

THE PURDUE LANDSCAPE REPORT

Fungicides, Homeowners, and the Garden Center

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All plants are susceptible to attack by pests and pathogens. Under certain conditions, a homeowner may require the use of a pesticide, but only after they've included, or exhausted the use of cultural practices like removal of diseased tissue (sanitation and eradication); considered resistant varieties to replace continual problem plants; and making sure the plant is in the proper site and is receiving adequate sunlight and water (avoidance). Many homeowners, especially those that look for 'organic pesticides' (Table 1) haven't attempted simple cultural practices that effectively manage their problem. These same practices allow them to avoid or reduce pesticides. This combination of cultural practices coupled with chemical management is referred to as integrated pest management, or IPM.

Table 1. Fungicides that possess formulations that are considered acceptable for organic growers.

Copper	Bordeaux Mixture, Bonide Captain Jack's Copper Fungicide	Foliar / Protectant	Most readily available to gardeners, it controls fungal and bacterial diseases. Can cause burn if applied too early or under cool conditions.
Lime Sulfur	Polysul, Liquid sulfur, Flower and Vegetable Dust.	Foliar / Protectant	Best used on dormant woody plants. Labeled for PM, scab, brown rot, and rusts on ornamentals. Can cause burns if applied to young leaves/ shoots or in hot weather. May cause mite flare ups.
Neem Oil	Bonide Captain Jack's Neem Oil; Southern Ag 08722 Triple Action Neem Oil	Foliar / Protectant	Excellent control for PM Never apply oil within 2 weeks of a sulfur spray to prevent plant injury. Do not apply oil when temperatures are above 90°F or to drought-stressed plants.
Salts of Bicarbonate	First Step, Kalgreen	Foliar / Protectant	More effective when used in combination with oil.
Sulfur	Safer's Garden Fungicide, Sulfur 90W	Foliar / Protectant	Elemental sulfur is effective against PM, leaf blights, rusts, and fruit rots. Can burn young tissue in hot weather. May cause mite flare ups. Do not use within 14 days of any oil.

A cornerstone of integrated pest management is the correct diagnosis of the problem. All too often, a frustrated homeowner first arrives at a garden center without knowing not only what the host is, but what the problem is! These homeowners should be directed to use a plant and pest diagnostic clinic, either through an extension office, or land grant university, to aid in the diagnosis or management of their problem.

Only upon successful diagnosis can effective management take place. A great example would be garden phlox. A frustrated homeowner who owns Phlox 'White Admiral' wants to know how to best manage the problem of powdery mildew. Purchasing fungicides are an option—but an expensive one in product and in time. First, there is the cost of the fungicides (between \$10-\$30), and then there is the time it takes spraying (every 7-14 days, and even more frequently with organic options!). Unless this is a highly valued ornamental, the homeowner might want to consider the many varieties of powdery mildew resistant phlox, like 'David,' 'Robert Poore,' or 'Natascha.' For the cost of a bottle of spray and a little patience, the homeowner may completely

eliminate (at best) the need for fungicides and the problem of powdery mildew for many years to come. This scenario can be repeated with roses for diseases like black spot, powdery mildew, and anthracnose; bee balm for powdery mildew and rust; snapdragon for rust and powdery mildew; dogwoods for leaf spot, anthracnose, powdery mildew—the list is extensive! See: [Disease Resistant Annuals and Perennials](#) for more information.

Unfortunately, resistance isn't always available, and the best and most conscientiously- applied cultural techniques may fail to give adequate control. Gardeners that choose to use **fungicides** as part of their management practices have many chemicals to choose from, with brand names like Bonide, Green Light, Hi-Yield, K-Gro, Ortho, Pro Care, Safer, Security, and Spectracide, to name but a few (Table 2). Many of these chemicals are packaged together as '3-in-1.' It is important for the homeowner to know what it is they need, since they may not always need a fungicide with an insecticide and vice versa. For this reason, it is important to carry single active ingredient fungicides (and insecticides) to prevent unnecessary chemical applications and keeping with a strategy of IPM.

Table 2. Fungicides available for home use.

Common Name	Trade Name(s)	Uses/Mechanism	Comments
Aluminum tris	Monterey Garden Phos	Foliar or Root/ Systemic	For specific control of downy mildews, Phytophthora and Pythium diseases.
Captan	Captan Garden Fungicide, Hi-Yield Captan 50W Fungicide	Foliar or Seed / Protectant	General-purpose fungicides for numerous plant diseases Not effective against powdery mildew and rusts
Chlorothalonil	Daconil Garden Fungicide, Multipurpose Fungicide, Bonide Fung-onil Multi-Purpose Fungicide; Hi-Yield Vegetable, Flower, Fruit, and Ornamental Fungicide	Foliar / Protectant	General-purpose fungicides for numerous plant diseases. Discoloration of blooms may occur on some flowers, especially roses.
Copper	Bordeaux Mixture, Fixed Copper Liqui-Cop, Southern Ag Liquid Copper Fungicide, Bonide Captain Jack's Copper Fungicide	Foliar / Protectant	Most readily available to gardeners, it controls fungal and bacterial disease. Can cause burn if applied too early or under cool conditions
Horticultural Oil	Stylet Oil, Saf-T-Side Spray Oil, Sunspray Ultra-Fine Spray Oil	Foliar /Protectant	Good control for powdery mildew. Never apply oil within 2 weeks of a sulfur spray to prevent plant injury. Do not apply oil when temperatures are above 90°F or to drought-stressed plants.
Lime Sulfur	Polysul, Liquid sulfur, Flower and Vegetable Dust	Foliar / Protectant	Labeled for powdery mildew, scab, brown rot, and rusts on ornamentals. Can cause burns if applied to young leaves/ shoots or in hot weather.
Myclobutanil	Spectracide Immunox Multi-Purpose Fungicide	Foliar/Systemic	For control of powdery mildew, rusts, leaf spots.
Propiconazole	Ferti-Lome Liquid Systemic Fungicide II; Bonide Infuse Systemic Disease Control	Foliar/Systemic	For control of powdery mildew, rusts, leaf spots.
Salts of Bicarbonate	First Step, Kalgreen	Foliar / Protectant	More effective when used in combination with oil.
Sulfur	Safer's Garden Fungicide, Sulfur 90W	Foliar / Protectant	Elemental sulfur is effective against powdery mildew, leaf blights, rusts, and fruit rots. Can burn young tissue.
Tebuconazole	BioAdvanced Disease Control for Roses, Flowers, and Shrubs	Foliar/Systemic	For control of powdery mildew, rusts, leaf spots.
Thiophanate-methyl	Thiomyl	Foliar or Root/ Systemic	Effective control of powdery mildew, botrytis, leaf spots and blights, rust and scab.
Triadimefon	Bayleton, Fungi-Fighter	Foliar/ Systemic	For control of rose diseases, powdery mildew, rusts and tip blights.
Triticonazole	Ortho Rose and Flower Disease	Foliar/ Systemic	For control of powdery mildew, rusts, leaf spots.

Finally, for the garden professional and homeowner alike: We must all work together to prevent pests (insects and diseases) from becoming resistant to chemicals. Use of one sole chemical repeatedly allows pests to develop resistance. For this reason,

use pesticides only when necessary and at labeled rates and frequency.

Pesticide Application and Safety

Pesticides are poisonous— period. Organic pesticides are natural products, and some are just as poisonous as their synthetic counterparts. Applicators should be aware of any hazards

associated with pesticides they are applying. Take appropriate steps to protect yourself, your children, your pets, your neighbors, and the environment. Although chemicals listed in this guide are relatively low in toxicity to humans and warm-blooded animals, safety measures should be followed carefully. Remember: The label isn't just a suggestion—it's the law!

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