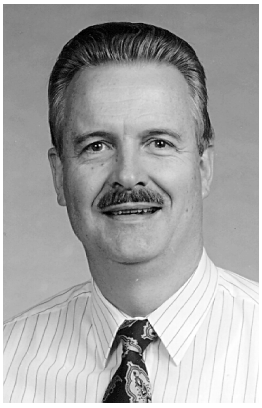
Fellows

Ten members of The American Phytopathological Society were honored as Fellows of the Society at the 1996 APS/MSA Annual Meeting in Indianapolis, IN. Election as a Fellow is a reflection of the high esteem in which a member is held by colleagues. The award is given in recognition of outstanding contributions in extension, research, teaching, or other activities related to the science of plant pathology, to the profession, or to the Society. Publication no. P-1996-1125-05O

James R. Aist



James R. Aist was born in Cheverly, MD, and grew up in Arkansas. He matriculated at the University of Arkansas, Fayetteville, in 1962 and graduated Phi Beta Kappa with a combined major in botany and bacteriology in 1966. He continued his education, as an NSF Graduate Fellow, at the University of Arkansas, where he received an M.S. degree in plant pathology in 1968. It was here that he began his studies of the nuclear behavior of plant-pathogenic fungi. He pursued further graduate training as an NSF Graduate Fellow at the University of Wisconsin, Madison, where he obtained a Ph.D. degree in plant pathology in 1971. During this time, Dr. Aist became interested in the biology of fungal pathogens of plants and plant disease resistance mechanisms. His paper on the method of plant cell penetration by Plasmodiophora brassicae is a modern classic that set a standard of high quality, accuracy, and detail for future cytological studies. With a postdoctoral fellowship from NATO, he conducted a freeze-fracture study of host-pathogen membrane interfaces at the Swiss Federal Institute of Technology in Zurich.

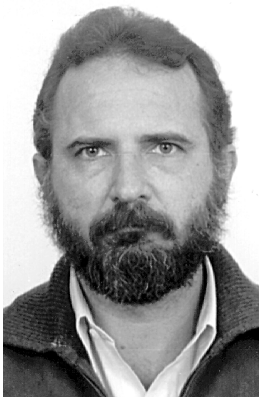
Returning to the United States, Dr. Aist began a career in research and teaching in the Department of Plant Pathology at Cornell University, Ithaca, NY. Following his appointment as assistant professor in 1972, he was promoted to associate professor in 1978 and professor in 1986. At Cornell, Dr. Aist continued his research in the areas of fungal cell biology and cellular mechanisms of plant disease resistance. He made major contributions to our understanding of nuclear motility and mitosis in plant-pathogenic fungi and elucidated much of what is known about papilla formation as a disease resistance mechanism.

Dr. Aist has published extensively, with 66 original research articles and 13 review articles to his credit. His research is characterized by the application of state-of-the-art technologies to plant pathology and mycology, including freeze-etching and -substitution, acoustic and video microscopy, microspectrophotometry, computer-assisted 3D serial-section reconstruction, laser microbeam microsurgery, and laser-induced optical traps. He is currently teaching Introductory Mycology, a course in fungal biology. Eight graduate students have received advanced degrees under his guidance.

The consistent quality of Dr. Aist's research is attested to by the 15 federal grants awarded to him over the past 23 years. He has been asked to organize or coorganize eight national or international symposia and has presented more than 60 invited lectures and seminars at conferences, congresses, and universities around the world. Dr. Aist is recognized as a world authority on both the cytology of fungi and the cellular mechanisms of plant disease resistance.

Dr. Aist has also been active in professional and community service. He has been an associate editor of *Phytopathology* and *Experimental Mycology* and has served on several APS committees. He is the faculty advisor for three student organizations at Cornell, including the Chi Alpha Christian Fellowship. Dr. Aist's contributions to the community include church and para-church leadership.

Armando Bergamin Filho



Armando Bergamin Filho was born in Piracicaba, Brazil. He graduated from Escola Superior de Agricultura Luiz de Queiroz (ESALQ), University of Sao Paulo in 1971 with a B.S. degree in agronomy. He received his M.Sc. and Ph.D. degrees in phytopathology from the same university in 1973 and 1975, respectively. In 1974, he joined the Phytopathology Department at ESALQ as an assistant professor. He was promoted to associate professor in 1985, coordinated the graduate program in plant pathology (1984–1986), and has served on faculty and administrative committees. He has remained at ESALQ his entire career.

Dr. Bergamin specializes in plant disease. epidemiology He has traveled extensively to participate in courses and workshops. As a visiting professor, Dr. Bergamin worked on epidemiology of virus diseases with T. Inouye, Osaka Prefectural University, Japan; on general epidemiology with J. Kranz, Tropeninstitut of the Justus-Liebig University, Germany, and with F. Rapilly, Institut National de la Recherche Agronomique, France; and on crop damage and loss with B. Hau, University of Hannover, Germany. He is now collaborating with colleagues from several universities and research institutes to develop a sustainable disease management program for bean in tropical and subtropical regions.

Dr. Bergamin is best known for his work in epidemiology of diseases of tropical crops and the difference in strategies that tropical pathogens use to cycle infections over a broad range of environmental conditions compared to pathogens in temperate regions. He has documented that lesion expansion is a more important component of many tropical epidemics than cycling of new infections. These concepts and other unique features of tropical plant pathosystems have been developed in his new book (with L. Amorim) *Doencas de Plantas Tropicais*: *Epidemologia e Controle Economico*. He also has edited or written a number of books published in Portuguese, which are the only plant pathological texts in this language (*Manual de Fitopatologia*, 2 vol., 3 ed.). Sales of these volumes (over 38,000 copies) suggest they may be the most widely used plant pathology texts in the world!

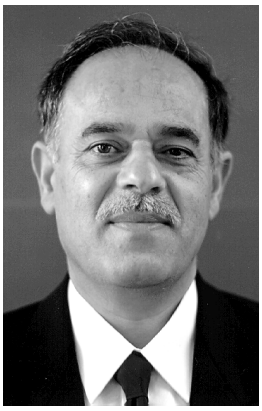
Although a successful researcher, Dr. Bergamin has had even more impact as a teacher, teaching a number of classes at both the undergraduate and graduate levels, and has been the advisor to 11 M.Sc. and 13 doctorate students in phytopathology from Brazil and other countries in Latin America. His laboratory is a major international center of epidemiological research, providing an excellent training facility on epidemiology of tropical plant diseases for graduate students and visitors. Dr. Bergamin is now teaching epidemiology for graduate students as a visiting professor at two Brazilian universities: Passo Fundo (Rio Grande do Sul) and Lavras (Minas Gerais).

Dr. Bergamin has participated in the organization of three phytopathology regional congresses, is a consultant to several agencies involved in tropical agriculture, and provides expertise on the epidemiology of South American leaf blight of rubber, citrus, sunflower, Phaseolus bean, sugarcane, and oil palm diseases, as well as coffee rust.

Dr. Bergamin has been a member of APS since 1975 and is a member of the Brazilian Phytopathological Society, the British So-

ciety for Plant Pathology, the Canadian Phytopathological Society, and the Plant Pathology Group of Sao Paulo. In 1984, he was awarded the Summa Phytopathologica prize for having published the best scientific paper in the journal from 1981 to 1982. His research projects have been financed by several Brazilian and foreign agencies.

Yigal R. Cohen

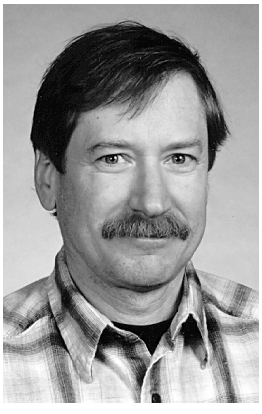


Yigal R. Cohen is a professor of Plant Pathology in the Department of Life Sciences at Bar-Ilan University, Ramat-Gan, Israel. He was awarded the Ph.D. degree from the Hebrew University of Jerusalem in 1969 and has spent his career at Bar-Ilan University. In 1977, Dr. Cohen was elected a dean of the Faculty of Natural Sciences and Mathematics and twice has been elected a member of the Board of Trustees of the University. His outstanding contributions to the science of phytopathology include original research, academic instruction, agricultural extension, and service to science.

Dr. Cohen's more than 100 research publications focus on the epidemiology, genetics of plant resistance, and control of downy mildews and late blight of potato; 40 have been published in *Phytopathology* or *Plant Disease*. Dr. Cohen was the first to discover resistance in Pernonsporales to metalaxyl, leading to the development of innovative pathogen resistance management strategies. His studies in genetics of resistance resulted in the release of muskmelon lines with multiple resistances to fungal diseases. His recent discoveries are related to systemically induced resistance against mildews and late blight. He was the first to demonstrate that polyunsaturated fatty acids can induce systemic resistance against late blight. He also showed that DL-β-aminobutyric acid can induce resistance to foliar and root diseases caused by fungi. His research has resulted in three patents. Dr. Cohen's research interests extend beyond phytopathology. He was the first to produce a homozygous gynoecious muskmelon line for hand-free F_1 hybrid seed production.

Dr. Cohen is responsible for teaching mycology and phytopathology undergraduate courses and a graduate course on mechanisms of disease resistance in plants. He is an outstanding teacher, ranked by his students as one of the best instructors in the department. Twenty M.Sc. and Ph.D. candidates have completed graduate degree programs under his supervision. Dr. Cohen's expertise in epidemiology and control of plant diseases is widely recognized by his government and the potato and melon growers of Israel. Dr. Cohen has served as president of the Israel Phytopathological Society, on the Editorial Board of *Phytopathology*, and as senior editor of *Phytoparasitica.*

Alan Collmer



Alan Collmer was born in 1945 in Philadelphia. He received a B.A. degree from Antioch College (1973) and a Ph.D. degree from Cornell University (1981). He was a postdoctoral associate in the laboratory of D. Wilson at Cornell (1981–1982) before accepting a faculty position in the Department of Botany at the University of Maryland, where he was promoted to associate professor in 1987. He joined the Department of Plant Pathology at Cornell in 1988 and became a full professor in 1994.

Dr. Collmer has made major contributions to the teaching of plant pathology and is widely recognized for his research program, both among plant pathologists and in the wider community of microbiologists. His laboratory has consistently made fundamental discoveries that have changed our view of microbiological processes and molecular mechanisms of bacteria pathogenic to plants. He determined the relative role of pectate lyase (PL) isozymes in *Erwinia chrysanthemi* soft rot disease by deleting from the bacterial genome the genes encoding PL. In the process, he discovered an unknown set of enzymes produced by the bacterium primarily in the plant. His laboratory contributed to the demonstration that the type II protein secretion pathway is widely found in gram-negative bacteria, including plant pathogens. He also discovered that type II pathways are species-specific (i.e., any particular species can secrete its own PL but not that of any other species) and determined the source of the specificity: for at least one pair of PL proteins, the C-terminal regions appear to be recognized by two species-specific secretory proteins. Dr. Collmer was instrumental in the discovery of a totally new bacterial secretory pathway (type III), encoded by a 25-kb cluster of *hrp* genes in *Pseudomonas synringae*. This pathway secretes, the recently discovered harpins, proteins contributing to induction of the hypersensitive response (HR) in incompatible plants and pathogenicity in compatible plants. The most remarkable outcome of these investigations was the discovery that the type III pathway is conserved in bacterial pathogens of both plants and animals and has evolved for the sole purpose of secreting virulence factors in both plant and animal pathogens. Thus, mechanisms of microbial pathogenesis are evolutionarily ancient and most, if not all, bacterial pathogens share common means of attacking their hosts, even if the hosts are in different taxonomic kingdoms. Dr. Collmer's laboratory also showed that harpins are produced not only by *P. syringae* pathovars that cause specialized genotype-specific diseases, but also by nonspecialized pathogens, such as *E. chrysanthemi*, that cause soft rots.

Dr. Collmer's teaching contributions are reflected by the outstanding graduate and undergraduate students he has trained and by the core graduate course he has developed at Cornell, which exposes students to concepts, terminology, current topics, tools, and techniques of plant pathology from the molecular to organismal levels. He was a corecipient of the APS Foundation Genesis Program Award for Academic Development and has been invited to participate in several conferences dealing with teaching skills and resources. In addition to his many original research articles, Dr. Collmer regularly contributes reviews and participates in the scientific publication process by serving as an editor for two professional journals.

Cleora J. D'Arcy

Cleora Jo D'Arcy was born in Asheboro, NC, in 1951. Her first exposure to plant pathology came during high school in Yonkers, NY, when she participated in a summer program at the Boyce Thompson Institute. She spent 2 years working part-time in the laboratory of R. Granados, an entomologist studying insect viruses and insect transmission of plant diseases believed to be caused by viruses. After receiving her A.B. degree in biology (magna cum laude) from Harvard University (1973), D'Arcy obtained her M.S. (1975) and Ph.D. (1978) degrees in plant pathology from the University of Wisconsin-Madison under the guidance of G. A. deZoeten. In Madison, she began working with luteoviruses, studying the purification, cytopathology, and aphid transmission of beet western yellows virus (BWYV).

In 1978, Dr. D'Arcy joined the Department of Plant Pathology (now Crop Sciences) at the University of Illinois at Urbana-Champaign as an assistant professor. Her appointment was 80% research on "viruses of importance to the state of Illinois" and 20% teaching a course in plant virology every other year. Dr. D'Arcy subsequently was promoted to associate (1984) and full (1990) professor. She became the teaching coordinator for the Department of Crop Sciences in May 1996.

Dr. D'Arcy's research program has focused on plant and insect viruses and viral diseases. She is nationally and internationally recognized for her research on luteoviruses, particularly barley yellow dwarf viruses (BYDVs). This research program has spanned development of methods, basic biological research, and applied field studies. She and her colleagues have developed methods for virus purification and produced monoclonal antibodies that are used in laboratories worldwide. Her research program has contributed basic information on the characterization of luteoviral particles, taxonomy of members of the luteovirus group, and genome organization and function. She and her colleagues also have done applied field studies, including surveys for BYDVs and BWYV and studies on host plant resistance to luteoviruses.

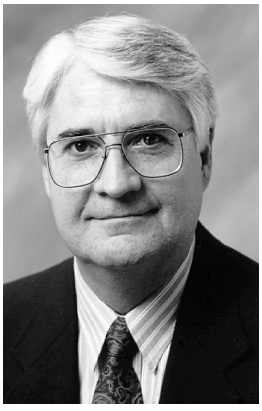
Dr. D'Arcy and her colleagues were the first to purify and characterize a virus from aphids. Rhopalosiphum padi virus (RhPV) infects several species of aphids, which are the vectors of BYDVs. In subsequent studies, she and her colleagues determined the effects of RhPV on aphid longevity and reproduction and demonstrated the spread of RhPV from one aphid to another via plants—a mirror image of BYDVs, which multiply in aphids and are spread by plants!

In her role as a virologist for the state of Illinois, Dr. D'Arcy has studied several important viruses in the state, most notably maize dwarf mosaic virus (MDMV). Studies have included epidemiology, host resistance, and yield responses.

Dr. D'Arcy has been invited to make numerous national and international presentations about her research and teaching. At Illinois, Dr. D'Arcy has developed two new courses: a graduate level course on professionalism, cotaught with W. L. Pedersen, and an undergraduate course, Plants, Pathogens, and People, which fulfills campus composition and natural science requirements. Both of these courses are unique and have served as models for courses developed at other institutions. Dr. D'Arcy has been listed 7 times on the Incomplete List of Excellent Teachers at the University of Illinois, and in 1995, she received the NACTA Teaching Award of Merit.

Dr. D'Arcy has served APS as a member of 20 committees (14 of which she chaired) and as associate editor of *Plant Disease*. She was elected to serve as councilor-at-large (1988–1991) and APS president (1993–1994). During her term as president, she increased opportunities for networking at the Annual Meeting through the addition of such program elements as the Beer and Bull Sessions at the posters, the First Timer's Orientation, and the deBary Bowl. She also presided over the first annual Breakfast Business Meeting, which has encouraged members to learn more about APS.

Larry D. Dunkle



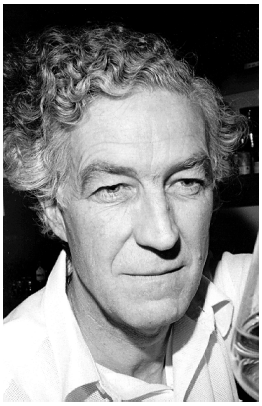
Larry D. Dunkle was born in 1943 in Helena, OK. He received his B.S. degree in biology in 1965 from Colorado State College (now the University of Northern Colorado), where his interest in fungi was cultivated by J. Gapter. He received his M.S. degree in 1968 and his Ph.D. degree in 1970 from the University of Wisconsin, under the direction of P. J. Allen, working on wheat stem rust urediospore germination and germ tube differentiation. He was an NIH postdoctoral fellow with J. VanEtten at the University of Nebraska, studying biochemistry of fungal spore dormancy and germination. In 1971, he became assistant professor in the Department of Plant Pathology at Nebraska, investigating root and stalk diseases of corn and sorghum and teaching a course in introductory plant pathology. In 1978, he moved to Purdue University to his current position with the USDA-ARS as a research plant pathologist and adjunct professor in the Department of Botany and Plant Pathology.

Dr. Dunkle's research interests include the physiology and biochemistry of fungal pathogens and host-pathogen interactions. His research involves investigations of phytotoxic metabolites produced by fungi. He has studied the structure, biosynthesis, mechanism of action, and role in pathogenesis of host-selective toxins produced by pathogens of corn and sorghum. His work involves a variety of approaches, including classical field studies, biochemical and physiological studies, genetic analyses, and molecular investigations. His studies on the mechanism of action of purified and chemically characterized preparations of peritoxin challenged the generally held hypothesis that damage to the plasma membrane resulting in loss of cellular electrolytes is the primary cause of toxin-induced cell death and disease symptoms. His demonstration that disease symptoms could be induced without detectable damage to cell membranes or impairment of their function indicated that other effects of the toxin, such as alterations in gene expression and signal transduction, are more significant to disease development.

Dr. Dunkle's studies on the toxin produced by *Cochliobolus carbonum* and its role in pathogenesis of maize demonstrated localized induced resistance, previously undescribed in maize, and indicated the toxin binds to DNA, alters protein synthesis in susceptible maize genotypes, and prevents synthesis of an antimicrobial compound by infected maize leaves. His recent studies indicate the genes controlling toxin production by the fungus are expressed during conidial germination, and the synthesis and release of the toxin by germinating conidia are regulated by morphogenesis of the germ tube during penetration of the maize leaf.

In addition to his research, Dr. Dunkle has supervised graduate students and postdoctoral associates, who he enjoys engaging in critical discussions of pathological principles and fallacious dogma. He has been active in APS, as well as the American Society of Plant Physiologists (ASPP) and the Mycological Society of America (MSA). He has served as member and chair of committees in APS and MSA, as a member of the Editorial Board of APS Press, and as senior editor or associate editor of *Phytopathology* and *Plant Physiology*. He has been invited to contribute book chapters and discuss his research findings in seminars, symposia, colloquia, and Gordon Conferences. He is recognized for his work on host-selective toxins and has been invited to participate in and organize national symposia on topics dealing with biochemical and molecular aspects of plant pathogenesis as well as on host-selective toxins.

Allen Kerr



Allen Kerr was born in Edinburgh, Scotland. He was awarded the B.S. degree with honors from the University of Edinburgh, and the Ph.D. degree from the University of Adelaide. Dr. Kerr spent most of his exemplary career as a phytopathologist at the University of Adelaide. His previous honors include the Ruth Allen and E. C. Stakman awards, the Walter Burfitt Prize of the Royal Society of New South Wales, and the inaugural Australia Prize. He was elected a Fellow of the Australasian Plant Pathology Society, the Australian Academy of Science, and the Royal Society, a Foreign Associate of the U.S. National Academy of Sciences, and an officer of the Order of Australia.

Dr. Kerr's early research was on the soilborne fungi *Rhizoctonia*, *Fusarium*, and *Pythium*, with special reference to host-parasite relationships, interactions among pathogens, and influence of soil moisture on infection. During his tenure at the Tea Research Institute in Sir Lanka, he studied the epidemiology of blister blight of tea, developed a model relating disease incidence to weather, and successfully integrated the model with a user-friendly calculating device for implementation of effective control of this disease.

In Dr. Kerr's own words, however, "My most important work has been a study of crown gall, one of the three known plant cancers. It is the only cancer, of either plant or animal, induced by a bacterium." His work on this disease began in 1967, as an ecological study of

agrobacteria in soil and on the roots of stone-fruit trees. It resulted in significantly improved understanding of the ecology and biology of the pathogen, and a unique and widely adopted biological method for control of the disease. Dr. Kerr's findings and scientific leadership facilitated numerous cooperative projects with graduate and postgraduate students and colleagues throughout the world. Strain K1026, the genetically engineered organism for crown gall control, was the first such organism registered as a pesticide and released for general use. Dr. Kerr's research led to the characterization of the chemistry of Agrocin 84, a new and very potent antibiotic with marked specificity. Other major contributions include fundamental research on the nature of bacterial conjugation, plasmid transfer, and conjugation factors. This work was of crucial importance in demonstrations by others that pathogenicity in *Agrobacterium* is encoded by the Ti plasmid. In addition to his investigations of crown gall of stone fruit, Dr. Kerr has conducted research on the transformation and regeneration of flax, control of cane gall disease of grapes, and annual ryegrass toxicity.

Dr. Kerr has served the science of phytopathology as president of the Australasian Plant Pathology Society, as vice-president of the International Society for Plant Pathology, and in numerous other capacities.

Kyung Soo Kim

Kyung Soo Kim was born in Seoul, Korea, and raised in North Korea. He fled to South Korea during the Korean conflict in 1950. He received his B.S. degree in biology from Kyung Puk National University, Korea. He received his M.S. degree in zoology in 1963 and his Ph.D. degree in plant pathology in 1971 from the University of Arkansas. His doctoral research, under J. P. Fulton, involved studying subcellular responses of systematic and hypersensitive hosts to infection by comoviruses. In 1974, he was appointed as a research associate and he became an assistant professor in the Department of Plant Pathology at the University of Arkansas. He was promoted to associate professor in 1978 and to professor in 1982. In 1993, he was appointed university professor. He is responsible for administration of the university-wide electron microscope facility and has research and teaching responsibilities in plant pathology. His research contributions are well recognized nationally and internationally, and his students can testify to his excellence in teaching.

Dr. Kim's research has been directed primarily toward plant cell ultrastructure, particularly reactions of plant cells to virus infection. Dr. Kim is a strong believer that viruses are living entities, rather than nonliving, that can sign their names in host cells. He has devoted much of his time to deciphering virus signatures and has produced the background for orderly recognition of signatures during infection. He showed that viral signatures are unique for each of several groups of plant viruses. The virus signature concept has been widely utilized to identify many unknown viruses and to discover new ones. Discovery of the mimosa striped chlorosis virus in 1987 represents one of the significant accomplishments made using this concept. This is the first plant virus with a nonenveloped, bullet-shaped particle morphology, which contains a DNA genome. This discovery helped establish a new virus group, the badnavirus group, which has been recognized by the International Committee on Taxonomy of Viruses.

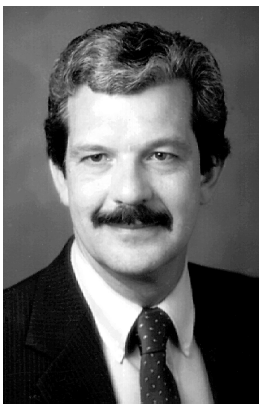
In collaboration with R. M. Goodman and J. Bird, Dr. Kim pioneered research on the ultrastructural response of host plants to whitefly-transmitted geminiviruses, whose etiological agents were unknown. A series of studies led to the discovery of a unique DNA-containing inclusion in cells infected with bean golden mosaic virus. These inclusions, often referred to as "Kim's bodies" by investigators, have been instrumental in diagnosing the diseases caused by whitefly-transmitted geminiviruses throughout the world. As a result, Dr. Kim's help and suggestions are sought by a large number of individuals researching plant virology problems. He has worked very closely with virologists as a team at the University of Arkansas and has collaborated with individuals at a number of institutions in the United States. He has done cooperative research with scientists from Brazil, Costa Rica, Canada, Puerto Rico, Great Britain, Korea, Japan, Thailand, China, and Israel. He also has collaborated with a variety of scientists in areas other than plant pathology, including entomology, agronomy, animal science, botany, and zoology.

In recognition of his distinguished contributions in science to the university community and outstanding research accomplishments, Dr. Kim received the prestigious University of Arkansas Alumni Association Award for Outstanding Research in 1989. He is a Fellow of the American Association for the Advancement of Science, and a member of APS, the American Society for Cell Biology, and Gamma Sigma Delta. He also has served as an associate editor for *Virology*.

In addition to numerous publications in scientific journals, Dr. Kim has presented a large number of seminars and invited lectures in the United States and around the world.

Each spring semester, Dr. Kim teaches a course in the use of electron microscopy in biology. By reputation, students know that this is a demanding course and that long hours and meticulous work will be required. Nonetheless, this course is regularly oversubscribed. In addition, he has directed the Ph.D. degree programs of a number of graduate students, foreign and U.S. Dr. Kim is one of today's most hard-working, conscientious, devoted leaders in plant pathology.

Robert D. Lumsden



Robert Douglas Lumsden was born in Washington, D.C., in 1938. After graduating from high School in Falls Church, VA, he attended Randolph Macon College before transferring to North Carolina State University, where he received his B.S. degree in botany and horticulture in 1961. During the summers of 1958 and 1959, he worked as an assistant in the Plant Pathology Section of the National Capital Parks in Washington, D.C. He continued his studies at North Carolina State University and received his M.S. degree in 1963. He completed his Ph.D. degree under D. F. Bateman at Cornell University in 1967, in the physiology of parasitism and the role of pectolytic, proteolytic, and phosphatide-degrading enzymes produced by *Thielaviopsis basicola.* While in graduate school, he received assistantships and fellowship awards from the National Defense Education Act and the National Institutes of Health.

In 1966, Dr. Lumsden accepted a USDA-ARS position as a research plant pathologist at what has become the Biocontrol of Plant Diseases Laboratory in Beltsville, MD. Dr. Lumsden's initial research focused on the physiology of *Sclerotinia* infection of bean. In a series of publications, Dr. Lumsden developed an understanding of the physiology of *Sclerotinia* infections and the mechanism of pathogenesis. Key enzymes were implicated. This accomplishment provided the first basic knowledge of the sequence of physiologic events that occur during pathogenesis by *Sclerotinia.* The process was further elucidated by a study of the histopathology and histochemistry of infected plants.

Dr. Lumsden is recognized for his expertise on *Pythium*, *Rhizoctonia*, and *Sclerotinia* and the ecology of soils naturally infested with these pathogens. Ecological studies resulted in identification of microorganisms potentially useful as biocontrol agents. Dr. Lumsden investigated the physiology of oospore formation, ecology of dormancy and survival of *Pythium* spp., and histopathology of *Pythium* infection. Additional ecological studies recognized the importance of municipal

sludge compost as a resource for low input sustainable agriculture for plant disease control. Dr. Lumsden and his research team demonstrated suppression by composts of Pythium damping-off and Sclerotinia rot. Related to these studies, he investigated the only operational man-made suppressive soils in the Americas (the Aztec chinampa and Mayan popal systems). Dr. Lumsden led a U.S.-Mexican project supported and funded by the USDA. He established that suppressiveness in Mexican agricultural soils to Pythium damping-off is associated with elevated organic matter, calcium content, and enhanced disease-suppressive microbial activity. Specific isolates of microbial antagonists, including *Pseudomonas cepacia*, were identified and shown to be effective in biological control of Pythium damping-off.

In 1987, Dr. Lumsden received an ARS fellowship for work at the Agricultural Food Research Council, Glasshouse Crops Research Institute (GCRI) in Littlehampton, England. While at GCRI, Dr. Lumsden conducted research on the mechanism of action of *Gliocladium virens* antagonism toward *Pythium ultimum* and damping-off of lettuce. After returning to Beltsville, Dr. Lumsden led a team to characterize the mechanism of action of *G. virens*, establishing the importance and presence in soilless potting media of the fungal antibiotic gliotoxin. This discovery demonstrated the presence of a fungus-produced antibiotic in soilless potting media with biological activity against soilborne plant pathogens. Further work has shown that certain proteins are associated with strains of *G. virens* that produce gliotoxin. Work on production of antibodies to these proteins, purification of the proteins, and determination of amino acid sequences will serve as the basis for future studies on genes of *G. virens* associated with biological control and long-range improvement in biocontrol performance. Research led by Dr. Lumsden over the past decade on biological control of Pythium and Rhizoctonia damping-off of seedlings and bedding plants by *G. virens* resulted in the registration of strain GL-21 for disease control by the U.S. Environmental Protection Agency. This biocontrol agent is now available as the commercial product SoilGard and is one of the first U.S.-developed mycofungicides effective against these diseases. Four U.S. patents resulted from this and related work.

Since 1992, Dr. Lumsden has been research leader of the Biocontrol of Plant Diseases Laboratory. He also has led a research team investigating the characteristics of ubiquitous *Fusarium* species in relation to biological control. *Fusarium* spp. are being studied (i) for biological control of diseases caused by *Fusarium* spp. by various antagonists, (ii) for the potential of isolates of *F. oxysporum* as antagonistic biocontrol agents for inducing resistance to other Fusarium diseases and soilborne plant pathogens, and (iii) as host-specific mycoherbicidal biocontrol agents. This research has potential for solving national and international problems with disease losses and for control of undesirable plants.

Dr. Lumsden has received several awards, including the Underwood Fellowship Award from the British Agriculture and Food Research Council, USDA/ARS awards for leadership and technology transfer, and a USDA award for the research leading to SoilGard. Dr. Lumsden has been active in APS, serving as organizer and chair of workshops, discussions, and paper sessions at national and division meetings. Recently, he was coorganizer of Beltsville Symposium XVIII, Pest Management: Biologically Based Strategies, and served as senior editor of the symposium proceedings. Dr. Lumsden has published over 200 papers, book chapters, abstracts, and articles and has presented numerous invited talks worldwide. He has served on the editorial boards of *Plant Disease Reporter*, *Annual Review of Phytopathology*, and *Biocontrol Science and Technology*.

Seiji Ouchi

Seiji Ouchi was born in Hiroshima City, Japan. He received his B.S. degree in horticultural sciences at Kagawa Agricultural College and M.Sc. and Ph.D. degrees in plant pathology from Kyoto University. In 1963, he joined the Faculty of Agriculture at Kyoto University as an assistant professor of plant pathology. From 1970 to 1985, he was an associate professor of plant pathology in the Faculty of Agriculture at Okayama University. Since 1985, he has been professor and chair of the Faculty of Agriculture at Kinki University in Nara, where he also has served as director of the Institute of Comprehensive Agricultural Sciences since 1991 and as assistant dean of Student Affairs from 1991 to 1994.

Dr. Ouchi has developed a multifacted research program and is internationally known for his work in molecular and physiological plant pathology. He is recognized for his pioneering work on the development of the concept of induced susceptibility. He and coworkers described experiments in which *Erysiphe graminis* f. sp. *hordei*, which causes powdery mildew of barley, induced susceptibility in barley to either an incompatible race of the same pathogen or to *Sphaerotheca fulignea*, a pathogen of melon. Subsequently, Dr. Ouchi and coworkers described the induction of susceptibility in the *Mycosphaerella pinodes*-pea system and identified a low molecular weight fungal suppressor molecule that suppresses production of the pea phytoalexin, pisatin, and delays initiation of host defense reactions. This work has laid the foundation for work by others who have presented evidence that fungal suppressor molecules inhibit or delay the activity of other plant defense genes, reducing the ability of susceptible plant cells to respond defensively to infection.

One of Dr. Ouchi's current research efforts focuses on development of methodology for introducing foreign genes into single cells of host and pathogen. His studies indicate that gene expression can be studied at the single-cell level, both in the host and fungal pathogen, and can lead to a clearer understanding of how individual cells of a host and pathogen communicate during the infection process. They also provide an alternative method of transforming plant cells.

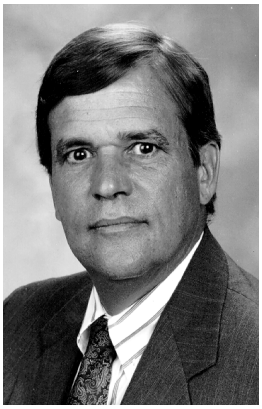
Dr. Ouchi is author or coauthor of more than 150 journal articles, book chapters, and reviews, and he has edited several books. His coauthored book, *Physiological Plant Pathology*, is the most widely used graduate-level textbook of its kind in Japan. He has presented papers and chaired sessions at more than 25 international symposia and conferences. He is president of the Phytopathological Society of Japan. He was coorganizer of the U.S.-Japan Cooperative Science Seminar held in Hawaii in 1990. He was coorganizer of the 5th International Congress of Plant Pathology in Kyoto in 1988 and has served for more than a decade on the editorial boards of *Physiological and Molecular Plant Pathology* and *Annals of the Phytopathological Society of Japan.*

Dr. Ouchi has trained 83 graduate students, some of whom hold full professorships and chairs of plant pathology departments in major universities in Japan. In addition, he has trained over 300 undergraduates, most of whom he remembers by name. Because of his ability to converse fluently in English, Dr. Ouchi is frequently called to serve as his university representative at home and abroad in matters relating to international education. Dr. Ouchi has received awards from the Japan Society for the Promotion of Science and the Ministry of Education for sabbatical leaves in Italy and at the University of Missouri, respectively. He is a Fellow of the Phytopathological Society of Japan.

Excellence in Teaching Award

This award was established in 1987 by the APS Council in recognition of excellence in teaching plant pathology. The award is presented to individuals with active responsibility for one or more courses in plant pathology and recognizes the individual's distinguished proficiency in teaching, as indicated by the development and effectiveness of courses taught.

Donald G. White



For 20 years, Dr. Donald White has demonstrated an unflagging commitment to excellence in teaching plant pathology. His highly effective courses at the University of Illinois have reached hundreds of students and kindled a life-long interest in plant pathology in many. Dr. White has the rare ability to relate to his students as individuals, a quality many of his former students mention. Students consistently appreciate his knowledge of and enthusiasm for plant pathology.

Dr. White grew up in South Charleston, WV, and received a B.A. degree in biology from Marshall University in 1968. He began his teaching career at Huntington High School in Huntington, WV. Don continued his education in the Department of Plant Pathology at The Ohio State University and was appointed assistant professor of plant pathology at the University of Illinois in 1974. He teaches three effective undergraduate courses: Introductory Plant Pathology, Diseases of Field Crops, and Diseases of Ornamentals and Turfgrass. Dr. White attributes much of his success in college teaching to lessons he learned while teaching in the public school system. Experience and training enable him to help many graduate students and faculty members improve their performance in the classroom.

Dr. White demonstrates a tremendous commitment to his students. As part of the Introductory Plant Pathology course, Don offers laboratory review sessions at night and on the weekends. Students appreciate the extra hours he puts in and routinely comment on the personal interest he displays. During these sessions, he reviews materials with small groups of students. Students clearly enjoy these interactions and appreciate the individual attention. The sessions also enable Dr. White to assess how well students are learning and help him determine which topics need more attention in the classroom and laboratory. These personal student-teacher interactions have helped make this an outstanding course. One former student comments that "he establishes a rapport with the class that I have never seen another instructor achieve." Dr. White regularly teaches the Introductory Plant Pathology and Diseases of Field Crops courses off campus at several sites throughout Illinois. This requires extraordinary effort and, again, demonstrates Don's commitment to students.

Don's philosophy of teaching can best be summarized in his own words: "Good teaching promotes more than just cognition of subject material. Teaching must stimulate curiosity and develop reasoning skills so the student will have both the desire and skills to continue learning. Students may eventually forget the detail of the subject material but quite often remember the process of gathering and assimilating information. The most important role of teaching, therefore, is not just the conveyance of subject material but the creation of enthusiasm for the subject and the development of skills that allow the student to continue the learning process."

Dr. White is viewed as a master teacher by his students and peers. His courses consistently receive "excellent" ratings from students, and he has been included on the Incomplete List of Teachers Ranked as Excellent by Students virtually every semester he has taught since 1974. Graduating seniors rank him among the very best teachers in the College of Agriculture. His excellence in teaching also has been recognized by numerous University of Illinois campus teaching awards, including the University of Illinois Harriet and Charles Luckman Undergraduate Distinguished Teaching Award, the College of Agriculture Senior Faculty Award for Excellence in Teaching, the John Clyde and Henrietta Downy Spitler Teaching Award, the University of Illinois Off-Campus Teaching Award, the University of Illinois Burlington Northern Foundation Faculty Achievement Award for Teaching and Research, and the Morrow Chapter of Alpha Zeta Outstanding Instructor Award. In the words of one colleague: "Don has won just about every teaching award offered at the University of Illinois, for both on-campus and off-campus instruction." His teaching talents also have been recgnized by the Illinois House of Representatives and the National Association of Colleges and Teachers of Agriculture.

Throughout his career, Don White has generously given his time to education endeavors at the University and in the public schools. He has served on departmental, college, and university curriculum committees. He provided leadership in developing a departmental peer evaluation system and helped organize a nationally recognized scholarship program in the College of Agriculture. He has served on several university committees focused on teaching improvement. Don also has served the public schools as an active member of the PTA and as a member of the Urbana Board of Education. These efforts have been recognized by awards from the PTA and the volunteer center of the United Way.

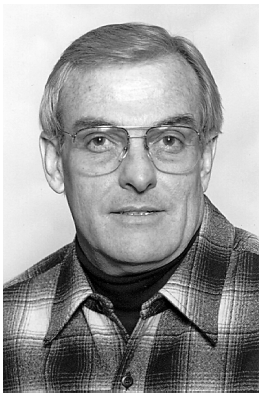
Dr. White has also been active in APS activities relating to teaching. He is currently serving his second term on the Teaching Committee, which he chaired (1984–1985). He was instrumental in initiating the Disease Recognition Contest for the Society in 1985, and he chaired a symposium in 1981 on Teaching Introductory Plant Pathology. Most recently, he initiated the "deBary Bowl" at the 1993 APS meeting.

In addition to his substantial teaching commitment, Dr. White has maintained a well-funded and productive research program. His research on breeding corn for disease resistance and corn grain quality are highly respected by his peers. Dr. White's sustained productivity in both teaching and research is impressive.

Excellence in Extension Award

This award was established in 1988 by the APS Council in recognition of excellence in extension plant pathology. The award is presented to those involved in formal plant pathology extension with recognized superior contributions in developing or implementing leadership roles in local, regional, or national honor societies or professional organizations.

John E. Watkins



John E. Watkins was born in Lander, WY. He attended the University of Wyoming, receiving his B.S. degree in 1968 and M.S. degree in 1970 in dairy microbiology. After a short stint at the Carnation Company, he moved to North Dakota State University to work with G. Statler and L. Littlefield on wheat leaf rust, receiving his Ph.D degree in 1975. He accepted a position at the University of Nebraska as extension plant pathologist and has remained at this institution his entire career. He was promoted to full professor in 1986.

Dr. Watkins' responsibilities include small grains, especially wheat, forage and pasture grass, turfgrass, and ornamentals. He also serves as statewide coordinator for extension plant pathology in these areas. He is strong in winter wheat, initiating and coordinating a cooperative effort to carry out field surveys to determine incidence, distribution, and severity of wheat diseases. He plays a lead role in the High Plains area, chairing a regional committee for the Great Plains Agricultural Council on wheat streak mosaic virus. The region is concentrating on management of the disease. Dr. Watkins' small grains and forage disease programs are unique, comining several extension education methods and are a cooperative efort by individuals over a large region.

His extension plant pathology program addressing turfgrass diseases has been successful at the homeowner and professional turfgrass manager levels. This program is a cooperative effort in which he has taken an aggressive approach to turf disease management through cultural practices, use of resistant cultivars, and cost-effective fungicide programs. As a result, Nebraska golf course superindentents are more effectively integrating disease management practices.

All of Dr. Watkins' extension programs take a balanced approach to information dispersal, including developing extension publications, slide-tape sets, and video cassettes, in addition to field surveys, grower meetings and tours, and mass media materials. They also include participation in the Backyard Farmer program, the longest running garden advice series (38 years) on public television.

His service to the profession has ranged from participating in and chairing regional committees to editorial functions, including associate and senior editor of *Plant Disease*, section editor of *Fungicide and Nematicide Tests*, and section editor of *Biological and Cultural Tests*. He has received recognition individually and as a team in the state, region, and nation, including a Nebraska Cooperative Extension Association's Distinguished Service Award, an Excellence in Extension Award from the National Association of Wheat Growers, and a Blue Ribbon Award from the American Society of Agricultural Engineers.

Lee M. Hutchins Award

The Lee M. Hutchins Fund was established in 1979 by gifts from the estate of Dr. Lee M. Hutchins. The award, consisting of a certificate and income from the invested fund, is made for the best contribution to basic or applied research on diseases of perennial fruit plants (tree fruits, tree nuts, small fruits and grapes, including tropical fruits but excluding vegetables). The results of the research must have been published in an official journal of the Society.

L. W. Timmer

L. W. "Pete" Timmer was born in West Olive, MI. He received a B.S. degree from Michigan State University and a Ph.D. degree from the University of California, Riverside. In 1970, he accepted a position as assistant professor at the Texas A&I Citrus Center in Weslaco and was later promoted to associate professor. In 1978, he accepted a position at the Citrus Research and Education Center (CREC), University of Florida, Lake Alfred. He was promoted to full professor in 1982.

Pete has developed a comprehensive research program on the etiology, epidemiology, and management of diseases caused by all of the major groups of citrus pathogens. He described citrus ringspot virus, demonstrated its relationship to psorosis bark scaling, and collaborated on work on mechanical transmission and purification studies, which led to the proposal of a new virus group. With Phytophthora diseases, he developed methods for evaluation of fungicides, developed quantitative assays for *Phytophthora* populations, and demonstrated the relationship of populations to root rot and yield loss. In Florida, one of the greatest challenges has been dealing with citrus blight, a serious decline disease of unknown etiology. With his colleagues at CREC, he developed diagnostic techniques to differentiate blight from other decline diseases and demonstrated root-graft transmission.

In 1983, a new disease, postbloom fruit drop (PFD), appeared in Florida citrus groves. Initially, PFD was confined to Tahiti lime plantings in south Florida. In 1988, PFD became widespread on sweet oranges and Dr. Timmer, with his students and associates, initiated an extensive research program to determine (i) the nature of causal strains of *Colletotrichum*, (ii) the disease cycle, (iii) the effects of environmental factors on the disease, and (iv) how to develop predictive models for effective timing of fungicide applications. Dr. Timmer's prolific research program culminated in 11 publications from 1992 to 1996 in Phytopathology and Plant Disease, and 8 in citrus industry publications.

Timmer and J. P. Agostini confirmed PFD is caused by a specialized strain of *Colletotrichum*, designated slow-growing orange (SGO). They differentiated the ubiquitous *C. gloeosporioides* strain, fast-growing gray (FGG), from the SGO strain by morphological characters, including conidial shape, setae presence, and appressorial shape. Inter-

estingly, they discovered the SGO strain was almost identical to *Gloeosporium limetticolum*, which causes anthracnose on Key lime. Isolates of the fungus from Key lime, KLA strains, produced blossom blight and persistent buttons (fruit pedicels remaining after fruitlet drop) as did SGO strains, but SGO isolates did not produce typical Key lime anthracnose. Timmer and Agostini theorized that PFD developed when the fungus moved from Key limes into sweet orange groves and attacked blossoms. Both the SGO and KLA strains have recently been identified as *Colletotrichum acutatum.*

Through laboratory and field studies, Timmer and associates worked out the disease cycle of PFD. The SGO strain produces abundant conidia in acervuli on diseased petals. Conidia of the SGO strain germinate to form appressoria on the surface of living leaves, whereas the FGG strains produce appressoria that penetrate leaves and invade tissue after it becomes senescent. Timmer and students observed that the SGO strain produces appressoria that persist on the leaves but do not colonize senescent or dead tissue. Instead, they germinate in the presence of moisture and blossom extracts and produce conidia borne singly on hyphae. These conidia serve as the inoculum for infection of the first few flowers, which reinitiates the disease cycle in the spring.

Next, Timmer and colleagues examined the interaction of environment and pathosystem. They confirmed that free water is required for infection, but more importantly, rain splash and wind-blown rain are needed for dispersal from conidia. Disease incidence is more strongly related to rainfall prior to infection than to leaf wetness. Consolidating knowledge of disease cycle and environmental effects, Timmer and Zitko conducted a series of studies of fungicide efficacy and timing. Because adequate control with benomyl is highly dependent on timely applications, they developed an equation for prediction of disease incidence 3 to 4 days in advance. The model has been widely adopted by the citrus industry to determine whether and when to spray.

Dr. Timmer's presentations and articles have emphasized the need for accurate information on which to base spray decisions: knowledge of stage of bloom, PFD level, and accurate local rainfall records. Losses due to PFD tend to be overestimated because of the large number of buttons produced. Fungal infection induces the formation of a button regardless of whether the flower would actually set a fruit. Timmer and Zitko found that trees tend to compensate for fruit lost to PFD by dropping less fruit during normal physiological drop. The number of buttons remaining from the previous season are a good early season predictor of disease severity in the current season. Furthermore, there is a strong correlation between number of buttons in the current year and number of fruit set. Timmer's model-based decisions on fungicide application result in large, economically important increases (25 to 500%) in fruit production.

PFD has become an increasingly prevalent and locally disastrous problem in the Caribbean and South America. Dr. Timmer is called on regularly to provide educational programs, particularly in Spanish-speaking countries, and to consult with individual citrus growers. In 1994, he lectured to over 1,200 people at a symposium specifically held on PFD in Sao Paulo, Brazil.

Dr. Timmer is an avid birder. He participates in many bird counts and is active in conservation organizations. He has seen and identified over 2,000 species of birds worldwide.

Ciba-Geigy Award

Sponsored by the Ciba-Geigy Corporation, this award is given to individual plant pathologists who have made significant contributions to the advancement of knowledge of plant diseases or their control. The award consists of a trophy and an expense-paid trip to Basel, Switzerland.

Kenneth B. Johnson

Kenneth B. Johnson obtained his B.S. degree in plant health technology in 1979 from the University of Minnesota and an M.S. degree in plant pathology from Oregon State University in 1982. He completed his Ph.D. degree in plant pathology in 1986 at the University of Minnesota and continued as a postdoctoral associate and lecturer until 1988. Subsequently, he joined the faculty of the Department of Botany and Plant Pathology at Oregon State University, where he is an associate professor.

Dr. Johnson has distinguished himself as a productive member of APS, through outstanding, pioneering research on potato and deciduous tree fruit and nut crop diseases. His research focuses on the areas of quantitative epidemiology, integrated control, and application of epidemiological principles for enhancing biocontrol.

Dr. Johnson's contributions to plant pathology began with his graduate work, which centered on understanding the mechanistic basis of pest- and disease-induced crop loss in potato. He not only developed a conceptual framework to study the effects of multiple pest/pathogens on potato, but also provided experimental data to support the concept. Prior to this work the effects of plant disease epidemics on crop productivity generally were studied with single pathogens/pests. Dr. Johnson hypothesized that pathogens/pests affect crop productivity either by reducing the photosynthetic area, in turn affecting solar radiation interception, or by interfering with radiation use efficiency. He demonstrated that early blight and Verticillium wilt reduce radiation interception by causing premature senescence of older leaf tissues and that feeding by the potato leafhopper reduces radiation use efficiency in photosynthetically active tissues, the latter of which exerted a greater net effect on crop yield. This information was coupled with a potato growth simulation model to study yield losses in different environments and with other variables.

In his current position, Dr. Johnson has made outstanding contributions on two host-pathosystems: eastern filbert blight of European hazelnut caused by *Anisogramma anomala* and fire blight of pear and apple caused by *Erwinia amylovora.* With colleagues, Dr. Johnson ascertained how and when *A. anomala* gains entry into a hazelnut tree and showed that only immature tissues near the apical meristem are susceptible to infection. He further determined optimal inoculum densities and conditions for infection and developed fungicide application schedules for immediate disease management. Dr. Johnson also has collaborated to develop resistant hazelnut clones and techniques to rapidly screen hazelnut for disease resistance. In fire blight research, Dr. Johnson studied efficiency of pollinator bees as vectors of bacterial antagonists of *E. amylovora.* The bees delivered the antagonists to sites on open blossoms where they suppressed epiphytic growth of *E. amylovora*, showing the potential for honey bees to disperse biocontrol bacteria in a manner compatible with conventional orchard management practices. Dr. Johnson and colleagues have examined the population dynamics of bacterial antagonists in antibiotic-sprayed and unsprayed orchards, showing that by delaying antibiotic sprays until 7 days after the application of the antagonists, their population can be maintained at high levels, paving the way for integration of chemical and biological approaches to fire blight management.

Dr. Johnson also developed a conceptual framework to study dose-response relationships in biological control of plant disease. Because of the potential practical implications, his development of a theory defining epidemiological parameters that govern the efficacy of biolog-

ical control of plant disease is a major breakthrough. His model states that the degree of disease control obtained with a biocontrol agent depends on the density of the agent, the density of the pathogen, how efficiently individual agents render units of the pathogen ineffective, and the proportion of the pathogen population potentially affected by the agent. Evaluation of these parameters for different host-pathosystems will clearly identify ways to improve the efficacy of biological control.

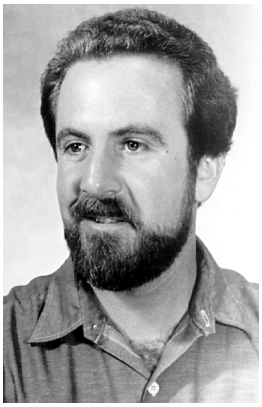
Dr. Johnson has been an outstanding teacher and faculty member in the Department of Botany and Plant Pathology at Oregon State University. He teaches graduate courses on plant pathology and disease management that are consistently rated highly by students. He has overseen the research of five M.S. and two Ph.D. students. Oregon State University's College of Agriculture has recognized his achievements by conferring three awards: the Briskey Award for Faculty Excellence; the Oldfield/Jackman Team Award, recognizing his collaborative efforts; and the Savary Outstanding Young Faculty Member Award.

Dr. Johnson has served APS as member and chair of the Plant Disease Losses and Epidemiology committees, as a member of the Adhoc Committee for Plant Pathology 2000, and as associate and senior editor of *Phytopathology*. He also has been active in the IPPC Epidemiology Committee.

Ruth Allen Award

The Ruth Allen Memorial Fund was established in 1965 by gifts from the estate of Dr. Ruth Allen through the generosity of her heirs: Sam Emsweller, Mabel Nebel, Hally Sax, and Evangeline Yarwood. The award, consisting of a certificate and income from the invested fund, is given for outstanding contributions to the science of plant pathology.

Bruce C. Kirkpatrick



Bruce C. Kirkpatrick was born in San Jose, CA. He received a B.S. degree in biological sciences from the University of California, Irvine, in 1980 and M.S. and Ph.D. degrees in plant pathology from the University of California, Berkeley, in 1983 and 1986, respectively. In 1986, he was appointed assistant professor in the Department of Plant Pathology, University of California, Davis, and was promoted to associate professor in 1992. The primary focus of his research has been molecular detection and characterization of mycoplasma-like organisms (MLOs) and development of control strategies for MLO-diseases of fruit and nut trees. Western X-disease MLO (WX-MLO) caused heavy losses in cherry and peach orchards. Dr. Kirkpatrick's approach to the problem has been systematic, first developing techniques to detect and characterize the pathogens involved, studying their epidemiology, and developing management strategies to minimize losses.

Plant-pathogenic MLOs have been nearly impossible to manipulate in the laboratory. Electron microscopy (EM) has been used to detect MLOs in diseased plants but cannot distinguish MLOs pleiomorphically or morphologically. MLO-specific serological reagents have been produced, but they have limited utility for comparing pathologically diverse MLOs. In 1987, Dr. Kirkpatrick was the first to develop methods for isolating and cloning MLO DNA by raising WX-MLO–infected leafhoppers and isolating partially purified fractions containing the MLO. DNA was isolated from the MLO-enriched fraction, and an MLO-specific, low-density DNA band was recovered. This DNA was cloned, and fragments of the WX-MLO chromosome were identified by differential hybridization with healthy and WX-MLO plant and leafhopper DNA probes. Cloned fragments of WX-MLO DNA were used as hybridization probes to detect the pathogen in field collections of herbaceous and woody plants, as well as infected insect vectors. Hybridization analyses with cloned portions of the WX-MLO genome provided the first insights into the genetic relationships between MLOs that infect plants. The ability to isolate and clone MLO DNA paved the way for genetic characterization of other plant MLOs and enabled cloning and sequencing of evolutionarily conserved genes, which allowed definitive classification.

In 1989, Dr. Kirkpatrick and his students began cloning and sequencing the 16S ribosomal RNA (rRNA) genes of several MLOs to determine the phylogenetic relationships among phytopathogenic MLOs and other members of the class Mollicutes. In 1989, researchers published the first full-length sequence of an MLO 16S rRNA. Analyses of the sequence, as well as sequences of the WX- and western aster yellows MLOs determined in Kirkpatrick's laboratory, clearly established that MLOs are members of the class Mollicutes, but they are phylogenetically different from previously characterized mollicutes. Cloning and sequencing of full-length 16S rRNA genes is a laborious task that limits the total number of MLOs that can be rapidly characterized. Dr. Kirkpatrick investigated the possibility of using other evolutionary markers to more rapidly classify MLOs. He found that phylogenetic relationships based on the sequences of the spacer region (SR) separating the 16S and the 23S rRNA genes agreed with relationships based on full-length 16S rRNA sequences. Because the SR was only one-fifth the size of the 16S rRNA, it was much easier to characterize MLOs. As a result, the phylogenetic relationships of more than 70 MLOs recently have been determined in his laboratory.

In 1993, collaborative research by Kirkpatrick and H. Neimark at SUNY, Brooklyn, resulted in the first isolation and characterization of full-length MLO chromosomes. This technique, involving linearization of chromosomes and separation by pulse-field gel electrophoresis (PFGE) contributed important information on MLO genomes and provided a source of MLO DNA completely free of contaminating host DNA. The ability to characterize MLO chromosomes by PFGE also permitted the construction of the first genomic map of an MLO.

In the field, Dr. Kirkpatrick used molecular probes in epidemiological studies to identify important plant reservoirs and insect vectors of the WX-MLO in California. Collaborative studies done over several years with colleagues at UC Berkeley and Davis determined the population dynamics of the primary WX-MLO insect vectors. Management guidelines were established, and the current incidence of WX-MLO in sweet cherry orchards in California is low. Dr. Kirkpatrick's recent investigations on peach yellow leafroll (PYLR) showed that two genetically distinct MLOs induce symptoms in peach trees. One of the MLOs is genetically similar to the WX-MLO, whereas the other is very similar to the MLO that causes pear decline disease. Most PYLR-diseased trees in California are infected with the pear decline-type MLO and management strategies to prevent its insect vector from infecting peach are currently being evaluated.

Dr. Kirkpatrick welcomes collaboration and has hosted scientists from around the world. He is more interested in the advancement of the MLO field than in personal advancement and routinely provides researchers with unpublished procedures and data. He uses his enthusiasm and influence to promote innovative research on MLOs and is a recognized leader. Dr. Kirkpatrick's accomplishments have stimulated research on phytopathogenic MLOs throughout the world. Dr. Kirkpatrick is the chair of the MLO working team of the International Organization for Mycoplasmology (IOM) and is a member of the Subcommittee on Taxonomy of Mollicutes. The IOM working team has proposed that the more definitive term, Phytoplasma, be adopted in place of MLO.