

# CIBA-Geigy Award

Sponsored by the CIBA-Geigy Corporation, this award is given to individual plant pathologists who have made significant recent 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.

## Steven E. Lindow



**Steven E. Lindow** was born on May 20, 1951 in Portland, Oregon. He received a B.S. degree at Oregon State University and a Ph.D. degree at the University of Wisconsin-Madison. In 1978, he joined the University of California at Berkeley and was promoted to associate professor in 1983.

Dr. Lindow has been a pioneer in research demonstrating the role of epiphytic bacteria in ice nucleation and resultant frost damage to plants, as well as the genetic control of ice

nucleation in bacteria and the feasibility of biological and chemical control of frost injury. While in graduate school at the University of Wisconsin, Lindow showed that the material in powdered corn leaves used as inoculum for leaf blight, observed by Paal Hoppe to be associated with frost susceptibility, was bacterial in nature. Of the 42 colonies isolated from the corn leaf-*Helminthosporium* powder, only *Pseudomonas syringae* was active in initiating ice

crystal formation at  $-4$  to  $-6$  C and caused frost damage when applied to maize leaves. He found that later in the growing season, *Erwinia herbicola* was the dominant ice nucleation active bacterium. He was able to reduce the temperature at which plants freeze by antibiotic treatments and the use of antagonistic bacteria.

At the University of California, Dr. Lindow and co-workers used recombinant DNA techniques to remove the gene conferring ice nucleation in non-pathogenic nucleating strains of *P. syringae* for use in the biological control of frost. Their application to HIH for permission to use these genetically engineered strains for field studies was the first to be approved and resulted in a landmark lawsuit. Dr. Lindow and co-workers showed that ice nucleation activity is proteinaceous and takes place in the outer membrane. They also determined the size of ice nucleation sites in situ.

Dr. Lindow has been widely acclaimed for his development of a computer-directed video image analysis system for the quantitative measurement of plant disease. He coordinated the distribution of video image analysis software to more than 30 plant pathology laboratories. For his research on ice nucleation, Dr. Lindow was awarded the Initiatives in Science Award in the area of applied biology by the National Academy of Sciences.