

**1. IDENTIFICATION**

Product name: **Orius® 45 DF Foliar Fungicide**  
 Chemical name of active ingredient(s): Tebuconazole:  $\alpha$ -(2-(4-Chlorophenyl)ethyl)- $\alpha$ -(1-1-dimethylethyl)-1H-1,2,4-triazole-1-ethanol  
 Chemical family: Triazole  
 Manufacturer: Makhteshim Agan of North America, Inc.  
 4515 Falls of Neuse Road, Suite 300  
 Raleigh, NC 27609  
 Phone: 919-256-9300  
 For fire, spill, and/or leak emergencies, contact Infotrac: Phone: 1-800-535-5053  
 For medical emergencies and health and safety inquiries, contact Prosar: Phone: 1-877-250-9291

**2. COMPOSITION/INFORMATION ON INGREDIENTS**

COMMON NAME	CAS NO.	%	OSHA PEL	ACIGH TLV	NTP/IARC/OSHA (Carcinogen)
<b>Tebuconazole</b>	107534-96-3	45	NE	NE	NA
Total crystalline silica (quartz)	14808-60-7	1.22	0.1 mg/m <sup>3</sup> TWA (respirable)	0.05 mg/m <sup>3</sup> TWA (respirable)	IARC Rating:1*

NE=None established

NA=Not applicable

\*Substances or groups of substances and medical treatments that are known to be carcinogenic.

**3. HAZARDS IDENTIFICATIONS****EMERGENCY OVERVIEW**

**WARNING.** Cause substantial but temporary eye injury. Harmful if swallowed, inhaled or absorbed through the skin. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Do not get in eyes, on skin, or on clothing. Avoid breathing dust or spray mist.

**PHYSICAL PROPERTIES**

Appearance: Tan granules

Odor: Slight

**LIKELY ROUTES OF EXPOSURE**

Inhalation; skin contact; skin absorption; eye contact.

**IMMEDIATE EFFECTS :****Eye:** Cause substantial but temporary eye injury. Do not get in eyes.**Skin:** Harmful if absorbed through skin. May cause slight irritation. May cause sensitization by skin contact. Avoid contact with skin and clothing.**Ingestion:** Harmful if swallowed. Do not take internally.**Inhalation:** Harmful if inhaled. Avoid breathing dust or spray mist.**CHRONIC OR DELAYED LONG-TERM :**

This product is not listed as a carcinogen by ACGIH, NTP, IARC or OSHA. However, it may contain crystalline silica (quartz), a substance which has been listed as a carcinogen by ACGIH, NTP and IARC. Crystalline silica is a naturally-occurring mineral component of many sands and clays. Although the carcinogenic potential of crystalline silica in humans is controversial, it must be considered if it is inhaled under excessive exposure conditions. The respirable portion of the silica that may be contained in this product, however, is small, such that excessive inhalation exposure during anticipated conditions of use is unlikely.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE**

No specific medical conditions are known which may be aggravated by exposure to this product. As with all materials which can cause upper respiratory tract irritation, persons with a history of asthma, emphysema, or hyperactive airways disease may be more susceptible to overexposure. Pulmonary and respiratory diseases may be aggravated by exposure to respirable crystalline silica.

**HAZARDOUS DECOMPOSITION PRODUCTS :** Thermal decomposition, CO, CO<sub>2</sub> and NO<sub>x</sub>

**UNUSUAL FIRE/EXPLOSION HAZARDS:** Dust Explosion Hazard: Specific testing with tebuconazole is not complete. Tests indicate low ignition energy for dust cloud, meaning that an explosive mixture can develop. Measures should be taken to eliminate buildup of static charge during routine material handling. All equipment should be grounded and material stored in containers lined with conductive plastic bags. If large dust cloud develops, turn off all devices that may cause spark and leave area until cloud dissipates.

**4.FIRST AID MEASURES**

<b>FIRST AID</b>	
<b>IF IN EYES:</b>	<ul style="list-style-type: none"> <li>• Hold eye open and rinse slowly and gently with water for 15-20 minutes.</li> <li>• Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
<b>IF ON SKIN OR CLOTHING:</b>	<ul style="list-style-type: none"> <li>• Take off all contaminated clothing immediately.</li> <li>• Rinse skin immediately with plenty of water for at least 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>• Call a poison control center or doctor immediately for treatment advice.</li> <li>• Have person sip a glass of water if able to swallow.</li> <li>• Do not induce vomiting unless told to by a poison control center or doctor.</li> <li>• Do not give anything by mouth to an unconscious person.</li> </ul>
<b>IF INHALED:</b>	<ul style="list-style-type: none"> <li>• Move person to fresh air.</li> <li>• If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible.</li> <li>• Call a poison control center or doctor for further treatment advice.</li> </ul>
<p><b>Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact PROSAR at 1-887-250-9291 for emergency medical treatment information.</b></p>	

**Note to Physicians:** No specific antidote. Appropriate supportive and symptomatic treatment as indicated by the patient's condition is recommended.

**5. FIRE FIGHTING MEASURES**

**FLASH POINT:** Not applicable.

**EXTINGUISHING MEDIA:** Water spray, carbon dioxide (CO<sub>2</sub>), dry chemical, foam.

**HAZARDOUS DECOMPOSITION PRODUCTS :** Thermal decomposition, CO, CO<sub>2</sub> and NO<sub>x</sub>

**FIRE-FIGHTING PROCEDURES:** Keep out of smoke. Fight fire from upwind position. Cool closed containers exposed to fire with water spray. Dike area to prevent runoff and contamination of water sources. Equipment or materials involved in pesticide fires may become contaminated. Wear self-contained breathing apparatus and protective suit.

**UNUSUAL FIRE/EXPLOSION HAZARDS:** This product, when mixed with air in critical proportions and in the presence of an ignition source, may present an explosion hazard.

**6. ACCIDENTAL RELEASE MEASURES**

**PERSONAL PRECAUTIONS:** Keep unauthorized people away. Isolate hazard area. Avoid contact with spilled product or contaminated surfaces.

**METHODS FOR CLEANING UP:** Avoid creating a dust cloud. Sweep up spilled material. Keep in suitable, closed containers for disposal. Clean contaminated floors and objects thoroughly with water and detergents, observing environmental regulations.

**ADDITIONAL ADVICE:** Use personal protective equipment. Avoid contact with skin. Avoid breathing dust. Do not allow material to enter streams, sewers, or other waterways.

**7. HANDLING AND STORAGE**

**HANDLING:** Read label carefully before use. Handle and open container in a manner as to prevent spillage. Use only in area provided with appropriate exhaust ventilation. Wash hands thoroughly with soap and water after handling and 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.

**STORAGE:** Store in a cool, dry place and in such a manner as to prevent cross contamination with other pesticides, fertilizers, food, and feed. Store in original container and out of the reach of children, preferably in a locked storage area. Handle and open container in a manner as to prevent spillage.

**STORAGE TEMPERATURE (MIN/MAX):**

There is no minimum storage temperature. 60 day average temperature not to exceed 100°F.

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

**THE FOLLOWING RECOMMENDATIONS FOR EXPOSURE CONTROLS/PERSONAL PROTECTION ARE INTENDED FOR THE MANUFACTURE, FORMULATION, PACKAGING AND USE OF THIS PRODUCT.**

**FOR COMMERCIAL APPLICATIONS AND/OR ON-FARM APPLICATIONS CONSULT THE PRODUCT LABEL.**

**EYE PROTECTION REQUIREMENTS:** Goggles.

**SKIN PROTECTION REQUIREMENTS:** Wear long-sleeved shirt and long pants and shoes plus socks.

**HAND PROTECTION:** Wear chemical resistant gloves such as nitrile, and additional protective clothing when needed to prevent dermal exposure.

**RESPIRATOR REQUIREMENTS:** If necessary under conditions of use, wear a NIOSH-approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industry recommendations.

**ADDITIONAL PROTECTIVE MEASURES:** Clean water should be available for washing in case of eye or skin contamination. Educate and train employees in safe use of this product. Follow all label instructions. Launder clothing after use. Prevent eating, drinking, tobacco usage and cosmetic application in areas where there is a potential for exposure to the material. Wash hands thoroughly before eating, drinking, chewing gum, using tobacco or using the toilet. Remove clothing immediately if product gets inside. Then wash thoroughly and put on clean clothing.

**EXPOSURE GUIDELINES:** Refer to Section 2.

**ENGINEERING CONTROLS:** Maintain exposure levels below the exposure limit through the use of general and local exhaust ventilation.

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.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

**APPEARANCE:** Tan

**PHYSICAL STATE:** Solid granular

**pH:** 6-8

**BULK DENSITY:** 33-39 lb/ft<sup>3</sup>

**10. STABILITY AND REACTIVITY**

**STABILITY:** This product is stable under normal conditions.

**CONDITIONS TO AVOID:** Exposure to moisture and extreme heat.

**MATERIALS TO AVOID:** None known.

**HAZARDOUS POLYMERIZATION:** Will not occur.

**HAZARDOUS DECOMPOSITION PRODUCTS:** Thermal decomposition, CO, CO<sub>2</sub> and NO<sub>x</sub>

**11. TOXICOLOGICAL INFORMATION**

Only acute toxicity studies have been performed on this product as formulated. The non-acute information pertains to the technical-grade active ingredient, tebuconazole.

### ACUTE TOXICITY/IRRITATION STUDIES

Acute Oral LD<sub>50</sub> (Rat): 4,865 mg/kg (male); 2,593 mg/kg (female)

Acute Dermal LD<sub>50</sub> (Rabbit): >2,000 mg/kg (male and female)

Acute Inhalation LC<sub>50</sub> (Rat): >0.97 mg/L air (4-hours to liquid aerosol); >3.880 mg/l (1-hour; extrapolated from 4-hr LC<sub>50</sub>)

Eye Irritation (Rabbit): Mild irritation

Dermal Irritation (Rabbit): Slight irritation

Dermal Sensitization (Guinea pig): Positive dermal sensitizer

### CHRONIC TOXICITY

The principal organs affected in rats and dogs from long-term exposure to high doses of tebuconazole included the liver, spleen, adrenals, and/or eyes.

### ASSESSMENT CARCINOGENICITY

Tebuconazole was not carcinogenic in a chronic feeding studies using rats. In an oncogenicity study in mice, there was an increased incidence of liver tumors at the highest dose tested, a dose 3x the maximum tolerated dose(MTD). EPA classified tebuconazole as a Group C(possible human carcinogen) chemical based on liver tumors. The Agency used a non-liners methodology approach for determining the Margin of Exposure (MOE) for the estimation of cancer risk. Therefore, EPA has a reasonable certainty that no harm will result from exposure to residues of tebuconazole.

### DEVELOPMENTAL TOXICITY

Tebuconazole was not a primary developmental toxicant in rats, mice and rabbits. Developmental and/or teratogenic effects were observed but were considered secondary to maternal toxicity.

### REPRODUCTION TOXICITY

Tebuconazole was not considered a primary reproductive Toxicant in rats. Decreased pup body weights and smaller litters were observed at the highest concentration but were considered secondary to maternal toxicity.

### NEUROTOXICITY

Tebuconazole has been tested in acute and subchronic neurotoxicity screening studies in rats. Transient neurobehavioral effects (e.g., decreased motor activity) were observed in the acute study. Neuropathological changes were not observed in either study. Tebuconazole did not cause any specific neurobehavioral effects in the offspring in a one-generation developmental neurotoxicity study in rats.

### MUTAGENICITY

Tebuconazole was not mutagenic or genotoxic in a battery of *in vitro* and *in vivo* mutagenicity studies.

## 12. ECOLOGICAL INFORMATION

This pesticide is toxic to fish, aquatic invertebrates and marine/estuarine organisms. Do not apply directly to water, 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 fish/aquatic organisms in adjacent sites. Do not contaminate surface or ground water by cleaning equipment or disposal of wastes, including equipment wash water.

## 13. DISPOSAL CONSIDERATIONS

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

**CONTAINER DISPOSAL:** Completely empty container into application equipment, then dispose of empty container in a sanitary landfill, by incineration or by other procedures approved by state/provincial and local authorities. If burned, stay out of smoke.

## 14. TRANSPORT INFORMATION

**DOT CLASSIFICATION:** Not regulated

**B/L FREIGHT CLASSIFICATION:** Item 102120 [Insecticides, Fungicides, Insect or Animal Repellants]  
Class 60

**INTERNATIONAL TRANSPORTATION:**

**IMO (vessel):** Not regulated

**IATA (air):** Not regulated

**15. REGULATORY INFORMATION**

**SARA TITLE III CLASSIFICATION:**

Section 302: Not applicable  
Section 311/312: Acute health hazard (immediate)  
Chronic health hazard (delayed)  
Section 313: Not applicable

**CA PROPOSITION 65:** Quartz(Silica, crystalline)(1.22%); CAS#14808-60-7

**CERCLA RQ:** Not applicable

**RCRA CLASSIFICATION:** Not applicable

**TSCA STATUS:** Quartz(Silica, crystalline)(1.22%); CAS#14808-60-7

**16. OTHER INFORMATION**

<b>NFPA HAZARD RATINGS</b>	<b>NFPA</b>	
<b>HEALTH:</b>	2	0 MINIMAL
<b>FLAMMABILITY:</b>	1	1 SLIGHT
<b>REACTIVITY:</b>	1	2 MODERATE
		3 SEVERE
		4 EXTREME

**MSDS issued:** 5-12-06; Supercedes 2-16-05.

The information herein is given in good faith, but no warrant, express or implied, is made. Consult Makhteshim Agan of North America, Inc. for further information.