Leo Joseph Klotz, 1895–1984

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Leo Joseph Klotz died March 2, 1984 in Riverside, California. He was emeritus professor and former chairman of the Department of Plant Pathology, on the Riverside campus of the University of California. A world authority on diseases of citrus, his many special contributions in this field helped in the solution of industry problems and contributed greatly to the worldwide reputation of the Citrus Experiment Station of the University of California as a citrus research center.

Born in Carleton, Michigan, April 3, 1895, Dr. Klotz served in World War I from November 1917 to March 1919, with five months in France. He received the B.S. and M.S. degrees from Michigan Agricultural College and in 1923 the Ph.D. degree from Washington University in St. Louis, as a Rufus J. Lackland Research Fellow at the Missouri Botanical Garden. His first full-time position was as assistant professor in botany and assistant botanist in the Experiment Station at the University of New Hampshire, from 1923 to 1925. In 1925, he came to the Citrus Experiment Station of the University of California, at Riverside, on a National Research Council fellowship. Following an outstanding record in that position he was appointed as assistant plant pathologist in the Experiment Station in 1928 by Dr. Howard S. Fawcett. Dr. Klotz continued in this department for his distinguished 34-year career.

Dr. Klotz became professor and plant pathologist in 1945, and chairman of the department in 1946. He served in this capacity with wisdom and dedication from 1946 to 1957. During his administration, this became a well-rounded department, which covered most of the major aspects of plant pathology.

Benefiting from the early and fruitful association with Dr. Fawcett, the pioneer citrus pathologist, Dr. Klotz rapidly ascended to a position of eminence among citrus pathologists, and accepted numerous invitations to speak at international conferences and to advise on citrus and other plant disease problems in many countries, including Sicily, North Africa, Cyprus, Canary Islands, Morocco, Portugal, Spain, and Corsica.

At his retirement in 1962, Professor Klotz had contributed 92 technical publications and 216 semitechnical articles, which were largely devoted to citrus disease problems. These publications included two books, a number of bulletins and circulars, chapters in other books, and many substantial articles including invitational papers presented at international symposia. Dr. Klotz authored the extremely popular and useful *Color Handbook of Citrus Diseases*; in 1973, he completed a revision that was published as the fourth edition. This book has been translated into French and Spanish and is very widely used by growers and research workers alike in all citrus-growing countries. His early interest in scientific photography including pioneering work with color is reflected in the excellence of the illustrations in his publications. Professor Klotz continued to work very actively as professor emeritus for a number of years after retirement in 1962, and published an additional 22 technical and 47 semitechnical articles.

Dr. Klotz received many awards and honors. The crowning honor was the awarding of the Doctor of Laws degree by the University of California in 1965; a portion of the citation follows: "...A distinguished contributor to the fields of mycology and plant pathology through his studies on the physiology and biology of fungi and his investigation of the diseases of citrus and dates, leading to the development of valuable methods of control. Honored as First Faculty Research Lecturer at Riverside, and widely consulted as an adviser by agencies and governments around the world. For the distinction his work has brought to the University, and for his loyal service, we confer upon him today our highest honor." Other awards and honors include: National Research Fellow in Agricultural Sciences 1925–1928; Fellow, Societa Internazione di Microbiologia (Milan, Italy); Outstanding Research Contributor for 1956–1957 by Riverside County Farm Bureau; Sunkist Growers Letter of Appreciation for Research Contributions, 1962; Plaque of commendation for Spanish Government of Tenerife (Canary Islands) for survey of and help with plant disease problems in 1957; appointed "Expert for Co-option/Consultation" on fruit and vegetable diseases by Chancellor, West Pakistan Agricultural University, Lyallpur, 1964.

Dr. Klotz's research contributions dealt primarily with fungal and bacterial diseases of citrus in the nursery, in the field, and in storage. While his area of special expertise involved the control of diseases induced in citrus by *Phytophthora*, he made many contributions dealing with other fungal diseases and with bacterial and viral diseases as well.

His studies of the enzymes of *Phytophthora citrophthora* and the biology of that pathogen are classical contributions. Dr. Klotz also developed control measures for Phytophthora brown rot in the field, initiated the use of heat in the wash tank in the packing house to supplement fungicidal control measures in the field, introduced surgical methods for treating gummosis lesions, developed methods for using selected fumigants to treat soils to be replanted to citrus, made a study of resistance in rootstocks and selected those tolerant of attack, used heat to treat seed and root systems of citrus, studied the role of oxygen in the distribution of root-rotting fungi, determined the effects of soil moisture and aeration on root decay of citrus, and demonstrated the lethal effect of nitrites on young citrus trees resulting from anaerobic conditions in wet soils to which nitrates and organic fertilizers had been added.

Dr. Klotz introduced the use of nitrogen trichloride in the packing house to reduce the Penicillium spore concentration in the air. He studied the toxic effect of certain chemical solutions on spores of *Penicillium italicum* and *P. digitatum* and introduced chemicals in the wash tank for protecting wounds on the fruit from infection. He controlled Trichoderma infection of fruit from packing box wood by use of a polyethylene barrier. He also contributed to the use of fungistatic materials in the carton.

He controlled Rhizoctonia damping-off of citrus seedlings by the acidification of the soil with aluminum sulfate to encourage the development of *Trichoderma* whose toxic metabolite suppressed *Rhizoctonia*. He developed fungicidal control measures for citrus bacterial blast and black pit. He studied the effects of 2,4-D on citrus fruit stem dieback and fruit drop which led to its use by the citrus industry for holding fruit on the tree. His studies of viral diseases included tristeza, psorosis, and psorosislike diseases of citrus, and furnished background data for the development of citrus indexing procedures.

Dr. Klotz was respected and universally liked by all who came in contact with him during his more than 50 years of association with the Riverside campus. His wise counsel, vision of the future development of this department, outstanding contributions in the basic as well as the soundly applied aspects of plant pathology, and his many trips abroad did much to establish the international reputation of the University of California, Riverside, in citrus disease research. He was an ardent and very good tennis player and a keen competitor; he enjoyed many other sports as a participant and a spectator, including particularly badminton and baseball. Dr. Klotz had a combination of marvelous personal qualities that are found all too rarely. He was an understanding and wonderful friend to many of us.

Professor Klotz is survived by his wife Esther, to whom he was married for more than 50 years, a daughter Eunice Riemer of Underhill Center, Vermont, and a son, Professor Jerome Klotz, of the University of Wisconsin at Madison.