



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, DC 20460

OFFICE OF CHEMICAL SAFETY  
AND POLLUTION PREVENTION

August 23, 2019

Wendy A. McCombie  
U.S. Agent for Finchimica S.P.A.  
Lewis & Harrison LLC  
2461 S. Clark Street, Suite 710  
Arlington, VA 22202

Subject: Registration Review Label Mitigation for Pendimethalin  
Product Name: IPIMETHALIN-L  
EPA Registration Number: 53591-7  
Application Date: October 17, 2018  
Decision Number: 553775

Dear Wendy A. McCombie:

The Agency, in accordance with the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), as amended, has completed reviewing all of the information submitted with your application to support the Registration Review of the above referenced product in connection with the Pendimethalin Interim Decision, and has concluded that your submission is acceptable. The label referred to above, submitted in connection with registration under FIFRA, as amended, is acceptable.

Should you wish to add/retain a reference to the company's website on your label, then please be aware that the website becomes labeling under the Federal Insecticide Fungicide and Rodenticide Act and is subject to review by the Agency. If the website is false or misleading, the product would be misbranded and unlawful to sell or distribute under FIFRA section 12(a)(1)(E). 40 CFR 156.10(a)(5) list examples of statements EPA may consider false or misleading. In addition, regardless of whether a website is referenced on your product's label, claims made on the website may not substantially differ from those claims approved through the registration process. Therefore, should the Agency find or if it is brought to our attention that a website contains false or misleading statements or claims substantially differing from the EPA approved registration, the website will be referred to the EPA's Office of Enforcement and Compliance.

A copy of your label stamped "Accepted" is enclosed. Products shipped after 12 months from the date of this amendment must bear the new revised label. Your release for shipment of the product bearing the amended label constitutes acceptance of these conditions. If these conditions are not complied with, the registration will be subject to cancellation in accordance with FIFRA section 6.

If you have any questions about this letter, please contact Darius Stanton by phone at 703-347-0433, or via email at [Stanton.darius@epa.gov](mailto:Stanton.darius@epa.gov).

Sincerely,

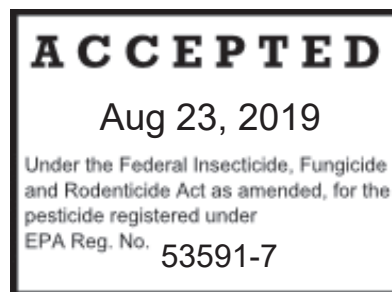
A handwritten signature in blue ink, appearing to read 'Linda Arrington', with a long horizontal flourish extending to the right.

Linda Arrington, Branch Chief  
Risk Management and Implementation Branch 4  
Pesticide Re-Evaluation Division  
Office of Pesticide Programs

Enclosure

# IPIMETHALIN-L

## Herbicide



For use in selected crops

Active Ingredient:

pendimethalin: N-(1-ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzenamine..... 37.4%

Inert Ingredients<sup>‡</sup>..... 62.6%

Total 100.0%

<sup>‡</sup>contains aromatic naphtha

Contains 3.3 lb of pendimethalin per gallon.

### KEEP OUT OF REACH OF CHILDREN

## CAUTION PRECAUCION

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.)

### PRECAUTIONARY STATEMENTS

#### Hazards to Humans and Domestic Animals

Caution. Causes moderate eye irritation. Harmful if swallowed or absorbed through the skin. Avoid contact with skin, eyes 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

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.

#### Engineering Controls

When handlers use closed systems, enclosed cabs, or aircraft 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.

#### 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.

## FIRST AID

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-992-5994 for emergency medical treatment information.

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

**If swallowed:** Call a poison control center or doctor immediately for treatment advice. Do not give any liquid to the person. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person.

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

**Note to physician:** Because of increased risk of chemical pneumonia or pulmonary edema caused by aspiration of the hydrocarbon solvent, vomiting should be induced only under professional supervision.

## ENVIRONMENTAL HAZARDS

This product is toxic to fish. Do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Drift and runoff from treated areas may be hazardous to aquatic organisms in adjacent aquatic sites. Do not contaminate water when disposing of equipment washwaters or rinsate.

NON-TARGET ORGANISM ADVISORY STATEMENT: This product is toxic to plants and may adversely impact the forage and habitat of non-target organisms, including pollinators, in areas adjacent to the treated site. Protect the forage and habitat of non-target organisms by following label directions intended to minimize spray drift.

### Agricultural Use Requirements

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

**Refer to label booklet for Directions for Use, including Storage and Disposal.**

Notice: Read the entire label. Use only according to label directions. Before using this product, read Terms and Conditions of Use and Limitations of Liability and Damages at end of label booklet. If terms are unacceptable, return at once unopened.

In case of emergency endangering health or the environment involving this product, call 1-800-992-5994.

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

EPA Reg. No. 53591-7 EPA Est. No. \_\_\_

Manufactured by:  
Finchimica S.p.A.  
Via Lazio, 13  
25025 Manerbio (BS)  
Italy

Net Contents \_\_\_\_\_ gal

(Label Booklet)

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Herbicide

For use in selected crops

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

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

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- Long-sleeved shirt and long pants
- Chemical-resistant gloves, such as barrier laminate or viton  $\geq 14$  mils
- Shoes plus socks

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.

### Engineering Controls

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**NON-TARGET ORGANISM ADVISORY STATEMENT:** This product is toxic to plants and may adversely impact the forage and habitat of non-target organisms, including pollinators, in areas adjacent to the treated site. Protect the forage and habitat of non-target organisms by following label directions intended to minimize spray drift.

## DIRECTIONS FOR USE

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

Read all Directions for Use carefully before applying.

Observe all cautions and limitations in this label and the labels of products used in combination with Ipimethalin-L herbicide. The use of Ipimethalin-L not consistent with this label can result in injury to crops, animals, or persons. Keep containers closed to avoid spills and contamination.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide protection.

### 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.

**Exception:** If the product is soil injected or soil incorporated, the Worker Protection Standard, under certain circumstances, allows workers to enter the treated area if there will be no contact with anything that has been treated.

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, long sleeves and long pants
- 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.

**Entry Restrictions for Non-WPS Uses:** For applications to turfgrasses (except sod farms), ornamentals (except nurseries), landscape and grounds maintenance, non-cropland areas and total vegetation control, do not enter or allow others to enter the treated area until sprays have dried.

## STORAGE AND DISPOSAL

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

**Pesticide Storage:** Do not store below 40°F. Extended storage at temperatures below 40°F can result in the formation of crystals on the bottom of the container. If crystallization does occur, store the container on its side at room temperature (70°F) and rock occasionally until crystals re-dissolve.

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

### Container Handling

[*Non-refillable Bags:*] Nonrefillable container. Do not reuse or refill this container. Completely empty bag into application equipment, then dispose of empty bag in a sanitary landfill or by incineration, or by

other procedures approved by state and local authorities, Offer for recycling or reconditioning, if available.

[*Non-refillable Drums with Liners:*] Nonrefillable container. Do not reuse or refill this container. Completely empty liner by shaking and tapping sides and bottom to loosed clinging particles. Empty residue into processing equipment. Then dispose of liner in a sanitary landfill or by incineration if allowed by state and local authorities. Offer the drum for recycling, if available.

[*Non-refillable Plastic Containers or Drums:*] Nonrefillable container. Do not reuse or refill this container. Triple rinse or pressure rinse container (or equivalent) promptly after emptying and offer for recycling (or reconditioning) if available. If recycling or reconditioning is not available, 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.

## USE IN AGRICULTURAL CROPS

### GENERAL INFORMATION

Ipimethalin-L herbicide provides control of most annual grasses and certain broadleaf weeds as they germinate. Ipimethalin-L does not control established weeds. Before applying Ipimethalin-L, destroy all existing weeds (except as recommended in specific postemergence combination treatments). Certain weather conditions such as unusually cold, excessively wet, or extremely hot or dry conditions that can delay germination or extend germination over a long period of time may also reduce weed control.

Ipimethalin-L is labeled for use on cotton, dry bulb onions, dry bulb shallots, edible beans, field corn, forage legumes, garlic, grain sorghum, nonbearing fruit, nut crops and vineyards, peanuts, peas, potatoes, rice, soybeans, sugarcane, sunflowers, sweet corn, sweet lupines, and tobacco.

Ipimethalin-L should be used in accordance with the directions in this booklet and in supplemental labels (for those registered uses that are not included in this booklet) which are available from Finchimica or at point of purchase. Read all directions carefully before using.

Observe all cautions and limitations in this label and the labels of products used in combination with Ipimethalin-L. The use of Ipimethalin-L not consistent with this label can result in injury to crops, animals, or persons. Keep containers closed to avoid spills and contamination.

Read all label precautions, directions for use, and general information sections before referring to specific crop use.

Uses with Other Products (Tank Mixes): Ipimethalin-L may be applied in a tank mix with other registered herbicides labeled for use in the target crop. When tank mixing this product with other herbicides, all applicable directions, restrictions, and precautions for the additional herbicides must be followed. Use the most restrictive limitations stated on the product labels. Before initiating full tank mix application, the physical compatibility of the proposed mixture should be evaluated on a small scale of recommended spray mixture concentrations. Also, such mixtures should be evaluated for vegetation control before expanding commercial use.

### General Use Precautions

When applied according to label directions and under normal growing conditions, Ipimethalin-L or Ipimethalin-L tank-mix combinations will not cause crop injury. Over-application, however, may cause crop stand loss, crop injury, or soil residues.

Uneven application or improper soil incorporation can reduce weed control or cause crop injury. Soil

incorporation deeper than the recommended levels can reduce weed control.

An increased possibility of crop damage and weakened seedlings and plants from Ipimethalin-L can result from seedling diseases, cold weather, excessive moisture, shallow or deep planting, low or high soil pH, high soil salt concentration, or drought. Under these conditions, crop yields can be reduced.

Using Ipimethalin-L herbicide in accordance with label directions should produce normal growth of rotational crops in most situations. However, various environmental and agronomic factors make it impossible to eliminate all risks associated with the use of this product and, therefore, rotational crop injury is always a possibility.

Naturally occurring biotypes<sup>†</sup> of some of the weeds listed on this label may not be effectively controlled by this and/or other products with the mitotic inhibiting mode of action. Other herbicides with the mitotic inhibiting mode of action include other dinitroaniline herbicides such as Treflan<sup>™</sup> herbicide, trifluralin and Sonalan herbicide. If naturally occurring mitotic inhibiting resistant biotypes are present in a field, Ipimethalin-L should be tank-mixed or applied sequentially with an appropriate registered herbicide that has a different mode of action to ensure control.

† A weed biotype is a naturally occurring plant within a given species that has a slightly different, but distinct, genetic makeup from other plants.

See your Finchimica representative for additional information.

## Mixing Directions

1. Fill tank one-half to three-quarters full with clean water or liquid fertilizer. Agitate. Before mixing Ipimethalin-L or Ipimethalin-L tank mixtures with liquid fertilizer, refer to appropriate label sections (see table of contents for page number) for recommended uses in liquid fertilizer, application directions, and compatibility determinations.
2. **Ipimethalin-L Alone:** When using Ipimethalin-L alone, add Ipimethalin-L to the partially filled tank while agitating. Then, fill the rest of the tank with water or liquid fertilizer.
3. **Ipimethalin-L Tank Mixtures:** Add the tank mixture ingredients in the order listed below before adding Ipimethalin-L (for tank mixtures with 2,4-DB, paraquat dichloride or glyphosate, refer to mixing directions at the end of this section):
  - (a) **Wettable powder formulations:** Make a slurry of the wettable powder in water (1 part WP + 2 parts water). While agitating, add the slurry slowly to the partially filled tank. If tank mixing more than one wettable powder formulation, while agitating, add the first one. Continue agitation and add second wettable powder only after completely mixing of the first wettable powder.
  - (b) **Dry flowable/water dispersible granule formulations:** While agitating, add the granules to the partially filled tank. Make a slurry of the granules in water before adding to liquid fertilizer.
  - (c) **Flowable formulations:** While agitating, add the flowable to the partially filled tank.
  - (d) **Water soluble concentrate formulations:** While agitating, add the water soluble concentrate to the partially filled tank.
  - (e) **Emulsifiable concentrate formulations:** While agitating, add the emulsifiable concentrate to the partially filled tank.

After mixing completely, add Ipimethalin-L to the tank.

- (f) **Note (for tank mixes that contain 2,4-DB, paraquat dichloride or glyphosate):** After completely mixing Ipimethalin-L, continue filling the sprayer with water and add 2,4-DB or paraquat dichloride or glyphosate to the tank near the end of the filling process.

If paraquat dichloride is included in the tank mixture, add 8 fl oz of Ortho X-77 spreader or similar nonionic surfactant per 100 gallons of total spray mixture as the last ingredient in the

tank.

While agitating, fill the remainder of the tank with water or liquid fertilizer.

4. Continuous agitation must be maintained while adding herbicides and until spraying is completed. If the spray mixture is permitted to settle for any period of time, thorough agitation is necessary to resuspend the mixture before spraying is resumed. Continue agitation while spraying.

## General Application Directions

**With Ground Equipment:** Uniformly apply recommended Ipimethalin-L or Ipimethalin-L tank mixture treatments in 10 gallons or more of water or 20 gallons or more of liquid fertilizer per acre. Use higher gallonage for fields that have heavy weed infestations or excessive crop residues. Refer to Applications with Liquid Fertilizers section (see table of contents for page number) for liquid fertilizer recommended uses, application directions and compatibility determinations. Refer to Applications with Dry Bulk Fertilizers section (see table of contents for page number) for Ipimethalin-L /dry bulk fertilizer applications.

**With Aircraft:** Apply in 5 gallons or more of water per acre. Refer to Spraying Directions section (see table of contents for page number) for instructions.

### Rates

Follow all recommendations in the crop-specific use directions of this label regarding rates per acre of Ipimethalin-L and herbicides used in combination with Ipimethalin-L. Unless otherwise indicated in the crop-specific use directions, when a rate range is recommended, use the high rate of the range if heavy weed populations are expected or if extensive crop residues were present before seedbed preparation.

### Soil Textures

The rate tables for the recommended crop-specific Ipimethalin-L treatments refer to coarse, medium, and fine soils. Soil type should be determined because the use rates for Ipimethalin-L treatments vary with soil texture. The following table lists soil types for coarse, medium and fine soils:

Coarse	Medium	Fine
sands loamy sands sandy loams	sandy clay loams <sup>†</sup> sandy clays loams silt loams silts	silty clay loams <sup>†</sup> silty clays clay loams clays

<sup>†</sup>Sometimes considered transitional soils and may be classified as either medium or fine textured soils.

Ipimethalin-L is not recommended for use on peat or muck soils unless otherwise specified.

## Chemigation

Ipimethalin-L may be applied through sprinkler irrigation systems in cotton, field corn, garlic, dry bulb shallots, and direct-seeded and transplanted dry bulb onions, grain sorghum, nonbearing fruit and nut crops, nonbearing vineyards, peanuts, potatoes, soybeans and sunflowers. Follow all label recommendations for these crops regarding application rates per acre, timing of application, special directions, and precautions.

Apply this product only through a sprinkler system, including center pivot, lateral move, end tow, side (wheel) roll, traveler, big gun, solid set, or hand move irrigation systems. Do not apply this product

through any other type of irrigation system.

Crop injury, lack of effectiveness, or illegal pesticide residues in the crop can result from nonuniform distribution of treated water.

The system must be properly calibrated (with water only) to ensure that the amount of Ipimethalin-L applied corresponds to the recommended use rate.

Apply Ipimethalin-L in 1/2 to 3/4 inches of water during the first sprinkler set. When application is complete, flush the system with water.

If you have any questions about calibration, you should contact State Extension Service specialists, equipment manufacturers, or other experts.

### **Special Precautions for Chemigation**

1. Do not connect an irrigation system (including greenhouse systems) used for pesticide application to a public water system unless the pesticide label-prescribed safety devices for public water systems are in place.
2. A person knowledgeable of the chemigation system and responsible for its operation, or under the supervision of the responsible person, shall shut the system down and make necessary adjustments should the need arise.
3. The system must be free of leaks and clogged nozzles.
4. The pesticide must be supplied continuously for the duration of the aqueous application. Uneven application of the pesticide may cause crop injury or poor weed control.
5. Agitation must be maintained in the nurse tank.
6. The sprinkler-chemigation 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, or in cases where there is no water pump, when the water pressure decreases to the point where pesticide distribution is adversely affected.
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.

### **Chemigation Systems Connected to Public Water Systems**

1. 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.
2. Chemigation systems connected to public water systems must contain a functional, reduced-pressure zone, backflow preventer (RPZ) or the functional equivalent in the water supply line upstream from the point of pesticide introduction. As an option to the RPZ, the water from the public water system should be discharged into a reservoir tank prior to pesticide introduction. There shall be a complete physical break (air gap) between the outlet end of the fill pipe and the top or overflow rim of the reservoir tank of at least twice the inside diameter of the fill pipe.

3. All chemigation systems connected to public water systems must also follow restrictions listed in the preceding section titled Chemigation.

## Weeds Controlled

Ipimethalin-L treatments control the following grasses and broadleaf weeds in all registered crops at the rates recommended for each soil texture in the respective crop-specific use directions:

Grass Weeds Controlled	Broadleaf Weeds Controlled
barnyardgrass	bugloss, small carpetweed
crabgrass	Florida pusley
crowfootgrass	kochia
field sandbur	lambsquarters, common
foxtail (giant)	lambsquarters, slimleaf
foxtail (green) <sup>1</sup>	pigweed ( <i>Amaranthus</i> spp.)
foxtail (yellow)	purslane
goosegrass	smartweed, Pennsylvania <sup>2</sup>
Johnsongrass, seedling	spurge, annual
panicum, fall	velvetleaf <sup>2</sup>
panicum, Texas (buffalograss)	
signalgrass <sup>3</sup>	
witchgrass	

1 Ipimethalin-L will not control DNA resistant biotypes of green foxtail (*Setaria viridis*).

2 Reduced competition only.

3 Signalgrass: In cotton and soybeans, effective management is achieved by using a program that involves application of Ipimethalin-L as a preplant incorporated treatment followed by a labeled postemergence grass product. For effective control, signalgrass populations should be managed in all crop rotations.

In addition to controlling the weeds listed above, Ipimethalin-L (when applied as directed) will control the weeds in the crops in accordance with the following table:

Grass Weeds Controlled	Crop
bluegrass; annual	nonbearing fruit and nuts and vineyards
guineagrass	sugarcane
itchgrass (Raoulgrass)	soybeans <sup>1</sup> sugarcane <sup>2</sup> (not Hawaii)
Johnsongrass, rhizome	cotton <sup>1</sup> soybeans <sup>1</sup>
junglerice	nonbearing fruit and nuts and vineyards rice sugarcane
lovegrass	nonbearing fruit and nuts and vineyards
panicum, browntop	nonbearing fruit and nuts and vineyards sugarcane
red rice	soybeans <sup>1</sup>
shattercane	field corn <sup>3</sup> grain sorghum <sup>3</sup> soybeans <sup>1</sup>
sprangletop ( <i>Leptochloa</i> spp.)	nonbearing fruit and nuts and vineyards rice
swollen fingergrass	sugarcane
volunteer sorghum	cotton <sup>6</sup> (not California and Arizona)

wild proso millet	field <sup>4</sup> and sweet corn grain sorghum <sup>3</sup> peas
woolly cupgrass	field <sup>3</sup> and sweet corn nonbearing fruit and nuts and vineyards soybeans <sup>1</sup>
<b>Broadleaf Weeds Controlled</b>	<b>Crop</b>
carpetweed	nonbearing fruit and nuts and vineyards sunflowers, no-till
chickweed, common	nonbearing fruit and nuts and vineyards
fiddleneck	nonbearing fruit and nuts and vineyards
henbit	nonbearing fruit and nuts and vineyards
knotweed, prostrate	nonbearing fruit and nuts and vineyards
London rocket	nonbearing fruit and nuts and vineyards
puncturevine	nonbearing fruit and nuts and vineyards
shepherd's purse	nonbearing fruit and nuts and vineyards
smartweed, Pennsylvania	field and sweet corn nonbearing fruit and nuts and vineyards
stinging nettle	potatoes
velvetleaf	field and sweet corn nonbearing fruit and nuts and vineyards

- 1 **Cotton/Soybeans (Rhizome Johnsongrass):** Control or reduced competition (refer to appropriate section for use directions (see table of contents for page number).
- 2 **Sugarcane (Not Hawaii) (Itchgrass):** Ipimethalin-L must be applied at the 7.2 pint per acre broadcast rates for itchgrass control. Surface application (no mechanical incorporation) will provide partial itchgrass control. An additional application of 4.8 to 7.2 pint per acre may be made at layby.
- 3 **Field Corn/Grain Sorghum (Shattercane):** Control with postemergence incorporated applications only. Refer to appropriate section for use directions (see table of contents for page number).
- 4 **Field Corn (Wild Prose Millet):** Ipimethalin-L controls wild prose millet when applied as a postemergence incorporated application. Ipimethalin-L reduces the competition of wild proso millet when applied preemergence. Effective management of wild prose millet can be achieved with a program that involves herbicide applications and mechanical cultivation to eliminate weed escapes. Ipimethalin-L plus nicosulfuron applied as an early postemergence (no later than when corn is in the 4- leaf stage) treatment have provided the most consistent suppression of wild proso millet because of the following: (1) early postemergence treatments provide a burn-down of the initial germination flush of wild prose millet; and, (2) early postemergence treatments provide residual activity later during the growing season.
- 5 **Field Corn (Woolly Cupgrass):** Effective management of woolly cupgrass can be achieved with a program that involves herbicide applications and mechanical cultivation to eliminate weed escapes. Ipimethalin-L plus nicosulfuron applied as an early postemergence (no later than when corn is in the 4- leaf stage) treatment have provided the most consistent control of woolly cupgrass because of the following: (1) early postemergence treatments provide a burn-down of the initial germination flush of woolly cupgrass; and, (2) early postemergence treatments provide residual activity later during the growing season.
- 6 **Cotton (Volunteer Sorghum):** Use the high rate for each soil texture. Apply broadcast to flat land and mechanically incorporate (two passes at an angle to one another) prior to bedding up.

## Spraying Directions

### Ground Applications

Use sprayers with appropriate nozzles that provide uniform spray distribution and minimize drift. Keep the bypass line on or near the bottom of the tank to minimize foaming. Nozzle and in-line screens must



be no finer than 50 mesh. **Do not** apply Ipimethalin-L during periods of gusty winds. As with all herbicides, windy conditions can cause uneven applications. Do not apply over the top of trees with leaves or buds or fruit.

**Broadcast Treatment:** Uniformly apply in 10 gallons or more of water or 20 gallons or more of liquid fertilizer as specified in the appropriate sections of this booklet.

**Band Treatment:** Uniformly apply the broadcast equivalent rate and volume per acre. To determine these, use the following calculations:

$$\frac{\text{Band width (in inches)}}{\text{Row width (in inches)}} \times \text{Broadcast RATE per acre} = \text{Band RATE per acre}$$

$$\frac{\text{Band width (in inches)}}{\text{Row width (in inches)}} \times \text{Broadcast VOLUME per acre} = \text{Band VOLUME per acre}$$

### Aerial Applications

Uniformly apply in 5 gallons or more of water per acre. Use caution to minimize drift. **Do not** apply during periods of gusty winds or when wind conditions favor drift. Spray drift can cause injury to sensitive crops. Use a flagman or an automatic mechanical flagging unit on the aircraft to avoid overlap and possible crop injury.

### Spray Drift Management

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

The following drift management requirements must be followed to avoid off -target drift movement from ground applications to agricultural field crops. These requirements do not apply to forestry applications, public health uses or to applications using dry formulations.

#### Ground Boom Applications:

- Applicators must only apply with the nozzle height recommended by the manufacturer, but no more than 3 feet above the ground or crop canopy.
- Applicators are required to use a medium or coarser droplet size (ASABE S572.1).
- Do not apply when wind speeds exceed 15 miles per hour at the application site.
- Do not apply during temperature inversions.”

#### Boom-less Ground Applications:

- Applicators are required to use a Medium or coarser droplet size (ASABE S572.1) for all applications.
- Do not apply when wind speeds exceed 15 miles per hour at the application site.
- Do not apply during temperature inversions.
- Setting nozzles at the lowest effective height will help to reduce the potential for spray drift.

#### Aerial Applications:

The following drift management requirements must be followed to avoid off -target drift movement from aerial applications to agricultural field crops. These requirements do not apply to forestry applications, public health uses or to applications using dry formulations.

- Do not release spray at a height greater than 10 ft above the crop canopy, unless a greater application height is necessary for pilot safety.
- Applicators are required to use a medium or coarser droplet size (ASABE S572.1).
- Do not apply when wind speeds exceed 15 mph at the application site. If the wind speed is greater

than 10 mph, the boom length must not exceed 65% of the wingspan for fixed wing aircraft or 75% of the rotor diameter for helicopters. Otherwise, the boom length must not exceed 75% of the wingspan for fixed wing aircraft or 90% of the rotor diameter for helicopters.

- Applicators must use 1/2 swath displacement upwind at the downwind edge of the field.
- Nozzles must be oriented so the spray is directed toward the back of the aircraft.
- Do not apply during temperature inversions.

Where states have more stringent regulations, they should be observed.

The applicator should be familiar with and take into account the information covered in the Spray Drift Advisories section.

## Spray Drift Advisories

THE APPLICATOR IS RESPONSIBLE FOR AVOIDING OFF-SITE SPRAY DRIFT. BE AWARE OF NEARBY NON-TARGET SITES AND ENVIRONMENTAL CONDITIONS.

**Importance Of Droplet Size:** An effective way to reduce spray drift is to apply large droplets. Use the largest droplets that provide target pest control. While applying larger droplets will reduce spray drift, the potential for drift will be greater if applications are made improperly or under unfavorable environmental conditions.

### Controlling Droplet Size – Ground Boom:

- Volume - Increasing the spray volume so that larger droplets are produced will reduce spray drift. Use the highest practical spray volume for the application. If a greater spray volume is needed, consider using a nozzle with a higher flow rate.
- Pressure - Use the lowest spray pressure recommended for the nozzle to produce the target spray volume and droplet size.
- Spray Nozzle - Use a spray nozzle that is designed for the intended application. Consider using nozzles designed to reduce drift.

### Controlling Droplet Size – Aircraft:

- Adjust Nozzles - Follow nozzle manufacturers recommendations for setting up nozzles. Generally, to reduce fine droplets, nozzles should be oriented parallel with the airflow in flight.

**Boom Height – Ground Boom:** For ground equipment, the boom should remain level with the crop and have minimal bounce.

**Release Height – Aircraft:** Higher release heights increase the potential for spray drift.

**Boom-less Ground Applications:** Setting nozzles at the lowest effective height will help to reduce the potential for spray drift.

**Shielded Sprayers:** Shielding the boom or individual nozzles can reduce spray drift. Consider using shielded sprayers. Verify that the shields are not interfering with the uniform deposition of the spray on the target area.

**Temperature And Humidity:** When making applications in hot and dry conditions, use larger droplets to reduce effects of evaporation.

**Temperature Inversions:** Drift potential is high during a temperature inversion. Temperature inversions are characterized by increasing temperature with altitude and are common on nights with limited cloud cover and light to no wind. The presence of an inversion can be indicated by ground fog or by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing. Avoid applications during temperature inversions.

**Wind:** Drift potential generally increases with wind speed. AVOID APPLICATIONS DURING GUSTY WIND CONDITIONS. Applicators need to be familiar with local wind patterns and terrain that could affect spray drift.

## **Incorporation Directions**

Use tillage, if necessary, to break up soil clods prior to preplant incorporated application.

### **1. Flat-Planted Crop**

Ipimethalin-L should be incorporated prior to planting and within 7 days of application. When Ipimethalin-L is applied to flat land that will not be bedded, it should be mechanically incorporated into the top 1 or 2 inches of soil. Mechanical incorporation of Ipimethalin-L into the top 1 or 2 inches of soil can be achieved by the following methods:

- Disk harrow set to cut 3 to 4 inches deep and operated in two different directions at 4 to 6 mph. The second pass should be made at an angle to the first
- PTO-driven equipment (tillers, cultivators, hoes) set to cut 2 inches deep and operated one time at 4 mph or less.
- Rolling cultivator set to cut 2 to 3 inches deep and operated two times at 6 to 8 mph. The second pass should be made at an angle to the first Use only on coarse and medium textured soils.
- Field cultivator set to cut 3 inches deep operated two times at more than 5 mph. The second pass should be made at an angle to the first Equipment must have 3 or 4 rows of sweeps, spaced at intervals of 7 inches or less and staggered so that no soil remains unturned. Do not use chisel points.
- Lely-Roterra equipment set and operated according to the manufacturer's directions to thoroughly incorporate Ipimethalin-L to a depth of 1 to 2 inches.
- Do-All set and operated according to the manufacturer's directions to thoroughly incorporate Ipimethalin-L to a depth of 1 to 2 inches.

**Note:** Ipimethalin-L can be incorporated in a single pass when the soil is of good tilth with moderate moisture and is relatively free of clods and trash. Implements must be properly set up to thoroughly incorporate Ipimethalin-L into the top 1 or 2 inches of soil. Recommended implements include the following: (1) C-shank or S-shank field cultivators equipped with flextime drag or rolling basket attachment and (2) the combination disk/field cultivator implement equipped with flextime drag or rolling basket attachment Field cultivators must have 3 or 4 rows of sweeps, spaced at intervals of 7 inches or less and staggered so that no soil remains unturned. Implements must be operated at 6 to 8 miles per hour and set to cut 3 to 4 inches deep.

### **2. Bedded Crop - Application over Beds**

Ipimethalin-L is to be incorporated prior to planting and within 7 days of application. When Ipimethalin-L is applied over beds, it should be mechanically incorporated into the top 1 or 2 inches of soil. Mechanical incorporation of Ipimethalin-L into the top 1 or 2 inches of soil can be achieved by the following methods:

- Rolling cultivator set to cut 2 to 3 inches deep and operated two times at 6 to 8 mph. Use only on coarse and medium textured soils.
- PTO-driven equipment (tillers, cultivators, hoes) set to cut 2 inches deep and operated one time at 4 mph or less.
- Bed conditioner set to cut 2 to 3 inches deep and operated one time at 4 to 6 mph.

During planting, or if beds will be reshaped prior to planting, avoid tillage that will bring untreated soil to the surface or expose untreated soil in the seedbed or in the furrow.

### **3. Bedded Crop - Application Prior to Bedding**

Ipimethalin-L is to be incorporated prior to planting and within 7 days of application. When Ipimethalin-L is applied to flat land prior to bedding, it should be mechanically incorporated at a sufficient depth so

that bedding does not bring up untreated soil. Mechanical incorporation of Ipimethalin-L can be achieved by the following methods:

- Disk harrow set to cut 4 to 6 inches deep and operated in two different directions at 4 to 6 mph. The second pass should be made at an angle to the first.
- PTO-driven equipment (tillers, cultivators, hoes) set to cut 3 to 4 inches deep and operated one time at 4 mph or less. During planting, or if beds must be reshaped prior to planting, avoid tillage that will bring untreated soil to the surface or expose untreated soil on the seedbed or in the furrow.

### Application with Liquid Fertilizers

Ipimethalin-L alone or in tank mix combinations with wettable powders (WP), dry flowables (DF), flowables (F), water soluble concentrates (S) or emulsifiable concentrates (EC) may not combine properly with some liquid fertilizer materials. Always test small quantities before full scale mixing. To determine compatibility and if a compatibility agent is needed, follow the testing procedure provided below.

Follow all label recommendations for Ipimethalin-L regarding registered crops, use rates per acre, application timing, special directions and precautions. Apply; treatments in 20 gallons or more of liquid fertilizer per acre with ground equipment. Do not apply Ipimethalin-L postemergence in liquid fertilizers.

All individual state regulations relating to fluid fertilizer mixing, registration, labeling and application are the responsibility of the individual and/or company selling the Ipimethalin-L / liquid fertilizer mixture.

### Liquid Fertilizer Compatibility Determinations

If liquid fertilizer/herbicide(s) mixture separates in the spray tank, clogged equipment and uneven application can result, which can cause crop injury and poor weed control. Always predetermine the compatibility of Ipimethalin-L alone or with other herbicides in the specific liquid fertilizer to be used according to the following directions:

1. Add 1 pint of fertilizer to a quart jar.
2. Add 1 to 4 teaspoon(s) of the DF, WP, AS, F or L formulation (depending on mixing ratio required) to the liquid fertilizer. The number of teaspoons of the formulation to be added can be determined by the following formula:

$$\frac{\text{lb or pt of product/acre}}{\text{gallons of fertilizer/acre}} \times 11.4 = \text{number of teaspoons of herbicide to add to 1 pint of fertilizer}$$

3. Close the jar and agitate until the herbicide(s) are evenly dispersed in the liquid fertilizer. If the materials do not disperse well, it may be necessary to slurry the chemicals in water before adding to the fertilizer.
4. After dispersing the materials (step 2) add appropriate number of teaspoons of Ipimethalin-L (see formula in step 2) to the jar and shake well. Add water soluble concentrate herbicides to the mixture last and agitate. Let the mixture stand for 30 minutes and then observe the results. Look for signs of separation, an oily layer or globules, sludge, flakes or other precipitates.
5. Determine compatibility.
  - (a) If the herbicide(s) and liquid fertilizer mixture does not separate, use this mixture in your spray tank.
  - (b) If the mixture separates, but mixes readily with shaking, the mixture can be used if good agitation is maintained in the spray tank.
  - (c) If separation of the mixture occurs and agitation does not correct this problem, a compatibility agent<sup>†</sup> is needed.

6. If the need for a compatibility agent<sup>†</sup> is demonstrated, follow this procedure:

Use a clean quart jar and repeat step 1 above. Add 1/2 teaspoon of the compatibility agent to the liquid fertilizer. Mix well and repeat steps 2, 3 and 4. If separation or precipitation occurs with the compatibility agent, do not use Ipimethalin-L with that specific liquid fertilizer.

An effective compatibility agent will cause the mixture to remain uniformly dispersed with little or no separation (oil rising to the surface) for one-half hour or longer. If slight separation occurs, 2 to 3 inversions of the jar should be sufficient to redisperse the mixture uniformly.

Use a clean jar for each test. A compatible mixture will have a uniform appearance and it will be relatively easy to redisperse with gentle agitation of the jar.

† Compex-Kalo Laboratories Incorporated, Kansas City, MO; Sponto 168-D-Witco Chemical Company, Houston, TX; Unite-Hopkins Agricultural Chemical Company, Madison, Wi. or other comparable adjuvants.

### Application with Dry Bulk Fertilizers

Ipimethalin-L may be impregnated on dry bulk fertilizers. When applied as directed, Ipimethalin-L/dry bulk fertilizer mixtures provide weed control equal to that provided by the same rates of Ipimethalin-L applied in water.

Follow all label recommendations for Ipimethalin-L regarding rates per acre, registered crops, incorporation, special directions and precautions. Ipimethalin-L/dry bulk fertilizer mixtures should only be applied with ground equipment.

All individual state regulations relating to dry bulk fertilizer blending, registration, labeling, and application are the responsibility of the individual and/or company selling the Ipimethalin-L/dry bulk fertilizer mixture.

A minimum of 200 lb of dry bulk fertilizer impregnated with the recommended amount of Ipimethalin-L must be applied per acre.

**Do not** impregnate Ipimethalin-L onto coated ammonium nitrate or limestone because these materials do not absorb the herbicide. Dry fertilizer blends containing mixtures of ammonium nitrate or limestone may be impregnated with Ipimethalin-L. A minimum of 200 lb of impregnated dry bulk fertilizer, excluding the weight of ammonium nitrate or limestone, must be applied per acre.

Refer to appropriate crop-specific use directions in the Ipimethalin-L booklet to determine the rate of Ipimethalin-L per acre. Use the following table to determine the amount of Ipimethalin-L to be impregnated on a ton of dry bulk fertilizer based on the rate of fertilizer that will be applied per acre.

**Rate Chart for Impregnation of Dry Bulk Fertilizers: Table values are pints of Ipimethalin-L per ton of fertilizer for the indicated per acre rates of fertilizer and Ipimethalin-L.**

Fertilizer Rate (lb/acre)	Ipimethalin-L (Rate per Acre) (recommended rate for crop and soil texture)				
	1.2 pint	1.8 pint	2.4 pint	3 pint	3.6 pint
200	12 pt/ton	18 pt/ton	24 pt/ton	30 pt/ton	36 pt/ton
250	9.6 pt/ton	14.4 pt/ton	19.2 pt/ton	24 pt/ton	28.8 pt/ton
300	8 pt/ton	12 pt/ton	16 pt/ton	20 pt/ton	24 pt/ton
350	6.9 pt/ton	10.3 pt/ton	13.7 pt/ton	17.1 pt/ton	20.6 pt/ton

<b>400</b>	6 pt/ton	9 pt/ton	12 pt/ton	15 pt/ton	18 pt/ton
<b>450</b>	5.33 pt/ton	8 pt/ton	10.66 pt/ton	13.33 pt/ton	16 pt/ton

For rates not listed in the table, use the following formula to calculate the pints of Ipimethalin-L to be impregnated on a ton of dry bulk fertilizer:

$$\frac{2000}{\text{lb of dry fertilizer per acre}} \times \text{Pints of Ipimethalin-L per acre (recommended rate for crop and soil texture)} = \text{pints of Ipimethalin-L per ton of fertilizer}$$

To impregnate Ipimethalin-L on bulk fertilizer, use a closed rotary-drum mixer or other commonly used dry bulk fertilizer blender equipped with suitable spray equipment. Spray nozzles must be placed to provide uniform coverage of Ipimethalin-L onto the fertilizer during mixing.

Apply the Ipimethalin-L / dry bulk fertilizer mixture with an accurately calibrated dry fertilizer spreader. The Ipimethalin-L / dry bulk fertilizer mixture must be spread uniformly on the soil surface. Uneven spreading can result in crop injury and poor weed control.

Refer to Incorporation Directions section (see table of contents for page number) for incorporation directions.

## Cultural Practices Following Application

If weeds develop, a shallow cultivation or rotary hoeing will generally result in better weed control. Ipimethalin-L treatments may be followed by any registered herbicide to control weeds that are not listed on the label for Ipimethalin-L.

## Follow Crop Restrictions

1. Land that has been treated with Ipimethalin-L may be planted with other crops the following year. Note the restrictions given below for sugar beets, red beets, and spinach.

### 2. Winter Wheat, Winter Barley

Winter wheat and winter barley may be planted in the fall 4 months after an application of Ipimethalin-L to any registered crop. Winter wheat and winter barley may be planted in the fall 3 months after a postemergence incorporated application of Ipimethalin-L in irrigated field corn or grain sorghum. The treated crop must grow to maturity and be harvested before planting wheat or barley.

In areas where irrigation is necessary to produce the crop treated with Ipimethalin-L, **do not** plant winter wheat or winter barley as follow crops if crop failure and/or destruction occurs and land is fallowed during the summer, otherwise crop injury may result.

**Do not** plant winter wheat or winter barley as follow crops until the next growing season in treated land if Ipimethalin-L is applied at 4.8 pints or higher.

**Do not** feed forage or graze livestock for 75 days after planting wheat or barley in treated land.

### 3. Sugar Beets, Red Beets, Spinach

To prevent crop injury, do not plant sugar beets, red beets or spinach for 12 months following an Ipimethalin-L application. To insure thorough mixing of soil, land should be plowed using a moldboard plow to a depth of 12 inches prior to planting these crops.

4. When Ipimethalin-L is used in tank-mix or sequential combinations, refer to the label(s) of other herbicides for additional follow crop restrictions.

Use of Ipimethalin-L herbicide in accordance with label directions is expected to result in normal growth of rotational crops in most situations; however, various environmental and agronomic factors make it impossible to eliminate all risks associated with the use of this product and, as a result, rotational crop injury is always a possibility.

## **Weed Resistance Management**

For resistance management, Ipimethalin-L is a Group K1 herbicide. While weed resistance to Group K1 herbicides is common in a number of weed species, these herbicides remain an important component of successful weed control programs. Resistance management should be part a diversified weed control strategy that integrates multiple options including chemical, cultural, mechanical, and biological control tactics. Cultural control tactics include agronomic practices that improve the competitive ability of the crop via rotation, variety/cultivar selection, precision fertilizer placement and optimum crop plant density. Agronomic practices should also limit the development and spread of weeds by using clean crop seed (e.g. certified seed), prevent crop trait out-crossing, control weed influx from field borders, and manage weed seed at harvest / post-harvest to minimize the carryover weed seed-bank into the following crop. Mechanical control tactics include timely tillage where practical, equipment cleaning to avoid weed spread, and minimization of harvest crop seed losses in the field through close attention to timeliness of harvesting, correct setup of harvest equipment, and covering crop seed loads during harvest and transport to avoid dispersing seed. An example of a biological control tactic is field grazing during or after cropping to manage weeds and reduce weed seed production.

Scout after herbicide application to monitor weed populations for early signs of resistance development. Indicators of possible herbicide resistance include: (1) failure to control a weed species normally controlled by the herbicide at the dose applied, especially if control is achieved on adjacent weeds; (2) a spreading patch of non-controlled plants of a particular weed species; (3) surviving plants mixed with controlled individuals of the same species. If resistance is suspected, prevent weed seed production in the affected area by an alternative herbicide from a different group or by a mechanical method such as hoeing or tillage. Prevent movement of resistant weed seeds to other fields by cleaning harvesting and tillage equipment when moving between fields, and planting clean seed.

### **Chemical Control**

- Start clean with tillage or an effective burndown herbicide program.
- Apply preemergence herbicides that provide soil residual control of broadleaf and grass weeds to reduce early season weed competition and allow for timely in-crop postemergence herbicide applications
- Use tank mixes and sequential applications with other herbicides possessing different modes of action (MOAs) that are also effective on the target weeds.
- Follow labeled application rate and weed growth stage specifications.
- DO NOT rely on a single herbicide mode of action for weed control during the growing season.
- Avoid application of herbicides with the same mode of action more than twice per growing season.
- Use recommended adjuvant, adequate spray volume, proper nozzle and pressure (see label) to ensure effective weed coverage for applications.
- Control weeds in field borders to prevent weeds from influx into field.

### **Scouting and Containment**

- Scout fields before application to ensure optimum herbicide selection, rates and timing for effective control of target weeds.
- Scout fields after herbicide application to identify areas where weed control was ineffective. Consider application and environmental factors that may have led to incomplete control.
- Control weed escapes with herbicides possessing a different mode of action or use a mechanical control measure. Weed escapes should not be allowed to reproduce by seed or to proliferate

vegetatively.

- Clean equipment before moving to a different field to avoid spread of resistant weeds (especially harvest and tillage equipment).
- Contact your state cooperative extension service, land grant university weed scientist, professional consultants, your herbicide supplier and/or your local sales representative if resistance is suspected.
- Prevent crop trait out-crossing to weeds and weed influx from border to field.

## Specific Use Directions by Crop

### FIELD CORN

#### General Directions and Precautions

- Ipimethalin-L may be applied in conventional, minimum or no-till systems as a preemergence, postemergence, or postemergence incorporated treatment in field corn.
- **Do not apply as a preplant incorporated treatment** or serious corn injury can occur.
- **Do not apply Ipimethalin-L in no-till systems in California.**
- With the exception of minimum or no-tillage systems (see below), plant into a firm seedbed that is free of clods and trash. Use only where adequate tillage is practiced to provide good soil coverage of the corn seed. **Plant corn at least 1.5 inches deep. Completely cover corn seed with soil.**
- Ipimethalin-L or Ipimethalin-L tank mix combination treatments will control weeds most effectively when adequate rainfall or overhead irrigation is received within 7 days after application. If cultivation is necessary because of soil crusting, soil compaction or weed germination before rain or irrigation, use shallow tillage (such as rotary hoe), and confirm that corn seeds are below the tilled area.
- If Ipimethalin-L is used alone and corn loss occurs as a result of weather conditions, corn or any crop registered for Ipimethalin-L preplant incorporated use can be replanted the same year without adverse effects. If corn is replanted, seeding depth must be below re-tilled area or crop injury may occur.
- **Do not** exceed the maximum labeled rate for any soil type.
- Ipimethalin-L is not recommended for use on peat or muck soils.
- **Field Corn Grown in Minimum or No-Tillage Systems:** Ipimethalin-L alone and Ipimethalin-L tank mixtures may be used in field corn in minimum or no-tillage systems. **Plant corn at least 1.5 inches deep. Completely cover corn seed with soil.** Using no-till planters under conditions that do not allow good soil coverage of the corn seed can result in reduced crop stand or injury if Ipimethalin-L comes into contact with the germinating corn seed. Check equipment to ensure good seed coverage.
- **Do not** apply within one day of harvest of field corn.
- **Do not** apply this product through any other irrigation system.

#### Use Methods and Timings

**Preemergence Application:** Apply Ipimethalin-L after planting, but before weeds and crop emerge. Apply Ipimethalin-L tank mixes and sequential programs as specified under the tank mix section.

**Postemergence Application:** Apply Ipimethalin-L tank mixes postemergence until corn is 30 inches in height or has 8 visible leaf collars (V8), whichever is more restrictive. Use drop nozzles and apply as a directed spray if the density of the corn canopy prevents applications from reaching the soil and target weeds.

**Postemergence Incorporated Application:** Apply Ipimethalin-L alone or Ipimethalin-L plus atrazine when corn is at least 4 inches tall until layby (last cultivation). Refer to Postemergence Incorporated Application section of this label for complete directions.

**Do not apply as a preplant incorporated treatment** or serious corn injury can occur.

**Tank Mixes and Sequential Programs in Field Corn:** Ipimethalin-L may be applied in a tank mix with



any registered herbicide labeled for use in field corn. Apply Ipimethalin-L based on the timing indicated by the companion label or until corn is 30 inches tall or V8, whichever is more restrictive. Use drop nozzles and apply as a directed spray if the density of the corn canopy prevents applications from reaching the soil and target weeds. **Do not** apply in liquid fertilizer.

When using tank mixtures or sequential applications with Ipimethalin-L, always read the labels of companion product(s) to determine the specific use rates by soil types, weed species, and weed or crop growth stage. In addition, follow all precautions and restrictions, including state and local use restrictions, that may apply to specific products. Always follow the most restrictive label directions.

## Application Rates in Field Corn

Use rates recommended for Ipimethalin-L alone and in tank mix or sequential applications are given in the following table.

### Broadcast Application Rates: Preemergence or Postemergence Application in Field Corn

Soil Texture	Ipimethalin-L (pint/acre) <sup>†</sup>		
	<1.5% Organic Matter	1.5 - 3% Organic Matter	>3% Organic Matter
Coarse	1.8 to 2.4	2.4 to 3.6	3.6
Medium	2.4 to 3.6	3.6	3.6 to 4.8
Fine	2.4 to 3.6	3.6 to 4.8	3.6 to 4.8

<sup>†</sup> Use the high rate for each soil classification when using Ipimethalin-L alone.

## Postemergence Incorporated Application

### General Directions and Precautions

Ipimethalin-L or Ipimethalin-L plus atrazine tank mixtures applied as a **postemergence incorporated** treatment will control most late season annual grasses and certain broadleaf weeds in field corn. Ipimethalin-L treatments can be applied from the 4-inch growth stage to as late as the last cultivation (layby) of field corn. Ipimethalin-L plus atrazine must be applied before the field corn reaches 12 inches in height. Ipimethalin-L treatments will not control established weeds. **Destroy emerged weeds by cultivation before** applying Ipimethalin-L.

Postemergence incorporated applications of Ipimethalin-L or Ipimethalin-L plus atrazine tank mixture can be applied in field corn that was previously treated with herbicides registered for use in field corn. Refer to the labels of those herbicides for suggested treatments, rates to be used, and precautions or restrictions for use in field corn and for Follow Crop Restrictions.

### Postemergence Incorporated Applications (Ipimethalin-L alone or Ipimethalin-L plus Atrazine)

1. Cultivate with a sweep-type or rolling cultivator operated at sufficient speed to throw at least 1 inch of soil over the bases of the field corn plants. This will kill any small weed seedlings that are growing in the field corn row, and it will prevent direct contact of the zone of brace root formation by Ipimethalin-L during application.
2. Apply broadcast with a ground sprayer when corn is at least 4 inches tall up to layby (last cultivation). Use drop nozzles if crop foliage will prevent uniform coverage of the soil surface within the rows.
3. Uniformly and thoroughly incorporate Ipimethalin-L treatments into the soil (1) with a sweep-type or rolling cultivator set to provide thorough incorporation in the top 1 inch of soil OR (2) with

adequate irrigation water or rainfall. For best results, incorporate Ipimethalin-L treatments as soon as possible after application. Incorporation must be concluded within 7 days after application. If adequate moisture is not received within 7 days after application, incorporate Ipimethalin-L with a sweep-type or rolling cultivator.

In situations such as low rainfall or soil moisture when deep germinating weeds such as shattercane or field sandbur are anticipated, mechanical incorporation will provide best results.

If cultivation is needed after application and incorporation of Ipimethalin-L, the depth of cut should be no deeper than the depth of cut used to incorporate.

**Broadcast Application Rates: Postemergence Incorporated Application in Field Corn**

Soil Texture	Ipimethalin-L (pint/acre)	
	Southern States†	Northern States†
Coarse	1.2 to 1.8	1.8 to 2.4
Medium	1.8 to 2.4	2.4 to 3.6
Fine	1.8 to 3.6	2.4 to 3.6

†Use the high rate for each soil classification when using Ipimethalin-L alone.

See map at end of this label for specific states.

For Ipimethalin-L plus atrazine tank mixtures, do not exceed 1.2 lb of active ingredient per acre of atrazine.

**Note:** Livestock can graze or be fed forage from treated field corn after 21 days following application.

**SWEET CORN, SEED CORN OR POPCORN**

**General Directions and Precautions**

- Ipimethalin-L may be used in conventional tillage sweet corn, seed corn or popcorn as a preemergence or postemergence application.
- **Do not apply as a preplant incorporated treatment** or serious corn injury can occur.
- Do not apply Ipimethalin-L in reduced, minimum or no-till sweet corn, seed corn or popcorn.
- Plant into a firm seedbed that is free of clods and trash. Use only where adequate tillage is practiced to provide good soil coverage of the corn seed. **Plant corn at least 1 1/2 inches deep. Completely cover corn seed with soil.**
- Using Ipimethalin-L alone will not control emerged weeds. Ipimethalin-L can be applied in a tank mix with atrazine or other herbicide labeled for use in sweet corn, seed corn or popcorn. When using a tank mixture, always read the companion product label(s) to determine the specific use rates by soil types, weed species, and weed or crop growth stage. Always follow the most restrictive label and any precautions and restrictions, including state and local use restrictions, that may apply to specific products.
- Do not exceed the maximum labeled rate for any soil type.
- Ipimethalin-L or Ipimethalin-L tank-mix combination treatments control weeds most effectively when mechanically incorporated or when adequate rainfall or overhead irrigation is received within 7 days after application. If cultivation is necessary because of soil crusting, soil compaction or weed germination before rain or irrigation, use shallow tillage.
- If Ipimethalin-L is used alone and corn loss occurs as a result of weather conditions, corn or any crop registered for Ipimethalin-L preplant incorporated use can be replanted the same year with no adverse effects. If corn is replanted, make sure seeding depth is below retilled area or crop injury may occur.
- Ipimethalin-L is not recommended for use on peat or muck soils.

## Use Methods and Timings

**Preemergence Application:** Apply Ipimethalin-L after planting, but before weeds and crop emerge.

**Postemergence Application:** Apply Ipimethalin-L postemergence until corn is 20 to 24 inches in height or V8, whichever is more restrictive. Use drop nozzles and apply as a directed spray if the density of the corn canopy prevents applications from reaching the soil and target weeds.

Do not apply in liquid fertilizer.

**Tank Mixes and Sequential Programs:** Ipimethalin-L may be applied in a tank mix with any registered herbicide labeled for use in sweet corn, seed corn and popcorn. Apply Ipimethalin-L based on the timing indicated by the companion label or until corn is 20 to 24 inches tall or V8, whichever is more restrictive. Use drop nozzles and apply as a directed spray if the density of the corn canopy prevents applications from reaching the soil and target weeds. **Do not** apply in liquid fertilizer.

When using tank mixtures or sequential applications with Ipimethalin-L, always read the labels of companion product(s) to determine the specific use rates by soil types, weed species, and weed or crop growth stage. Also follow all precautions and restrictions, including state and local use restrictions, that may apply to specific products. Always follow the most restrictive label directions.

## Application Rates in Sweet Corn, Seed Corn or Popcorn

Use rates recommended for Ipimethalin-L alone and in tank mix applications are given in the following table.

### Broadcast Application Rates: Preemergence or Postemergence Application

Soil Texture	Ipimethalin-L (pint/acre) <sup>†</sup>		
	<1.5% Organic Matter	1.5 - 3% Organic Matter	>3% Organic Matter
Coarse	1.8 to 2.4	2.4 to 3.6	3.6
Medium	2.4 to 3.6	3.6	3.6 to 4.8
Fine	2.4 to 3.6	3.6 to 4.8	3.6 to 4.8

<sup>†</sup> When using Ipimethalin-L alone, use the high rate for each soil classification.

## Restrictions for Postemergence Applications

Observe the following restrictions to avoid serious crop injury with postemergence applications:

- Plant into a firm seedbed that is free of clods and trash. Use only where adequate tillage is practiced to provide good soil coverage of the corn seed. **Plant corn at least 1 1/2 inches deep. Completely cover corn seed with soil.**
- **Do not apply as a preplant incorporated treatment** or serious corn injury can occur.
- **Do not** apply following Ipimethalin-L preemergence applications.
- **Do not** apply in liquid fertilizer.

## COTTON

### General Directions and Precautions

**Ipimethalin-L may be applied in the following ways in cotton:** conventional, minimum, stale seedbed or no-till as a preplant surface, preplant incorporated, or preemergence or layby application.

- **Do not** use in no-till cotton in California.
- Preplant surface, preemergence and layby treatments control weeds most effectively when adequate rainfall or overhead irrigation is received within 7 days after application. A shallow cultivation is recommended if soil crusting or soil compaction occurs. If weeds begin to germinate or adequate moisture is not received within 7 days after application, use shallow tillage, such as rotary hoe or light harrow, and make sure cotton seeds are below tilled area. Otherwise, the use of a postemergence herbicide treatment may be required to control weed escapes at planting or following cotton emergence.
- If crop loss occurs as a result of weather conditions, cotton or any crop registered for Ipimethalin-L preplant incorporated application can be replanted without adverse effects the same year. If replanting is necessary, **do not** rework the soil deeper than the treated zone.
- **Preharvest Interval:** Do not apply Ipimethalin-L within 60 days before harvest of cotton.
- **Do not** feed forage or graze livestock in treated cotton fields.
- Ipimethalin-L is not recommended for use on peat or muck soils.

### Use Methods and Timings

**Preplant Surface Application:** Apply Ipimethalin-L up to 15 days before planting. Apply Ipimethalin-L tank mixes and sequential programs as specified under the tank mix section.

**Preplant Incorporated Application:** Apply Ipimethalin-L up to 60 days before planting and incorporate within 7 days of application. Apply Ipimethalin-L tank mixes and sequential programs as specified under the tank mix section.

**Preemergence Application:** Apply Ipimethalin-L at planting or up to 2 days after planting. Apply to a firm seedbed that is free of clods. Apply Ipimethalin-L tank mixes and sequential programs as specified under the tank mix section.

**Preplant Incorporated Application Followed by Preemergence Application:** Apply Ipimethalin-L up to 60 days before planting and incorporate within 7 days of application. Apply overlay application of Ipimethalin-L at planting or up to 2 days after planting. Total amount of Ipimethalin-L applied per acre cannot exceed the highest labeled rate for a given soil type. Preplant incorporated and preemergence applications of Ipimethalin-L may be applied with labeled tank mix herbicide(s).

**Layby Application (at Last Cultivation):** Apply Ipimethalin-L as a directed spray to the soil between rows following the last normal cultivation (layby). Lay by applications can be applied in cotton previously treated with Ipimethalin-L or any herbicide registered for use in cotton. Consult the labels of those herbicides for suggested treatments, use rates, and precautions or restrictions for use in cotton and for follow crop restrictions. The total amount of Ipimethalin-L applied per acre per season cannot exceed the highest labeled rate for a given soil type.

**Do not** apply as a broadcast spray over the top of the cotton or serious crop injury can occur. Avoid contact of the spray to the non-woody portion of cotton stems and cotton foliage or serious crop injury can occur. To reduce the potential crop injury if the herbicide comes in contact with cotton foliage and stems, use protective shields if conditions occur which favor spray drift.

Glyphosate-containing products may be applied in a tank mix with Ipimethalin-L at layby for enhanced weed control lay by in cotton with the Roundup Ready gene. **Do not** apply a glyphosate-containing product at layby on non-Roundup Ready cotton. **Do not** apply Ipimethalin-L and Roundup Ultra in a tank mix as a broadcast spray over the top of cotton or crop injury can occur.

**Fall Application:** Ipimethalin-L may be applied for weed control in cotton in the fall, after October 15 (up to 140 days before planting cotton) in Arizona, California, Louisiana, New Mexico, Mississippi, Oklahoma and Texas. Apply Ipimethalin-L at the broadcast rate of 1.8 pints on coarse soils, 2.4 pints on medium soils and 3.6 pints on fine soils.

**Tank Mixes and Sequential Programs:** Ipimethalin-L may be applied in a tank mix or sequential application with any registered herbicide labeled for use in cotton. Refer to the labels of companion products for weeds controlled in addition to Ipimethalin-L alone.

When using tank mixtures or sequential applications with Ipimethalin-L, always read the labels of companion products to determine the specific use rates by soil types, weed species, and weed or crop growth stage. In addition, follow all precautions and restrictions, including state and local use restrictions. that may apply to specific products. Always follow the most restrictive label directions.

**Application Rates in Cotton**

Use rates recommended for Ipimethalin-L alone and in tank mix or sequential applications are given in the following table.

**Broadcast Application Rates in Cotton**

Soil Texture	Ipimethalin-L (pint/acre)	
	Conventional or Minimum Tillage	No-Tillage <sup>†</sup>
Coarse	1.2 to 2.4 <sup>††</sup>	1.8 to 2.4
Medium	1.8 to 2.4	2.4 to 3.6
Fine	2.4 to 3.6	3.6 to 4.8

<sup>†</sup>This use is not recommended for soils with more than 3% organic matter.

<sup>††</sup> Do not exceed 1.8 pint per acre on coarse soils in California.

For heavy clay soils, apply Ipimethalin-L at the broadcast rate of 3.6 pints per acre.

The high rates for each soil texture above should be used if heavy weed populations are anticipated, extensive crop residues were present before seedbed preparation, or in no-till.

The total amount of Ipimethalin-L applied per acre per season cannot exceed the highest labeled rate for a given soil type.

**Tank Mixes in Cotton**

Follow additional use directions in this table for Ipimethalin-L tank mixes. (Refer to the application rate table above Broadcast Application Rates in Cotton to determine appropriate Ipimethalin-L use rate in cotton.)

**For no-till:** Ipimethalin-L alone or Ipimethalin-L tank mixes may be used with paraquat dichloride or glyphosate to kill any existing vegetation that is present before planting. Refer to these labels for specific use recommendations, rates, and weeds controlled.

Ipimethalin-L Plus:	Tank Mix Use Directions
Fluometuron (0.8 to 2 lb ai/acre)	<p><b>Preplant Incorporated Application Followed by Preemergence Application:</b> Apply Ipimethalin-L up to 60 days before planting and incorporate within 7 days of application. Apply fluometuron as an overlay preemergence application as directed on the label for fluometuron (use the preemergence rates for fluometuron alone).</p> <p><b>Preemergence Application:</b> Apply immediately after planting or crop injury may result. Apply in water or nitrogen solution with ground equipment only. Do not apply tank mix preemergence in Arizona, California, Oklahoma, New Mexico and West Texas.</p>

	<ul style="list-style-type: none"> <li>• Read and strictly follow all precautions and directions on the label for fluometuron.</li> <li>• Plant cotton seeds 1 inch or deeper below the soil surface.</li> <li>• The use of fluometuron as a preemergence application following the use of a systemic insecticide at planting may result in crop injury. Do not plant crops other than cotton within 6 months of the last application of fluometuron or injury may result.</li> <li>• Maintain good agitation at all times until spraying is completed.</li> <li>• Do not feed livestock foliage from treated cotton plants or gin trash.</li> </ul>
<p>Prometryn (1.2 to 2.4 lb ai/acre)</p> <p>For use in Arizona, California, New Mexico, and the Upper and Lower El Paso Valley of Texas.</p>	<p><b>Preplant Incorporated Application:</b> Apply with ground equipment prior to listing or over partially finished or finished beds. Incorporate immediately after application.</p> <ul style="list-style-type: none"> <li>• Read and strictly follow all precautions and directions on the label for prometryn.</li> <li>• <b>Do not</b> use on sands or loamy sands.</li> <li>• <b>Do not</b> use this tank mix in cut areas of newly leveled fields, in areas of excess salt, or in areas where flooding over the bed is likely to occur or crop injury may result. Cotton should not be planted in tractor wheel depressions or crop injury may result.</li> <li>• <b>Do not</b> use this tank mixture when cotton is irrigated up or crop injury may result. On mulch planted cotton, water back only after cotton seedlings are well established.</li> <li>• Maintain good agitation at all times until spraying is completed to keep the material in suspension. Mechanical agitation should be used in Arizona and California.</li> <li>• Do not rework the soil if replanting is necessary.</li> </ul>
<p>Prometryn</p> <p>For use in specified areas of Oklahoma and Texas.</p>	<p><b>Preplant Surface Application:</b> Apply up to 15 days before planting.</p> <p><b>Preemergence Application:</b> Apply at planting or up to 2 days after planting before weeds and crops emerge.</p> <ul style="list-style-type: none"> <li>• Read and strictly follow all precautions and directions on the label for prometryn.</li> <li>• See the label for prometryn for use rates and specified areas of Oklahoma and Texas.</li> </ul>
<p>Diuron (0.5 to 1.6 lb ai/acre)</p>	<p><b>Preplant Incorporated Application Followed by Preemergence Application:</b> Apply Ipimethalin-L up to 60 days prior to planting and incorporate within 7 days of application. Apply diuron as an overlay preemergence application as directed on the label for diuron (use the preemergence rates for diuron alone).</p> <ul style="list-style-type: none"> <li>• Read and strictly follow all precautions and directions on the label for diuron.</li> <li>• The use of diuron as a preemergence application following the use of a systemic insecticide at planting may cause injury to cotton.</li> </ul>
<p>Norflurazon (1.25 to 2.5 lb ai/acre)</p> <p><b>Do not</b> use in Arizona, California, New Mexico, Oklahoma and Texas.</p>	<p><b>Preplant Surface Application:</b> Apply up to 15 days before planting.</p> <p><b>Preplant Incorporated Application:</b> Apply up to 30 days before planting and incorporate within 7 days of application. <b>Do not</b> incorporate deeper than 2 to 3 inches with commonly used equipment.</p> <p><b>Preemergence Application:</b> Apply tank mix with ground equipment immediately after planting or crop injury may result. Be sure that cotton seeds are planted 1 inch or deeper below soil surface.</p> <p><b>Preplant Incorporated Followed by Preemergence Application:</b> Apply</p>

	<p>Ipimethalin-L up to 60 days before planting and incorporate within 7 days of application. Apply norflurazon as an overlay preemergence application as directed on the label for norflurazon (use the preemergence rates for norflurazon alone).</p> <ul style="list-style-type: none"> <li>• Read and strictly follow all precautions and directions on the label for norflurazon.</li> <li>• If cotton plants undergo stress during early development, application of Ipimethalin-L plus norflurazon at the labeled rate may cause temporary bleaching or chlorosis of the leaves from which the plants will recover.</li> <li>• Maintain good agitation at all times until application is complete.</li> </ul>
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**Preplant Incorporated Application for Control of Rhizome Johnsongras ;**

Ipimethalin-L, applied as a preplant incorporated treatment for 2 consecutive years, will control rhizome johnsongrass (*Sorghum halepense*) in cotton at the rates recommended for soil textures listed below. **This use is not recommended for Arizona, New Mexico, and California,** Rhizome johnsongrass will be suppressed after the first year and controlled after the second year.

Before application, use a chisel plow or similar equipment to bring johnsongrass rhizomes to the surface. Chop rhizomes into small pieces with a disk harrow set to cut 4 to 6 inches deep and operated in 2 different directions at 4 to 6 mph.

Incorporate Ipimethalin-L into the soil within 7 days after application before planting. For maximum control of rhizome johnsongrass, incorporate Ipimethalin-L as soon as possible after application. To control rhizome johnsongrass, deep and thorough incorporation of Ipimethalin-L is necessary. Mechanical incorporation can be achieved by the following methods:

- a) Disk harrow set to cut 4 to 6 inches deep and operated in 2 different directions at 4 to 6 mph.
- b) PTO-driven equipment, such as tillers, cultivators, and hoes, set to cut 3 to 4 inches deep and operated 1 time at 4 mph or less.

For johnsongrass escapes during the crop season, cultivation and/or application of registered postemergence herbicides is recommended. Follow the use directions on the labels of the respective herbicides.

**Broadcast Application Rates: Preplant Incorporated for Control of Rhizome Johnsongrass in Cotton (APPLY FOR 2 CONSECUTIVE YEARS)**

Soil Texture (Up to 3% organic matter <sup>†</sup> )	Ipimethalin-L (pint/acre)
Coarse	2.4
Medium	3.6
Fine	4.8

<sup>†</sup>This use is not recommended for soils with more than 3% organic matter.

**Note: Do not** feed forage or graze livestock in treated cotton fields.

If cotton crop loss occurs as a result of weather conditions, cotton or soybeans can be replanted the same year into treated soil without adverse effects. **Do not** rework the soil deeper than the treated zone if replanting is necessary.

**EDIBLE BEANS**

**[Dry, Lima, Snap, Chickpeas (Garbanzo Beans), Southern Peas (Cowpeas) and Sweet Lupines]**

**General Directions and Precautions**

- Ipimethalin-L may only be applied as a preplant incorporated treatment in chickpeas (garbanzo beans), dry beans (such as navy, great northern, red kidney, black turtle, cranberry and small white type), lima beans, snap beans and southern peas (cowpeas).
- Ipimethalin-L may be applied as a preplant incorporated treatment or preemergence treatment in sweet lupines.
- **Do not** feed lupine hay and forage or graze livestock in treated lupine fields.
- If crop loss occurs as a result of weather conditions, beans or any crop registered for Ipimethalin-L preplant incorporated use can be replanted without adverse effects the same year. **Do not** rework the soil deeper than the treated zone if replanting is necessary.
- Ipimethalin-L is not recommended for use on peat or muck soils.

**Use Methods and Timings**

**Preplant Incorporated Application:** Apply Ipimethalin-L up to 60 days before planting and incorporate within 7 days of application. Apply Ipimethalin-L tank mixes as specified under the tank mix section.

**Preemergence Application:** Apply Ipimethalin-L to sweet lupines only at planting or up to 2 days after planting. Apply to a firm seedbed that is free of clods. Do not apply Ipimethalin-L as a preemergence application (surface treatment) to chickpeas, dry beans, lima beans, snap beans and southern peas (cowpeas) after planting or serious crop injury can occur.

**Application Rates in Edible Beans**

Use rates recommended for Ipimethalin-L alone and in tank mix applications are given in the following table.

**Broadcast Application Rates in Edible Beans**

Soil Texture	Ipimethalin-L (pint/acre)		
	Southern States†	Northern States†	
		<3% Organic Matter	>3% Organic Matter
Coarse	1.2 to 1.8	1.2 to 2.4	2.4
Medium	1.8 to 2.4	1.8 to 3	3 to 3.6
Fine	1.8 to 3.6	2.4 to 3.6	3.6

† See map at the end of this label for specific states.

Use the 3.6 pint per acre rate for heavy clay soils.

**Tank Mixes in Edible Beans**

Ipimethalin-L may be applied in a tank mix with metolachlor, EPTC, or alachlor labeled for use in edible beans. Refer to the labels of companion products for weeds controlled in addition to Ipimethalin-L alone.

When using tank mixtures with Ipimethalin-L, always read the labels of companion products to determine the specific use rates by soil types, weed species, and weed or crop growth stage. In addition, follow all precautions and restrictions, including state and local use restrictions that may apply to specific products. Always follow the most restrictive label.

Follow additional use directions in this table for tank mixes of Ipimethalin-L. (Refer to the application rate table Broadcast Application Rates in Edible Beans to determine the appropriate use rate for Ipimethalin-L.)



<b>Ipimethalin-L Plus:</b>	<b>Tank Mix Use Directions</b>
<p>Metolachlor (see metolachlor product label for rate information)</p> <p>For use in dry, lima or snap beans, chickpeas, and southern peas.</p>	<p><b>Preplant Incorporated Application:</b> Apply up to 14 days before planting and incorporate within 7 days of application.</p> <ul style="list-style-type: none"> <li>• Read and strictly follow all precautions and directions on the label for the metolachlor product.</li> <li>• <b>Do not</b> apply preemergence to dry, lima or snap beans, chickpeas or southern peas.</li> <li>• <b>Do not</b> graze or feed forage or fodder.</li> <li>• <b>Do not</b> apply to sweet lupines.</li> </ul>
<p>EPTC (see EPTC product label for rate information)</p> <p>For use in dry and snap beans only.</p>	<p><b>Preplant Incorporated Application:</b> Apply with ground sprayer up to 2 days before planting. Incorporate within minutes after application to prevent loss of EPTC. Whenever possible, application and incorporation should be done in the same application.</p> <p>Read and strictly follow all precautions and directions on the label for EPTC.</p> <p><b>Incorporation Directions:</b> Use power driven cultivation equipment set to cut to a depth of 2 to 3 inches or tandem disks set to cut to a depth of 4 to 6 inches, operated at 4 to 6 mph. Follow with a spike-toothed harrow or some other leveling device that extends beyond the ends of the disks. For thorough mixing, disk in 2 different directions (cross disk).</p> <ul style="list-style-type: none"> <li>• <b>Do not</b> exceed 3.5 pints per acre of EPTC on small white beans on coarse-textured soils.</li> <li>• <b>Do not</b> use this tank mixture on Adzuki beans, chickpeas, southern peas (cowpeas, including blackeye peas, blackeye beans), soybeans, lima beans or other flat podded beans.</li> <li>• <b>Do not</b> feed bean hay, vines and forage, or graze livestock in treated bean fields.</li> <li>• For nutsedge control, use 4.5 pints per acre of EPTC.</li> </ul>
<p>Alachlor (see alachlor product label for rate information)</p> <p>For use only in dry beans west of the Mississippi River.</p> <p><b>Do not</b> use in California.</p>	<p><b>Preplant Incorporated Application:</b> Apply within 7 days before planting and incorporate within 7 days of application.</p> <ul style="list-style-type: none"> <li>• Read and strictly follow all precautions and directions on the label for alachlor.</li> <li>• Apply in water with ground equipment only.</li> <li>• This tank mixture may delay crop maturity and/or decrease crop yield if cold, wet soil conditions occur after planting.</li> </ul>

## FORAGE LEGUMES

### General Directions and Precautions

Ipimethalin-L may be used in forage legumes used as a cover crop in federal set-aside or conservation reserve program areas.

- Some stand reduction of the legume cover crop may result from this use. Consult local county extension service or the local ASC committee for recommended cover crops.
- If loss of cover crop occurs as a result of adverse weather conditions, any crop registered for Ipimethalin-L preplant incorporated use can be replanted the same year into Ipimethalin-L treated soil without adverse effects. **Do not** rework the soil deeper than the Ipimethalin-L treated zone if

replanting is necessary.

- **Do not** feed or graze legume cover crops established following Ipimethalin-L application.
- The cover crop residue should ultimately be destroyed by tillage or it should be left on the surface to retard erosion or as directed by the local ASC committee.

### Use Methods and Timings

Ipimethalin-L may be applied as a preplant incorporated treatment or preemergence treatment to control weeds in legume cover crops. Refer to Mixing, Application and Incorporation Directions, Weeds Controlled and Follow Crop Restrictions sections (see table of contents for page numbers).

### Application Rates in Forage Legumes

Use rates recommended for Ipimethalin-L alone are given in the following table.

#### Broadcast Application Rates: Preplant Incorporated in Forage Legumes

Soil Texture	Ipimethalin-L (pint/acre)
Coarse	1.2 to 1.8
Medium	1.8 to 2.4
Fine	2.4 to 3

## GARLIC, DRY BULB SHALLOTS, AND DIRECT-SEEDED AND TRANSPLANTED DRY BULB ONIONS

### General Directions and Precautions

- **Application with ground equipment:** Uniformly apply in 10 gallons per acre or more of water.
- **Application with aircraft:** Uniformly apply in 5 gallons per acre or more of water.
- **Chemigation:** Apply Ipimethalin-L only through center pivot, solid set or hand move irrigation. **Do not** apply through other irrigation system. Apply Ipimethalin-L between the 2 to 9 true leaf stage (2 to 6 true leaf stage in California) only unless otherwise specified. **Do not** irrigate in excess of 0.5 inches of water. **Do not** apply Ipimethalin L-treated irrigation water over the top of trees with leaves or buds or fruit. Refer to Chemigation section in this label for complete directions
- Ipimethalin-L treatments are most effective when adequate rainfall or overhead irrigation is received within 7 days after application.
- **Do not** mechanically incorporate except as specified for use on dry bulb onions in Colorado and the Texas High Plains.
- **Do not** apply to green (bunching) onions or leeks.

### Use Directions for Mineral Soils

#### Broadcast Application Rate for Use on Mineral Soils in all States

Soil Texture	Ipimethalin-L (pint/acre)
Coarse	1.2 to 1.8
Medium	1.8 to 2.4
Fine	1.8 to 3.6

- **Do not** exceed 3.6 pints per acre per crop (except Idaho, Oregon and Washington).
- **Preharvest Interval: Do not** apply within 60 days of harvest in California and within 45 days of harvest in all other states.

- **Do not** feed or graze these crops.

If loss of treated crop occurs as a result of adverse weather conditions, any crop registered for preplant incorporated use of Ipimethalin-L can be replanted the same year. **Do not** rework the soil deeper than 2 inches if replanting is necessary.

## **Garlic**

Ipimethalin-L may be applied to garlic in the following ways:

1. Preemergence treatment after planting but before crop and weeds emerge.
2. Postemergence treatment to garlic at the 1 to 5 true leaf growth stage.
3. Apply at both preemergence and postemergence timings as a split application.

## **Dry Bulb Shallots and Direct-Seeded and Transplanted Dry Bulb Onions**

In all states **except California**, apply Ipimethalin-L as a broadcast treatment when onions or shallots have 2 to 9 true leaves.

**Additional Use in Colorado, Kansas and Nebraska:** In seeded onions, Ipimethalin-L may be applied sequentially. First application of Ipimethalin-L should be applied at loop stage. Apply sequential application of Ipimethalin-L as an early postemergence treatment (2 to 9 true leaf stage). **Do not** exceed the maximum labeled rate for a given soil texture. **Do not** apply Ipimethalin-L at loop stage through the 9 true leaf stage if heavy rains are expected or severe crop injury may result.

**Additional Use in Colorado and the Texas High Plains:** For transplanted onions only, apply and shallow incorporate (less than 2 inches deep) Ipimethalin-L into preformed beds before transplanting.

**Additional Use in Idaho, Oregon, and Washington:** Apply Ipimethalin-L as a broadcast treatment when onions or shallots are between the flag leaf to 9 true leaf stage. For dodder control on medium and fine textured soils, Ipimethalin-L may be used at 3.6 to 4.8 pints per acre. **Do not** use chemigation to apply Ipimethalin-L at the dodder control rate.

Ipimethalin-L may be applied in the fall or spring to the furrow area of land bedded in the fall in preparation for planting seed of dry bulb onions the following spring. Apply Ipimethalin-L as a banded application using rates based on appropriate soil texture. Band width should be approximately one-half the width of the row spacing. Keep Ipimethalin-L away from the area where onion seed will be planted. Before planting onions, harrow-off tops of beds following Ipimethalin-L furrow applications. For selective weed control in the onion row, apply Ipimethalin-L as a banded postemergence application to flag leaf onions at the labeled rates based on soil texture. Apply Ipimethalin-L only once to the furrow area and once to the onion row as a postemergence treatment.

**Additional Use in Michigan:** For mineral soils containing >10% organic matter, follow the directions for muck soils (see below).

**In California:** Ipimethalin-L may only be applied as a single application when onions or shallots have 2 to 6 true leaves.

## **Use Directions for Muck Soils (Onions Only)**

On muck soils in all states **except California**, Ipimethalin-L may be applied sequentially to **onions only** on muck soils by following the given rates and application timings indicated below:

### **Broadcast Application Rates and Application Timing for Muck Soils**

Application Timing and Growth Stage	Ipimethalin-L (pint/acre)
Preemergence through loop stage	2.4 to 4.8
Early postemergence (2 to 6 true leaf stage)	3.6 to 4.8
Late postemergence (6 to 9 true leaf stage)	3.6 to 4.8

- **Do not** apply more than 14.4 pints of Ipimethalin-L per acre per growing season on muck soils. To maximize crop safety, ensure good soil coverage during planting or transplanting. In addition, delay preemergence applications to the loop stage if possible.
- **Do not** apply Ipimethalin-L as a preemergence treatment through the loop stage if heavy rains are expected or severe crop injury may result. **Do not** irrigate in excess of 0.5 inches of water if irrigating immediately after applying Ipimethalin-L at the preemergence through loop stage.
- **Preharvest Interval: Do not** apply within 45 days of harvest.
- **Do not** plant sugar beets, red beets, spinach, winter wheat, or winter barley as rotational crops on muck soils for 12 months from the time of last application if more than 3.6 pints of Ipimethalin-L per acre is applied to the onion crop. See the Follow Crop Restrictions section in this label booklet for additional follow crop restrictions.
- If loss of onion crop occurs as a result of adverse weather conditions, **do not** replant any crop other than onions in muck soil during the same cropping year. **Do not** rework the soil deeper than 2 inches.
- **Do not** use on muck soils in California.

## GRAIN SORGHUM

Ipimethalin-L or Ipimethalin-L plus atrazine may be applied as a postemergence incorporated application in grain sorghum grown in all states.

In addition, Ipimethalin-L plus atrazine may be applied as an early postemergence treatment in grain sorghum grown in states east of the Mississippi River and in Arkansas, East Texas, Louisiana, and the Missouri "bootheel."

### Postemergence Incorporated Application (For Use in All States)

#### General Directions and Precautions

Ipimethalin-L or Ipimethalin-L plus atrazine tank mixtures applied as a postemergence incorporated treatment will provide control of most late season annual grasses and certain broadleaf weeds in grain sorghum.

Ipimethalin-L treatments can be applied from the 4-inch growth stage until the last cultivation (layby) of grain sorghum.

Ipimethalin-L plus atrazine must be applied before the grain sorghum reaches 12 inches in height. Ipimethalin-L treatments will not control established weeds. **Destroy emerged weeds by cultivation prior to applying Ipimethalin-L.**

Postemergence incorporated treatments of Ipimethalin-L or Ipimethalin-L plus atrazine tank mixture can be applied in grain sorghum previously treated with herbicides registered for use in grain sorghum. Consult the labels of those herbicides for suggested treatments, rates to be used, and precautions or restrictions for use in grain sorghum and for Follow Crop Restrictions.

- **Do not** apply Ipimethalin-L in grain sorghum as a preplant incorporated treatment or preemergence treatment because serious crop injury can occur.
- **Do not** apply Ipimethalin-L in grain sorghum that is planted in double row beds because this cultural practice does not allow adequate soil coverage of the bases of the grain sorghum plants with cultivation.

**Postemergence Incorporated Applications: Alone or in Tank Mixture with Atrazine**

1. Cultivate using a sweep-type or rolling cultivator operated at a speed that will throw at least 1 inch of soil over the bases of the grain sorghum plants. This will kill small weed seedlings growing in the grain sorghum row and it will prevent direct contact of the zone of brace root formation by Ipimethalin- L during application.
2. Apply broadcast with a ground sprayer when grain sorghum is at least 4 inches tall until layby or last cultivation (atrazine must be applied before grain sorghum reaches 12 inches tall). Use drop nozzles if crop foliage will prevent uniform coverage of the soil surface within the rows.
3. Uniformly and thoroughly incorporate Ipimethalin-L treatments into the soil (1) with a sweep-type or rolling cultivator set to provide thorough incorporation in the top 1 inch of soil or (2) with adequate irrigation (water or rainfall). For best results, incorporate Ipimethalin-L treatments as soon as possible after application. Incorporation must be completed within 7 days after application. If adequate moisture is not received within 7 days after application, incorporate Ipimethalin-L with a sweep-type or rolling cultivator.

Under situations of low rainfall or soil moisture, when deep germinating weeds such as shattercane or field sandbur are anticipated, mechanical incorporation will provide the best results.

If cultivation is needed after application and incorporation of Ipimethalin-L, the depth of cut should be no deeper than the depth of cut used to incorporate.

Do not apply Ipimethalin-L in grain sorghum more than one time per crop season.

**Broadcast Application Rate: Postemergence Incorporated in Grain Sorghum**

Soil Texture	Ipimethalin-L (pint/acre)	
	Southern States†	Northern States†
Coarse	1.2 to 1.8	1.8 to 2.4
Medium	1.8 to 2.4	2.4 to 3.6
Fine	1.8 to 3.6	2.4 to 3.6

† See map at end of this label for specific states.

For Ipimethalin-L plus atrazine tank mixtures, apply 1 lb active ingredient per acre of atrazine. Do not apply tank mixture on coarse soils.

**Note:** Livestock can graze or be fed forage from treated grain sorghum after 21 days following application. Observe all precautions, limitations, and follow crop restrictions on atrazine labels.

**Early Postemergence Application**

For use in states east of the Mississippi River, in addition to Arkansas, East Texas, Louisiana, and the Missouri "boothel" only.

**Application Directions**

The seedbed should be firm and free of clods and trash. To provide good seed coverage, use only where adequate tillage is practiced. Plant grain sorghum **at least** 1 1/2 inches deep to ensure good seed coverage.

Uniformly apply Ipimethalin-L plus atrazine tank mix treatment in water by ground equipment or by aircraft. Apply Ipimethalin-L plus atrazine tank mixture only after grain sorghum has reached the 2-leaf stage and when weeds are no more than 1 inch tall.

- **Do not** apply Ipimethalin-L in grain sorghum as a preplant incorporated treatment or preemergence treatment because serious crop injury can occur.
- **Do not** apply in liquid fertilizer.

Ipimethalin-L plus atrazine treatments control weeds most effectively when adequate rainfall or overhead irrigation is received within 7 days after application. If cultivation is necessary due to soil crusting, soil compaction, or weed germination before rain or irrigation, use shallow tillage (such as a rotary hoe), and make certain grain sorghum seeds are below the tilled area. Wait 7 to 10 days after application before cultivating.

**Broadcast Application Rates: Ipimethalin-L plus Atrazine Early Postemergence in Grain Sorghum**

Soil Texture	Ipimethalin-L + Atrazine
Coarse	<b>DO NOT USE</b>
Medium	1.8 to 2.4 pints + 1 to 1.2 lb a.i.
Fine	2.4 pints + 1 to 1.2 lb a.i.

The high rate for each soil texture listed above should be used if heavy weed populations are anticipated.

**Note: Do not** replant grain sorghum if crop loss occurs as a result of weather conditions. Observe all precautions, limitations and follow crop restrictions on atrazine labels. Livestock can graze or be fed forage from Ipimethalin-L plus atrazine treated grain sorghum fields after 21 days following application.

**NONBEARING FRUIT AND NUT CROPS AND VINEYARDS**

**General Directions and Precautions**

Ipimethalin-L may be applied for preplant incorporated, preplant surface or preemergence control of most annual grasses and certain broadleaf weeds and most annual grasses in various nonbearing fruit and nut crops and vineyards. Ipimethalin-L may be used before or after transplanting the following nonbearing crops:

- |            |           |                 |
|------------|-----------|-----------------|
| almond     | lemon     | pistachio       |
| apple      | nectarine | plum            |
| apricot    | orange    | prune           |
| cherry     | peach     | tangelo         |
| citrus     | pear      | tangerine       |
| grape      | pecan     | walnut, English |
| grapefruit |           |                 |

Ipimethalin-L treatments control weeds most effectively when adequate rainfall or irrigation is received within 21 days after application.

Ipimethalin-L controls most annual grasses and certain broadleaf weeds as they germinate, but Ipimethalin-L will not control established weeds. Destroy existing weeds before or during application of Ipimethalin-L.

**Precautions:**

- Apply the spray directly to the ground under trees or vines. **Do not** apply above trees or vines with leaves or buds. Contact with leaves, shoots or buds by the spray mixture may cause plant tissues to become malformed.
- **Do not** apply to newly transplanted trees or vines until ground has settled and no cracks are present.

- **Do not** feed forage or graze livestock in treated fields.
- **For Newly Transplanted and One-Year-Old Grapevines:** Apply only to dormant grapevines. If buds have started to swell, **do not** apply. Leaf distortion may result if applied after the buds have started to swell.

### Use Methods and Timings

**Preplant Surface Application:** Uniformly apply in 10 gallons of water or more per acre (broadcast basis) with ground or aerial equipment prior to transplanting at the use rates listed in the table below. Treatments with Ipimethalin-L are most effective in controlling weeds when adequate rainfall or irrigation is received within 21 days after application. Avoid root contact with treated soil when placing transplants into the hole or injury may occur.

**Preplant Incorporated Application:** Uniformly apply Ipimethalin-L at the use rates listed in the table below before transplanting and before weeds emerge. Incorporate Ipimethalin-L to a depth of 1 to 2 inches. To mechanically incorporate, use Flex-tyne drag or diamond-toothed harrows operated 2 times at more than 5 mph with the second pass made at an angle to the first. Apply Ipimethalin-L and incorporate prior to transplanting to avoid mechanical injury to the crop. Avoid root contact with treated soil when placing transplants into the hole or injury may occur. Ipimethalin-L may be applied through properly equipped chemigation systems.

**Preemergence (Postplant) Application:** Uniformly apply in 10 gallons of water or more per acre (broadcast basis) with ground equipment. Applications may be band or broadcast.

### Application Rates in Nonbearing Fruit and Nut Crops and Vineyards

Use rates recommended for Ipimethalin-L alone and in tank mix applications are given in the following table.

#### Broadcast Application Rates: Preplant or Preemergence in Nonbearing Fruit and Nut Crops and Vineyards

Length of Control	Ipimethalin-L (quart/acre)
Short-term control (4 months)	2.4
Long-term control (6 to 8 months)	4.8

### Tank Mixes in Nonbearing Fruit and Nut Crops and Vineyards

Ipimethalin-L may be used in combination with a herbicide registered for use in the specific nonbearing crop to remove existing vegetation. Refer to the label of the contact herbicide for all directions, precautions and restrictions.

### Chemigation to Nonbearing Tree and Vine Crops

Apply Ipimethalin-L to nonbearing tree and vine crops through solid set, hand move, low volume sprinkler (micro sprinkler) and drip (trickle) irrigation systems. Follow all recommendations, special instructions, and precautions in the Chemigation section at the beginning of this label. **Do not** apply this product through any other type of irrigation system to nonbearing tree and vine crops.

**Low Volume Sprinkler (Micro Sprinkler) and Drop (Trickle) Irrigation Instructions:** Use a low volume sprinkler, 4 to 50 gallons per hour (gph) per emitter, drip 0.5 to 3 gph per emitter. The point of application should be above ground. The irrigation system should run a sufficient amount of time before injecting Ipimethalin-L in order to have all emitters functioning properly. After the system is operating properly, the length of injection should be that at one period of time during the injection, the first and last emitters in the system contain water treated with Ipimethalin-L. Add Ipimethalin-L to the supply tank that

is already filled with the required amount of water for the injection period. Maintain proper agitation in the injection tank. Mix Ipimethalin-L in clean water and inject down-line from filters. Following the injection, the system should be flushed for a period of time sufficient to clear the line of Ipimethalin-L. (If Ipimethalin-L is applied during a normal irrigation cycle, injection should be made during the last stage.)

**Chemigation Calibration (for Low Volume Micro Sprinklers):** The use rate calculation is based on **wetted area** around emitters, **not** on tree acres. To determine the correct amount of Ipimethalin-L, use the following formula:

1. Treated area per each emitter = A  
 $A = 3.14 \times (\text{radius} \times \text{radius})$

Example: If the average distance from emitter to perimeter of wetted area measured 1 inch below soil surface is 13 inches, then,

$$A = 3.14 \times (13 \times 13)$$

$$A = 3.14 \times (169)$$

$$A = 530.7 \text{ sq inches}$$

2. The area in square feet wet in each acre = B

$$B = \frac{A \times \text{emitters/acre}}{144}$$

Example: If there are 300 emitters per acre, then,

$$B = \frac{530.7 \times 300}{144} = B = 1105.6 \text{ sq ft wetted per acre}$$

3. The total area (in sq ft) wet by your system = C  
 $C = B \times \text{acres covered by system}$

Example: If the system covers 20 acres, then,

$$C = 1105.6 \text{ sq ft per acre} \times 20 \text{ acres}$$

$$C = 22,112 \text{ sq ft wetted by system}$$

4. Amount of Ipimethalin-L to inject = S  
 Rate per treated acre of Ipimethalin-L = R

$$S = \frac{C \times R}{43,560} = \text{quarts of Ipimethalin-L}$$

Example: If the desired application rate per treated acre is 2.4 quarts of Ipimethalin-L, then,

$$S = \frac{22,112}{43,560} \times 2.4 = S = 1.22 \text{ quarts of Ipimethalin-L should be injected into system.}$$

**Note:** Select the proper rate (R) based on length of control required.

## PEANUTS

### General Directions and Precautions

- Ipimethalin-L may be applied as a preplant incorporated treatment in peanuts.
- **Do not** use in California.



- If crop loss occurs as a result of weather conditions, peanuts or any crop registered for Ipimethalin-L preplant incorporated use can be replanted without adverse effects during the same year. **Do not** rework the soil deeper than the treated zone if replanting is necessary.

### Use Methods and Timings

**Preplant Incorporated Application:** Apply Ipimethalin-L up to 60 days before planting and incorporate within 7 days of application. Apply Ipimethalin-L tank mixes as specified under the tank mix section.

### Application Rates in Peanuts

Use rates recommended for Ipimethalin-L alone and in tank mix applications are provided in the following table.

#### Broadcast Application Rates in Peanuts

Region	Ipimethalin-L (pint/acre)
Texas, Oklahoma and New Mexico	1.2 to 2.4
Other peanut growing states	1.8 to 2.4

In Alabama, Georgia or Florida, up to 3.6 pints of Ipimethalin-L can be used for heavy weed infestations, especially of Texas panicum.

### Tank Mixes in Peanuts

Ipimethalin-L may be applied in a tank mix with imazethapyr, metolachlor or vernolate labeled for use in peanuts. Refer to the label of the companion product for weeds controlled in addition to Ipimethalin-L alone.

When using Ipimethalin-L with tank mixtures, always read the labels of companion products to determine the specific use rates by soil types, weed species, and weed or crop growth stage. In addition, follow all precautions and restrictions, including state and local use restrictions, that may apply to specific products. Always follow the most restrictive label directions.

Follow additional use directions in this table for tank mixes with Ipimethalin-L. (Refer to application rate table Broadcast Application Rates in Peanuts to determine appropriate use rates for Ipimethalin-L.)

Ipimethalin-L Plus:	Tank Mix Use Directions
Imazethapyr (see imazethapyr product label for rate information)	<p><b>Preplant Incorporated Application:</b> Apply by ground equipment only up to 45 days before planting and incorporate within 7 days of application. Apply and incorporate after bed formation if crop will be planted on beds.</p> <ul style="list-style-type: none"> <li>• Read and strictly follow all precautions and directions on the label for imazethapyr.</li> <li>• <b>Do not</b> apply tank mix preplant incorporated in West Texas, New Mexico and Arizona.</li> </ul>
Metolachlor (see metolachlor product label for rate information)	<p><b>Preplant Incorporated Application:</b> Apply up to 14 days before planting and incorporate within 7 days of application. Apply and incorporate after bed formation if crop will be planted on beds.</p> <ul style="list-style-type: none"> <li>• Read and strictly follow all precautions and directions on the label for the metolachlor product.</li> </ul>
Vernolate (see vernolate product label for rate information)	<p><b>Preplant Incorporated Application:</b> Apply with ground sprayer only up to 10 days before planting. Incorporate <b>immediately</b> (within minutes) after application to prevent loss of vernolate. Whenever possible, application</p>

information)	<p>and incorporation should be done during the same operation.</p> <p><b>Incorporation Instructions:</b> Use power driven cultivation equipment set to cut to a depth of 2 to 3 inches or tandem disks set to cut to a depth of 4 to 6 inches, operated at 4 to 6 mph, followed by a spike-toothed harrow or some other leveling device that extends beyond the ends of the disks. For thorough mixing, disk in 2 different directions (cross disk). Before the second disking, raise the disk to avoid cutting deeper than 4 to 6 inches.</p> <ul style="list-style-type: none"> <li>• Read and strictly follow all precautions and directions on the label for vernolate.</li> <li>• <b>Do not</b> plant seed deeper than 2 inches.</li> </ul>
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## Peas (English, Dry, Garden, Dwarf, Green, Pigeon, Edible Pod, and Lentils)

### General Directions and Precautions

- Ipimethalin-L may be applied as a preplant incorporated treatment for weed control in peas.
- **Do not** use in California.
- **Do not** apply Ipimethalin-L as a preemergence application in peas.
- **Chemigation: Do not** apply Ipimethalin-L to peas through any type of irrigation system.
- Do not use on muck or peat soils.
- **Note:** If crop loss occurs as a result of weather conditions, peas or any crop for which Ipimethalin-L is registered as a preplant incorporated treatment can be replanted into soil treated with Ipimethalin-L without adverse effects. Do **not** rework the soil deeper than the original treated zone if replanting is necessary.
- Any crop for which Ipimethalin-L is registered as a preplant incorporated treatment may be double cropped following peas.
- **Do not** apply Ipimethalin-L more than once per cropping season. **Do not** apply to peas, lentils, pea or lentil forage, pea silage, pea hay or pea straw grown for livestock feed.
- When Ipimethalin-L is applied in tank mix combinations, refer to the labels of the tank mix products for additional rotational crop restrictions. Always follow the most restrictive label requirement.

### Use Methods and Timings

**Preplant Incorporated Application:** Uniformly apply the recommended rate of Ipimethalin-L in 10 gallons of water or more per acre or in 20 gallons of liquid fertilizer or more per acre using ground equipment. If applied by aircraft, apply in 5 gallons of water or more per acre.

**Soil Preparation and Application Timing:** Thoroughly mix surface residues from previous crop into the soil to a depth of 4 to 6 inches by plowing or disking prior to application. Ipimethalin-L may be applied immediately before planting or up to 60 days before planting.

After application, rotary hoeing, shallow cultivation/tillage, or hand hoeing can be practiced without reducing weed control, but loss of weed control may result if tillage is deep enough to bring untreated soil to the surface.

An Ipimethalin-L treatment may be followed by a treatment with any registered herbicide to control weeds not listed on the label for Ipimethalin-L.

### Application Rates in Peas

Use rates recommended for Ipimethalin-L alone and in tank mix applications are provided in the following table.

## Broadcast Application Rates: Preplant Incorporated in Peas

Soil Texture <sup>†</sup>	Ipimethalin-L (pint/acre)
Coarse	1.2 to 1.8
Medium	1.8 to 2.4
Fine	2.4 to 3.6

<sup>†</sup>Refer to the label booklet for Ipimethalin-L for information on soil texture classification.

For each soil texture, use the high rate in the rate range where heavy weed populations are anticipated or if heavy crop residues were present prior to seedbed preparation. In all cases, use the 3.6 pint per acre rate for heavy clay soils.

## POTATOES

### General Directions and Precautions

Ipimethalin-L may be applied as a preemergence treatment, preemergence incorporated treatment or early postemergence treatment in potatoes. **Do not** apply to sweet potatoes or yams. Apply to a firm seedbed that is free of clods and trash.

- **Do not** apply before planting crop.
- Ipimethalin-L treatments control weeds most effectively when adequate rainfall or irrigation is received within 7 days of application.
- **Do not** make more than 1 application of Ipimethalin-L per season.
- If crop loss occurs as a result of weather conditions, any crop registered for Ipimethalin-L preplant incorporated use can be replanted without adverse effects the same year. **Do not** rework the soil deeper than the treated zone if replanting is necessary.
- Applying Ipimethalin-L on White Rose variety potatoes during or followed by cool and/or wet weather conditions may result in crop injury.
- Ipimethalin-L is not recommended for use on peat or muck soils.

### Use Methods and Timings

**Preemergence Application:** Apply Ipimethalin-L after planting but before potatoes and weeds emerge or after drag-off where this operation is practiced. Apply Ipimethalin-L tank mixes as specified under the tank mix section.

**Preemergence Incorporated Application:** Apply Ipimethalin-L and incorporate after planting but before potatoes and weeds emerge. Where drag-off is practiced, apply Ipimethalin-L and incorporate before, at, or after drag-off, but before potatoes and weeds emerge. Incorporate Ipimethalin-L within 7 days of application. Apply Ipimethalin-L tank mixes as specified under the tank mix section.

Ipimethalin-L must be uniformly and thoroughly incorporated into the top 1 to 2 inches of soil. Use care to ensure that incorporation equipment does not damage seed pieces or elongating sprouts.

Mechanical incorporation is not required if adequate rainfall for good crop and weed emergence occurs or irrigation is received within 7 days after application.

**Early Postemergence Application:** Apply Ipimethalin-L from crop emergence until the 6-inch stage of growth. **Do not** apply Ipimethalin-L postemergence if potatoes are under stress from cold/wet or hot/dry conditions or crop injury may occur. Ipimethalin-L treatments will not control established weeds. Emerged weeds must be destroyed before application. Apply Ipimethalin-L tank mixes as specified under the tank mix section.

**Sprinkler Irrigation System Application:** Apply Ipimethalin-L alone as a preemergence treatment after planting, but before potatoes and weeds have emerged, or after drag-off where this operation is practiced, or early postemergence through sprinkler irrigation systems. See Chemigation section for complete directions (see table of contents for page number).

**Application Rates in Potatoes**

Use rates recommended for Ipimethalin-L alone and in tank mix applications are given in the following table.

**Broadcast Application Rates in Potatoes**

Soil Texture	Ipimethalin-L (pint/acre) <sup>†</sup>	
	<3% Organic Matter	>3% Organic Matter
Coarse	1.2 to 1.8	1.2 to 1.8
Medium	1.8 to 2.4	2.4 to 3.6
Fine	2.4 to 3.6	3.6

<sup>†</sup>Use the high rate for Ipimethalin-L alone applications.

**Tank Mixes in Potatoes**

Ipimethalin-L may be applied in a tank mix with EPTC, linuron, metribuzin or EPTC plus metribuzin labeled for use in potatoes. Refer to the label of the companion product for weeds controlled in addition to Ipimethalin-L alone.

When using tank mixtures with Ipimethalin-L, always read the labels of companion products to determine the specific use rates by soil types, weed species, and weed or crop growth stage. In addition, follow all precautions and restrictions including state and local use restrictions that may apply to specific products. Always follow the most restrictive label directions.

Follow additional use directions in this table for Ipimethalin-L tank mixes. (Refer to the application rate table Broadcast Application Rates in Potatoes to determine the appropriate use rate for Ipimethalin-L.)

Ipimethalin-L Plus:	Tank Mix Use Directions
EPTC (see EPTC product label for rate information)	<p><b>Preemergence Incorporated Application:</b> Apply and incorporate after planting but before potatoes and weeds emerge. In areas where potatoes are normally dragged-off, apply and incorporate following drag-off, but before potatoes and weeds emerge. Incorporate immediately after application.</p> <p><b>Incorporation Directions:</b> Uniformly and thoroughly incorporate into the top 1 or 2 inches of soil. Whenever possible, application and incorporation should be done in the same operation. Use care to ensure that incorporation equipment does not damage seed pieces or elongating sprouts.</p> <p><b>Early Postemergence Application:</b> Apply through sprinkler irrigation systems only from crop emergence to the 6-inch stage of growth. Ipimethalin-L plus EPTC will not control established weeds. Emerged weeds must be destroyed prior to application. Do not apply if potatoes are under stress from cold/wet or hot/dry conditions or crop injury may occur.</p> <ul style="list-style-type: none"> <li>• Read and strictly follow all precautions and directions on the label for EPTC.</li> <li>• The Superior variety potato is sensitive to EPTC and early season</li> </ul>

	<p>stunting may occur under stress conditions.</p> <ul style="list-style-type: none"> <li>• For nutsedge control, use 4.5 to 7 pints of EPTC per acre.</li> </ul>
<p>Linuron (see linuron product label for rate information)</p> <p>For use on potatoes grown East of the Rocky Mountains only</p>	<p><b>Preemergence Application:</b> Apply after planting but before potatoes and weeds emerge or after drag-off or hilling where these operations are practiced.</p> <ul style="list-style-type: none"> <li>• Read and strictly follow all precautions and directions on the label for linuron.</li> <li>• Plant seed pieces at least 2 inches deep.</li> <li>• <b>Do not</b> use on sands and loamy sands (except in Wisconsin-Central Sands Area), gravelly soils or exposed subsoils, or on soils containing less than 1% organic matter because injury to the treated crop or subsequent crops may occur.</li> <li>• Wisconsin-Central Sands Area Only: Ipimethalin-L plus linuron tank mixture may be used on sands and loamy sands. Sands - apply 1.2 to 1.8 pints of Ipimethalin-L plus 1 lb of linuron or 1 pint of linuron per acre. Loamy sand - apply 1.2 to 1.8 pints of Ipimethalin-L plus 2 lb of linuron or 2 pints of linuron per acre.</li> </ul>
<p>Metribuzin (see metribuzin product label for rate information)</p>	<p><b>Preemergence Application:</b> Apply after planting but before potatoes and weeds emerge or after drag-off where this operation is practiced.</p> <p><b>Early Postemergence Application:</b> Apply from crop emergence to the 6-inch stage of growth. For optimum weed control, apply before weeds are 1 inch tall. Do not apply within 24 hours of applying other pesticides. Do not apply within 3 days after periods of cool, wet or cloudy weather or crop injury may occur. Do not use on early maturing, smooth-skinned white or red-skinned potato varieties.</p> <ul style="list-style-type: none"> <li>• Read and strictly follow all precautions and directions on the label for metribuzin. Observe organic matter restrictions on the labels.</li> <li>• This combination may be applied through sprinkler irrigation systems.</li> </ul>
<p>EPTC plus Metribuzin (see EPTC and metribuzin product labels for rate information)</p> <p>Do not use in California</p>	<p><b>Early Postemergence Application:</b> Apply through sprinkler irrigation systems only from crop emergence to the 6-inch stage of growth. For optimum weed control, apply before weeds are 1 inch tall.</p> <ul style="list-style-type: none"> <li>• Read and strictly follow all precautions and directions on the labels for EPTC and metribuzin. Observe organic matter restrictions on the labels for metribuzin.</li> <li>• Do not apply within 24 hours of applying other pesticides.</li> <li>• Do not apply within 3 days after periods of cool, wet or cloudy weather or crop injury may occur.</li> <li>• Do not use on early maturing, smooth-skinned white or red-skinned potato varieties.</li> <li>• The Superior variety potato is sensitive to EPTC and early season stunting may occur under stress conditions.</li> <li>• Do not apply within 60 days of potato harvest.</li> <li>• For nutsedge control, use 4.5 to 7 pints of EPTC per acre.</li> </ul>
<p>EPTC plus Metribuzin (see EPTC and metribuzin product labels for rate information)</p>	<p><b>Preemergence Application:</b> Apply with ground equipment only after planting but before potatoes and weeds emerge.</p> <ul style="list-style-type: none"> <li>• Read and strictly follow all precautions and directions on the label for metribuzin. Observe organic matter restrictions on the label.</li> <li>• The Superior variety potato is sensitive to EPTC and early season stunting may occur under stress conditions.</li> </ul>

For use in Idaho, Oregon and Washington only	<ul style="list-style-type: none"> <li>Do not make more than 1 application per season.</li> </ul>
EPTC plus Metribuzin (see EPTC and metribuzin product labels for rate information)  For use in Idaho, Oregon and Washington only	<p><b>Preemergence Application:</b> Apply with sprinkler irrigation systems after planting before potatoes and weeds emerge.</p> <ul style="list-style-type: none"> <li>Read and strictly follow all precautions and directions on the label for metribuzin. Observe organic matter and variety restrictions on the label.</li> <li>Add metribuzin first and mix thoroughly before adding EPTC. After mixing is complete add Ipimethalin-L. Maintain continuous agitation while adding herbicides and until spraying is completed.</li> <li>The Superior variety potato is sensitive to EPTC and early season stunting may occur under stress conditions.</li> <li>Do not make more than 1 application per season.</li> </ul>
Rimsulfuron (see rimsulfuron product label for rate information)	<p><b>Preemergence Application:</b> Apply after planting but before potatoes and weeds emerge or after drag-off where this operation is still practiced.</p> <ul style="list-style-type: none"> <li><b>Do not</b> apply by air.</li> <li><b>Do not</b> use on potatoes grown for seed.</li> <li>Use the most restrictive rotational crop interval.</li> <li>To avoid injury to desirable crops, follow Sprayer Tank Cleanout directions on the label for rimsulfuron.</li> <li>Read and follow all precautions on the label for rimsulfuron.</li> </ul>

## RICE

### General Directions and Precautions

- Apply Ipimethalin-L plus quinclorac, propanil (or propanil/molinate) or propanil plus bensulfuron-methyl labeled for use in rice as an early postemergence treatment in dry-seeded rice.
- Apply Ipimethalin-L alone or in a tank mix with quinclorac, thiobencarb or glyphosate labeled for use in rice as a delayed preemergence treatment in drilled, dry-seeded rice. **Do not** use in California.
- Do not** use this product on water seeded rice.
- This pesticide is toxic to fish and aquatic organisms. Fish may be killed at the recommended application rates. **Do not** contaminate water by cleaning of equipment or disposal of wastes.
- Do not** apply to rice fields if fields are used for fish production, especially catfish or crayfish farming.
- Do not** exceed the maximum rates listed on the label for any soil type in one season.
- Do not** bale or use rice straw from treated fields for feed or bedding.
- Do not** use water containing Ipimethalin-L residues from rice cultivation to irrigate food or feed crops that are not registered for use with Ipimethalin-L.
- Do not** plant crops in Ipimethalin-L treated fields unless Ipimethalin-L is registered for use on those crops.
- If crop failure occurs as a result of weather conditions or disease following treatment with Ipimethalin-L alone or in a tank mixture, only drilled dry-seeded rice may be immediately replanted. However, the grower assumes all risks and consequences associated with replanting of rice because there is the potential for stand reduction or stunting. A 10% increase in seeding rate is recommended. Replant seed below the herbicide layer because reduced stand or stunting may occur if Ipimethalin-L comes into contact with germinating rice seed. **Do not** replant with gibberellic acid-treated seed. **Do not** reapply Ipimethalin-L alone or in a tank mixture.
- When using tank mixes with Ipimethalin-L, always read the labels of companion products and follow all precautions and restrictions. Always follow the most restrictive label.
- Ipimethalin-L is not recommended for use on peat or muck soils.

## Early Postemergence Applications in Dry Seeded Rice

### Ipimethalin-L plus Propanil/Molinate or Propanil

Ipimethalin-L plus propanil/molinate or propanil labeled for use in rice are postemergence treatments combining the direct contact action of propanil and the residual activity of Ipimethalin-L. Since the residual activity of Ipimethalin-L provides preemergence control of certain annual grasses that can germinate after this tank-mix treatment is applied, flooding after application can be delayed.

For maximum weed control, it is important to carefully follow the directions below for (1) adequate spray coverage of weeds and soil and (2) proper timing of application, which is when barnyardgrass (watergrass) is in the 1 to 3 leaf stage of growth with an occasional 4 leaf plant (apply when sprangletop is less than 1/2 inch in height).

The seedbed should be firm and free of clods and trash. The seedbed must be prepared to allow for good seed coverage. Before planting rice, previous crop residues should be thoroughly mixed into the soil to a depth of 4 to 6 inches by plowing or disking.

Using aircraft or ground equipment, uniformly apply recommended Ipimethalin-L plus propanil/molinate or Ipimethalin-L plus propanil treatment after rice emergence, according to spraying directions for rice. This is when barnyardgrass is in the 1 to 3 leaf growth stage with an occasional 4 leaf plant (apply when sprangletop is less than 1/2 inch). The grower should inspect fields frequently to check growth of barnyardgrass and/or sprangletop to determine proper application timing. Application timing should be based on the growth stage of barnyardgrass and/or sprangletop and not on the growth stage of rice. If rice is too small to maintain a flood on the field, the treatment can still be applied because flooding can be delayed due to the residual activity of Ipimethalin-L.

While the residual activity of Ipimethalin-L allows flooding to be delayed, proper water management practices must be followed for normal rice growth. If weeds begin to develop after application, flooding should not be delayed. No flood water should be on the field at time of application because soil and weeds must be completely exposed to spray coverage. If necessary, fields may be flushed prior to treatment to produce vigorous rice and weed growth.

Since moisture activates the residual activity of Ipimethalin-L, Ipimethalin-L controls emerging weeds most effectively when adequate rainfall or irrigation (flush) is received within 7 days after application.

For maximum direct contact activity of propanil or propanil/molinate, delay application if there is a chance of rain within 6 to 8 hours.

Do not apply this tank mixture within 14 days before or after insecticide applications because serious damage to rice may occur.

### Application Rates in Rice

Use rates recommended for Ipimethalin-L in tank mix applications are given in the following table.

Broadcast Application Rates for Ipimethalin-L plus Propanil/Molinate or Propanil Tank Mixtures in Rice

Soil Texture	Ipimethalin-L (pint/acre)	Propanil/Molinate or Propanil <sup>†</sup> (pint/acre)
Coarse	1.8	6 to 8
Medium	1.8 to 2.4	6 to 8
Fine	1.8 to 2.4	6 to 8

<sup>†</sup> Based on 4 lb of active ingredient per gallon

Use the high rate of propanil/molinate or propanil if the following situations exist at the time of application: (1) unseasonably cool weather; (2) barnyardgrass has progressed to predominantly the 3 to 4 leaf stage; or (3) emerged sprangletop (less than 1/2 inch) is present.

### **Ipimethalin-L plus Propanil plus Bensulfuron-methyl**

Preflood Application: Ipimethalin-L plus propanil (or propanil/molinate) may be tank mixed with bensulfuron-methyl for early postemergence weed control. Bensulfuron-methyl provides improved control of certain broadleaves and sedges when applied as a preflood postemergence application. Refer to the label for bensulfuron-methyl for specific weeds controlled. Apply bensulfuron-methyl at 0.75 to 1 oz per acre with Ipimethalin-L plus propanil 1 to 7 days before establishment of the permanent flood. At the time of application, weeds should be actively growing.

**Preflood Sequential Applications:** Ipimethalin-L plus propanil (or propanil/molinate) plus bensulfuron-methyl may be applied in a sequential application with bensulfuron-methyl plus propanil (or propanil/molinate). Apply bensulfuron-methyl at 0.50 to 0.75 oz per acre with Ipimethalin-L plus propanil when broadleaf weeds are in the cotyledon to 4-leaf stage and the sedges are 3 to 6 inches tall. If

needed, apply the second application of bensulfuron-methyl plus propanil 1 to 7 days before establishment of the permanent flood.

### **Ipimethalin-L plus Quinclorac**

Ipimethalin-L plus quinclorac herbicides may be tank mixed for early postemergence weed control in dry-seeded rice. This mixture provides broad-spectrum grass and certain broadleaf weed control, especially where sprangletop (*Leptochloa* spp.) is a problem.

Quinclorac controls the emerged grasses and broadleaves listed on its label. Refer to the label for quinclorac for weed size limitations. Ipimethalin-L provides residual control of labeled grass weeds that can germinate after this tank mixture is applied and that quinclorac does not control.

For maximum weed control, it is important to carefully follow the directions below for (1) adequate spray coverage of weeds and soil; and (2) proper timing of application. Ipimethalin-L will not control emerged weeds. Quinclorac does not control sprangletop. Therefore, schedule spraying before sprangletop emergence.

Ipimethalin-L plus quinclorac tank mixture may be applied early postemergence as follows:

1. Treatments may be applied to conventional, reduced or minimum tillage, and no-till (stale seed-bed) rice. The seedbed should be firm and free of clods. The seedbed must be prepared to allow for complete soil coverage of the rice seed. Using a planter under conditions that prevent good soil coverage of the rice seed can cause reduced stand or stunting if Ipimethalin-L comes into contact with germinating rice seed.
2. Apply when soil surface is dry, moist, or wet without standing water. Fields may be flushed prior to treatment to produce vigorous rice and weed growth if necessary. No flood water should be on the field at time of application because soil and weeds must be completely exposed to spray coverage. Soil clods or standing water (puddles) at the time of application, or cracks in the soil that form after application, may result in reduced weed control.
3. Uniformly apply the recommended Ipimethalin-L plus quinclorac treatment after rice emergence (spiking), and at the correct timing for quinclorac, by aircraft or ground equipment according to spraying directions for rice. Refer to timing directions and illustrations in the label for quinclorac. The grower should inspect fields frequently to check growth of sprangletop, other labeled weeds, and rice to determine proper application timing.



4. For maximum direct contact activity of quinclorac, delay application of the tank mix if there is a chance of rain within 6 to 8 hours.
5. Because the residual activity of the Ipimethalin-L plus quinclorac allows for delayed flooding, this treatment may be applied if rice is too small to maintain a flood on the field for weed control. However, for normal rice grow1h and activity of Ipimethalin-L and quinclorac, proper water management practices must be followed. Refer to the Water Management section of the label for quinclorac. If weeds begin to develop after application, flooding should not be delayed.

Since moisture activates the residual activity of Ipimethalin-L and quinclorac. the tank mix is most effective in controlling emerging weeds when adequate rainfall or irrigation (flush) is received within 3 to 7 days after application or when new grass/weeds have emerged and are less than 1 inch tall.

**Broadcast Application Rate: Early Postemergence in Rice for Ipimethalin-L plus Quinclorac**

Soil Texture	Ipimethalin-L (pint/acre)	Quinclorac (lb/acre)
Coarse	1.8	0.5
Medium	1.8 to 2.4	0.5
Fine	1.8 to 2.4	0.5

Use the higher rate of Ipimethalin-L for each soil texture if heavy weed populations are anticipated.

**Mixing Directions:** Refer to the label for quinclorac for sections on mixing/spraying and on adjuvant for postemergence application. Addition of crop oil concentrate is required for application of quinclorac. Do not use liquid fertilizer solution. Add quinclorac to a half-full spray tank of clean water with agitation running. After the quinclorac is thoroughly mixed, add Ipimethalin-L. Mix thoroughly. Then, add the recommended amount of crop oil concentrate (see label for quinclorac) and remaining volume of water. Agitate constantly during the application process.

**Delayed (Late) Preemergence Application**

Ipimethalin-L alone, or a tank mixture of Ipimethalin-L plus glyphosate, quinclorac or thiobencarb herbicides labeled for use in rice may be applied for delayed (late) preemergence weed control in grain-drilled, dry-seeded rice.

The tank mixtures will provide broad-spectrum grass and certain broadleaf weed control. Tank mixtures are especially effective where sprangletop (*Leptochloa* spp.) is a problem. Ipimethalin-L alone will not control broadleaf weeds. A postemergence application of propanil, propanil/molinate, thiobencarb, quinclorac or bensulfuron-methyl herbicide may be necessary to control weeds during the entire season.

Glyphosate or quinclorac will control the emerged grasses and broadleaves listed on their label. Ipimethalin-L will provide residual control of labeled grass weeds that can germinate after the tank mixture has been applied and that quinclorac does not control. Ipimethalin-L will not control emerged weeds. Quinclorac does not control sprangletop. Accordingly, schedule spraying before sprangletop emergence.

For maximum weed control and rice stand, it is important to carefully follow the directions below for (1) adequate spray coverage of soil; and (2) proper application timing:

1. Treatments may be applied to conventional, reduced or minimum tillage, and no-till (stale seedbed) rice. The seedbed should be firm and free of clods, and must be prepared to allow for good seed coverage. Plant rice with a grain drill at a depth that provides complete soil coverage of the rice seed. Using a planter under conditions that prevent good soil coverage of the rice seed can cause reduced stand or stunting if Ipimethalin-L comes into contact with germinating rice seed.

2. Apply Ipimethalin-L alone or in tank mixture to levees after the levees are pulled and planted. Exposed seeds may be injured if they come in contact with Ipimethalin-L or quinclorac.
3. Uniformly apply the recommended Ipimethalin-L plus glyphosate after rice planting (as described below), and before rice emergence (spiking), by aircraft or ground equipment according to spraying directions for rice. The grower should inspect fields frequently to check growth of rice to determine proper application timing.

Uniformly apply the recommended rate of Ipimethalin-L alone, Ipimethalin-L plus quinclorac or Ipimethalin-L plus thiobencarb after rice planting (as described below), and before rice and weed emergence (spiking), by aircraft or ground equipment according to spraying directions for rice. The grower should inspect fields frequently to check growth of rice to determine proper application timing.

4. Apply only when growing conditions favor vigorous rice growth. The seedbed should have adequate moisture for seed germination. If there is insufficient moisture, flushing is recommended before applying Ipimethalin-L to supply moisture for root (radicle) initiation and for vigorous rice and weed growth.

Do not apply Ipimethalin-L and then flush for germination. Do not apply to stressed rice. Stress factors include cold or hot temperature extremes, excessive moisture or drought, problem soils, poor field drainage or deep water after application. Do not apply early preemergence or preplant incorporated because severe rice injury is possible.

5. Apply when soil surface is dry, moist, or wet without standing water. No flood water should be on the field at time of application since soil and weeds (only for glyphosate) must be completely exposed to spray coverage. Soil clods, standing water (puddles) at the time of application, or cracks in the soil that form after application may result in reduced weed control.
6. Apply after the rice seed has absorbed water and germinated and after the soil has been previously sealed over the seed by at least 1 inch of rainfall or by irrigation (flush). If the soil has not been sealed by rain or flush, apply when 80% of germinated seeds have a primary root (radicle) or a shoot at least 1/2 inch long.

If applied to soil before these conditions, or if applied to cracked soil, then stand reduction or stunting of rice may occur. Quinclorac may cause buggy-whipping. Under some conditions, when using gibberellic acid-treated seed, heavy rainfall after application, or flushing after application, may result in herbicide injury to rice. With appropriate cultural practices, rice can overcome moderate injury.

7. For maximum direct contact activity of glyphosate, delay application of the tank mix if there is a chance of rain within 6 or 8 hours.
8. Because the residual activity of Ipimethalin-L alone, Ipimethalin-L plus quinclorac or Ipimethalin-L plus thiobencarb tank mix allows for delayed flooding. This treatment may be applied if rice is too small to maintain a flood on the field for weed control. However, proper water management practices must be followed for normal rice growth and activity of Ipimethalin-L, quinclorac or thiobencarb. Refer to the Water Management section of the label for quinclorac. If weeds begin to develop after application, flooding should not be delayed.

Residual activity of Ipimethalin-L, quinclorac and thiobencarb is most effective when applied to moist soil. Soil should be kept moist after application and not be allowed to crust or crack.

**Broadcast Application Rates: Delayed Preemergence in Rice for Ipimethalin-L Alone, Ipimethalin-L plus Quinclorac, Ipimethalin-L plus Thiobencarb or Ipimethalin-L plus**

## Glyphosate† Tank Mixtures

Soil Texture	Ipimethalin-L (pint/acre)	Quinclorac (lb/acre)	Thiobencarb (pint/acre)
Sands, loamy sands	<b>DO NOT USE</b>	<b>DO NOT USE</b>	<b>DO NOT USE</b>
Sandy loams	1.8	0.33 to 0.44	2 to 3
Learns, silt loams, silts, sandy clay loams	1.8 to 2.4	0.44 to 0.5	3 to 4
Silty clay loams, clay loams, sandy clays, silty clays, clays	1.8 to 2.4	0.5 to 0.67	3 to 4

Use the higher rate of Ipimethalin-L for each soil texture if heavy weed populations are anticipated.

†See the label for glyphosate for recommended rates.

### Mixing Directions

#### Ipimethalin-L Plus Glyphosate Tank Mix

Refer to Mixing Directions in the label booklet for Ipimethalin-L and to Mixing, Additives, and Application directions on the label for glyphosate. **Addition of nonionic surfactant may be required with glyphosate application** (see product label) and use of ammonium sulfate may increase performance.

#### Ipimethalin-L Plus Quinclorac Tank Mix

Refer to the labels of Ipimethalin-L and quinclorac for sections on mixing and spraying. **Do not** use liquid fertilizer solution. Add quinclorac to a half-full spray tank of clean water with agitation running. After the quinclorac is thoroughly mixed, add Ipimethalin-L. Mix thoroughly and then add the remaining volume of water. Agitate constantly during application.

#### Ipimethalin-L Plus Thiobencarb Tank Mix

Add Ipimethalin-L to the half-full spray tank of clean water with agitator running. After Ipimethalin-L is thoroughly mixed, add thiobencarb and mix thoroughly. Then add the remaining volume of water. Agitate constantly during application.

### Spraying Directions

Spray drift can cause injury to sensitive crops. See the labels for propanil or propanil/molinate, quinclorac, thiobencarb and glyphosate for sensitive crops, and follow all recommendations to minimize drift.

- **Chemigation:** **Do not** apply Ipimethalin-L through any type of irrigation system.
- **Do not** apply in liquid fertilizer.

**Aerial Applications:** To ensure adequate coverage, apply the recommended rate in 5 to 10 (10 to 12 for propanil and propanil/molinate) gallons of water per acre. To minimize drift, **do not** apply during periods of gusty winds or when wind conditions favor drift. It is recommended that a flagman or an automatic mechanical flagging unit on the aircraft be used to prevent overlap and possible crop injury.

**Ground Equipment Applications:** To ensure adequate coverage, apply the recommended rate in 10 to 20 (15 to 25 for propanil and propanil/molinate) gallons of water per acre. Use a properly calibrated low-pressure (20 to 40 psi) sprayer equipped with 8002 or larger size Tee-Jet or comparable nozzles for uniform spray distribution and to minimize drift. Keep the bypass line on or near the bottom of the tank to minimize foaming. Nozzle screens must be no finer than 50 mesh. **Do not** apply Ipimethalin-L

during periods of gusty winds or when wind velocity is greater than 20 mph.

## SOYBEANS

### General Directions and Precautions

- Ipimethalin-L may be applied in conventional, minimum, or no-till systems as a fall surface, fall incorporated, preplant surface, preplant incorporated or preemergence application in soybeans, including Roundup Ready soybeans.
- **Do not apply postemergence** because serious crop injury can occur.
- **Do not** make applications of Ipimethalin-L preemergence north of Interstate 80, except as specified in other supplemental labeling.
- **Do not** use Ipimethalin-L in soybeans in California.
- Preplant surface and preemergence treatments control weeds most effectively when adequate rainfall or overhead irrigation is received within 7 days after application. If moisture is insufficient to activate Ipimethalin-L, a shallow cultivation (preferably with a rotary hoe) should be made after emergence of soybeans, but while weeds are small enough to be controlled by mechanical cultivation. Otherwise, a postemergence herbicide treatment may be required to control weed escapes at planting or following soybean emergence.
- If crop loss occurs as a result of weather conditions, soybeans or any crop registered for Preplant incorporated use can be replanted without adverse effects the same year. **Do not** rework the soil deeper than the treated zone if replanting is necessary.
- Livestock can graze or be fed forage from treated soybean fields.
- Ipimethalin-L is not recommended for use on peat or muck soils.

### Use Methods and Timings

**Fall Application:** Ipimethalin-L may be surface applied or incorporated in the fall, October 1 to December 31, in states north of I-80 and the entire states of Iowa, Oklahoma and Texas. Applying Ipimethalin-L in the fall will not provide season-long weed control. For season-long weed control, fall applications of Ipimethalin-L should be followed by a postemergence program using imazethapyr, imazamox or other registered postemergence herbicide labeled for use in soybeans.

**Preplant Surface Application:** Apply Ipimethalin-L up to 15 days before planting. Ipimethalin-L may be applied up to 45 days before planting when used in a tank mix or applied sequentially with imazethapyr or imazaquin herbicides labeled for use in soybeans. Preplant surface applications of Ipimethalin-L alone should be followed by a postemergence program using imazamox or imazethapyr herbicide. Apply Ipimethalin-L tank mixes and sequential programs as specified under the tank mix section.

**Preplant Incorporated Application:** Apply Ipimethalin-L up to 60 days before planting and incorporate within 7 days of application. Apply Ipimethalin-L tank mixes and sequential programs as specified under the tank mix section.

**Preemergence Application:** Apply Ipimethalin-L at planting or up to 2 days after planting. Apply to a firm seedbed that is free of clods. **Do not** make applications of Ipimethalin-L preemergence north of Interstate 80, except as specified in other supplemental labeling. Apply Ipimethalin-L tank mixes and sequential programs as specified under the tank mix section.

**Do not** apply Ipimethalin-L as a postemergence treatment because serious crop injury can occur.

### Application Rates in Soybeans

Use rates recommended for Ipimethalin-L alone and in tank mix combinations or sequential applications with other herbicides are given in the following tables.

### Broadcast Application Rates: Fall Surface, Fall Incorporated, Preplant Surface or Preplant

### Incorporated in Soybeans

Soil Texture	Ipimethalin-L (pint/acre)	
	<3% Organic Matter	>3% Organic Matter
Coarse	1.2 to 1.8	2.4
Medium	1.8 to 3 <sup>†</sup>	3 to 3.6
Fine	2.4 to 3.6	3.6

† Do not exceed 2.4 pints per acre for southern states. See map at the end of this label for specific states.

For heavy clay soils, apply Ipimethalin-L at the broadcast application rate of 3.6 pints per acre.

The high rates for each soil texture above should be used if heavy weed populations are anticipated, extensive crop residues were present prior to seedbed preparation, or in no-till systems.

### Broadcast Application Rates: Preemergence in Soybeans

Soil Texture	Ipimethalin-L (pint/acre)	
	<3% Organic Matter	>3% Organic Matter
Coarse	1.2 to 1.8	1.8
Medium	1.8 to 2.4	1.8 to 2.4
Fine	1.8 to 2.4	2.4 to 3

The high rates for each soil texture above should be used if heavy weed populations are anticipated, extensive crop residues were present prior to seedbed preparation or in no-till systems.

### Tank Mix and Sequential Programs in Soybeans

Ipimethalin-L may be applied in a tank mix with imazethapyr, imazaquin, clomazone, metribuzin/chlorimuron, metolachlor, alachlor, linuron, metribuzin/chlorimuron, and metribuzin labeled for use in soybeans. Ipimethalin-L may be applied in a sequential application with imazethapyr, imazamox, imazaquin, benzoic acid/imazaquin, linuron and metribuzin labeled for use in soybeans. Refer to the labels of companion products for weeds controlled in addition to Ipimethalin-L alone.

When using tank mixtures or sequential applications with Ipimethalin-L, always read the labels of companion product to determine the specific use rates by soil types, weed species, and weed or crop growth stage. In addition, follow all precautions and restrictions including state and local use restrictions that may apply to specific products. Always follow the most restrictive label directions.

For no-till, Ipimethalin-L alone or Ipimethalin-L tank mixes may be used with paraquat dichloride, glyphosate, 2-4,D or 2,4-DB to kill existing vegetation that may be present prior to planting. Refer to these labels for specific use recommendations, restrictions, rates, and weeds controlled. Ipimethalin-L alone will control weeds as they germinate, but it will not control emerged weeds.

Follow additional use directions in this table for Ipimethalin-L Tank Mixes. (Refer to application rate tables above to determine appropriate use rates for Ipimethalin-L.)

Ipimethalin-L Plus:	Tank Mix Use Directions
Imazethapyr (see imazethapyr product label for rate information)	<p><b>Preplant Surface Application:</b> Apply up to 45 days before planting.</p> <p><b>Preplant Incorporated Application:</b> Apply up to 45 days before planting and incorporate within 7 days of application.</p> <p><b>Preemergence Application:</b> Apply at planting or up to 2 days after planting before weeds and crops emerge.</p>

	<p><b>Preplant Surface Application, Preplant Incorporated Application or Preemergence Followed by Early Postemergence Application:</b> Apply Ipimethalin-L as described above. Follow with an early postemergence treatment of imazethapyr as directed on the label for imazethapyr.</p> <ul style="list-style-type: none"> <li>• Read and strictly follow all precautions and directions on the label for imazethapyr.</li> <li>• Preplant surface applications of Ipimethalin-L alone should be followed by a postemergence program using imazethapyr herbicide.</li> <li>• <b>Do not</b> graze or feed treated soybean forage, hay or straw to livestock.</li> </ul>
<p>Imazaquin (see imazaquin product label for rate information)</p>	<p><b>Preplant Surface Application:</b> Apply up to 45 days before planting.</p> <p><b>Preplant Incorporated Application:</b> Apply up to 45 days before planting (30 days in Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee and Texas) and incorporate within 7 days of application.</p> <p><b>Preemergence Application:</b> Apply at planting or up to 2 days after planting before weeds and crops emerge.</p> <p><b>Preplant Surface Application, Preplant Incorporated Application or Preemergence Application Followed by Early Postemergence Application:</b> Apply Ipimethalin-L as described above. Follow with an early postemergence treatment of imazaquin as directed on the label for imazaquin.</p> <ul style="list-style-type: none"> <li>• Read and strictly follow all precautions and directions on the label for imazaquin.</li> <li>• <b>Do not</b> graze or feed treated soybean forage, hay or straw to livestock.</li> </ul>
<p>Clomazone (see clomazone product label for rate information)</p>	<p><b>Preplant Incorporated Application:</b> Apply to the soil surface and uniformly incorporate. See the label for clomazone for incorporation requirements and directions.</p> <ul style="list-style-type: none"> <li>• Read and strictly follow all precautions and directions on the label for clomazone.</li> <li>• Apply with calibrated ground equipment in 10 to 40 gallons of water per acre. The use of an agriculturally approved drift reduction agent is required at finished spray volumes of 10 to 15 gallons per acre.</li> <li>• <b>Do not</b> apply this tank mix to overly moist or wet soils.</li> <li>• Clomazone is a volatile compound. Off-site movement of spray drift or vapors of clomazone can cause foliar whitening or yellowing of some plant parts.</li> <li>• <b>Do not</b> allow livestock to graze on soybean vines or use the vines for feed. Cover crops may be planted anytime, but stand reductions may occur. <b>Do not</b> graze or use the cover crop for feed.</li> </ul>
<p>Metribuzin/chlorimuron (see metribuzin/chlorimuron product label for rate information)</p>	<p><b>Preplant Surface Application:</b> Apply up to 30 days before planting.</p> <p><b>Preplant Incorporated Application:</b> Apply up to 14 days before planting and incorporate within 7 days of application.</p> <p><b>Preemergence Application:</b> Apply at planting or up to 2 days after planting before weeds and crops emerge.</p> <ul style="list-style-type: none"> <li>• Read and strictly follow all precautions and directions on the label for metribuzin/chlorimuron. Observe all soil type, soil pH, and soybean variety</li> </ul>

	<p>restrictions.</p> <ul style="list-style-type: none"> <li>• <b>Do not</b> apply to soils with less than 0.5% organic matter.</li> <li>• Continuous agitation in the spray tank is required to keep the material in suspension.</li> <li>• Avoid overlap and shut off spray booms while starting, turning, slowing or stopping; otherwise, crop injury may occur.</li> </ul>
Metolachlor (see metolachlor product label for rate information)	<p><b>Preplant Surface Application:</b> Apply up to 15 days before planting.</p> <p><b>Preplant Incorporated Application:</b> Apply up to 14 days before planting and incorporate within 7 days of application. Use a preplant incorporated application if furrow irrigation is used or after application when a period of dry weather is expected. If soybeans are planted on beds, apply and incorporate after bed formation.</p> <p><b>Preemergence Application:</b> Apply at planting or up to 2 days after planting before weeds and crops emerge.</p> <ul style="list-style-type: none"> <li>• Read and strictly follow all precautions and directions on the label for the metolachlor product.</li> </ul>
Alachlor (see alachlor product label for rate information)	<p><b>Preplant Surface Application:</b> Apply up to 15 days before planting.</p> <p><b>Preplant Incorporated Application:</b> Apply up to 7 days before planting and incorporate within 7 days of application.</p> <p><b>Preemergence Application:</b> Apply at planting or up to 2 days after planting before weeds and crops emerge. This treatment must be applied within 5 days of the last preplant tillage.</p> <ul style="list-style-type: none"> <li>• Read and strictly follow all precautions and directions on the label for alachlor.</li> <li>• Apply with ground equipment.</li> <li>• Incorporation on coarse soils may reduce length of control as a result of leaching of alachlor with rainfall or irrigation.</li> <li>• Incorporation is not recommended on coarse soils in the Southeastern States</li> <li>• High intensity or excessive rainfall or excessive irrigation after preemergence application may reduce weed control.</li> </ul>
Linuron (see linuron product label for rate information)	<p><b>Preplant Surface Application:</b> Apply up to 15 days before planting.</p> <p><b>Preplant Incorporated Followed by Preemergence Application:</b> Apply Ipimethalin-L up to 60 days before planting and incorporate within 7 days of application. Follow with a preemergence treatment of linuron as directed on the label for linuron.</p> <p><b>Preemergence Application:</b> Apply at planting or up to 2 days after planting before weeds and crops emerge.</p> <ul style="list-style-type: none"> <li>• Read and strictly follow all precautions and directions on the label for linuron.</li> <li>• Do not use on sands, loamy sands, gravelly soils or soils containing less than 0.5% organic matter.</li> </ul>
Linuron (see linuron product label for rate information)	<p><b>Preplant Surface Application:</b> Apply up to 30 days before planting.</p> <p><b>Preplant Incorporated Application:</b> Apply up to 30 days before planting and incorporate within 7 days of application.</p>

	<p><b>Preemergence Application:</b> Apply at planting or up to 2 days after planting before weeds and crops emerge.</p> <ul style="list-style-type: none"> <li>• Read and strictly follow all precautions and directions on the label for linuron. Observe all soil type, soil pH and soybean variety restrictions.</li> <li>• Do not apply to soils with less than 0.5% organic matter.</li> <li>• Continuous agitation in the spray tank is required to keep the material in suspension.</li> <li>• Avoid overlap and shut off spray booms while starting, turning, slowing or stopping; otherwise, crop injury may occur.</li> </ul>
Metribuzin/chlorimuron (see metribuzin/chlorimuron product label for rate information)	<p><b>Preplant Surface Application:</b> Apply up to 30 days before planting.</p> <p><b>Preplant Incorporated Application:</b> Apply up to 14 days before planting and incorporate within 7 days of application.</p> <p><b>Preemergence Application:</b> Apply at planting or up to 2 days after planting before weeds and crops emerge.</p> <ul style="list-style-type: none"> <li>• Read and strictly follow all precautions and directions on the label for metribuzin/chlorimuron. Observe all soil type, soil pH and soybean variety restrictions.</li> <li>• Do not apply to soils with less than 0.5% organic matter.</li> <li>• Continuous agitation in the spray tank is required to keep the material in suspension.</li> <li>• Avoid overlap and shut off spray booms while starting, turning, slowing or stopping; otherwise, crop injury may occur.</li> </ul>
Metribuzin (see metribuzin product label for rate information)	<p><b>Preplant Surface Application:</b> Apply up to 15 days before planting.</p> <p><b>Preplant Incorporated Application:</b> Apply up to 7 days before planting and incorporate within 7 days of application.</p> <p><b>Preplant Incorporated Application Followed by Preemergence Application:</b> Apply Ipimethalin-L up to 60 days before planting and incorporate within 7 days of application. Follow with a preemergence treatment of metribuzin as directed on the label for metribuzin.</p> <p><b>Preemergence Application:</b> Apply at planting or up to 2 days after planting before weeds and crops emerge.</p> <ul style="list-style-type: none"> <li>• Read and strictly follow all precautions and directions on the label for metribuzin. Observe all soil type, soil pH, soybean variety and incorporation restrictions.</li> <li>• Do not use on sands. Do not use on loamy sands or on sandy loams that contain less than 0.5% organic matter as crop injury may occur. This tank mixture is not recommended for use on soils with less than 2% organic matter in the Coastal Plain of New Jersey or the Delmarva Peninsula.</li> <li>• Soybean seed should be planted at least 1.5 inches below the soil surface.</li> <li>• Do not rework the soil if replanting is necessary.</li> </ul>
<b>Ipimethalin-L Followed by:</b>	<b>Sequential Application Use Directions</b>
Benzoic acid/imazaquin (see benzoic acid/imazaquin product label for rate information)	<p><b>Preplant Surface Application Followed by Early Postemergence Application:</b> Apply Ipimethalin-L up to 15 days before planting. Follow with a early postemergence treatment of benzoic acid/imazaquin as directed on the label for benzoic acid/imazaquin.</p>



	<p><b>Preplant Incorporated Application Followed by Early Postemergence Application:</b> Apply Ipimethalin-L up to 60 days before planting and incorporate within 7 days of application. Follow with an early postemergence treatment of benzoic acid/imazaquin as directed on the label for benzoic acid/imazaquin.</p> <p><b>Preemergence Application Followed by Early Postemergence Application:</b> Apply Ipimethalin-L at planting or up to 2 days after planting. Follow with a postemergence treatment of benzoic acid/imazaquin as directed by the label for benzoic acid/imazaquin.</p> <ul style="list-style-type: none"> <li>• Read and strictly follow all precautions and directions on the label for benzoic acid/imazaquin.</li> </ul>
<p>Imazamox (see imazamox product label for rate information)</p>	<p><b>Preplant Surface Followed by Early Postemergence Application:</b> Apply Ipimethalin-L up to 15 days before planting. Follow with an early postemergence treatment of imazamox as directed on the label for imazamox.</p> <p><b>Preplant Incorporated Followed by Early Postemergence Application:</b> Apply Ipimethalin-L up to 60 days before planting and incorporate within 7 days of application. Follow with an early postemergence treatment of imazamox as directed on the label for imazamox.</p> <p><b>Preemergence Followed by Early Postemergence Application:</b> Apply Ipimethalin-L at planting or up to 2 days after planting. Follow with a postemergence treatment of imazamox as directed on the label for imazamox.</p> <ul style="list-style-type: none"> <li>• Read and strictly follow all precautions and directions on the label for imazamox.</li> </ul>

## Special Weeds

### Shattercane and Woolly Cupgrass

Preplant incorporated treatments of Ipimethalin-L alone, Ipimethalin-L plus imazaquin or Ipimethalin-L plus metribuzin preplant incorporated tank mixtures, or preplant incorporated Ipimethalin-L applications followed by registered sequential preemergence or postemergence herbicides will control shattercane (wild cane) (*Sorghum bicolor*).

Woolly cupgrass (*Eriochloa villosa*) will be controlled by the following: preplant incorporated treatments of Ipimethalin-L plus imazethapyr, Ipimethalin-L applied preplant incorporated followed by an early postemergence application of imazethapyr herbicide; or, other registered sequential preemergence or postemergence herbicides.

Shattercane and woolly cupgrass are difficult to control in many soybean-growing areas because they can germinate from a greater depth in the soil than most other weeds. Shattercane and woolly cupgrass can emerge at any time during the growing season, depending on soil temperature, moisture, and seed dormancy.

Thoroughly mix previous crop residues into the soil and destroy any existing vegetation before applying herbicide. Apply Ipimethalin-L or Ipimethalin-L combinations at the recommended rates listed in following tables. See Incorporation Directions section (see table of contents for page number) for incorporation directions. Thoroughly and uniformly mechanically incorporate Ipimethalin-L into the top 2 inches of soil. Acceptable results cannot be expected if Ipimethalin-L is applied preemergence. Cultivation may be necessary to control escapes and late germinating shattercane or woolly cupgrass

during the crop season.

**Broadcast Application Rates: Preplant Incorporated for Control of Shattercane or Woolly Cupgrass in Soybeans**

Soil Texture	Ipimethalin-L (pint/acre)	
	<3% Organic Matter	>3% Organic Matter
Coarse	2.4	2.4
Medium	3	3.6
Fine	3.6	3.6

**Broadcast Application Rates: Ipimethalin-L Plus Metribuzin Tank Mix Preplant Incorporated for Control of Shattercane in Soybeans**

Soil Texture <sup>†</sup>	Ipimethalin-L + Metribuzin <sup>††</sup> (0.5% to 3% Organic Matter) (pint/acre + lb/acre)	Ipimethalin-L + Metribuzin <sup>††</sup> (>3% organic matter) (pint/acre+ lb/acre)
Coarse	1.8 + 0.5	1.8 + 0.5
Medium	2.4 + 0.5	2.4 + 0.5 to 0.67
Fine	2.4 + 0.5 to 0.67	3 + 0.67

† Do not use on sands. Do not use on loamy sands or on sandy loams that contain less than 1% organic matter, or on other soils with less than 0.5% organic matter because crop injury may occur.

†† Read and strictly follow all precautions and directions on the label for metribuzin. Observe all soil type, soil pH and soybean variety restrictions.

**Red Rice and Itchgrass**

Ipimethalin-L applied as a preplant incorporated treatment will control red rice (*Oryza saliva*) and will help control and reduce competition from itchgrass (*Rottboellia exaltata*) at the rates listed in the following table:

**Broadcast Application Rates: Preplant Incorporated Application for Control of Red Rice and Suppression of Itchgrass in Soybeans**

Soil Texture	Ipimethalin-L (pint/acre) Up to 3% Organic Matter <sup>†</sup>
Coarse	2.4 to 3.66 <sup>††</sup>
Medium	3.6
Fine	4.8

† This use is not recommended for soils with more than 3% organic matter.

†† The higher rate should be used if heavy red rice or itchgrass infestation is anticipated.

**Note:** Livestock can graze or be fed forage from treated soybean fields. If soybean crop loss occurs as a result of weather conditions, cotton or soybeans can be replanted the same year into treated soil without adverse effects. Do not rework the soil deeper than the treated zone if replanting is necessary.

**Rhizome Johnsongrass**

Ipimethalin-L applied as a Preplant incorporated treatment for 2 consecutive years will control rhizome johnsongrass (*Sorghum halepense*) in soybeans at the rates recommended for soil textures listed in the following table. This use is not recommended for Arizona, New Mexico and California. Rhizome johnsongrass will be suppressed after the first year and controlled after the second year.

Before application, use a chisel plow or similar implement to bring johnsongrass rhizomes to the

surface. Chop rhizomes into small pieces with a disk harrow set to cut 4 to 6 inches deep and operated in 2 different directions at 4 to 6 mph.

Ipimethalin-L should be incorporated into the soil within 7 days after application before planting. For maximum control of rhizome johnsongrass, incorporate Ipimethalin-L as soon as possible after application. Deep and thorough incorporation of Ipimethalin-L is necessary for control of rhizome johnsongrass. Mechanical incorporation can be achieved by the following methods:

- (a) Disk harrow set to cut 4 to 6 inches deep and operated in 2 different directions at 4 to 6 mph.
- (b) PTO-driven equipment (tillers, cultivators, hoes) set to cut 3 to 4 inches deep and operated 1 time at 4 mph or less.

For johnsongrass escapes during the crop season, cultivation and/or application of registered postemergence herbicides are recommended. Follow the directions for use on the labels of the respective herbicides.

**Broadcast Application Rates: Preplant Incorporated Application for Control of Rhizome Johnsongrass in Soybeans (APPLY FOR 2 CONSECUTIVE YEARS)**

Soil Texture	Ipimethalin-L (pint/acre) Up to 3% Organic Matter <sup>†</sup>
Coarse	2.4
Medium	3.6
Fine	4.8

<sup>†</sup>This use is not recommended for soils with more than 3% organic matter.

**SUGARCANE (Except Hawaii)**

**General Directions and Precautions**

Ipimethalin-L may be applied to newly planted or ratoon sugarcane as a preemergence treatment through layby and again in late summer or early fall to the newly planted sugarcane.

- **Do not** apply on sugarcane through irrigation systems.
- **Do not** make aerial applications at close-in because complete and uniform coverage cannot be obtained.
- **Do not** apply more than 14.4 pints per acre of Ipimethalin-L during one growing season.
- Ipimethalin-L is not recommended for use on peat or muck soils.
- **Do not** apply within 90 days of harvest.
- **Do not** graze treated fields or feed treated forage or fodder to livestock.

**Use Methods and Timings**

Apply Ipimethalin-L as a preemergence treatment through layby to newly planted or ratoon sugarcane and again in late summer or early fall to the newly planted sugarcane. Applications may be made band or broadcast. Although there may be adequate crop tolerance for postemergence applications at layby, in order to obtain effective weed control the spray must be directed under the sugarcane canopy.

**Application Rates**

**Broadcast Rate in Sugarcane (except Hawaii)**

Apply 4.8 to 7.2 pints of Ipimethalin-L but do not exceed 14.4 pints per acre in one growing season. See spraying directions to calculate the band treatment rate.

Use the 7.2 pint rate under the following conditions:

- heavy clay soils;
- no mechanical incorporation is planned;
- heavy weed populations are anticipated;
- itchgrass infestation is anticipated; or,
- no shaving is planned.

### **Incorporation Directions**

Ipimethalin-L must be thoroughly and uniformly incorporated into the soil with either (a) mechanical incorporation equipment as outlined below, or (b) with rainfall or irrigation as long as rainfall or irrigation is adequate for good crop and weed emergence and is received within 7 days after application. If rainfall or irrigation is not obtained, Ipimethalin-L should be mechanically incorporated.

**Mechanical Incorporation:** Apply Ipimethalin-L herbicide to loosened beds and incorporate into the top 1 to 2 inches of soil within 7 days after application. Ratoon sugarcane must be lightly shaved during the early spring to remove the old stubble before incorporation over the line of sugarcane is possible. Carefully adjust equipment to incorporate without causing excessive damage to emerging shoots. Mechanical incorporation can be achieved by the following:

- a. Rolling cultivator (Lilliston type - Lely Roterra) set to cut 2 or 3 inches deep and operated 2 times at 6 to 8 mph. This technique may be used with all application timings.
- b. Rolling disc cultivator (Hipper) set to cut 2 to 3 inches deep and operated 2 times at 6 to 8 mph. This technique may be used to incorporate between sugarcane lines (rows) at layby only.

### **Tank Mixes in Sugarcane (Except Hawaii)**

Ipimethalin-L may be used in combination with any registered herbicide. Refer to labels of companion herbicides for all directions, precautions and restrictions. Always check compatibility when applying in a tank mix and follow the most restrictive label directions.

### **SUGARCANE (for Use in Hawaii)**

#### **General Directions and Precautions**

Ipimethalin-L may be applied preemergence through layby in plant or ratoon sugarcane.

- **Do not** apply to sugarcane through irrigation systems.
- **Do not** make aerial applications at close-in because complete and uniform coverage cannot be obtained.
- **Do not** apply more than 14.4 pints per acre of Ipimethalin-L during 1 growing season.
- Ipimethalin-L is not recommended for use on peat or muck soils.
- **Do not** apply within 90 days of harvest.
- **Do not** graze treated fields or feed treated forage or fodder to livestock.

#### **Use Methods and Timings**

Ipimethalin-L may be applied twice per season, as a preemergence treatment through layby, in plant or ratoon sugarcane. Band or broadcast applications may be made. Although there may be adequate crop tolerance for postemergence applications at layby, in order to obtain effective weed control the spray must be directed under the sugarcane canopy.

## Application Rates

### Broadcast Rate for Sugarcane Grown in Hawaii

Apply 4.8 to 9.7 pints per acre of Ipimethalin-L but do **not** exceed 14.4 pints per acre in one growing season. See spraying directions to calculate the band treatment rate.

Use the higher rates under the following conditions:

- for dark clay soils;
- no mechanical incorporation is planned;
- heavy weed populations are anticipated; or,
- no shaving is planned.

### Tank Mixes in Sugarcane (for Use in Hawaii)

Ipimethalin-L may be used in combination with any registered herbicide. Refer to labels of companion products for all directions, precautions and restrictions. Always check compatibility when applying in a tank mix and follow the most restrictive label directions.

## SUNFLOWERS

### General Directions and Precautions

- Ipimethalin-L may be applied as a preplant incorporated treatment in the spring in sunflowers in all states.
- Ipimethalin-L alone may be applied as a preplant incorporated treatment in the fall prior to planting sunflowers in the spring in the states of North Dakota, South Dakota, and Minnesota only.
- Ipimethalin-L plus EPTC tank mixture may be applied as a preplant incorporated treatment in the fall in sunflowers in the states of North Dakota and Minnesota only.
- Ipimethalin-L may be applied as preplant surface treatment or preemergence treatment in no-till sunflowers in the states of Colorado, Kansas, Minnesota, Nebraska, North Dakota, Oklahoma, South Dakota, and Texas.
- Ipimethalin-L may be applied as a preemergence treatment in conventional tillage sunflowers in the states of Colorado, Kansas, Minnesota, Nebraska, North Dakota and South Dakota.
- If crop loss occurs as a result of weather conditions, sunflowers or any crop registered for Ipimethalin-L preplant incorporated use can be replanted without adverse effects the same year. **Do not** rework the soil deeper than the treated zone if replanting is necessary.
- **Do not** feed forage or graze livestock in treated sunflower fields.
- Ipimethalin-L is not recommended for use on peat or muck soils.

### Use Methods and Timings

**Preplant Incorporated (Spring) Application:** Apply Ipimethalin-L up to 60 days before planting and incorporate within 7 days of application.

**Preplant Incorporated (Fall) Application:** Apply Ipimethalin-L or Ipimethalin-L plus EPTC and immediately incorporate in late fall before planting sunflowers the following spring. Refer to Incorporation Directions section (see table of contents for page number) and the label for EPTC for incorporation directions. Destroy existing weeds before applying Ipimethalin-L or Ipimethalin-L tank mixture. The soil should be dry enough to allow good incorporation.

**Do not** apply Ipimethalin-L plus EPTC tank mixture by air.

Apply Ipimethalin-L or Ipimethalin-L plus EPTC tank mixture in the late fall when soil temperatures are 45°F or below, but before the ground freezes. **Do not** apply when the air temperature is below 45°F.

Before planting sunflower in the spring, fields treated with Ipimethalin-L or Ipimethalin-L plus EPTC should receive at least one additional shallow incorporation. Spring incorporation should be made at an angle to the last tillage operation.

**Preemergence (Spring) Application:** Ipimethalin-L may be applied immediately after planting. **Do not** apply Ipimethalin-L as a postemergence treatment because sunflowers exposed at the time of application will be killed or injured. Ipimethalin-L is most effective in controlling weeds when adequate rainfall or irrigation is received within 7 days after application. Otherwise, a registered postemergence grass herbicide treatment may be required.

Existing living vegetation must be controlled at or before the application of Ipimethalin-L.

A registered contact herbicide for use in sunflowers may be applied sequentially or in a tank mix with Ipimethalin-L. Refer to the label for the contact herbicide for all directions, precautions and restrictions.

Preemergence applications of Ipimethalin-L on conventional tillage sunflowers may increase the likelihood of crop injury and decrease herbicide performance compared to Preplant incorporated applications. If dry conditions with limited precipitation exists or unseasonably cool temperatures following planting are forecasted, apply Ipimethalin-L prior to planting and mechanically incorporate with tillage.

**Application Rates in Sunflowers**

Recommended use rates for Ipimethalin-L are given in the following tables.

**Broadcast Application Rates: Preplant Incorporated Spring Application or Preemergence Spring Application in Sunflowers**

Soil Texture	Ipimethalin-L (pint/acre)		
	Southern States <sup>†</sup>	Northern States <sup>†</sup>	
		<3% Organic Matter	>3% Organic Matter
Coarse	1.2 to 1.8	1.2 to 2.4	2.4
Medium	1.8 to 2.4	1.8 to 3	3 to 3.6
Fine	1.8 to 3.6	2.4 to 3.6	3.6

<sup>†</sup>See map at the end of this label for specific states.

Use the 3.6 pint per acre broadcast application rate for heavy clay soils.

**Broadcast Application Rates: Preplant Incorporated Fall Application in Sunflowers<sup>†</sup>**

Soil Texture	Ipimethalin-L (pint/acre)	
	<3% Organic Matter	>3% Organic Matter
Coarse	1.8 to 3	3
Medium	2.4 to 3.6	3.6 to 4.2
Fine	3 to 4.2	4.2

<sup>†</sup>For use in North Dakota, South Dakota and Minnesota only

Use the high application rate for each soil texture if heavy weed pressure is anticipated.

**Broadcast Application Rates: Ipimethalin-L Plus EPTC Tank Mixture Fall Application Preplant Incorporated in Sunflowers†**

Soil Texture	Ipimethalin-L plus EPTC (pint/acre)	
	<3% Organic Matter	>3% Organic Matter
Coarse	1.2 to 2.4 +2.25	2.4 + 2.25
Medium	2.8 to 3 + 2.25	3 to 3.6 +2.25
Fine	2.4 to 3.6 + 2.25	3.6 + 2.25

†For use in North Dakota and Minnesota only.

Use the high application rate for each soil texture if heavy weed pressure is anticipated. Read and strictly follow all precautions and directions on the label for EPTC.

**No-Till Sunflowers**

**(For Use in Colorado, Kansas, Minnesota, Nebraska, North Dakota, Oklahoma, South Dakota, and Texas)**

Ipimethalin-L may be applied immediately after planting or up to 30 days before planting. **Do not** apply Ipimethalin-L postemergence because sunflowers exposed at the time of application will be killed. Ipimethalin-L controls weeds most effectively when adequate rainfall or irrigation is received within 7 days after application. Otherwise, treatment with a registered postemergence grass herbicide may be required.

If the field has a history of heavy weed infestations or contains excessive crop residues, uniformly apply Ipimethalin-L alone or in combination with other herbicides registered for gallonage.

Existing living vegetation must be controlled at or before the application of Ipimethalin-L.

A registered contact herbicide for use in sunflowers may be applied sequentially or in a tank mix with Ipimethalin-L. Consult the label of the contact herbicide for all directions, precautions and restrictions.

**Broadcast Application Rates: Preplant Surface Application or Preemergence Application in No-Till Sunflowers**

Soil Texture	Ipimethalin-L (pint/acre)	
	<3% Organic Matter	>3% Organic Matter
Coarse	3 to 3.6	3.6
Medium	3.6	3.6
Fine	3.6	<b>DO NOT USE</b>

**TOBACCO**

**General Directions and Precautions**

- Ipimethalin-L may be applied as a preplant incorporated treatment or layby application in transplanted tobacco.
- If crop loss occurs as a result of weather conditions, transplanted tobacco or any crop registered for Ipimethalin-L Preplant incorporated use can be replanted without adverse effects the same year. **Do not** rework the soil deeper than the treated zone if replanting is necessary.
- Ipimethalin-L is not recommended for use on peat or muck soils.

**Use Methods and Timings**

**Preplant Incorporated Application:** Apply Ipimethalin-L with ground sprayer up to 60 days before

transplanting tobacco and incorporate within 7 days of application.

Ipimethalin-L will not harm transplanted tobacco when applied according to directions and under normal growing conditions. Under stressful plant growth conditions, such as cold/wet or hot/dry weather, Ipimethalin-L may induce a temporary retardation of tobacco development.

**Layby Application:** Ipimethalin-L may be applied as a directed spray following the last normal cultivation (layby), usually 4 to 6 weeks after transplanting tobacco. Apply Ipimethalin-L in a 16- to 24-inch band in the middle of the row between the crop rows. The spray should not come into contact with tobacco plants. If the spray nozzles on the ends of the spray boom pass over the same row middle twice, use nozzles that apply one-half (1/2) the normal number of gallons per acre to prevent over application.

Layby applications can be applied to tobacco previously treated with herbicides registered for use in tobacco. Consult the labels of those herbicides for suggested treatments, rates to be used, and precautions or restrictions for use in tobacco and for follow crop restrictions.

Ipimethalin-L controls weeds most effectively when adequate rainfall or irrigation is received within 7 days after application.

Ipimethalin-L will not control established weeds. Destroy emerged weeds before application.

**Do not apply as a broadcast spray over top of tobacco leaf. Contact may cause malformed leaves.**

**Application Rates in Transplanted Tobacco**

Recommended use rates for Ipimethalin-L alone are given in the following table.

**Broadcast Application Rates: Preplant Incorporated in Transplanted Tobacco**

Region	Soil Texture	Ipimethalin-L (pint/acre) <sup>†</sup>
Maryland, Virginia, North Carolina, South Carolina, Georgia. Florida	Coarse	1.8 to 2.4
	Medium: sandy clay loams, loams	
	Medium: silt loams, silts	2.4 to 3
	Fine	
Other tobacco-growing states	Coarse	1.8 to 2.4
	Medium	3 to 3.6
	Fine	

†To calculate the band treatment rate, see Spraying Directions section (see table of contents for page number).

††The high rate for each soil texture above should be used if a registered herbicide treatment was not applied prior to layby.

**Broadcast Application Rates: Layby Application in Transplanted Tobacco**

Soil Texture	Ipimethalin-L (pint/acre) <sup>††</sup>
Coarse	1.2 to 1.8
Medium	1.8 to 2.4
Fine	1.8 to 2.4

†To calculate the band treatment rate, see Spraying Directions section (see table of contents for page number).

††The high rate for each soil texture above should be used if a registered herbicide treatment was not



applied prior to layby.

## REGIONAL MAP FOR RATE DETERMINATION



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