



# Bulletin

Extension

## Controlling Diseases and Insects in Home Fruit Plantings

### Bulletin 780-01

#### Fungicides

**Captan** is the primary fungicide found in home fruit spray mixtures (Multi-Purpose fruit sprays) such as Fruit Guard, Home Orchard Spray, Fruit Tree Spray, etc. It can also be purchased separately as Captan or Othocide. Captan is most commonly available as a wettable powder. It is an effective and reliable fungicide for control of many fruit crop diseases ([Table 7](#)). On apples it controls scab, and most summer leaf and fruit spotting or rotting diseases. It will not control powdery mildew or rust. On stone fruit it will control brown rot, scab, cherry leaf spot and black knot of plum. On strawberry it controls most fruit rot and leaf spot diseases as well as mummy berry on blueberry. On grapes it controls downy mildew and Phomopsis cane and leaf spot. It is not registered for use on raspberries. Because of incompatibility and plant injury problems, Captan should not be used in combination with either sulfur or spray oil and should not be applied within 7 to 10 days of a sulfur or oil spray. Captan causes severe injury on Schmidt, Emperor Francis and Grant sweet cherries and on Japanese-type or Stanley plums if used before July.

**Chlorothalonil** is a flowable (liquid) fungicide that is sold under a variety of trade names such as Daconil 2787, Ortho multipurpose fungicide and others for use by home owners. The trade name Bravo is used by commercial fruit growers. It is only registered for use on stone fruits and is very effective for control of brown rot, peach leaf curl, peach scab, cherry leaf spot and black knot of plum. It can be used on stone fruit early in the growing season, but cannot be used after petal fall.

**Ferbam** is sold under the trade name Carbamate 76WP or Ferbam fungicide. It is a black, dry, wettable powder. It is a broad spectrum fungicide that controls scab, cedar apple rust and summer fruit rots and blemishes on apples and pears. On stone fruit it provides fair control of brown rot and cherry leaf spot and excellent control of peach leaf curl. On grapes it provides excellent control of black rot and fair control of downy mildew and Phomopsis. Ferbam leaves a black unsightly residue on treated plant surfaces; therefore, its use should be restricted to early in the growing season.

**Myclobutanil** is a locally systemic fungicide that provides excellent control of many diseases on apple, stone fruits and grapes. It is sold as **Spectracide IMMUNOX**. On apple, it provides excellent control of scab, powdery mildew and rust. It is a very good fungicide for early season disease control on apple. It is not very effective for control of fruit blemishes or rots; thus, it is not recommended for late season disease control on apple. On stone fruit (peaches, nectarines, cherries and plums) it provides control of brown rot and powdery mildew. It will also control cherry leaf spot. On grapes it provides excellent control of black rot and powdery mildew. It does not control downy mildew or Phomopsis cane and leaf spot.

**Mancozeb** is available under many trade names as a wettable powder or dry flowable (DF) formulation. It is used primarily by commercial fruit growers and may not be available in packages specifically for use by home fruit growers. Some of the more common trade names are Dithane DF, Dithane M-45, Penncozeb and Manzate 200. Although intended for use by commercial growers they can be used by home fruit growers as long as all label instructions are strictly followed. Mancozeb provides excellent control of apple scab, cedar apple rust, and most summer fruit rots and blemishes on apple and pear. Mancozeb provides excellent control of black rot, Phomopsis cane and leaf spot and downy mildew on grapes. Mancozeb cannot be applied within 77 days of harvest on apples and pears or within 66 days of harvest on grapes; thus, its use is restricted to early in the growing season.

**Thiophanate-Methyl** is a locally systemic fungicide that provides excellent control of many diseases on apple, stone fruits, and strawberry. It is sold as Cleary's 3336 and Topsin-M. Cleary's 3336 is intended for use by home fruit growers and Topsin-M is primarily packaged and labeled for use in commercial fruit plantings. On apple thiophanate-methyl provides excellent control of apple scab, powdery mildew, and most summer fruit rots and blemishes. On stone fruit it provides good control of brown rot, peach scab, powdery mildew, cherry leaf spot and black knot of plum. Topsin-M is registered for use on strawberry and provides excellent control of Botrytis fruit rot and most leaf spotting diseases. Cleary's 3336 is not labeled for use on strawberry.

### **Copper Fungicides**

When different formulations of copper are dissolved in water, copper ions are released into solution. These copper ions are toxic to fungi and bacteria because of their ability to destroy proteins in plant tissues. However, because copper can kill all types of plant tissues, the use of copper fungicides carries the risk of injuring foliage and fruit of most crops. Factors promoting this injury include: 1) the amount of actual copper applied, and 2) cold, wet weather (slow drying conditions) that apparently increases the availability of copper ions and, thus, increases the risk of plant injury. Because of the potential to injure plants, the use of copper fungicides has largely been replaced with fungicides that are safer and often more effective.

Several terms are used when discussing copper as a fungicide. The original material used was copper sulfate (also known as blue vitriol or bluestone). When this material was combined with lime in the French vineyards, the combination became known as Bordeaux

mixture.

**Bordeaux Mixture.** Bordeaux mixture is a mixture of copper sulfate and hydrated lime in water. It has long residual action and has been used to control many diseases, including peach leaf curl, fire blight and scab of apple and black rot, downy mildew and powdery mildew of grape. It is available as a dry wettable powder.

**Fixed Copper Fungicides.** Following the discovery and use of Bordeaux mixture, several relatively insoluble copper compounds or fixed coppers were developed. Fixed copper formulations are less injurious to plant tissues than Bordeaux mixture, but their use is still limited because of their potential to injure plants and lack of compatibility with other pesticides. Some of the more common commercial formulations of fixed copper include C-O-C-S, Kocide 101, Tribasic Copper Sulfate, and Tenn-Copp 5E. There are several fixed copper fungicides registered for use by home fruit growers.

### **Sulfur Fungicides**

Sulfur is available as liquid lime sulfur and as dry wettable powders or liquid (flowable) formulations of sulfur.

**Liquid Lime Sulfur.** Liquid lime sulfur fungicide can be used at high concentrations as a dormant spray on peaches for control of peach leaf curl and on raspberries and blackberries for cane blight, spur blight and anthracnose. At high concentrations, it should be used only when plants are dormant. It can cause severe damage if applied after green foliage appears. At more dilute concentrations, it provides good control of most other diseases of apple, pear, and stone fruits. Lime sulfur has a foul odor that many people dislike.

**Dry Wettable Sulfurs or Flowable Sulfurs.** Sulfur for use as a fungicide is available under many trade names. The microfine wettable sulfurs or flowable sulfurs are usually much less injurious to foliage and fruit than liquid lime sulfur, but their use during hot weather (above 85°F) may result in some leaf burning and fruit russeting. Sulfur fungicides are very effective for control of powdery mildew on most fruit crops, but is not highly effective for control of most other fruit crop diseases. Sulfur is very toxic to foliage of certain grape varieties (mainly American grapes) including Concord, Chancellor, DeChaunac and Foch. Sulfur is relatively safe on most other varieties. Applications after the fruit begins to ripen may pose problems during fermentation if the grapes are intended for wine making.

Growers should note that sulfur is lethal to some beneficial insects, spiders and mites. These beneficial insects are natural predators of harmful insects and mites that affect fruit crops. Killing these beneficial insects may increase certain pest problems, especially mites.

Sulfur provides good control of brown rot and scab of stone fruits. Sulfur is only moderately effective against apple scab. Wettable sulfur is generally not recommended for control of apple scab.

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