

# **BARLEY, TRITICALE AND WHEAT - EARLY SEASON DISEASE CONTROL**

## General Information

## Product Information

This package contains Caramba fungicide. To maximize disease control, apply Caramba in a regularly scheduled protective spray program and use in a rotation program with other fungicides.

Caramba has good residual activity against target fungi.

Caramba is not for use in greenhouse or transplant production.

## Mode of Action

Metconazole, the active ingredient of Caramba, inhibits demethylation of sterol biosynthesis (DMI), disrupting cell membrane synthesis of target site of action Group 3 fungicides.

## Resistance Management

Caramba fungicide contains metconazole, a Group 3 fungicide, and is effective against pathogens resistant to fungicides with modes of action different from those of QoI fungicides (target site Group 3). Fungal isolates resistant to Group 3 fungicides may eventually dominate the fungal population if Group 3 fungicides are used predominantly and repeatedly in the same field in successive years as the primary method of control for the targeted pathogen species. This may result in reduction of disease control by Caramba or other Group 3 fungicides.

To maintain the performance of Caramba in the field, DO NOT exceed the maximum seasonal use rate or the total number of applications of Caramba per season and the maximum number of applications of Caramba stated in Table 1. Caramba fungicide Crop- specific Restrictions and Limitations. Adhere to the label instructions regarding the use of Caramba or other target site of action Group 3 fungicides that have a similar site of action on the same pathogens.

## Resistance Management Advisory

The following recommendations may be considered to delay the development of fungicide resistance.

1. Tank mixtures - Use tank mixtures with effective fungicides from different target site of action groups that are registered/permitted for the same use and that are effective against the pathogens of concern. Use at least the minimum labeled rates of each fungicide in the tank mix.
2. Integrated Pest Management (IPM) - Caramba should be integrated into an overall disease and pest management program. Cultural practices known to reduce disease development should be followed. Consult your local extension specialist, certified crop advisor and/or BASF representative for additional IPM strategies established for your area. Caramba may be used in Agricultural Extension advisory (disease forecasting) programs, which recommend application timing based on environmental factors favorable for disease development.
3. Monitoring - Monitor efficacy of all fungicides used in the disease management program against the targeted pathogen and record other factors that may influence fungicide performance and/or disease development. If a Group 3 target site fungicide, such as Caramba, appears to be less effective against a pathogen that it previously controlled or suppressed, contact a BASF representative, local extension specialist, or certified crop advisor for further investigation.

## Application Instructions

Apply Caramba at rates and timings as required in the label.

### Use Directions for Sprinkler Irrigation Applications

- Apply this product only through sprinkler irrigation systems 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.

- Add this product to the pesticide supply tank containing sufficient water to maintain a continuous flow by the injection equipment. In continuous moving systems, inject this product-water mixture continuously, applying the labeled rate

per acre for that crop. DO NOT exceed 1/2 inch (13,577 gallons) per acre. In stationary or noncontinuous moving systems, inject the product-water mixture in the last 15 to 30 minutes of each set, allowing sufficient time for all of the required pesticide to be applied by all the sprinkler heads and applying the labeled rate per acre for that crop. DO NOT apply when wind speed favors drift beyond the area intended for treatment. Crop injury, lack of effectiveness, or illegal pesticide residues in the crop can result from nonuniform distribution of treated water. Thorough coverage of foliage is required for good control. Good agitation should be maintained during the entire application period.

- If you have questions about calibration, you should contact state extension service specialists, equipment manufacturers or other experts.
- The system must contain a functional check valve, vacuum relief valve, and low-pressure drain appropriately located on the irrigation pipeline to prevent watersource contamination from backflow.
- The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
- The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.
- The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.
- The irrigation line or water pump must include a functional pressure switch which will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.
- 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.
- Allow sufficient time for pesticide to be flushed through all lines and all nozzles

before turning off irrigation water. A person knowledgeable of the chemigation system and responsible for its operation, or under supervision of the responsible person, shall shut the system down and make necessary adjustments should the need arise.

- DO NOT connect an irrigation system used for pesticide application to a public water system unless the pesticide label-prescribed safety devices for public water systems are in place.

### Application Instructions

Apply Caramba fungicide according to the rate, timing, resistance management and adjuvant use instructions in the disease-specific use directions (Table 2. Caramba fungicide Crop-specific Instructions) in the label.

Caramba may be applied by ground sprayer, aerial equipment, or through sprinkler irrigation equipment. Equipment should be checked frequently for calibration.

### Ground Application

Apply Caramba in = 5 gallons/acre. Thorough coverage of foliage, blooms, and fruit is required for optimum disease control. The use of a nonionic surfactant at the lowest labeled rate may be used to improve spray coverage. Refer to the adjuvant product label for specific use directions. DO NOT use adjuvants that contain methylated seed oil, crop oil concentrate, or crop oil with emulsifier properties.

### Aerial Application

DO NOT apply when conditions favor drift from target area. DO NOT use less than 2 gallons per acre (gpa) spray volume on barley, oats, rye, sugarcane, triticale, and wheat. DO NOT use less than 5 gallons per acre spray volume on sugar beets.

For all aerial application volumes (gpa), the use of a nonionic surfactant at the lowest labeled rate may be used to improve spray coverage. Refer to the adjuvant product label for specific use directions. DO NOT use adjuvants that contain methylated seed oil, crop oil concentrate, or crop oil with emulsifier properties. Select spray nozzles, pumping pressure, and sprayer height to provide medium-to-fine spray droplets that penetrate throughout the crop canopy. Spray calibration must be conducted to confirm spray droplet sizes. Continue to monitor spray application (including weather conditions) to assure proper droplet size and canopy

penetration.

### Restrictions and Limitations

- DO NOT use less than 5 gallons per acre (gpa) spray volume for ground applications.
- For aerial applications, DO NOT use less than 2 gallons per acre (gpa) spray volume on barley, oats, rye, sugarcane, triticale and wheat. DO NOT use less than 5 gallons per acre spray volume on sugar beets.
- No livestock feeding restrictions for all crops on the label.

Refer in the supplemental label for more information.

### Limitations, Restrictions, and Exceptions

#### BARLEY, TRITICALE AND WHEAT

Application Directions for Early Season Disease Control. Apply 5.0 to 8.3 fl ozs/A of Caramba fungicide either in combination with a herbicide application or when conditions favor disease development prior to flag leaf emergence. When the early season application is used, a second Caramba application (10 to 14 fl ozs/A) may be required to protect the emerged flag leaf. Environmental conditions and disease pressure at the time of flag leaf emergence are factors to determine the Caramba rate for the second application. Early season sprays of Caramba will not suppress or control head scab (*Fusarium* head blight).

The minimum retreatment interval (RTI) is 6 days.

No livestock feeding restrictions.

The combination of an early season spray plus a second regular season application after flag leaf emergence must not exceed 34 fl ozs/A per season.

Crop Tolerance. Under certain environmental conditions, Caramba demonstrates some phytotoxicity when mixed with EC formulated herbicides or insecticides and/or fertilizers. The possibility of phytotoxicity increases if applications are made under cool, cloudy conditions that persist for several days following application. Caramba applications with bromoxynil containing products can result in phytotoxicity if applied under cool, wet conditions.

Specific Use Requirements. Apply Caramba plus herbicide/insecticide tank mixes by air in a minimum of 5 gallons per acre (gpa) total spray volume. If applied by ground, apply a minimum of 10 gpa. Lower gpa applications can increase the risk of phytotoxicity. DO NOT use adjuvants that contain methylated seed oil, crop oil concentrate or crop oil with emulsifier properties. DO NOT apply Caramba if the final spray solution contains fertilizer at a concentration greater than 20% on a v/v basis. DO NOT use early season Caramba applications in bromoxynil based herbicide tank mixes in barley.

Tank Mix Recommendations. For improved disease control, including stripe rust, tank mix 5.0 to 8.3 fl ozs of Caramba with 3 to 6 fl ozs of Headline fungicide.

- Early season disease control is not registered for use in California.

Method

[Broadcast/Foliar Air](#)

[Broadcast/Foliar Ground](#)

Pre-Harvest Interval

30 days

Rates

[field rates 0](#)

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Restricted Entry Interval

12 hours

Timings

[When conditions favor disease development prior to flag leaf emergence.](#)