitchella repens</i>
PETUNIA*	<i>Petunia hybrida</i>
PHLOX	<i>Phlox</i> spp.
PINKS	<i>Dianthus</i> spp.
PORTULACA	<i>Portulaca grandiflora</i>

SALVIA	<i>Salvia</i> spp.
SAXIFRAGE	<i>Saxifraga</i> spp.
SEDUM	<i>Sedum</i> spp.
SELLOUM	<i>Philodendron selloum</i>
SNAPDRAGON*	<i>Antirrhinum majus</i>
SWEET FLAG	<i>Acorus gramineus</i>
TICKSEED	<i>Coreopsis grandiflora</i>
TOUCH-ME-NOT	<i>Impatiens</i> spp.
VERBENA	<i>Verbena</i> spp.
VIOLET	<i>Viola</i> spp.
YMANA ARROW, COMMON	<i>Achillea millefolium</i>
ZINNIA	<i>Zinnia elegans</i>

\*Slight foliage or flower speckling has been observed on these species.

**GROUND COVERS**

BUGLEWEED, CARPET	<i>Ajuga reptans</i>
IVY, ENGLISH	<i>Hedera helix</i>
JAPANESE SPURGE	<i>Pachysandra terminalis</i>
LILYTURF	<i>Liriope muscari</i>
MONEYWORT	<i>Lysimachia nummularia</i>
MONDO GRASS, WHITE	<i>Ophiopogon jaburan</i>
MONDO GRASS, DWARF	<i>Ophiopogon japonicus</i>
PERIWINKLE, LESSER	<i>Vinca minor</i>

**SHRUBS**

ABELIA	<i>Abelia</i> spp.
ANISE, PURPLE	<i>Illicium floridanum</i>
AUCUBA	<i>Aucuba</i> spp.
AZALEA*	<i>Rhododendron</i> spp.
BAMBOO	<i>Bambusa</i> spp.
BARBERRY, JAPANESE	<i>Berberis thunbergii</i>
BARBERRY, MAGELLAN	<i>Berberis buxifolia</i>
BAYBERRY	<i>Myrica pensylvanica</i>
BOTTLEBRUSH	<i>Callistemon citrinus</i>
BOXWOOD, COMMON	<i>Buxus sempervirens</i>
CAMELLIA, COMMON	<i>Camellia japonica</i>
CANDYTUFT	<i>Iberis sempervirens</i>
CLEYERA	<i>Cleyera japonica</i>
CORALBERRY	<i>Ardisia crenata</i>
CRAPE MYRTLE	<i>Lagerstroemia indica</i>
COYOTE BRUSH	<i>Baccharis pilularis</i>
FIG, CREEPING	<i>Ficus pumila</i>
GARDENIA	<i>Gardenia</i> spp.
HOLLY	<i>Ilex</i> spp.
HONEYSUCKLE	<i>Lonicera pileata</i>
INDIAN HAWTHORN	<i>Raphiolepis indica</i>
JASMINE	<i>Jasminum</i> spp.
JASMINE, ASIATIC	<i>Trachelospermum asiaticum</i>
JASMINE, STAR	<i>Trachelospermum jasminoides</i>
JUNIPER	<i>Juniperus</i> spp.
LANTANA	<i>Lantana</i> spp.
NANDINA* BAMBOO, HEAVENLY	<i>Nandinia domestica</i>
OLEANDER, COMMON	<i>Nerium oleander</i>
OREGON GRAPE	<i>Mahonia aquifolium</i>
PHOTINIA	<i>Photinia</i> spp.
PITTOSPORUM	<i>Pittosporum</i> spp.
PODOCARPUS	<i>Podocarpus</i> spp.
PRIVET	<i>Ligustrum</i> spp.
PYRACANTHA	<i>Pyracantha</i> spp.
RHODODENDRON	<i>Rhododendron</i> spp.
ROSE	<i>Rosa</i> spp.
SPIREA	<i>Spiraea bumalda</i>
SWEET OLIVE	<i>Osmanthus fragrans</i>
TEA OLIVE	<i>Osmanthus fragrans</i>
VIBURNUM	<i>Viburnum tinus</i>



33/35

WISTERIA	<i>Wisteria</i> spp.
YELLOW SAGE/SHRUB VERBENA	<i>Lantana camara</i>

\*Slight foliage or flower speckling has been observed on these species.

**RECOMMENDATIONS FOR ANNUAL GRASSES IN ORNAMENTALS**

- Apply only to actively growing grasses at recommended weed heights.
- Apply when the first grass weed species in a mixed grass weed population reaches the recommended growth stage for treatment.
- Use the high rate under heavy grass pressure and/or when grasses are at maximum height.

GRASS SPECIES	SCIENTIFIC NAME	WEED* HEIGHT INCHES	RATE FL. OZ./ACRE <sup>(1)</sup>	HIGH RATE <sup>(2)</sup>
BARNYARDGRASS	<i>Echinochloa crus-galli</i>	2 to 8	8	16
BROADLEAF SIGNALGRASS	<i>Brachiaria platyphylla</i>	2 to 6	8	16
BROME				
California	<i>Bromus carinatus</i>	2 to 6	8	16
Cheatgrass	<i>Bromus secalinus</i>	2 to 6	8	16
Downy	<i>Bromus tectorum</i>	2 to 6	8	16
Ripgut	<i>Bromus diandrus</i>	2 to 6	8	16
CANARYGRASS	<i>Phalaris canariensis</i>	1 to 4	8	16
CRABGRASS				
Hairy	<i>Digitaria adscendens</i>	2 to 6**	8	16
Large	<i>Digitaria sanguinalis</i>	2 to 6**	8	16
Smooth	<i>Digitaria ischaemum</i>	2 to 6**	8	16
Southern	<i>Digitaria ciliaris</i>	2 to 6**	8	16
CROWFOOTGRASS	<i>Dactyloctenium aegyptium</i>	2 to 6**	8	16
FALL PANICUM	<i>Panicum dichotomiflorum</i>	2 to 8	8	16
FIELD SANDBUR	<i>Cenchrus incertus</i>	2 to 6	8	16
FOXTAIL				
Giant	<i>Setaria faberi</i>	2 to 12	8	16
Green	<i>Setaria viridis</i>	2 to 8	8	16
Yellow	<i>Setaria glauca</i>	2 to 8	8	16
FOXTAIL BARLEY	<i>Hordeum jubatum</i>	2 to 6	8	16
GOOSEGRASS	<i>Eleusine indica</i>	2 to 6**	8	16
ITCHGRASS	<i>Rottboellia exaltata</i>	2 to 6	8	16
JUNGLERICE	<i>Echinochloa colona</i>	2 to 6	8	16
LOVEGRASS (Stinkgrass)	<i>Eragrostis cilianensis</i>	2 to 6	8	16
RABBITSFOOTGRASS	<i>Polypogon monspeliensis</i>	1 to 4	8	16
RED RICE	<i>Oryza sativa</i>	1 to 3	8	16
RYEGRASS				
Hardy	<i>Lolium remotum</i>	2 to 6	8	16
Italian	<i>Lolium multiflorum</i>	2 to 6	8	16
SEEDLING JOHNSONGRASS	<i>Sorghum halepense</i>	4 to 10	8	16
SHATTERCANE	<i>Sorghum bicolor</i>	6 to 18	8	16
SOUTHWESTERN CUPGRASS	<i>Eriochloa gracilis</i>	2 to 6	8	16
SPRANGLETOP				
Amazon	<i>Leptochloa panicoides</i>	2 to 6	8	16
Bearded	<i>Leptochloa fascicularis</i>	2 to 6	8	16
Mexican	<i>Leptochloa uninervia</i>	2 to 6	8	16
Red	<i>Leptochloa filiformis</i>	2 to 6	8	16
TEXAS PANICUM	<i>Panicum texanum</i>	2 to 6	8	16
VOLUNTEER CEREALS				
Barley	<i>Hordeum vulgare</i>	2 to 6	8	16
Oats	<i>Avena sativa</i>	2 to 6	8	16
Rye	<i>Secale cereale</i>	2 to 6	8	16
Wheat	<i>Triticum aestivum</i>	2 to 6	8	16
VOLUNTEER CORN	<i>Zea mays</i>	4 to 12	6	8
VOLUNTEER CORN	<i>Zea mays</i>	12 to 24	8	16
VOLUNTEER GRAIN SORGHUM	<i>Sorghum bicolor</i>	8 to 12	8	16
WILD OATS	<i>Avena fatua</i>	2 to 6	8	16
WILD PROSO MILLET	<i>Panicum miliaceum</i>	2 to 10	8	16

34/35

WITCHGRASS	<i>Panicum capillare</i>	2 to 8	8	16
WOOLLY CUPGRASS	<i>Eriochloa villosa</i>	2 to 8	8	16

\*Generally occurs between 3-leaf stage and tillering.

\*\*Length of lateral growth.

(1) 8 fl. oz./A=approximately 0.2 fl. oz./1000 sq. ft.

(2) 16 fl. oz./A=approximately 0.4 fl. oz./1000 sq. ft.

Add a non-ionic surfactant containing at least 80% active ingredient at the rate of 1 pt. per 50 gals. (0.25% v/v).

**RECOMMENDATIONS FOR ANNUAL BLUEGRASS CONTROL WITH MANA ARROW 2 EC HERBICIDE IN ORNAMENTALS**

GRASS SPECIES	WEED STAGE	RATE FL. OZ. ACRE	HIGH RATE
ANNUAL BLUEGRASS ( <i>Poa annua</i> )	to 4-leaf	6	16

Apply under favorable soil moisture and humidity which exists within a few days after rainfall or within 7 days after irrigation. Grass needs to be actively growing at time of application(s).

Apply at weed stage indicated on the label, as reduced control can be expected with more mature annual bluegrass.

Use the high rate under heavy grass pressure and/or when annual bluegrass is more mature.

Add a non-ionic surfactant containing at least 80% active ingredient at the rate of 1 pt. per 50 gals. (0.25% v/v).

**RECOMMENDATIONS FOR PERENNIAL GRASSES**

- Apply only to actively growing grasses at recommended weed heights.
- Apply when the first grass weed species in a mixed grass weed population reaches the recommended growth stage for treatment.
- Use the high rate under heavy grass pressure and/or when grasses are at maximum height.

GRASS SPECIES	WEED HEIGHT INCHES	RATE FL. OZ./ACRE <sup>(1)</sup>	HIGH RATE <sup>(2)</sup>
<b>Bermudagrass (<i>Cynodon dactylon</i>)</b>			
First Application	3 (or up to 6" runners)	8	16
Repeat Application(s) (if regrowth occurs)	3 (or up to 6" runners)	8	16
<b>Quackgrass (<i>Agropyron repens</i>)</b>			
First Application	4 to 8	8	16
Repeat Application(s) (if regrowth occurs)	4 to 8	8	16
<b>Rhizome Johnsongrass (<i>Sorghum halepense</i>)</b>			
First Application	12 to 24	8	16
Repeat Application(s) (if regrowth occurs)	6 to 18	6	8
<b>Wirestem Muhly (<i>Muhlenbergia frondosa</i>)</b>			
First Application	4 to 8	8	16
Repeat Application(s) (if regrowth occurs)	4 to 8	8	16

(1) 8 fl. oz./A=approximately 0.2 fl. oz./1000 sq. ft.

(2) 16 fl. oz./A=approximately 0.4 fl. oz./1000 sq. ft.

Add non-ionic surfactant containing at least 80% active ingredient at the rate of 1 pt. per 50 gals. (0.25% v/v).

**STORAGE AND DISPOSAL**

Do not contaminate water, food, or feed by storage or disposal or cleaning of equipment. Open dumping is prohibited.

**STORAGE:** Keep pesticide in original container. Do not put concentrate or dilute into food or drink containers. Store in cool, dry place. Do not store diluted spray.

**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:** Triple rinse (or equivalent). Do not reuse container. Offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration, or if allowed by State and local authorities, by burning. If burned, stay out of smoke.

**FOR 24-HOUR EMERGENCY ASSISTANCE (SPILL, LEAK, OR FIRE), CALL INFOTRAC AT (800) 535-5053.**

**LIMITATION OF WARRANTY AND LIABILITY**

Read the entire Directions for Use, Conditions of Warranties and Limitations of Liability before using this product. If terms are not acceptable, return the unopened product container at once.

By using this product, user or buyer accepts the following Conditions, Disclaimer of Warranties and Limitations of Liability.

**CONDITIONS:** The directions for use of this product are believed to be adequate and must be followed carefully. However, it is impossible to eliminate all risks associated with the use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials, or the manner of use or application, all of which are beyond the control of Makhteshim Agan of North America, Inc. All such risks shall be assumed by the user or buyer.

**DISCLAIMER OF WARRANTIES:** To the extent consistent with applicable law, Makhteshim Agan of North America, Inc. makes no other warranties, express or implied, of merchantability or of fitness for a particular purpose or otherwise, that

extend beyond the statements made on this label. No agent of Makhteshim Agan of North America, Inc. is authorized to make any warranties beyond those contained herein or to modify the warranties contained herein. To the extent consistent with applicable law, Makhteshim Agan of North America, Inc. disclaims any liability whatsoever for special, incidental or consequential damages resulting from the use or handling of this product.

**LIMITATIONS OF LIABILITY:** To the extent consistent with applicable law, the exclusive remedy of the user or buyer for any and all losses, injuries or damages resulting from the use or handling of this product, whether in contract, warranty, tort, negligence, strict liability or otherwise, shall not exceed the purchase price paid or at Makhteshim Agan of North America, Inc.'s election, the replacement of product.

- BANVEL®-Reg. TM of BASF Corporation
- BASAGRAN®-Reg. TM of BASF AG.
- BAYTHROID®-Reg. TM Bayer Corporation
- BETAMIX®-Reg. TM of The Aventis Group
- BETANEX®-Reg. TM of The Aventis Group
- BLAZER®-Reg. TM of BASF Corporation
- BUCTRIL®-Reg. TM of Rhone-Poulenc
- CLASSIC®-Reg. TM of E.I. duPont de Nemours & Co. Inc.
- COBRA®-Reg. TM of Valent U.S.A. Corporation
- DANITOL®-Reg. TM of Sumitomo Chemical Co., Ltd.
- DUAL®, DUAL II® and DUAL MAGNUM® -Reg. TMs of Novartis Crop Protection, Inc.
- FIRSTRATE®-Reg. TM of Dow AgroSciences LLC
- FLEXSTAR®-Reg. TM of Zeneca Ag. Products
- FRONTROW™-TM of Dow AgroSciences LLC
- GALAXY®-Reg. TM of BASF AG
- IMI-CORN®-Reg. TM of American Canamid Co.
- LIBERTY LINK®-Reg. TM of The Aventis Group
- LORSBAN®-Reg. TM of Dow AgroSciences LLC
- ORTHENE®-Reg. TM of OMS Investments, Inc.
- POUNCE®-Reg. TM FMC Corporation
- PROWL®-Reg. TM of American Cyanamid Co.
- PURSUIT® and PURSUIT DG®-Reg. TMs of American Cyanamid Co.
- RAPTOR®-Reg. TM of American Cyanamid Co.
- REFLEX®-Reg. Tm of Zeneca Ag. Products
- RESOURCE®-Reg. TM of Valent U.S.A. Corporation
- ROUNDUP READY® and ROUNDUP ULTRA®-Reg. TMs of Monsanto Company
- SELECT®-Reg. TM of Valent U.S.A. Corporation
- SENCOR®-Reg. TM of Bayer Corporation
- STINGER®-Reg. TM of Dow AgroSciences LLC
- STORM®-Reg. TM of BASF Corporation
- SYNCHRONY® STS™-Reg. TM and TM of E.I. duPont de Nemours & Co. Inc.
- WARRIOR®- Reg. TM of Zeneca AG. Products