

Fungicide Testing on Amenity Plants

This article summarizes the fungicide trials on ornamental plants and landscape trees reported in volumes 39 and 40 of *Fungicide and Nematicide Tests*; most of the trials were conducted during 1983 and 1984. Of necessity, many details concerning dates, rates and methods of application, and fungicide formulations and combinations are omitted; these may be found in the original published reports. Comments on efficacy of fungicides are based on limited trials and should not be the sole basis for recommendations to growers but, rather, should encourage further testing.

Succulents. Fungicide efficacy trials on aster, chrysanthemum, Easter lily, impatiens, iris, oxalis, pansy, poinsettia, and snapdragon were reported from New Jersey, North Carolina, Florida, Indiana, Michigan, Wisconsin, California, and Washington.

Rust is a conspicuous and prominent leaf disease on many succulent ornamentals. Tests were conducted to control *Coleosporium asterum* on aster (*Callistephus chinensis*), *Puccinia oxalidis* on oxalis (*Oxalis violacea*), and *P. antirrhini* on snapdragon (*Antirrhinum majus*). The sterol-inhibiting fungicides triadimefon (Bayleton), bitertanol (Baycor), and triforine gave excellent control of the diseases and showed both protective and eradicated action. The agents were mostly applied at 10-day intervals. No phytotoxicity was noted with any treatment.

Botrytis spp. may cause a blight of buds, bulbs, corms, shoots, leaves, or flowers. Tests were conducted to control *B. elliptica* on Easter lily (*Lilium longiflorum* 'Ace') and *B. cinerea* on pansy (*Viola tricolor*). Chlorothalonil (Daconil 2787) and iprodione (Chipco 26019) gave excellent control of *Botrytis* on Easter lily after artificial inoculation with the fungus in a greenhouse study. In a field trial on pansy, no fungicide gave excellent control of *Botrytis* or was significantly better than any other fungicide. Blight was least on plants sprayed with benomyl (Benlate), Baycor, and copper hydroxide (Kocide 101); Bayleton treatment resulted in serious phytotoxicity (plant yellowing, stunting, and necrosis).

Fungal disease symptoms on leaves

vary from leaf spots and scab to blotch and blight. Tests were conducted to control leaf spot (*Didymellina macrospora*) on tall bearded iris (*Iris* sp.), scab (*Sphaceloma poinsettiae*) on poinsettia (*Euphorbia pulcherrima*), anthracnose (*Colletotrichum violae-tricoloris*) on pansy (*Viola tricolor*), and Ascochyta blight (*Didymella ligulicola*) on chrysanthemum (*Chrysanthemum morifolium*). Fungicides were applied three times at 14-day intervals to a field plot of iris. Bayleton and Benlate provided excellent control of leaf spot. Kocide 101 reduced severity but control was inadequate. Fungicides were applied 10 times at 4-day intervals to a field plot of poinsettia rooted cuttings. Among the best treatments for scab control were the combinations that included a benzimidazole (Benlate or zyban) in tank-mixed combinations with mancozeb (Manzate 200), Daconil 2787, or captan (Orthocide). Several fungicides did not provide commercially acceptable disease control. Manzate 200, zyban, Kocide 101, and Benlate applied at 10-day intervals controlled anthracnose on pansy. Propiconazole (Tilt), vinclozolin (Ornalin), and Chipco 26019, in weekly or biweekly sprays, gave equally good control of Ascochyta leaf, stem, and flower lesions on chrysanthemum, whereas the commonly used treatment of Benlate + Manzate 200 gave less control than the best treatments.

Pythium spp. cause root rot on many species of succulent ornamentals. Tests were conducted on poinsettia and impatiens (*Impatiens wallerana*). In greenhouse tests with artificially infested soil, metalaxyl (Subdue) gave excellent control of poinsettia root rot in both single and multiple drench treatments. Drenches of propamocarb (Previcur N) and ethazol (Truban) gave good control; granular Previcur and granular Truban were less effective. Soil-incorporated granules of MF-687 or Truban and a drench of Truban + thiophanate-methyl (Banrot) gave excellent protection against damping off of impatiens.

Shrubs. Fungicide efficacy trials on andromeda, azalea, camellia, crabapple, crapemyrtle, dogwood, firethorn, hawthorn, honeysuckle, leucothoë, lilac, photinia, pittosporum, potentilla, and rose were reported from Connecticut, New Jersey, Virginia, North Carolina, Alabama, Louisiana, Indiana, Illinois,

Wisconsin, and Minnesota.

Powdery mildew is not one of the most damaging diseases on shrubs but is conspicuous and undesirable on amenity plants. Tests were conducted to control *Microsphaera alni* on azalea (*Rhododendron* sp.), *Erysiphe lagerstroemiae* on crapemyrtle (*Lagerstroemia indica*), *Microsphaera* sp. on leucothoë (*Leucothoë axillaris*) and on lilac (*Syringa vulgaris*), and *Sphaerotheca pannosa* on rose (*Rosa* sp. 'Mr. Lincoln'). Since powdery mildew is usually a late-season disease, fungicide applications were started in mid-June or mid-July and repeated at 10- to 14-day intervals. Although ranking among shrub species varied somewhat, control of powdery mildew was generally good or excellent with Bayleton, Benlate, dodemorph (Milban), phenylmercury acetate (Tag), Topas, triforine, and etaconazole (Vanguard). At very high rates of application, Bayleton was occasionally slightly phytotoxic.

Although rust diseases often can be avoided through cultivar selection, fungicide application is the preferred control measure on established woody plants. Tests were conducted to control *Gymnosporangium juniperi-virginianae* on crabapple (*Malus ioensis*), *G. globosum* on hawthorn (*Crataegus mollis*), and *Phragmidium* sp. on potentilla (*Potentilla fruticosa*). As with the succulent ornamentals, the sterol-inhibiting systemics Baycor, Bayleton, and triforine, applied two or three times at 14-day intervals, gave excellent or good control.

Scab is another serious problem on landscape crabapples. Tests were conducted to control *Venturia inaequalis* on crabapple (*Malus* spp.) and *Fusicladium pyracanthae* on firethorn (*Pyracantha coccinea*). In one test on crabapple, a single application of captafol (Difolatan) was markedly superior to other treatments. In other tests, Baycor and Topas gave acceptable control of scab. Timing of fungicide applications was often critical.

The acceptable threshold level for leaf spot diseases in amenity plantings is much lower than that for leaf diseases on agronomic plants. Tests were conducted for control of *Septoria cornicola* on dogwood (*Cornus stolonifera*), *Entomosporium maculatum* on photinia (*Photinia fraseri*), *Alternaria tenuissima* on pittosporum (*Pittosporum tobira*),

Diplocarpon rosae on rose (*Rosa* spp.), and *Herpobasidium deformans* on honeysuckle (*Lonicera tatarica*). These pathogens have either primary and secondary or extended primary infection periods. Protection of leaves for several weeks is desirable. The protectant fungicides Daconil 2787, zineb (Dithane Z-78), Manzate 200, zyban, and Benlate generally controlled diseases better than did the systemics Bayleton and triforine. Improved control was reported with applications at intervals shorter than 14 days.

Root rots caused by *Phytophthora cinnamomi* reduce growth and may kill ericaceous plants. Tests were conducted on andromeda (*Pieris* sp. 'Browers Beauty') and azalea (*Rhododendron obtusum*). Fosetyl Al (Aliette) and Subdue significantly reduced disease damage. Foliar spray, top dress, granular, and water-siphon applications were as effective as soil drenches.

Trees. Established trees in the landscape are frequently so large that individuals or institutions do not own equipment capable of covering the plants with a fungicide. A disease must be aesthetically unacceptable or threatening to plant health before a fungicide application is warranted and a commercial arborist is hired. Anthracnose diseases on deciduous trees and Diplodia dieback on pine are often considered sufficiently serious to justify spray application. Fungicide efficacy trials for these diseases were reported from New Jersey, Illinois, and Mississippi.

Anthracnose diseases on trees cause leaf blight but may also cause twig and/or shoot blight. Selection of a suitable fungicide is influenced by the plant part requiring protection. Tests were conducted to control *Gnomonia platani* on sycamore (*Platanus occidentalis*), *G. leptostyla* on walnut (*Juglans nigra*), and *Glomerella cingulata* on tulip tree (*Liriodendron tulipifera*). For protection of leaves on walnut and tulip tree, Benlate gave the best control, with Topas, Manzate 200, and zyban giving significant control over untreated checks. Baycor gave the best protection of twigs and shoots on sycamore.

Fungicides reduce the incidence and severity of tip blight (*Diplodia pinea*) of Scots pine (*Pinus silvestris*) occurring on trees under environmental stress. In New Jersey, three sprays of Benlate, Baycor, or Daconil 2787 at 14-day intervals beginning in mid-May gave satisfactory control.

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