

THE AMERICAN PHYTOPATHOLOGICAL SOCIETY

Founded 1908

Incorporated 1915

The APS Council

President, GEORGE W. BRUEHL, Washington State University, Pullman
President-Elect, DURWARD F. BATEMAN, Cornell University, Ithaca, New York
Immediate Past President, ROBERT AYCOCK, North Carolina State University, Raleigh
Vice-President, JOHN F. SCHAFER, Washington State University, Pullman
Secretary, WILEY N. GARRETT, University of Georgia, Athens
Treasurer, EDGAR L. KENDRICK, Agricultural Research Service-USDA, New Orleans, Louisiana
Editor-in-Chief, ROY L. MILLAR, Cornell University, Ithaca, New York

Councilors:

DAVID W. ROSBERG, Texas A&M University, College Station (At Large)
FRANCIS A. WOOD, University of Minnesota, St. Paul (At Large)
J. ARTIE BROWNING, Iowa State University, Ames (At Large)
BENJAMIN H. WAITE, AID/University of Florida, San Salvador (Caribbean)
ARTHUR L. HOOKER, University of Illinois, Urbana (North Central)
L. V. EDGINGTON, University of Guelph, Ont., Canada (Northeastern)
R. JAMES COOK, Washington State University, Pullman (Pacific)
W. L. KLARMAN, University of Maryland, College Park (Potomac)
CLINTON H. GRAVES, JR., Mississippi State University, State College (Southern)

Staff:

R. J. TARLETON, Executive Vice-President; The American Phytopathological Society, 3340 Pilot Knob Road, St. Paul, Minnesota 55121.

DIVISIONS OF THE SOCIETY

Caribbean: Pres. RAUL MUNOZ, Compania de Desarrollo Bananero de Guatemala, Ltd., Bandegua, Bananera, Izabel, Guatemala, C.A.; Vice-Pres. ROBERT T. MC MILLAN, JR., University of Florida, Homestead; Sec'y.-Treas. GUILLERMO E. GALVEZ-E., CIAT, Apartado Aéreo 6713, Cali, Colombia, S.A.
Northeastern: Pres. J. S. BOYLE, The Pennsylvania State University, University Park; Vice-Pres. E. G. BRENNAN, Rutgers University, New Brunswick, New Jersey; Sec'y.-Treas. R. A. CAPPELLINI, Rutgers University, New Brunswick, New Jersey.
North Central: Pres. JOSEPH E. HUGUELET, North Dakota State University, Fargo; Vice-Pres. A. H. ELLINGBOE, Michigan State University, E. Lansing; Sec'y.-Treas. CLARE B. KENAGA, Purdue University, Lafayette, Indiana.
Pacific: Pres. D. E. MATHRE, Montana State University, Bozeman; Vice-Pres. J. A. HOFFMANN, Utah State University, Logan; Sec'y.-Treas. M. F. STONER, Calif. State Polytechnic University, Pomona
Potomac: Pres. T. H. BARKSDALE, Agricultural Research Center, Beltsville, Maryland; Vice-Pres. FRANCES M. LATTERELL, U.S. Department of Agriculture, Frederick, Maryland; Sec'y.-Treas. J. R. STAVELY, Agricultural Research Center, Beltsville, Maryland.
Southern: Pres. CARTER P. SEYMOUR, Florida Department of Agriculture and Consumer Services, Gainesville; Vice-Pres. ROBERT H. LITTRELL, University of Georgia, Tifton; Sec'y.-Treas. ROBERT W. TOLER, Texas A&M University, College Station.

EDITORIAL AND BUSINESS STAFF

TECHNICAL EDITOR, Robert J. Minter; BUSINESS MANAGER, R. J. Tarleton; The American Phytopathological Society, 3340 Pilot Knob Road, St. Paul, Minn. 55121.

Subscriptions: Communications should be addressed to The American Phytopathological Society, 3340 Pilot Knob Road, St. Paul, Minn. 55121. **Nonmember subscription price:** \$70 per year domestic, foreign postage \$6.00/yr. extra (including Canada and Mexico). **Single current numbers** (within 60 days of publication): \$7.00. (Price of back volumes and separate numbers on request.) **Airmail rates for delivery outside of North America quoted on request.** **Ten-Year Index** (Vol. 31-40, 1941-1950): paper cover, \$5.00. **Ten-Year Index** (Vol. 41-50, 1951-1960): paper cover, \$5.00. Claims for copies lost in domestic mails must be received within 90 days from the date of issue, otherwise the replacement charge will be \$7.00. Deliveries overseas are not guaranteed; foreign mailings are made at the subscriber's risk. No endorsement of any statement of claims made in advertisements is assumed by this Journal or by The American Phytopathological Society. **Membership in The American Phytopathological Society:** Information concerning membership in The American Phytopathological Society and special publication rates for members will be supplied by the Secretary or the Business Manager.

Published monthly at The American Phytopathological Society
3340 Pilot Knob Road, St. Paul, Minn. 55121

Second class postage paid at St. Paul, Minn. and additional mailing offices.
Subscription, \$70.00 per year

Phytopathology

EDITORIAL BOARD

Editor-in-Chief:

R. L. MILLAR, Department of Plant Pathology, Cornell University, Ithaca, NY 14853

Senior Editors:

R. J. COOK, USDA, Washington State University, Pullman 99163

R. G. GROGAN, University of California, Davis 95616

T. P. PIRONE, University of Kentucky, Lexington 40506

L. SEQUEIRA, University of Wisconsin, Madison 53706

ASSOCIATE EDITORS

R. BAKER, Colorado State University, Fort Collins

R. D. BERGER, University of Florida, Gainesville

G. B. BERGESON, Purdue University, West Lafayette, Indiana

G. BIRD, Michigan State University, East Lansing

J. F. BROWN, University of New England, Armidale, N.S.W., Australia

D. COPLIN, Ohio Agricultural Research & Development Center, Wooster

D. D. DAVIS, Pennsylvania State University, University Park

U. DIENER, Auburn University, Auburn, AL

J. E. DUFFUS, USDA, Salinas, California

A. H. ELLINGBOE, Michigan State University, East Lansing

R. E. FORD, University of Illinois, Urbana

D. M. GRIFFIN, Australian National University, Canberra, Australia

G. GRIFFIN, Virginia Polytechnic Institute, Blacksburg

H. E. HEGGESTAD, USDA, Beltsville, Maryland

E. HIEBERT, University of Florida, Gainesville

A. L. HOOKER, University of Illinois, Urbana

J. KUĆ, University of Kentucky, Lexington

F. M. LATTERELL, USDA, Frederick, Maryland

R. LAWSON, USDA, Agricultural Research Center-West, Beltsville, Maryland

K. LEONARD, North Carolina State University, Raleigh

L. LITTLEFIELD, North Dakota State University, Fargo

A. H. MC CAIN, University of California, Berkeley

C. J. MIROCHA, University of Minnesota, St. Paul

C. NIBLETT, Kansas State University, Manhattan

S. PATIL, University of Hawaii, Honolulu

R. PATTON, University of Wisconsin, Madison

J. D. ROGERS, Washington State University, Pullman

D. J. SAMBORSKI, Canada Agriculture, Winnipeg

H. W. SCHROEDER, USDA, College Station, Texas

J. S. SEMANCIK, University of California, Riverside

E. SHARP, Montana State University, Bozeman

R. J. SHEPHERD, University of California, Davis

A. L. SHIGO, USDA, Durham, New Hampshire

W. A. SINCLAIR, Cornell University, Ithaca, NY

D. H. SMITH, Texas A & M University, Yoakum

M. STANGHELLINI, University of Arizona, Tucson

J. STEADMAN, University of Nebraska, Lincoln

J. STRANDBERG, University of Florida, Sanford

B. G. TWEEDY, Ciba-Geigy, Greensboro, North Carolina

H. VAN ETTEN, Cornell University, Ithaca, NY

A. K. VIDAVER, University of Nebraska, Lincoln

R. ZEYEN, University of Minnesota, St. Paul

GENERAL PUBLICATION POLICIES

At least one author must be a member of The American Phytopathological Society, except that any subscription outside the United States or Canada may have published, by a staff member, one paper (in English) per volume. A letter of transmittal, signed by an official of the foreign institution, should accompany such manuscripts.

Submission of manuscripts: Submit all new manuscripts to The American Phytopathological Society, Editorial Office, 3340 Pilot Knob Road, St. Paul, Minnesota 55121. Do not submit new manuscripts to the Editor-in-Chief. Submission implies nonsubmission elsewhere and (if accepted) no publication elsewhere in the same form without consent.

Content: Contributions should fall into the following categories: 1) Original research on some aspect of plant pathology or brief accounts of techniques or phytopathological history of general importance. Subject matter is not a criterion for judging the merit of an article for publication in *Phytopathology*. It is, however, the author's duty to establish relevancy to the science of plant pathology. 2) Review papers developing a new concept, hypothesis, theory, or other integration of plant pathology. 3) Letters to the Editor: These may explain, amplify, or otherwise comment upon research published in the journal or elsewhere. Letters to the editor are reviewed in the same manner as regular contributions, and the Editorial Board reserves the right to reject, or to publish, letters of rebuttal when appropriate. If possible, the opportunity will be provided for a letter of rebuttal to appear in the same issue as the letter to which it is directed.

Separates: No free copies supplied. Reprints will be available at a nominal cost; quotation will be sent with proof.

For style details, follow: Author's Guide for Manuscript Preparation, *Phytopathology* 67:5-8, 1977, and CBE Style Manual (third edition, 1972), available from Amer. Inst. Biol. Sci., Washington, D.C. Authors are urged to have one or more colleagues read the manuscript *critically* prior to submission.

Use of material from this journal: *Phytopathology* is copyrighted, and those who wish to borrow illustrations or data appearing in *Phytopathology* for use in other publications should obtain the permission of the author of the paper and of the Editor-in-Chief, and provide a line crediting *Phytopathology* as the source of the material.