



1812 - 303

09/14/2001

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES
AND TOXIC SUBSTANCES

SEP 14 2001

Dr. W.A. Hawkins, Jr.
Griffin LLC
P.O. Box 1847
Valdosta, Georgia 231603-1847

Subject: Kocide® 4.5LF
EPA Registration No. 1812-303
Your label amendment application dated June 11, 2001,
incorporating the revised page 1 dated August 17, 2001

Dear Dr. Hawkins,

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

1. Make the following changes to the label:

a. Immediately after the subheading "PERSONAL PROTECTIVE EQUIPMENT (PPE)" insert the following text:

"Some materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for category A on an EPA chemical resistance category selection sheet."

b. In the "PERSONAL PROTECTIVE EQUIPMENT (PPE)" subsection and the "AGRICULTURAL USE REQUIREMENTS" section, change "waterproof gloves" to "chemical-resistant gloves made of any waterproof material, such as polyvinyl chloride, nitrile rubber, or butyl rubber."

2. Submit one copy of your final printed labeling before you release the product for shipment.

If these conditions are not complied with, the registration may be subject to cancellation in accordance with FIFRA section 6(e). Your release for shipment of the product bearing the amended labeling constitutes acceptance of these conditions.

If you have any questions about this letter, please contact John Bazuin at (703)305-7381.

Sincerely yours,

/s/

Cynthia L. Giles-Parker
Product Manager (22)
Fungicide Branch
Registration Division (7505C)

Attachment: Label stamped "ACCEPTED with COMMENTS"

08/16/01

KOCIDE® 4.5LF

g303s01b

FUNGICIDE/BACTERICIDE

Active Ingredient	
Copper Hydroxide*	37.5%
Inert Ingredients	62.5%
Total	100.0%

(* Metallic Copper Equivalent 24.4% or 3.0 Pounds Metallic Copper per Gallon)
(4.5 Pounds Copper Hydroxide per Gallon)

ACCEPTED
with COMMENTS
In EPA Letter Dated:
SEP 14 2001
Under the Federal Insecticide,
Fungicide, and Rodenticide Act,
as amended, for the pesticide
registered under EPA Reg. No.
1812-303

KEEP OUT OF REACH OF CHILDREN
CAUTION

FIRST AID	
IF IN EYES:	<ul style="list-style-type: none">• Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after the first five minutes, then continue rinsing eye.• Call a poison control center or doctor for treatment advice.
IF SWALLOWED:	<ul style="list-style-type: none">• Call a poison control center or doctor immediately for treatment advice.• Have person sip a glass of water if able to swallow.• Do not induce vomiting unless told to do so by a poison control center or doctor.• Do not give anything by mouth to an unconscious person.
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 1-888-324-7598.	
NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate use of gastric lavage.	
See Label for Additional Precautions and Directions for use.	

Griffin L.L.C.
Valdosta, GA 31601

EPA Reg. No. 1812-303
EPA Est. No.

Net Contents _____

**PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS (AND DOMESTIC ANIMALS)
CAUTION**

Causes moderate eye injury. Avoid breathing vapor or spray mist. Harmful if swallowed or absorbed through the skin. Avoid contact with skin, eyes or clothing.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Waterproof gloves
- Shoes plus socks
- Protective eyewear

Follow the 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.

User Safety Recommendations:

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

ENVIRONMENTAL HAZARDS

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

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 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 intervals. 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 without required PPE.

The following equipment and precautions must be followed for 7 days following the application of this product:

- An eye-flush container, designed specifically for flushing eyes, must be available at the WPS decontamination site for workers entering the area treated with copper hydroxide.
- Notify workers of the application by warning them orally that residues in the treated areas may be highly irritating to their eyes and to take precautions such as refraining from rubbing their eyes and if they get residues in their eyes they should immediately flush their eyes using the eye-flush container.

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
- Waterproof gloves
- 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.

Keep unprotected persons out of treated area until sprays have dried.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal. Store in a cool, dry place.

PESTICIDE DISPOSAL: Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use 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.

CONTAINER DISPOSAL: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by incineration, or if allowed by state and local authorities, by burning. If burned, stay out of smoke.

GENERAL INSTRUCTIONS

Kocide 4.5LF may be applied as an aerial, ground dilute or ground concentrate spray unless specifically directed otherwise in the specific crop use directions.

The per acre use rate of Kocide 4.5LF is applicable for both dilute and concentrate spraying. Depending upon the equipment used and the specific crop, the spray volume applied per acre will differ. Refer to Minimum Recommended Spray Volume Table. Complete spray coverage is essential to assure optimum performance from Kocide 4.5LF. When treating by aerial application or with low volume application equipment, unless you have had specific previous experience, it is advisable to test for compatibility and tolerance to crop injury prior to full scale commercial utilization.

Consult the Kocide 4.5LF label for specific rates and timing of application by crop. ~~Do not apply less than the label recommended minimum amount when selecting a Kocide 4.5LF use rate.~~ Where application rates and intervals are provided in a range (e.g. 3 to 8 pints and 7 to 10 days), ~~the~~ higher rates and shorter intervals are recommended when rainfall is heavy and/or disease pressure is high. Use the higher rates for large mature tree crops.

SPECIAL PRECAUTIONS

- * Kocide 4.5LF **should not be applied** in a spray solution having a pH of less than 6.5 as phytotoxicity may occur.
- * Do not tank mix Kocide 4.5LF with Aliette® fungicide for use on any registered crops or ornamentals unless appropriate precautions have been taken to buffer the spray solution because severe phytotoxicity may result. Use in accordance with the most restrictive of label limitations and precautions. No label dosage rates should be exceeded. This product cannot be mixed with any product containing a label prohibition against such

mixing.

- * This product may be reactive on masonry and metal surfaces such as galvanized roofing. Avoid contact with metal surfaces. Do not spray on cars, houses, lawn furniture, etc.
- * Environmental conditions such as extended periods of wet weather, acid rain, etc. which alter the pH of the leaf surface may affect the performance of Kocide 4.5LF resulting in possible phytotoxicity or loss of effectiveness.
- * Agricultural chemicals may perform in an unpredictable manner when tank mixed, especially where several products are involved. Reduced effect on pests or crop injury may occur. Unless recommended on this label or by a state/local expert, it is advisable to test for compatability and potential crop injury prior to commerical use of a new tank mix; otherwise, tank mixing should not be undertaken.
- * It must be determined if proper application equipment is available and if the waste associated with its use can be properly handled. Agricultural chemicals are often reactive with the materials used in the construction of application equipment, such as aluminum, rubber and some synthetic materials. This factor should be taken into consideration when selecting proper application equipment. It is necessary that all application equipment be thoroughly flushed with clean water after each day's use.
- * Do not apply this product through any irrigation (chemigation) system using aluminum parts or components as damage to the system may occur. Such application is prohibited regardless of whether the irrigation system is flushed with water after use of this product.
- * Apply this product only through one or more of the following types of systems: sprinkler, including center pivot, lateral move, traveler, big gun, or plastic pipe solid set system(s) which contain no aluminum parts or components. Do not apply this product through any other type of irrigation system.
- * While volume is important in obtaining full spray coverage, often factors such as foliage density, environmental conditions and sprayer calibration have a greater impact. Always be sure that sprayers are calibrated to spray equipment manufacturer's specifications and environmental conditions are within those recommended by State and local regulatory authorities.
- * When mixing, fill the spray tank one-half full with water. Add Kocide 4.5LF slowly to tank while hydraulic or mechanical agitation is operating and continue filling with water. Spreaders, stickers, insecticides, nutrients, etc. should be added last. If compatibility is in question, use the Compatibility Jar Test before mixing a whole tank. Observe all precautions and limitations on the labels of all products used in mixtures.

CROP CLASSIFICATION

CITRUS: Grapefruit, Kumquat, Lemon, Lime, Orange, Pummelo, Tangelo and Tangerine.

FIELD CROPS: Alfalfa, Barley, Oats, Peanut, Potato, Sugar Beet and Wheat.

SMALL FRUITS: Blackberry, Blueberry, Cranberry, Currant, Gooseberry, Raspberry and Strawberry.

TREE CROPS: Almond, Apple, Apricot, Avocado, Banana, Cacao, Cherry, Coffee, Filbert, Mango, Nectarine, Olive, Peach, Pear, Pecan, Pistachio, Plum, Prune, Quince and Walnut.

VEGETABLES: Bean, Beet, Beet Greens, Broccoli, Brussels Sprout, Cabbage, Cantaloupe, Carrot, Cauliflower, Celeriac, Celery, Cucumber, Eggplant, Endive, Escarole, Greens (Collard, Mustard and Turnip), Honeydew, Lettuce, Muskmelon, Onion/Garlic, Pea, Pepper, Pumpkin, Spinach, Squash, Tomato, Watercress and Watermelon.

VINES: Grape, Hops and Kiwi.

MISCELLANEOUS: Atemoya, Carambola, Chives, Dill, Douglas Fir, Ginseng, Guava, Litchi, Live Oak, Macadamia, Mamey Sapote, Papaya, Parsley, Passion Fruit, Pecan, Sugar Apple and Sycamore.

SEED DRESSING: Barley, Rice and Wheat.

GREENHOUSE AND SHADEHOUSE CROPS: Kocide 4.5LF may be used in greenhouses and shadehouses to control diseases on any crop on this label where physiology allows greenhouse or shadehouse culture. While specific directions are presented for Citrus, Cucumber, Eggplant, Pepper and Tomato, general use may occur for any crop on this label where physiology allows greenhouse or shadehouse culture.

TURFGRASS: Algae control.

ORNAMENTALS: Species as listed.

**Minimum Recommended Spray Volume (Gallons) Per Acre
When Applying Kocide 4.5LF**

	Aerial	Ground	
		Dilute	Concentrate
Citrus	10	800	100* (Florida)
Field Crops	3	20	---
Ornamentals	10	100	50
Small Fruits	5	150	50
Tree Crops	10	400	50
Vegetables	3	20	---
Vines	5	150	50
Miscellaneous	10	150	50

*Pesticide application equipment such as Curtec® or other similar sprayers which are capable of obtaining thorough coverage at low volumes may be used at as low as 20 gpa ~~gallons per acre~~ of spray volume.

The following specific instructions are based on general application procedures. The recommendations of the State Agricultural Extension Service should be closely followed as to timing, frequency and number of sprays per season.

FROST INJURY PROTECTION

BACTERIAL ICE NUCLEATION INHIBITOR

(Application of Kocide 4.5LF made to all crops listed on this label at rates and stages of growth indicated on this label, at least 24 hours prior to anticipated frost conditions, will afford control of ice nucleating bacteria (*Pseudomonas syringae*, *Erwinia herbicola*, and *Pseudomonas fluorescens*) and may therefore provide some protection against light frost. Not recommended for those geographical areas where weather conditions favor severe frost.

CITRUS

Adding foliar nutritionals or other products to spray mixtures containing Kocide 4.5LF and applying to citrus during the post bloom period when young fruit are present may result in spray burn.

<u>Disease</u>	<u>Rate/Acre</u>	<u>Use Instructions</u>
Algal Spot, Melanose, Scab	2 $\frac{2}{3}$ -8 pts.	Apply as pre-bloom and post-bloom sprays. Use the higher rates when conditions favor disease.
Greasy Spot, Pink Pitting	1 $\frac{1}{3}$ -4 pts.	Apply in summer on expanded new flush. Repeat on subsequent flushes where disease pressure is severe. Use the higher rates when conditions favor disease.
Alternaria Brown Spot	2 $\frac{2}{3}$ -5 $\frac{1}{3}$ pts.	On susceptible varieties, apply when the first spring flush appears and each flush thereafter. Application to fruit should start after two thirds of the petals have fallen and be repeated on a 21 day schedule or as needed. Use the higher rates when conditions favor disease.
Phytophthora Brown Rot, Septoria Spot	2 $\frac{2}{3}$ -5 $\frac{1}{3}$ pts.	Begin application in fall before or just after the first rain and continue as needed. For Brown Rot only, apply to skirts of trees to a height of at least 4 feet. For control of Septoria Spot or where fruit have already been infected with Brown Rot, apply to entire tree. Apply also to bare ground one foot beyond skirt. Use the higher rates when conditions favor disease. NOTE: In California, in areas subject to copper injury, add $\frac{1}{3}$ to 1 pound of high quality lime per gallon of Kocide 4.5LF.
Phytophthora Foot Rot	$\frac{2}{3}$ pt.	Mix with one quart of water, Tre-Hold [®] or latex paint. Paint trunks of trees from the soil surface to the lowest scaffold limbs. Apply in May prior to summer rains and/or in the fall prior to wrapping trees for freeze protection. Treatment serves as protection for up to 1 year, but does not cure existing infections. NOTE: Areas where microjet or low volume irrigation hit the tree trunk may require retreatment due to wash off.

Citrus Canker (suppression)	8 pts.	Spray flushes 7 to 14 days after shoots begin to grow. Young fruit may require an additional application. Number and timing of applications will be dependent upon disease pressure. Under heavy pressure, each flush of new growth should be sprayed.
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NOTE: Phytotoxicity may occur on young tender flush when Kocide 4.5LF is applied to citrus seedlings grown in greenhouses or shadehouses.

CITRUS Field Nursery Grown

To control Melanose, Scab, Pink Pitting, Greasy Spot, Brown Rot and for suppression of Citrus Canker, apply 2 $\frac{2}{3}$ to 5 $\frac{1}{3}$ pints of Kocide 4.5LF per acre. Apply Kocide 4.5LF at 28 day intervals or as needed depending on disease severity.

FIELD CROPS

<u>Crop</u>	<u>Disease</u>	<u>Rate/Acre</u>	<u>Use Instructions</u>
Alfalfa	Cercospora Leaf Spot, Leptosphaerulina Leaf Spot	1 $\frac{1}{3}$ pt	Apply 10 to 14 days before each harvest or earlier if disease threatens. NOTE: Spray injury may occur with sensitive varieties such as Lahontan.
Peanut	Cercospora Leaf Spot	1-2 pts.	Begin spraying at 35 to 40 days after planting or when disease symptoms first appear and repeat at 10 to 14 day intervals or as needed. Reduce sprays to 7 day intervals during humid weather. Use the higher rates when conditions favor disease. Flowable sulfur may be added.
Potato	Early Blight, Late Blight	$\frac{2}{3}$ -2 $\frac{2}{3}$ pts.	Apply $\frac{2}{3}$ to 1 pint per acre at 7 to 10 day intervals or as needed starting when plants are 2 to 6 inches high in locations where disease is light. Apply up to 2 $\frac{2}{3}$ pints per acre when disease is more severe. Under conditions of severe disease, control

with Kocide 4.5LF will be improved by tank mixing with other compatible fungicides registered for use on potatoes. Read and follow all label instructions of tank mix partners.

Sugar Beet	Cercospora Leaf Spot	1½-3¼ pts.	Begin applications when conditions first favor disease development and repeat at 10 to 14 day intervals or as needed. Use the higher rates when conditions favor disease. Addition of a spreader/sticker is recommended.
Wheat, Barley, Oats	Helminthosporium Spot Blotch, Septoria Leaf Blotch	1-1½ pts.	Make first application at early heading and follow with second spray 10 days later. Use the higher rates when conditions favor disease.

SMALL FRUITS

<u>Crop</u>	<u>Disease</u>	<u>Rate/Acre</u>	<u>Use Instructions</u>
Blackberry (Aurora, Boysen, Cascade, Chehalem, Logan, Marion, Santiam, Thornless Evergreen)	Anthracnose, Cane Spot, Leaf Spot, Pseudomonas Blight, Purple Blotch, Yellow Rust	2¾ pts.	Make fall application after harvest. Apply delayed dormant spray after pruning/training in the spring. If needed, agricultural-type spray oil may be added.
	Anthracnose, Cane Spot, Leaf Spot, Purple Blotch, Yellow Rust	1½ pts.	Apply when leaf buds begin to open and repeat when flower buds show white. If needed, agricultural-type spray oil may be added.
<p>NOTE: Crop injury may occur if applied to foliage under certain environmental conditions such as hot or prolonged moist periods. Discontinue applications if signs of crop injury appear.</p>			

Blueberry	Bacterial Canker	2 $\frac{2}{3}$ -5 $\frac{1}{3}$ pts.	Make first application before fall rains and a second application 4 weeks later. Use the higher rates when conditions favor disease.
	Fruit Rot, Phomopsis Twig Blight	4 pts.	Dormant Application: Begin applications when bloom buds begin to swell. Make additional applications at 10 to 14 day intervals or as needed before blooms open.
Cranberry	Fruit Rot	5 $\frac{1}{3}$ pts.	Make first application in late bloom. Apply one or two additional applications at 10 to 14 day intervals or as needed depending upon disease severity.
	Rose Bloom	5 $\frac{1}{3}$ pts.	Apply three sprays on 10 to 14 day schedule or as needed as soon as symptoms are observed.
	Bacterial Stem Canker	5 $\frac{1}{3}$ pts.	Apply post-harvest and again in spring at bud swell. Apply one or two additional applications at 10 to 14 day intervals or as needed depending on disease severity.
	Leaf Blight, Red Leaf Spot, Stem Blight, Tip Blight (<i>Monilinia</i>)	5 $\frac{1}{3}$ pts.	Apply delayed dormant spray in the spring. Repeat at 10 to 14 day intervals or as needed through pre-bloom.
Currant, Gooseberry	Anthrachnose, Leaf Spot	6 $\frac{2}{3}$ pts.	Make initial application after first leaves have expanded. Continue on a 10 to 14 day schedule or as needed during wet conditions in the spring. Make an additional application after harvest.
Raspberry	Anthrachnose, Cane Spot, Leaf Spot,	2 $\frac{2}{3}$ pts.	Make fall application after harvest. Apply delayed dormant spray after training in the spring. If needed,

Pseudomonas
Blight,
Purple Blotch,
Yellow Rust

agricultural-type spray oil may be added.

Anthracnose,
Cane Spot,
Leaf Spot,
Purple Blotch,
Yellow Rust

1 1/3 pts.

Apply when leaf buds begin to open and repeat when flower buds show white. If needed, agricultural-type spray oil may be added.

NOTE: Crop injury may occur if applied to foliage under certain environmental conditions such as hot or prolonged moist periods. Discontinue applications if signs of crop injury appear.

Strawberry

Angular Leaf Spot
(*Xanthomonas*),
Leaf Blight,
Leaf Scorch,
Leaf Spot

1 1/3-2 pts.

Begin application when plants are established and continue on a weekly schedule throughout season. Apply in at least 20 gallons of water. Use the higher rates when conditions favor disease.

NOTE: Discontinue applications if signs of crop injury appear.

TREE CROPS

<u>Crop</u>	<u>Disease</u>	<u>Rate/Acre</u>	<u>Use Instructions</u>
Almond, Apricot, Cherry, Plum, Prune	Bacterial Blast (<i>Pseudomonas</i>), Bacterial Canker, Coryneum Blight (Shot Hole)	5 1/3-10 2/3 pts.	Make first application before fall rains and a second at late dormant. Use the higher rates when conditions favor disease. If needed, agricultural-type spray oil may be added. For Cherries: Where disease is severe, an additional application shortly after harvest may be required.

Almond only: For Bacterial Blast control in sprinkler irrigated orchards or where disease is severe, apply 1 1/3 pints per acre post-bloom at 2 week intervals or as needed or just before sprinkling.

NOTE: Foliar injury may occur from post-bloom sprays on almonds, especially on NePlus varieties.

Blossom Brown
Rot,
Coryneum Blight
(Shot Hole)

4-5 1/3 pts.
(Almond)
5 1/3-8 pts.
(All Others)

Apply during early bloom. Do not apply after full bloom or injury may result. Use ~~the~~ higher rates when rainfall is heavy and disease pressure is high.

Black Knot
(Plum)

2 2/3-5 1/3 pts.

Make an application at bud swell up to early bloom for early season disease suppression. Apply before full bloom. Use the higher rates when rainfall is heavy and disease pressure is high.

NOTE: To avoid plant injury, do not use after full bloom.

Cherry Leaf Spot
(Sour Cherries
Only)

4-5 1/3 pts.

Apply at petal fall as well as 1 to 2 times after petal fall. Use ~~the~~ lower rates where disease infection is light and use ~~the~~ higher rates for a dormant application or where disease infection is moderate to heavy. Do not apply to sweet cherry or the English Morello variety as severe injury will result. The addition of 1 to 3 pounds of hydrated lime per 1 1/3 pints of Kocide 4.5LF may reduce crop injury.

NOTE: Moderate to severe injury such as leaf spotting and defoliation may occur from post-bloom

Apple	Anthracnose, Blossom Blast, European Canker (<i>Nectria</i>), Shoot Blast (<i>Pseudomonas</i>)	8-10 $\frac{2}{3}$ pts.	applications. Apply before fall rains. Use the higher rates when conditions favor disease. NOTE: Use on yellow varieties may cause discoloration. To avoid discoloration, pick before spraying.
	Apple Scab, Fire Blight	5 $\frac{1}{3}$ -10 $\frac{2}{3}$ pts.	Make application between silver-tip and green-tip. Apply as a full cover spray for early season disease suppression. NOTE: Moderate to severe crop injury may occur from late application; discontinue use when green-tip reaches $\frac{1}{2}$ inch.
	Extended spray schedule where fruit finish is not a concern:		
	Apple Scab Fire Blight	1 $\frac{1}{3}$ -2 $\frac{2}{3}$ pts. 2 $\frac{2}{3}$ -1 $\frac{1}{3}$ pts.	Continued applications may be made at 5 to 7 day intervals or as needed between $\frac{1}{2}$ inch green-tip and first cover spray. NOTE: Moderate to severe crop injury may result from this extended spray schedule. It is not intended for fresh market apples or for apples where fruit finish is a concern as it is likely to cause fruit russetting. The addition of 1 to 3 pounds of hydrated lime per 1 $\frac{1}{3}$ pints of Kocide 4.5LF may reduce crop injury.
	Collar Rot, Crown Rot	2 $\frac{2}{3}$ pts.	Mix in 100 gallons of water. Apply 4 gallons of suspension as a drench on the lower trunk area of each tree.

Apply in early spring or in fall after harvest for best results. Do not apply to foliage or fruit if present.

NOTE: Do not use if soil pH is below 5.5 since copper toxicity may result.

Avocado	Anthrachnose, Blotch, Scab	5½-8 pts.	Apply when bloom buds begin to swell and continue application at monthly intervals for five to six applications. Use the higher rates when conditions favor disease.
Banana	Sigatoka (Black and Yellow)	1½ pts.	Apply by air in 3 gallons of water. If needed, oil may be added. Apply on a 14 day schedule or as needed throughout the wet season. Apply at 21 day intervals or as needed during dry periods.
	Black Pitting	2¾ pts.	Mix in 100 gallons of water. Apply to the fruit stem and the basal portion of the leaf crown. Apply during the first and second weeks after fruit emergence.
Cacao	Black Pod	1½-5½ pts.	Begin applications at the start of the rainy season and continue while infection conditions persist. Apply 1½ to 3 pints at 14 to 21 day intervals or as needed depending on disease severity. For drier areas, make two to four applications using 3 to 5½ pints per acre according to disease incidence and planting density.
Coffee	Coffee Berry Disease (<i>Colletotrichum coffeanum</i>)	4-5½ pts.	Apply first spray after flowering and before onset of long rains and then at 21 to 28 day intervals or as needed until picking. Use the higher rates when conditions favor disease.

	Bacterial Blight (<i>Pseudomonas syringae</i>)	4-5½ pts.	Begin spray program before the onset of long rainy periods and continue throughout the rainy season at 14 to 21 day intervals or as needed. The critical time of spraying to control this disease is just before, during and after flowering(s) especially when coinciding with wet weather. Use the higher rates when rainfall is heavy and disease pressure is high.
	Leaf Rust (<i>Hemileia vastatrix</i>)	1½-2½ pts.	Apply before the onset of rain and then at 21 day intervals or as needed while the rains continue. Use the higher rates when rainfall is heavy and disease pressure is high.
	Iron Spot (<i>Cercospora coffeicola</i>), Pink Disease (<i>Corticium salmonicolor</i>)	1½ pts.	Use concentrate or dilute spray. Begin treatment at the start of wet season and continue at monthly intervals for three applications.
Filbert	Bacterial Blight	10¾-16 pts.	Apply as a post harvest spray. In seasons of heavy rainfall apply a second spray when three-fourths of the leaves have dropped. Use the higher rates when rainfall is heavy and disease pressure is high. If needed, agricultural-type spray oil may be added.
	Eastern Filbert Blight	10¾-16 pts.	Apply as a dilute spray in adequate water for thorough coverage. Make applications starting at bud swell to bud break and continue at 2 week intervals or as needed until early May. Thorough coverage is essential. Use the higher rates when rainfall is heavy and disease pressure is high. If needed, agricultural-type

			spray oil or sticking agent may be added.
Mango	Anthrachnose	5 1/3-6 2/3 pts.	Apply monthly after fruit set until harvest. Use the higher rates when rainfall is heavy and disease pressure is high.
Olive	Olive Knot, Peacock Spot	5 1/3-8 pts.	Make first application before winter rains begin. A second application in early spring should be made if disease is severe. Apply the higher rates for heavy disease pressure or when conditions favor disease development.
Peach, Nectarine	Bacterial Blast (<i>Pseudomonas</i>), Bacterial Canker, Bacterial Spot (<i>Xanthomonas</i>), Coryneum Blight (Shot Hole), Leaf Curl	5 1/3-10 2/3 pts.	Make first application before fall rains and a second at late dormant. For peach leaf curl, late dormant application must be made before leaf buds swell. Use the higher rates when rainfall is heavy and disease pressure is high. If needed, agricultural-type spray oil may be added.
	Blossom Brown Rot, Coryneum Blight (Shot Hole), Leaf Curl	5 1/3-8 pts.	Full cover spray at pink bud. Use the higher rates when conditions favor disease.
	Bacterial Spot	2/3 pt.	Post bloom application applied at first and second cover sprays.
<p>NOTE: Do not spray 3 weeks prior to harvest. Use only recommended rates. Spotting of leaves and defoliation may occur from use in cover sprays.</p>			
Pear	Fire Blight	2/3 pt.	Apply at 5 day intervals or as needed throughout the bloom period.

NOTE: Russetting may occur in copper sensitive varieties. Excessive dosages may cause fruit russet on any variety.

	Blossom Blast (<i>Pseudomonas</i>)	8-10 $\frac{2}{3}$ pts.	Apply before fall rains and again during dormancy before spring growth starts. Use the higher rates when disease pressure is high or when conditions favor disease development.
Pecan	Kernel Rot, Shuck Rot, (<i>Phytophthora cactorum</i>), Zonate Leaf Spot (<i>Cristulariella pyramidalis</i>)	1 $\frac{1}{3}$ -2 $\frac{2}{3}$ pts.	For suppression, apply in sufficient water to ensure complete spray coverage at 2 to 4 week intervals or as needed starting at kernal growth and continue until shucks open. Use the higher rates and shorter intervals intervals if frequent rainfall occurs.
Pistachio	Botryosphaeria Panicle and Shoot Blight, Botrytis Blight, Late Blight (<i>Alternaria alternata</i>), Septoria Leaf Blight	2 $\frac{2}{3}$ -5 $\frac{1}{3}$ pts.	Make initial application at bud swell and repeat on a 14 to 28 day schedule or as needed. If disease conditions are severe, use the higher rates and shorter spray intervals.
Quince	Fire Blight	$\frac{2}{3}$ pt.	Apply at 5 day intervals or as needed throughout the bloom period. Apply in adequate water for thorough coverage.
Walnut	Walnut Blight	5 $\frac{1}{3}$ -8 pts.	Apply first spray at early pre-bloom prior to or when catkins are partially expanded. Make additional applications during bloom and early nutlet stage or as needed when frequent rainfall or extended periods of moisture occur. Thorough coverage of catkins, leaves and

nutlets is essential for effective control.

NOTE: Adequate control may not be obtained when copper tolerant species of *Xanthomonas* bacteria are present.

VEGETABLES

<u>Crop</u>	<u>Disease</u>	<u>Rate/Acre</u>	<u>Use Instructions</u>
Bean (Dry, Green)	Brown Spot, Common Blight, Halo Blight	$\frac{2}{3}$ -2 pts.	For protective sprays, make first application when plants are 6 inches high; repeat on a 7 to 14 day schedule or as needed depending upon environmental conditions. Use the higher rates for more severe disease.
Beet (Table Beet, Beet Greens)	Cercospora Leaf Spot	$1\frac{1}{3}$ - $3\frac{1}{3}$ pts.	Begin applications when conditions first favor disease development and repeat at 10 to 14 day intervals or as needed. Use the higher rates when conditions favor disease.
Carrot	Alternaria Leaf Spot, Cercospora Leaf Spot	$1\frac{1}{3}$ pts.	Begin applications when disease first threatens and repeat at 7 to 14 day intervals or as needed depending on disease severity.
Celery, Celeriac	Bacterial Blight, Cercospora Early Blight, Septoria Late Blight	$1\frac{1}{3}$ pts.	Begin applications as soon as plants are first established in the field, repeating at 5 to 7 day intervals or as needed depending on disease severity and environmental conditions.
Crucifers (Broccoli, Brussels Sprout, Cabbage, Cauliflower,	Black Leaf Spot (<i>Alternaria</i>), Black Rot (<i>Xanthomonas</i>), Downy Mildew	$\frac{2}{3}$ - $1\frac{1}{3}$ pts.	Apply at 7 to 10 day intervals or as needed. Begin application after transplants are set in the field, or shortly after emergence of field seeded crops or when conditions

Collard Greens,
Mustard Greens,
Turnip Greens)

favor disease development. Use the higher rates when conditions favor disease.

NOTE: Reddening of older leaves may occur on broccoli and a flecking of wrapper leaves may occur on cabbage.

Cucurbits (Cantaloupe, Cucumber, Honeydew, Muskmelon, Pumpkin, Squash, Watermelon)	Alternaria Leaf Spot, Angular Leaf Spot, Anthracnose, Downy Mildew, Gummy Stem Blight, Powdery Mildew, Watermelon Bacterial Fruit Blotch (suppression)	1-2 pts.
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Begin applications prior to disease development and continue while conditions are favorable for disease development. Repeat at 5 to 7 day intervals or as needed. Use ~~the~~ higher rates when conditions favor disease.

NOTE: Crop injury may occur from application at higher rates and shorter intervals. Discontinue use if injury occurs.

Eggplant	Alternaria Blight, Anthracnose, Phomopsis	1 1/3 pts.
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Begin applications prior to development of disease symptoms. Repeat sprays at 7 to 10 day intervals or as needed depending on disease severity.

Endive, Escarole, Lettuce	Downy Mildew	2/3-1 1/3 pts.
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Begin treatment when disease first appears and repeat every 7 to 10 days or as needed to suppress disease. Use ~~the~~ higher rates and shorter ~~spray~~ intervals when conditions favor disease.

NOTE: Flecking and/or yellowing of leaves may occur under certain environmental conditions such as extended periods of moist weather, acid rains, or other conditions favoring reduced pH on leaf surfaces. Injury may be severe enough to reduce crop value.

Onion, Garlic	Bacterial Blight, Downy Mildew, Purple Blotch	1 1/3 pts.	Begin when plants are 4 to 6 inches high and repeat at 7 to 10 day intervals or as needed depending on disease severity. Can cause phytotoxicity to leaves.
Pea	Powdery Mildew	1-2 pts.	Begin applications when disease symptoms first appear and repeat at weekly intervals or as needed. Use the higher rates when conditions favor disease.
Pepper	Anthrachnose, Bacterial Spot, Cercospora Leaf Spot	1 1/3-2 pts.	Begin applications when conditions first favor disease development and repeat at 7 to 10 day intervals or as needed depending on disease severity. Use the higher rates when conditions favor disease.
Spinach	Anthrachnose, Blue Mold, Cercospora Leaf Spot, White Rust	1 1/3-2 pts.	Begin application when disease first appears or when conditions favor disease development. Repeat at 7 to 10 day intervals or as needed. Use the higher rates when conditions favor disease.
NOTE: Flecking may occur on Spinach leaves.			
Tomato	Anthrachnose, Bacterial Speck, Bacterial Spot, Early Blight, Gray Leaf Mold, Late Blight, Septoria Leaf Spot	1 1/3-2 3/4 pts.	Begin application when disease first threatens and repeat at 5 to 10 day intervals or as needed depending on disease severity. Use the higher rates when conditions favor disease.
Watercress	Cercospora Leaf Spot	1 1/3 pts.	Begin applications when plants are first established in the field, repeating at 7 to 14 day intervals or as needed depending on disease severity. Do not exceed four applications per crop. Apply using

ground spray equipment at no less than 50 gallons of spray solution per acre.

VINES

<u>Crops</u>	<u>Disease</u>	<u>Rate/Acre</u>	<u>Use Instructions</u>
Grape	Black Rot, Downy Mildew, Phomopsis, Powdery Mildew	1 1/3-2 2/3 pts.	Begin applications at bud break with subsequent applications throughout the season depending on disease severity. Use the higher rates when conditions favor disease.
<p>NOTE: Foliage injury may occur on copper sensitive varieties such as Concord, Delaware, Niagara and Rosette. Either test for sensitivity or add 1 to 3 pounds of hydrated lime per 1 1/3 pints of Kocide 4.5LF.</p>			
Hops	Downy Mildew	1 1/3 pts.	Make crown treatment after pruning, but before training. After training, additional treatments are needed at about 10 day intervals.
<p>NOTE: Discontinue use two weeks before harvest.</p>			
Kiwi	<i>Erwinia herbicola</i> , <i>Pseudomonas fluorescens</i> , <i>Pseudomonas syringae</i>	5 1/3 pts.	Apply in 200 gallons of water per acre. Make applications on a monthly basis. A maximum of three applications may be made.

SEED DRESSING

Do not use treated seed for food, feed or oil purposes.

<u>Crop</u>	<u>Disease</u>	<u>Rate</u>	<u>Use Instructions</u>
Barley,	<i>Pseudomonas</i>	2 fl. ounces	When using a seed treating machine,

Wheat	<i>syringae</i> , <i>Tilletia caries</i> , <i>Xanthomonas</i> <i>translucens</i>	per 100 pounds of seed	dilute with sufficient water to assure uniform coverage. Consult State Agricultural Experiment Station regarding specific recommendations.
Rice	<i>Achlya</i> sp., <i>Pythium</i> sp.	2-4 fl. ounces per 100 pounds of seed	When using a seed treating machine, dilute with sufficient water to assure uniform coverage. Consult State Agricultural Experiment Station regarding specific recommendations.

MISCELLANEOUS

<u>Crop</u>	<u>Disease</u>	<u>Rate/Acre</u>	<u>Use Instructions</u>
Atemoya	Anthrachnose	2-3 pts.	Make initial application just before flowering and repeat on a weekly schedule until just before harvest. Apply in sufficient water for thorough coverage. Use the higher rates for severe disease.
Carambola	Anthrachnose	4-6 pts.	Make initial application just before flowering and repeat on a weekly schedule until just before harvest. Apply in sufficient water for thorough coverage. Use the higher rates for severe disease.
Chives	Downy Mildew	1 1/3 pts.	Begin applications when plants are established in the field. Repeat applications every 7 to 10 days or as needed depending on disease conditions.
Dill	Phoma Leaf Spot, Rhizoctonia Foliage Blight	1 1/3-2 pts.	Begin applications when plants are first established in the field and repeat at 7 to 10 day intervals or as needed depending upon disease severity and environmental conditions. Use the higher rates when conditions favor disease.

Douglas Fir	Rhabdocline Needlecast	1½-2 pts.	Begin applications at bud break and repeat at 3 to 4 week intervals or as needed. Use the higher rates for severe disease.
Ginseng	Alternaria Leaf Blight, Stem Blight	1⅔-2⅔ pts.	Use as a tank mix with 2 pounds Rovral® 50W in 100 gallons of water. Use in accordance with the most restrictive of label limitations and precautions. No label dosage rates should be exceeded. This product cannot be mixed with any product containing a label prohibition against such mixing. Begin Kocide-Rovral applications as soon as plants have emerged in spring. Applications should be repeated every 7 days or as needed until plants become dormant in fall. Apply fungicides at least 8 hours before rain. Use of a spreader-sticker or sticker is advised.
<p>NOTE: Alternaria Leaf and Stem Blight is most severe in humid conditions such as those found in the dense canopies of 2 to 4 year old Ginseng. It is very important that the stems be thoroughly covered with fungicide; therefore, use a spray apparatus which distributes the fungicide throughout the canopy.</p>			
Guava	Anthravnose, Red Algae	2-3 pts.	Make initial application just before flowering and repeat on a weekly schedule until just before harvest. Apply in sufficient water for thorough coverage. Use the higher rates for severe disease.
Litchi	Anthravnose	2-3 pts.	Make initial application just before flowering and repeat on a weekly schedule until just before harvest.

			Apply in sufficient water for thorough coverage. Use the higher rates for severe disease.
Live Oak, Pecan	Ball Moss	4-6 pts.	Apply in 100 gallons of water in the spring when ball moss is actively growing, using 1½ gallons of spray per foot of tree height. Make sure to wet ball moss tufts thoroughly. A second application may be required after 12 months.
			NOTE: Kocide 4.5LF may be injurious to ornamentals grown under live oaks or pecans. This product may be reactive on masonry and metal surfaces such as galvanized roofing. Avoid contact with metal surfaces. Do not spray on cars, houses, lawn furniture, etc.
Macadamia	Anthracnose	4-6 pts.	Initiate sprays at first sign of flowering and repeat on a weekly schedule until just before harvest. Apply in sufficient water for thorough coverage. Use the higher rates for severe disease.
	Phytophthora Blight (P. capsici), Raceme Blight (<i>Botrytis cinerea</i>)	3-4 pts.	Apply during raceme development and bloom periods. Apply in sufficient water for thorough coverage. Use the higher rates when conditions favor disease.
Mamey Sapote	Anthracnose, Algal Leaf Spot	4-5½ pts.	Apply when conditions favor disease development. Repeat on 14 to 30 day schedule or as needed as disease severity and environmental conditions dictate. Use the higher rates when conditions favor disease.
Papaya	Anthracnose	2½- 6½ pts.	Apply before disease appears. Apply at 10 to 14 day intervals under

light disease pressure and 5 to 7 day intervals or as needed under heavy disease pressure. The addition of an approved spreader is desirable. Use the higher rates when conditions favor disease.

Parsley	Bacterial blight (<i>Pseudomonas</i> sp.)	2 pts.	Begin applications when plants are first established in the field and repeat at 5 to 7 days intervals or as needed depending on disease severity and environmental conditions.
Passion Fruit	Anthrachnose	4-6 pts.	Make initial application just before flowering and repeat on a weekly schedule until just before harvest. Apply in sufficient water for thorough coverage. Use the higher rates when conditions favor disease.
Sugar Apple (<i>Annona</i>)	Anthrachnose	8-12 pts.	Make initial application just before flowering and repeat on a weekly schedule until just before harvest. Apply in sufficient water for thorough coverage. Use the higher rates when conditions favor disease.
Sycamore	Anthrachnose	1½-2 pts.	Apply as a full cover spray in 100 gallons of water or sufficient volume for thorough coverage. Make first application at bud crack and second application 7 to 10 days later at 10% leaf expansion. Use the higher rates when conditions favor disease.

TURFGRASS

~~For use to control algae in turfgrass on sod farms, golf courses, cemeteries, home lawns and industrial or municipal turf areas, including parks, playgrounds and athletic fields. Apply 1 pint Kocide 4.5LF per 1,000 square feet in 5 gallons of water. Kocide 4.5LF may be used alone or in combination with other registered turf fungicides as a maintenance spray. Observe all precautions and limitations on the label of each product used in tank mixes.~~

~~NOTE: Phytotoxicity may occur depending on varietal differences. Apply the recommended rate to a small area and observe for 7 to 10 days for signs of injury. If phytotoxicity occurs, discontinue use. Do not apply in spray solutions with a pH of less than 6.5.~~

~~NOTE: This product may be reactive on masonry and metal surfaces such as galvanized roofing. Avoid contact with metal surfaces. Do not spray on cars, houses, lawn furniture, etc.~~

GREENHOUSE AND SHADEHOUSE CROPS

Notice to User: Kocide 4.5LF may be used in greenhouses and shadehouses to control diseases on crops which appear on this label, and specific instructions have been developed for the crops listed. The grower should bear in mind that the sensitivity of crops grown in greenhouses and shadehouses differs greatly from crops grown under field conditions. Neither the manufacturer nor seller has determined whether or not Kocide 4.5LF can be used safely on all greenhouse and shadehouse grown crops. The user should determine if Kocide 4.5LF can be used safely prior to commercial use. In a small area, apply the recommended rates to the plants in question, i.e., foliage, fruit, etc., and observe for 7 to 10 days for symptoms of phytotoxicity prior to commercial use.

Apply Kocide 4.5LF according to specific rates given for those crops in pints per acre. **One tablespoon of Kocide 4.5LF per 1,000 square feet is equivalent to 1 pint per acre.** Kocide 4.5LF should be applied in adequate water for thorough coverage of plant parts. Begin application at first sign of disease and repeat at 7 to 14 day intervals or as needed; use shorter spray intervals during periods when severe disease conditions persist.

NOTE: Phytotoxicity may occur on young tender flush when Kocide 4.5LF is applied to citrus seedlings grown in greenhouses or shadehouses.

<u>Crop</u>	<u>Disease</u>	<u>Rate Per 1,000 Sq Ft</u>	<u>Use Instructions</u>
Citrus (Non-Bearing Nursery)	Brown Rot, Citrus Canker, Greasy Spot, Melanose, Pink Pitting, Scab	3 TBSP.	Begin applications when disease first threatens. Repeat at 30 day intervals or as needed depending on disease severity.
Cucumber	Angular Leaf Spot, Downy Mildew	1-2 TBSP.	Apply weekly when plants begin to vine. Use the higher rates when conditions favor disease.
Eggplant	Alternaria Blight,	1½ TBSP.	Begin applications prior to

	Anthracnose, Phomopsis		development of disease symptoms. Repeat sprays at 7-10 day intervals or as needed depending on disease severity. Use higher rates when conditions favor disease.
Pepper	Bacterial Spot	1½-2 TBSP.	Begin applications when conditions first favor disease development and repeat at 5 to 10 day intervals or as needed depending on disease severity. Use the higher rates when conditions favor disease.
Tomato	Anthracnose, Bacterial Speck, Bacterial Spot, Early Blight, Grey Leaf Mold, Late Blight, Septoria Leaf Spot	1½-3 TBSP.	Begin applications when disease first threatens and repeat at 5 to 10 day intervals or as needed depending on disease severity. Use the higher rates when conditions favor disease.

TURFGRASS

For use to control algae in turfgrass on sod farms, golf courses, cemeteries, home lawns and industrial or municipal turf areas, including parks, playgrounds and athletic fields. Apply 1 ~~ounce~~ fluid ounces pint Kocide 4.5LF per 1,000 square feet in 5 gallons of water. Kocide 4.5LF may be used alone or in combination with other registered turf fungicides as a maintenance spray. Observe all precautions and limitations on the label of each product used in tank mixes.

NOTE: Phytotoxicity may occur depending on varietal differences. Apply the recommended rate to a small area and observe for 7 to 10 days for signs of injury. If phytotoxicity occurs, discontinue use. Do not apply in spray solutions with a pH of less than 6.5.

NOTE: This product may be reactive on masonry and metal surfaces such as galvanized roofing. Avoid contact with metal surfaces. Do not spray on cars, houses, lawn furniture, etc.

ORNAMENTALS

Use Kocide 4.5LF for control of bacterial and fungal diseases of foliage, flowers and stems on ornamentals in greenhouses, shadehouses, outdoor nurseries and outdoor landscape plantings.

For ornamental crops in dormancy, apply as a thorough cover spray at rates ranging from ⅔ to 2⅔ pints per acre of Kocide 4.5LF. When new growth is present, apply as a thorough cover

spray at rates ranging from $\frac{2}{3}$ to 2 pints per acre of Kocide 4.5LF. **One tablespoon of Kocide 4.5LF per 1,000 square feet is equivalent to 1 pint per acre.** Begin application at first sign of disease and repeat at 7 to 14 day intervals or as needed; use the higher rates and shorter spray intervals during periods of frequent rains or when severe disease conditions persist.

Kocide 4.5LF may be used alone or in combination with other fungicides registered for use on ornamentals as a maintenance spray. Use in accordance with the most restrictive of label limitations and precautions. No label dosage rates should be exceeded. This product cannot be mixed with any product containing a label prohibition against such mixing.

Notice to User: Plant sensitivities to Kocide 4.5LF have been found to be acceptable for the specific genera and species listed on this label under the conditions tested. However, phytotoxicity may occur. Due to the large number of species and varieties of ornamental and nursery plants, and the wide range of growing conditions, it is impossible to test every one for sensitivity to Kocide 4.5LF. Neither the manufacturer nor seller has determined whether or not Kocide 4.5LF can be safely used on ornamental or nursery plants not listed on this label. The user should determine if Kocide 4.5LF can be used safely prior to commercial use. In a small area, apply the recommended rates to the plants in question, i.e., bedding plants, foliage, etc., and observe for 7 to 10 days for symptoms of phytotoxicity prior to commercial use.

NOTE: This product may be reactive on masonry and metal surfaces such as galvanized roofing. Avoid contact with metal surfaces. Do not spray on cars, houses, lawn furniture, etc.

<u>Crop</u>	<u>Scientific Name</u>	<u>Disease</u>
Aglaonema	<i>Aglaonema</i> spp.	Bacterial Leaf Spot
Althea (Rose of Sharon)	<i>Hibiscus syriacus</i>	Bacterial Leaf Spot
Andromeda, Japanese	<i>Pieris japonica</i>	Leaf Spots, Twig Blight
Aralia	<i>Dizygotheca elegantissima</i>	Alternaria, Cercospora Leaf Spot, Xanthomonas Leaf Spot
Arborvitae	<i>Thuja</i> spp.	Alternaria Twig Blight, Cercospora Leaf Blight
Aster	<i>Aster</i> spp.	Downy Mildew, Leaf Spots
Azalea 1/	<i>Rhododendron</i> spp.	Botrytis Blight,

		Cercospora Leaf Spot, Phytophthora Dieback, Powdery Mildew
Beech	<i>Fagus</i> spp.	Leaf Spots
Begonia	<i>Begonia semperflorens</i>	Bacterial Leaf Spot (<i>Erwinia</i> spp., <i>Pseudomonas</i> spp., <i>Xanthomonas</i> spp.)
Boston Fern	<i>Nephrolepis exaltata</i>	Bacterial Leaf Spot
Bougainvillea	<i>Bougainvillea spectabilis</i>	Anthracnose, Bacterial Leaf Spot
Boxwood	<i>Buxus</i> spp.	Leaf Spots
Camellia	<i>Camellia japonica</i> , <i>C. sasanqua</i>	Anthracnose, Bacterial Leaf Spot
Camphor Tree	<i>Cinnamomum camphora</i>	<i>Pseudomonas</i> Leaf Spot
Canna	<i>Canna</i> spp.	<i>Pseudomonas</i> Leaf Spot
Carnation 1/	<i>Dianthus</i> spp.	<i>Alternaria</i> Blight, <i>Botrytis</i> Blight, <i>Pseudomonas</i> Leaf Spot
Cedar	<i>Cedrus</i> spp.	Tip Blight
Cherry Prunella	<i>Prunus tomentosa</i>	Bacterial Leaf Spot
Chinese Tallow Tree	<i>Sapium sebiferum</i>	Bacterial Leaf Spot (<i>Pseudomonas</i> spp., <i>Xanthomonas</i> spp.)
Chrysanthemum 1/	<i>Chrysanthemum morifolium</i>	<i>Botrytis</i> Blight, <i>Pseudomonas</i> Leaf Spot, <i>Septoria</i> Leaf Spot
Cotoneaster	<i>Cotoneaster</i> spp.	<i>Botrytis</i> Blight

Crabapple	<i>Malus</i> spp.	Fire Blight
Cypress	<i>Cupressus</i> spp.	Twig Blight
Dahlia	<i>Dahlia pinnata</i>	Alternaria Leaf Spot, Botrytis Gray Mold, Cercospora Leaf Spot
Date Palm	<i>Phoenix canariensis</i>	Pestalotia Leaf Spot
Delphinium	<i>Delphinium</i> spp.	Leaf Spots
Dianthus	<i>Dianthus</i> spp.	Bacterial Soft Rot, Bacterial Spot
Dogwood, Flowering	<i>Cornus florida</i>	Anthracnose
Dogwood, Kousa	<i>Cornus kousa</i>	Bacterial Leaf Spot
Douglas Fir	<i>Pseudotsuga menziesii</i>	Rhabdocline Needlecast
Dracaena	<i>Dracaena marginata</i>	Bacterial Leaf Spot
Dumb Cane	<i>Dieffenbachia</i> spp.	Bacterial Leaf Spot
Dusty Miller	<i>Senecio cineraria</i>	Bacterial Leaf Spot (<i>Pseudomonas cichorii</i>)
Easter Lily 2/	<i>Lilium longiflorum</i>	Botrytis Blight
Echinacea	<i>Echinacea</i> spp.	Bacterial Leaf Spot (<i>Pseudomonas cichorii</i>)
Elm, Chinese	<i>Ulmus parvifolia</i>	Xanthomonas Leaf Spot
Euonymus	<i>Euonymus</i> spp.	Anthracnose, Botrytis Blight
European Fan Palm	<i>Chamaerops humilis</i>	Pestalotia Leaf Spot
Fern, Boston	<i>Nephrolepis exaltata</i>	Bacterial Leaf Spot
Fern, Holly	<i>Cyrtomium falcatum</i>	Pseudomonas Leaf Spot

Fig, Weeping	<i>Ficus benjamina</i>	Bacterial Leaf Spot
Filbert (Ornamental)	<i>Corylus</i> spp.	Filbert Blight
Fir	<i>Abies</i> spp.	Needlecasts
Gardenia	<i>Gardenia jasminoides</i>	Alternaria Leaf Spot, Botrytis Bud Rot, Cercospora Leaf Spot
Geranium	<i>Pelargonium</i> spp.	Alternaria Leaf Spot, Botrytis Gray Mold, Cercospora Leaf Spot
Gladiola	<i>Gladiolus</i> spp.	Alternaria Leaf Spot, Anthracnose, Bacterial Leaf Blight, Botrytis Gray Mold
Golden Rain Tree	<i>Koelreuteria paniculata</i>	Bacterial Leaf Spot
Grape Ivy	<i>Cissus</i> spp.	Bacterial Leaf Spot
Hawthorn	<i>Crataegus</i> spp.	Fire Blight
Hibiscus <u>4/</u>	<i>Hibiscus</i> spp.	Bacterial Leaf Spot
Holly	<i>Ilex</i> spp.	Bacterial Blight, Leaf Spots
Holly-Fern	<i>Cyrtomium falcatum</i>	Pseudomonas Leaf Spot
Honeylocust	<i>Gleditsia triacanthos</i>	Bacterial Leaf Spot
Honeysuckle, Tatarian	<i>Lonicera tatarica</i>	Bacterial Leaf Spot
Impatiens	<i>Impatiens sallerana</i>	Bacterial Leaf Spot
Indian Hawthorn <u>5/</u>	<i>Raphiolepis indica</i>	Anthracnose, Entomosporium Leaf Spot
Iris <u>6/</u>	<i>Iris</i> spp.	Bacterial Leaf Spot

Ivy (English, Algerian) <u>1/</u>	<i>Hedera helix, H. canariensis</i>	Xanthomonas Leaf Spot
Ixora	<i>Ixora coccinea</i>	Xanthomonas Leaf Spot
Juniper	<i>Juniperus</i> spp.	Anthrachnose, Phomopsis Twig Blight Dieback
Lantana	<i>Lantana camera</i>	Bacterial Leaf Spot
Levland Cypress	<i>Cupressus nana, Levlandii</i>	Cercospora Leaf Spot
Lilac	<i>Syringa</i> spp.	Cercospora Leaf Spot, Pseudomonas
Lily, Easter <u>2/</u>	<i>Lilium longiflorum</i>	Botrytis Blight
Linden	<i>Tilia</i> spp.	Anthrachnose, Leaf Blight
Loblolly Bay	<i>Gordonia lasianthus</i>	Anthrachnose
Loquat	<i>Eriobotrya japonica</i>	<i>Colletotrichum</i> spp., <i>Entomosporium maculata</i>
Magnolia (Southern)	<i>Magnolia grandiflora</i>	Algal Leaf Spot, Anthrachnose, Bacterial Leaf Spot
Magnolia (Sweetbay)	<i>Magnolia virginiana</i>	Anthrachnose
Magnolia (Oriental)	<i>Magnolia soulangiana</i>	Bacterial Leaf Spot
Mandevilla	<i>Mandevilla</i> spp.	Anthrachnose
Maple	<i>Acer</i> spp.	Pseudomonas Leaf Blight
Marigold	<i>Tagetes</i> spp.	Alternaria Leaf Spot, Botrytis Leaf Rot, Cercospora Leaf Spot, Flower Rot
Mountain-Ash	<i>Sorbus</i> spp.	Fire Blight

Mulberry, Contorted	<i>Morus bombycis</i>	Bacterial Leaf Spot
Mulberry, Weeping	<i>Morus alba</i>	Bacterial Leaf Spot
Narcissus	<i>Narcissus</i> spp.	Leaf Blight
Nephtytis	<i>Syngonium podophyllum</i>	Bacterial Leaf Spot
Oak	<i>Quercus</i> spp.	Leaf Spots
Oak, Laurel	<i>Quercus laurifolia</i>	Algal Leaf Spot (<i>Cephaleuros virescens</i>)
Oleander	<i>Nerium oleander</i>	Bacterial Leaf Spot, Fungal Leaf Spot
Oregon Grapeholly	<i>Mahonia aquifolium</i>	Leaf Spots
Pachysandra	<i>Pachysandra procumbens</i>	Volutella Leaf Blight
Palm, Date	<i>Phoenix canariensis</i>	Pestalotia Leaf Spot
Palm, European Fan	<i>Chamaerops humilis</i>	Pestalotia Leaf Spot
Palm, Parlor	<i>Chamaedorea elegans</i>	Bacterial Leaf Spot
Palm, Queen	<i>Arecastrum romanzoffianum</i>	Exosporium Leaf Spot, Phytophthora Bud Rot
Palm, Washingtonia	<i>Washingtonia robusta</i>	Pestalotia Leaf Spot
Peach (Flowering) 3/	<i>Prunus</i> spp.	Bacterial Blast, Brown Rot, Fire Blight
Pear (Flowering)	<i>Pyrus calleryana</i> ,	Fire Blight, Leaf Spots
Pentas (Egyptian Star)	<i>Pentas</i> spp.	Bacterial Leaf Spot (<i>Pseudomonas</i> spp., <i>Xanthomonas</i> spp.)
Peony	<i>Paeonia</i> spp.	Botrytis Blight

Periwinkle	<i>Catharanthus roseus</i> , <i>Vinca</i> spp.	Phomopsis Stem Blight
Philodendron	<i>Philodendron selloum</i>	Bacterial Leaf Spot
Phlox	<i>Phlox</i> spp.	Alternaria Leaf Spot
Photinia (Red Tip)	<i>Photinia</i> x <i>fraserii</i> , <i>P. glabra</i>	Anthracnose, Entomosporium Leaf Spot
Pine	<i>Pinus</i> spp.	Needle galls Blight
Pistachio	<i>Pistacia chinensis</i>	Anthracnose
Plantain Lily 6/	<i>Hosta</i> spp.	Bacterial Leaf Spot
Plum (Flowering) 3/	<i>Prunus</i> spp.	Bacterial Blast, Phytophthora Spot, Brown Rot, Fire Blight
Pothos	<i>Scindapsus</i> spp.	Bacterial Leaf Spot
Powder Puff Plant	<i>Calliandra</i> spp.	Bacterial Leaf Spot
Pyracantha	<i>Pyracantha</i> spp.	Fire Blight, Scab
Queen Palm	<i>Arecastrum romanzoffianum</i>	Exosporium Leaf Spot, Phytophthora Bud Rot
Rhododendron	<i>Rhododendron</i> spp.	Alternaria Flower Spot
Rose 1/	<i>Rosa</i> spp.	Black Spot, Powdery Mildew
Snapdragon	<i>Antirrhinum majus</i>	Anthracnose, Dieback, Downy Mildew
Spathe Flower	<i>Spathiphyllum</i> spp.	Bacterial Leaf Spot
Spiraea	<i>Spiraea</i> spp.	Fire Blight

Spruce	<i>Picea</i> spp.	Needlecasts
Sycamore	<i>Platanus</i> spp.	Anthracnose, Leaf Spots
Tatarian Honeysuckle	<i>Lonicera tatarica</i>	Bacterial Leaf Spot
Tulip	<i>Tulipa</i> spp.	Anthracnose, Botrytis Blight
Umbrella Tree	<i>Schefflera</i> spp.	Bacterial Leaf Spot
Verbena	<i>Verbena</i> spp.	Xanthomonas Leaf Spot
Viburnum	<i>Viburnum odoratissimum</i> , <i>V. plicatum</i> , <i>V. suspensum</i>	Anthracnose
Viola (Pansy, Violet)	<i>Viola</i> spp.	Downy Mildew
Washingtonia Palm	<i>Washingtonia robusta</i>	Pestalotia Leaf Spot
Weeping Fig	<i>Ficus benjamina</i>	Bacterial Leaf Spot
Willow	<i>Salix</i> spp.	Anthracnose
Yew	<i>Taxus</i> spp.	Needle Blight
Yucca (Adam's Needle)	<i>Yucca</i> spp.	Cercospora Leaf Spot, Septoria Leaf Spot
Zinnia	<i>Zinnia</i> spp.	Leaf Spots

~~*Use in all states except California~~

- 1/ Discoloration of foliage and/or blooms has been noted on some varieties. To prevent residues on commercial plants, do not spray immediately before selling season.
- 2/ Apply Kocide 4.5LF at 2 to 3½ pints per acre.
- 3/ Apply dormant through bloom only.
- 4/ Hibiscus - Do not apply to plants in flower.

5/ For Indian Hawthorn use 1½ to 2¾ pints per acre.

6/ Some cultivars may be sensitive to Kocide 4.5LF.

NOTE: Phytotoxicity may depend on varietal differences. If unfamiliar with the use of Kocide 4.5LF, apply the recommended rate to a few plants and observe after 7 to 10 days for symptoms of phytotoxicity.

NURSERY ROOT CONTROL

FIBER CONTAINERS AND MULCH

The addition of Kocide 4.5LF to fiber pot pulp prior to molding will extend container life and control spiral root growth of container-grown plants. Add Kocide 4.5LF to paper pulp mix at the rate of 28 to 48 fluid ounces per 100 pounds of dry fiber weight. Kocide 4.5LF should be mixed evenly throughout the pulp before molding. These rates may also be used in paper pulp mix used for molded mulch products.

PLANT RESPONSE

Kocide 4.5LF has been extensively researched; however, testing has not been conducted on all species or cultivars, or under all growing conditions. In some instances performance characteristics may vary. For a complete listing of plant species contact Griffin L.L.C. Technical Services Group at (800) 237-1854.

TREE WOUND DRESSING

Kocide 4.5LF may be sprayed or painted over dressed wounds and cuts in tree bark to seal the wound and help prevent bacterial and fungus infections of the tree. Spray or paint an even coat of Kocide 4.5LF over tree wounds or cuts. One coat of Kocide 4.5LF should protect wounds or cuts for up to one year or until average size wounds have healed.

Kocide 4.5LF has been extensively researched; however, testing has not been conducted on all species or cultivars, or under all growing conditions. In some instances performance characteristics may vary.

GENERAL CHEMIGATION INSTRUCTIONS

Do not apply this product through any irrigation (chemigation) system using aluminum parts or components as damage to the system may occur. Such application is prohibited regardless of whether the irrigation system is flushed with water after use of this product.

Apply this product only through one or more of the following types of systems: sprinkler,

including center pivot, lateral move, traveler, big gun, or plastic pipe solid set system(s) which contain no aluminum parts or components. Do not apply this product through any other type of irrigation system.

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

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

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.

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.

Shut off injection equipment after treatment and continue to operate irrigation system until Kocide 4.5LF has been cleared from the last sprinkler head.

CHEMIGATION SYSTEMS CONNECTED TO PUBLIC WATER SYSTEMS

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.

Chemigation systems connected to public water systems must contain a functional, reduced-pressure zone, backflow preventer (RPZ) or the functional equivalent in the water supply line upstream from the point of pesticide introduction. As an option to the RPZ, the water from the public water system should be discharged into the reservoir tank prior to pesticide introduction.

There shall be a complete physical break (air gap) between the outlet end of the fill pipe and the top or overflow rim of the reservoir tank of at least twice the inside diameter of the fill pipe.

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 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, or in cases where there is no water pump, 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.

Do not apply when wind speed favors drift beyond the area intended for treatment.

NOTE: It must be determined in the selection process if proper application equipment is available and if the waste associated with its use can be properly handled. Materials used in the construction of application equipment is also an important factor as Agricultural chemicals are often reactive with soft metals. **the materials used in the construction of application equipment;** such as aluminum, and even some synthetic materials such as plastics, rubbers, etc. **and some synthetic materials.** **This factor should be given the consideration when selecting the pump application equipment.** Therefore It is necessary when working with equipment containing these materials that they are **thoroughly flushed with clean water** after each day's use.

When mixing, fill the nurse tank half full with water. Add Kocide 4.5LF slowly to tank while hydraulic or mechanical agitation is operating and continue filling with water. Stickers, spreaders, insecticides, nutrients, etc. should be added last. If compatibility is in question, use the Compatibility Jar Test before mixing a whole tank. Because of the wide variety of possible combinations which can be encountered, observe all precautions and limitations on the labels of all products used in mixtures. Agitation of the mixture in the nurse tank is recommended.

Kocide 4.5LF should be added through a traveling irrigation system continuously or at the last 30 minutes of solid set or hand-moved irrigation systems. Shut off injection equipment after treatment and continue to operate irrigation system until Kocide 4.5LF has been cleared from the last sprinkler head.

SPRINKLER CHEMIGATION

The system must contain a functional check valve, vacuum relief valve, and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow.

The pesticide injection pipeline must also 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.

Do not apply when wind speed favors drift beyond the area intended for treatment.

NOTE: It must be determined in the selection process if proper application equipment is available and if the waste associated with its use can be properly handled. ~~Materials used in the construction of application equipment is also an important factor as~~ Agricultural chemicals are often reactive with soft metals ~~the materials used in the construction of application equipment;~~ such as aluminum, ~~and even some synthetic materials such as plastics, rubbers, etc. and some synthetic materials.~~ ~~This factor should be taken into consideration when selecting proper application equipment.~~ Therefore It is necessary when working with equipment containing these materials that they are ~~that all application equipment be~~ thoroughly flushed with clean water after each day's use.

When mixing, fill ~~the~~ nurse tank half full with water. Add Kocide 4.5LF slowly to tank while hydraulic or mechanical agitation is operating and continue filling with water. Stickers, spreaders, insecticides, nutrients, etc. should be added last. If compatibility is in question, use the Compatibility Jar Test before mixing a whole tank. Because of the wide variety of possible combinations which can be encountered, observe all precautions and limitations on the labels of all products used in mixtures. Agitation of the mixture in the nurse tank is recommended.

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WARRANTY STATEMENT

GRIFFIN warrants that this product conforms to the chemical description on the label thereof and is reasonably fit for purposes stated on such label only when used in accordance with directions under normal use conditions. It is impossible to eliminate all risks inherently associated with 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 GRIFFIN. In no case shall GRIFFIN be liable for consequential, special or indirect damages resulting from the use or handling of this product. All such risks shall be assumed by the Buyer. The exclusive remedy of any buyer or user of this product for any and all losses, injuries, or damages resulting from or in any way arising from the use, handling, or application of this product, whether in contract, warranty, tort, negligence, strict liability, or otherwise, shall not exceed the purchase price paid for this product or at GRIFFIN'S election, the replacement of this product. GRIFFIN MAKES NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE NOR ANY OTHER EXPRESS OR IMPLIED WARRANTY EXCEPT AS STATED ABOVE.

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[Based on EPA stamped accepted labels dated June 14, 1999 and August 24, 1999 and a notification dated March 21, 2000]