

Fungicide and Nematicide Update

DAN NEELY, Illinois Natural History Survey, Champaign

Fungicide Testing on Woody Ornamentals and Shade Trees

Of the 39 reports of fungicide trials on ornamental plants and landscape trees in volume 38 of *Fungicide and Nematicide Tests, Results of 1982*, 22 concern diseases of woody ornamentals and shade trees. The trials were conducted on 10 species of trees and 8 woody ornamentals.

Phytophthora root rot. Tests were conducted in Virginia to control Phytophthora root rot (*Phytophthora cinnamomi*) on azalea (*Rhododendron obtusum* 'Hershey Red'), mountain laurel (*Kalmia latifolia* 'Pink Surprise,' 'Nipmuck'), pieris (*Pieris japonica*), rhododendron (*Rhododendron* 'Nova Zembla'), and yew (*Taxus cuspidata* 'Densiflora'). Phytophthora root rot and wilt of ericaceous plants primarily affects young stock and hybrid seedlings. It occurs frequently on grafted plants 2 and 3 years old but seldom affects older plants. In Virginia tests in 1982, Subdue drench prevented infection and protected mountain laurel cuttings from root rot and wilt and significantly reduced infection on yew. Aliette granules incorporated or broadcast were as effective as Subdue drench on pieris, azalea, and rhododendron. Tests in 1981 in Ohio showed that Subdue was more effective than Aliette against *P. parasitica* on azalea but was not significantly different from Aliette against *P. cinnamomi* on rhododendron.

Rust. Fungicide trials were completed in Illinois on the control of rust (*Gymnosporangium juniperi-virginianae*) on crabapple (*Malus ioensis*) and leaf rust (*G. globosum*) on hawthorn (*Crataegus mollis*). In Louisiana, fungicide tests on the control of fusiform rust (*Cronartium quercuum* f. sp. *fusiforme*) on slash pine (*Pinus elliottii*) were completed in 1982. The primary purpose of the leaf rust tests on woody plants was to confirm the protective and eradicated action of the sterol-inhibiting (SI) fungicides. The SI fungicides gave excellent control of birch rust in Oregon, hawthorn rust in Wisconsin and Illinois, and crabapple rust in Illinois in 1980. Rust control was excellent on hawthorn in Wisconsin and Illinois, on crabapple in Illinois, and on rose in Wisconsin in 1981. In 1982 in Illinois, no lesions were observed on crabapple or hawthorn trees sprayed twice with Bayleton, whereas disease severity was moderate to heavy on unsprayed trees or trees sprayed with other broad-spectrum fungicides. Bayleton is now labeled for use on crabapple and hawthorn and should be included in fungicide trials by commercial applicators.

Bayleton was not effective in reducing the growth or sporulation of fusiform rust galls on pine in Louisiana.

Scab. Scab (*Venturia inaequalis*) is a second serious disease of flowering crabapple, and a 1982 test in Wisconsin compared the SI fungicides with Benlate for the control of scab on the *Malus* cultivar Hopa. Baycor, Benlate, and Baycor plus Benlate gave significantly better control than Bayleton or no treatment. Baycor and Benlate gave equally good scab control in New Jersey tests in 1981. When both scab and rust are problems on established crabapple or hawthorn trees, a spray mixture of Benlate and Bayleton would appear to be most efficacious.

Entomosporium leaf spot. In the South, Entomosporium leaf spot (*Entomosporium maculatum*) is a problem on *Photinia fraseri*. Four test reports were submitted on this disease in 1982, three from Alabama and one from Virginia. Daconil 2787 was more effective than other fungicide treatments in reducing the incidence of leaf spot on new foliage. Manzate 200 and Bordeaux mixture also significantly reduced leaf spot incidence in Alabama tests. Bayleton reduced leaf spot incidence significantly at the 1/2 lb and 1 lb/100 gal rates but not at the 1/4 lb rate in Virginia.

Sclerotinia flower blight. Camellia flower blight (*Sclerotinia camelliae*) has been a locally serious problem in many southern states for the last 30 years. Neither blossom nor ground sprays with fungicides have been particularly successful in controlling the disease. A report was submitted from Louisiana in which one of the SI fungicides (Baycor) was evaluated on *Camellia japonica* 'Tricolor.' In this test, in which 50% of the blossoms on unsprayed controls were blighted, five spray applications of Baycor to blossoms reduced the number of flowers blighted by 39%.

Needle cast. Rhabdocline needle cast on Douglas-fir (*Pseudotsuga menziesii*) causes defoliation of infected needles in the first year, while healthy trees retain needles for 8 years or longer. This disease is serious in Christmas tree plantations and ornamental plantings in the Northeast and in native stands in the West. A test in Connecticut in 1982 evaluated fungicides for the control of *Rhabdocline pseudotsugae*. Only trees treated with Daconil 2787 were in significantly better condition than the controls, and even then, performance of Daconil 2787 was not commercially acceptable.

Canker. Phomopsis canker limits the use of the Russian olive (*Elaeagnus*

angustifolia) as an ornamental in the Midwest. Frequently, many branches on a tree are girdled and killed. Wisconsin researchers evaluated SI fungicides and Benlate for the control of *Phomopsis elaeagni* in a naturally infected commercial nursery sprayed in May and June of 1982. Benlate and Baycor dramatically reduced the number of new cankers forming on the plants through mid-July. Bayleton was not effective. No treatment was effective through the end of August.

Chemical phytotoxicity. Seven reports from Ohio had as their primary aim the determination of possible fungicide phytotoxicity to host trees. The fungicides were applied one and four times at a standardized rate. Daconil 2787 was not toxic to Simon poplar, Hall's honeysuckle, or American elm; Triforine was not toxic to Radiance crabapple (two tests); Kocide 101 was not toxic to Washington hawthorn; and Terraclor was not toxic to Japanese larch.

Summary. Woody plants on residential, institutional, or urban sites place restrictions on fungicide usage not encountered with field, forage, or orchard crops. The limited target surface to be sprayed and the essential avoidance of nontarget plants make the choice of method, machine, and pesticide crucial. The sizes of woody plants may force grounds managers to hire professional applicators with large sprayers. The desire to limit fungicide usage in populated sites and the expense per application encourage the use of as few applications as give good results. Bordeaux fungicides have never been aesthetically appealing in urban sites. The organic mercury fungicides with their limited systemic capabilities, broad spectrum, and high fungitoxicity were widely used before they were removed from the market. The dithiocarbamate fungicides are effective but require repeated applications. The benzimidazole fungicides are widely used but are not effective in the control of rust or root rot diseases. The SI fungicides that move systemically up and down the plant and require limited repeat applications should find a ready market in the urban site once their efficacy has been established.

Dr. Neely is editor of the ornamentals section of Fungicide and Nematicide Tests. William C. Nesmith, Editor, published annually by the New Fungicide and Nematicide Data Committee of The American Phytopathological Society. Copies of current and past volumes may be obtained from Richard E. Stuckey, Business Manager F & N Tests, Plant Pathology Department, University of Kentucky, Lexington 40546.

APS SUSTAINING ASSOCIATES

ABBOTT LABORATORIES, North Chicago, IL
 AGWAY, INC., Syracuse, NY
 AMERICAN CYANAMID CO., Princeton, NJ
 AMERICAN HOECHST CORP., Somerville, NJ
 ARIZONA AGROCHEMICAL CO., Phoenix, AZ
 BASF WYANDOTTE CORPORATION, Parsippany, NJ
 BFC CHEMICALS, INC., Wilmington, DE
 BUCKMAN LABORATORIES, INC., Memphis, TN
 CARGILL, INC., Aurora, IL
 A. L. CASTLE, INC., Hollister, CA
 CHEVRON CHEMICAL COMPANY, Richmond, CA
 CHEVRON CHEMICAL COMPANY, San Francisco, CA
 CIBA-GEIGY CORP., Agricultural Division, Greensboro, NC
 DEKALB-PFIZER GENETICS, St. Louis, MO
 DEL MONTE CORP., San Leandro, CA
 DIAMOND SHAMROCK CORPORATION, Cleveland, OH
 DOW CHEMICAL CO., Midland, MI
 E. I. DU PONT DE NEMOURS & CO., Wilmington, DE
 FERRY-MORSE SEED CO., Mountain View, CA
 FMC CORP., Agricultural Chemical Division, Princeton, NJ
 FRITO-LAY, INC., Irving, TX
 GREAT LAKE CHEMICAL CO., West Lafayette, IN
 GUSTAFSON, INC., Des Moines, IA
 JOSEPH HARRIS CO., INC., Moreton Farm, Rochester, NY
 H. J. HEINZ CO., Bowling Green, OH
 ICI AMERICAS, INC., Goldsboro, NC

ILLINOIS CROP IMPROVEMENT ASSOCIATION, INC., Urbana, IL
 ILLINOIS FOUNDATION SEEDS INC., Champaign, IL
 JANSSEN PHARMACEUTICA, Piscataway, NJ
 KALO AGRICULTURAL CHEMICALS, Quincy, IL
 LAB DI FITOVIROLOGIA, Torino, Italy
 ELI LILLY & CO., ELANCO PRODUCTS CO. DIVISION, Indianapolis, IN
 MALLINCKRODT, INC., St. Louis, MO
 MERCK & CO., INC., Rahway, NJ
 MOBAY CHEMICAL CORP., Kansas City, MO
 MONSANTO CO., St. Louis, MO
 NOR-AM AGRICULTURAL PRODUCTS, Naperville, IL
 NORTHRUP KING & CO., Minneapolis, MN
 OGLEVEE ASSOCIATES, INC., Connellsville, PA
 OLIN CORPORATION, Agricultural Division, Little Rock, AR
 PENNWALT CORP., Tacoma, WA
 PFISTER HYBRID CORN CO., El Paso, IL
 PFIZER, INC., Chemical Division, TEKCHEM, New York, NY
 PIONEER HI-BRED INTERNATIONAL, INC., Johnston, IA
 RHONE-POULENC INC., Monmouth Junction, NJ
 ROHM AND HAAS CO., Philadelphia, PA
 SANDOZ, INC., San Diego, CA
 O. M. SCOTT & SONS, Marysville, OH
 STAUFFER CHEMICAL CO., Mountain View, CA
 UNIROYAL CHEMICAL, Bethany, CT
 UNITED BRANDS CO., Lalima Cortes, Honduras
 WONDER LIFE CORPORATION OF AMERICA, Des Moines, IA
 YODER BROTHERS, Barberton, OH

1983 Advertisers Index

Page Number

Academic Press, Inc.
 Breakthrough, Inc.
 Ted Brown Associates
 Campbell Scientific Inc.
 Electro-General Corporation
 Environmental Growth Chambers
 The Free Press, Division of MacMillan Publishing Co., Inc.
 Fungicide and Nematicide Tests
 Irrrometer Company
 The New York Botanical Garden 840
 Omnidata International Inc.
 Rheem Manufacturing Company, Scientific Products Division
 Springer-Verlag New York Inc.
 Telatemp Corp.
 University of Texas Press

Call for Photographs

Full-color photographs will be published on the front cover of PLANT DISEASE each month. If you would like to have your photographs considered for publication on the cover (at no cost to you), please send them to PLANT DISEASE, c/o Mary Beth Hendrickson, 3340 Pilot Knob Road, St. Paul, MN 55121.

Send slides only. Slides will not be returned unless arrangements are made before their submission. A copy or photocopy of the form at right must accompany each slide. If more than one slide is submitted, number each one and place the same number after the word "Number" on the corresponding form.

OFFICE USE ONLY ID _____	Number _____ Description _____
Group _____ Category _____	_____
Source _____	_____
Host _____	_____
Disease _____	Your name _____
Pathogen—Scientific name _____	Address _____
Other _____	<input type="checkbox"/> No need to return slide
_____	<input type="checkbox"/> Please return slide