

GROUP

27

HERBICIDE

# Meso Star

**CONTROLS ANNUAL BROADLEAF WEEDS IN SOYBEAN, CORN (FIELD, SEED, YELLOW POP, SWEET),  
AND OTHER LISTED CROPS**

**ACTIVE INGREDIENT:**

Mesotrione: 2-[4-(methylsulfonyl)-2-nitrobenzoyl]-1,3-cyclohexanedione ..... 40.0%

**OTHER INGREDIENTS:** ..... 60.0%

Contains 4 lbs. Mesotrione per gallon.

**TOTAL: 100.0%**

**KEEP OUT OF REACH OF CHILDREN**

## CAUTION

See inside booklet for complete First Aid, Precautionary Statements, Directions For Use, and Limitation of Warranty and Liability.

**Manufactured For:**

**Sharda USA LLC** 

7217 Lancaster Pike, Suite A  
Hockessin, Delaware 19707

EPA Reg. No. 83529-51  
EPA Est. No. 39578-TX-001

**Net Contents: 1 Gallon**

## FIRST AID

### IF ON SKIN:

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

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

## HOT LINE NUMBER

For 24-Hour Medical Emergency Assistance (Human or Animal) call: **1-800-222-1222**. For Chemical Emergency Assistance (Spill, Leak, Fire, or Accident) call CHEMTREC: **1-800-424-9300**.

## PRECAUTIONARY STATEMENTS

### Hazards to Humans and Domestic Animals

### CAUTION

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

### Personal Protection Equipment (PPE)

#### Applicators and Other Handlers much wear:

- Long-sleeved shirt and long pants
- Shoes plus socks
- Chemical-resistant gloves (barrier laminate, butyl rubber  $\geq$  14 mils, nitrile rubber  $\geq$  14 mils, poly-ethylene, polyvinyl chloride (PVC)  $\geq$  14 mils, and viton  $\geq$  14 mils)

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

## USER SAFETY RECOMMENDATIONS

### Users should:

- Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Remove and wash contaminated clothing before reuse.
- 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.

### Engineering Control Statements

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

### Environmental Hazards

Do not apply directly to water or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment wash water or rinsate.

### Surface Water Advisory

This product may contaminate water through drift or spray in wind. This product has a high potential for runoff for several weeks after application. Poorly draining soils and soils with shallow water tables are more prone to produce runoff that contains this product. A level, well maintained vegetative buffer strip between areas to which this product is applied and surface water features such as ponds, streams, and springs will reduce the potential for contamination of water from runoff. Runoff of this product will be reduced by avoiding applications when rainfall is forecasted to occur within 48 hours. Sound erosion control practices will reduce this product's contribution to surface water contamination.

## Physical and Chemical Hazards

Do not use or store near heat or open flame. Do not use with or store near any oxidizing or reducing agents.

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

**Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours.**

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

- coveralls
- shoes plus socks
- chemical-resistant gloves (barrier laminate, butyl rubber  $\geq$  14 mils, nitrile rubber  $\geq$  14 mils, poly-ethylene, polyvinyl chloride (PVC)  $\geq$  14 mils, and viton  $\geq$  14 mils)

### PRODUCT INFORMATION

**Meso Star** is a systemic pre-emergence and post-emergence herbicide for selective contact and residual control of broadleaf weeds in labeled crops. In pre-emergence applications, weeds take up the product through the soil during weed emergence. Dry weather conditions reduce pre-emergent effectiveness of **Meso Star**. At least ¼-inch of rainfall must occur within 7-10 days of application; rotary hoeing activates **Meso Star**. In post-emergence applications, vulnerable weeds take up the product through treated foliage and stop growing soon after application. It can take up to two weeks for weeds to die. **Meso Star** is absorbed by soil and/or through foliage of emerged weeds.

**Meso Star** does not control most species of grass weeds. **Meso Star** can be tank-mixed with other herbicides registered to control grass weeds (see tank-mix information in this label for additional information). **Meso Star** can be used in combination with a burndown herbicide prior to planting to provide weed control in field corn, seed corn, yellow popcorn, and sweet corn.

### RESISTANCE MANAGEMENT FOR MESO STAR (GROUP 27 HERBICIDE)

The efficacy of **Meso Star** is not affected by the presence of biotype weed species that are resistant to Protoporphyrinogen Oxidase (PPO), 4-Hydroxyphenylpyruvate Dioxxygenase (HPPD) or Acetolactate Synthase (ALS) inhibiting herbicides or to Triazine or Glyphosate herbicides.

To reduce the risk of weeds developing resistance to mesotrione in corn, always use full specified label rates. When applying **Meso Star** post-emergence after a mesotrione-containing pre-emergence herbicide, add atrazine as a tank mix partner. Do not apply more than 0.24 lb. of mesotrione active ingredient per acre of corn per year (equivalent to 7.7 fl. oz. per acre per year of **Meso Star**). If additional herbicide is needed, use an herbicide product other than a HPPD inhibitor (Group 27 Herbicide). Use specified label rates of **Meso Star** to prevent selection for, or population shifts toward, marginally tolerant weed species and/or species biotypes.

### INTEGRATED WEED PEST MANAGEMENT

Integrate **Meso Star** into an overall weed pest management strategy whenever the use of an herbicide is required. Practices known to reduce weed development (tillage, crop competition) and herbicide use (weed scouting, proper application timing, banding) should be followed wherever possible. Consult local agricultural and weed authorities for additional IPM strategies established for your area.

## USE PRECAUTIONS - MESO STAR

Severe corn injury and/or yield loss can occur:

- From post-emergent application of **Meso Star** to corn treated with Counter® or Lorsban®.
- If foliar post-emergent applications of **Meso Star** are made to corn in a tank mix with any organophosphate or carbamate insecticide.
- If an organophosphate or carbamate insecticide is applied foliar post-emergence within 7 days before or 7 days after **Meso Star** application.
- When weeds are stressed due to drought, heat, lack of fertility, flooding, or prolonged cool temperatures, control can be reduced or delayed since the weeds are not actively growing. Weed escapes or regrowth may occur when application is made under prolonged stress conditions. Optimum weed control will be obtained if an application of **Meso Star** is made following label directions when weeds are actively growing.
- **Meso Star** may be applied with pyrethroid type insecticides (e.g., Lambda cyhalothrin).

## USE RESTRICTIONS - MESO STAR

- **DO NOT** apply this product to white popcorn or ornamental (Indian) corn.
- **DO NOT** cultivate corn within 7 days before or after application of this product as weed control may be reduced.
- **DO NOT** apply this product through any type of irrigation system unless specified under the specific crop section of the label.
- **DO NOT** apply this product with suspension fertilizers as the carrier.
- **DO NOT** apply this product post-emergence in a tank mix with emulsifiable concentrate grass herbicides, unless specifically directed under one of the tank mix sections of this label, or crop injury can occur.
- **DO NOT** make aerial applications of this product unless specified in the specific crop directions of this label.

## SPRAY DRIFT RESTRICTIONS

- Avoid drift to adjacent crops and non-target areas.
- For aerial applications use only nozzles that produce coarse to very coarse droplets. **DO NOT** use nozzles that produce fine to medium size droplets.
- **DO NOT** apply when weather conditions can cause drift to non-target areas to avoid injury to adjacent crops and vegetation.
- **DO NOT** apply when wind speed is greater than 10 mph or during a temperature inversion.
- Use of larger droplet sizes will help avoid spray drift.

## AVOIDING SPRAY DRIFT AT THE APPLICATION SITE IS THE RESPONSIBILITY OF THE APPLICATOR.

The interaction of many equipment and weather related factors determine the potential for spray drift. The applicator is responsible for considering all of these factors when making application decisions.

### Importance of Droplet Size

The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. APPLYING LARGER DROPLETS REDUCES DRIFT POTENTIAL, BUT MAY NOT PREVENT DRIFT IF APPLICATIONS ARE MADE IMPROPERLY OR UNDER UNFAVORABLE ENVIRONMENTAL CONDITIONS! See the Aerial Application section for specific instructions regarding droplet size.

### Controlling Droplet Size - General Techniques

- **Volume** - Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- **Pressure** - Use the lower spray pressures specified for the nozzle. Higher pressure reduces droplet size and does not improve canopy penetration. WHEN HIGHER FLOW RATES ARE NEEDED, USE A HIGHER-RATED NOZZLE INSTEAD OF INCREASING PRESSURE.
- **Number of Nozzles** - Use the minimum number of nozzles that provide uniform coverage.

### Sensitive Areas

Apply **Meso Star** when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g., when wind is blowing away from sensitive areas).

## SPRAY DRIFT PRECAUTIONS FOR AERIAL APPLICATION TO CORN & SUGARCANE ONLY

The distance of the outer-most nozzles on the boom must not exceed  $\frac{3}{4}$  the length of the wingspan or rotor.

Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees. Where states have more stringent regulations, they must be observed.

Spray must be released at the lowest height consistent with effective weed control and flight safety.

For best results with aerial application of this product, each type of airplane and helicopter must be quantifiably pattern tested initially and every year thereafter.

**RESTRICTION: FOR AERIAL APPLICATION USE ONLY NOZZLES PRODUCING COARSE TO VERY COARSE DROPLETS. DO NOT USE NOZZLES PRODUCING FINE OR MEDIUM SIZE DROPLETS.**

For some use patterns, reducing the effective boom length to less than  $\frac{3}{4}$  of the wingspan or rotor length may further reduce drift without reducing swath width.

Do not make applications at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase with increasing drift potential (higher wind, smaller drops, etc.).

Drift potential is lowest between wind speeds of 2-10 mph. However, many factors, including droplet size and equipment type determine drift potential at any given speed. Application should be avoided below 2 mph due to variable wind direction and high inversion potential.

**NOTE:** Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect drift.

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

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

Apply **Meso Star** when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat, for threatened or endangered species, non-target crops) is minimal (e.g., when wind is blowing away from the sensitive areas).

### **AERIAL APPLICATION INSTRUCTIONS FOR CORN AND SUGARCANE**

**Aerial application of Meso Star is permitted only on corn and sugarcane.** Make aerial applications with nozzles that produce coarse to very coarse droplets. **DO NOT** use nozzles producing fine to medium size droplets.

#### **CORN**

**Meso Star** is approved for aerial application for pre-emergence and post-emergence control in corn in the states of: **Alabama, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Nebraska, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Wyoming.**

#### **SUGARCANE**

**Meso Star** is approved for aerial application for pre-emergence and post-emergence control in sugarcane in the states of: **Florida, Louisiana, and Texas.** Make aerial applications in a minimum of 2 gallons water per acre.

## PRE-EMERGENCE GROUND APPLICATION INSTRUCTIONS

Apply **Meso Star** pre-emergence with a carrier volume of 10-60 gals./A.

Space spray nozzles of the same size and type uniformly to provide accurate and uniform coverage. Use medium to coarse droplet size nozzles to ensure coverage and avoid drift. Apply in a spray volume of 10-60 gals./A with water or liquid fertilizer (NOT suspension fertilizer) as the carrier. Use a pump that will maintain pump pressure of 35-40 psi at the nozzles and provide proper agitation within the tank to keep the product dispersed. Lower pressures can be used with extended range or drift reduction nozzles.

Maintain constant agitation until spraying is complete, even if stopping for brief periods of time. If agitation is stopped for longer than 5 minutes, re-suspend the spray solution by running on full agitation prior to spraying.

## POST-EMERGENCE GROUND APPLICATION INSTRUCTIONS

Space spray nozzles of the same size and type uniformly to provide accurate and uniform coverage. Use medium to coarse droplet size nozzles to ensure coverage and avoid drift. Complete weed coverage is essential for optimum weed control. Boom height for broadcast over-the-top applications must be based on the height of the crop, at least 15 inches above the crop canopy.

Apply in a spray volume of 10-30 gals./A with water as the carrier. Use a pump that will maintain pump pressure of 35-40 psi at the nozzles and provide proper agitation within the tank to keep the product dispersed. Lower pressures can be used with extended range or drift reduction nozzles. If weed foliage is dense, use a minimum of 20 gals.

Apply with flat fan nozzles 80°-100° for optimum post-emergent coverage. Do not use flood jet nozzles or controlled droplet application equipment for post-emergence applications.

Angle nozzles forward 45° to enhance product penetration and provide better coverage. In-line strainers and nozzle screens must be a minimum of 50-mesh or coarser.

Maintain constant agitation until spraying is complete, even if stopping for brief periods of time. If agitation is stopped for longer than 5 minutes, resuspend the spray solution by running on full agitation prior to spraying.

## USE DIRECTIONS WITH SPRAY ADDITIVES

### Post-Emergence Adjuvants

It is recommended that any adjuvant used with **Meso Star** meet the certification program requirements of the Chemical Producers and Distributors Association (CPDA). The following recommendations are mainly for use in corn. For other crops refer to the specific **Crop Use Directions**.

### Adjuvant Use in Post-Emergence Applications to Field and Seed Corn

After corn emerges, add 1.0 gal./100 gals. of water (1.0% v/v) Crop Oil Concentrate (COC) to the spray solution. 1 qt./100 gals. of water (0.25% v/v) of a non-ionic surfactant (NIS) can be used, but better weed control is achieved with the use of a COC compared to NIS.

**DO NOT** use methylated seed oil (MSO) or MSO adjuvant blends for post-emergence applications of **Meso Star** or severe crop injury can occur. **DO NOT** use MSO adjuvants unless it is specifically permitted in the **Tank Mixtures for Corn** section of this label, or if permitted by a state-specific supplemental label.

In addition to COC, add 2.5% (v/v) of a spray grade UAN (e.g., 28-0-0) to the spray solution, or 8.5 lbs./100 gallons of ammonium sulfate (AMS), except if precluded elsewhere on this label or a state-specific supplemental label.

### Adjuvant Use Post-Emergence to Sweet and Yellow Corn

**DO NOT** use UAN or AMS on sweet and yellow corn as severe crop injury can occur.

Use a NIS instead of a COC to reduce the likelihood of crop injury. COCs will maximize weed control under dry growing conditions, but will significantly injure crops under lush growing conditions. To optimize weed control, add atrazine wherever rotational or local atrazine restrictions allow.

### Pre-Emergence Adjuvant Use

Any adjuvant approved for use on agriculture is permitted when making **Meso Star** pre-plant or pre-emergence applications. MSO adjuvants perform better than COC and NIS adjuvants under pre-plant/pre-emergence conditions. UAN and AMS adjuvants will provide better weed control than not using any adjuvant. If **Meso Star** is being tank-mixed with another registered herbicide, refer to the tank mix partner label for adjuvant precautions and restrictions.

## SPRAY EQUIPMENT CLEANING

It is important to follow the procedures below for cleaning equipment before spraying a crop other than corn. Mix only as much spray solution as is needed.

- 1) Flush tank, hoses, boom, and nozzles with clean water.
- 2) Prepare cleaning solution of 1 gal. of household ammonia per 25 gals. of water. Commercial spray tank cleaners can be used in lieu of ammonia/water solution.
- 3) Using a pressure washer, clean the inside of the spray tank with the cleaning solution. Wash ALL parts of the tank, including the inside top surface. If a pressure washer is not available, fill the sprayer with the cleaning solution to ensure contact of the cleaning solution with all internal surfaces of the tank and plumbing. Start agitation in the spray and recirculate the cleaning solution for a minimum of 15 minutes. All visible deposits of spray solution must be removed from the spray tank before making any other applications.
- 4) Flush hoses, spray lines, and nozzles with cleaning solution for a minimum of 1 minute.
- 5) Dispose of rinsate from steps 1-3 in an appropriate manner.
- 6) Repeat steps 2-5.
- 7) Remove nozzles, screens, and strainers and clean separately in the ammonia solution after completing the previous steps.
- 8) Rinse the complete spray system with clean water.

## MIXING INSTRUCTIONS

See the **Crop Use Directions** sections of the label for specific tank mix instructions.

Always refer to labels of other pesticide products for mixing directions and precautions which may differ from those outlined here. Use in accordance with the most restrictive label limitations and precautions.

## MIXING RESTRICTIONS

- **DO NOT** exceed any dosage rates specified on labels.
- **DO NOT** mix this product with any product containing a label prohibition against such mixing.
- **DO NOT** tank mix **Meso Star** with any other insecticide, fungicide, fertilizer, or adjuvant not specified on this label without first testing compatibility, as poor mixing can occur. Test compatibility on a small scale (such as a jar test) before actual tank mixing.

## MIXING PROCEDURE

1. Use sprayers in good operating condition with good agitation. Ensure that the sprayer is cleaned according to the label instructions of the product label used prior to **Meso Star**. For post-emergence applications, use clean water only for the spray solution. Ensure that all in-line strainers and nozzle screens in the sprayer are 50-mesh or coarser. **DO NOT** use screens finer than 50-mesh.
2. Use liquid fertilizer (NOT suspension fertilizer) as the carrier for pre-emergence applications.
3. Start filling spray tank or pre-mix tank with clean water and begin agitation. Maintain constant agitation.
4. When sprayer or pre-mix is half full of water, add AMS, maintaining agitation until dispersed.
5. Add **Meso Star** slowly and agitate until completely dissolved. Wait at least 1 minute after the last of the **Meso Star** has been added to allow for complete dispersion. If using cold water, a longer agitation period may be required to ensure adequate dispersing.
6. If tank mixing, add the tank mix product.
7. Add the adjuvant and UAN, if needed, and continue to fill tank to desired level with water.

## MESO STAR WEED CONTROL TABLES

**Meso Star** applied as directed in this label will control or partially control the weeds listed in Tables 1 and 2.

Partial control means either erratic control (good to poor control) or control that is below what is generally regarded as acceptable control for commercial weed control.

For best post-emergence results, apply **Meso Star** to actively growing weeds.

Dry weather following pre-emergence applications may reduce efficacy of residual weed control. If irrigation is available, apply ½-1-inch water after pre-emergence application. If irrigation is not available, make a uniform shallow cultivation as soon as weeds emerge.

**Meso Star** applied alone or in a tank-mix with atrazine will not provide consistent or adequate control of weeds that are resistant to post-emergence HPPD inhibiting herbicides.

Refer to the crop sections of this label for specific use directions and application rates.

**Table 1. Weeds Controlled with Post-Emergence Applications of Meso Star**

Common Name	Scientific Name	Meso Star 3 Fl. Oz./A Applied Alone	Meso Star <sup>1</sup> 2.5-3.0 Fl. Oz./A + Atrazine
		Apply to Weeds <5" Tall <sup>2</sup>	
Amaranth, palmer	<i>Amaranthus palmeri</i>	PC <sup>+</sup>	C <sup>+</sup>
Amaranth, powell	<i>Amaranthus powellii</i>	C	C
Amaranth, spiny	<i>Amaranthus spinosus</i>	C	C
Atriplex	<i>Chenopodium orach</i>	C	C
Broadleaf signalgrass	<i>Urochloa platyphylla</i>	C <sup>+</sup>	C <sup>+</sup>
Buckwheat, wild	<i>Polygonum convolvulus</i>	PC	PC
Buffalobur	<i>Solanum rostratum</i>	C	C
Burcucumber	<i>Sicyos angulatus</i>	PC	C <sup>+</sup>
Carpetweed	<i>Mollugo verticillata</i>	C	C
Carrot, wild	<i>Daucus carota</i>	PC	C
Chickweed, common	<i>Stellaria media</i>	C	C
Cocklebur, common	<i>Xanthium strumarium</i>	C	C
Crabgrass, large	<i>Digitaria sanguinalis</i>	C <sup>+</sup>	C <sup>+</sup>
Dandelion	<i>Taraxacum officinale</i>	NC	PC
Dock, curly	<i>Rumex crispus</i>	PC	PC
Galinsoga	<i>Galinsoga parviflora</i>	C	C
Hemp	<i>Cannabis sativa</i>	C	C
Horsenettle	<i>Solanum carolinense</i>	PC	C
Jimsonweed	<i>Datura stramonium</i>	C	C
Horseweed (marestail)	<i>Conyza canadensis</i>	PC	C
Knotweed, prostrate	<i>Polygonum aviculare</i>	PC	PC
Kochia	<i>Kochia scoparia</i>	PC <sup>+</sup>	C <sup>+</sup>
Lambsquarters, common	<i>Chenopodium album</i>	C	C
Mallow, Venice	<i>Hibiscus trionum</i>	NC	C

<sup>1</sup>Meso Star tank mixture with atrazine is approved only for use on corn and sugarcane.

<sup>2</sup>Weeds can be controlled at larger than listed sizes; however, to protect crop yield, manage weed resistance, and provide effective control, treat weeds before they reach 5" tall.

<sup>+</sup>Apply before weeds exceed 3" tall.

C = Control    NC = Not Controlled    PC = Partial Control

(continued)



**Table 1. Weeds Controlled with Post-Emergence Applications of Meso Star (cont.)**

Common Name	Scientific Name	Meso Star 3 Fl. Oz./A Applied Alone	Meso Star <sup>1</sup> 2.5-3.0 Fl. Oz./A + Atrazine
		Apply to Weeds <5" Tall <sup>2</sup>	
Morningglory, entireleaf	<i>Ipomoea hederacea</i>	PC	C
Morningglory, ivyleaf	<i>Ipomoea hederacea</i>	PC	C
Morningglory, pitted	<i>Ipomoea lacunosa</i>	PC	C
Mustard, wild	<i>Brassica kaber</i>	C	C
Nightshade, black	<i>Solanum nigrum</i>	C	C
Nightshade, Eastern black	<i>Solanum ptychanthum</i>	C	C
Nightshade, hairy	<i>Solanum sarrachoides</i>	C	C
Nutsedge, yellow	<i>Cyperus esculentus</i>	PC	PC
Pigweed, redroot	<i>Amaranthus retroflexus</i>	C	C
Pigweed, smooth	<i>Amaranthus hybridus</i>	C	C
Pigweed, tumble	<i>Amaranthus albus</i>	C	C
Pokeweed, common	<i>Phytolacca americana</i>	PC	PC
Potatoes, volunteer	<i>Solanum</i> spp.	C	C
Pusley, Florida	<i>Richardia scabra</i>	C <sup>+</sup>	C <sup>+</sup>
Ragweed, common	<i>Ambrosia artemisiifolia</i>	PC	C
Ragweed, giant	<i>Ambrosia trifida</i>	C <sup>+</sup>	C
Sesbania, hemp	<i>Sesbania exaltata</i>	C	C
Sida, prickly (teaweed)	<i>Sida spinosa</i>	NC	C <sup>+</sup>
Smartweed, ladysthumb	<i>Polygonum persicaria</i>	C <sup>+</sup>	C
Smartweed, pale	<i>Polygonum lapathifolium</i>	C <sup>+</sup>	C
Smartweed, Pennsylvania	<i>Polygonum pensylvanicum</i>	C <sup>+</sup>	C
Sunflower, common	<i>Helianthus annuus</i>	C	C
Thistle, Canada	<i>Cirsium arvense</i>	NC	PC
Velvetleaf	<i>Abutilon theophrasti</i>	C	C
Waterhemp, common	<i>Amaranthus rudis</i>	C <sup>+</sup>	C
Waterhemp, tall	<i>Amaranthus tuberculatus</i>	C <sup>+</sup>	C

**Meso Star** tank mixture with atrazine is approved only for use on corn and sugarcane.

<sup>2</sup>Weeds can be controlled at larger than listed sizes; however, to protect crop yield, manage weed resistance, and provide effective control, treat weeds before they reach 5" tall.

<sup>1</sup>Apply before weeds exceed 3" tall.

C = Control    NC = Not Controlled    PC = Partial Control

**Table 2. Weeds Controlled with Pre-Emergence Applications of Meso Star**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Meso Star Applied Alone</b>	<b>Meso Star + Atrazine<sup>1</sup></b>
Amaranth, palmer	<i>Amaranthus palmeri</i>	C	C
Amaranth, powell	<i>Amaranthus powellii</i>	C	C
Amaranth, spiny	<i>Amaranthus spinosus</i>	C	C
Broadleaf signalgrass	<i>Urochloa platyphylla</i>	PC	PC
Buffalobur	<i>Solanum rostratum</i>	C	C
Carpetweed	<i>Mollugo verticillata</i>	C	C
Chickweed, common	<i>Stellaria media</i>	C	C
Cocklebur, common	<i>Xanthium strumarium</i>	PC	C
Crabgrass, large	<i>Digitaria sanguinalis</i>	PC	PC
Galinsoga	<i>Galinsoga parviflora</i>	C	C
Jimsonweed	<i>Datura stramonium</i>	C	C
Kochia	<i>Kochia scoparia</i>	PC	C
Lambsquarters, common	<i>Chenopodium album</i>	C	C
Morningglory, entireleaf	<i>Ipomoea hederacea</i>	PC	C
Morningglory, ivyleaf	<i>Ipomoea hederacea</i>	PC	C
Morningglory, pitted	<i>Ipomoea lacunosa</i>	PC	C
Nightshade, Eastern black	<i>Solanum ptychanthum</i>	C	C
Nightshade, hairy	<i>Solanum sarrachoides</i>	C	C
Pigweed, redroot	<i>Amaranthus retroflexus</i>	C	C
Pigweed, smooth	<i>Amaranthus hybridus</i>	C	C
Pigweed, tumble	<i>Amaranthus albus</i>	C	C
Ragweed, common	<i>Ambrosia artemisiifolia</i>	C	C
Ragweed, giant	<i>Ambrosia trifida</i>	PC	C
Smartweed, ladysthumb	<i>Polygonum persicaria</i>	C	C
Smartweed, pale	<i>Polygonum lapathifolium</i>	C	C
Smartweed, Pennsylvania	<i>Polygonum pensylvanicum</i>	C	C
Sunflower, common	<i>Helianthus annuus</i>	PC	C
Velvetleaf	<i>Abutilon theophrasti</i>	C	C
Waterhemp, common	<i>Amaranthus rudis</i>	C	C
Waterhemp, tall	<i>Amaranthus tuberculatus</i>	C	C

**Meso Star** tank mixture with atrazine is approved only for use on corn, grain sorghum and sugarcane. Refer to the crop sections on this label for specific use directions.

C = Control    PC = Partial Control

### ROTATIONAL CROP INTERVALS

If **Meso Star** is applied alone, follow the crop rotation intervals listed below in Table 3. If **Meso Star** is tank-mixed with other products, then follow the most restrictive product's crop rotation interval.

**Table 3. Time Interval between Meso Star Application and Replanting/Planting of Rotational Crop**

Replant/Rotational Interval	Crop
Anytime	Asparagus, Corn (all types), Cranberry, Flax, Kentucky bluegrass grown for seed, Pearl Millet, Oats, Rhubarb, Ryegrass (perennial and annual) grown for seed, Sorghum (grain and sweet), Sugarcane, Tall fescue grown for seed
4 Months	Small grain cereals (wheat, barley, rye)
10 Months	Alfalfa, Blueberry, Canola, Cotton, Currant, Lingonberry, Okra, Peanuts, Peas*, Potato, Rice, Snap Beans*, Soybeans, Sunflowers, Tobacco
18 Months	Cucurbits, Dry beans, Red Clover, Sugar Beets, All other crops

\*Plant these rotation crops ONLY if the criteria listed below have been met. If all criteria have NOT been met, plant peas and snap beans a minimum of 18 months following **Meso Star** application.

- A minimum of 20 inches of rainfall plus irrigation has occurred between application and planting of the rotational crop.
- Soil pH is greater than 6.0.
- 3 fl. oz./A or less of this product has been applied no later than June 30th the year preceding rotational crop planting.
- No other HPPD herbicides (e.g., Callisto®, Halex® GT, Lexar® EZ, Lumax® EZ, Zemax®, Armezon™, Balance® Flex, Capreno®, Corvus®, Impact®, or Laudis®) were applied the year prior to planting peas and snap beans.
- Do not plant peas or snap beans on sand, sandy loam, or loamy sand soils in Minnesota or Wisconsin.

### CROP USE DIRECTIONS – CORN

Apply **Meso Star** by ground for pre-emergence or post-emergence weed control in field corn, seed corn, yellow popcorn, and sweet corn. Apply **Meso Star** to corn up to 30" tall or up to the 8-leaf stage of corn growth to control broadleaf and grass weeds listed in Tables 1 and 2.

Aerial applications of **Meso Star** can be made pre-emergence or post-emergence in the following states: **Alabama, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Wyoming.**

See seed company instructions for use on field corn inbred lines. Special adjuvant restrictions must be followed for post-emergence applications of **Meso Star** in yellow popcorn or sweet corn (see the **Spray Additives** section of this label). Do not apply **Meso Star** to white popcorn or ornamental (Indian) corn.

Post-emergence application of **Meso Star** to yellow popcorn and sweet corn hybrids may cause crop bleaching. Bleach is transitory and will not affect final yield or quality. Herbicide sensitivity, however, can vary widely in yellow popcorn and sweet corn, and all hybrids of these have not been tested. Contact your local popcorn/sweet corn company, Fieldman, or University Specialist to learn about hybrid recommendations before making a post-emergence application of **Meso Star** to yellow popcorn or sweet corn. Do not include nitrogen based adjuvants (UAN or AMS) when making post-emergence applications of **Meso Star** to yellow popcorn or sweet corn.

Temporary transient bleaching may occur in field corn treated with **Meso Star** post-emergence under extreme weather conditions or when the crop is under stress. Field corn will quickly outgrow this condition and develop normally.

### Corn Restrictions:

- **Do not** apply more than 7.7 fl. oz. (0.24 lb. mesotrione AI) of **Meso Star** per year.
- **Do not** make more than 2 applications per year.
- **Do not** exceed 3.0 fl. oz. (0.094 lb. AI/A) in a single post-emergence application.
- **Do not** make a second application of **Meso Star** within 14 days of the first application.
- **Do not** feed or harvest forage, grain, or stover within 45 days after application.

### Meso Star Used Alone – Post-Emergence

Apply 3.0 fl. oz./A per application. Always add an appropriate adjuvant to the spray tank (see the **Spray Additives** section of this label).

Apply to actively growing weeds. See Table 1 for a complete list of weeds controlled. Susceptible weeds that emerge post-application may be controlled after the herbicide is absorbed into the soil. **Meso Star** will not control most grass weeds.

Two post-emergence applications of **Meso Star** may be made under the following restrictions:

- Only one post-emergence application may be made if **Meso Star** has been applied pre-emergence. Do not exceed a total of 7.7 fl. oz./A (0.24 lb. AI/A) per year.
- **Do not** make a second application within 14 days of the first application.
- Applications made at rates lower than 3.0 fl. oz./A. (0.094 lb. AI/A) post-emergence may not provide adequate weed control and may result in reduced residual control.
- **Do not** exceed a total of 6.0 fl. oz./A (0.19 lb. AI/A) for the two post-emergence applications.
- If a post-emergence application of **Meso Star** was made to ground that received pre-emergence treatment of another mesotrione-containing herbicide, atrazine must be tank mixed with **Meso Star**.
- If mixing **Meso Star** with atrazine, do not apply to corn taller than 12".
- Treat corn up to 30" tall or up to the 8-leaf stage of growth.
- **Do not** harvest, forage, or stover within 45 days post-application.

### Meso Star Used Alone – Pre-Emergence

Apply 6.0-7.7 fl. oz./A (0.188-0.24 lb. AI/A) by ground sprayer in 10-30 gals. of water per acre to control broadleaf weeds (up to 80 gals. if applied with liquid fertilizer). See Table 2 for a complete list of weeds controlled. **Meso Star** can be tank mixed with other approved pre-emergence grass herbicides to control grasses. Refer to the tank mix section for a list of tank-mix partners.

### Meso Star Tank Mixtures for Corn

Apply **Meso Star** in tank mix with other registered herbicides to improve spectrum of weed control in burndown, pre-emergence, or post-emergence applications. These tank mixtures can also be used to include a different mode of action herbicide to control and manage the development of resistant weed biotypes.

### Burndown Tank Mixtures in Corn

Apply **Meso Star** in tank mixture with other registered herbicides for burndown and residual weed control.

Apply 3.0 fl. oz./A **Meso Star** with Sharda Paraquat Concentrate, Shypho 41% SL, and/or DiCash DGA-4, for improved broadleaf weed control with limited residual control before planting corn and before corn emergence. For better residual control, apply 6.0-7.7 fl. oz./A **Meso Star** (see Table 2) with the products listed. Use the adjuvant system specified by the burndown herbicide. Refer to individual product labels for precautionary statements, restrictions, rates, approved uses, and a list of weeds controlled.

### Pre-Emergence Tank Mixture in Corn

Apply 5.3-7.7 fl. oz./A of **Meso Star** in tank mixture with other registered herbicides (Table 4) for pre-emergence residual weed control. Refer to Table 2 for a list of weeds controlled by **Meso Star** applied pre-emergence.

**Table 4. Meso Star Tank Mixtures for Pre-Emergence Application in Corn**

Refer to the individual product labels of the products listed for precautionary statements, restrictions, use rates, approved uses, and a list of weeds controlled.

AAtrex	Degree Xtra®	Harness Xtra® 5.6L
Bicep Lite II Magnum®	Dual II Magnum®	Keystone®
Bicep II Magnum®	Expert®	Keystone® LA
Cinch®	Fulltime®	Outlook®
Cinch® ATZ	Guardsman Max®	Prowl®
Cinch® ATZ Lite	Harness®	Surpass® EC
Degree®	Harness Xtra®	TopNotch®

**Post-Emergence Tank Mixtures in Corn**

See Table 5 below for a list of tank mixtures that can be applied after corn has emerged. Do not apply less than 3.0 fl. oz./A of **Meso Star** unless specified on this label or on a state-specific supplemental label, as a loss of residual control can occur.

Always add an appropriate adjuvant to the spray tank (See the **Spray Additives** section of this label). Refer to the individual product labels for precautionary statements, restrictions, rates, approved uses, and a list of weeds controlled. Not all of the tank mix pesticides listed are registered for use on field corn, yellow popcorn, or sweet corn.

**Table 5. Meso Star Tank Mixtures for Post-Emergence Application to Corn**

Refer to the individual product labels for products listed for precautionary statements, restrictions, use rates, approved uses, and a list of weeds controlled.

<b>Tank Mix Partner</b>	<b>Use Directions</b>
AAtrex® 4L AAtrex® Nine-O®	See Table 1 for application rates and list of weeds controlled.
Accent® Q	This mixture will provide additional grass control. Refer to the product label for a list of weeds controlled.
Basagran®	This mixture will provide additional broadleaf weed control. Refer to the product label for a list of weeds controlled.
Basis® Basis Gold®	This mixture will provide additional weed control. Refer to the product label for a list of weeds controlled.
Bicep II Magnum Bicep Lite II Magnum	Do not use nitrogen based adjuvants (UAN or AMS); apply as post-directed spray. Do not use crop oil concentrate (COC); use a non-ionic surfactant (NIS) to avoid crop injury. Control of emerged weeds can be reduced due to the adjuvant effect on weed coverage.
Buctril® Moxy®	This mixture will provide additional broadleaf weed control. Add 2 lbs./gal. Buctril or Moxy at up to 6 fl. oz./A. Add 4 lbs./gal. Buctril at up to 3 fl. oz./A.
Expert	Use only on glyphosate tolerant corn (e.g., Agrisure® GT, Roundup Ready®). Crop death will occur if this mixture is applied to a corn hybrid that is not glyphosate tolerant. Do not add urea ammonium nitrate (UAN) or methylated seed oil (MSO) adjuvants to this mixture or crop injury can occur.
Willowood Glufosinate 280SL Ignite® 280 SL	Use only on corn designated as LibertyLink® or warranted as tolerant to glufosinate. Use of this mixture on corn hybrids not tolerant to glufosinate will result in severe crop injury or death. Do not use crop oil concentrate (COC) as an adjuvant or crop injury can occur.
Lightning®	Use only on corn designated at Clearfield® corn or warranted by BASF as tolerant to Lightning®. Use of this mixture on corn hybrids not tolerant to Lightning will result in severe crop injury or death. Do not use Methylated Seed Oil (MSO) or any MSO blend with this mixture or severe crop injury can occur.
<i>(continued)</i>	

**Table 5. Meso Star Tank Mixtures for Post-Emergence Application to Corn (continued)**

<b>Tank Mix Partner</b>	<b>Use Directions</b>
Northstar®	This mixture will control additional weeds. See product label for list of weeds controlled.
Peak®	This mixture will control additional weeds. See product label for list of weeds controlled.
Spirit®	This mixture will control additional weeds. See product label for list of weeds controlled.
Steadfast® Steadfast® ATZ Steadfast® Q	This mixture will control additional weeds. See product label for list of weeds controlled.
Stout®	This mixture will control additional weeds. See product label for list of weeds controlled.
Touchdown® Roundup® Solo Glyphosate Products	Use only on glyphosate tolerant corn (e.g., Agrisure GT, Roundup Ready). Use of this mixture on corn hybrids that are not glyphosate tolerant will result in crop death. Add spray-grade ammonium sulfate (AMS) at a rate that delivers 8.5-17.0 lbs. of AMS/100 gals. of water. If the glyphosate product calls for an adjuvant in addition to AMS, add 0.25-0.5% v/v (1-2 quarts/100 gallons) of a non-ionic surfactant (NIS). Do not add urea ammonium nitrate (UAN), crop oil concentrate (COC) or methylated seed oil (MSO) adjuvants to this tank mixture or crop injury can occur.

### **CROP USE DIRECTIONS – ASPARAGUS**

**Meso Star** can be applied broadcast or banded at a rate of 3.0-7.7 fl. oz./A to asparagus as a spring application prior to spear emergence, as a post-harvest application (after final harvest), or both.

Use the 3.0 fl. oz./A rate for post-emergence control or partial control of the emerged weeds listed in Table 1. Use the 6.0-7.7 fl. oz./A rate for pre-emergence control or partial control of the weeds listed in Table 2. For banded applications, the application must be made to account for band width, i.e., to deliver 3.0-7.7 fl. oz. per treated acre. For the best pre-emergence weed control with spring applications, **Meso Star** must be applied after fern mowing, disking or other tillage operation but prior to asparagus spear emergence.

When making post-harvest applications, the rate applied pre-emergence in the spring must be taken into account so as not to exceed the 7.7 fl. oz./A per year rate limit. Post-harvest applications must be made in a way that minimizes contact with any standing asparagus spears or ferns and maximizes contact with the weeds and/or soil, e.g., by using a directed or semi-directed type application, or crop injury may occur. With post-harvest applications, the use of an adjuvant will increase the risk of crop injury.

If weeds are emerged at the time of the **Meso Star** application, the addition of a crop oil concentrate (COC) type adjuvant at the rate of 1% v/v or a non-ionic surfactant (NIS) at the rate of 0.25% v/v is recommended. In addition to COC or NIS, a spray grade UAN (e.g., 28-0-0) at the rate of 2.5% v/v **or** ammonium sulfate (AMS) at the rate of 8.5 lbs./100 gallons of spray solution may be added for improved burndown of emerged weeds. If weeds have not yet emerged, no adjuvant is recommended.

#### **Asparagus Restrictions:**

- **Do not** apply more than 7.7 fl. oz./A of **Meso Star** per year.
- **Do not** make more than two **Meso Star** applications per year.

### **CROP USE DIRECTIONS - BLUEGRASS, RYEGRASS (ANNUAL AND PERENNIAL), AND TALL FESCUE GROWN FOR SEED**

**Meso Star** can be applied to bluegrass, annual ryegrass, perennial ryegrass, or tall fescue which is grown for seed. **Meso Star** can be applied as a pre-emergence application to bare soil (new seeding) or as a post-emergence application to an emerged grass crop.

#### **Pre-Emergence Applications**

Apply **Meso Star** as a broadcast, surface spray at a rate of 6.0 fl. oz./A to a newly seeded crop. The **Meso Star** application must be made prior to crop and weed emergence. Rainfall or irrigation as the newly seeded grass crop emerges from the soil may increase the risk of injury from **Meso Star**. Grass crop

injury symptoms include temporary bleaching of newly emerged leaves, or in extreme conditions, stunting. For a list of pre-emergence weeds controlled or partially controlled, see Table 2. In addition to the weeds listed in Table 2, **Meso Star** applied pre-emergence will control mannagrass.

### Post-Emergence Application

Apply **Meso Star** as a broadcast post-emergence spray at a rate of 3.0-6.0 fl. oz./A to emerged bluegrass, perennial ryegrass or tall fescue grown for seed. Use the 3.0 fl. oz./A rate for post-emergence control or partial control of the weeds listed in Table 1. In addition to the weeds listed in Table 2, **Meso Star** applied post-emergence will control mannagrass (up to 3 tillers).

Use the 6.0 fl. oz./A rate for post-emergence weed control plus extended residual weed control (see Table 2). The addition of a crop oil concentrate type adjuvant at 1% v/v or a non-ionic surfactant (NIS) type adjuvant at a rate of 0.25% v/v is recommended. Post-emergence applications of **Meso Star** may result in temporary bleaching of the grass crop.

In addition to COC or NIS, a spray grade UAN (e.g., 28-0-0) at the rate of 2.5% v/v or ammonium sulfate (AMS) at the rate of 8.5 lbs./100 gallons of spray solution may also be added for improved control of emerged weeds. The addition of UAN or AMS will improve consistency of post-emergence weed control but will also increase the risk of grass crop injury, especially at **Meso Star** rates greater than 3.0 fl. oz./A. If grass crop injury is a concern, do not add UAN or AMS to the spray solution.

Tank mixing other pesticides with **Meso Star** post-emergence may increase the risk of crop injury. Avoid adding pesticides with emulsifiable concentrate (EC) type formulations to **Meso Star** for applications made post-emergence to the crop.

### Restrictions:

- **Do not** harvest the grass crop for seed or straw within 60 days following the application of **Meso Star**.
- **Do not** graze or feed forage from treated areas within 14 days following harvest of seed or straw and at least 74 days after application of **Meso Star**.
- **Do not** make more than two applications of **Meso Star** per year.
- **Do not** apply more than 6 fl. oz./A in a single application and not more than 9 fl. oz./A of **Meso Star** per year.
- Applications of **Meso Star** to grasses grown for seed species not listed on this label may result in severe injury.

### CROP USE DIRECTIONS – BUSH AND CANEBERRIES (CROP GROUP 13-07A AND 13-07B)

**Note:** Not all cultivars and types of berries that are included within the Environmental Protection Agency's definition of bush and caneberreries (Crop Subgroups 13-07A and 13-07B) have been tested and shown to have adequate crop safety to mesotrione. Those that have been tested, and are believed to be reasonably fit, are listed below along with use directions for that crop. If **Meso Star** is used on bush or caneberreries not listed below, severe crop injury may occur.

**Meso Star** may be applied as a pre-bloom post-directed spray in high bush blueberry, lingonberry, red currant, black currant, black raspberry, red raspberry, and blackberry. For a list of weeds controlled see Tables 1 and 2. **Meso Star** may be applied in bush or caneberreries at a rate up to 6 fl. oz./A. If a split application weed control program is desired, 3 fl. oz./A followed by 3 fl. oz./A may be used, but no more than two applications per crop per year are allowed and not more than 6 fl. oz./A in total per year. If two applications are made, they must be made no closer than 14 days apart. The use of a crop oil concentrate (COC) type adjuvant at the rate of 1% v/v is recommended, but avoid using COC adjuvants that are injurious to bush or caneberry leaves. Do not apply **Meso Star** to bush or caneberreries after the onset of the bloom stage or illegal residues may occur.

In low bush blueberries, **Meso Star** may only be applied in the non-bearing year. This application may be a broadcast application. Up to 6 fl. oz./A of **Meso Star** may be applied in a single application, or 3 fl. oz./A followed by 3 fl. oz./A if used in a split application program. No more than two applications per year are allowed and not more than 6 fl. oz./A in total per year. If two applications are made, they must be made no closer than 14 days apart. The use of a crop oil concentrate (COC) type adjuvant at 1% v/v is recommended. Applications of **Meso Star** during dry weather conditions and/or temperatures above 85° can cause injury to low bush blueberries. Applications of **Meso Star** can cause yellowing or necrosis of leaves and under severe conditions, leaf drop may occur especially on "Sourtop" variety blueberries.

### Bush & Caneberry Restrictions:

- **Do not** make more than two applications of **Meso Star** per year.
- **Do not** apply more than 6.0 fl. oz./A per year.

## CROP USE DIRECTIONS – CRANBERRY

Apply **Meso Star** to bearing or non-bearing cranberry beds to control or suppress the weeds listed in Tables 1 and 2, and:

- bog St. John's wort (*Hypericum boreale*)
- rushes (*Juncus canadensis*, *J. effuses*, *J. bufonulus*, *J. tenuis*)
- sedges spp. (*Carex* spp.)
- silverleaf (*Potentilla pacifica*)
- yellow loosestrife (*Lysimachia terrestris*)

### Bearing/Non-Bearing Application Rates:

- Apply up to 8 fl. oz./A, but do not apply more than 16 fl. oz./A in total per year.
- Make no more than two 8 fl. oz./A applications per crop per year.
- If two applications are made, do not make them closer than 14 days apart. Use 1% v/v of a crop oil concentrate (COC) or 0.25% v/v non-ionic surfactant (NIS).
- **Do not** use COC adjuvants that are known to injure cranberry leaves.
- **Non-bearing Cranberries:** Apply after the bud break stage no less than 45 days before flooding in fall or winter.
- **Bearing Cranberries:** Apply after the bud break stage no less than 45 days before flooding or harvest.

**Meso Star** can be applied through irrigation systems (chemigation) including center pivot or solid set.

### Cranberry Restrictions:

- **Do not** make more than two applications of **Meso Star** per year.
- **Do not** apply more than 16.0 fl. oz./A per year.

### Sprinkler Irrigation Application – Cranberries Only

Check the irrigation system to ensure uniform application of water to all areas. Thorough coverage of foliage is required for optimal control. Maintain good agitation in the pesticide supply tank prior to and during the entire application process. Inject the specified rate of **Meso Star** into the irrigation system with a metering device designed to introduce a constant flow and that will distribute the product to target areas in 0.1-0.2 acre-inch of water. Use the least amount of water with this rate range required for proper distribution and coverage.

After application is complete, flush the entire irrigation and injection systems with clean water before stopping the system. If application is being made during a normal irrigation set of a stationary sprinkler, the specified rate of **Meso Star** for the area covered should be injected into the system only during the end of the irrigation set for sufficient time to provide optimal coverage and distribution.

### CHEMIGATION USE PRECAUTIONS – SPRINKLER IRRIGATION APPLICATION

Apply this product through center pivot or solid set sprinkler irrigation systems only. **Do not apply this product through any other type of irrigation system.**

Non-uniform distribution of treated water can cause crop injury, product ineffectiveness, and/or illegal pesticide residues in the crop. Contact State Extension Service Specialists, equipment manufacturers or other experts if you have questions about calibrating equipment.

Do not connect an irrigation system or greenhouse system used for pesticide application to any public water system. A public water system is any system used for 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. A person knowledgeable of the chemigation system and responsible for its operation or under the supervision of the responsible personal shall shut the system down and make necessary adjustments should the need arise.

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 back-flow. The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.

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. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.



The irrigation line or water pump must include a functional pressure switch which will stop the water pump motor when pressure decreases to the point where pesticide distribution is adversely affected. Systems must also 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 are capable of being fitted with a system interlock.

Any alternatives to the above required safety devices must conform to the list of EPA approved alternative devices.

### CHEMIGATION USE RESTRICTIONS – SPRINKLER IRRIGATION APPLICATION

- **Do not** apply this product through any other type of irrigation system.
- **Do not** apply when wind speed favors drift beyond the area intended for treatment or non-uniform distribution of treated water.
- **Do not** apply directly to water or areas where surface water is present outside the bog system.
- **Do not** contaminate water when disposing of equipment washwater or rinsate.
- **Do not** apply within 10 feet of surface water outside the bog system.
- **Do not** spray to runoff.

### CROP USE DIRECTIONS – FLAX

**Meso Star** may be applied pre-emergence in flax, i.e., after planting but before crop emergence, at a rate up to 6 fl. oz./A. For a list of weeds controlled see Tables 1 and 2. Do not apply more than one application, and not more than 6 fl. oz./A, per crop or per year in flax. If weeds are emerged at the time of application, the use of a crop oil concentrate (COC) type adjuvant at the rate of 1% v/v is recommended. In addition, a spray grade UAN (e.g., 28-0-0) at the rate of 2.5% (v/v) or AMS at the rate of 8.5 lbs./100 gals. of spray solution may be added to improve the burndown of existing weeds. Applications of **Meso Star** to emerged flax can result in severe crop injury.

#### Flax Restrictions:

- **Do not** make more than one application of **Meso Star** per year.
- **Do not** apply **Meso Star** more than 6.0 fl. oz./A per year.

### CROP USE DIRECTIONS – OATS

**Meso Star** can be applied pre-emergence or post-emergence (but not both) for weed control in oats.

For pre-emergence control or partial control of the weeds listed in Table 2, apply **Meso Star** broadcast at a rate of 6.0 fl. oz./A prior to oat emergence. For best pre-emergence weed control, the **Meso Star** application must be made prior to weed emergence.

For post-emergence (after oat emergence) control or partial control of the weeds listed in Table 1, apply **Meso Star** at a rate of 3.0 fl. oz./A. For best results, **Meso Star** must be applied to emerged weeds that are less than 5" tall. Post-emergence applications of **Meso Star** may result in temporary injury of the oat crop. Injury symptoms may include leaf bleaching, leaf burn and in extreme conditions, stunting.

If emerged weeds are present at the time of the **Meso Star** application, the addition of a crop oil concentrate (COC) type adjuvant at a rate of 1% v/v or a non-ionic surfactant (NIS) type adjuvant at a rate of 0.25% v/v is recommended. In addition to COC or NIS, a spray grade UAN (e.g., 28-0-0) at the rate of 2.5% v/v or ammonium sulfate (AMS) at the rate of 8.5 lbs./100 gallons of spray solution may be added for improved weed control. If emerged weeds are not present at the time of the **Meso Star** application, no additives are recommended. If oat injury is a concern, eliminating the use of UAN or AMS will reduce the risk for post-emergence crop injury. Additionally, the use of NIS instead of COC will also reduce the oat injury risk. However, weed control is also reduced if UAN or AMS is eliminated and when switching from COC to NIS.

Tank mixing other pesticides with **Meso Star** post-emergence may increase the risk of injury. Avoid adding pesticides with emulsifiable concentrate (EC) type formulations to **Meso Star** for applications made post-emergence to the crop.

#### Oat Restrictions:

- **Do not** graze or feed forage from treated areas within 30 days following an application of **Meso Star**.
- **Do not** harvest oats within 50 days following the application of **Meso Star**.
- **Do not** make more than one application of **Meso Star** per year.
- **Do not** apply **Meso Star** pre-emergence (prior to oat emergence) at more than 6.0 fl. oz./A per year.
- **Do not** apply **Meso Star** post-emergence at more than 3.0 fl. oz./A per year.

- If the oat crop treated with **Meso Star** is lost or destroyed, oats may be replanted immediately. If **Meso Star** was applied to the lost oat crop, no additional **Meso Star** can be applied to the replanted oat crop.

### **CROP USE DIRECTIONS – OKRA**

**Meso Star** can be applied as a row-middle or a hooded post-direct treatment (but not both) for weed control in okra.

#### **Pre-Emergence Row-Middle Applications**

Apply **Meso Star** at a rate of 6.0 fl. oz./A as a banded application to the row middles prior to weed emergence. For this banded application, leave one foot of untreated area over the okra row or 6" to each side of the planted row. For banded applications, the application must be made to account for band width, i.e., to deliver 6.0 fl. oz. per treated acre. Do not apply **Meso Star** directly over the planted okra row or severe crop injury may occur. Injury risk is greatest on coarse textured soils (sand, sandy loam or loamy sand).

#### **Post-Emergence Hooded Applications**

Apply **Meso Star** at a rate of 3.0 fl. oz./A as a post-emergence directed application using a hooded sprayer for control or partial control of the weeds listed in Table 1. Okra must be at least 3" tall at the time of this application. It is recommended that a non-ionic surfactant (NIS) type adjuvant at a rate of 0.25% v/v be added to the spray solution. For post-emergence hooded applications, the spray equipment must be set up to minimize the amount of **Meso Star** that contacts the okra foliage or crop injury will occur. For best post-emergence results, **Meso Star** must be applied to actively growing weeds.

#### **Okra Restrictions:**

- **Do not** harvest okra within 28 days following the application of **Meso Star**.
- **Do not** make more than one application of **Meso Star** per okra crop.
- **Do not** apply **Meso Star** as a row-middle application at more than 6.0 fl. oz. per treated acre per year.
- **Do not** apply **Meso Star** as a post-directed application at more than 3.0 fl. oz. per acre per year.
- **Do not** apply **Meso Star** as a broadcast pre-emergence or broadcast post-emergence application to okra or severe injury will occur.
- If the okra crop treated with **Meso Star** is lost or destroyed, okra can be replanted only in the soil band that was not treated with **Meso Star**.

### **CROP USE DIRECTIONS - PEARL MILLET**

**Meso Star** may be applied pre-emergence in pearl millet, i.e., after planting but before crop emergence, at a rate up to 6 fl. oz./A. For a list of weeds controlled, see Table 2. Do not apply more than one application, and not more than 6 fl. oz./A per crop or per year in pearl millet. If weeds are emerged at the time of application, the use of a crop oil concentrate (COC) type adjuvant at the rate of 1% v/v is recommended. In addition, a spray grade UAN (e.g., 28-0-0) at the rate of 2.5% (v/v) or AMS at the rate of 8.5 lbs./100 gals. of spray solution may be added to improve the burndown of existing weeds. Applications of **Meso Star** to emerged pearl millet can result in severe crop injury.

#### **Pearl Millet Restrictions:**

- **Do not** make more than one application of **Meso Star** per year.
- **Do not** apply more than 6.0 fl. oz./A per year.

### **CROP USE DIRECTIONS – RHUBARB**

**Meso Star** can be applied prior to crop emergence for weed control in established rhubarb.

Apply **Meso Star** at a rate of 6.0 fl. oz./A to dormant (prior to any spring green-up) rhubarb for control or partial control of the weeds listed in Table 2. If weeds are emerged at the time of application, it is recommended that a crop oil concentrate (COC) type adjuvant at 1% v/v or a non-ionic surfactant (NIS) type adjuvant at a rate of 0.25% v/v be added to the spray solution. Applications of **Meso Star** to rhubarb that is not dormant may result in a temporary bleaching symptomatology. Rainfall or irrigation after the **Meso Star** application may increase the risk of injury to emerging rhubarb.

#### **Rhubarb Restrictions:**

- **Do not** harvest rhubarb within 21 days following the application of **Meso Star**.
- **Do not** make more than one application of **Meso Star** per year.
- **Do not** apply more than 6.0 fl. oz./A per year.

## CROP USE DIRECTIONS – SORGHUM (GRAIN AND SWEET)

### Pre-Emergence Application Directions

Make pre-emergence application of **Meso Star** or pre-plant non-incorporated applications up to 21 days before planting sorghum for control or partial control of the weeds listed in Table 2.

Apply 6.0-6.4 fl. oz./A broadcast non-incorporated application prior to sorghum emergence. Making the application less than 7 days before planting will increase the risk of plant injury, especially if rainfall or irrigation occurs after the application. Injury symptoms include temporary bleaching of newly emerged leaves. Making application of this product 8-21 days prior to planting will decrease risk of crop injury.

If **Meso Star** is applied prior to planting, minimize disturbance of soil treated with herbicide during the planting process in order to reduce the potential for weed emergence.

If emerged weeds are present at the time of pre-emergence application, use 0.25% v/v of a non-ionic surfactant (NIS) adjuvant or 1% v/v of crop oil concentrate (COC) and add it to the spray solution. A spray-grade UAN applied at a rate of 2.5% v/v or 8.5 lbs./100 gallons of spray solution of ammonium sulfate (AMS) can be added to the spray solution in addition to the COC or NIS.

### Pre-Emergence Application Restrictions:

- **Do not** apply more than 6.4 fl. oz./A per year.
- **Do not** apply to emerged sorghum or severe crop injury can occur.
- **Do not** use **Meso Star** in the production of forage sorghum, sudangrass, sorghum-sudangrass hybrids, or dual purpose sorghum.
- **Do not** apply to sorghum that is grown on coarse textured soils (e.g., sandy loam, loamy sand, sand).
- **Texas Restriction:** Do not apply to sorghum grown south of Interstate 20 (I-20) or east of Highway 277.

### Post-Emergence Application Directions

Apply **Meso Star** post-directed to grain sorghum to control and/or partially control weeds listed in Table 1. Apply to actively growing weeds for optimal control.

Apply 3.0 fl. oz./A post-directed application when sorghum is at least 8" tall. Make the application by directing the spray between crop rows, and toward the base of the plant. Direct application of **Meso Star** onto foliage can result in crop injury including temporary bleaching. If leaves do bleach, newly emerged leaves following application will not be affected.

Use 0.25% v/v of a non-ionic surfactant (NIS) adjuvant or 1% v/v of crop oil concentrate (COC) and add it to the spray solution. A spray-grade UAN applied at a rate of 2.5% v/v or 8.5 lbs./100 gallons of spray solution of ammonium sulfate (AMS) can be added to the spray solution in addition to the COC or NIS.

**Meso Star** can be tank-mixed with herbicides registered for use on sorghum to improve weed control. These tank-mixtures can also include a herbicide with a different mode of action to help control or manage the development of resistant weed biotypes.

### Post-Directed Restrictions:

- **Do not** make more than one post-directed application.
- **Do not** apply more than 3.0 fl. oz./A post-directed.
- **Do not** apply more than 6.4 fl. oz./A per year.
- **Do not** apply broadcast over-the-top to emerged sorghum or severe crop injury can occur.
- **Do not** harvest sorghum for forage for 30 days following application.
- **Do not** harvest for grain or stover for 60 days following application.
- **Do not** apply after the sorghum seedhead emerges.
- **Do not** use in the production of forage sorghum, sudangrass, or sorghum-sudangrass hybrids.

## CROP USE DIRECTIONS – SOYBEAN

**Meso Star** can be applied pre-emergence to soybeans that are identified as mesotrione tolerant. Applications to soybeans that are not mesotrione tolerant will result in significant crop injury.

## Pre-Emergence Applications

For pre-emergence control of the weeds listed in Table 2, apply **Meso Star** prior to soybean emergence at a rate of 6.0 fl. oz./A. Apply the higher rate for longer residual control. **Meso Star** may be tank mixed with other registered soybean herbicides such as Dual Magnum®, Dual II Magnum, and Prefix®. Refer to the tank mix partner label and follow all precautions and restrictions.

If weeds are emerged at the time of application, add either a non-ionic surfactant (NIS) at 1 qt./100 gallons (0.25% v/v) or a crop oil concentrate (COC) at 1 gallon/100 gallons (1% v/v). In addition to NIS or COC, it is also recommended to add either ammonium sulfate (AMS) at 8.5-17 lbs./100 gallons (or equivalent).

## Soybean Restrictions:

- Apply no more than 6.0 fl. oz./A per soybean crop per year.
- **Do not** apply to emerged soybeans.
- **Do not** graze or feed soybean forage or hay to livestock.

## CROP USE DIRECTIONS – SUGARCANE

Apply **Meso Star** by ground for pre-emergence, post-emergence over-the-top or post-emergence direct weed control in sugarcane.

Apply **Meso Star** aerially for pre-emergence and post-emergence weed control in the states of: **Florida, Louisiana, and Texas.**

## Pre-Emergence Applications

Apply 6.0-7.7 fl. oz./A of **Meso Star** to control weeds listed in Table 2. Make application after the planting of plant-cane or after harvest of ratooncane. If weeds are emerged at the time of application, add a crop oil concentrate (COC) type adjuvant at 1% v/v OR a non-ionic surfactant (NIS) type adjuvant at 0.25% v/v to the spray solution. In addition to the COC or NIS, a spray grade UAN at a rate of 2.5% v/v OR ammonium sulfate (AMS) at a rate of 8.5 lbs./100 gals. of spray solution can be added to the spray solution. Tank mix AAtrex® or Evik® with **Meso Star** to improve weed control. Refer to the tank mix partner label for specific rates and use directions.

## Post-Emergence Applications

Apply 3.0 fl. oz./A of **Meso Star** to control weeds listed in Table 1. Apply as a post-over-the-top or as a post-directed spray to the base of the sugarcane. If a pre-emergence application was made earlier in the season, only one single post-emergence application can be made. If no pre-emergence application was made earlier in the season, then both a post-over-the-top and a post-directed spray application can be made. For optimum weed control, apply to actively growing weeds.

Add either a crop oil concentrate (COC) adjuvant at 1% v/v OR a non-ionic surfactant (NIS) adjuvant to the spray solution. In addition to the COC or NIS, use a spray grade UAN (e.g., 28-0-0) at 2.5% v/v OR ammonium sulfate (AMS) at 8.5 lbs./100 gals. of spray solution to improve weed control.

For additional post-emergence weed control, tank mix **Meso Star** with atrazine, Asulox® and/or Evoke®. Refer to the tank mix product label for specific rate and use directions.

## Sugarcane Restrictions:

- **Do not** apply more than 7.7 fl. oz./A in a pre-emergence application.
- **Do not** apply more than 3.0 fl. oz./A in a post-emergence application.
- **Do not** make more than 2 applications per year. If a pre-emergence application is made, only one post-emergence application can be made.
- **Do not** make two applications less than 14 days apart.
- **Do not** apply more than 10.7 fl. oz./A per year.
- **Do not** harvest sugarcane within 114 days following a post-over-the-top treatment (114-day PHI).
- **Do not** harvest sugarcane with 100 days following a post-directed application (100-day PHI).

## STORAGE AND DISPOSAL

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

**Pesticide Storage:** Keep container tightly closed when not in use. Keep away from heat and flame. Do not store near seed, fertilizers, or foodstuffs. Can be stored at temperatures as low as minus 20°F. Keep away from heat and flame.

**Pesticide Disposal:** Waste resulting from the use of this product may be disposed of on site or at an approved waste disposal facility. Open dumping is prohibited.

**Container Handling ≤ 5 Gallons:** Non-refillable container. Do not reuse or refill this container. Offer for recycling if available. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into formulation equipment. Fill the container ¼ full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into formulation equipment or store rinsate for later use or disposal. Repeat this procedure two more times. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

**Container Handling ≥ 5 Gallons:** Refillable container. Refill this container with pesticide only. Do not use this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the person refilling. To clean container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

**Container Handling [Greater Than 5 Gallons]:** Non-refillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container ¼ full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures approved by state and local authorities.

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