

Making Sense of Fungicides

Prepared by Sam Marshall, Horticultural Agent, North Carolina Cooperative Extension

Fungicides are a type of pesticide used to control plant diseases caused by fungal pathogens. Many diseases cannot be controlled with fungicides, including those caused by viruses, nematodes, and bacteria. Even among diseases caused by fungi, fungicides cannot treat many serious problems, such as most canker, root rot, and vascular wilt diseases.

Fungicides should not be used as the only tool for controlling plant diseases. Early detection of plant disease, proper diagnosis, selection of disease-resistant cultivars, and proper cultural practices such as pruning, proper watering, and crop rotation will mitigate plant disease pressure and will reduce the need for use of fungicides.

Selecting the appropriate fungicide treatment first requires correct identification of the plant disease. Contact your local NC Cooperative Extension County Center for assistance with disease and pest diagnosis.

Curative fungicides stop development of plant diseases that are already present in the environment. Plants do not have to display disease symptoms for the disease to be active. Curative fungicides are locally systemic, meaning they are absorbed into plant tissue and move within the plant. Curative fungicides, therefore, do not break down as quickly in the environment and work best when used in areas that have had past or recurring problems with plant diseases (e.g. black spot on roses); thus, timing of application of curative fungicides is essential.

Preventative fungicides, also known as contact fungicides, remain on the surface of the leaf. These products must be exposed to the pathogen to be effective. Preventative fungicides break down quickly in the environment and must be applied every 7-14 days to stop the spread of plant disease. Application timing and frequency may vary depending on rainfall/irrigation, and other environmental factors, like heat and humidity.

Preventative fungicides work best when diseases are detected early in their development. Preventative fungicides help prevent the spread of the disease, but will not cure parts of the plant that are already infected. For optimal performance when using preventative fungicides, prune out infected plant materials and treat new growth.

Read the label, know the difference. Choosing the right product can be intimidating. While there are many *brand names* from which to choose, there are only about 15 active *ingredients* available in fungicide products labeled for use in home landscapes. Active ingredients (AI) are the chemicals in a fungicide that kill or control the target disease while *brand names* are how companies distinguish their products; thus, when choosing a product, make sure you are choosing the right active ingredient.

Killz-all Fungicide

Broad-spectrum fungicide for control of plant diseases in lawns and ornamental plants around residential, public, commercial, and industrial areas.

Active ingredient
 Azoxystrobin; methyl((E)-2-[6-(2-cyanophenoxy) pyrimidin-4-yloxy]phenyl)-3-methoxyacrylate* 0.55%

Other ingredients 99.45%

Total: 100.00%

Contains 0.0051 lb a.i./lb. product

**KEEP OUT OF REACH OF CHILDREN.
CAUTION**

See additional precautionary statements and directions for use inside booklet.

30 pounds

THIS LABEL FOR EDUCATIONAL PURPOSES ONLY.

Figure 1. Fungicide label example.

Before using any pesticide, first take uninterrupted time to read the label. It is critical to read the label carefully before using any pesticide, as the label contains vital information on how to mix, apply, store, and dispose of that product, protecting you, your family, and the environment. *Using a pesticide in a manner that is inconsistent with the label is a violation of federal law.*

Curative Fungicides for established plant diseases control.

Active Ingredient	Brand Name	Type of disease controlled
Azoxystrobin	<ul style="list-style-type: none"> Heritage (turfgrass only); Strobe 50 WG (turfgrass only) 	<ul style="list-style-type: none"> Large patch; leaf spots; pythium blight; pythium root rot
Cyazofamid	<ul style="list-style-type: none"> Segway (turfgrass only) 	<ul style="list-style-type: none"> Pythium blight; pythium root rot; downy mildew
Mefenoxam	<ul style="list-style-type: none"> Quali-Pro Mefenoxam 2AQ (Turfgrass, ornamental plants) 	<ul style="list-style-type: none"> Pythium; phytopthera; downy mildew
Myclobutanil	<ul style="list-style-type: none"> Eagle 20W (turfgrass, ornamental plants); Ferti-lome F Stop (turfgrass only); Spectracide Immunox Multi-purpose Fungicide (ornamental plants, vegetables) 	<ul style="list-style-type: none"> Leaf spot; dollar spot; powdery mildew; rusts; large patch
Penthiopyrad	<ul style="list-style-type: none"> Velista (turfgrass only) 	<ul style="list-style-type: none"> Leaf spot; large patch; powdery mildew; rusts
Propiconazole	<ul style="list-style-type: none"> Bayer Fungus Control for Lawns (turfgrass only); Bonide Infuse (turfgrass, ornamental plants); Ferti-lome Liquid Systemic Fungicide (turfgrass, ornamental plants); Spectracide Immunox Fungus Plus Insect Control for Lawns (turfgrass only) 	<ul style="list-style-type: none"> Large patch; root rot; pythium blight; downy mildew
Tebuconazole	<ul style="list-style-type: none"> Bayer Advanced 3-in-1 Insect, Disease, and Mite Control (Ornamental plants); Bayer Advanced Disease Control (Ornamental plants); Bayer Advanced All-in-One Rose and Flower (Ornamental plants); Bonide Rose Rx Systemic Drench (Ornamental plants) Ferti-Lome 2-n-1 Systemic Drench (Ornamental Plants) 	<ul style="list-style-type: none"> Black spot; powdery mildew; rust; southern blight
Thiophanate-methyl	<ul style="list-style-type: none"> Cleary's 3336F Fungicide (turfgrass, ornamental plants); Scotts Lawn Fungus Control (turfgrass) 	<ul style="list-style-type: none"> Anthracoise; dollar spot; rust; fusarium; crown and root rots; gray leaf spot
Triticonazole	<ul style="list-style-type: none"> Ortho Rose and Flower Disease Control (ornamental plants) 	<ul style="list-style-type: none"> Black spot; powdery mildew; rust

Protective Fungicides for prevention of plant diseases.

Active Ingredient	Brand Name	Type of disease controlled
Captan	<ul style="list-style-type: none"> • Bonide Fruit Tree Spray (fruit trees); • Tiger Brand Fruit Tree Spray (fruit trees); 	<ul style="list-style-type: none"> • Damping off; powdery mildew; anthracnose; rust; early and late blight
Copper (includes copper ammonium complex and copper octanoate)	<ul style="list-style-type: none"> • Bonide Copper Fungicide (Turfgrass, ornamental plants, fruits, vegetables)* • Bonide Dragoon Dust with Copper (vegetables/fruits)* • Miracle-Gro Nature's Care Garden Disease Control (fruits/vegetables, ornamental plants)* 	<ul style="list-style-type: none"> • Powdery mildew; black spot; rust; anthracnose; fire blight
Fludioxonil	<ul style="list-style-type: none"> • Medallion (turfgrass only) 	<ul style="list-style-type: none"> • Leaf spot; anthracnose; rhizoctonia
Mancozeb	<ul style="list-style-type: none"> • Bonide Mancozeb Flowable with Zinc Concentrate (ornamental plants, vegetables) 	<ul style="list-style-type: none"> • Leaf spot; downy mildew; blights; anthracnose
Neem oil	<ul style="list-style-type: none"> • Many available 	<ul style="list-style-type: none"> • Powdery mildew; black spot; rust; wilt; leaf spot; fire blight
Sulfur	<ul style="list-style-type: none"> • Safer Garden Fungicide* (ornamental plants, fruits/vegetables); • Bonide Sulfur Plant Fungicide (fruits/vegetables, ornamental plants); • Bonide 6885 Tomato and Vegetable (fruits/vegetables, ornamental plants); • Espoma Earth-Tone 3-in-1 Disease Control (ornamental plants); • Ortho 3-in-1 (ornamental plants, fruits/vegetables, fruit trees) 	<ul style="list-style-type: none"> • Powdery mildew; rust; leaf blight

*Approved for use in organic gardening.

If you have further questions, please contact your local extension office for more information.

Data collection for this publication was made possible through the tremendous efforts of the Brunswick County Extension Master Gardener Volunteers, Class of 2017.

Learn More with these Online Resources!

Extension Master Gardener Handbook:

[https://content.ces.ncsu.edu/extension-gardener-handbook/appendix-b-pesticide-safety;](https://content.ces.ncsu.edu/extension-gardener-handbook/appendix-b-pesticide-safety)

NC Cooperative Extension Gardening Portal:

<https://gardening.ces.ncsu.edu/>

NC State University and N.C. A&T State University work is a collaborative effort between federal, state and local governments, to form a strategic partnership called N.C. Cooperative Extension, which staffs local offices in all 100 counties and with the Eastern Band of Cherokee Indians.

NC State University and N.C. A&T State University are collectively committed to positive action to secure equal opportunity and prohibit discrimination and harassment regardless of race, color, national origin, religion, political beliefs, family and marital status, sex, age, veteran status, sexual identity, sexual orientation, genetic information, or disability.

North Carolina Cooperative Extension partners with communities to deliver education and technology through programs and partnerships focused on agriculture, food, health, nutrition, and 4-H youth development that enrich the lives, land and economy of North Carolinians.

