

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.

Laurence V. Madden



Laurence V. Madden was born on October 10, 1953, in Ashland, PA. He received his B.S. degree in biology in 1975, his M.S. degree in plant pathology in 1977, and his Ph.D. degree in plant pathology with a minor in statistics in 1980 from the Pennsylvania State University. His graduate program was under the guidance of Stan Pennypacker.

Dr. Madden joined the Department of Plant Pathology at the Ohio State University in 1980 as a postdoctoral research associate to work on the epidemiology of maize virus diseases in cooperation with Ray Louie and John Knoke. They determined which aphid species were most important in spreading maize dwarf mosaic virus (MDMV). He also developed a procedure that predicts the relative incidence of MDMV based on environmental conditions before planting; demonstrated that ambient weather conditions during a season are not sufficient to predict weekly levels of MDMV; developed methodology to ascertain the pattern of virus-infected plants, which is useful for elucidating the means of virus spread; and demonstrated and quantified the dispersal of MDMV from overwintering hosts to susceptible corn.

In 1983, Dr. Madden was promoted to assistant professor. He

then extended his research into several additional areas. With colleague Mike Ellis he initiated a major study of the effects of environment on fungal plant diseases. He and graduate students and postdoctoral associates working under his direction quantified the effects of temperature and wetness duration on infection and sporulation of several fungal pathogens of fruit crops. Dr. Madden has developed and validated disease prediction systems in which models are incorporated into field-based microprocessors that record and process environmental measurements to project optimal timing of fungicide applications. Dr. Madden recently developed a unique and important program of research on the mechanisms of rain splash dispersal. Results have shown how fungal spores are dispersed in single splash events and are distributed throughout a field during a rainstorm.

Dr. Madden continues to be actively involved in research on epidemics caused by plant pathogens with insect vectors. He and co-workers in Ohio and Kentucky showed that nonpersistent viruses increase in a consistent manner and that the pattern of diseased plants progresses from random to highly clustered and then becomes random again. These results have greatly increased the understanding of the population dynamics and dispersal of nonpersistent viruses at the population level. Recently, he developed dynamic models for virus disease increase as a function of vector numbers. Additionally, his work with L. R. Nault has contributed significantly to the knowledge of the coevolution of plant pathogenic mollicutes, their vectors, and plant hosts. They showed that mollicutes are differentially pathogenic to leafhopper vectors, depending upon their history of evolutionary association

with the different leafhopper species.

Dr. Madden has conducted research on the assessment and modeling of yield loss since he was a graduate student. In addition to his work with virus diseases, he and Randy Rowe have a program on modeling yield losses in potatoes due to early dying, the most serious uncontrolled disease of potatoes in the United States. A predictive, discriminant model was developed and validated, and should eventually improve management of this disease.

Dr. Madden is a world authority on the development and use of statistical models and analytical techniques for describing and comparing plant disease epidemics in time and space. His work on the development and interpretation of flexible disease progress models and the interrelationship between spatial patterns of inoculum or diseased plants and resulting disease increase are of great significance.

Dr. Madden is an exceptional young scientist; in his relatively

short career he has published 60 refereed papers, 11 book chapters, and numerous nonrefereed technical papers and trade journal articles. He has been an invited speaker at many national and international meetings. He also has received several competitive grants to support his work. He was promoted to associate professor in 1986 after only three years as assistant professor. Dr. Madden maintains a strong commitment to graduate education. Although he has no formal teaching appointment, he developed and teaches a course in epidemiology at Ohio State and has coauthored with C. Lee Campbell a textbook on plant disease epidemiology, scheduled to be published at the end of 1989.

Dr. Madden has been very active in APS. He has been a member of and chaired the Epidemiology and the Plant Disease Losses committees, he serves on the editorial board of APS Press, and is a senior editor of *Phytopathology*, perhaps being the youngest senior editor that the journal has had.