



New Jersey Agricultural  
Experiment Station

This is a section from the

## **2012 DISEASE CONTROL RECOMMENDATIONS FOR ORNAMENTAL CROPS**

Publication E036

The full manual, containing recommendations specific to New Jersey, can be found on the Rutgers NJAES website in the publications section:

[njaes.rutgers.edu/pubs/publication.asp?pid=E036](http://njaes.rutgers.edu/pubs/publication.asp?pid=E036)

Note: The label is a legally-binding contract between the user and the manufacturer. The user must follow all rates and restrictions as per label directions. The use of any pesticide inconsistent with the label directions is a violation of Federal law.

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2012

**DISEASE CONTROL RECOMMENDATIONS  
FOR ORNAMENTAL CROPS**

**Section I  
Disease Recommendations by Crop**

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# INTRODUCTION AND NOTES

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## INTRODUCTION-----

A preventive program is the best approach to control most insects and diseases. Some important considerations are:

Plant only insect and disease-free trees and shrubs. A THOROUGH INSPECTION SHOULD BE MADE OF ALL TREES AND SHRUBS BEFORE PLANTING to prevent the introduction of scales, wood-borers, bacterial crown galls, cankers, and other pests. Reject all infested plant material.

INSPECT ESTABLISHED PLANTINGS AT REGULAR INTERVALS for the presence of insects and diseases. It is much easier to obtain control when the problem is just beginning.

KEEP SEASONAL RECORDS OF PEST PROBLEMS AND HOST PLANTS. Records are helpful in developing a preventive control schedule and will minimize "surprise" outbreaks.

If you need assistance additional information on specific problems, contact your local RUTGERS COOPERATIVE EXTENSION COUNTY AGRICULTURAL AGENT.

## DISCLAIMER – USE OF TRADE NAMES-----

In many instances it is advisable to use trade names to avoid using long and complicated chemical names. No endorsement of named products is intended, nor is criticism implied of similar products that are not mentioned. The label is a legally-binding contract between the user and the manufacturer. It remains the responsibility of the user to follow all label directions, ensuring that application site, method, and timing, host crop, and disease are legal for the pesticide being used.

## CONTROL OF BOTRYTIS BLIGHT-----

Although compounds containing cyprodinil, iprodione, or thiophanate-methyl are registered for control of Botrytis blight or gray mold, isolates of *Botrytis* that are resistant to these compounds may be present. If a treatment applied as per label recommendations is not effective, shortening the intervals or increasing the rate will not improve disease control; as a result, another fungicide should be used. To reduce the possibility of fungal resistance in the future, avoid the sole use of any fungicide for extended periods of time when other reliable products are available.

## EXOTHERM TERMIL-----

Exotherm Termil is a vaporizing form of chlorothalonil. It may be burned to produce a gas in greenhouses which cools to a fine dust. Under greenhouse conditions, these particles distribute to provide an invisible covering of treated plants. Exotherm Termil is labelled for control of Botrytis blossom blight, leaf spot, and stem rot as well as several other fungal diseases (leaf spot, powdery mildew, flower spot, and rust) on certain hosts in commercial greenhouses. See label for use restrictions.

## PREVENTION OF DUTCH ELM DISEASE-----

### *Elm Bark Beetle Control*

Spray applications may be made when weather conditions are favorable and temperatures are above freezing. The best results have been obtained when applications are made between March 1st and budbreak. Refer to Rutgers Cooperative Extension Bulletin E334 for insecticides labeled for elm bark beetle control.

Thorough spray coverage is absolutely necessary to obtain protection. Be certain that smaller twigs in the tops of trees receive adequate coverage. Mist blower applications should be attempted only when there is little or no wind.

Do not allow the insecticide spray to drip onto automobiles because spotting or pitting may result. Some damage to lawn areas may result under trees.

Remove all dead or dying elms to eliminate potential breeding sites for the bark beetle vector.

### *Fungicide and Cultural Control for Dutch Elm Disease*

Inject valuable trees on a preventive basis with Abasol, copper (pentahydrate), Fungisol, Imisol, propiconazole, tebuconazole, thiabendazole, or triadimefon as per manufacturer's recommendations. Once symptoms develop, fungicide treatments should be combined with drastic eradication pruning (removing 10 feet of branch tissue below yellow symptomatic foliage). When trees exhibit more than 5% crown symptoms, fungicide injection may be ineffective.

To prevent root graft transmission of Dutch elm disease, dig a trench (3 ft deep) midway between diseased and healthy elms.

## **BACTERIAL LEAF SCORCH OF OAK -----**

Cultural management practices, such as water during drought, judicious application of mulch, and hazard pruning are recommended to help manage bacterial leaf scorch of oak (red oak family) in most plantings. There is no cure for this disease at this time. Mycoject capsules (oxytetracycline) may be used yearly on specimen trees, however, to delay symptom development. Read the label carefully for timing and rate of application.

## **BIORATIONAL AND BIOPESTICIDE PRODUCTS ----**

Biorational products available for disease control include aliphatic petroleum solvents (**JMS Stylet-Oil, Saf-T-Side, SuffOil-X, TriTek**), essential oils (**Sporatec**), neem oil (**70% Neem Oil, DeBug Turbo, Triact 70, Triology, Triple Action Neem Oil**), soybean oil (**Oleotrol-M**), disinfestants (**Consan Triple Action 20, ZeroTol**), potassium bicarbonate (**Armicarb 100, MilStop**), potassium silicate (**Sil-Matrix**), and insecticidal soap (**M-Pede**). Biological control products include strains of *Agrobacterium radiobacter* (**Galltrol-A**), *Bacillus pumilis* (**Sonata**), *Bacillus subtilis* (**Companion, Subtilex, ArmorTech Sonnet, Cease, Rhapsody, Serenade, Taegro**), *Coniothyrium minitans* (**Contans**), *Gliocladium virens* (**Soil Gard 12G**), *Reynoutria sachalinensis* (**Regalia**), *Streptomyces lydicus* (**ActinoGrow**), and products that contain species of *Trichoderma* (**Tenet, PlantShield, RootShield, Rootshield Plus**).

Although biorational products and biopesticides are not included with the synthetic pesticides in Section I (disease recommendations by crop) of this guide, more information on these products may be found in Section II. **Be sure to read labels carefully prior to application of any pesticide.**

# DISEASE CONTROL RECOMMENDATIONS BY CROP

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## **ABELIA** -----

Family Caprifoliaceae (Linnaeaceae)

*Anthracnose*—azoxystrobin, tebuconazole.

*Leaf spot*—azoxystrobin, copper (octanoate), myclobutanil, Pageant, tebuconazole, thiophanate-methyl.

*Powdery mildew*—azoxystrobin, copper (octanoate), myclobutanil, Pageant, polyoxin-D, Sanction, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin, Pageant, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—cyazofamid.

## **AESCULUS** (Buckeye, Horse Chestnut) -----

Family Sapindaceae

*Anthracnose*—Armada, chlorothalonil, chlorothalonil + thiophanate-methyl, Junction, mancozeb, tebuconazole.

*Leaf blotch/leaf spot*—chlorothalonil, chlorothalonil + thiophanate-methyl, Junction, mancozeb, sulfur, tebuconazole, thiophanate-methyl.

*Powdery mildew*—Armada, chlorothalonil + thiophanate-methyl, myclobutanil, polyoxin-D, Sanction, sulfur, tebuconazole, thiophanate-methyl, triadimefon, triflumizole.

## **AFRICAN VIOLET** -----

Family Gesneriaceae

(Do not use propiconazole, tebuconazole on African Violet.)

*Botrytis blight*—copper (octanoate, pentahydrate), Exotherm Termil, fenhexamid, fludioxonil, fluoxastrobin, imazalil, mancozeb, Pageant, polyoxin-D.

*Powdery mildew*—copper (octanoate, pentahydrate), fludioxonil, fluoxastrobin, imazalil, myclobutanil, Pageant, piperalin, polyoxin-D, pyraclostrobin, thiophanate-methyl, triadimefon.

*Soilborne diseases (non-water molds)*—Banrot, fludioxonil, fluoxastrobin, Hurricane, Pageant, polyoxin-D, pyraclostrobin, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—Banrot, copper (pentahydrate), cyazofamid, dimethomorph (*Phytophthora* only), etridiazole, fluoxastrobin (*Phytophthora* only), mfenoxam, propamocarb hydrochloride.

## **AGERATUM** (Floss Flower, Pussyfoot) -----

Family Asteraceae

*Botrytis blight*—azoxystrobin, Exotherm Termil, fludioxonil, fluoxastrobin, iprodione, iprodione + thiophanate-methyl, mancozeb, Palladium, polyoxin-D.

*Powdery mildew*—Armada, azoxystrobin, fluoxastrobin, iprodione + thiophanate-methyl, kresoxim-methyl, myclobutanil, Palladium, phosphorous acid, polyoxin-D, pyraclostrobin, Sanction, tebuconazole, thiophanate-methyl, triadimefon.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, fludioxonil, fluoxastrobin, Hurricane, iprodione, iprodione + thiophanate-methyl, phosphorous acid, polyoxin-D, pyraclostrobin, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole, fluoxastrobin (*Phytophthora* only), Hurricane, mfenoxam, phosphorous acid, propamocarb hydrochloride.

## **AGLAONEMA** (Chinese Evergreen) -----

Family Araceae

*Anthracnose*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (octanoate), polyoxin-D.

*Bacterial leaf spot/blight*—copper (Badge, hydroxide, octanoate, salts), fosetyl-Al.

*Leaf spot*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (octanoate), Exotherm Termil, mancozeb, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, chlorothalonil + thiophanate-methyl, PCNB, phosphorous acid, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole, fosetyl-Al, mfenoxam, phosphorous acid.

## **AJUGA** (Bugleweed) -----

Family Lamiaceae

*Leaf spot (Alternaria, Cercospora, Colletotrichum, Corynespora)*—azoxystrobin, iprodione, iprodione + thiophanate-methyl, polyoxin-D, propiconazole, pyraclostrobin, tebuconazole, thiophanate-methyl, trifloxystrobin.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, iprodione, iprodione + thiophanate-methyl, PCNB, polyoxin-D, pyraclostrobin, thiophanate-methyl, trifloxystrobin.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole.

*Southern blight (Sclerotium)*—tebuconazole.

**ALDER** -----  
Family Betulaceae

*Powdery mildew*—myclobutanil, polyoxin-D, Sanction, sulfur, tebuconazole, thiophanate-methyl, triflumizole.

**ALUMINUM PLANT (Pilea cadierei)**-----  
Family Urticaceae

(To avoid injury, do not use PCNB on Aluminum Plant.)

*Botrytis blight*—chlorothalonil, chlorothalonil + thiophanate-methyl, iprodione, iprodione + thiophanate-methyl, mancozeb, polyoxin-D.

*Leaf spot*—chlorothalonil, chlorothalonil + thiophanate-methyl, copper (octanoate), iprodione, iprodione + thiophanate-methyl, mancozeb, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—Banrot, chlorothalonil + thiophanate-methyl, iprodione, iprodione + thiophanate-methyl, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole.

**ALYSSUM (Lobularia spp.)**-----  
Family Brassicaceae

*Botrytis blight*—azoxystrobin, copper (pentahydrate), fludioxonil, iprodione, iprodione + thiophanate-methyl, mancozeb, Palladium, polyoxin-D.

*Basal stem rot (Pythium)*—Banrot, cyazofamid, etridiazole.

*Downy mildew*—azoxystrobin, copper (pentahydrate), cyazofamid, dimethomorph, fenamidone, mancozeb, mandipropamid, trifloxystrobin.

*Leaf spot*—fludioxonil, iprodione, iprodione + thiophanate-methyl, mancozeb, Palladium, polyoxin-D, tebuconazole, thiophanate-methyl.

*Powdery mildew*—polyoxin-D, Sanction, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, fludioxonil, Hurricane, iprodione, iprodione + thiophanate-methyl, PCNB, phosphorous acid, polyoxin-D, thiophanate-methyl, trifloxystrobin.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, dimethomorph (*Phytophthora* only), etridiazole, fenamidone, Hurricane, mandipropamid, phosphorous acid, propamocarb hydrochloride.

**AMELANCHIER** -----  
Family Rosaceae

*Powdery mildew*—Armada, Concert, copper (pentahydrate), kresoxim-methyl, myclobutanil, polyoxin-D, propicon-

azole, Sanction, tebuconazole, thiophanate-methyl, triadimefon, triflumizole.

*Rust (Gymnosporangium)*—Armada, myclobutanil, tebuconazole, thiophanate-methyl, triadimefon (tree injection), triflumizole.

**ANDROMEDA (Pieris spp.)**-----  
Family Ericaceae

*Leaf spot*—azoxystrobin, chlorothalonil + thiophanate-methyl, copper (Badge [Japanese Andromeda], hydroxide, salts), iprodione, iprodione + thiophanate-methyl, mancozeb, tebuconazole, thiophanate-methyl, triflumizole.

*Phytophthora dieback*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, cyazofamid, dimethomorph, mancozeb, phosphorous acid.

*Soilborne diseases (non-water molds)*—azoxystrobin, iprodione, iprodione + thiophanate-methyl, phosphorous acid, polyoxin-D, thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—cyazofamid, etridiazole, fosetyl-AI, mfenoxam, phosphorous acid, propamocarb hydrochloride.

**ANEMONE**-----  
Family Ranunculaceae

*Downy mildew*—polyoxin-D.

*Leaf spot (Cercospora, Didymaria, Phloeospora, Phyllosticta, Ramularia, Septoria)*—tebuconazole, thiophanate-methyl.

*Powdery mildew*—polyoxin-D, Sanction, tebuconazole, thiophanate-methyl.

*Rust (Puccinia, Tranzschelia)*—myclobutanil, tebuconazole, thiophanate-methyl.

**ANGELICA**-----  
Family Apiaceae

*Leaf spot*—myclobutanil, tebuconazole, thiophanate-methyl.

*Rust (Puccinia)*—myclobutanil, tebuconazole, thiophanate-methyl.

**ANTHURIUM** -----  
Family Araceae

*Anthrachnose (spadix rot/leaf spot) (Colletotrichum)*—copper (octanoate), mancozeb, polyoxin-D, tebuconazole, thiophanate-methyl.

*Bacterial blight*—copper (octanoate), fosetyl-AI, phosphorous acid.

*Botrytis blight*—mancozeb, polyoxin-D.

*Soilborne diseases (non-water molds)*—PCNB, phosphorous acid, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—cyazofamid, dimethomorph (*Phytophthora* only), etridiazole, mfenoxam, phosphorous acid.



**APHELANDRA** (Zebra Plant)-----  
Family Acanthaceae

*Leaf spot*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (octanoate), Exotherm Termil, iprodione, iprodione + thiophanate-methyl, mancozeb, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin, chlorothalonil + thiophanate-methyl, iprodione, iprodione + thiophanate-methyl, PCNB, phosphorous acid, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—cyazofamid, fosetyl-Al, mefenoxam, phosphorous acid.

**ARBORVITAE** (*Thuja* spp.) -----  
Family Cupressaceae

*Botrytis blight*—azoxystrobin (White Cedar), copper (pentahydrate), dicloran, mancozeb, polyoxin-D, triflumizole.

*Conifer twig and tip blights*—Abasol (tree injection), azoxystrobin (White Cedar), chlorothalonil + thiophanate-methyl, copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, oxychloride, salts), Fungisol (tree injection), Imisol (tree injection), iprodione + thiophanate-methyl, Junction, mancozeb.

*Soilborne diseases (non-water molds)*—azoxystrobin (White Cedar), Banrot, iprodione + thiophanate-methyl, PCNB, phosphorous acid, polyoxin-D, pyraclostrobin, thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole, mandipropamid, mefenoxam (White Cedar), phosphorous acid, propamocarb hydrochloride.

**ARCTOSTAPHYLOS** (Manzanita) -----  
Family Ericaceae

*Leaf spot*—tebuconazole, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—cyazofamid, etridiazole.

**ARTEMESIA** (Mugwort, Sagebrush, Wormwood) -----  
Family Asteraceae

*Botrytis blight*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, Exotherm Termil, iprodione, iprodione + thiophanate-methyl, polyoxin-D, triflumizole.

*Leaf spot*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, Exotherm Termil, iprodione, iprodione + thiophanate-methyl, pyraclostrobin, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin, chlorothalonil + thiophanate-methyl, iprodione, iprodione + thiophanate-methyl, phosphorous acid, polyoxin-D, pyraclostrobin, thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—cyazofamid, mefenoxam, phosphorous acid.

**ASH** -----  
Family Oleaceae

*Anthracnose*—Abasol (tree injection), Armada, chlorothalonil, chlorothalonil + thiophanate-methyl, Fungisol (tree injection), Imisol (tree injection), Junction, mancozeb, tebuconazole, triadimefon (tree injection).

*Leaf spot*—Armada, chlorothalonil, chlorothalonil + thiophanate-methyl, mancozeb, pyraclostrobin (Red Ash), tebuconazole, thiophanate-methyl.

*Powdery mildew*—Armada, Concert, chlorothalonil + thiophanate-methyl, copper (pentahydrate), polyoxin-D, propiconazole, pyraclostrobin (Red Ash), Sanction, tebuconazole, thiophanate-methyl, triadimefon, triflumizole.

*Rust (Puccinia)*—Armada, chlorothalonil + thiophanate-methyl, mancozeb, myclobutanil, pyraclostrobin (Red Ash), tebuconazole, thiophanate-methyl, triflumizole.

**ASTER**-----  
Family Asteraceae

*Botrytis blight*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (oxychloride, pentahydrate), Exotherm Termil (foliage only), fludioxonil, iprodione, iprodione + thiophanate-methyl, mancozeb, polyoxin-D.

*Leaf spot*—Armada, azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (Badge, hydroxide, oxychloride, salts), Exotherm Termil (foliage only), fludioxonil, iprodione, iprodione + thiophanate-methyl, mancozeb, sulfur, tebuconazole, thiophanate-methyl.

*Powdery mildew*—Armada, azoxystrobin, copper (oxychloride, pentahydrate), iprodione + thiophanate-methyl, kresoxim-methyl, myclobutanil, phosphorous acid, polyoxin-D, Sanction, sulfur, tebuconazole, thiophanate-methyl, trifloxystrobin.

*Rust (Coleosporium)*—Armada, azoxystrobin, mancozeb, myclobutanil, sulfur, tebuconazole, triadimefon, trifloxystrobin, ziram.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, chlorothalonil + thiophanate-methyl, fludioxonil, Hurricane, iprodione, iprodione + thiophanate-methyl, phosphorous acid, polyoxin-D, thiophanate-methyl, trifloxystrobin.

*Soilborne diseases (oomycetes)*—Banrot, copper (pentahydrate), cyazofamid, etridiazole, Hurricane, mefenoxam, phosphorous acid, propamocarb hydrochloride.

**AUCUBA**-----  
Family Garryaceae (formerly Cornaceae)

*Leaf spot (Phyllosticta)*—azoxystrobin, mancozeb, Pageant, tebuconazole.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, Pageant, PCNB, polyoxin-D, pyraclostrobin, thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, mefenoxam (Japanese).

## AZALEA/RHODODENDRON-----

Family Ericaceae

(Discoloration of blooms has been noted on certain varieties when applications of copper, chlorothalonil, Junction (contains copper), mancozeb are made during flowering. Check for phytotoxicity before large-scale use of copper mancozeb fungicides; to prevent residues on commercial plants, do not spray just before selling season. To minimize potential injury to azaleas, see label restrictions for mfenoxam – use lower rate for “Coral Bell” variety.)

*Botrytis blight*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, pentahydrate, salts), Exotherm Termil, fludioxonil (including Florist Azalea), imazalil (including Florist Azalea), iprodione, iprodione + thiophanate-methyl, Junction, mancozeb, Pageant, polyoxin-D, trifloxystrobin, triflumizole.

*Cutting rot*—captan.

*Cylindrocladium rot*—chlorothalonil + thiophanate-methyl, copper (pentahydrate), fludioxonil, iprodione (pre-stick cutting dip), iprodione + thiophanate-methyl, mancozeb, Pageant, thiophanate-methyl, triflumizole.

*Dieback (Botryosphaeria)*—mancozeb, Pageant.

*Flower and leaf gall (Exobasidium)*—chlorothalonil + thiophanate-methyl, Junction, mancozeb, Pageant, triadimefon. Remove galls when seen.

*Leaf spot*—Armada, azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, oxychloride, pentahydrate, salts), fludioxonil (including Florist Azalea), imazalil, iprodione, iprodione + thiophanate-methyl, Junction, mancozeb, Pageant, pyraclostrobin, tebuconazole, thiophanate-methyl, triadimefon, trifloxystrobin.

*Petal blight (Ovulinia)*—captan, chlorothalonil, chlorothalonil + thiophanate-methyl, Concert, iprodione + thiophanate-methyl, Junction, mancozeb, myclobutanil when flowers start to show color, PCNB in a ground application to established bushes, propiconazole, tebuconazole, thiophanate-methyl, triadimefon, ziram.

*Phytophthora (aerial)*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, pentahydrate, salts), cyazofamid, dimethomorph, Exotherm Termil, fenamidone, fosetyl-Al, Junction, mancozeb, mfenoxam (use caution), Pageant, phosphorous acid, pyraclostrobin.

*Powdery mildew*—Armada, azoxystrobin, Concert, chlorothalonil + thiophanate-methyl, copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, salts), fludioxonil (including Florist Azalea), imazalil (including Florist Azalea), iprodione + thiophanate-methyl, Junction, kresoxim-methyl, myclobutanil, Pageant, phosphorous acid, polyoxin-D, propiconazole, pyraclostrobin, Sanction, sulfur, tebuconazole, thiophanate-methyl, triadimefon, trifloxystrobin, triflumizole.

*Rust (deciduous azalea) (Pucciniastrum)*—Armada, fludioxonil (including Florist Azalea), flutolanil, imazalil (in-

cluding Florist Azalea), Junction, mancozeb, tebuconazole, thiophanate-methyl, trifloxystrobin.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, chlorothalonil + thiophanate-methyl, copper (pentahydrate), fludioxonil, flutolanil, Hurricane, iprodione, iprodione + thiophanate-methyl, Pageant, PCNB, phosphorous acid, polyoxin-D, pyraclostrobin, thiophanate-methyl, trifloxystrobin, triflumizole.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, dimethomorph (*Phytophthora* only), etridiazole, fenamidone, fluopicolide, fosetyl-Al, Hurricane, mandipropamid, mfenoxam (use caution), phosphorous acid, propamocarb hydrochloride.

*Twig blight (Phomopsis)*—copper (Badge, C-O-C-S WDG), iprodione + thiophanate-methyl, mancozeb.

## BABY'S BREATH (*Gypsophila* spp.)-----

Family Caryophyllaceae

*Botrytis blight*—chlorothalonil, chlorothalonil + thiophanate-methyl, iprodione, iprodione + thiophanate-methyl, mancozeb, polyoxin-D, triflumizole.

*Soilborne diseases (non-water molds)*—Banrot, chlorothalonil + thiophanate-methyl, iprodione, iprodione + thiophanate-methyl, phosphorous acid, polyoxin-D, pyraclostrobin (Alpine), thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole, mfenoxam, phosphorous acid.

## BEECH-----

Family Fagaceae

*Leaf spot*—copper (Badge, hydroxide, salts), Junction, tebuconazole, thiophanate-methyl.

## BEGONIA-----

Family Begoniaceae

(Avoid use of chlorothalonil during bloom where flower injury is unacceptable. Evaluate all cultivars to sensitivity to piperalin prior to large-scale use. Do not use propiconazole, tebuconazole.)

*Bacterial leaf spot*—copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, pentahydrate, salts), Junction.

*Cutting/tuber rot*—captan, thiram.

*Botrytis blight*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (oxychloride, pentahydrate), Exotherm Termil, fludioxonil, fluoxastrobin, imazalil, Junction, mancozeb, Pageant, Palladium, polyoxin-D, trifloxystrobin.

*Powdery mildew*—Armada, azoxystrobin (not for Rieger Begonia), calcium polysulfide (Tuberous Begonia), chlorothalonil + thiophanate-methyl, copper (oxychloride, pentahydrate, salts), fenarimol, fludioxonil, fluoxastrobin, imazalil, myclobutanil, Pageant, Palladium, piperalin

(evaluate cultivars for spotting prior to wide-scale use), phosphorous acid, polyoxin-D, pyraclostrobin (Wax Begonia), Sanction, thiophanate-methyl, triadimefon, trifloxystrobin.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, captan (tuber rot), chlorothalonil + thiophanate-methyl, fludioxonil, fluoxastrobin, Hurricane, Pageant, phosphorous acid, polyoxin-D, pyraclostrobin (Wax Begonia), thiophanate-methyl, thiram (tuber rot), trifloxystrobin.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, dimethomorph (*Phytophthora* only), etridiazole, fluoxastrobin (*Phytophthora* only), fosetyl-Al, Hurricane, mefenoxam, phosphorous acid.

## **BIRCH**-----

Family Betulaceae

*Leaf blister (Taphrina)*—mancozeb.

*Leaf spot*—Armada, azoxystrobin, mancozeb, tebuconazole, thiophanate-methyl.

*Powdery mildew*—Armada, azoxystrobin (River Birch), copper (pentahydrate), polyoxin-D, Sanction, tebuconazole, thiophanate-methyl, triadimefon, triflumizole, trifloxystrobin.

*Rust*—Armada, azoxystrobin (River Birch), Junction, mancozeb, myclobutanil, triadimefon, trifloxystrobin.

## **BITTERSWEET**-----

Family Celastraceae

*Leaf spot*—Junction, tebuconazole, thiophanate-methyl.

*Powdery mildew*—myclobutanil, polyoxin-D, Sanction, sulfur, tebuconazole, thiophanate-methyl, triflumizole.

## **BLANKET FLOWER (Gaillardia aristata)** -----

Family Asteraceae

*Leaf spot*—azoxystrobin, pyraclostrobin, tebuconazole, thiophanate-methyl.

*Powdery mildew*—azoxystrobin, myclobutanil, polyoxin-D, pyraclostrobin, Sanction, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin, phosphorous acid, polyoxin-D, pyraclostrobin, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—cyazofamid, mefenoxam, phosphorous acid.

## **BOUGAINVILLEA**-----

Family Nyctaginaceae

*Bacterial leaf spot/blight*—copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, pentahydrate, salts), fosetyl-Al, phosphorous acid.

*Botrytis blight*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (pentahydrate), mancozeb, polyoxin-D.

*Leaf spot*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (basic sulfate, hydroxide), mancozeb, tebuconazole, thiophanate-methyl.

*Powdery mildew*—azoxystrobin, copper (pentahydrate), phosphorous acid, polyoxin-D, Sanction, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin, chlorothalonil + thiophanate-methyl, phosphorous acid, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—cyazofamid, fosetyl-Al, mandipropamid, phosphorous acid.

## **BOXELDER (see “Maple”)**-----

## **BOXWOOD**-----

Family Buxaceae

*Canker*—Bordeaux, calcium polysulfide, copper (basic sulfate).

*Leaf spot*—azoxystrobin, copper (Badge, hydroxide, oxychloride, salts), iprodione, iprodione + thiophanate-methyl, mancozeb, Pageant, pyraclostrobin (Common Boxwood, Japanese Boxwood), tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, iprodione, iprodione + thiophanate-methyl, Pageant, PCNB, phosphorous acid, polyoxin-D, pyraclostrobin (Common Boxwood, Japanese Boxwood), thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole, fosetyl-Al, mandipropamid (including Common Boxwood, Japanese Boxwood), mefenoxam, phosphorous acid, propamocarb hydrochloride.

*Volutella leaf blight and canker*—copper (pentahydrate), mancozeb.

## **BUCKTHORN (Rhamnus spp.)**-----

Family Rhamnaceae

*Leaf spot*—Armada, tebuconazole, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—cyazofamid, etridiazole, propamocarb hydrochloride.

## **BUDDLEIA (Butterfly Bush)**-----

Family Scrophulariaceae

*Leaf spot*—azoxystrobin, Pageant, pyraclostrobin, tebuconazole, thiophanate-methyl, trifloxystrobin.

## **BUTTERNUT (see “Walnut”)**-----

**CACTUS** -----  
Family Cactaceae

(Do not apply chlorothalonil + thiophanate-methyl, thiophanate-methyl to Cactus (Easter).)

*Botrytis blight*—azoxystrobin (Holiday Cactus), chlorothalonil + thiophanate-methyl (Holiday Cactus), copper (pentahydrate) (Holiday Cactus), fludioxonil (Holiday Cactus), iprodione, iprodione + thiophanate-methyl, mancozeb (Holiday Cactus), Pageant (Holiday Cactus), polyoxin-D.

*Leaf spot*—azoxystrobin (Holiday Cactus), chlorothalonil (Holiday Cactus), chlorothalonil + thiophanate-methyl (Holiday Cactus), copper (octanoate) (Holiday Cactus), fludioxonil (Holiday Cactus), iprodione, iprodione + thiophanate-methyl, mancozeb (Holiday Cactus), Pageant (Holiday Cactus), thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin (Holiday Cactus), Banrot (including Holiday Cactus), chlorothalonil + thiophanate-methyl (Holiday Cactus), fludioxonil (Holiday Cactus), Hurricane (Holiday Cactus), iprodione, iprodione + thiophanate-methyl, Pageant (Holiday Cactus), PCNB (Holiday Cactus), phosphorous acid (Holiday Cactus), polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—Banrot (including Holiday Cactus), cyazofamid, etridiazole (Holiday Cactus), Hurricane (Holiday Cactus), mfenoxam (Holiday Cactus), phosphorous acid (Holiday Cactus).

**CALADIUM**-----  
Family Araceae

*Leaf spot*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, Exotherm Termil (foliage only), fludioxonil, Pageant, Palladium, pyraclostrobin, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, chlorothalonil + thiophanate-methyl, fludioxonil, Hurricane, Pageant, PCNB, phosphorous acid, polyoxin-D, pyraclostrobin, thiophanate-methyl, trifloxystrobin.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole, Hurricane, mandipropamid, mfenoxam, phosphorous acid.

*Tuber rot (Botrytis and Fusarium)*—dip tubers in a solution of pyraclostrobin, thiophanate-methyl, thiram.

**CALATHEA** (Peacock Plant, Rattlesnake Plant)-----  
Family Marantaceae

*Leaf spot*—chlorothalonil, chlorothalonil + thiophanate-methyl, copper (octanoate), thiophanate-methyl.

*Soilborne diseases (non-water molds)*—chlorothalonil + thiophanate-methyl, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—cyazofamid, etridiazole.

**CALCEOLARIA** -----  
Family Calceolariaceae

*Botrytis blight*—Exotherm Termil.

*Soilborne diseases (non-water molds)*—PCNB, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—cyazofamid, etridiazole.

*Stem rot (Sclerotinia)*—thiophanate-methyl.

**CALENDULA**-----  
Family Asteraceae

*Botrytis blight*—fludioxonil, iprodione, iprodione + thiophanate-methyl, Palladium, polyoxin-D, potassium bicarbonate.

*Leaf spot*—Armada, fludioxonil, iprodione, iprodione + thiophanate-methyl, myclobutanil, Palladium, sulfur, tebuconazole, thiophanate-methyl.

*Powdery mildew*—Armada, Concert, fenarimol, iprodione + thiophanate-methyl, Palladium, polyoxin-D, propiconazole, Sanction, sulfur, tebuconazole, thiophanate-methyl, triadimefon.

*Rust (Coleosporium)*—Armada, tebuconazole, triadimefon.

*Soilborne diseases (non-water molds)*—Banrot, fludioxonil, Hurricane, iprodione, iprodione + thiophanate-methyl, PCNB, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole, Hurricane.

**CAMELLIA** -----  
Family Theaceae

(Avoid use of chlorothalonil during bloom where flower injury is unacceptable.)

*Anthracnose*—Armada, azoxystrobin (Japanese Camellia), chlorothalonil + thiophanate-methyl, copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, salts), Junction, mancozeb, Pageant (including Tea Plant), polyoxin-D, pyraclostrobin (Japanese Camellia), thiophanate-methyl, tebuconazole, trifloxystrobin.

*Bacterial leaf spot*—copper (ammonium complex, cuprous oxide, hydroxide, salts), Junction.

*Botrytis blight*—azoxystrobin (Japanese Camellia), chlorothalonil, chlorothalonil + thiophanate-methyl, copper (Badge, basic sulfate), mancozeb, Pageant (including Tea Plant), polyoxin-D, trifloxystrobin, triflumizole.

*Flower blight (Ciborinia [Sclerotinia])*—captan during bloom, chlorothalonil + thiophanate-methyl, Junction, mancozeb, PCNB (ground application to established bushes), triadimefon, ziram.

*Leaf spot*—Armada, azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, mancozeb, Pageant (including Tea Plant), propiconazole, pyraclostrobin (Japanese Camellia), tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, chlorothalonil + thiophanate-methyl, Pageant (including

Tea Plant), PCNB, polyoxin-D, pyraclostrobin (Japanese Camellia), thiophanate-methyl, trifloxystrobin, triflumizole.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, dimethomorph (*Phytophthora* only), etridiazole, fluopicolide, mandipropamid, propamocarb hydrochloride.

**CAMPANULA** (Bellflower)-----  
Family Campanulaceae

*Leaf spot*—myclobutanil, pyraclostrobin, tebuconazole, thiophanate-methyl.

*Powdery mildew*—myclobutanil, polyoxin-D, pyraclostrobin, Sanction, tebuconazole, thiophanate-methyl, trifloxystrobin.

*Rust (Coleosporium)*—myclobutanil, tebuconazole, trifloxystrobin.

**CARISSA** (Natal Plum)-----  
Family Apocynaceae

*Soilborne diseases (oomycetes)*—cyazofamid, etridiazole.

**CARYA** (Hickory, Pecan) (non bearing)-----  
Family Juglandaceae

*Anthracnose*—Junction (includes Pecan), mancozeb, propiconazole (Pecan), pyraclostrobin (Pecan), tebuconazole.

*Leaf spot*—Junction (includes Pecan), mancozeb, Pageant (Pecan), propiconazole (Pecan), pyraclostrobin (Pecan), tebuconazole, thiophanate-methyl.

*Powdery mildew*—Pageant (Pecan), polyoxin-D, propiconazole (Pecan), pyraclostrobin (Pecan), Sanction, tebuconazole, thiophanate-methyl, triflumizole.

**CATALPA** (Catawba)-----  
Family Bignoniaceae

*Leaf spot*—Junction, mancozeb, myclobutanil, sulfur, tebuconazole, thiophanate-methyl.

*Powdery mildew*—myclobutanil, piperalin, polyoxin-D, Sanction, sulfur, tebuconazole, thiophanate-methyl, triflumizole.

**CATHARANTHUS** (see “Vinca”)-----

**CEDAR** (*Cedrus* spp.)-----  
Family Pinaceae

*Rust (Gymnosporangium)*—Armada, azoxystrobin (including Atlas Cedar), flutolanil, mancozeb, tebuconazole, thiophanate-methyl, trifloxystrobin, triflumizole.

*Soilborne diseases (non-water molds)*—azoxystrobin (including Atlas Cedar), Banrot, flutolanil, iprodione +

thiophanate-methyl, phosphorous acid, polyoxin-D, thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—Banrot, copper (pentahydrate), cyazofamid, phosphorous acid, propamocarb hydrochloride.

*Tip blight (Phomopsis)*—Abasol (tree injection), azoxystrobin (including Atlas Cedar), chlorothalonil + thiophanate-methyl, copper (Badge, hydroxide, salts), Fungisol (tree injection), Imisol (tree injection), iprodione + thiophanate-methyl, mancozeb, thiophanate-methyl.

**CELOSIA** (Cockscomb)-----  
Family Amaranthaceae

*Botrytis blight*—Exotherm Termil, fludioxonil, mancozeb, Palladium, polyoxin-D, trifloxystrobin.

*Leaf spot*—Exotherm Termil, fludioxonil, kresoxim-methyl, mancozeb, Palladium, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—Banrot, fludioxonil, Hurricane, polyoxin-D, thiophanate-methyl, trifloxystrobin.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole, Hurricane, propamocarb hydrochloride.

**CENTROSEMA**-----  
Family Fabaceae

*Web blight (Rhizoctonia)*—fludioxonil, Palladium, polyoxin-D, triflumizole.

**CHAMAECYPARIS**-----  
Family Cupressaceae

*Tip blight (Phomopsis)*—azoxystrobin (Sawara Cypress), chlorothalonil + thiophanate-methyl, iprodione + thiophanate-methyl, thiophanate-methyl.

**CHENILLE**-----  
Family Euphorbiaceae

*Leaf spot*—fludioxonil, myclobutanil, Palladium, tebuconazole, thiophanate-methyl.

**CHERRY** (Flowering) (non bearing)-----  
Family Rosaceae

(DO NOT apply azoxystrobin to *Prunus* × *yedoensis* (Yoshino variety); apply to other cherry species and varieties with care – see label.)

*Black knot*—chlorothalonil (Legend, orchard crops), Junction.

*Blossom blight/brown rot (Monilinia)*—chlorothalonil, chlorothalonil + thiophanate-methyl (including Sand

Cherry), Concert, Junction, mancozeb, propiconazole, pyraclostrobin (Kwanzan Cherry, Mt. Fuji Shirotae, Sour Cherry, Wild Cherry), thiophanate-methyl.

*Botrytis blight*—azoxystrobin (Sand Cherry), chlorothalonil, chlorothalonil + thiophanate-methyl (including Sand Cherry), copper (pentahydrate), iprodione, iprodione + thiophanate-methyl, Junction, mancozeb, Pageant, polyoxin-D, triflumizole.

*Leaf spot*—Armada, azoxystrobin (Sand Cherry), Badge (bacterial leaf spot, Nanking Cherry only), chlorothalonil, chlorothalonil + thiophanate-methyl (including Sand Cherry), Concert, iprodione, iprodione + thiophanate-methyl, Junction, kresoxim-methyl (including Kwanzan Cherry, Mt. Fuji Shirotae, Okame Cherry, Shirofugen Cherry, Yoshino Cherry), mancozeb, myclobutanil, Pageant, propiconazole, pyraclostrobin (Kwanzan Cherry, Mt. Fuji Shirotae, Sour Cherry, Wild Cherry), tebuconazole, thiophanate-methyl.

*Powdery mildew*—Armada, azoxystrobin (Sand Cherry), chlorothalonil + thiophanate-methyl (including Sand Cherry), copper (pentahydrate), iprodione + thiophanate-methyl, kresoxim-methyl (including Kwanzan Cherry, Mt. Fuji Shirotae, Okame Cherry, Shirofugen Cherry, Yoshino Cherry), myclobutanil, Pageant, polyoxin-D, pyraclostrobin (Kwanzan Cherry, Mt. Fuji Shirotae, Sour Cherry, Wild Cherry), Sanction, thiophanate-methyl, tebuconazole, trifloxystrobin, triflumizole.

*Soilborne diseases (non-water molds)*—azoxystrobin (Sand Cherry), chlorothalonil + thiophanate-methyl (including Sand Cherry), iprodione, iprodione + thiophanate-methyl, Pageant, polyoxin-D, pyraclostrobin (Kwanzan Cherry, Mt. Fuji Shirotae, Sour Cherry, Wild Cherry), thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—cyazofamid, mfenoxam (nursery only), propamocarb hydrochloride.

## CHERRY LAUREL----- Family Rosaceae

*Bacterial shot hole*—chlorothalonil + thiophanate-methyl, copper (pentahydrate), Junction, mancozeb, thiophanate-methyl.

*Leaf spot*—chlorothalonil, chlorothalonil + thiophanate-methyl, Junction, mancozeb, sulfur, tebuconazole, thiophanate-methyl.

## CHINA ASTER----- Family Asteraceae

*Botrytis blight/bud blight*—mancozeb, polyoxin-D.

*Powdery mildew*—polyoxin-D, Sanction, tebuconazole, thiophanate-methyl.

*Stem canker (Phomopsis)*—mancozeb.

*Wilt (Fusarium)*—use resistant varieties; thiophanate-methyl may help prevent disease spread when applied on a preventive basis.

## CHOCKECHERRY----- Family Rosaceae

*Leaf spot*—tebuconazole, thiophanate-methyl.

## CHRYSANTHEMUM (*Chrysanthemum* spp., *Dendranthema* spp.)----- Family Asteraceae

(Avoid use of chlorothalonil and copper during bloom where flower injury is unacceptable. Check for phytotoxicity prior to large-scale use of copper fungicides.)

*Bacterial blight and wilt/leaf spot*—copper (Badge, hydroxide, pentahydrate, salts), streptomycin sulfate (cutting soak).

*Botrytis blight (blossoms, foliage)*—azoxystrobin, captan, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, oxychloride, pentahydrate, salts), dicloran, Exotherm Termil, fludioxonil, fluoxastrobin, imazalil, iprodione, iprodione + thiophanate-methyl, Junction, mancozeb, Pageant, polyoxin-D, trifloxystrobin, triflumizole.

*Crown gall*—copper (pentahydrate).

*Cutting rot*—Banrot, captan, etridiazole, thiophanate-methyl.

*Leaf spot*—Armada, azoxystrobin, captan, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, oxychloride, salts), Exotherm Termil, fludioxonil, fluoxastrobin, imazalil, iprodione, iprodione + thiophanate-methyl, Junction, mancozeb, Pageant, pyraclostrobin, tebuconazole, thiophanate-methyl, trifloxystrobin, triflumizole, ziram.

*Powdery mildew*—Armada, azoxystrobin, chlorothalonil + thiophanate-methyl, copper (oxychloride, pentahydrate), fenarimol, fludioxonil, fluoxastrobin, imazalil, iprodione + thiophanate-methyl, kresoxim-methyl, Pageant, piperalin, phosphorous acid, polyoxin-D, pyraclostrobin, Sanction, sulfur, tebuconazole, thiophanate-methyl, triadimefon, triflumizole.

*Ray blight (Ascochyta)*—chlorothalonil, chlorothalonil + thiophanate-methyl, Concert, fluoxastrobin, iprodione, iprodione + thiophanate-methyl, mancozeb, myclobutanil, propiconazole, thiophanate-methyl.

*Rust*—azoxystrobin, chlorothalonil + thiophanate-methyl, fludioxonil, fluoxastrobin, flutolanil, imazalil, kresoxim-methyl, mancozeb, myclobutanil, Pageant, pyraclostrobin, sulfur, tebuconazole, thiophanate-methyl, triadimefon, trifloxystrobin, triflumizole.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, chlorothalonil + thiophanate-methyl, fludioxonil, fluoxastrobin, flutolanil, Hurricane, iprodione, iprodione + thiophanate-methyl, Pageant, PCNB, phosphorous acid, polyoxin-D, pyraclostrobin, thiophanate-methyl, trifloxystrobin, triflumizole.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, dimethomorph (*Phytophthora* only), etridiazole, fluoxastrobin (*Phytophthora* only), Hurricane, mfenoxam, mandipro-

pamid (Shasta Daisy), phosphorous acid, propamocarb hydrochloride.

*Storage rot (Botrytis)*—PCNB as a dip or spray.

*White rust*—myclobutanil.

*Wilt*—use cultured cuttings or clean stock in sterilized soil or fresh artificial mix.

**CINERARIA** -----  
Family Asteraceae

*Botrytis blight*—copper (pentahydrate), Exotherm Termil, iprodione, iprodione + thiophanate-methyl, polyoxin-D, Stature.

*Powdery mildew*—Armada, iprodione + thiophanate-methyl, polyoxin-D, Sanction, tebuconazole, triadimefon, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—iprodione, iprodione + thiophanate-methyl, PCNB, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—cyazofamid, etridiazole.

**CINQUEFOIL (Potentilla spp.)** -----  
Family Rosaceae

*Botrytis blight*—azoxystrobin, copper (pentahydrate), triflumizole.

*Leaf spot*—Armada, azoxystrobin, tebuconazole, thiophanate-methyl.

*Powdery mildew*—Armada, azoxystrobin, copper (pentahydrate), kresoxim-methyl (Shrubby Cinquefoil), polyoxin-D, Sanction, tebuconazole, thiophanate-methyl, triflumizole.

**CLEMATIS** -----  
Family Ranunculaceae

*Botrytis blight*—copper (pentahydrate), polyoxin-D, triflumizole.

*Powdery mildew*—copper (pentahydrate), kresoxim-methyl, polyoxin-D, Sanction, sulfur, tebuconazole, thiophanate-methyl, triflumizole.

**CLERODENDRUM** -----  
Family Lamiaceae

*Leaf spot*—chlorothalonil, tebuconazole, thiophanate-methyl.

**COLEUS** -----  
Family Lamiaceae

*Botrytis blight*—azoxystrobin, copper (pentahydrate), Exotherm Termil (foliage only), fludioxonil, fluoxastrobin, iprodione, iprodione + thiophanate-methyl, mancozeb, Pageant, Palladium, polyoxin-D, trifloxystrobin.

*Downy mildew*—fluopicolide, fluoxastrobin, mancozeb, mandipropamid, mefenoxam, Pageant, phosphorous acid, polyoxin-D.

*Leaf spot*—azoxystrobin, Exotherm Termil (foliage only), fludioxonil, fluoxastrobin, iprodione, iprodione + thiophanate-methyl, mancozeb, Pageant, Palladium, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, fludioxonil, fluoxastrobin, Hurricane, iprodione, iprodione + thiophanate-methyl, Pageant, phosphorous acid, polyoxin-D, thiophanate-methyl, trifloxystrobin.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole, fluoxastrobin (*Phytophthora* only), Hurricane, mandipropamid, mefenoxam, phosphorous acid, propamocarb hydrochloride.

**COLUMBINE** -----  
Family Ranunculaceae

*Botrytis blight*—copper (pentahydrate), iprodione, iprodione + thiophanate-methyl, mancozeb, polyoxin-D, triflumizole.

*Leaf spot (Alternaria, Ascochyta, Cercospora, Septoria)*—iprodione, iprodione + thiophanate-methyl, mancozeb, polyoxin-D, pyraclostrobin, sulfur, tebuconazole, thiophanate-methyl.

*Powdery mildew*—copper (pentahydrate), iprodione + thiophanate-methyl, kresoxim-methyl, phosphorous acid, polyoxin-D, pyraclostrobin, Sanction, sulfur, tebuconazole, thiophanate-methyl, triflumizole.

*Soilborne diseases (non-water molds)*—iprodione, iprodione + thiophanate-methyl, PCNB, phosphorous acid, polyoxin-D, pyraclostrobin, thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—cyazofamid, mefenoxam, phosphorous acid.

**CORDYLIN (Ti Plant)** -----  
Family Asparagaceae

*Leaf spot*—chlorothalonil, chlorothalonil + thiophanate-methyl, copper (octanoate), mancozeb, tebuconazole, thiophanate-methyl.

**COREOPSIS** -----  
Family Asteraceae

*Botrytis blight*—copper (pentahydrate), fludioxonil, Pageant, polyoxin-D, trifloxystrobin.

*Leaf spot*—fludioxonil, Pageant, pyraclostrobin, tebuconazole, thiophanate-methyl, trifloxystrobin.

**CORYLUS** (Hazel) (Ornamental) (non bearing) -----  
Family Betulaceae

*Filbert blight (filbert)*—copper (Badge, hydroxide, salts).

**COSMOS**-----  
Family Asteraceae

*Powdery mildew*—myclobutanil, Pageant, Palladium, polyoxin-D, Sanction, sulfur, tebuconazole, thiophanate-methyl, trifloxystrobin.

**COTONEASTER**-----  
Family Rosaceae

*Fireblight*—copper (pentahydrate), phosphorous acid, streptomycin sulfate.

*Botrytis blight (blossoms, foliage)*—azoxystrobin (Creeping Cotoneaster, Variegated Rockspray Cotoneaster), copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, pentahydrate, salts), fludioxonil, imazalil, Junction, mancozeb, polyoxin-D, triflumizole.

*Leaf spot*—azoxystrobin (Creeping Cotoneaster, Variegated Rockspray Cotoneaster), fludioxonil, Junction, mancozeb, propiconazole, pyraclostrobin (Cranberry Cotoneaster), tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin (Creeping Cotoneaster, Variegated Rockspray Cotoneaster), phosphorous acid, polyoxin-D, pyraclostrobin (Cranberry Cotoneaster), thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—cyazofamid, mefenoxam, phosphorous acid, propamocarb hydrochloride.

*Scab (Venturia)*—azoxystrobin (Creeping, Variegated Rockspray Cotoneaster), copper (pentahydrate), Junction, mancozeb, propiconazole, pyraclostrobin (Cranberry Cotoneaster), tebuconazole, thiophanate-methyl, triflumizole.

**CRABAPPLE** (Flowering) (non bearing) -----  
Family Rosaceae

(DO NOT apply azoxystrobin to Apple or dimethoate to Crabapple. Apply azoxystrobin to Crabapple with care – refer to label for sensitive and tolerant varieties.)

*Botrytis blight*—azoxystrobin (use caution), chlorothalonil, chlorothalonil + thiophanate-methyl, copper (pentahydrate), fenhexamid, mancozeb, Pageant, polyoxin-D, triflumizole.

*Fireblight*—copper (Badge, hydroxide, pentahydrate, salts), Junction (single application between silver tip and green tip), phosphorous acid.

*Leaf spot*—Armada, azoxystrobin (use caution), chlorothalonil, chlorothalonil + thiophanate-methyl, Concert, mancozeb, Pageant, propiconazole, pyraclostrobin, tebuconazole, thiophanate-methyl, triadimefon (tree injection), trifloxystrobin.

*Powdery mildew*—Armada, azoxystrobin (use caution), chlorothalonil + thiophanate-methyl, Concert, fenarimol, kresoxim-methyl, myclobutanil, Pageant, polyoxin-D, propiconazole, pyraclostrobin, Sanction, tebuconazole, thiophanate-methyl, triadimefon, trifloxystrobin, triflumizole.

*Rust (Gymnosporangium)*—Armada, azoxystrobin (use caution), chlorothalonil, chlorothalonil + thiophanate-methyl, Concert, fenarimol, flutolanil, mancozeb, myclobutanil, Pageant, propiconazole, pyraclostrobin, tebuconazole, thiophanate-methyl, triadimefon, trifloxystrobin, triflumizole.

*Scab*—Armada, azoxystrobin (use caution), chlorothalonil, chlorothalonil + thiophanate-methyl, copper (pentahydrate), fenarimol, kresoxim-methyl, mancozeb, myclobutanil, Pageant, phosphorous acid (tree injection), polyoxin-D, propiconazole, pyraclostrobin, tebuconazole (including tree injection), thiophanate-methyl, trifloxystrobin, triflumizole.

*Soilborne diseases (non-water molds)*—azoxystrobin (use caution), chlorothalonil + thiophanate-methyl, flutolanil, Pageant, polyoxin-D, pyraclostrobin, thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—cyazofamid, fluopicolide, mandipropamid, mefenoxam (nursery only), phosphorous acid, propamocarb hydrochloride.

**CRANESBILL** (*Geranium* spp.)-----  
Family Geraniaceae

*Botrytis blight*—azoxystrobin, mancozeb, polyoxin-D.

*Leaf spot*—azoxystrobin, mancozeb, thiophanate-methyl.

*Powdery mildew*—azoxystrobin, polyoxin-D, Sanction, thiophanate-methyl.

*Rust (Puccinia)*—azoxystrobin, mancozeb, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—cyazofamid.

**CRAPE MYRTLE** -----  
Family Lythraceae

*Leaf spot*—Armada, azoxystrobin, copper (octanoate), iprodione, iprodione + thiophanate-methyl, mancozeb, Pageant, pyraclostrobin, sulfur, tebuconazole, thiophanate-methyl.

*Powdery mildew*—Armada, azoxystrobin, calcium polysulfide, Concert, copper (octanoate pentahydrate), fenarimol, iprodione + thiophanate-methyl, myclobutanil, Pageant, polyoxin-D, propiconazole, pyraclostrobin, Sanction, sulfur, tebuconazole, thiophanate-methyl, triadimefon, trifloxystrobin, triflumizole.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, iprodione, iprodione + thiophanate-methyl, Pageant, polyoxin-D, pyraclostrobin, thiophanate-methyl, triflumizole.



*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, propanocarb hydrochloride.

**CRASSULA** (Jade Plant)-----  
Family Crassulaceae

*Leaf spot*—Armada, chlorothalonil, chlorothalonil + thiophanate-methyl, iprodione, iprodione + thiophanate-methyl, mancozeb, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—chlorothalonil + thiophanate-methyl, iprodione, iprodione + thiophanate-methyl, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—cyazofamid, etridiazole.

**CROCUS**-----  
Family Iridaceae

*Botrytis blight*—chlorothalonil, Exotherm Termil, polyoxin-D.

*Leaf spot*—chlorothalonil, Exotherm Termil, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—chlorothalonil + thiophanate-methyl, polyoxin-D, thiophanate-methyl.

**CROSSANDRA**-----  
Family Acanthaceae

*Botrytis blight*—polyoxin-D, triflumizole.

**CROTON**-----  
Family Euphorbiaceae

*Bacterial leaf spot*—copper (octanoate).

*Botrytis blight*—chlorothalonil, chlorothalonil + thiophanate-methyl, iprodione, iprodione + thiophanate-methyl, mancozeb, polyoxin-D.

*Leaf spot*—chlorothalonil, chlorothalonil + thiophanate-methyl, iprodione, iprodione + thiophanate-methyl, mancozeb, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—Banrot, chlorothalonil + thiophanate-methyl, iprodione, iprodione + thiophanate-methyl, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid.

**CUCURBITA** (Gourd, Squash) (Ornamental)-----  
Family Cucurbitaceae

*Powdery mildew*—myclobutanil, polyoxin-D, Sanction, sulfur, thiophanate-methyl.

**CYCLAMEN**-----  
Family Myrsinaceae (formerly Primulaceae)

*Botrytis blight*—azoxystrobin, copper (pentahydrate), Exotherm Termil, fludioxonil, iprodione, iprodione + thiophanate-methyl, mancozeb, Pageant, polyoxin-D, ziram.

*Soilborne diseases (non-water molds)*—azoxystrobin, fludioxonil, Hurricane, iprodione, iprodione + thiophanate-methyl, Pageant, PCNB, polyoxin-D, pyraclostrobin, tebuconazole, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—cyazofamid, Hurricane.

*Wilt and corm rot (Fusarium)*—triflumizole.

**CYPRESS** (*Cupressus* spp.)-----  
Family Cupressaceae

*Tip blight*—Abasol (tree injection), chlorothalonil + thiophanate-methyl, copper (Badge, hydroxide, salts), Fungisol (tree injection), Imisol (tree injection), iprodione + thiophanate-methyl, mancozeb, thiophanate-methyl.

**DAFFODIL** (See “Narcissus”)-----

**DAHLIA**-----  
Family Asteraceae

*Flower blight (Botrytis)*—copper (ammonium complex, Badge, basic sulfate, C-O-C-S WDG, cuprous oxide, hydroxide, oxychloride, pentahydrate, salts), fludioxonil, fluoxastrobin, iprodione, iprodione + thiophanate-methyl, Junction, mancozeb, Pageant, Palladium, polyoxin-D.

*Leaf spot*—copper (ammonium complex, Badge, basic sulfate, C-O-C-S WDG, cuprous oxide, hydroxide, oxychloride, salts), fludioxonil, fluoxastrobin, iprodione, iprodione + thiophanate-methyl, Junction, mancozeb, Pageant, Palladium, pyraclostrobin, sulfur, tebuconazole, thiophanate-methyl, ziram.

*Powdery mildew*—Armada, calcium polysulfide, copper (oxychloride, pentahydrate), fenarimol, fluoxastrobin, iprodione + thiophanate-methyl, kresoxim-methyl, myclobutanil, Pageant, Palladium (including Dahlietta), piperalin, polyoxin-D, pyraclostrobin, Sanction, sulfur, tebuconazole, thiophanate-methyl, triadimefon, ziram.

*Soilborne diseases (non-water molds)*—Banrot, fluoxastrobin, iprodione, iprodione + thiophanate-methyl, Pageant, PCNB, polyoxin-D, pyraclostrobin, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole, fluoxastrobin (*Phytophthora* only), propamocarb hydrochloride.

**DAISY** (including Gerbera)-----  
Family Asteraceae

(Apply trifloxystrobin with caution on open Gerbera flowers.)

*Botrytis blight*—azoxystrobin (Transvaal), chlorothalonil, chlorothalonil + thiophanate-methyl (Gerbera), copper (pentahydrate) (Gerbera), Exotherm Termil, fenhexamid (Gerbera), fludioxonil, fluoxastrobin (Gerbera), mancozeb, Pageant (Gerbera), Palladium (Gerbera), polyoxin-D, Stature (Gerbera), triflumizole, trifloxystrobin (Gerbera).

*Leaf spot*—Armada (including Gerbera), azoxystrobin (Transvaal), chlorothalonil, chlorothalonil + thiophanate-methyl (Gerbera), Exotherm Termil, fludioxonil, fluoxastrobin (Gerbera), mancozeb, Pageant (Gerbera), Palladium (Gerbera), pyraclostrobin (Gerbera), sulfur, tebuconazole, thiophanate-methyl, trifloxystrobin (Gerbera), triflumizole.

*Powdery mildew*—Armada (including Gerbera), azoxystrobin (Transvaal), chlorothalonil (Gerbera), chlorothalonil + thiophanate-methyl (Gerbera), copper (pentahydrate), fluoxastrobin (Gerbera), kresoxim-methyl (Gerbera), myclobutanil (Gerbera), Pageant (Gerbera), Palladium (Gerbera), phosphorous acid, piperalin (Gerbera), polyoxin-D, pyraclostrobin (Gerbera), Sanction, sulfur, tebuconazole, thiophanate-methyl, triadimefon, trifloxystrobin (Gerbera), triflumizole.

*Soilborne diseases (non-water molds)*—azoxystrobin (Transvaal), Banrot (Gerbera), chlorothalonil + thiophanate-methyl (Gerbera), fludioxonil, fluoxastrobin (Gerbera), Hurricane (Gerbera), Pageant (Gerbera), phosphorous acid, polyoxin-D, pyraclostrobin (Gerbera), thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—Banrot (Gerbera), cyazofamid, dimethomorph (Gerbera) (*Phytophthora* only), etridiazole (Gerbera), flupicolide (Transvaal), fluoxastrobin (Gerbera) (*Phytophthora* only), Hurricane (Gerbera), mandipropamid (Gerbera), mefenoxam, phosphorous acid.

**DAPHNE**-----  
Family Thymelaeaceae

*Soilborne diseases (non-water molds)*—polyoxin-D, thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—cyazofamid, etridiazole.

**DELPHINIUM** (Larkspur)-----  
Family Ranunculaceae

*Botrytis blight*—azoxystrobin, copper (pentahydrate), Exotherm Termil (foliage only), iprodione, iprodione + thiophanate-methyl, mancozeb, polyoxin-D, trifloxystrobin.

*Leaf spot*—Armada, azoxystrobin, copper (Badge, hydroxide, salts), Exotherm Termil (foliage only), iprodione, iprodione + thiophanate-methyl, mancozeb, pyraclostrobin, sulfur, tebuconazole, thiophanate-methyl, trifloxystrobin.

*Powdery mildew*—Armada, azoxystrobin, calcium polysulfide, Concert, copper (pentahydrate), fenarimol, iprodione + thiophanate-methyl, kresoxim-methyl, myclobutanil, phosphorous acid, polyoxin-D, propiconazole, pyraclostrobin, Sanction, sulfur, tebuconazole, thiophanate-methyl, triadimefon, trifloxystrobin, ziram.

*Rust (Puccinia)*—Armada, azoxystrobin, calcium polysulfide, mancozeb, myclobutanil, pyraclostrobin, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, iprodione, iprodione + thiophanate-methyl, PCNB, phosphorous acid, polyoxin-D, pyraclostrobin, thiophanate-methyl, trifloxystrobin.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole, mefenoxam, phosphorous acid.

**DIANTHUS** (Carnation, Pink, Sweet William)-----  
Family Caryophyllaceae

(Avoid use of chlorothalonil and copper during bloom where flowery injury is unacceptable. Check for phytotoxicity before large-scale use of copper fungicides.)

*Anthracnose (Colletotrichum)*—Armada, azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (oxychloride), fluoxastrobin, iprodione + thiophanate-methyl, mancozeb, Pageant (Carnation, Pink), Palladium, polyoxin-D, pyraclostrobin, thiophanate-methyl, trifloxystrobin.

*Bacterial leaf spot*—copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, pentahydrate, salts), Junction, streptomycin sulfate.

*Bacterial soft rot*—copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, salts).

*Botrytis blight (blossoms, foliage)*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, oxychloride, pentahydrate, salts), Exotherm Termil, fludioxonil, fluoxastrobin, imazalil, iprodione, iprodione + thiophanate-methyl, Junction, mancozeb, Pageant (Carnation, Pink), Palladium, polyoxin-D, trifloxystrobin.

*Cutting rot*—captan, thiophanate-methyl.

*Leaf spot*—azoxystrobin, captan, chlorothalonil, chlorothalonil + thiophanate-methyl, Concert (Sweet William), copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, oxychloride, salts), Exotherm Termil, fludioxonil, fluoxastrobin, imazalil, iprodione, iprodione + thiophanate-methyl, Junction, mancozeb, Pageant (Carnation, Pink), Palladium, propiconazole (Sweet William), pyraclostrobin, sulfur, tebuconazole, thiophanate-methyl, trifloxystrobin, ziram.

*Powdery mildew*—Armada, azoxystrobin, chlorothalonil + thiophanate-methyl, copper (oxychloride, pentahydrate), fludioxonil, fluoxastrobin, imazalil, iprodione + thiophanate-methyl, myclobutanil, Pageant (Carnation, Pink), phosphorous acid, polyoxin-D, pyraclostrobin, Sanction, sulfur, tebuconazole, thiophanate-methyl, triadimefon.

*Rust*—Armada, azoxystrobin (Carnation, Pink), chlorothalonil + thiophanate-methyl, Concert, captan, fludioxonil, fluoxastrobin, imazalil, kresoxim-methyl, mancozeb, myclobutanil, Pageant (Carnation, Pink), propiconazole, pyraclostrobin, sulfur, tebuconazole, thiophanate-methyl, triadimefon, trifloxystrobin, ziram.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, chlorothalonil + thiophanate-methyl, fludioxonil, fluoxastrobin, Hurricane, iprodione, iprodione + thiophanate-methyl, Pageant (Carnation, Pink), PCNB, phosphorous acid, polyoxin-D, pyraclostrobin, thiophanate-methyl, trifloxystrobin.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, dimethomorph (*Phytophthora* only), etridiazole, fluoxastrobin (*Phytophthora* only), Hurricane, mfenoxam, phosphorous acid, propamocarb hydrochloride.

*Stem and branch rot (Alternaria)*—azoxystrobin (Carnation, Pink), chlorothalonil, iprodione, Junction, mancozeb. Start when cuttings are first stuck in propagating bench.

*Storage rot (Botrytis)*—PCNB as a dip or spray.

## DICHONDRA-----

Family Convolvulaceae

*Leaf spot (Alternaria)*—polyoxin-D, tebuconazole, thiophanate-methyl.

*White mold (Sclerotium rolfsii)*—captan.

## DIEFFENBACHIA-----

Family Araceae

*Anthraxnose (Colletotrichum)*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, Exotherm Termil, iprodione + thiophanate-methyl, mancozeb, Pageant, polyoxin-D, thiophanate-methyl.

*Bacterial blight/stem rot*—copper (Badge, hydroxide, octanoate, salts), fosetyl-Al, phosphorous acid, streptomycin sulfate (cutting soak).

*Leaf spot (Myrothecium)*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (octanoate); Exotherm Termil, iprodione, mancozeb, Pageant, polyoxin-D, thiophanate-methyl, trifloxystrobin.

*Soilborne diseases (non-water molds)*—azoxystrobin, chlorothalonil + thiophanate-methyl, iprodione, iprodione + thiophanate-methyl, Banrot, Pageant, PCNB, phosphorous acid, polyoxin-D, thiophanate-methyl, trifloxystrobin.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, dimethomorph (*Phytophthora* only), etridiazole, fosetyl-Al, mfenoxam, phosphorous acid, trifloxystrobin.

## DIETES (African Iris)-----

Family Iridaceae

*Soilborne diseases (non-water molds)*—azoxystrobin, polyoxin-D, pyraclostrobin, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—cyazofamid.

## DOGWOOD-----

Family Cornaceae

*Botrytis blight (blossoms, foliage)*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (pentahydrate), fluoxastrobin, iprodione, iprodione + thiophanate-methyl, Junction, mancozeb, Pageant, polyoxin-D, triflumizole.

*Dogwood anthracnose (Discula)*—chlorothalonil, Concert, copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, oxychloride, pentahydrate, salts), Junction, mancozeb, myclobutanil, propiconazole. Controls leaf spot phase of disease only.

*Leaf spot*—Armada, azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, Concert, copper (Badge [Kousa dogwood], hydroxide [Kousa dogwood], oxychloride), fluoxastrobin, iprodione, iprodione + thiophanate-methyl, Junction, mancozeb, myclobutanil, Pageant, pyraclostrobin, sulfur, tebuconazole, thiophanate-methyl.

*Powdery mildew*—Armada, azoxystrobin, chlorothalonil + thiophanate-methyl, Concert, copper (pentahydrate), fenarimol, fluoxastrobin, iprodione + thiophanate-methyl, kresoxim-methyl, myclobutanil, Pageant, phosphorous acid, polyoxin-D, propiconazole, pyraclostrobin, Sanction, sulfur, tebuconazole, thiophanate-methyl, triadimefon, trifloxystrobin, triflumizole.

*Soilborne diseases (non-water molds)*—azoxystrobin, chlorothalonil + thiophanate-methyl, fluoxastrobin, iprodione, iprodione + thiophanate-methyl, Pageant, phosphorous acid, polyoxin-D, pyraclostrobin, thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—cyazofamid, dimethomorph (*Phytophthora* only), fluoxastrobin (*Phytophthora* only), mfenoxam, phosphorous acid, propamocarb hydrochloride.

*Spot anthracnose*—azoxystrobin, fluoxastrobin, Junction, mancozeb, tebuconazole.

## DOUGLAS FIR-----

Family Pinaceae

*Needle cast (Rhabdocline)*—chlorothalonil (candles are 1/2-inch long and 1, 3, and 6 weeks later; on stands where irregular budbreak occurs, apply chlorothalonil weekly until all trees have broken bud and repeat at 3- to 4-wk intervals as specified above), chlorothalonil + thiophanate-methyl, copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, salts), Junction, mancozeb, thiophanate-methyl.

*Needle cast (Swiss)*—when candles are 1/2 to 2 inches long: azoxystrobin, chlorothalonil, copper (basic sulfate), mancozeb, thiophanate-methyl.

*Needle rust (Melampsora)*—azoxystrobin, mancozeb, myclobutanil, propiconazole, pyraclostrobin, ziram.

*Soilborne diseases (oomycetes)*—cyazofamid, dimethomorph (*Phytophthora* only), fosetyl-AI (foliar application or dip treatment at transplant) (*Phytophthora* only), mefenoxam (nursery and Christmas tree plantations only), phosphorous acid, propamocarb hydrochloride.

## **DRACAENA**-----

Family Asparagaceae

*Bacterial leaf spot*—copper (Badge, hydroxide, octanoate, salts).

*Botrytis blight*—chlorothalonil, chlorothalonil + thiophanate-methyl, copper (octanoate), Exotherm Termil, iprodione, iprodione + thiophanate-methyl, mancozeb, polyoxin-D.

*Leaf spot (Fusarium)*—chlorothalonil, chlorothalonil + thiophanate-methyl, copper (octanoate), Exotherm Termil, iprodione, iprodione + thiophanate-methyl, mancozeb, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—Banrot, chlorothalonil + thiophanate-methyl, iprodione, iprodione + thiophanate-methyl, PCNB, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid.

## **DUSTY MILLER (Jacobaea spp.)**-----

Family Asteraceae

*Bacterial leaf spot*—copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, salts).

*Botrytis blight*—copper (pentahydrate), mancozeb, Palladium, polyoxin-D.

*Powdery mildew*—Palladium, polyoxin-D, Sanction, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—Banrot, polyoxin-D, thiophanate-methyl, trifloxystrobin.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, dimethomorph (*Phytophthora* only), etridiazole, propamocarb hydrochloride.

## **ECHEVERIA**-----

Family Crassulaceae

*Soilborne diseases (non-water molds)*—polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—cyazofamid, etridiazole.

## **ECHINACEA (Purple Coneflower)**-----

Family Asteraceae

*Bacterial leaf spot*—copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, pentahydrate, salts).

*Botrytis blight*—copper (pentahydrate), Pageant, polyoxin-D.

*Powdery mildew*—copper (pentahydrate), Pageant, polyoxin-D, pyraclostrobin, Sanction, tebuconazole, thiophanate-methyl.

## **ELM**-----

Family Ulmaceae

*Bacterial leaf spot*—copper (ammonium complex, Badge [Chinese Elm], basic sulfate [Drake's Chinese Elm], cuprous oxide [Drake's Chinese Elm], hydroxide [Drake's Chinese Elm], pentahydrate, salts [Chinese Elm]), Junction.

*Black leaf spot*—Junction, mancozeb.

*Dutch elm disease*—tree injection: Abasol, copper (pentahydrate), Fungisol, Imisol, propiconazole, tebuconazole, thiabendazole, triadimefon.

*Leaf spot*—Armada, Junction, mancozeb, propiconazole, tebuconazole, thiophanate-methyl.

*Powdery mildew*—Armada, myclobutanil, polyoxin-D, propiconazole, Sanction, tebuconazole, thiophanate-methyl, triadimefon, triflumizole.

## **EUONYMUS**-----

Family Celastraceae

*Anthracnose (Colletotrichum)*—Armada, azoxystrobin (Dwarf Winged Euonymus, Evergreen Euonymus), chlorothalonil, chlorothalonil + thiophanate-methyl, copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, pentahydrate, salts), iprodione + thiophanate-methyl, Junction, mancozeb, Pageant (including Spreading Euonymus, Wintercreeper), polyoxin-D, propiconazole, pyraclostrobin, tebuconazole, thiophanate-methyl, trifloxystrobin.

*Botrytis blight*—azoxystrobin (Dwarf Winged Euonymus, Evergreen Euonymus), chlorothalonil, chlorothalonil + thiophanate-methyl, copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, pentahydrate, salts), Exotherm Termil, fludioxonil, imazalil, iprodione, iprodione + thiophanate-methyl, Junction, mancozeb, Pageant (including Spreading Euonymus, Wintercreeper), polyoxin-D, triflumizole.

*Crown gall*—dip liners in a solution of water containing Galltrol-A.

*Dieback*—mancozeb.

*Leaf spot*—Armada, azoxystrobin (Dwarf Winged Euonymus, Evergreen Euonymus), chlorothalonil, chlorothalonil + thiophanate-methyl, Exotherm Termil, fludioxonil, iprodione, iprodione + thiophanate-methyl, Junction, mancozeb, Pageant (including Spreading Euonymus, Wintercreeper), propiconazole, pyraclostrobin, sulfur, tebuconazole, thiophanate-methyl.

*Powdery mildew*—Armada, azoxystrobin (Dwarf Winged Euonymus, Evergreen Euonymus), calcium polysulfide, chlorothalonil + thiophanate-methyl, fenarimol, fludioxonil, imazalil, iprodione + thiophanate-methyl, kresoxim-methyl, myclobutanil, Pageant (including

Spreading Euonymus, Wintercreeper), polyoxin-D, propiconazole, pyraclostrobin, Sanction, sulfur, tebuconazole, thiophanate-methyl, triadimefon, trifloxystrobin, triflumizole.

*Soilborne diseases (non-water molds)*—azoxystrobin (Dwarf Winged Euonymus, Evergreen Euonymus), Banrot, chlorothalonil + thiophanate-methyl, iprodione, iprodione + thiophanate-methyl, Pageant (including Spreading Euonymus, Wintercreeper), polyoxin-D, pyraclostrobin, thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole, mandipropamid (Wintercreeper), propamocarb hydrochloride.

#### **EXACUM** ----- Family Gentianaceae

*Botrytis blight*—chlorothalonil, chlorothalonil + thiophanate-methyl, copper (pentahydrate), Exotherm Termil, polyoxin-D, tebuconazole, trifloxystrobin.

#### **FATSIA** (includes Aralia) ----- Family Araliaceae

(Check for phytotoxicity before large-scale use of copper fungicides.)

*Leaf blight/spot*—azoxystrobin (Japanese Fatsia), chlorothalonil (Aralia), chlorothalonil + thiophanate-methyl, copper (octanoate [Japanese Fatsia]), Exotherm Termil, mancozeb, thiophanate-methyl.

*Rust*—azoxystrobin (Japanese Fatsia), mancozeb.

*Soilborne diseases (non-water molds)*—Banrot, chlorothalonil + thiophanate-methyl, polyoxin-D, thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid.

#### **FERN** ----- Division Pteridophyta

(Check labels for individual plant recommendations. Do not use chlorothalonil + thiophanate-methyl, propiconazole, tebuconazole, thiophanate-methyl on Boston Fern. Do not apply fludioxonil to Leatherleaf Fern.)

*Bacterial leaf spot*—copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, octanoate, pentahydrate, salts) fosetyl-Al.

*Botrytis blight*—chlorothalonil, chlorothalonil + thiophanate-methyl, copper (pentahydrate), Exotherm Termil, fludioxonil, imazalil, mancozeb, polyoxin-D, trifloxystrobin.

*Leaf spot*—chlorothalonil, chlorothalonil + thiophanate-methyl, Exotherm Termil, fludioxonil, imazalil, kresoxim-methyl, mancozeb, pyraclostrobin, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—Banrot, chlorothalonil + thiophanate-methyl, copper (pentahydrate), fludioxonil,

flutolanil, phosphorous acid, polyoxin-D, pyraclostrobin, thiophanate-methyl, trifloxystrobin.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole, fosetyl-Al, phosphorous acid, propamocarb hydrochloride.

*Web blight (Rhizoctonia)*—chlorothalonil, chlorothalonil + thiophanate-methyl, myclobutanil, polyoxin-D, pyraclostrobin.

#### **FICUS** (Fig)----- Family Moraceae

*Anthraxnose (Colletotrichum)*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, Exotherm Termil, iprodione + thiophanate-methyl, mancozeb, polyoxin-D, thiophanate-methyl, trifloxystrobin.

*Bacterial blight/leaf spot*—copper (Badge, hydroxide, pentahydrate, salts), fosetyl-Al, phosphorous acid, Stature.

*Botrytis blight*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (octanoate, pentahydrate), Exotherm Termil, iprodione, iprodione + thiophanate-methyl, mancozeb, polyoxin-D, triflumizole.

*Leaf spot*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (octanoate), Exotherm Termil, iprodione, iprodione + thiophanate-methyl, mancozeb, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, chlorothalonil + thiophanate-methyl, iprodione, iprodione + thiophanate-methyl, PCNB, phosphorous acid, polyoxin-D, thiophanate-methyl, trifloxystrobin, triflumizole.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, dimethomorph (*Phytophthora* only), etridiazole, mfenoxam, phosphorous acid, propamocarb hydrochloride.

#### **FIR** ----- Family Pinaceae

*Needle cast*—azoxystrobin (Fraser Fir), chlorothalonil + thiophanate-methyl, copper (Badge, basic sulfate, hydroxide), Junction, mancozeb.

*Rust*—azoxystrobin (Fraser Fir), mancozeb, myclobutanil, propiconazole (Shasta Fir), pyraclostrobin (Silver Fir), triadimefon (not for Concolor Fir), ziram (Shasta Fir).

*Soilborne diseases (non-water molds)*—azoxystrobin (Fraser Fir), Banrot, iprodione + thiophanate-methyl, polyoxin-D, pyraclostrobin (Silver Fir), thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, dimethomorph (Fraser Fir, Noble Fir) (*Phytophthora* only), etridiazole, fluopicolide (Grand Fir, Noble Fir), mfenoxam (nursery and Christmas tree plantations only), phosphorous acid, propamocarb hydrochloride.

**FITTONIA**-----  
Family Acanthaceae

*Leaf spot*—chlorothalonil, chlorothalonil + thiophanate-methyl, mancozeb, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—Banrot, chlorothalonil + thiophanate-methyl, PCNB, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid.

*Web blight (Rhizoctonia)*—chlorothalonil + thiophanate-methyl, copper (octanoate), mancozeb, polyoxin-D.

**FLOWERING FRUIT TREES** (non bearing) (see individual species)-----

**FORSYTHIA**-----  
Family Oleaceae

*Leaf spot*—azoxystrobin, copper (octanoate), iprodione, iprodione + thiophanate-methyl, Junction, pyraclostrobin, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin, iprodione, iprodione + thiophanate-methyl, polyoxin-D, pyraclostrobin, thiophanate-methyl, triflumizole.

**FOXGLOVE** (*Digitalis* spp.)-----  
Family Plantaginaceae

*Leaf spot*—azoxystrobin, pyraclostrobin, sulfur, tebuconazole, thiophanate-methyl.

*Powdery mildew*—azoxystrobin, phosphorous acid, polyoxin-D, pyraclostrobin, Sanction, sulfur, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin, PCNB, phosphorous acid, polyoxin-D, pyraclostrobin, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—cyazofamid, etridiazole, mfenoxam, phosphorous acid.

**FREESIA**-----  
Family Iridaceae

*Botrytis blight*—copper (pentahydrate), polyoxin-D.

**FUCHSIA**-----  
Family Onagraceae

*Botrytis stem rot*—copper (pentahydrate), Exotherm Termil, fenhexamid, fludioxonil, imazalil, mancozeb, Palladium, polyoxin-D.

*Rust (Pucciniastrum)*—fludioxonil, imazalil, mancozeb, myclobutanil, tebuconazole.

*Soilborne diseases (non-water molds)*—fludioxonil, PCNB, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—cyazofamid.

**GARDENIA**-----  
Family Rubiaceae

*Bacterial blight*—copper (pentahydrate, salts).

*Botrytis blight/bud rot*—azoxystrobin (Cape Jasmine Gardenia), copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, oxychloride, pentahydrate, salts), mancozeb, Pageant (Cape Jasmine Gardenia), polyoxin-D, pyraclostrobin (Cape Jasmine Gardenia), triflumizole, ziram.

*Leaf spot*—azoxystrobin (Cape Jasmine Gardenia), copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, oxychloride, salts), mancozeb, Pageant (Cape Jasmine Gardenia), pyraclostrobin (Cape Jasmine Gardenia), tebuconazole, thiophanate-methyl.

*Powdery mildew*—Armada, azoxystrobin (Cape Jasmine Gardenia), copper (oxychloride, pentahydrate), myclobutanil, Pageant (Cape Jasmine Gardenia), polyoxin-D, pyraclostrobin (Cape Jasmine Gardenia), Sanction, tebuconazole, thiophanate-methyl, triadimefon, triflumizole.

*Soilborne diseases (non-water molds)*—azoxystrobin (Cape Jasmine Gardenia), Banrot, Pageant (Cape Jasmine Gardenia), PCNB, polyoxin-D, pyraclostrobin (Cape Jasmine Gardenia), thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, fluopicolide, mandipropamid (Dwarf Gardenia), propamocarb hydrochloride.

**GERANIUM** (*Pelargonium* spp.)-----  
Family Geraniaceae

(Avoid use of chlorothalonil during bloom where flower injury is unacceptable. Do not apply propiconazole, tebuconazole to Geranium. Use caution when applying Hurricane to Geranium. Application of fludioxonil to some Geranium varieties may cause stunting or chlorosis at higher rates.)

*Black leg (Pythium)*—if disease appears in the cutting bench, remove affected plants and drench the area with cyazofamid, etridiazole, mfenoxam, propamocarb hydrochloride.

*Botrytis blight*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, oxychloride, pentahydrate, salts), dicloran, Exotherm Termil, fenhexamid, fludioxonil, fluoxastrobin, imazalil, iprodione, iprodione + thiophanate-methyl, Junction, mancozeb, Pageant, polyoxin-D, trifloxystrobin. Remove dead flowers from propagating blocks.

*Leaf spot*—Armada, azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, oxychloride, salts), Exotherm Termil, fludioxonil, fluoxastrobin, imazalil, iprodione, iprodione + thiophanate-methyl, Junction, mancozeb, Pageant, pyraclostrobin, thiophanate-methyl, trifloxystrobin.

*Mosaic virus*—destroy plants that have symptoms of mosaic, crinkle, and ring spot virus. Do not take cuttings from infected stock.

*Powdery mildew*—Armada, azoxystrobin, chlorothalonil + thiophanate-methyl, copper (oxychloride), fludioxonil, fluoxastrobin, imazalil, iprodione + thiophanate-methyl, kresoxim-methyl, myclobutanil, Pageant, phosphorous acid, polyoxin-D, pyraclostrobin, Sanction, thiophanate-methyl, triadimefon, trifloxystrobin.

*Rust (Puccinia)*—Armada, azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (pentahydrate), Exotherm Termil, fludioxonil, fluoxastrobin, flutolanil, imazalil, mancozeb, myclobutanil, Pageant, pyraclostrobin, thiophanate-methyl, triadimefon, trifloxystrobin.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, chlorothalonil + thiophanate-methyl, fludioxonil, fluoxastrobin, flutolanil, iprodione, iprodione + thiophanate-methyl, Pageant, PCNB, phosphorous acid, polyoxin-D, pyraclostrobin, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, dimethomorph (*Phytophthora* only), etridiazole, fenamidone, fluopicolide, fluoxastrobin (*Phytophthora* only), fosetyl-AI, mandipropamid, mefenoxam, phosphorous acid, propamocarb hydrochloride.

*Wilt (Ralstonia)*—phosphorous acid.

## GLADIOLUS-----

(Avoid use of chlorothalonil during bloom where flower injury is unacceptable.)

*Bacterial leaf blight*—copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, salts), Junction, mancozeb, streptomycin sulfate.

*Botrytis (flower blight, leaf spot)*—chlorothalonil, chlorothalonil + thiophanate-methyl, copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, oxychloride, pentahydrate [as spray or Bordeaux], salts), dicloran, Exotherm Termil, iprodione, iprodione + thiophanate-methyl, Junction, kresoxim-methyl, mancozeb, Pageant, polyoxin-D, pyraclostrobin, tebuconazole, thiophanate-methyl, ziram.

*Dry rot*—use crop rotation and a preplant row treatment of dicloran, PCNB.

*Fusarium basal (corm) rot*—use resistant varieties and DO NOT plant in fields with a history of Fusarium rot. Within 48 hours after digging, clean corms and dip in captan, iprodione, iprodione + thiophanate-methyl, pyraclostrobin, thiophanate-methyl, as per label recommendations. Discard suspension when it becomes dirty or after 24 hours has elapsed. Dry in a shaded location and store in a well-ventilated area.

*Mosaic virus*—destroy all plants (and corms) with mosaic streaking in leaves or white-breaking in flowers.

*Powdery mildew*—copper (oxychloride), iprodione + thiophanate-methyl, Pageant, polyoxin-D, pyraclostrobin, Sanction, sulfur, tebuconazole, thiophanate-methyl.

## GLEDITSIA (Honey Locust, Locust)-----

*Bacterial leaf spot*—copper (Badge, hydroxide, pentahydrate, salts).

*Leaf spot*—tebuconazole, thiophanate-methyl.

*Powdery mildew*—Armada, copper (pentahydrate), myclobutanil, polyoxin-D, Sanction, tebuconazole, thiophanate-methyl, triadimefon, triflumizole.

## GLOXINIA -----

Family Gesneriaceae

*Botrytis blight*—copper (pentahydrate), Exotherm Termil, iprodione, iprodione + thiophanate-methyl, mancozeb, polyoxin-D.

*Soilborne diseases (non-water molds)*—Banrot, iprodione, iprodione + thiophanate-methyl, PCNB, phosphorous acid, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole, mefenoxam, phosphorous acid, propamocarb hydrochloride.

## GOMPHRENA-----

Family Amaranthaceae

*Leaf spot*—Concert, fludioxonil, mancozeb, propiconazole, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—fludioxonil, Hurricane, polyoxin-D, thiophanate-methyl.

## GRAPE IVY (*Cissus rhombifolia*) -----

Family Vitaceae

*Powdery mildew*—Armada, copper (octanoate), myclobutanil, phosphorous acid, piperalin, polyoxin-D, tebuconazole, thiophanate-methyl, triadimefon, triflumizole.

## GYNURA (Purple Passion Vine)-----

Family Asteraceae

*Botrytis blight*—chlorothalonil, chlorothalonil + thiophanate-methyl, polyoxin-D, triflumizole.

*Soilborne diseases (non-water molds)*—Banrot, chlorothalonil + thiophanate-methyl, PCNB, polyoxin-D, thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole.

## HACKBERRY -----

Family Cannabaceae

*Botrytis blight*—copper (pentahydrate), polyoxin-D, triflumizole.

*Leaf spot*—myclobutanil, tebuconazole, thiophanate-methyl.

*Powdery mildew*—copper (pentahydrate), myclobutanil, polyoxin-D, Sanction, tebuconazole, thiophanate-methyl, triflumizole.

**HAWTHORN** -----  
Family Rosaceae

*Fireblight*—copper (Badge, hydroxide, salts), fosetyl-AI (pre-bloom and repeat every 7 days until bloom), phosphorous acid.

*Leaf blight/spot*—Armada, chlorothalonil, chlorothalonil + thiophanate-methyl, iprodione, iprodione + thiophanate-methyl, mancozeb, myclobutanil, Pageant, tebuconazole, thiophanate-methyl, trifloxystrobin.

*Powdery mildew*—Armada, chlorothalonil + thiophanate-methyl, fenarimol, iprodione + thiophanate-methyl, kresoxim-methyl, myclobutanil, Pageant, polyoxin-D, Sanction, tebuconazole, thiophanate-methyl, triadimefon, triflumizole.

*Rust (Gymnosporangium)*—Armada, chlorothalonil, chlorothalonil + thiophanate-methyl, Concert, copper (pentahydrate), fenarimol, flutolanil, kresoxim-methyl, mancozeb, myclobutanil, Pageant, propiconazole, tebuconazole, triadimefon, thiophanate-methyl, triflumizole.

*Scab*—Armada, chlorothalonil + thiophanate-methyl, fenarimol, iprodione + thiophanate-methyl, kresoxim-methyl, mancozeb, myclobutanil, Pageant, phosphorous acid (tree injection), propiconazole (tree injection), tebuconazole, thiophanate-methyl, trifloxystrobin, triflumizole.

**HEATHER (Heath)**-----  
Family Ericaceae

*Leaf spot*—azoxystrobin (Darley Heath), tebuconazole, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—cyazofamid, etridiazole, propamocarb hydrochloride.

**HEMLOCK**-----  
Family Apiaceae

*Rust (Melampsora)*—azoxystrobin, mancozeb, Pageant (Western Hemlock), pyraclostrobin (Canadian Hemlock), tebuconazole, triadimefon.

*Soilborne diseases (oomycetes)*—cyazofamid, etridiazole, propamocarb hydrochloride.

**HEUCHERA (Coral Bells)**-----  
Family Saxifragaceae

*Botrytis blight*—fludioxonil, imazalil, iprodione, iprodione + thiophanate-methyl, polyoxin-D.

*Leaf spot*—fludioxonil, iprodione, iprodione + thiophanate-methyl, pyraclostrobin, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—iprodione, iprodione + thiophanate-methyl, PCNB, polyoxin-D, pyraclostrobin, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—cyazofamid.

**HIBISCUS (China Rose, Rose of Sharon, Rose Mallow)**-----  
Family Malvaceae

(Do not apply neem oil without testing for sensitivity.)

*Bacterial leaf spot/blight*—copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, pentahydrate, salts), fosetyl-AI, phosphorous acid.

*Botrytis blight*—azoxystrobin (China Rose, Rose of Sharon, Rose Mallow), copper (pentahydrate), fludioxonil, imazalil, mancozeb, Palladium, polyoxin-D, trifloxystrobin, triflumizole.

*Dieback (Fusarium)*—mancozeb, Palladium, thiophanate-methyl.

*Leaf spot*—azoxystrobin (China Rose, Rose of Sharon, Rose Mallow), fludioxonil, imazalil, mancozeb, Palladium, pyraclostrobin, sulfur, tebuconazole, thiophanate-methyl, triflumizole, trifloxystrobin.

*Powdery mildew*—azoxystrobin (China Rose, Rose of Sharon, Rose Mallow), fludioxonil, imazalil, myclobutanil, Palladium, phosphorous acid, polyoxin-D, pyraclostrobin, Sanction, sulfur, tebuconazole, thiophanate-methyl, triflumizole.

*Soilborne diseases (non-water molds)*—azoxystrobin (China Rose, Rose of Sharon, Rose Mallow), phosphorous acid, polyoxin-D, pyraclostrobin, thiophanate-methyl, trifloxystrobin, triflumizole.

*Soilborne diseases (oomycetes)*—cyazofamid, fosetyl-AI, mandipropamid, phosphorous acid, propamocarb hydrochloride, trifloxystrobin.

**HOLLY**-----  
Family Aquifoliaceae

*Leaf spot*—Armada, azoxystrobin (including Winterberry, Yaupon Holly), chlorothalonil, chlorothalonil + thiophanate-methyl, copper (Badge, hydroxide, salts), fludioxonil, iprodione, iprodione + thiophanate-methyl, Junction, mancozeb, Pageant (including Dwarf Yaupon Holly, Japanese Holly, Meserve Holly), propiconazole, pyraclostrobin (Chinese Holly, Japanese Holly, Yaupon Holly), tebuconazole, thiophanate-methyl.

*Powdery mildew*—Armada, azoxystrobin (including Winterberry, Yaupon Holly), chlorothalonil + thiophanate-methyl, copper (pentahydrate), fludioxonil, imazalil, iprodione + thiophanate-methyl, myclobutanil, Pageant (including Dwarf Yaupon Holly, Japanese Holly, Meserve Holly), phosphorous acid (including Japanese Holly), polyoxin-D, propiconazole, pyraclostrobin (Chinese Holly, Japanese Holly, Yaupon Holly), Sanction, sulfur, tebuconazole, thiophanate-methyl, triadimefon, triflumizole.

*Soilborne diseases (non-water molds)*—azoxystrobin (including Winterberry, Yaupon Holly), Banrot, chlorothalonil



+ thiophanate-methyl, flutolanil, iprodione, iprodione + thiophanate-methyl, Pageant (including Dwarf Yaupon Holly, Japanese Holly, Meserve Holly), PCNB, phosphorous acid, polyoxin-D, pyraclostrobin (Chinese Holly, Japanese Holly, Yaupon Holly), thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, fosetyl-AI (Japanese Holly), mandipropamid (including Burford Holly, Schillings Holly), mefenoxam, phosphorous acid (including Japanese), propamocarb hydrochloride.

*Tar spot*—Junction, mancozeb.

## **HOLLYHOCK**-----

Family Malvaceae

(Avoid chlorothalonil during bloom.)

*Anthracnose (Colletotrichum)*—Pageant.

*Botrytis blight*—chlorothalonil + thiophanate-methyl, copper (oxychloride, pentahydrate), fluoxastrobin, mancozeb, Pageant, polyoxin-D.

*Leaf spot (Ascochyta, Cercospora, Myrothecium, Septoria)*—Armada, chlorothalonil + thiophanate-methyl, copper (oxychloride), fluoxastrobin, mancozeb, Pageant, polyoxin-D, propiconazole, sulfur, tebuconazole, thiophanate-methyl.

*Powdery mildew*—Armada, chlorothalonil + thiophanate-methyl, copper (oxychloride, pentahydrate), fluoxastrobin, myclobutanil, Pageant, polyoxin-D, propiconazole, Sanction, sulfur, tebuconazole, thiophanate-methyl, triadimefon, ziram.

*Rust (Puccinia malvacearum)*—Armada, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (pentahydrate), Exotherm Termil, fluoxastrobin, flutolanil, mancozeb, myclobutanil, Pageant, propiconazole, sulfur, tebuconazole, thiophanate-methyl, triadimefon.

## **HONEYSUCKLE**-----

Family Caprifoliaceae

*Bacterial leaf spot*—copper (Badge, hydroxide, salts), streptomycin sulfate.

*Botrytis blight*—mancozeb, Pageant (Japanese Honeysuckle), polyoxin-D, tebuconazole, triflumizole.

*Leaf blight (Herpobasidium)*—Junction, mancozeb.

*Leaf spot*—Junction, mancozeb, myclobutanil, Pageant (Japanese Honeysuckle), sulfur, tebuconazole, thiophanate-methyl.

*Powdery mildew*—kresoxim-methyl, myclobutanil, Pageant (Japanese Honeysuckle), polyoxin-D, Sanction, sulfur, tebuconazole, thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—cyazofamid, dimethomorph (*Phytophthora* only), mandipropamid, mefenoxam (Halls Honeysuckle), propamocarb hydrochloride.

## **HOSTA (Plantain Lily)**-----

Family Asparagaceae

*Bacterial leaf spot*—copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, pentahydrate, salts).

*Botrytis blight*—azoxystrobin, copper (hydroxide, pentahydrate), polyoxin-D, trifloxystrobin.

*Leaf spot*—azoxystrobin, kresoxim-methyl, pyraclostrobin, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin, polyoxin-D, pyraclostrobin, thiophanate-methyl, trifloxystrobin.

## **HOUSELEEK (Sempervivum spp.)**-----

Family Crassulaceae

*Soilborne diseases (non-water molds)*—azoxystrobin, PCNB, phosphorous acid, polyoxin-D, thiophanate-methyl, trifloxystrobin.

*Soilborne diseases (oomycetes)*—cyazofamid, mefenoxam, phosphorous acid.

## **HOYA (Wax Plant)**-----

Family Apocynaceae

*Leaf spot*—chlorothalonil + thiophanate-methyl, copper (octanoate), Exotherm Termil (foliage only), iprodione, iprodione + thiophanate-methyl, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—Banrot, chlorothalonil + thiophanate-methyl, iprodione, iprodione + thiophanate-methyl, PCNB, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole.

## **HYACINTH**-----

Family Asparagaceae

*Botrytis blight*—copper (pentahydrate), Pageant, polyoxin-D.

## **HYDRANGEA**-----

Family Hydrangeaceae

(Avoid use of chlorothalonil during bloom where flower injury is unacceptable. DO NOT apply chlorothalonil + thiophanate-methyl or piperalin after flowers begin to form.)

*Botrytis blight*—azoxystrobin (including French Hydrangea), chlorothalonil (foliage only), chlorothalonil + thiophanate-methyl (foliage only), copper (octanoate, pentahydrate), dicloran, Exotherm Termil (foliage only), iprodione, iprodione + thiophanate-methyl, Junction, mancozeb, Pageant, polyoxin-D, sulfur, triflumizole.

*Leaf spot*—Armada, azoxystrobin (including French Hydrangea), chlorothalonil (foliage only), chlorothalonil + thiophanate-methyl (foliage only), copper (octanoate, pentahydrate, salts), Exotherm Termil (foliage only), iprodione, iprodione + thiophanate-methyl, Junction, kresoxim-methyl, mancozeb, myclobutanil, Pageant, pyraclostrobin, sulfur, tebuconazole, thiophanate-methyl.

*Powdery mildew*—Armada, azoxystrobin (including French Hydrangea), chlorothalonil + thiophanate-methyl (foliage only), copper (octanoate, pentahydrate, salts), fenarimol, iprodione + thiophanate-methyl, kresoxim-methyl, Pageant, piperalin (do not apply after flower buds are visible), polyoxin-D, pyraclostrobin, Sanction, sulfur, tebuconazole, thiophanate-methyl, triadimefon, trifloxystrobin, triflumizole.

*Rust (Pucciniastrum)*—Armada, chlorothalonil (foliage only), copper (octanoate), Exotherm Termil (foliage only), Junction, mancozeb, tebuconazole.

*Soilborne diseases (non-water molds)*—azoxystrobin (including French Hydrangea), Banrot, chlorothalonil + thiophanate-methyl (foliage only), iprodione, iprodione + thiophanate-methyl, Pageant, polyoxin-D, pyraclostrobin, thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, mandipropamid, propamocarb hydrochloride.

sam Impatiens, New Guinea Impatiens), tebuconazole, thiophanate-methyl, trifloxystrobin.

*Powdery mildew*—azoxystrobin (including Balsam Impatiens), copper (pentahydrate), fludioxonil (New Guinea Impatiens), fluoxastrobin (New Guinea Impatiens), Walleriana Impatiens), imazalil (New Guinea Impatiens), iprodione + thiophanate-methyl (foliar application only), Pageant, phosphorous acid, polyoxin-D, propiconazole, pyraclostrobin (Balsam Impatiens, New Guinea Impatiens), Sanction, sulfur, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin (including Balsam Impatiens), Banrot (including Balsam Impatiens), chlorothalonil + thiophanate-methyl, fluoxastrobin (New Guinea Impatiens, Walleriana Impatiens), iprodione + thiophanate-methyl (foliar application only), Pageant, PCNB, phosphorous acid, polyoxin-D, pyraclostrobin (Balsam Impatiens, New Guinea Impatiens), thiophanate-methyl, trifloxystrobin.

*Soilborne diseases (oomycetes)*—Banrot (including Balsam Impatiens), copper (pentahydrate), cyazofamid, dimethomorph (*Phytophthora* only), etridiazole, fluoxastrobin (New Guinea, Walleriana) (*Phytophthora* only), fosetyl-Al, mandipropamid (including New Guinea Impatiens), mefenoxam, phosphorous acid, propamocarb hydrochloride.

## **IMPATIENS** (including New Guinea Impatiens) ----- Family Balsaminaceae

(Do not use iprodione as a soil drench on Impatiens. Drench or at-seedling applications of fludioxonil, Hurricane to Impatiens or New Guinea Impatiens may cause stunting and/or chlorosis. Avoid use of triflumizole on plugs and do not exceed 2 oz per 100 gal on transplants. Do not use neem oil without prior testing for sensitivity.)

*Bacterial leaf spot*—copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, pentahydrate, salts), Junction, streptomycin sulfate.

*Botrytis blight*—azoxystrobin (including Balsam Impatiens), chlorothalonil, chlorothalonil + thiophanate-methyl, copper (pentahydrate), Exotherm Termil (including Balsam Impatiens) (foliage only), fenhexamid, fludioxonil (New Guinea Impatiens), fluoxastrobin (New Guinea Impatiens), Walleriana Impatiens), imazalil (New Guinea Impatiens), iprodione (foliar application only), iprodione + thiophanate-methyl (foliar application only), mancozeb (including Garden Balsam Impatiens), Pageant, polyoxin-D, potassium bicarbonate.

*Leaf spot*—azoxystrobin (including Balsam Impatiens), chlorothalonil, chlorothalonil + thiophanate-methyl, copper (pentahydrate), Exotherm Termil (including Balsam Impatiens) (foliage only), fludioxonil (New Guinea Impatiens), fluoxastrobin (New Guinea Impatiens, Walleriana Impatiens), iprodione (foliar application only), iprodione + thiophanate-methyl (foliar application only), Junction, kresoxim-methyl, mancozeb (including Garden Balsam Impatiens), Pageant, propiconazole, pyraclostrobin (Bal-

## **INDIAN HAWTHORN**----- Family Rosaceae

*Leaf spot (Entomosporium)*—azoxystrobin, copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, pentahydrate, salts), Junction, mancozeb, propiconazole, pyraclostrobin, tebuconazole, thiophanate-methyl.

## **IRIS** ----- Family Iridaceae

(Avoid use of chlorothalonil during bloom where flower injury is unacceptable.)

*Bacterial leaf spot*—copper (Badge, hydroxide, pentahydrate, salts).

*Bulb rot*—see “Narcissus.”

*Crown rot*—PCNB, thiophanate-methyl.

*Botrytis blight*—chlorothalonil, chlorothalonil + thiophanate-methyl, copper (pentahydrate), Exotherm Termil, fenhexamid, iprodione, iprodione + thiophanate-methyl, mancozeb, Pageant, Palladium (Bulbous Iris), polyoxin-D.

*Ink spot (Drechslera)*—chlorothalonil, chlorothalonil + thiophanate-methyl, Exotherm Termil, iprodione, iprodione + thiophanate-methyl, mancozeb.

*Leaf spot*—chlorothalonil, chlorothalonil + thiophanate-methyl, Exotherm Termil, iprodione, iprodione + thiophanate-methyl, kresoxim-methyl, mancozeb, myclobutanil, Pageant, Palladium (Bulbous Iris), pyraclostrobin, tebuconazole, thiophanate-methyl, triadimefon, trifloxystrobin (Dwarf Iris, Japanese Iris, Siberian

Iris). Begin when plants are 8 inches tall or with the appearance of spots.

**Rust** (*Puccinia*)—Armada, chlorothalonil + thiophanate-methyl, Concert, flutolanil, mancozeb, myclobutanil, Pageant, propiconazole, pyraclostrobin, tebuconazole, thiophanate-methyl.

**IVY** (*Hedera* spp.)-----  
Family Araliaceae

(Metalaxyl should not be applied to English Ivy more than once every six months or injury may occur. Due to possible phytotoxicity, avoid use of copper just before selling season. Caution: check for phytotoxicity before large-scale use of copper pesticides.)

**Bacterial blight/spot**—copper (ammonium complex, Badge [Algerian Ivy, English Ivy], basic sulfate [Algerian Ivy, English Ivy], cuprous oxide [Algerian Ivy, English Ivy], hydroxide, octanoate [English Ivy], pentahydrate, salts [Algerian Ivy, English Ivy]), fosetyl-Al (English Ivy), phosphorous acid (English Ivy), streptomycin sulfate.

**Botrytis blight**—azoxystrobin (Algerian Ivy, English Ivy), copper (octanoate [English Ivy], oxychloride, pentahydrate), Exotherm Termil (foliage only), fludioxonil, imazalil, iprodione (including English Ivy), iprodione + thiophanate-methyl (Common Ivy, English Ivy), mancozeb (English Ivy), Palladium (English Ivy), polyoxin-D, trifloxystrobin, triflumizole.

**Leaf spot**—azoxystrobin (Algerian Ivy, English Ivy), copper (octanoate [English Ivy], oxychloride), Exotherm Termil (foliage only), fludioxonil, imazalil, iprodione (including English Ivy), iprodione + thiophanate-methyl (Common Ivy, English Ivy), mancozeb (English Ivy), Palladium (English Ivy), propiconazole (English Ivy), pyraclostrobin (California Ivy, English Ivy), sulfur (English Ivy), thiophanate-methyl, trifloxystrobin, triflumizole.

**Soilborne diseases (non-water molds)**—azoxystrobin (Algerian Ivy, English Ivy), Banrot, flutolanil (English Ivy), iprodione (including English Ivy), iprodione + thiophanate-methyl (Common Ivy, English Ivy), PCNB (English Ivy), phosphorous acid (Algerian Ivy, English Ivy), polyoxin-D, pyraclostrobin (California Ivy, English Ivy), thiophanate-methyl, trifloxystrobin (including Dwarf Ivy), triflumizole.

**Soilborne diseases (oomycetes)**—Banrot, cyazofamid, etridiazole, fenamidone (English Ivy), fluopicolide, mandipropamid (including Algerian Ivy, English Ivy), mefenoxam (Algerian Ivy, English Ivy) (use caution), phosphorous acid (Algerian Ivy, English Ivy), trifloxystrobin.

**JUNIPER** (*Juniperus* spp.)-----  
Family Cupressaceae

**Rust**—early July: Armada, azoxystrobin (including Eastern Red Cedar, Procumbens Juniper, Rocky Mountain Juniper), copper (salts), fludioxonil, flutolanil, imazalil, Junction, mancozeb, myclobutanil, Pageant, pyraclostrobin

(Chinese Juniper, Creeping Juniper), tebuconazole, thiophanate-methyl, triadimefon, triflumizole. Do not plant juniperous species near rosaceous hosts (e.g., Crabapple, Hawthorn, Quince).

**Soilborne diseases (non-water molds)**—azoxystrobin (including Eastern Red Cedar, Procumbens Juniper, Rocky Mountain Juniper), Banrot, flutolanil, iprodione, iprodione + thiophanate-methyl, Pageant, PCNB, phosphorous acid, polyoxin-D, pyraclostrobin (Chinese Juniper, Creeping Juniper), thiophanate-methyl, trifloxystrobin (Torulosa Juniper), triflumizole.

**Soilborne diseases (oomycetes)**—Banrot, cyazofamid, etridiazole, fosetyl-Al, mandipropamid, mefenoxam, phosphorous acid, propamocarb hydrochloride.

**Tip blight (Phomopsis)**—azoxystrobin (including Eastern Red Cedar, Procumbens Juniper, Rocky Mountain Juniper), chlorothalonil + thiophanate-methyl, copper (Badge, basic sulfate, cuprous oxide, hydroxide, pentahydrate, salts), iprodione + thiophanate-methyl, Junction, mancozeb, propiconazole, thiophanate-methyl. For tip blight caused by *Kabatina*, apply chlorothalonil + thiophanate-methyl, mancozeb, thiophanate-methyl. Add a spreader-sticker for best results.

**KALANCHOE**-----  
Family Crassulaceae

**Botrytis blight**—copper (pentahydrate), fludioxonil, imazalil, iprodione, iprodione + thiophanate-methyl, mancozeb, polyoxin-D.

**Leaf spot**—fludioxonil, iprodione, iprodione + thiophanate-methyl, mancozeb, tebuconazole, thiophanate-methyl.

**Powdery mildew**—Armada, copper (pentahydrate), fludioxonil, imazalil, iprodione + thiophanate-methyl, piperalin, polyoxin-D, Sanction, tebuconazole, thiophanate-methyl, triadimefon.

**Soilborne diseases (non-water molds)**—Banrot, iprodione, iprodione + thiophanate-methyl, polyoxin-D, thiophanate-methyl.

**Soilborne diseases (oomycetes)**—Banrot, cyazofamid, etridiazole.

**LANTANA**-----  
Family Verbenaceae

**Bacterial leaf spot**—copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, pentahydrate, salts).

**Botrytis blight**—copper (pentahydrate), Exotherm Termil, fludioxonil, fluoxastrobin, imazalil, Pageant, Palladium, polyoxin-D, triflumizole.

**Leaf spot**—Exotherm Termil, fludioxonil, fluoxastrobin, Pageant, Palladium, pyraclostrobin (Trailing), tebuconazole, thiophanate-methyl.

**Powdery mildew**—copper (pentahydrate), fludioxonil (Mozart TR), fluoxastrobin, imazalil, Pageant, polyoxin-D, pyraclostrobin (Trailing), Sanction, tebuconazole, thiophanate-methyl, triflumizole.

*Rust*—fludioxonil, fluoxastrobin, imazalil, Pageant, tebuconazole, trifloxystrobin.

*Soilborne diseases (non-water molds)*—fluoxastrobin, Pageant, polyoxin-D, pyraclostrobin (Trailing), thiophanate-methyl, trifloxystrobin, triflumizole.

**LAUREL** (*Laurus* spp.) -----  
Family Lauraceae

*Anthracnose (Colletotrichum)*—azoxystrobin, polyoxin-D, tebuconazole, thiophanate-methyl.

*Powdery mildew*—azoxystrobin, polyoxin-D, Sanction, tebuconazole, thiophanate-methyl, triflumizole.

**LAVENDER** -----  
Family Lamiaceae

*Botrytis blight*—copper (pentahydrate), Pageant, polyoxin-D.

*Soilborne diseases (oomycetes)*—cyazofamid, etridiazole, flupicolide (English).

**LEUCOTHOE** -----  
Family Ericaceae

*Leaf spot*—Armada, myclobutanil, tebuconazole, thiophanate-methyl, triadimefon.

*Soilborne diseases (non-water molds)*—Banrot, polyoxin-D, thiophanate-methyl, triflumizole.

**LEYLAND CYPRESS** -----  
Family Cupressaceae

*Needle blight (Cercospora)*—Armada, copper (Badge, basic sulfate, hydroxide, pentahydrate, salts), mancozeb, myclobutanil.

*Soilborne diseases (oomycetes)*—cyazofamid, mandipropamid, propamocarb hydrochloride.

**LILAC** -----  
Family Oleaceae

*Bacterial blight*—copper (Badge, hydroxide, pentahydrate), Junction, polyoxin-D, streptomycin sulfate.

*Leaf spot*—Armada, chlorothalonil + thiophanate-methyl, copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, oxychloride, pentahydrate, salts), mancozeb, Pageant, pyraclostrobin, sulfur, tebuconazole, thiophanate-methyl.

*Powdery mildew*—Armada, calcium polysulfide, chlorothalonil, chlorothalonil + thiophanate-methyl, Concert, copper (pentahydrate), kresoxim-methyl, myclobutanil, Pageant, piperalin, polyoxin-D, propiconazole, pyraclostrobin, Sanction, sulfur, tebuconazole, thiophanate-methyl, triadimefon, trifloxystrobin, triflumizole.

**LILY** (*Lilium* spp.) -----  
Family Liliaceae

(Avoid use of chlorothalonil during bloom where flower injury is unacceptable. Use caution when applying products that contain mefenoxam to Easter Lily. Check for phytotoxicity before large-scale use of copper fungicides.)

*Bulb rot*—see “Narcissus.”

*Botrytis blight*—chlorothalonil, chlorothalonil + thiophanate-methyl, copper (ammonium complex [Easter Lily], Badge [Easter Lily], basic sulfate [Easter Lily], cuprous oxide [Easter Lily], hydroxide [Easter Lily], oxychloride, pentahydrate (as spray or Bordeaux) [Easter Lily], salts [Easter Lily], Exotherm Termil (including Easter Lily), fenhexamid (Asiatic Lily, Oriental Lily), fludioxonil, imazalil, iprodione, iprodione + thiophanate-methyl, Junction (Easter Lily), mancozeb, Pageant, Palladium (Asiatic Lily), polyoxin-D, pyraclostrobin. Start when disease first appears on lower leaves. Disease is seldom observed in well-regulated greenhouses, but it is a very common problem on field-grown plants. For flower spot control in the greenhouse, use Exotherm Termil.

*Rust (Uromyces)*—chlorothalonil + thiophanate-methyl, fludioxonil, flutolanil, imazalil, mancozeb, Pageant, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—Banrot (Easter Lily), chlorothalonil + thiophanate-methyl, flutolanil, iprodione, iprodione + thiophanate-methyl, Pageant, PCNB, phosphorous acid (Easter Lily), polyoxin-D, pyraclostrobin, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—Banrot (Easter Lily), cyazofamid, etridiazole (Easter Lily), fenamidone (Easter Lily), mefenoxam (Easter Lily) (use caution), phosphorous acid (Easter Lily), propamocarb hydrochloride (Easter Lily).

*Streak, fleck, and other viruses*—control aphids and discard infected plants.

**LIMONIUM** (Statice) -----  
Family Plumbaginaceae

*Botrytis blight*—chlorothalonil, chlorothalonil + thiophanate-methyl, Exotherm Termil, iprodione, iprodione + thiophanate-methyl, mancozeb, Pageant, polyoxin-D.

*Leaf spot*—chlorothalonil, chlorothalonil + thiophanate-methyl, Exotherm Termil, iprodione, iprodione + thiophanate-methyl, kresoxim-methyl, mancozeb, Pageant, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—Banrot, chlorothalonil + thiophanate-methyl, iprodione, iprodione + thiophanate-methyl, Pageant, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, dimethomorph (*Phytophthora* only), etridiazole.

**LINDEN (Basswood)**-----  
Family Malvaceae

*Leaf spot*—copper (Badge, hydroxide, salts), Junction, mancozeb, sulfur, tebuconazole, thiophanate-methyl.

**LIRIOPE (Lilyturf)**-----  
Family Asparagaceae

*Anthracnose (Colletotrichum)*—azoxystrobin (Lilyturf), mancozeb, Pageant, polyoxin-D, pyraclostrobin, tebuconazole, thiophanate-methyl.

*Leaf spot*—azoxystrobin (Lilyturf), mancozeb, Pageant, propiconazole, pyraclostrobin, tebuconazole, thiophanate-methyl.

**LISIANTHUS**-----  
Family Gentianaceae

*Botrytis blight*—copper (pentahydrate), fenhexamid, fludioxonil, Pageant, Palladium, polyoxin-D.

*Leaf spot*—fludioxonil, Pageant, Palladium, pyraclostrobin, tebuconazole, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—copper (salts), cyazofamid, dimethomorph (*Phytophthora* only).

*Stem rot (Fusarium, Rhizoctonia)*—fludioxonil, Pageant, pyraclostrobin, thiophanate-methyl.

**LOBELIA**-----  
Family Campanulaceae

*Botrytis blight*—copper (pentahydrate), Exotherm Termil (foliage only), fluoxastrobin, mancozeb, polyoxin-D.

*Leaf spot*—Exotherm Termil (foliage only), fluoxastrobin, mancozeb, pyraclostrobin, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—Banrot, fluoxastrobin, polyoxin-D, pyraclostrobin, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, fluoxastrobin (*Phytophthora* only), propamocarb hydrochloride.

**LUPINE**-----  
Family Fabaceae

*Botrytis blight*—copper (pentahydrate), fluoxastrobin, polyoxin-D, trifloxystrobin.

*Soilborne diseases (non-water molds)*—fluoxastrobin, PCNB, polyoxin-D, pyraclostrobin, thiophanate-methyl, trifloxystrobin.

**LYCOPODIUM**-----  
Family Lycopodiaceae

*Leaf spot*—tebuconazole, thiophanate-methyl.

**MAGNOLIA**-----  
Family Magnoliaceae

*Leaf spot*—azoxystrobin (Saucer Magnolia, Southern Magnolia), chlorothalonil, chlorothalonil + thiophanate-methyl, copper (ammonium complex, basic sulfate, cuprous oxide [Southern Magnolia, Sweet Bay Magnolia], hydroxide, pentahydrate, salts), Junction, mancozeb, PCNB (Southern Magnolia), propiconazole, pyraclostrobin (Saucer Magnolia, Star Magnolia), tebuconazole, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—cyazofamid, etridiazole, mandipropamid, phosphorous acid, propamocarb hydrochloride.

**MAPLE (including Boxelder)**-----  
Family Sapindaceae

(Do not apply dimethoate to Maple.)

*Anthracnose*—Armada, azoxystrobin (Japanese Maple, Sugar Maple), chlorothalonil, chlorothalonil + thiophanate-methyl, copper (oxychloride, salts), Junction (including Boxelder), mancozeb, propiconazole, tebuconazole (including tree injection), triadimefon (tree injection).

*Leaf spot*—Armada, azoxystrobin (Japanese Maple, Sugar Maple), chlorothalonil, chlorothalonil + thiophanate-methyl, copper (oxychloride, salts), Junction (including Boxelder), mancozeb, Pageant (Amur Maple), propiconazole, pyraclostrobin (Amur Maple, Boxelder, Japanese Maple, Norway Maple, Silver Maple, Sugar Maple), tebuconazole, thiophanate-methyl.

*Powdery mildew*—Armada, azoxystrobin (Japanese Maple, Sugar Maple), chlorothalonil + thiophanate-methyl, copper (pentahydrate), kresoxim-methyl (Hedge Maple, Norway Maple, Southern Maple, Sycamore Maple), myclobutanil (treated trees may not be used for syrup production), Pageant (Amur Maple), polyoxin-D, propiconazole, pyraclostrobin (Amur Maple, Boxelder, Japanese Maple, Norway Maple, Silver Maple, Sugar Maple), Sanction, tebuconazole, thiophanate-methyl, triadimefon, triflumizole.

*Soilborne diseases (non-water molds)*—azoxystrobin (Japanese Maple, Sugar Maple), Banrot, chlorothalonil + thiophanate-methyl, Pageant (Amur Maple), PCNB, phosphorous acid, polyoxin-D, pyraclostrobin (Amur Maple, Boxelder, Japanese Maple, Norway Maple, Silver Maple, Sugar Maple), thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole, phosphorous acid, propamocarb hydrochloride.

*Tar spot*—copper (Badge, C-O-C-S WDG, hydroxide), Junction (including Boxelder), mancozeb.

**MARIGOLD** -----  
Family Asteraceae

(Junction and other products that contain mancozeb may be phytotoxic to French dwarf double or signet-type marigolds – see label.)

*Botrytis blight*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, oxychloride, pentahydrate, salts), Exotherm Termil, fludioxonil, imazalil, iprodione, iprodione + thiophanate-methyl, Junction, mancozeb, Pageant, Palladium (including African), polyoxin-D, trifloxystrobin.

*Leaf spot (Alternaria, Septoria, Cercospora)*—Armada, azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, Concert, copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, oxychloride, salts), Exotherm Termil, fludioxonil, imazalil, iprodione, iprodione + thiophanate-methyl, Junction, kresoxim-methyl, mancozeb, myclobutanil, Pageant, Palladium (including African Marigold), polyoxin-D, propiconazole, pyraclostrobin, tebuconazole, thiophanate-methyl, triadimefon, trifloxystrobin.

*Powdery mildew*—Armada, azoxystrobin, calcium polysulfide, copper (oxychloride, pentahydrate), fludioxonil, imazalil, iprodione + thiophanate-methyl, Pageant, phosphorous acid, polyoxin-D, pyraclostrobin, Sanction, sulfur, tebuconazole, thiophanate-methyl, trifloxystrobin.

*Rust (Puccinia)*—Armada, calcium polysulfide, chlorothalonil + thiophanate-methyl, fludioxonil, imazalil, mancozeb, myclobutanil, Pageant, pyraclostrobin, sulfur, tebuconazole, triadimefon, ziram.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, chlorothalonil + thiophanate-methyl, fludioxonil, Hurricane, iprodione, iprodione + thiophanate-methyl, Pageant, PCNB, phosphorous acid, polyoxin-D, pyraclostrobin, thiophanate-methyl, trifloxystrobin.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole, fluopicolide, fosetyl-Al, Hurricane, mefenoxam, mandipropamid, phosphorous acid, propamocarb hydrochloride.

**MIMOSA** (Silk tree)-----  
Family Fabaceae

*Mimosa wilt (Fusarium wilt)*—Abasol (tree injection), Fungisol (tree injection), Imisol (tree injection).

**MONARDA** (Bee-balm, Bergamot) -----  
Family Lamiaceae

*Botrytis blight*—copper (pentahydrate), fludioxonil, fluoxastrobin, imazalil, iprodione, iprodione + thiophanate-methyl, Pageant, polyoxin-D, trifloxystrobin.

*Powdery mildew*—Concert, copper (pentahydrate), fludioxonil, fluoxastrobin, imazalil, iprodione + thiophanate-methyl, kresoxim-methyl, Pageant, piperalin, polyoxin-D,

propiconazole, pyraclostrobin, Sanction, tebuconazole, thiophanate-methyl, trifloxystrobin.

**MOUNTAIN ASH**-----  
Family Rosaceae

*Fireblight*—copper (Badge, hydroxide, pentahydrate, salts), Junction, oxytetracycline.

*Leaf spot*—Junction, mancozeb, tebuconazole, thiophanate-methyl.

*Rust (Puccinia)*—Junction, mancozeb, tebuconazole, thiophanate-methyl, triflumizole.

*Scab*—copper (pentahydrate), Junction, mancozeb, phosphorous acid (tree injection), tebuconazole, thiophanate-methyl, triflumizole.

**MOUNTAIN LAUREL** (*Kalmia* spp.) -----  
Family Ericaceae

*Flower blight (Ovulinia)*—chlorothalonil + thiophanate-methyl, mancozeb, myclobutanil (when flowers start to show color), thiophanate-methyl, triadimefon.

*Leaf spot*—Armada, chlorothalonil, chlorothalonil + thiophanate-methyl, mancozeb, myclobutanil, pyraclostrobin, tebuconazole, thiophanate-methyl, triadimefon. Add a spreader-sticker for best results.

*Soilborne diseases (oomycetes)*—cyazofamid, propamocarb hydrochloride.

**MULBERRY** (Ornamental) (non bearing) -----  
Family Moraceae

*Bacterial leaf spot*—copper (ammonium complex [Weeping Mulberry], Badge [Contorted Mulberry, Weeping Mulberry], basic sulfate [Weeping Mulberry], cuprous oxide [Weeping Mulberry], hydroxide, salts), Junction.

*Leaf spot*—Junction, tebuconazole, thiophanate-methyl.

**NARCISSUS** (Daffodil)-----  
Family Amaryllidaceae

(Avoid use of chlorothalonil during bloom where flower injury is unacceptable.)

*Bulb rot*—within 24 to 48 hours after digging, clean bulbs and soak in PCNB, pyraclostrobin (Wild Daffodil), thiabendazole, thiophanate-methyl, thiram as per label recommendations. Maintain suspension temperature between 55 to 75°F. Discard solution when it becomes dirty or after 24 hours have elapsed. Dry in a shaded, well-ventilated area, and store. PCNB may also be applied to beds prior to planting.

*Botrytis blight*—chlorothalonil, chlorothalonil + thiophanate-methyl, copper (hydroxide, pentahydrate, salts), Exotherm Termil, fenhexamid, iprodione, iprodione +

thiophanate-methyl, mancozeb, Pageant, Palladium, polyoxin-D, pyraclostrobin (Wild Daffodil).

*Leaf scorch (Stagonospora)*—chlorothalonil, chlorothalonil + thiophanate-methyl, Exotherm Termil, iprodione, iprodione + thiophanate-methyl, Palladium.

*Soilborne diseases (non-water molds)*—chlorothalonil + thiophanate-methyl, iprodione, iprodione + thiophanate-methyl, Pageant, PCNB, polyoxin-D, pyraclostrobin (Wild Daffodil), thiophanate-methyl.

**NASTURTIUM** (*Tropaeolum* spp.) -----  
Family Tropaeolaceae

*Botrytis blight*—copper (C-O-C-S WDG, oxychloride), Exotherm Termil, mancozeb, polyoxin-D.

*Leaf spot*—copper (C-O-C-S WDG, oxychloride), Exotherm Termil, mancozeb, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—Banrot, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid.

**NAUTILICALYX** -----  
Family Gesneriaceae

*Soilborne diseases (non-water molds)*—Banrot, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid.

**NEPHTHYTIS** -----  
Family Araceae

*Leaf spot*—Armada, fludioxonil, mancozeb, myclobutanil, Palladium, thiophanate-methyl, triadimefon.

*Soilborne diseases (non-water molds)*—polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—cyazofamid, etridiazole.

**OAK** -----  
Family Fagaceae

*Anthraxnose*—Abasol (tree injection), Armada, azoxystrobin (Pin Oak, Red Oak), chlorothalonil (Red Oak group only), chlorothalonil + thiophanate-methyl, Concert, copper (Badge, C-O-C-S WDG, oxychloride, pentahydrate [tree injection], salts), Fungisol (tree injection), Imisol (tree injection), Junction (Laurel Oak), mancozeb, pyraclostrobin (Bur Oak, Red Oak), tebuconazole (including tree injection), triadimefon (tree injection).

*Bacterial leaf scorch (Xylella fastidiosa)*—yearly in spring: oxytetracycline (bacteriostatic only).

*Leaf blister*—chlorothalonil (Red Oak group only), chlorothalonil + thiophanate-methyl, Junction (Laurel Oak), mancozeb.

*Leaf spot*—Armada, azoxystrobin (Pin Oak, Red Oak), chlorothalonil (Red Oak group only), chlorothalonil + thiophanate-methyl, Concert, copper (Badge, hydrox-

ide, oxychloride, salts), fludioxonil, Junction (Laurel Oak), mancozeb, Pageant (Chinquapin Oak), propiconazole, pyraclostrobin (Bur Oak, Red Oak), tebuconazole, thiophanate-methyl.

*Powdery mildew*—Armada, azoxystrobin (Pin Oak, Red Oak), chlorothalonil + thiophanate-methyl, fludioxonil, imazalil, kresoxim-methyl (English Oak, Swamp Chestnut Oak, Water Oak), myclobutanil, Pageant (Chinquapin Oak), polyoxin-D, pyraclostrobin (Bur Oak, Red Oak), Sanction, tebuconazole, thiophanate-methyl, triadimefon, triflumizole.

**ORCHID** -----  
Family Orchidaceae

(Check labels for individual plant recommendations.)

*Botrytis blight*—copper (pentahydrate), fludioxonil, imazalil, mancozeb, polyoxin-D.

*Soilborne diseases (non-water molds)*—phosphorous acid, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—cyazofamid, etridiazole, fosetyl-Al, phosphorous acid.

**OREGON GRAPE HOLLY** (*Mahonia aquifolium*) -----  
Family Berberidaceae

*Leaf spot*—chlorothalonil + thiophanate-methyl, copper (Badge, hydroxide, salts), Exotherm Termil, mancozeb, tebuconazole, thiophanate-methyl.

*Rust*—chlorothalonil, chlorothalonil + thiophanate-methyl, mancozeb, tebuconazole.

**OSMANTHUS** -----  
Family Oleaceae

*Leaf spot*—mancozeb, pyraclostrobin, tebuconazole, thiophanate-methyl.

**PACHYSANDRA** -----  
Family Buxaceae

*Volutella shoot blight and canker*—chlorothalonil, chlorothalonil + thiophanate-methyl, copper (ammonium complex, Badge, basic sulfate, C-O-C-S WDG, cuprous oxide, hydroxide, pentahydrate, salts), Junction, mancozeb.

**PALMS AND CYCADS** -----  
Palms: Family Arecaceae (or Palmae)  
Cycads: Family Cycadaceae

(Check labels for individual plant recommendations.)

*Bacterial leaf spot*—copper (ammonium complex, Badge, hydroxide, octanoate, pentahydrate, salts).

*Botrytis blight*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (oxychloride, pentahydrate), Exotherm Termil (foliage only), iprodione, iprodione + thiophanate-methyl, mancozeb, polyoxin-D.

*Leaf spot*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, octanoate, oxychloride, salts), Exotherm Termil (foliage only), iprodione, iprodione + thiophanate-methyl, mancozeb, pyraclostrobin (Sago Palm), thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot (Parlor Palm), chlorothalonil + thiophanate-methyl, iprodione, iprodione + thiophanate-methyl, PCNB, phosphorous acid, polyoxin-D, pyraclostrobin (Sago Palm), thiophanate-methyl, trifloxystrobin (Coontie).

*Soilborne diseases (oomycetes)*—Banrot (Parlor Palm), cyazofamid, etridiazole, mandipropamid, phosphorous acid.

**PEACH** (including Nectarine) (Flowering) (non bearing) ----  
Family Rosaceae

*Blossom blight/brown rot (Monilinia)*—chlorothalonil, chlorothalonil + thiophanate-methyl, Concert, copper (Badge [dormant through bloom only], hydroxide, salts), Junction, mancozeb, Pageant, propiconazole, pyraclostrobin.

*Fireblight*—copper (Badge [dormant through bloom only], hydroxide, salts).

*Leaf blister (curl)*—chlorothalonil + thiophanate-methyl, Junction, mancozeb.

*Leaf spot*—chlorothalonil, chlorothalonil + thiophanate-methyl, copper (pentahydrate), iprodione, iprodione + thiophanate-methyl, Junction, mancozeb, Pageant, pyraclostrobin, tebuconazole, thiophanate-methyl, trifloxystrobin (Nectarine).

*Powdery mildew*—chlorothalonil + thiophanate-methyl, iprodione + thiophanate-methyl, kresoxim-methyl, Pageant, polyoxin-D, pyraclostrobin, Sanction, tebuconazole, thiophanate-methyl, trifloxystrobin (Nectarine), triflumizole.

*Soilborne diseases (non-water molds)*—chlorothalonil + thiophanate-methyl, iprodione, iprodione + thiophanate-methyl, Pageant, polyoxin-D, pyraclostrobin, thiophanate-methyl, trifloxystrobin (Peach), triflumizole.

*Soilborne diseases (oomycetes)*—cyazofamid, mfenoxam (nursery only).

**PEAR** (Flowering) (non bearing) -----  
Family Rosaceae

*Fireblight*—copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, pentahydrate, salts), fosetyl-Al (pre-bloom and repeat every 7 days until bloom), Junction (5-day intervals during bloom), oxytetracycline, streptomycin sulfate.

*Leaf spot*—Armada, azoxystrobin (Bradford Pear), copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, salts), mancozeb, Pageant (Asian Pear,

Common Pear), propiconazole (Bartlett Pear), pyraclostrobin, tebuconazole, thiophanate-methyl.

*Powdery mildew*—Armada, azoxystrobin (Bradford Pear), copper (pentahydrate), kresoxim-methyl, myclobutanil, Pageant (Asian Pear, Common Pear), polyoxin-D, propiconazole (Bartlett Pear), pyraclostrobin, Sanction, tebuconazole, thiophanate-methyl, triadimefon, triflumizole.

*Scab*—Armada, copper (pentahydrate), azoxystrobin (Bradford Pear), kresoxim-methyl, mancozeb, myclobutanil, Pageant (Asian Pear, Common Pear), phosphorous acid (tree injection), propiconazole (Bartlett Pear), pyraclostrobin, thiophanate-methyl, triflumizole.

**PELARGONIUM** (See “Geranium”) -----

**PENTAS** -----  
Family Rubiaceae

*Bacterial leaf spot*—copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, pentahydrate, salts).

**PEONY** -----  
Family Paeoniaceae

*Botrytis blight*—when flower buds are pea size: copper (ammonium complex, Badge, basic sulfate, C-O-C-S WDG, cuprous oxide, hydroxide, oxychloride, pentahydrate, salts), Junction, mancozeb, polyoxin-D, triflumizole.

*Leaf spot*—copper (C-O-C-S WDG, oxychloride), Junction, mancozeb, propiconazole, tebuconazole, thiophanate-methyl.

*Phytophthora (aerial)*—cyazofamid, mancozeb.

*Powdery mildew*—copper (oxychloride, pentahydrate), polyoxin-D, propiconazole, Sanction, tebuconazole, thiophanate-methyl, triflumizole.

**PEPEROMIA** -----  
Family Piperaceae

*Botrytis blight*—azoxystrobin (Baby Rubber-plant), chlorothalonil, chlorothalonil + thiophanate-methyl, Exotherm Termil, iprodione, iprodione + thiophanate-methyl, mancozeb, polyoxin-D.

*Leaf spot*—azoxystrobin (Baby Rubber-plant), chlorothalonil, chlorothalonil + thiophanate-methyl, copper (octanoate), Exotherm Termil, iprodione, iprodione + thiophanate-methyl, mancozeb, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin (Baby Rubber-plant), Banrot, chlorothalonil + thiophanate-methyl, iprodione, iprodione + thiophanate-methyl, PCNB, phosphorous acid, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole, mfenoxam, phosphorous acid.



## PETUNIA-----

Family Solanaceae

(Avoid use of chlorothalonil during bloom where flower injury is unacceptable.)

*Botrytis blight*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (pentahydrate), Exotherm Termil, fenhexamid, fludioxonil, fluoxastrobin, iprodione + thiophanate-methyl, mancozeb, Pageant, polyoxin-D, trifloxystrobin.

*Leaf spot*—Armada, azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, Exotherm Termil, fludioxonil, fluoxastrobin, imazalil, iprodione + thiophanate-methyl, kresoxim-methyl, mancozeb, Pageant, pyraclostrobin, sulfur, tebuconazole, thiophanate-methyl.

*Powdery mildew*—Armada, azoxystrobin, chlorothalonil + thiophanate-methyl, copper (pentahydrate), fludioxonil, fluoxastrobin, imazalil, iprodione + thiophanate-methyl, myclobutanil, Pageant, phosphorous acid, polyoxin-D, pyraclostrobin, sulfur, tebuconazole, thiophanate-methyl, triadimefon.

*Rust*—Armada, azoxystrobin, chlorothalonil + thiophanate-methyl, fludioxonil, fluoxastrobin, flutolanil, imazalil, mancozeb, myclobutanil, Pageant, tebuconazole, triadimefon.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, chlorothalonil + thiophanate-methyl, fludioxonil, fluoxastrobin, flutolanil, Hurricane, iprodione + thiophanate-methyl, Pageant, PCNB, phosphorous acid, polyoxin-D, pyraclostrobin, thiophanate-methyl, trifloxystrobin.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, dimethomorph (*Phytophthora* only), etridiazole, fluoxastrobin (*Phytophthora* only), fosetyl-Al, Hurricane, mandipropamid, mfenoxam, phosphorous acid, propamocarb hydrochloride.

## PHILODENDRON-----

Family Araceae

(To avoid injury, do not use PCNB on Philodendron.)

*Bacterial leaf spot/blight*—copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, salts), fosetyl-Al, streptomycin sulfate.

*Botrytis blight*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (octanoate), Exotherm Termil, fludioxonil, imazalil, iprodione, iprodione + thiophanate-methyl, mancozeb, Palladium, phosphorous acid, polyoxin-D.

*Leaf spot*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, Exotherm Termil, fludioxonil, iprodione, iprodione + thiophanate-methyl, mancozeb, Palladium, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, chlorothalonil + thiophanate-methyl, iprodione, iprodione + thiophanate-methyl, phosphorous acid, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole, fosetyl-Al, mfenoxam, phosphorous acid.

## PHLOX-----

Family Polemoniaceae

(Avoid use of chlorothalonil during bloom where flower injury is unacceptable.)

*Botrytis blight*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (oxychloride, pentahydrate), Exotherm Termil, iprodione, iprodione + thiophanate-methyl, mancozeb, Pageant, polyoxin-D, trifloxystrobin.

*Leaf spot*—Armada, azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, oxychloride, salts), Exotherm Termil, iprodione, iprodione + thiophanate-methyl, mancozeb, myclobutanil, Pageant, pyraclostrobin, sulfur, tebuconazole, thiophanate-methyl, triadimefon.

*Powdery mildew*—Armada, azoxystrobin, chlorothalonil + thiophanate-methyl, Concert, copper (oxychloride, pentahydrate), fenarimol, iprodione + thiophanate-methyl, kresoxim-methyl, myclobutanil, Pageant, phosphorous acid, piperalin, polyoxin-D, propiconazole, pyraclostrobin, Sanction, sulfur, tebuconazole, thiophanate-methyl, triadimefon, trifloxystrobin, ziram.

*Rust (Puccinia)*—Armada, azoxystrobin, chlorothalonil + thiophanate-methyl, mancozeb, myclobutanil, Pageant, pyraclostrobin, tebuconazole, thiophanate-methyl, triadimefon.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, chlorothalonil + thiophanate-methyl, iprodione, iprodione + thiophanate-methyl, Pageant, phosphorous acid, polyoxin-D, pyraclostrobin, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, dimethomorph (*Phytophthora* only), etridiazole, mandipropamid, mfenoxam, phosphorous acid.

## PHOTINIA-----

Family Rosaceae

*Leaf spot (Entomosporium)*—Armada, azoxystrobin (Red-tip), chlorothalonil, chlorothalonil + thiophanate-methyl, Concert (Red-tip), copper (ammonium complex, Badge [Red-tip], basic sulfate, cuprous oxide, hydroxide [Red-tip], pentahydrate, salts [Red-tip]), Junction, mancozeb (Red-tip), myclobutanil, propiconazole, pyraclostrobin, tebuconazole, thiophanate-methyl, triadimefon, trifloxystrobin.

*Powdery mildew*—Armada, azoxystrobin (Red-tip), chlorothalonil + thiophanate-methyl, fenarimol, Junction, myclobutanil, Pageant, phosphorous acid, polyoxin-D, pyraclostrobin, Sanction, tebuconazole, thiophanate-methyl, triadimefon, trifloxystrobin, triflumizole.

*Rust (Gymnosporangium)*—Armada, azoxystrobin (Red-tip), chlorothalonil + thiophanate-methyl, mancozeb (Red-

tip), myclobutanil, Pageant, pyraclostrobin, tebuconazole, thiophanate-methyl, triadimefon, triflumizole.

*Soilborne diseases (non-water molds)*—azoxystrobin (Red-tip), Banrot, chlorothalonil + thiophanate-methyl, Pageant, phosphorous acid, polyoxin-D, pyraclostrobin, thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, mefenoxam, phosphorous acid, propamocarb hydrochloride.

**PINE** -----  
Family Pinaceae

*Brown spot (Scirrhia)*—chlorothalonil (new growth is 1/2 inch and repeat at 3- to 4-wk intervals), chlorothalonil + thiophanate-methyl, copper (cuprous oxide), Junction, mancozeb, thiophanate-methyl (seedling treatment of Longleaf Pine).

*Needle blight (Dothistroma)*—copper (cuprous oxide, octanoate, oxychloride, pentahydrate, salts), Junction, PCNB (including Southern Pine seedlings).

*Needle cast*—Armada, azoxystrobin, chlorothalonil (early spring and repeat at 6- to 8-wk intervals until spore release ceases in fall; apply monthly during periods of frequent rainfall; applications may be suspended during drought and resumed upon next occurrence of needle wetness), chlorothalonil + thiophanate-methyl, copper (Badge, basic sulfate, hydroxide), Junction, mancozeb, triadimefon.

*Rust*—Armada, azoxystrobin, fludioxonil, imazalil, mancozeb, myclobutanil (including Austrian Pine, Loblolly Pine, Slash Pine) (nursery use only), triadimefon, ziram (seedlings).

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, iprodione, iprodione + thiophanate-methyl, PCNB (including Southern Pine seedlings), phosphorous acid, polyoxin-D, pyraclostrobin (Eastern White Pine, Japanese Black Pine, Mugo Pine, Stone Pine), thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole (Red Pine, Southern Pine, Western Pine), fosetyl-Al (foliar application or dip treatment at transplant) (*Phytophthora* only), mandipropamid (including Eastern White Pine, Mugo Pine), mefenoxam (including nursery and Christmas tree plantations), phosphorous acid (including Monterey Pine, White Pine), propamocarb hydrochloride.

*Tip blight (Sphaeropsis [Diplodia])*—azoxystrobin, chlorothalonil + thiophanate-methyl, Concert, copper (cuprous oxide, pentahydrate, salts), iprodione + thiophanate-methyl, Junction, mancozeb, propiconazole, thiophanate-methyl.

**PITTIOSPORUM** -----  
Family Pittosporaceae

(Do not apply chlorothalonil + thiophanate-methyl to green variegated Pittosporum more than once.)

*Leaf spot*—Armada, azoxystrobin (Japanese Mock-orange), iprodione, iprodione + thiophanate-methyl, mancozeb, Pageant, pyraclostrobin (Japanese Mock-orange), tebuconazole, thiophanate-methyl, trifloxystrobin.

*Powdery mildew*—Armada, azoxystrobin (Japanese Mock-orange), copper (pentahydrate), iprodione + thiophanate-methyl, Pageant, phosphorous acid, polyoxin-D, pyraclostrobin (Japanese Mock-orange), Sanction, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin (Japanese Mock-orange), Banrot, copper (pentahydrate), fludioxonil, flutolanil, iprodione, iprodione + thiophanate-methyl, Pageant, phosphorous acid, polyoxin-D, pyraclostrobin (Japanese Mock-orange), thiophanate-methyl, trifloxystrobin.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, fosetyl-Al, mefenoxam, phosphorous acid, propamocarb hydrochloride.

**PLUM (Flowering) (non bearing)**-----  
Family Rosaceae

*Black knot*—chlorothalonil (orchard crops), Junction.

*Blossom blight/brown rot (Monilinia)*—chlorothalonil + thiophanate-methyl, Concert, copper (Badge [dormant through bloom only], hydroxide, salts), iprodione (Cistena Plum), iprodione + thiophanate-methyl (including Cistena Plum, Rose Tree of China), Junction, mancozeb, Pageant, propiconazole, pyraclostrobin (including Common Plum, Purple Leaf Plum).

*Fire blight*—copper (Badge [dormant through bloom only], hydroxide, salts).

*Leaf spot*—Armada, azoxystrobin (including Purple Leaf Plum), chlorothalonil, chlorothalonil + thiophanate-methyl, iprodione (including Cistena Plum, Rose Tree of China), iprodione + thiophanate-methyl (including Cistena Plum, Rose Tree of China), Junction, kresoxim-methyl, mancozeb, Pageant, pyraclostrobin (including Common Plum, Purple Leaf Plum), tebuconazole, thiophanate-methyl.

*Powdery mildew*—Armada, azoxystrobin (including Purple Leaf Plum), chlorothalonil + thiophanate-methyl, copper (pentahydrate), iprodione + thiophanate-methyl (including Cistena Plum, Rose Tree of China), kresoxim-methyl, Pageant, polyoxin-D, pyraclostrobin (including Common Plum, Purple Leaf Plum), Sanction, tebuconazole, thiophanate-methyl, trifloxystrobin, triflumizole.

*Soilborne diseases (non-water molds)*—azoxystrobin (including Purple Leaf Plum), chlorothalonil + thiophanate-methyl, iprodione (including Cistena Plum, Rose Tree of China), iprodione + thiophanate-methyl (including Cistena Plum, Rose Tree of China), Pageant, polyoxin-

D, pyraclostrobin (including Common Plum, Purple Leaf Plum), thiophanate-methyl, triflumizole.  
*Soilborne diseases (oomycetes)*—cyazofamid, mefenoxam (nursery only).

#### **PODOCARPUS**-----

Family Podocarpaceae

*Leaf spot*—tebuconazole, thiophanate-methyl.

*Rust (Melampsora)*—tebuconazole.

#### **POINSETTIA**-----

Family Euphorbiaceae

(Avoid most sprays, especially chlorothalonil, piperalin after bracts start to show color.)

*Botrytis blight*—most products are not to be used when plants are in color or after Nov. 1, some cultivars may also be sensitive to leaf spotting: azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (pentahydrate, salts), Exotherm Termil, fenhexamid, fludioxonil, imazalil, iprodione, iprodione + thiophanate-methyl, mancozeb, Pageant, Palladium, polyoxin-D, trifloxystrobin.

*Leaf spot*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, Exotherm Termil, fludioxonil, imazalil, iprodione, iprodione + thiophanate-methyl, mancozeb, Pageant, Palladium, pyraclostrobin, tebuconazole, thiophanate-methyl, trifloxystrobin.

*Powdery mildew*—Armada, azoxystrobin, chlorothalonil + thiophanate-methyl, copper (pentahydrate, salts), fludioxonil, imazalil, iprodione + thiophanate-methyl, kresoxim-methyl, myclobutanil, Pageant, phosphorous acid, piperalin (evaluate cultivars for spotting on bracts prior to wide-scale use), polyoxin-D, pyraclostrobin, Sanction, tebuconazole, thiophanate-methyl, triadimefon, trifloxystrobin. Caution should be taken when treating plants during bloom.

*Scab*—copper (pentahydrate), mancozeb, myclobutanil, trifloxystrobin.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, chlorothalonil + thiophanate-methyl, fludioxonil, flutolanil, iprodione, iprodione + thiophanate-methyl, Pageant, PCNB, phosphorous acid, polyoxin-D, pyraclostrobin, thiophanate-methyl, trifloxystrobin.

*Soilborne diseases (oomycetes)*—Banrot, copper (pentahydrate), cyazofamid, dimethomorph (*Phytophthora* only), etridiazole, fenamidone, mandipropamid, mefenoxam, phosphorous acid, propamocarb hydrochloride.

#### **POPLAR (Populus spp.)**-----

Family Salicaceae

*Leaf spot*—Armada, azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (oxychloride), Junc-

tion, mancozeb, pyraclostrobin (Black Cottonwood, Cottonwood), sulfur, tebuconazole, thiophanate-methyl.

#### **PORTULACA**-----

Family Portulacaceae

*Leaf spot*—fludioxonil, kresoxim-methyl, mancozeb, Palladium, pyraclostrobin (Moss Rose, Purslane), tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—PCNB, polyoxin-D, pyraclostrobin (Moss Rose, Purslane), thiophanate-methyl.

*Soilborne diseases (oomycetes)*—cyazofamid, etridiazole, propamocarb hydrochloride.

#### **POTHOS**-----

Family Araceae

(Do not apply iprodione as a soil drench to Pothos. To minimize injury to Pothos from products that contain mfenoxam, see label use restrictions.)

*Bacterial leaf spot*—copper (Badge, hydroxide, octanoate, salts).

*Leaf spot*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, Exotherm Termil, fludioxonil, iprodione (foliar application only), iprodione + thiophanate-methyl (foliar application only), mancozeb, Palladium, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, chlorothalonil + thiophanate-methyl, fludioxonil, flutolanil, iprodione + thiophanate-methyl (foliar application only), PCNB, phosphorous acid, polyoxin-D, thiophanate-methyl, trifloxystrobin.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, dimethomorph (*Phytophthora* only), etridiazole, fluopicolide, fosetyl-Al, mandipropamid, mefenoxam (use with caution), phosphorous acid, trifloxystrobin.

#### **POWDER PUFF PLANT (Calliandra spp.)**-----

Family Fabaceae

*Bacterial leaf spot*—copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, salts).

#### **PRAYER PLANT (Maranta leuconeura)**-----

Family Marantaceae

*Leaf spot*—chlorothalonil, chlorothalonil + thiophanate-methyl, copper (octanoate), Exotherm Termil, mancozeb, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—Banrot, chlorothalonil + thiophanate-methyl, PCNB, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole.

**PRIMULA** -----

Family Primulaceae

*Botrytis blight*—copper (pentahydrate), Exotherm Termil, iprodione, iprodione + thiophanate-methyl, mancozeb, Pageant, polyoxin-D, trifloxystrobin.

*Leaf spot*—azoxystrobin, Exotherm Termil, iprodione, iprodione + thiophanate-methyl, mancozeb, Pageant, tebuconazole, thiophanate-methyl.

*Powdery mildew*—azoxystrobin, copper (pentahydrate), iprodione + thiophanate-methyl, Pageant, phosphorous acid, polyoxin-D, Sanction, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin, iprodione, iprodione + thiophanate-methyl, Pageant, phosphorous acid, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—cyazofamid, dimethomorph (*Phytophthora* only), mefenoxam, phosphorous acid.

**PRIVET** (*Ligustrum* spp.) -----

Family Oleaceae

*Anthracnose (Glomerella)*—Armada, chlorothalonil, chlorothalonil + thiophanate-methyl, iprodione + thiophanate-methyl, Junction, mancozeb, polyoxin-D, pyraclostrobin, tebuconazole, thiophanate-methyl, trifloxystrobin.

*Powdery mildew*—Armada, chlorothalonil + thiophanate-methyl, iprodione + thiophanate-methyl, myclobutanil, polyoxin-D, propiconazole, pyraclostrobin, Sanction, sulfur, tebuconazole, thiophanate-methyl, triadimefon, triflumizole.

*Soilborne diseases (non-water molds)*—Banrot, chlorothalonil + thiophanate-methyl, iprodione, iprodione + thiophanate-methyl, PCNB, polyoxin-D, pyraclostrobin, thiophanate-methyl, trifloxystrobin, triflumizole.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole, mandipropamid, propamocarb hydrochloride.

**PYRACANTHA** (Firethorn) -----

Family Rosaceae

*Fireblight*—copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, pentahydrate, salts), fosetyl-Al (pre-bloom and repeat every 7 days until bloom), Junction, phosphorous acid, streptomycin sulfate.

*Leaf spot*—Armada, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (octanoate), iprodione, iprodione + thiophanate-methyl, mancozeb, propiconazole, tebuconazole, thiophanate-methyl.

*Powdery mildew*—Armada, chlorothalonil + thiophanate-methyl, copper (octanoate), iprodione + thiophanate-methyl, polyoxin-D, Sanction, tebuconazole, thiophanate-methyl, triadimefon, triflumizole.

*Scab (Spilocaea)*—Concert, chlorothalonil + thiophanate-methyl, copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, pentahydrate, salts), Junction, mancozeb, myclobutanil, phosphorous acid (tree injection), propiconazole, tebuconazole.

**QUINCE** (Flowering) (non bearing) -----

*Leaf spot* and *scab*—chlorothalonil, chlorothalonil + thiophanate-methyl, mancozeb, myclobutanil, Pageant, pyraclostrobin, tebuconazole, thiophanate-methyl, triflumizole.

*Rust*—mancozeb, myclobutanil, Pageant, pyraclostrobin, tebuconazole, thiophanate-methyl, triflumizole.

**RANUNCULUS**-----

Family Ranunculaceae

*Botrytis blight*—fenhexamid, polyoxin-D.

*Powdery mildew*—polyoxin-D, pyraclostrobin, Sanction, tebuconazole, thiophanate-methyl, trifloxystrobin.

**REDBUD**-----

Family Fabaceae

*Botrytis blight*—azoxystrobin (Western Redbud), copper (pentahydrate), polyoxin-D, triflumizole.

*Leaf spot (Cercospora)*—azoxystrobin (Western Redbud), Junction, propiconazole, pyraclostrobin, tebuconazole, thiophanate-methyl.

**RHODODENDRON** (see “Azalea”)-----

**ROSE** -----

Family Rosaceae

(Do not use neem oil without prior testing for sensitivity. If neem oil is used on greenhouse roses, it should be sprayed in a rotation that includes the oil only once every 4 weeks. Check for phytotoxicity before large-scale use of copper fungicides, and do not spray plants with copper, Junction (contains copper) compounds just before selling season to prevent residues on commercial plants. Do not use captan in combination with, immediately before after, oil sprays. Lime, lime-sulfur, and Bordeaux will reduce the efficacy of captan. DO NOT apply phosphorous acid to roses that are moisture or heat stressed.)

*Black spot*—Armada, azoxystrobin, calcium polysulfide (dormant), captan, chlorothalonil, chlorothalonil + thiophanate-methyl, Concert (outdoors only), copper (ammonium complex, Badge, basic sulfate, C-O-C-S WDG, cuprous oxide, hydroxide, octanoate, pentahydrate, salts), Exotherm Termil, iprodione + thiophanate-methyl, Junction, kresoxim-methyl, mancozeb, myclobutanil, phosphorus acids, propiconazole (outdoor use only), pyraclostrobin, sulfur, tebuconazole, thiophanate-methyl, trifloxystrobin, ziram.

*Botrytis blight*—azoxystrobin, captan, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (C-O-C-S WDG, octanoate, pentahydrate, oxychloride), dicloran, Exotherm Termil, fenhexamid, fludioxonil, fluoxastrobin,

imazalil, iprodione (also for storage rot), iprodione + thiophanate-methyl (also for storage rot), Junction, mancozeb, Pageant, Palladium, polyoxin-D, trifloxystrobin, triflumizole.

*Canker*—prune and destroy infected canes; cut at least 2 inches below visible cankers. Spray as for black spot control.

*Crown gall*—Never set plants with even the smallest galls. Dip seedlings liners in a solution containing Galltrol-A; use streptomycin sulfate (New Jersey only).

*Downy mildew*—Armada, azoxystrobin, copper (octanoate, oxychloride, pentahydrate), cyazofamid, dimethomorph (Cut Roses, Hybrid Tea Roses, Miniature Roses), fenamidone (Hybrid Tea Roses), fludioxonil, fluoxastrobin, fosetyl-AI (foliar spray for field, container, and landscape roses), imazalil, kresoxim-methyl, mancozeb, mandipropamid (including Miniature Roses), mfenoxam, Pageant, phosphorus acids, polyoxin-D, pyraclostrobin, trifloxystrobin.

*Leaf spot*—Armada, azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (C-O-C-S WDG, octanoate, oxychloride), Exotherm Termil, fludioxonil, fluoxastrobin, imazalil, iprodione, iprodione + thiophanate-methyl, Junction, kresoxim-methyl, mancozeb, Pageant, Palladium, pyraclostrobin, tebuconazole, thiophanate-methyl, triflumizole.

*Powdery mildew*—Armada, azoxystrobin, calcium polysulfide, chlorothalonil + thiophanate-methyl, copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, octanoate, oxychloride, pentahydrate, salts), fenarimol (field and landscape only), fludioxonil, fluoxastrobin, imazalil, iprodione + thiophanate-methyl, Junction, kresoxim-methyl, myclobutanil, Pageant, Palladium, phosphorus acids, piperalin (Cut Roses, Potted Roses), polyoxin-D, propiconazole (outdoor use only), pyraclostrobin, Sanction, sulfur, tebuconazole, thiophanate-methyl, triadimefon, trifloxystrobin, triflumizole, ziram.

*Rust (Phragmidium)*—Armada, azoxystrobin, calcium polysulfide, Concert (outdoors only), copper (C-O-C-S WDG, octanoate), fludioxonil, fluoxastrobin, flutolanil, imazalil, Junction, kresoxim-methyl, mancozeb, myclobutanil, propiconazole (outdoor use only), sulfur, tebuconazole, trifloxystrobin.

*Soilborne diseases (non-water molds)*—azoxystrobin, chlorothalonil + thiophanate-methyl, fludioxonil, fluoxastrobin, flutolanil, Hurricane, iprodione, iprodione + thiophanate-methyl, Pageant, phosphorous acid, polyoxin-D, pyraclostrobin, thiophanate-methyl, trifloxystrobin, triflumizole.

*Soilborne diseases (oomycetes)*—cyazofamid, dimethomorph (Cut Roses, Hybrid Tea Roses, Miniature Roses) (*Phytophthora* only), fenamidone (Hybrid Tea Roses), fluoxastrobin (*Phytophthora* only), Hurricane, mandipropamid (including Miniature Roses), mfenoxam, phosphorus acids, propamocarb hydrochloride.

*Storage rot (Botrytis)*—iprodione (dip), iprodione + thiophanate-methyl (dip or spray), PCNB (dip or spray).

## ROSEMARY ----- Family Lamiaceae

*Leaf spot*—azoxystrobin (Prostrate Rosemary), mancozeb, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin (Prostrate Rosemary), phosphorous acid, polyoxin-D, thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—cyazofamid, mfenoxam (Prostrate Rosemary), phosphorous acid (Prostrate Rosemary).

## RUDBECKIA (Black-eyed Susan) ----- Family Asteraceae

*Botrytis blight*—azoxystrobin, copper (pentahydrate), fludioxonil, imazalil, Pageant, polyoxin-D.

*Leaf spot*—azoxystrobin, fludioxonil, Pageant, pyraclostrobin, tebuconazole, thiophanate-methyl.

*Powdery mildew*—azoxystrobin, copper (pentahydrate), fludioxonil, imazalil, Pageant, polyoxin-D, pyraclostrobin, Sanction, thiophanate-methyl, ziram (Golden Glow).

## RUSSIAN OLIVE ----- Family Elaeagnaceae

*Leaf spot*—Armada, Junction, mancozeb, myclobutanil, Pageant, pyraclostrobin, tebuconazole, thiophanate-methyl, triadimefon.

## SALVIA (Sage) ----- Family Lamiaceae

*Botrytis blight*—azoxystrobin, copper (pentahydrate), Exotherm Termil, fludioxonil, iprodione, iprodione + thiophanate-methyl, mancozeb, Pageant, Palladium, polyoxin-D, trifloxystrobin.

*Leaf spot*—Armada, azoxystrobin, Exotherm Termil, fludioxonil, iprodione, iprodione + thiophanate-methyl, mancozeb, Pageant, Palladium, pyraclostrobin (Meadow Sage, Texas Sage), sulfur, tebuconazole, thiophanate-methyl, trifloxystrobin.

*Powdery mildew*—Armada, azoxystrobin, copper (pentahydrate), iprodione + thiophanate-methyl, myclobutanil, Pageant, Palladium, phosphorous acid, polyoxin-D, pyraclostrobin (Meadow Sage, Texas Sage), Sanction, sulfur, tebuconazole, thiophanate-methyl, triadimefon, trifloxystrobin.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, fludioxonil, Hurricane, iprodione, iprodione + thiophanate-methyl, Pageant, PCNB, phosphorous acid, polyoxin-D, pyraclostrobin (Meadow Sage, Texas Sage), thiophanate-methyl, trifloxystrobin.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole, Hurricane, mandipropamid, mfenoxam, phosphorous acid, propamocarb hydrochloride.

**SANSEVIERIA** (Bird's Nest, Snake Plant) -----  
Family Asparagaceae

*Leaf spot*—chlorothalonil, chlorothalonil + thiophanate-methyl, copper (octanoate), mancozeb, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—chlorothalonil + thiophanate-methyl, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—cyazofamid, etridiazole.

**SAXIFRAGA** -----  
Family Saxifragaceae

*Botrytis blight*—polyoxin-D.

*Leaf spot*—tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—polyoxin-D, thiophanate-methyl.

**SCHEFFLERA** (Rubber Tree, Umbrella Tree) -----  
Family Araliaceae

(Do not apply chlorothalonil to Schefflera, and do not apply chlorothalonil + thiophanate-methyl more than once.)

*Bacterial blight/leaf spot*—copper (Badge, hydroxide, octanoate, salts), fosetyl-Al, phosphorous acid.

*Leaf blight/spot*—azoxystrobin, copper (octanoate), fludioxonil, imazalil, iprodione, iprodione + thiophanate-methyl, mancozeb, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, iprodione, iprodione + thiophanate-methyl, PCNB, phosphorous acid, polyoxin-D, thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole, fosetyl-Al, mefenoxam, phosphorous acid, propamocarb hydrochloride.

**SEDUM** (Orpine, Stonecrop) -----  
Family Crassulaceae

*Botrytis blight*—azoxystrobin, copper (pentahydrate), Pageant, polyoxin-D.

*Powdery mildew*—Armada, azoxystrobin, copper (pentahydrate), kresoxim-methyl, myclobutanil, Pageant, phosphorous acid, polyoxin-D, pyraclostrobin, Sanction, tebuconazole, thiophanate-methyl, triadimefon.

*Soilborne diseases (non-water molds)*—azoxystrobin, Pageant, PCNB, phosphorous acid, polyoxin-D, pyraclostrobin, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—cyazofamid, mefenoxam, mandipropamid, phosphorous acid.

**SENECIO** -----  
Family Asteraceae

(Note: See Dusty Miller for *Jacobaea maritima* [formerly *Senecio cineraria*].)

*Botrytis blight*—mancozeb, polyoxin-D.

*Leaf spot*—mancozeb, tebuconazole, thiophanate-methyl.

*Powdery mildew*—polyoxin-D, Sanction, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—polyoxin-D, thiophanate-methyl.

**SNAPDRAGON** -----  
Family Plantaginaceae

*Anthrachnose (Colletotrichum)*—Armada, azoxystrobin, copper (Badge, hydroxide, oxychloride, salts), fluoxastrobin, Exotherm Termil, iprodione + thiophanate-methyl, mancozeb, Pageant, Palladium, polyoxin-D, pyraclostrobin, thiophanate-methyl, trifloxystrobin.

*Botrytis blight*—azoxystrobin, copper (oxychloride, pentahydrate), Exotherm Termil, fenhexamid, fludioxonil, fluoxastrobin, iprodione, iprodione + thiophanate-methyl, mancozeb, Pageant, Palladium, polyoxin-D, trifloxystrobin.

*Downy mildew*—Armada, azoxystrobin, copper (Badge, hydroxide, oxychloride, pentahydrate, salts), cyazofamid, dimethomorph, fluoxastrobin, kresoxim-methyl, mancozeb, mandipropamid, mefenoxam, Pageant, phosphorous acid, polyoxin-D, pyraclostrobin, trifloxystrobin. Downy mildew is not a problem if the night temperature is kept above 52°F degrees.

*Leaf blight (Alternaria)*—azoxystrobin, copper (oxychloride), Exotherm Termil, fludioxonil, fluoxastrobin, iprodione, iprodione + thiophanate-methyl, mancozeb, Palladium, polyoxin-D, pyraclostrobin, thiophanate-methyl.

*Leaf spot*—Armada, azoxystrobin, copper (oxychloride), Exotherm Termil, fludioxonil, fluoxastrobin, iprodione, iprodione + thiophanate-methyl, mancozeb, Pageant, Palladium, pyraclostrobin, sulfur, tebuconazole, thiophanate-methyl, trifloxystrobin (*Septoria*), ziram.

*Powdery mildew*—Armada, azoxystrobin, copper (oxychloride), fluoxastrobin, iprodione + thiophanate-methyl, kresoxim-methyl, myclobutanil, Pageant, Palladium, phosphorous acid, polyoxin-D, pyraclostrobin, Sanction, tebuconazole, thiophanate-methyl, triadimefon, trifloxystrobin.

*Rust (Puccinia)*—Armada, azoxystrobin, copper (pentahydrate), fluoxastrobin, flutolanil, kresoxim-methyl, mancozeb, Pageant, propiconazole, myclobutanil, pyraclostrobin, sulfur, tebuconazole, thiophanate-methyl, triadimefon, trifloxystrobin, ziram.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, fludioxonil, fluoxastrobin, flutolanil, Hurricane, iprodione, iprodione + thiophanate-methyl, Pageant, PCNB, phosphorous acid, polyoxin-D, pyraclostrobin, thiophanate-methyl, trifloxystrobin.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, dimethomorph (*Phytophthora* only), etridiazole, fluopicolide, fluoxastrobin (*Phytophthora* only), Hurricane, mandipropamid, mefenoxam, phosphorous acid, propamocarb hydrochloride.

**SPATHIPHYLLUM** (Peace Lily, Spathe Flower) -----  
Family Araceae

(Do not use iprodione on Spathiphyllum.)

*Bacterial blight*—copper (Badge, hydroxide, salts), fosetyl-Al, Junction, phosphorous acid.

*Botrytis blight*—azoxystrobin, copper (pentahydrate), fenhexamid, fludioxonil, mancozeb, Pageant, Palladium, polyoxin-D.

*Leaf spot*—azoxystrobin, copper (octanoate), fludioxonil, Junction, mancozeb, Pageant, Palladium, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin, copper (pentahydrate), fludioxonil, Hurricane, Pageant, PCNB, phosphorous acid, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—copper (salts), cyazofamid, dimethomorph (*Phytophthora* only), fenamidone, fluopicolide, fosetyl-Al, Hurricane, phosphorous acid, polyoxin-D, trifloxystrobin.

**SPIRAEA**-----  
Family Rosaceae

*Fireblight*—copper (Badge, hydroxide, pentahydrate, salts).

*Powdery mildew*—Armada, azoxystrobin (Japanese), chlorothalonil + thiophanate-methyl, copper (pentahydrate), fludioxonil, imazalil, kresoxim-methyl, myclobutanil, Pageant, polyoxin-D, pyraclostrobin (including Bridal Wreath), Sanction, sulfur, tebuconazole, thiophanate-methyl, triadimefon, trifloxystrobin, triflumizole.

**SPRUCE**-----  
Family Pinaceae

(Oil sprays will discolor needles on Blue Spruce.)

*Canker*—Abasol (tree injection), Fungisol (tree injection), Imisol (tree injection). Prune affected branches and maintain tree vigor.

*Needle cast*—azoxystrobin (Blue Spruce, Norway Spruce, White Spruce), chlorothalonil, chlorothalonil + thiophanate-methyl, copper (Badge, basic sulfate, hydroxide, salts), mancozeb.

*Rust*—chlorothalonil, fludioxonil, imazalil, mancozeb, myclobutanil.

*Soilborne diseases (non-water molds)*—azoxystrobin (Blue Spruce, Norway Spruce, White Spruce), Banrot, iprodione + thiophanate-methyl, polyoxin-D, pyraclostrobin, thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, fosetyl-Al (foliar application or dip treatment at transplant) (*Phytophthora* only), mandipropamid (Colorado Blue Spruce), mefenoxam (nursery and Christmas tree plantations only), phosphorous acid, propamocarb hydrochloride.

**STOCK** -----  
Family Brassicaceae

*Botrytis blight*—Pageant, polyoxin-D.

*Soilborne diseases (non-water molds)*—Pageant, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—cyazofamid, dimethomorph (*Phytophthora* only), mandipropamid.

**STOKESIA** -----  
Family Asteraceae

*Botrytis blight*—polyoxin-D.

*Powdery mildew*—polyoxin-D, Sanction, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—cyazofamid, etridiazole.

**SUMAC** (*Rhus* spp.) -----  
Family Anacardiaceae

*Leaf spot*—Junction, mancozeb, Pageant, tebuconazole, thiophanate-methyl.

**SUNFLOWER** (non bearing) -----  
Family Asteraceae

*Botrytis blight*—fludioxonil, mancozeb, Palladium, polyoxin-D.

*Leaf spot*—fludioxonil, mancozeb, myclobutanil, Palladium, tebuconazole, thiophanate-methyl.

*Powdery mildew*—Armada, myclobutanil, Palladium, polyoxin-D, Sanction, sulfur, tebuconazole, thiophanate-methyl, triadimefon.

**SWEDISH IVY** -----  
Family Lamiaceae

(Do not apply chlorothalonil + thiophanate-methyl, thiophanate-methyl to Swedish Ivy.)

*Botrytis blight*—azoxystrobin, Palladium, polyoxin-D.

*Powdery mildew*—azoxystrobin, polyoxin-D.

**SWEET PEA** -----

Family Fabaceae

*Botrytis blight*—copper (oxychloride, pentahydrate), polyoxin-D.

*Powdery mildew*—calcium polysulfide, copper (oxychloride), fenarimol, polyoxin-D, Sanction, sulfur, tebuconazole, thiophanate-methyl, triadimefon.

**SYCAMORE/PLANE TREE** -----

Family Platanaceae

*Anthracnose*—Abasol (tree injection), Armada, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (Badge, basic sulfate, C-O-C-S WDG, cuprous oxide, hydroxide, octanoate, pentahydrate [including tree injection], salts), Fungisol (tree injection), Imisol (tree injection), Junction, mancozeb, propiconazole (tree injection), tebuconazole (including tree injection), thiabendazole (tree injection).

*Leaf spot*—Armada, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (ammonium complex, Badge, hydroxide, salts), Junction, mancozeb, propiconazole, sulfur, tebuconazole, thiophanate-methyl.

*Powdery mildew*—Armada, chlorothalonil + thiophanate-methyl, myclobutanil, polyoxin-D, propiconazole, Sanction, sulfur, tebuconazole, thiophanate-methyl, triadimefon, triflumizole.

**SYNGONIUM**-----

Family Araceae

*Bacterial blight*—copper (Badge, hydroxide, octanoate, salts), fosetyl-Al, phosphorous acid.

*Leaf spot*—chlorothalonil, chlorothalonil + thiophanate-methyl, copper (octanoate), Exotherm Termil, mancozeb, Palladium, thiophanate-methyl, trifloxystrobin.

*Soilborne diseases (non-water molds)*—Banrot, chlorothalonil + thiophanate-methyl, PCNB, polyoxin-D, thiophanate-methyl, trifloxystrobin.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, phosphorous acid.

**TOBACCO (Flowering)** -----

Family Solanaceae

*Leaf spot*—fludioxonil, mancozeb, tebuconazole, thiophanate-methyl.

**TRADESCANTIA (Oyster Plant)** -----

Family Commelinaceae

*Leaf spot*—chlorothalonil + thiophanate-methyl, fludioxonil, kresoxim-methyl, Palladium, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—Banrot, chlorothalonil + thiophanate-methyl, fludioxonil, PCNB, polyoxin-D, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid.

**TRUMPET VINE (Campsis spp.)**-----

Family Bignoniaceae

*Leaf spot*—myclobutanil, Pageant, tebuconazole, thiophanate-methyl.

*Powdery mildew*—myclobutanil, Pageant, polyoxin-D, Sanction, tebuconazole, thiophanate-methyl, triflumizole.

**TULIP**-----

Family Liliaceae

(Avoid use of chlorothalonil during bloom where flower injury is unacceptable.)

*Botrytis blight/fire*—chlorothalonil, chlorothalonil + thiophanate-methyl, copper (ammonium complex, Badge, cuprous oxide, hydroxide, oxychloride, pentahydrate [including as Bordeaux], salts), Exotherm Termil, fenhexamid, iprodione, iprodione + thiophanate-methyl, Junction, mancozeb, Pageant, Palladium, polyoxin-D, pyraclostrobin.

*Bulb rot*—see “Narcissus.”

*Leaf spot*—chlorothalonil, chlorothalonil + thiophanate-methyl, copper (basic sulfate, oxychloride, salts), Exotherm Termil, iprodione, iprodione + thiophanate-methyl, kresoxim-methyl, mancozeb, Pageant, Palladium, pyraclostrobin, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—chlorothalonil + thiophanate-methyl, iprodione, iprodione + thiophanate-methyl, Pageant, PCNB, polyoxin-D, pyraclostrobin, thiophanate-methyl.

**TULIP TREE**-----

Family Magnoliaceae

*Powdery mildew*—polyoxin-D, Sanction, tebuconazole, thiophanate-methyl, triflumizole.

**VERBENA (Vervain)**-----

Family Verbenaceae

*Bacterial leaf spot*—copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, pentahydrate, salts).

*Botrytis blight*—azoxystrobin, copper (pentahydrate), Exotherm Termil, fludioxonil, fluoxastrobin, mancozeb, Pageant, Palladium, polyoxin-D, trifloxystrobin.

*Leaf spot*—azoxystrobin, Exotherm Termil, fludioxonil, fluoxastrobin, mancozeb, Pageant, Palladium, pyraclostrobin, sulfur, tebuconazole, thiophanate-methyl.



*Powdery mildew*—azoxystrobin, copper (pentahydrate), fenarimol, fluoxastrobin, kresoxim-methyl, Pageant, Palladium, phosphorous acid, piperalin, polyoxin-D, pyraclostrobin, Sanction, sulfur, tebuconazole, thiophanate-methyl, trifloxystrobin.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, fludioxonil, fluoxastrobin, Hurricane, Pageant, PCNB, phosphorous acid, polyoxin-D, pyraclostrobin, thiophanate-methyl, trifloxystrobin.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, dimethomorph (*Phytophthora* only), etridiazole, fluoxastrobin (*Phytophthora* only), Hurricane, mandipropamid, mefenoxam, phosphorous acid, propamocarb hydrochloride.

#### **VERONICA** ----- Family Plantaginaceae

*Botrytis blight*—copper (pentahydrate), fludioxonil, imazalil, Pageant (Speedwell), polyoxin-D.

*Powdery mildew*—copper (pentahydrate), fludioxonil, imazalil, kresoxim-methyl, Pageant (Speedwell), polyoxin-D, pyraclostrobin (Speedwell), Sanction, tebuconazole, thiophanate-methyl, trifloxystrobin.

#### **VIBURNUM**----- Family Adoxaceae

*Botrytis blight*—azoxystrobin, chlorothalonil + thiophanate-methyl, copper (pentahydrate), fludioxonil, imazalil, iprodione, iprodione + thiophanate-methyl, mancozeb, Pageant (including Water Elder Viburnum), polyoxin-D, thiophanate-methyl, triflumizole.

*Leaf spot*—Armada, azoxystrobin, chlorothalonil + thiophanate-methyl, copper (basic sulfate, cuprous oxide, pentahydrate, salts), fludioxonil, iprodione, iprodione + thiophanate-methyl, mancozeb, Pageant (including Water Elder Viburnum), pyraclostrobin (including Arrowwood Viburnum), tebuconazole, thiophanate-methyl, trifloxystrobin.

*Powdery mildew*—Armada, azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, fludioxonil, imazalil, iprodione + thiophanate-methyl, kresoxim-methyl, myclobutanil, Pageant (including Water Elder Viburnum), polyoxin-D, pyraclostrobin (including Arrowwood Viburnum), Sanction, tebuconazole, thiophanate-methyl, triadimefon, triflumizole.

#### **VINCA** (Catharanthus, Ground-myrtle, Periwinkle) ----- Family Apocynaceae

*Botrytis blight*—azoxystrobin (Catharanthus), copper (pentahydrate), Exotherm Termil (foliage only), fludioxonil, iprodione, iprodione + thiophanate-methyl, mancozeb, Pageant, Palladium, polyoxin-D, tebuconazole, trifloxystrobin, triflumizole.

*Leaf spot*—azoxystrobin (Catharanthus), Exotherm Termil (foliage only), fludioxonil, iprodione, iprodione + thiophanate-methyl, kresoxim-methyl, mancozeb, Pageant, Palladium, propiconazole, pyraclostrobin, tebuconazole, thiophanate-methyl, trifloxystrobin.

*Powdery mildew*—azoxystrobin (Catharanthus), copper (pentahydrate), iprodione + thiophanate-methyl, Pageant, phosphorous acid, polyoxin-D, propiconazole, pyraclostrobin, Sanction, tebuconazole, thiophanate-methyl, triflumizole.

*Soilborne diseases (non-water molds)*—azoxystrobin (Catharanthus), copper (pentahydrate) (Minor), fludioxonil, Hurricane, iprodione, iprodione + thiophanate-methyl, Pageant, PCNB, phosphorous acid, polyoxin-D, pyraclostrobin, thiophanate-methyl, trifloxystrobin, triflumizole.

*Soilborne diseases (oomycetes)*—cyazofamid, dimethomorph (*Phytophthora* only), etridiazole, fenamidone, fluopicolide, fosetyl-Al, Hurricane, mandipropamid, mefenoxam, phosphorous acid, propamocarb hydrochloride, trifloxystrobin.

*Stem blight and canker (Phoma/Phomopsis)*—copper (ammonium complex, Badge, basic sulfate, C-O-C-S WDG, cuprous oxide, hydroxide, salts), iprodione + thiophanate-methyl, mancozeb, Palladium, thiophanate-methyl.

#### **VIOLA** (Pansy, Violet) ----- Family Violaceae

(Avoid use of chlorothalonil during bloom where flower injury is unacceptable. Do not drench Pansy with trifloxystrobin.)

*Anthracnose (Colletotrichum) or scab (Sphaceloma)*—Armada, azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (oxychloride), Exotherm Termil, iprodione + thiophanate-methyl, Junction, mancozeb, Pageant, Palladium, polyoxin-D, pyraclostrobin, tebuconazole, thiophanate-methyl, trifloxystrobin.

*Botrytis blight*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (oxychloride, pentahydrate), Exotherm Termil, fenhexamid, fludioxonil, iprodione, iprodione + thiophanate-methyl, mancozeb, Pageant, Palladium, polyoxin-D, trifloxystrobin.

*Downy mildew*—Armada, azoxystrobin, copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, oxychloride, pentahydrate, salts), cyazofamid, dimethomorph, fosetyl-Al, Junction, mancozeb, mandipropamid, mefenoxam, Pageant, phosphorous acid, polyoxin-D, pyraclostrobin, trifloxystrobin.

*Leaf spot*—Armada, azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (oxychloride, pentahydrate), Exotherm Termil, fludioxonil, iprodione, iprodione + thiophanate-methyl, mancozeb, Pageant, Palladium, pyraclostrobin, sulfur, tebuconazole, thiophanate-methyl, trifloxystrobin.

*Powdery mildew*—Armada, azoxystrobin, chlorothalonil + thiophanate-methyl, copper (oxychloride, pentahydrate),

iprodione + thiophanate-methyl, kresoxim-methyl, myclobutanil, Pageant, Palladium, phosphorous acid, polyoxin-D, pyraclostrobin, Sanction, sulfur, tebuconazole, thiophanate-methyl, triadimefon, trifloxystrobin.

*Rust (Puccinia)*—Armada, azoxystrobin, chlorothalonil + thiophanate-methyl, mancozeb, myclobutanil, Pageant, pyraclostrobin, tebuconazole, thiophanate-methyl, triadimefon.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, chlorothalonil + thiophanate-methyl, fludioxonil, Hurricane, iprodione, iprodione + thiophanate-methyl, Pageant, PCNB, phosphorous acid, polyoxin-D, pyraclostrobin, thiophanate-methyl, trifloxystrobin.

*Soilborne diseases (oomycetes)*—Banrot, copper (pentahydrate), cyazofamid, dimethomorph (*Phytophthora* only), etridiazole, fluopicolide, fosetyl-Al, Hurricane, mandipropamid, mefenoxam, phosphorous acid, propamocarb hydrochloride.

**VITEX (Chaste tree)**-----  
Family Lamiaceae

*Leaf spot*—Armada, tebuconazole, thiophanate-methyl, triadimefon.

**WALNUT (non bearing)**-----  
Family Juglandaceae

*Anthracnose*—Armada, chlorothalonil, chlorothalonil + thiophanate-methyl, Concert, Junction (includes Butternut), mancozeb, propiconazole, tebuconazole (including tree injection).

*Leaf spot*—Armada, chlorothalonil, chlorothalonil + thiophanate-methyl, Junction (includes Butternut), mancozeb, Pageant (Black Walnut, Common Walnut), pyraclostrobin (Black Walnut, Common Walnut), tebuconazole, thiophanate-methyl.

*Powdery mildew*—Armada, chlorothalonil + thiophanate-methyl, myclobutanil, Pageant (Black Walnut, Common Walnut), polyoxin-D, pyraclostrobin (Black Walnut, Common Walnut), Sanction, tebuconazole, thiophanate-methyl, triadimefon, triflumizole.

*Soilborne diseases (oomycetes)*—cyazofamid, mefenoxam (nursery only), propamocarb hydrochloride.

**WEIGELA**-----  
Family Caprifoliaceae

*Leaf spot*—azoxystrobin (Pink), tebuconazole, thiophanate-methyl.

**WILLOW**-----  
Family Salicaceae

*Anthracnose*—copper (ammonium complex [Weeping Willow], Badge, cuprous oxide [Weeping Willow], hydrox-

ide [Weeping Willow], salts), Junction, mancozeb, tebuconazole (including tree injection).

*Blight, canker, and scab (Venturia, Glomerella)*—Junction, mancozeb, thiophanate-methyl, triflumizole.

*Leaf spot*—Armada, copper (octanoate, basic sulfate [Weeping Willow]), Junction, mancozeb, sulfur, tebuconazole, thiophanate-methyl.

*Powdery mildew*—Armada, copper (octanoate), myclobutanil, polyoxin-D, Sanction, sulfur, tebuconazole, thiophanate-methyl, triadimefon, triflumizole.

*Rust (Melampsora)*—Armada, copper (octanoate), mancozeb, tebuconazole, triadimefon.

**WITCH-HAZEL**-----  
Family Hamamelidaceae

*Leaf spot*—Junction, sulfur, tebuconazole, thiophanate-methyl.

**YARROW**-----  
Family Asteraceae

*Botrytis blight*—polyoxin-D, tebuconazole.

*Powdery mildew*—myclobutanil, polyoxin-D, pyraclostrobin, Sanction, tebuconazole, thiophanate-methyl.

**YEW**-----  
Family Taxaceae

*Soilborne diseases (non-water molds)*—azoxystrobin (Spreading Yew), Banrot, phosphorous acid (*Taxus × media*), polyoxin-D, thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole, fenamidone, fosetyl-Al (*Taxus × media*), mefenoxam, phosphorous acid (*Taxus × media*), propamocarb hydrochloride.

**YUCCA (Adam's needle)**-----  
Family Asparagaceae

*Leaf spot*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (ammonium complex, Badge, basic sulfate, cuprous oxide, hydroxide, octanoate, salts), mancozeb, tebuconazole, thiophanate-methyl.

*Soilborne diseases (non-water molds)*—azoxystrobin, chlorothalonil + thiophanate-methyl, polyoxin-D, thiophanate-methyl, triflumizole.

*Soilborne diseases (oomycetes)*—cyazofamid, mandipropamid, propamocarb hydrochloride.

ZINNIA-----

Family Asteraceae

(Avoid use of chlorothalonil during bloom where flower injury is unacceptable.)

*Botrytis blight*—azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (oxychloride, pentahydrate), Exotherm Termil, fludioxonil, fluoxastrobin, iprodione, iprodione + thiophanate-methyl, Junction, mancozeb, Pageant, Palladium, polyoxin-D.

*Leaf spot/blight*—Armada, azoxystrobin, chlorothalonil, chlorothalonil + thiophanate-methyl, copper (Badge, hydroxide, oxychloride, salts), Exotherm Termil, fludioxonil, fluoxastrobin, iprodione, iprodione + thiophanate-methyl, Junction, mancozeb, myclobutanil, Pageant, Palladium, pyraclostrobin, sulfur, tebuconazole, thiophanate-methyl, triadimefon, trifloxystrobin.

*Powdery mildew*—Armada, azoxystrobin, calcium polysulfide, chlorothalonil, chlorothalonil + thiophanate-methyl, Concert, copper (oxychloride, pentahydrate), Exotherm Termil, fenarimol, fluoxastrobin, iprodione + thiophanate-methyl, kresoxim-methyl, myclobutanil, Pageant, Palladium, phosphorous acid, piperalin, polyoxin-D, propiconazole, pyraclostrobin, Sanction, sulfur, tebuconazole, thiophanate-methyl, triadimefon, trifloxystrobin.

*Soilborne diseases (non-water molds)*—azoxystrobin, Banrot, fludioxonil, fluoxastrobin, Hurricane, iprodione, iprodione + thiophanate-methyl, Pageant, PCNB, phosphorous acid, polyoxin-D, pyraclostrobin, thiophanate-methyl.

*Soilborne diseases (oomycetes)*—Banrot, cyazofamid, etridiazole, fluoxastrobin (*Phytophthora* only), fosetyl-Al, Hurricane, mefenoxam, phosphorous acid.

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