



FUNGICIDE

# Kestrel®

**Broad Spectrum and Systemic Disease Control for Turf and Ornamentals and  
\*a Flare Root-injected Systemic Fungicide for Control of Selected Diseases in Trees  
(\*Flare root-injected uses not registered for use in CA)**

ACTIVE INGREDIENT	% BY WT.
Propiconazole: 1-[[2-(2,4-dichlorophenyl)-4-propyl-1,3-dioxolan-2-yl]Methyl]-1 <i>H</i> -1,2,4-triazole .....	14.3%
<b>INERT INGREDIENTS:</b> .....	<b>85.7%</b>
<b>TOTAL</b> .....	<b>100.0%</b>

Kestrel contains 1.3 lbs. of active ingredient per gallon.

## KEEP OUT OF REACH OF CHILDREN WARNING – AVISO

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 to 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 contaminated clothing.</li> <li>• Rinse skin immediately with plenty of water for 15 to 20 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>• Immediately call a poison control center or doctor.</li> <li>• Do not give any liquid to the person.</li> <li>• Do not induce vomiting unless told to do so 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>

Have the product container or label with you when calling a poison control center or doctor or going for treatment. **For medical emergencies involving this product, call toll free 1-888-875-1724.**

**NOTE TO PHYSICIAN:** There is no specific antidote for this product. Induce emesis or lavage stomach, taking care to avoid aspiration of stomach contents into lungs.

**Manufactured for: Phoenix Environmental Care, LLC**  
P.O. Box 370 • Valdosta, GA 31603-0370

EPA Reg. No. 66222-41-81943

**PRECAUTIONARY STATEMENTS  
HAZARDS TO HUMANS AND DOMESTIC ANIMALS  
WARNING – AVISO**

Causes substantial, but temporary eye injury. Do not get in eyes or on clothing. Harmful if swallowed, inhaled, or absorbed through the skin. Avoid contact with skin or clothing. Avoid breathing vapor or spray mist.

**ENVIRONMENTAL HAZARDS**

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

**PHYSICAL OR CHEMICAL HAZARDS**

Do not use or store near heat or open flame.

**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 C 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, butyl rubber, nitrile rubber, neoprene rubber, polyvinyl chloride (PVC), or Viton
- Shoes plus socks
- Protective eyewear

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. 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 STATEMENT**

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**

**User 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.

**DIRECTIONS FOR USE**

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

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

**AGRICULTURAL USE REQUIREMENTS**

Use this product only in accordance with its labeling and 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
- Chemical-resistant gloves, such as barrier laminate, butyl rubber, nitrile rubber, neoprene rubber, polyvinyl chloride (PVC), or Viton
- Shoes plus socks
- Protective eyewear

**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.

**Do not enter treated areas without protective clothing until sprays have dried.**

**FAILURE TO FOLLOW THE DIRECTIONS FOR USE AND PRECAUTIONS ON THIS LABEL MAY RESULT IN PLANT INJURY OR POOR DISEASE CONTROL.**

## GENERAL INFORMATION

Kestrel is a systemic fungicide for use on turfgrasses for the control of dollar spot (*Sclerotinia homoeocarpa*), brown patch (*Rhizoctonia solani*), anthracnose (*Colletotrichum graminicola*), red thread (*Laetisaria fuciformis*), pink patch (*Limonomyces roseipellis*), rust (*Puccinia graminis*), powdery mildew (*Erysiphe graminis*), stripe smut (*Ustilago striiformis* and *Urocystis agropyri*), summer patch (*Magnaporthe poae*), necrotic ring spot (*Leptosphaeria korrae*), spring dead spot (*Leptosphaeria korrae*, *Leptosphaeria narmari*, *Ophiosphaerella herpotricha*, *Gaeumannomyces graminis*), take-all patch (*Gaeumannomyces graminis*), leafspot (*Bipolaris* spp., *Drechslera* spp.), gray leafspot (*Pyricularia grisea*), pink snowmold (*Microdochium nivale*), Fusarium patch (*Fusarium nivale*), gray snowmold (*Typhula* spp.), yellow patch (*Rhizoctonia cerealis*), and zoysia patch (*Rhizoctonia solani*).

Kestrel also controls numerous diseases on ornamentals and other landscape and nursery plantings. It controls powdery mildews, rusts, leafspots, scabs, and blights. Refer to the appropriate section for specified diseases and plants.

Do not apply this product through any type of irrigation system.

When an adjuvant is to be used with this product, Phoenix Environmental Care, LLC suggests the use of a Chemical Producers and Distributors Association certified adjuvant.

## MIXING INSTRUCTIONS

Fill the spray tank ½ to ¾ full with water. Add the proper amount of Kestrel and then add the rest of the water. Provide sufficient agitation during mixing and application to maintain a uniform emulsion.

If Kestrel is tank mixed with other products, use the following sequence:

1. Always check the compatibility of the tank mix using a jar test with proportionate amounts of Kestrel, other chemicals to be used, and the water, before mixing in the spray tank.
2. Provide sufficient jet or mechanical agitation during filling and application to keep the tank mix uniformly suspended.
3. Fill tank at least ½ full of clean water.
4. Add wettable powders to the tank first, allowing them to completely suspend in the tank before proceeding. This process can be hastened by premixing the product in water before adding to the tank.
5. Add flowables or suspensions next.
6. Add Kestrel next.
7. Add emulsifiable concentrates last.
8. Do not leave tank mix combinations in the spray tank for prolonged periods without agitation. Mix and apply them the same day.

## TANK MIXES

For broader spectrum control, Kestrel can be tank mixed with other fungicides. For example, Subdue may be tank mixed with Kestrel or used alone when conditions are favorable for Pythium blight. Kestrel is also compatible with numerous herbicides and insecticides. Check compatibility before tank mixing. Add Unite (3 pts. per 100 gals.) to tank mixes which are incompatible. Follow the directions under **MIXING INSTRUCTIONS** for tank mixes. Observe all directions, precautions, and limitations on labeling of all products used in tank mixes. Tank mixtures or other applications of products referenced on this label are permitted only in those states in which the referenced products are registered.

## TURFGRASS AND DICHONDRA DISEASE CONTROL

### 1. USE KESTREL IN A PREVENTIVE DISEASE CONTROL PROGRAM.

2. Apply in sufficient water to ensure thorough coverage.
3. Apply after mowing **OR** allow sprayed area to completely dry before mowing.
4. For control of foliar diseases, allow sprayed area to completely dry before irrigation.
5. For control of soil-borne diseases, Kestrel can be watered in after application.
6. Under conditions optimum for high disease pressure, use the higher rate and the shorter interval.
7. For optimum turf quality and disease control, use Kestrel in conjunction with turf management practices that promote good plant health and optimum disease control.
8. Evaluate spray additives prior to use. Label directions are based on data obtained with no additives.
9. Before use of any fungicide, proper diagnosis of the organism causing the disease is important. Use of diagnostic kits or other means of identification of the disease organism is essential to determine the best control measures.
10. Do not apply more than 16 fl. oz. per 1,000 ft.<sup>2</sup>/calendar year nor apply more than 5.4 gals. of product per acre per calendar year.
11. Do not graze animals on treated areas. Do not feed clippings from treated areas to livestock or poultry.
12. Bermudagrass can be sensitive to Kestrel. Do not exceed 4 fl. oz. per 1,000 sq. ft. every 30 days on any variety of bermudagrass. In Florida, do not apply Kestrel to bermudagrass golf course greens when temperatures exceed 90°F.

### Turfgrass—Specific Diseases, Rates, and Application Timing

Disease	Fl. Oz. Per 1,000 Sq. Ft.	Fl. Oz. Per Acre	Application Interval/ Timing	Instructions
<b>Dollar Spot</b> ( <i>Sclerotinia homoeocarpa</i> )	0.5	22	7 days	Apply when conditions are favorable for disease development.
	0.5	22	14 days	Tank mix with low label rate of one of the following fungicides: Daconil 2787 F Daconil Ultrex
	1	44	21-28 days	Tank mix with low label rate of one of the following fungicides: Daconil 2787 F Daconil Ultrex Chipco 26019
	1-2	44-88	14-28 days	If using the 1-2 fl. oz. per 1,000 sq. ft. rate without tank mixing, make no more than 3 consecutive applications for dollar spot control before rotating to an alternate EPA-registered fungicide having a different mode of action.

**Turfgrass—Specific Diseases, Rates, and Application Timing (Cont'd)**

<b>Disease</b>	<b>Fl. Oz. Per 1,000 Sq. Ft.</b>	<b>Fl. Oz. Per Acre</b>	<b>Application Interval/ Timing</b>	<b>Instructions</b>
<b>Anthracnose</b> ( <i>Colletotrichum graminicola</i> )	1-2	44-88	14-28 days	Apply when conditions are favorable for disease development. When disease pressure is high, use higher rates of Kestrel and shorter intervals. For broad spectrum control, tank mix with a registered contact fungicide at the label rate. If disease is present, mix 2 fl. oz. of Kestrel per 1,000 sq. ft. with the label rate of the above mentioned contact fungicides.
<b>Brown Patch</b> ( <i>Rhizoctonia solani</i> )	1-2	44-88	14-21 days	Begin applications in May or June before disease is present. Tank mix with a registered contact fungicide labeled for brown patch control at the label rate. Under conditions of high temperatures and high humidity, use the higher rates of Kestrel and shorter intervals.
<b>Powdery Mildew</b> ( <i>Erysiphe graminis</i> ), <b>Rust</b> ( <i>Puccinia graminis</i> )	1-2	44-88	14-28 days	Apply when conditions are favorable for disease development. If disease is present, use 2 fl. oz. of Kestrel per 1,000 sq. ft.
<b>Red Thread</b> ( <i>Laetisaria fuciformis</i> ), <b>Pink Patch</b> ( <i>Limonomyces roseipellis</i> )	2	88	14-21 days	Apply when conditions are favorable for disease development.
<b>Stripe Smut</b> ( <i>Ustilago striiformis</i> ) ( <i>Urocystis agropyri</i> )	1-2	44-88	Fall or Spring	Apply once in the fall after grass becomes dormant or in the early spring before grass starts to grow.
<b>Gray Leafspot</b> ( <i>Pyricularia grisea</i> )	1-2	44-88	14 days	Apply when conditions are favorable for disease development. If using the 1 fl. oz. per 1,000 sq. ft. rate, tank mix with a registered contact fungicide at the label rate.
<b>Melting out, Leaf Spot</b> ( <i>Bipolaris</i> spp.), ( <i>Drechslera</i> spp.)	1-2	44-176	14 days	Under light to moderate pressure, apply Kestrel to reduce the severity of leaf spot and melting out caused by Helminthosporium-type pathogens. For broad spectrum disease control, tank mix the 1 fl. oz. Kestrel rate with a registered contact fungicide at the label rate. Tank mix the 1-2 fl. oz. per 1,000 sq. ft. Kestrel rate with a registered contact fungicide at the label rate.
<b>Summer Patch, Poa Patch</b> ( <i>Magnaporthe poae</i> )	2 4	88 176	14 days 28 days	Apply Kestrel beginning in April. Use the 4 fl. oz. per 1,000 sq. ft. rate on a 28-day schedule and the 2 fl. oz. per 1,000 sq. ft. rate on a 14-day schedule.
<b>Take-All Patch</b> ( <i>Gaeumannomyces graminis</i> )	2-4	88-176	Spring and Fall	Apply Kestrel to reduce the severity of take-all patch. Make 1 to 2 fall applications in September and October or when night temperatures drop to 55°F, and 1 to 2 spring applications in April and May, depending on local recommendations.
<b>Spring Dead Spot</b> ( <i>Leptosphaeria korrae</i> , <i>Leptosphaeria narmari</i> , <i>Ophiosphaerella herpotricha</i> , <i>Gaeumannomyces graminis</i> )	4	176	30 days	Make 1 to 3 applications. For one application, apply in September or October. For multiple applications, begin sprays in August.
<b>Necrotic Ring Spot</b> ( <i>Leptosphaeria korrae</i> )	4	176	Fall or Spring	Apply in the fall and/or the early spring depending on local recommendations.
<b>Snowmold Gray</b> ( <i>Typhula</i> spp.) <b>Pink</b> ( <i>Microdochium nivale</i> )	2-4	88-176	Late Fall	Apply one application in the late fall before snow cover. Do not apply on top of snow. For optimum disease control, the 2 and 3 fl. oz. Kestrel rates should be tank mixed with either PCNB or chlorothalonil at label rates.
<b>Fusarium Patch</b> ( <i>Fusarium nivale</i> )	2-4	88-176	Fall-Early Spring	Apply when conditions are favorable for disease development.
<b>Yellow Patch</b> ( <i>Rhizoctonia cerealis</i> )	3-4	130-176	Late Fall	Apply one application in the late fall before snow cover. Do not apply on top of snow. If using a 3 fl. oz. per 1,000 sq. ft. rate, tank mix with a registered contact fungicide at the label rate.
<b>Zoysia Patch</b> , large patch of zoysia ( <i>Rhizoctonia solani</i> )	3-4	130-176	Early Fall	Make one application in the early fall (mid-September to mid-October) prior to development of disease symptoms. Consult local turfgrass extension experts to determine the optimum application timing for your area.

## Dichondra—Specific Disease, Rates, and Application Timing

Disease	Fl. Oz. Per 1,000 Sq. Ft.	Fl. Oz. Per Acre	Application Interval/Timing	Instructions
<b>Dichondra Rust</b> ( <i>Puccinia dichondrae</i> )	2	88	14-21 days	Apply when conditions are favorable for disease development.

### Establishment of Cool Season Turfgrass

Kestrel provides control of many diseases of turf, and its primary use is as a fungicide for use against the diseases listed on this label. As an additional benefit, Kestrel will improve the rate of establishment when it is applied to cool season grass seedlings or sod.

**New Seedlings:** Apply 1 fl. oz. per 1,000 sq. ft. at the 2- to 3-leaf stage of growth for faster root development and top growth.

**Sod:** Apply 1 fl. oz. per 1,000 sq. ft. 2-6 weeks before cutting for increased sod knitting and faster establishment after laying.

## DISEASE CONTROL IN NURSERIES (FIELD) AND LANDSCAPE PLANTINGS

- USE KESTREL IN A PREVENTIVE DISEASE CONTROL PROGRAM. To determine the use directions for controlling a disease on an ornamental plant species, select the plant species in Table 1. The number in parentheses following the plant species refers you to the disease(s) controlled in Table 2. Find the disease in Table 2. The letter in brackets following the disease refers you to the application regime in Table 3.
- Allow spray to dry before overhead irrigation is applied.
- Optimum benefit of Kestrel is obtained when used in conjunction with sound disease management practices.

### General Recommendations

Kestrel may be used at rates of 2-24 fl. oz. per 100 gals. of water for control of diseases of ornamental plant species (see Tables 1, 2, and 3).

**Note:** For outdoor uses, you can apply up to 5.4 gals. of Kestrel per acre per crop per calendar year.

For general disease control in landscapes, apply 6-8 fl. oz. per 100 gals. of water every 21 days. For best control, begin Kestrel applications before disease development.

**Note:** Plant tolerances to Kestrel have been found acceptable for the specific genera and species of plants listed under the Directions For Use. In addition, crop tolerance to Kestrel has been demonstrated (at a rate of 6-8 fl. oz. per 100 gals.) on the following ornamental plants: ajuga, Bartlett pear, bayberry, camelia, candy tuft, cotoneaster, elm, English ivy, euonymus, German statice, holly, hollyhock, impatiens, linden, liriope, magnolia, maples, peony, privet, raphiolepis, redbud, sweetgum, sycamore, tulip tree, vinca, and wax myrtle. Other plant species may be sensitive to Kestrel and diseases other than those listed may not be controlled. Before using Kestrel on plants or for diseases that are not listed in the Directions For Use, test Kestrel on a small-scale basis first. Do not apply Kestrel to African violets, begonias, Boston fern, or geraniums. Apply the recommended rates for a particular type of disease, i.e., rust, powdery mildew, etc., and evaluate for phytotoxicity and disease control prior to widespread use.

### Table 1. Ornamentals—Plant Species

Numbers in parentheses refer to diseases controlled. See Table 2.

#### Herbaceous Ornamentals

Calendula (4a)  
Carnation (5f)  
Chrysanthemum (2a)  
Delphinium (4a)  
Gomphrena (3a)  
Iris (5d)  
Marigold (3a)  
Monarda (4c)  
Phlox (4c)  
Snapdragon (5d)  
Sweet William (3k)  
(*Dianthus barbatus*)  
Zinnia (4c)

#### Woody Ornamentals

Amelanchier (4d)  
Ash (4c)  
Azalea (2c, 4b)  
Crabapple (3c, 3q, 4c, 5a)  
Crape Myrtle (4a)  
Dogwood (3h, 4c)  
Douglas Fir (5b)  
Hawthorn (5a)  
Juniper (1a)  
Lilac (4c)  
Oaks (3p)  
Pines (1b, 1c)  
Poplars (5b)  
Pyracantha (3o)  
Red Tip Photinia (3i)  
Rhododendron (2c, 3n)  
Roses (3g, 4e, 5c)  
(Outdoor Use Only)  
Shasta Fir (5e)

#### Nonbearing Fruits and Nuts (Nurseries and Landscape Plantings)

Apple (3q, 4d, 5a)  
Cherry (2b, 3d)  
Citrus (3m)  
Nectarine (2b)  
Peach (2b)  
Pecan (3b, 3c, 3f, 3l, 3n, 4e)  
Plum (2b)  
Walnut (3j)

## Table 2. Diseases

Letters in brackets refer to application regimes. See Table 3.

1. Conifer Blights
  - a. *Phomopsis juniperovora* (Phomopsis Blight) [B]
  - b. *Sirococcus strobolinus* (Tip Blight) [D]
  - c. *Sphaeropsis sapinea* (Diplodia Tip Blight) [B]
2. Flower Blight
  - a. *Ascochyta chrysanthemi* (Ray Blight) [C]
  - b. *Monilinia* spp. [A]
  - c. *Ovulinia* spp. [B]
3. Leaf Blights/Spots
  - a. *Alternaria* spp. [B]
  - b. *Cercospora* spp. (Brown Leaf Spot) [C]
  - c. *Cladosporium* spp. (Scab) [C]
  - d. *Coccomyces hiemalis* [A]
  - e. *Colletotrichum* spp. [B]
  - f. *Cristulariella* spp. (Zonate leafspot) [C]
  - g. *Diplocarpon rosae* (Blackspot) [B]
  - h. *Discula* spp. (Anthracnose) [A]
  - i. *Fabraea maculata* (syn. *Entomosporium maculata*) [B]
  - j. *Gnomonia leptostyla* (Anthracnose) [C]
  - k. *Heterosporium echinulatum* [B]
  - l. *Mycosphaerella caryigena* (Downy Spot) [C]
  - m. *Mycosphaerella fructicola* (Greasy Spot) [E]
  - n. *Septoria* spp. (Leaf Scorch) [C]
  - o. *Spilocaea pyracanthae* [B]
  - p. *Tubakia dryina* [D]
  - q. *Venturia inaequalis* (Scab) [A]
4. Powdery Mildew
  - a. *Erysiphe* spp. [B]
  - b. *Microsphaera* spp. [C]
  - c. *Oidium* spp. [B]
  - d. *Podosphaera* spp. [B]
  - e. *Sphaerotheca pannosa* [B]
5. Rust
  - a. *Gymnosporangium juniperi-virginianae* [A]
  - b. *Melampsora occidentalis* [D]
  - c. *Phragmidium* spp. [B]
  - d. *Puccinia* spp. [B]
  - e. *Pucciniastrum goeppertianum* [D]
  - f. *Uromyces dianthi* [B]

## Table 3. Application Regimes

- [A] Mix 2-4 fl. oz. of Kestrel in 100 gals. of water and apply as a full coverage spray to the point of drip. Apply every 14-21 days during the period of primary infection. If disease is present, tank mix with an EPA-registered contact fungicide. For flower blight, apply Kestrel when there is 5-10% bloom and again at 70-100% bloom. For dogwoods, apply the 2-4 fl. oz. rate every 14 days, or apply 8 fl. oz. of Kestrel every 28 days.
- [B] Mix 5-8 fl. oz. of Kestrel in 100 gals. of water and apply as a full coverage spray to the point of drip. Apply as needed, beginning when conditions are favorable for disease development. For blackspot, apply with a registered contact fungicide labeled for black spot. For Calendula, apply every 30 days. For diplodia tip blight, make 3 applications every 14 days prior to major period of infection. For juniper phomopsis blight, make first application as soon as junipers start to grow, and repeat the applications every 14-21 days during periods of active growth.
- [C] Mix 8-12 fl. oz. of Kestrel in 100 gals. of water and apply as a full coverage spray to the point of drip. Apply every 30 days beginning when conditions are favorable for disease development. For pecans, apply the 12 fl. oz. rate beginning at bud break. Apply 3 times on 14-day intervals. For walnut, apply 8.5 fl. oz. at 14- to 21-day intervals. For ray blight, apply 12 fl. oz. at 7-day intervals or 20 fl. oz. at 14-day intervals.
- [D] Mix 16 fl. oz. of Kestrel in 100 gals. of water and apply as a full coverage spray to the point of drip. Apply every 14-28 days, beginning when conditions are favorable for disease development. For Douglas fir needle rust, apply once in May. For tip blight, initiate applications in mid-late winter, and apply 3 times at 2-month intervals.
- [E] Mix 20-24 fl. oz. of Kestrel in 100 gals. of water and apply as a full coverage spray to the point of drip. Apply during June to August time period.

Do not apply to apple, cherry, citrus, nectarine, peach, pecan, plum, or walnut trees that will bear harvestable fruit within 12 months.

# A FLARE ROOT-INJECTED SYSTEMIC FUNGICIDE FOR CONTROL OF SELECTED DISEASES IN TREES (Not registered for use in CA)

## General Information

Kestrel is a systemic fungicide for use as a flare root injection for prevention and treatment of (1) oak wilt (*Ceratocystis fagacearum*) of oaks (*Quercus* spp.), (2) Dutch elm disease (*Ophiostroma ulmi*) of elms (*Ulmus* spp.), (3) sycamore anthracnose (*Apiognomonia veneta*), and (4) leaf diseases (i.e., *Venturia inaequalis*, *Gymnosporangium juniperi-virginianae*, *Pucciniastrum goeppertianum*, etc.) of crabapple (*Malus* spp.) It is recommended that Kestrel be administered by trained arborists or others trained in injection techniques and in the identification of tree diseases.

**Notes:** The active ingredient in Kestrel has been shown to be safe on a wide range of plant species. Before using Kestrel on plants or for diseases that are not listed in the DIRECTIONS FOR USE, test Kestrel on a small-scale basis and evaluate for phytotoxicity and disease control prior to widespread use.

## Correct Location for Injector Placement

The flare root area is the transitional zone between the trunk and the root system. Uptake and distribution of Kestrel is more effective when injections are made into the flare roots. In addition, wounds created in the flare root area close more rapidly in comparison to wounds above the flare root area.

## Tree Preparation

1. Heavy, thick, or loose outer bark may be carefully shaved to form a smoother injection point and to ensure the operator that the drill hole penetrates through the bark to the xylem.
2. If the flare roots are not clearly exposed, carefully remove 2 to 4 inches of soil from the base of the tree to uncover the top of the flare roots. Brush away loose soil.
3. Drill holes through the bark, into sapwood, using a clean sharp drill bit. Drill hole diameter should be adequate to allow insertion of injection tees and formation of air tight contact between active xylem and the delivery point of the injection tees. Generally, a drill hole diameter of  $\frac{7}{32}$  –  $\frac{5}{16}$  inch for elms, sycamores, and crabapples, and  $\frac{5}{16}$  inch for oaks is appropriate. Follow manufacturer's instructions for the particular injection device used in the treatment.  
Drill hole depth should be adequate to deliver the product into active xylem tissue. Generally,  $\frac{3}{4}$  inch depth is appropriate, but trees with thick bark may require increased drill hole depth to reach the active xylem layer. Space injectors 3 to 6 inches apart around the base of the tree. Do not drill in the valleys between the flare roots or into cankered areas. Drill above these areas into the trunk, then continue again into sound sapwood on the flares.
4. Disinfect the drill bit between trees with household bleach (20% solution), ethanol, or other disinfectant. Rinse bit with clean water after disinfecting.
5. Insert into the drilled holes the injection ports ("tees") which are connected to plastic tubing. The tubing should have inlet and outlet valves.
6. Mix the specified amount of Kestrel and water thoroughly in the tank before beginning the injection treatment.

## Tree measurement

Measure the diameter of the tree using a tree diameter-tape (D-tape) at  $4\frac{1}{2}$  feet above the ground. This is the diameter at breast height (DBH). If only a regular tape is available, measure the tree circumference and divide that number by 3.14. For crabapples, measure the diameter at the point where the tree begins to branch.

## Preparation of Injection Solution

Dilute 10 ml of Kestrel in up to 1 liter of water per inch DBH. Refer to the following table as an example of the amounts of Kestrel and water to use:

DBH inches	Treatment Level (ml)	Water Volume* (liters)
5	50	5
10	100	10
15	150	15
20	200	20
25	250	25
30	300	30
35	350	35
40	400	40

\*Use up to amount indicated.

## Injection

For pressurized injections, with the outlet valve open, connect the tank to the inlet valve and begin pumping solution until all air bubbles come out of the outlet valve. Direct the solution into a container and return the solution to the tank. Shut off the outlet valve. Pressurize tank to 20 to 30 psi. Check for leaks and gently tap in tees if necessary. Maintain continuous pressure on the injection system until the full amount of solution is in the tree.

After injection is complete, remove injection tees and leave drill holes unplugged. A water flush to cleanse the hole will assist with wound closure. Soil should be replaced around the tree. It is not necessary to treat the drill holes with wound paint or other sealing compounds.

Contact your local extension agent for more details on tree injection. The injection system described is meant as an example; please refer to manufacturer's instructions when using other types of tree injection systems.

## Retreatment

At the initial injection of Kestrel, take notes on the level of disease in each tree. Reevaluate disease level in trees at 12-month intervals after treatment for the potential need for retreatment with Kestrel. Preventive applications should be considered 12 to 36 months after the initial injection. Trees in high disease risk areas or high value trees should be evaluated for possible retreatment 12 months after each treatment. Follow application procedures described above for repeat injections; new drill holes will be needed for subsequent treatments.

## OAK WILT: OAKS

### Preventive and Therapeutic Treatment

Use 10 ml of Kestrel in up to 1 liter of water per inch DBH. For very high disease pressure, 20 ml of Kestrel per inch DBH may be used.

In the upper Midwest, treat oaks after June 15. Wounds in oaks in the upper Midwest between May 15 and June 15 attract insects that transmit the oak wilt pathogen.

Oak trees exhibiting less than 20% crown loss from oak wilt have the best chance of responding to treatment by Kestrel. Preventive application is more effective than therapeutic treatment. Trees in advanced stages of disease development may not respond to treatment.

Uninfected trees will generally absorb the full amount of Kestrel: water solution within 2 hours when injected under pressure. Trees exhibiting specific symptoms or those symptomless trees immediately adjacent to a diseased tree should be considered infected. Symptomless trees separated by a primary plow line from diseased trees may be at less risk of infection. Infected trees will absorb the material more slowly due to the vascular plugging caused by the disease. If the Kestrel water solution is not absorbed within 24 hours, the tree is considered high risk and has a poor chance of survival.

See the **GENERAL INFORMATION** section for details on retreatment.

## LEAF DISEASES: CRABAPPLES

### Preventive Treatment

Use 10 ml of Kestrel in up to 1 liter of water per inch trunk diameter. For trees less than 10 inches trunk diameter, use 6 ml of Kestrel per inch trunk diameter. Make applications when the trees are in full leaf and actively growing for control of the next season's leaf disease development. Disease symptoms may not be reduced the year of application. Do not use fruit-treated trees for food or feed purposes.

See the **GENERAL INFORMATION** section for details on retreatment.

## ANTHRACNOSE: SYCAMORE

### Preventive Treatment

Use 10 ml of Kestrel in up to 1 liter of water per inch DBH. For trees less than 10 inches DBH, use 6 ml of Kestrel per inch DBH. Make applications when the trees are in full leaf and actively growing for control of the next season's anthracnose development.

See the **GENERAL INFORMATION** section for details on retreatment.

## DUTCH ELM DISEASE IN ELMS

### Preventive and Therapeutic Treatment

Use 6-10 ml of Kestrel in up to 1 liter of water per inch DBH. For very high disease pressure, 20 ml of Kestrel per inch DBH may be used. Notes: (1) Accurate diagnosis of Dutch elm disease is important since Kestrel only provides control of Dutch elm disease in elms. (2) Kestrel will be most effective when used in conjunction with other cultural practices recommended for management of Dutch elm disease (removal of dead elm trees, pruning of diseased tree limbs and branches, control of bark beetles, etc.) (3) Preventive applications can be made at 6 to 10 ml/inch DBH. The 6 ml rate should provide 24 months control and the 10 ml rate should provide 36 months control. (4) Therapeutic treatment in trees showing disease symptoms should be made at 10-20 ml/inch DBH. Retreatment may be needed every 12 to 36 months. Trees in advanced stages of disease development may not respond to treatment. For further information on the proper diagnosis and control of Dutch elm disease, consult your local extension agent.

See the **GENERAL INFORMATION** section for details on retreatment.

## STORAGE AND DISPOSAL

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

**PESTICIDE DISPOSAL:** Pesticide wastes are toxic. Improper disposal of unused pesticide, spray mixture, or rinse water is a violation of Federal law. If these wastes cannot be used according to label instructions, contact your State Pesticide or Environmental Control Agency or the Hazardous Waste representative at the nearest EPA Regional Office for guidance in proper disposal methods.

### CONTAINER DISPOSAL:

**Nonrefillable Container (five gallons, or less):** Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. Clean container promptly after emptying. 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  $\frac{1}{4}$  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.

**Nonrefillable Container (greater than five gallons):** Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. Clean container promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container  $\frac{1}{4}$  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 mix tank or store rinsate for later use or disposal. Repeat this procedure two more times.

**Refillable Container:** Refillable container. Refill this container with propiconazole 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 recirculate water with the pump for 2 minutes. Pour or pump rinsate into application or rinsate collection system. Repeat this procedure two more times.

## LIMITATION OF WARRANTY AND LIABILITY

Read the entire directions for use, conditions of warranties and limitations of liability before using this product. If terms are not acceptable, return the unopened product container at once.

By using this product, user or buyer accepts the following **CONDITIONS, DISCLAIMER OF WARRANTIES** and **LIMITATIONS OF LIABILITY**.

**CONDITIONS:** The directions for use of this product are believed to be adequate and must be followed carefully. However, it is impossible to eliminate all risks associated with the use of this product. Crop injury, ineffectiveness, or other unintended consequences may result because of such factors as weather conditions, presence of other materials, or the manner of use or application, all of which are beyond the control of Phoenix Environmental Care LLC. All such risks shall be assumed by the user or buyer.

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1005-01-12/18/09

## NOTES

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