THE AMERICAN PHYTOPATHOLOGICAL SOCIETY

Founded 1908

Incorporated 1915

The APS Council

President, ROBERT AYCOCK, North Carolina State University, Raleigh President-Elect, GEORGE W. BRUEHL, Washington State University, Pullman Immediate Past President, JAMES F. TAMMEN, The Pennsylvania State University, University Park Vice-President, DURWARD F. BATEMAN, Cornell University, Ithaca, New York Secretary, WILEY N. GARRETT, University of Georgia, Athens Treasurer, LAURENCE H. PURDY, University of Florida, Gainesville Editor-in-Chief, ALBERT R. WEINHOLD, University of California, Berkeley

Councilors:

JOHN F. SCHAFER, Washington State University, Pullman (At Large) DAVID W. ROSBERG, Texas A & M University, College Station (At Large) FRANCIS A. WOOD, University of Minnesota, St. Paul (At Large) HOUSTON B. COUCH, Virginia Polytechnic Institute, Blacksburg (Potomac) BENJAMIN H. WAITE, AID/University of Florida, San Salvador (Caribbean) ARTHUR L. HOOKER, University of Illinois, Urbana (North Central) CARL W. BOOTHROYD, Cornell University, Ithaca, New York (Northeastern) R. B. HINE, University of Arizona, Tucson (Pacific) 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. JORGE VICTORIA, Instituto Colombiano Agropecuario, ICA, Palmira, Colombia; Vice-Pres. RAUL MUNOZ, Compania de Desarrollo Bananero de Guatemala, Ltd., Bandegua, Bananera, Izabel, Guatemala, C.A.; Sec'y.-Treas. GUILLERMO E. GALVEZ-E., CIAT, Apartado aéreo 6713, Cali, Colombia, S.A.

Northeastern: Pres. R. J. CAMPANA, University of Maine, Orono; Vice-Pres. R. L. MILLAR, Cornell University, Ithaca, N.Y.; Sec'y.-Treas. J. S. BOYLE, The Pennsylvania State University, University Park.

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. R. STACE-SMITH, Canada Department of Agriculture, Vancouver; Vice-Pres. D. E. MATHRE, Montana State University, Bozeman; Sec'y.-Treas. J. A. HOFFMAN, Utah State University, Logan.

Potomac: Pres. W. L. KLARMAN, University of Maryland, College Park; Vice-Pres. T. H. BARKSDALE, Agricultural Research Center, Beltsville, Maryland; Sec'y.-Treas. J. R. STAVELY, Agricultural Research Center, Beltsville, Maryland.

Southern: Pres. LOWELL BLACK, Louisiana State University, Baton Rouge; Vice-Pres. CARTER P. SEYMOUR, Florida Department of Agriculture and Consumer Services, Gainesville; Sec'y.-Treas. ROBERT W. TOLER, Texas A&M University, College Station.

EDITORIAL AND BUSINESS STAFF

TECHNICAL EDITOR, Robert J. Minteer; BUSINESS MANAGER and ADVERTISING DIRECTOR, 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. Subscription price: \$60 per year domestic, foreign postage \$3.00/yr. extra (including Canada and Mexico). Single current numbers (within 60 days of publication): \$6.00. (Price of back volumes and separate numbers 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 \$6.00. Deliveries werseas are not guaranteed; foreign mailings are made at the subscriber's risk. Advertisement: Rates may be secured from the Advertising Director. 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. Subscription, \$60.00 per year

Phytopathology

EDITORIAL BOARD

- A. R. WEINHOLD, Editor-in-Chief, Department of Plant Pathology, University of California, Berkeley 94720
- M. E. CORDEN, Senior Editor, Oregon State University, Corvallis 97331
- B. W. KENNEDY, Senior Editor, University of Minnesota, St. Paul 55101
- J. L. LOCKWOOD, Senior Editor, Michigan State University, East Lansing 48823

ASSOCIATE EDITORS

- L. J. ASHWORTH, JR., University of California, Parlier
- C. W. AVERRE, North Carolina State University, Raleigh
- J. A. BROWNING, Iowa State University, Ames
- W. R. BUSHNELL, USDA, University of Minnesota, St. Paul
- E. E. BUTLER, University of California, Davis
- D. D. DAVIS, Pennsylvania State University, University Park
- R. E. DAVIS, USDA, Beltsville, Maryland
- P. R. DAY, Connecticut Agricultural Experiment Station, New Haven
- G. DE ZOETEN, University of Wisconsin, Madison
- J. E. DUFFUS, USDA, Salinas, California
- W. H. ENGLISH, University of California, Davis
- J. W. GERDEMANN, University of Illinois, Urbana
- R. R. GRANADOS, Boyce Thompson Institute, Yonkers, New York
- R. G. GROGAN, University of California, Davis
- R. I. HAMILTON, Canada Agriculture, Vancouver
- H. E. HEGGESTAD, USDA, Beltsville, Maryland
- M. L. LACY, Michigan State University, East Lansing
- C. LEBEN, Ohio Agriculture R & D Center, Wooster

- E. S. LUTTRELL, University of Georgia, Athens
- S. PATIL, University of Hawaii, Honolulu
- Z. A. PATRICK, University of Toronto, Ontario, Canada
- R. D. RIGGS, University of Arkansas, Fayetteville
- A. P. ROELFS, University of Minnesota, St. Paul
- R. P. SCHEFFER, Michigan State University, East Lansing
- J. S. SEMANCIK, University of California, Riverside
- J. F. SHEPARD, Montana State University, Bozeman
- A. F. SHERF, Cornell University, Ithaca, New York
- M. R. SIEGEL, University of Kentucky, Lexington
- W. A. SINCLAIR, Cornell University, Ithaca, New York
- D. H. SMITH, Texas A&M University, Yoakum
- E. K. SOBERS, University of Georgia, Coastal Plain Station, Tifton
- D. H. SPALDING, USDA, Miami, Florida
- R. STACE-SMITH, Canada Agriculture, Vancouver
- M. E. STANGHELLINI, University of Arizona, Tucson
- P. H. TSAO, University of California, Riverside
- H. VAN ETTEN, Cornell University, Ithaca, New York
- J. L. VAN ETTEN, University of Nebraska, Lincoln
- B. M. ZUCKERMAN, University of Massachusetts, East Wareham

GENERAL PUBLICATION POLICIES

At least one author must be a member of The American Phytopathological Society, except that any subscribing institution 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. Subject matter is not a criterion for judging the merit of an article for publication in Phytopathology. It is, however, the authors' 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) Phytopathological Notes: These are accounts of techniques, original research, or phytopathological history of general importance, but sufficiently brief as not to exceed two published pages. 4) 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.

Page charge: A charge of \$25 per published page will apply to all manuscripts submitted by authors, except obituaries and those submitted in response to invitation by the Society.

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 Prepparation, Phytopathology 65:1-4, 1975, 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 not copyrighted, but 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 provide a line crediting *Phytopathology* as the source of the material.