



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

OFFICE OF CHEMICAL SAFETY  
AND POLLUTION PREVENTION

December 28, 2015

Jonathan Janis  
Regulatory Manager  
Isagro USA, Inc.  
430 David Drive, Suite 240  
Morrisville, NC 27560

Subject: Non-PRIA (Pesticide Registration Improvement Act) Labeling Amendment – Acceptable  
Amendment to Make Editorial Changes and Amend Directions for Use  
Product Name: IRF135  
EPA Registration Number: 89285-2  
Application Date: November 9, 2015  
OPP Decision Number: 511072

Dear Mr. Janis:

The amended labeling referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended, is acceptable.

This approval does not affect any terms or conditions that were previously imposed on this registration. You continue to be subject to existing terms or conditions on your registration and any deadlines connected with them.

A stamped copy of your labeling is enclosed for your records. This labeling supersedes all previously accepted labeling. You must submit one (1) copy of the final printed labeling before you release this product for shipment with the new labeling. In accordance with 40 CFR § 152.130(c), you may distribute or sell this product under the previously approved labeling for 18 months from the date of this letter. After 18 months, you may only distribute or sell this product if it bears this new revised labeling or subsequently approved labeling. "To distribute or sell" is defined under FIFRA section 2(gg) and its implementing regulation at 40 CFR § 152.3.

Should you wish to add/retain a reference to your company's website on your label, then please be aware that the website becomes labeling under FIFRA and is subject to review by the U.S. Environmental Protection Agency (EPA). If the website is false or misleading, the product will be considered to be misbranded and sale or distribution of the product is unlawful under FIFRA section 12(a)(1)(E). 40 CFR § 156.10(a)(5) lists examples of statements the 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

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process. Therefore, should the EPA 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 Assurance.

Your release for shipment of this product constitutes acceptance of these terms. If these terms are not complied with, this registration will be subject to cancellation in accordance with FIFRA section 6.

If you have any questions, please contact Andrew Reighart of my team by phone at (703) 347-0469 or via email at [reighart.andrew@epa.gov](mailto:reighart.andrew@epa.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "For Andrew C. Bryceland". The signature is written in a cursive style with a large, sweeping flourish at the end.

Andrew C. Bryceland, Team Leader  
Biochemical Pesticides Branch  
Biopesticides and Pollution  
Prevention Division (7511P)  
Office of Pesticide Programs

Enclosure

**ACCEPTED**

12/28/2015

Under the Federal Insecticide, Fungicide and Rodenticide Act as amended, for the pesticide registered under EPA Reg. No. 89285-2

# IRF135

(Alternate Brand Name: "DOMINUS®")

Biopesticide for Agricultural Soil Treatment Use

## A BROAD SPECTRUM PRE-PLANT SOIL BIOFUMIGANT FOR THE CONTROL OF CERTAIN SOIL BORNE FUNGI, NEMATODES, WEEDS and INSECTS

**ACTIVE INGREDIENT:**

Allyl isothiocyanate..... 96.3%

**OTHER INGREDIENTS:**..... 3.7%

**TOTAL:** ..... 100.0%

Contains 8.19 lbs. active ingredient (allyl isothiocyanate) per gallon. This product weighs 8.5 lbs. per gallon.

### KEEP OUT OF REACH OF CHILDREN DANGER/PELIGRO

*Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.  
If you do not understand the label, find someone to explain it to you in detail.*

FIRST AID	
<b>If in eyes</b>	<ul style="list-style-type: none"> <li>• Hold eye open and rinse slowly and gently with water for 15-20 minutes.</li> <li>• Remove contact lenses, if present, after the first 5 minutes, and then continue rinsing.</li> <li>• Call a poison control center or physician for treatment advice.</li> </ul>
<b>If on skin or clothing</b>	<ul style="list-style-type: none"> <li>• Take off contaminated clothing.</li> <li>• Rinse skin immediately with plenty of water for 15 minutes.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
<b>If swallowed</b>	<ul style="list-style-type: none"> <li>• Have person sip a glass of water if able to swallow.</li> <li>• Do not induce vomiting unless told to do so by the poison control center or doctor.</li> <li>• Do not give anything to an unconscious person.</li> <li>• Call a poison control center or physician for treatment advice.</li> </ul>
<b>If Inhaled</b>	<ul style="list-style-type: none"> <li>• Move person to fresh air.</li> <li>• If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible.</li> <li>• Call a poison control center or doctor for further treatment advice</li> </ul>
<b>NOTE TO PHYSICIAN</b>	
Probably mucosal damage may contraindicate the use of gastric lavage.	
<b>HOTLINE NUMBER</b>	
Have the product container or label with you when calling a poison control center or doctor, or going for treatment. For Chemical Emergency Spill Leak Fire Exposure or Accident Call CHEMTREC Day or Night Domestic North America 800-424-9300; International 703-527-3887 (collect calls accepted).	

EPA Reg. No. 89285-2

EPA Est. No. XXXXX-XXX-XXX

**Net Contents:**

(Batch Code/Lot No: will be placed on the container)

Manufactured for:

Isagro USA, Inc.

430 Davis Drive, Suite 240

Morrisville, NC 27560

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## PRECAUTIONARY STATEMENTS

### HAZARDS TO HUMANS AND DOMESTIC ANIMALS

**DANGER. Corrosive.** Causes irreversible eye damage and skin burns. May be fatal if swallowed, absorbed through skin, or inhaled. Do not get in eyes, on skin or on clothing. Do not breathe vapor. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Remove and wash contaminated clothing before use.

### PERSONAL PROTECTIVE EQUIPMENT (PPE)

When performing activities with the potential for liquid contact all handlers (including applicators) must wear:

- Coveralls worn over long sleeve shirt and long pants
- Chemical-resistant footwear plus socks
- Chemical-resistant (such as nitrile or butyl) gloves
- Protective eyewear
- Respirator (see below)

Where liquid contact is a potential all handlers (including mixers, loaders and applicators) in addition to the above listed PPE must wear an air purifying respirator with an organic-vapor removing cartridge with pre-filter approved for pesticides (MSHA/NIOSH approval number prefix TC-23C), or a canister approved for pesticides (MSHA/NIOSH approval number prefix TC-14G), or a NIOSH approved respirator with an organic vapor (OV) cartridge or canister with any N, R, P or HE pre-filter.

When cleaning equipment, wear a chemical resistant apron.

Follow the manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry. Discard any clothing and or PPE that have been drenched or heavily contaminated with this product's concentrate. Do not reuse clothing or PPE that has been drenched or heavily contaminated.

### ENGINEERING CONTROLS

When handlers use closed systems or enclosed cabs in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides, the handler PPE requirements may be reduced or modified as specified in the WPS at 40 CFR Part 170.

#### USER SAFETY RECOMMENDATIONS

- Users should remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Users should remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

### ENVIRONMENTAL HAZARDS

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

### DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling. Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirement specific to your State or Tribe, consult the State/Tribal agency responsible for pesticide regulation.

## AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. The requirements in this box apply to uses of this product that are covered by the Worker Protection Standard.

**No instruction elsewhere on this labeling relieve user from complying with the requirements of the WPS.**

For the entry restricted period and notification requirements, see the *Entry Restricted Period and Notification* section of this labeling. PPE for entry during the Entry Restricted Period that is permitted by this labeling is listed in the Personal Protective Equipment (PPE) section of this labeling.

Assure that labels and SDS are on-site and readily available for employees to review.

### ENTRY RESTRICTED PERIOD AND NOTIFICATION

Entry Restricted Period: Entry into the application block (including early entry that would otherwise be permitted under the WPS) by any person other than a correctly trained and PPE-equipped handler is PROHIBITED from the start of the application until 5 days after application is complete.

Notification: Notify workers of the application by warning them orally and by posting Biofumigant Treated Area signs. The sign must state:

1. "DANGER/PELIGRO"
2. "Areas under fumigation. DO NOT ENTER/NO ENTRE"
3. Allyl Isothiocyanate biofumigant in use
4. Date and time of fumigation
5. Date and time entry restricted period is over
6. IRF135 and (*name of co-application*)
7. Name, address and telephone of applicator in charge

Post the Biofumigant Treated Area sign instead of the WPS sign for this application, but follow all WPS requirements pertaining to location, legibility, text size and sign size (40 CFR § 170.120).

Post Biofumigant Treated Area signs defining the fumigation buffer zone, at all entrances to the application block no sooner than 24 hours prior to application and remain in place until at least 24 hours from the start of the application. Signs placed at the corners or on the edges of the treated area must remain posted for at least 5 days (120 hours) from the start of the application, e.g. for no less than the duration of the entry restricted period.

### TERMS USED IN THIS LABELING

Application Block: The area within the perimeter of the fumigated portion of a field (including furrows, irrigation ditches, and roadways). The perimeter of the application block is the border that connects the outermost edges of the total area treated with the biofumigant product.

Start of the Application: The time at which the biofumigant is first delivered/dispensed into the soil in the application block.

Application is Complete: The time at which the biofumigant has stopped being delivered/dispensed into the soil and the soil has been sealed; drip lines have been purged (if applicable).

Entry Restricted Period: This period begins at the start of the application and expires depending on the application method and if tarps are used when the tarps are perforated and removed.

Entry into the application block during this period is only allowed for appropriately PPE-equipped handlers performing handling tasks. See the *Entry Restricted Period* and *Notification* sections of this label for additional information.

**Buffer Zone:** An area established around the perimeter of each application block. The buffer zone must extend outward from the edge of the application block perimeter equally in all directions.

**Buffer Zone Period:** Begins at the start of the application and lasts for a minimum of 24-hours after the application is complete. Non-handlers must be excluded from the buffer zone during the buffer zone period.

**Roadway:** The portion of a street or highway improved, designed or ordinarily used for vehicular travel, exclusive of the sidewalk or shoulder even if such a sidewalk or shoulder is used by persons riding bicycles. In the event that a highway includes two or more separated roadways, the term Roadway shall refer to any such roadway separately.

### **PRODUCT INFORMATION**

Apply IRF135 as a preplant soil treatment only and as a part of an integrated pest management (IPM) program to aid in reducing or controlling the damaging effects of soil borne pests and diseases.

### **USE PRECAUTION**

The product must only be used in a well-ventilated area. Do not use IRF135 if it cannot be applied according to the use patterns on the label.

### **APPLICATION WITH OTHER PRODUCTS**

IRF135 may be applied with other pesticides or fertilizers by co-injection or co-application via the application methods outlined in this label. Consult specific product labels for additional information or restrictions concerning mix partner compatibility. Treat a small area first to ensure compatibility. Observe the most restrictive of the labeling limitations and precautions of all products used in mixtures.

### **SOIL TREATMENT APPLICATION METHODS**

Apply as a preplant shank injection, broadcast/flat fume application, or raised bed application either shank injected into the row or in a raised bed or non-bedded strip injected through the drip irrigation system. Specific directions for each application method are provided below. Always follow label instructions to achieve optimum performance.

### **TARP REMOVAL, PERFORATION AND PLANTING INTERVAL**

- Leave the soil undisturbed for at least 5 days after application is complete and prior to tarp cutting or perforation.
- For tarped applications, complete the cutting of the tarp or perforation/hole-punching 2 to 24 hours prior to tarp removal or planting to assist in IRF135 dissipation.
- Tarp cutters and removers shall wear long-sleeved shirt, long pants and gloves when removing tarps following application prior to planting.
- Cold, wet, or cold and wet soils can significantly decrease dissipation of IRF135 and can require a longer soil exposure period before soil conditions are favorable for planting of crop(s) following application of IRF135.
- After shank application is complete, wait 10 days under normal moisture conditions and at least 14 days when soils are wet/saturated prior to planting. After all other applications wait 10 days prior to planting.
- In addition to the 10-14 day waiting period, use of a Jar Seedling and/or Transplant tests may be needed to verify crop safety prior to planting the field to the next crop.

### **SOIL TREATMENT TIMING AND APPLICATION RATES**

- **Number of applications per year:**

- IRF135 may be applied to soil as a pre-plant soil treatment prior to planting with subsequent applications allowable to the same soil within the same year provided the previous crop is completely harvested prior to application.
- IRF135 may be applied to soil as an end of season crop termination application with subsequent applications allowable to the same soil within the same year provided harvest of the crop is complete prior to crop termination application.
- **Open field:** Use 10 - 40 gallons of IRF135 /A (85 - 340 lb/A).
- **Greenhouse:** Use 10 - 40 gallons of IRF135 /A (85 - 340 lb/A) or 0.23 gal / 1,000ft<sup>2</sup> – 0.92 gal/1,000ft<sup>2</sup>.
- **End of season crop termination in open field or greenhouse:** Use 3 – 20 gallons of IRF135 /A (26 – 170 lb/A) or 0.069 gal/1,000ft<sup>2</sup> to 0.45 gal/1,000ft<sup>2</sup>.

**TABLE 1. PRE-PLANT SOIL APPLICATION RATES**

TREATMENT SITE	BROADCAST RATES (GAL/A)*	BROADCAST RATES (LBS PRODUCT/A)*
<b>Field soils to be planted to:</b> Asparagus, brassica vegetables (broccoli, cauliflower), cereal grains, cucurbit crops (cucumber, squash, melons), fruiting vegetables (e.g. eggplant, peppers, tomatoes), herbs and spices, leek, leafy vegetables (lettuce), legume vegetables, pineapples, root and tuber vegetables (carrot, garlic, onion, potato, sweet potato)	10 - 40	85 - 340
<b>Field soils to be planted to:</b> Strawberries, berries (cane fruit) , fruit and nut crops, citrus, pome fruit trees, stone fruit trees, tree nuts, tropical and subtropical fruits, vineyards	10 - 40	85 - 340
<b>Nursery, Turf, and Ornamental Soils to be planted to:</b> Turf, lawns, parks, golf greens, athletic fields, recreational turf area, ornamentals, floral crops, forest tree seedlings	10 - 40	85 - 340
<b>Greenhouse soils to be planted to:</b> Food and Non-food crops	10 - 40	85 - 340
<b>Seed or Transplant beds to be planted to:</b> Food crops and non-food crops	10 - 40	85 - 340
*Use the higher labeled rates for muck and heavy clay soils, as well as for those pests and or diseases such as cyst forming nematodes, <i>Macrophomina</i> , <i>Fusarium</i> or <i>Phytophthora</i> or hard coated weed seeds for example Malva, Clover or Nutsedge		



**TABLE 2. END OF SEASON CROP TERMINATION TREATMENT RATES**

TREATMENT SITE	BROADCAST RATES (GAL/A)	BROADCAST RATES (LBS PRODUCT/A)
<b>Soils that were planted with the following crops:</b> Asparagus, brassica vegetables (broccoli, cauliflower), cereal grains, cucurbit crops (cucumber, squash, melons), fruiting vegetables (e.g. eggplant, peppers, tomatoes), herbs and spices, leek, leafy vegetables (e.g. lettuce), legume vegetables, root and tuber vegetables (carrot, garlic, onion, potato, sweet potato), strawberries, berries (cane fruit)	3 - 20	25.5 – 170

**APPLICATION SITE CONDITION DIRECTIONS**

**Soil temperature:** Minimum of 60°F and maximum of 90°F at a typical application depth

**Soil preparation (Pre-Plant Applications):**

- Ensure the soil is well prepared and generally free at the surface of large clods. Large clods can prevent efficient soil sealing and reduce effectiveness of the product.
- Cultivate the soil to a minimum depth of 5-8” and/or equal to the desired treatment depth.
- Thoroughly incorporate plant residues into the soil to allow decomposition prior to treatment. Leave little or no plant residue present on the soil surface. Undecomposed plant material can harbor pests that will not be controlled and can interfere with the soil seal after application. Let crop residue that is present lie flat to permit the soil to be sealed effectively.
- Where applicable, fracture compacted soil layers (plow pans) within the desired treatment zone before or during application of IRF135.

**Soil moisture:**

- It is critical to achieve adequate soil moisture before treatment. Plan soil treatment for seasons, crop rotations, or irrigation schedules which leave adequate moisture in the soil.
- The soil must be moist (typically with enough moisture to allow weed seeds to become imbibed) from 1.5 inches below the soil surface to at least the minimum desired depth of the target treatment zone. The amount of moisture needed (typically greater than 50% Available Water Content\* at 9 inches) in this zone will vary according to soil type. Use the USDA Feel and Appearance Method (<http://www.oneplan.org/Water/soilmoist.pdf>) or a device that will accurately measure soil moisture. The surface soil generally dries very rapidly and is not considered in this determination.

**Weather Conditions:**

- Prior to soil treatment the weather forecast for the day of application and the 48-hour period following the soil treatment must be checked to determine if unfavorable weather conditions exist or are predicted (such as no wind speed or the potential for inversion layers) and whether soil treatment can begin.
- If significant rainfall occurs within 24 hours after IRF135 application (enough to saturate soil that has been treated with IRF135), a reduction in pest control can occur.
- Apply IRF135 in the presence of wind speeds of at least 2 mph at the start of the applications or projected to reach at least 5 mph during the application.
- Check weather forecasts 48 hours prior to application to ensure proper conditions are

present at the time of application. Weather conditions and or advisories can be downloaded online at <http://www.nws.noaa.gov>.

**Buffer Zones:** Do not apply IRF135 within 25' of any occupied structure, such as a school, daycare, hospital, retirement home, business or residence.

### **PRE-PLANTING AFTER APPLICATION OF IRF135**

#### **Recontamination Prevention:**

- IRF135 will control pests that are present in the soil treatment zone at the time of soil treatment. It will not control pests that are introduced into the soil after soil treatment period has ended. To avoid re-infestation of treated soil, DO NOT use irrigation water, transplants, seed pieces, or equipment that could carry soil-borne pests from infested land into the treated area. Avoid contamination from moving infested soil onto treated beds through cultivation, movement of soil from outside the treated zone, dumping contaminated soil in treated fields and soil contamination from equipment or crop remains. Clean equipment carefully before entering treated fields.

#### **Testing of Treated Soils Prior to Planting:**

- Allow IRF135 to dissipate completely within and out of the treated soil before planting the crop.
- When determining the appropriate time interval before planting, consideration of factors that impact IRF135 dissipation include rate of application, depth of injection, soil temperature, soil preparation and type, soil moisture and use of various plastic films and or water sealing.
- Use of a lettuce seed and or tomato/pepper transplant test can be used to determine if sufficient time has elapsed between soil treatment and planting as described below.

#### *Lettuce Seed Test*

- After a minimum of 7 days after application proceed with the following Seed Jar test.
- Use a trowel to dig into the treated soil to a depth at or just beneath the depth of IRF135 injection and remove 2 to 5 samples with enough soil to fill a quart sized jar half-way, mix lightly, apply moisture enough to germinate seeds, sprinkle seeds evenly over the soil surface and seal immediately with a lid for air tight conditions.
- Sample the field in several areas, especially those areas that are not representative of the general field conditions and or having higher moisture content, different soil texture or areas where rate delivery is different.
- Prepare another similar sample of untreated soil for comparison.
- Keep the jars out of direct sunlight and at a temperature of 65° to 85°F. (Direct sunlight can overheat and kill the seedlings). Lettuce seed will not germinate in the dark so place in diffuse sunlight.
- After 1 to 3 days, check each jar for seed germination.
- If seeds in the treated jar germinate and grow similar to the untreated soil sample then the treated area is safe for planting.

#### *Tomato/Pepper Transplant Test*

- After a minimum of 7 days after application proceed with the following transplant test.
- Transplant 5 to 10 healthy, actively growing tomato or pepper seedlings into treated beds at normal planting depth and several locations within the treated area. If available repeat in an area of field *not treated* with IRF135 for comparison. If a wetter, heavier area of the treated field is available place the transplants there.
- Inspect the transplants in 3 days for plant injury including wilt, chlorosis, or leaf and root tip burn. Ensure that proper soil moisture conditions exist for transplants to remain free

from water stress. If plants in the treated area are asymptomatic and or are similar in growth and appearance to plants in the non-treated area it is safe to plant.

## **IRF135 DRIP (TRICKLE) CHEMIGATION APPLICATION USE DIRECTIONS**

### **Drip (Trickle) Chemigation Use Precautions:**

- The following applies to drip (trickle) irrigation systems.
- Crop injury and a reduction in efficacy can result from non-uniform distribution of IRF135 in irrigation water used to treat soil.
- For questions related to equipment calibration, consult your local State Extension Service specialist, equipment manufacturer or dealer.

### **Soil preparation:**

- Ensure compacted soil layers (plow pans) within the desired treatment zone are tilled and/or fractured if it is considered normal practice before application of IRF135 to ensure adequate soil drainage. Note that conditions where soil layers (plow pans) exist and are not tilled can result in reduced pest control, differences in planting interval or plant growth as a result of compacted or shallow soil conditions.
- The application site must be in seedbed condition. Ensure beds are listed, shaped and ready for planting.
- Ensure initial soil moisture is at ~50% of field capacity at 2 to 3 inches and down to 9 inches depth at the time of IRF135 application. Soil texture and amount of water to be applied will impact the desired initial % field capacity necessary for drip injection.

### **IRF135 Dosage:**

- Determining IRF135 dosage is based on consideration of the intended crop to be planted, treated area conditions, preparation, application method, target pest, and soil type.
- Use drip emitters with spacing of 4 to 12 inches with shallow subsurface placement to ensure thorough wetting of the soil area being treated by IRF135 drip injection.
- IRF135 must be metered at a target concentration between - 1000 – 3000 ppm (calculated by: total volume of product to be applied / total amount of water to be applied) x 1,000,000 into the water supply line and passed through a mixing device such as a centrifugal pump with by-pass agitation or static mixer to assure proper agitation and mixing to a target concentration (ppm) for even distribution before distribution into the drip irrigation system. The concentration of IRF135 should not exceed 3000 ppm at any time during the injection period within the drip line.
- The volume of irrigation water to deliver to the treated area is dependent upon the soil type, % soil moisture or the % of field capacity at the start of the application and the target moisture level following application and equipment rising.
- Determine the irrigation water flow and adjust the flow rate of IRF135 to meet the target ppm in irrigation water. Insert a static mixer or similar device immediately after the IRF135 injection point to insure adequate mixing with the irrigation water.

### **Chemigation Application Information:**

1. Apply this product only through drip (trickle) irrigation systems. Do not apply this product through any other type of irrigation system.
2. Crop injury or lack of effectiveness can result from non-uniform distribution of treated water.
3. If you have questions about calibration, contact State Extension Service specialists, equipment manufacturers or other experts.
4. Do not connect an irrigation system (including greenhouse systems) used for pesticide

application to a public water system unless the pesticide label-prescribed safety devices for public water systems are in place.

5. 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.

#### **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, back flow 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 flow 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.

#### **Equipment Considerations for Drip (Trickle) Chemigation Systems:**

1. The irrigation system (main line, headers, and drip tape) must be thoroughly inspected for leaks before the application starts. The leak detection process requires that the irrigations system be at full operating pressure. The time required at full operating pressure will vary according to the system design and layout, soil type and target ppm concentration. Signs of leaks may include puddling along major pipes and at the top or ends of rows and/or on the bed surface or movement or shifting of beds due to bed collapse in over saturated conditions. Any leaks discovered must be repaired prior to application of IRF135. For leaks discovered during application of IRF135, immediately stop injection, wear all appropriate PPE and repair the line insuring that the problem is corrected before commencing with the drip applied injection.
2. The system must contain a functional check valve (back flow prevention device), vacuum relief valve, and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from back flow.
3. The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
4. With use of injection pumps (e.g. Diaphragm or Centrifugal type pumps) 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.
5. 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.
6. 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.
7. To inject IRF135, use a metering device (such as a positive pressure system, positive displacement injection pump, diaphragm pump, or a Venturi system) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.
8. Use of an inert gas such as nitrogen or dry compressed air is acceptable for use in a

positive pressure system.

#### **Injection System Flush After IRF135 Application:**

- **After IRF135 injection, continue drip irrigation with clean water to flush remaining IRF135 completely out of the system.** Apply 3 times (3X) the volume of water equivalent to the capacity of the drip injection system from the point of injection to the ends of the drip tape to ensure IRF135 is completely voided from the injection lines and drip tape.
- Do not allow any IRF135 to remain in the system after application.
- If common lines are used for both the IRF135 application and to apply the water seal (if applied), the lines must be adequately flushed before starting the water seal and/or normal irrigation practices.

#### **Soil Sealing or Tarp Use:**

- When tarps are used with drip injection application, they must be in place prior to injection of IRF135.
- Tarp edges must be buried along the row furrow and at the ends of each row.

#### **Untarped Drip (Trickle) Chemigation Applications:**

- Use of shallow buried drip tape, i.e. >1 inch is acceptable when applying via Drip (trickle) Chemigation.

#### **Planting Interval for Raised Bed Drip Applications:**

- After application, leave the soil undisturbed for at least 10 days after the application is complete. Planting of the target crop is allowed at a minimum of 10 days following the completion of the application.
- Extremely cold, wet, or cold and wet soils can decrease dissipation of IRF135 and can require a longer soil exposure and/or aeration period.
- For tarped applications, where tarp perforation or hole punching occurs allow 2 to 24 hours aeration prior to planting to assist in IRF135 dissipation.
- Use of a Jar Seedling and/or Transplant test for crop safety can be performed prior to planting the target crop.

#### **Tarped or Non-Tarped Drip (Trickle) End of Season Crop Termination Chemigation Applications:**

- Use instructions listed above for preparation and application conditions for pre-plant drip (trickle) chemigation, with the exception of those instructions for soil preparation which are not applicable for this treatment. Use the following additional steps:
- Use existing drip or trickle tape in the bed.
- Ensure that all drip (trickle) tape is completely functional and without leaks or tears.
- Application is for soil already covered with plastic (with or without plant holes) and drip tape is buried at a depth of >1 inch.
- Apply IRF135 at 3 – 20 gallons/acre.
- IRF135 broadcast application rate is not to exceed 20 gallons/acre.
- IRF135 ppm concentration range in irrigation water (500 – 1,500 ppm).
- Dispose of all crop and / or plant residues following treatment by removal, tillage or other appropriate means.
- The terminated crop must not be used for any food or feed purposes after the product has been applied.

#### **Requirements for Greenhouse Soil Treatment**

- Applications methods for use in greenhouse soil treatment may be applied as drip

injection or tractor mounted shank where applicable according to the methods described for open field with exceptions listed below:

- All applications must be tarped or double water sealed (delivered via overhead sprinkler). Double water sealed is defined as twice the amount of water to deliver the soil treatment without causing over saturation of the soil or delivering enough water to maintain up to 80% soil moisture for 24 hours following application.
- During the application, keep doors, vents and windows to the outside open and keep fans or other mechanical ventilation systems running within the application area.
- Areas by which gases could enter adjacent enclosed areas must be sealed prior to application and remain closed for up to 48 hours post application.

**IRF135 TRACTOR MOUNTED SHANK RAISED BED AND BROADCAST/FLAT FUME APPLICATION USE DIRECTIONS**

**Soil moisture:**

- For tractor mounted shank applied treatments of IRF135 do not apply to dry soils. Target a soil moisture reading of 25 to 60% Available Water Content\* to a depth of 8 to 9 inches present for at least 24 to 48 hours prior to and until the start of the application.

\* Available Water Content (or Capacity) is the amount of water that a soil can store that is available for use by plants (USDA Soil Quality Information Sheet).

**Soil temperature at application:**

- Maximum of 60°F and a maximum of 90°F at application depth.

**Application Methods and Equipment:**

- Apply IRF135 using chisels spaced no more than 12 inches apart and no more than 3 outlets evenly spaced per chisel (rear and forward facing type shank). The top most outlets must be no less than 4 inches from the final air soil interface.
- For shank applications the use of tarps or a water cap does not eliminate the need to remove chisel traces. If chisel traces are not adequately closed by the application equipment the use of a press board, ring roller or other device to effectively close chisel traces must be performed.

**Application Depth:**

- The point of injection must be a minimum of 4 inches from the final soil/air interface.
- The point of deep injection must be at a minimum of 18 inches from the final soil/air interface. Use deeper placement when fumigating soil to be planted to deep-rooted plants, such as perennial fruit and nut crops, or to control deeply distributed pests.

Application Type	Injection depth	Single Sweep Chisel Spacing	Noble Plow Injector Outlet Spacing	Yetter Rig Injector Spacing	Tarped Type Sealing, Applied immediately after application*	Non-Tarped Type Sealing
Broadcast Shallow Shank	4 – 15 inches	6 – 12 inches**	6 – 12 inches	4 – 6 inches	PE, VIF, TIF	Overhead sprinkler, water cap and/or Roller/Packer to compact soil surface, and close chisel traces

Application Type	Injection depth	Single Sweep Chisel Spacing	Noble Plow Injector Outlet Spacing	Yetter Rig Injector Spacing	Tarped Type Sealing, Applied immediately after application*	Non-Tarped Type Sealing
Broadcast Deep Shank	> 17 inches	18 – 24 inches	NA	NA	NA	Roller/packer to compact soil surface
Raised Bed shallow shank or Strip Application	4 – 15 inches	6 – 12 inches**	NA	4 – 6 inches	PE, VIF, TIF	Overhead Sprinkler, water cap and/or Roller/Packer to compact soil surface, and close chisel traces
<p>* PE = Polyethylene film; VIF = Virtually Impermeable Film; TIF = Totally Impermeable Film</p> <p>** Use of no more than 3 nozzles per sweep with 4 – 5 inches / nozzle and bottom nozzle at no more than 15 inches from soil surface.</p>						

#### Prevention of End Row Spillage:

- Do not apply or allow IRF135 to spill onto the soil surface. Each injection line either needs a check valve located as close as possible to the soil injection point to avoid dripping or spillage. If a check valve system is not in place purge and drain the injection line prior to lifting the injection shanks from the ground.
- Only lift the injection shanks from the ground when the shut-off valve has been closed, and the IRF135 injection line has been depressurized to passively drain remaining IRF135 or when the system has been actively purged (e.g. via air compressor).

#### Injection Rig Calibration, Set-up, Repair, and Maintenance:

- IRF135 application equipment must be calibrated and all control systems working properly. Proper calibration is critical to ensure IRF135 application rate and soil placement. Refer to the equipment manufacturer's instructions to properly calibrate the injection equipment. The equipment dealer, local Cooperative Extension Service, crop advisor or IRF135 dealer can provide assistance.
- Flush all equipment with water after each day's use; disassemble valves and clean carefully. All rinsate should be properly applied to the field.

#### Planting Interval for Raised Bed Shank and Broadcast/Flat Fume Application

- After application, leave the soil undisturbed for at least 5 days after application prior to tarp cutting or perforation/hole punching.
- For tarped applications, complete cutting of the tarp for removal or perforation/hole punching 2 to 24 hours prior to tarp removal or planting to assist in IRF135 dissipation.
- Tarp cutters and removers shall wear long-sleeved shirt, long pants and gloves when there is no waiting or aeration period between tarp cutting and removing the tarp following application and prior to planting.
- Soil under un-tarped shanked applications must remain undisturbed for a minimum of 5 days following completion of the applications before tillage and or planting of the crop.
- Soil can be planted with the target crop at a minimum of 10 days following drip application.
- Soil can be planted with the target crops at a minimum of 10-14 days following shank applications only if conditions are favorable for soil moisture and dissipation of IRF135 in the soil.

- Cold and or wet soils can decrease dissipation of IRF135 and can require a longer soil exposure and or aeration period.
- Use of a Jar Seedling and/or Transplant test for crop safety can be performed prior to planting the target crop.

## PESTS CONTROLLED FROM SOIL TREATMENT USES

### Nematodes

Common Name (if applicable)	Scientific Name
Pin nematode	<i>Paratylenchus</i>
Ring nematode	<i>Mesocriconema (=Criconemoides, =Criconemella)</i>
Root knot nematode	<i>Meloidogyne</i>
Root-lesion nematode	<i>Pratylenchus</i>
Spiral nematode	<i>Helicotylenchus</i>
Sting nematode	<i>Belonolaimus</i>
Stubby-root nematode	<i>Paratrichodorus</i>
Stem and bulb nematode	<i>Tylenchus</i>

### Soil Borne Fungi

Common Name (if applicable)	Scientific Name
Charcoal rot	<i>Macrophomina phaseolina</i>
Clubroot organism	<i>Plasmodiophora</i>
Corky root	<i>Pyrenochaeta</i>
Fusarium wilt	<i>Fusarium spp.</i>
Phytophthora	<i>Phytophthora spp.</i>
Pythium	<i>Pythium spp.</i>
Rhizoctonia	<i>Rhizoctonia spp.</i>
Southern blight	<i>Sclerotium rolfsii</i>
Verticillium wilt	<i>Verticillium dahliae</i>

### Insects in the Soil at the Time of Treatment

Common Name (if applicable)	Scientific Name (if applicable)
Cutworms	
Japanese beetles	
June beetles and larva	
Symphylan (centipedes)	
White grubs	
Wireworms	

### Weeds

Common Name (if applicable)	Scientific Name
California burclover	<i>Medicago lupulina</i>
Common chickweed	<i>Stellaria media</i>
Common mallow	<i>Malva neglecta</i>
Common purslane	<i>Portulaca oleracea</i>
Field bindweed	<i>Convolvulus arvensis</i>
Annual grass spp.	
Morningglory spp.	<i>Ipomoea spp.</i>
Prostrate knotweed	<i>Polygonum aviculare</i>
Purple nutsedge*	<i>Cyperus rotundus</i>
Yellow nutsedge*	<i>Cyperus esculentus</i>

\* Suppression under wet conditions and heavy pest populations.

### Mollusks

Slugs and Snails.



## STORAGE AND DISPOSAL

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

### **PESTICIDE STORAGE**

Store in original container in a cool, dry place.

### **PESTICIDE DISPOSAL**

Waste resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

### **CONTAINER HANDLING for non-refillable containers**

This is a non-refillable container. Do not reuse or refill this container. Empty the package completely and triple rinse container (or equivalent pressure rinse) promptly after emptying with water to be used for application. Then dispose of the empty container according to state and local regulations. Place in trash or offer for recycling if available or return it to the Seller, or, if allowed by state and local authorities, by burning. If burned stay out of smoke.

### **TRIPLE RINSING INSTRUCTIONS:**

#### **For rigid, nonrefillable containers small enough to shake (with capacities equal to or less than 5 gallons):**

Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container one-fourth full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times.

#### **For rigid, non-refillable containers that are too large to shake (with capacities greater than 5 gallons):**

Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container one-fourth full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times.

### **PRESSURE RINSE PROCEDURE (all sizes):**

Pressure rinse as follows: Empty the remaining contents into application equipment or a tank mix and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 PSI for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

### **CONTAINER HANDLING for rigid, refillable containers**

Refillable container. Refill this container with IRF135 pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

## **LIMITATION OF WARRANTY AND LIABILITY**

Read the entire label before using this product, including this Limitation of Warranty and Liability.

If the terms are not acceptable, return the product at once unopened for a refund of the purchase price.

This Company warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes set forth in the Directions for Use, subject to the inherent risks described below, when used in accordance with the Directions for Use under normal conditions.

**TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, ISAGRO MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.**

Buyers and Users of this product must be aware that there are inherent unintended risks associated to the use of this product, independent from the control of Isagro. These risks include, but are not limited to, weather conditions, soil factors, moisture conditions, diseases, irrigation practices, condition of the crop at the time of application, materials which are present in the tank mix with this product or prior to the application of it, cultural practices or the manner of use or application, all risks which are impossible to eliminate. The Buyers and Users should be aware that these factors may cause: ineffectiveness of the product, reduction of harvested yield of the crop (entirely or partially), crop injury or injury to non-target crops or plants or to rotational crops caused by carryover in the soil, resistance of the target weeds to this product. Therefore additional care, treatment and expense are required to take the crop to harvest.

If the Buyer does not agree with the acceptance of these risks, then **THE PRODUCT SHOULD NOT BE APPLIED**. To the extent consistent with applicable law, by applying this product the Buyer acknowledges and accepts these inherent unintended risks and **AGREES THAT ALL SUCH RISKS ASSOCIATED WITH THE APPLICATION AND USE ARE ASSUMED BY THE BUYER**.

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