



## **Roy L. Millar**

May 24, 1924 – August 18, 2017

Roy L. Millar, Professor Emeritus of Plant Pathology, was a national leader in the teaching of his branch of science and was an internationally respected researcher into host-pathogen interactions in plants. He was born in Calgary, Alberta, and attended public schools there. He enlisted in the Royal Canadian Air Force in 1943 and served as pilot in the Air Force and Royal Naval Fleet Air Arm for two years. In 1946, he enrolled in the University of Alberta, Department of Plant Science, receiving the Bachelor of Science degree in 1950 and the Master of Science degree in 1952. He then began doctoral studies at Cornell University with a major in plant pathology and minors in plant physiology and biochemistry. His doctoral research was under the direction of W. H. Burkholder and focused on the bacterial plant pathogen *Xanthomonas phaseoli*. He received the Ph.D. in 1955. Subsequently he served as a research officer in the Canada Department of Agriculture at Ottawa. In 1959, Roy was recruited to the faculty of the Department of Plant Pathology at Cornell to teach introductory plant pathology to graduate and undergraduate students and to conduct research on diseases of forage crops. He was promoted to associate professor in 1965, to full professor in 1969, and became a U.S. citizen in 1970.

Roy was known as an especially effective and challenging teacher. His emphases on clear logical thinking and writing were legendary among plant science students and were sometimes challenging for those enrolled in his courses or conducting research under his guidance. He was a passionate and caring teacher who cared mightily that his students learn. Most of his students (sometimes in retrospect) felt it a privilege to be in his classroom. Several entered the field of plant pathology as a result of their encounters with him. Alums of his graduate level courses respected the breadth, rigor and concepts presented. He employed innovative practices, some of which are characteristic of today's 'flipped classroom'. One of these practices was to conduct oral exams. A student's major professor was invited to the final exam. This practice stimulated a tremendous amount of study by the students and was, therefore, a particularly effective teaching tool.

Roy understood that clear writing was mandatory in science and he rigorously edited reports by students. It was initially a shock to receive a report that had been edited so effectively but the students came to appreciate those tough lessons. His reputation as an editor led to numerous requests to review manuscripts before they were submitted to journals.

Roy's passion for teaching plant pathology was highlighted in a workshop, conducted with colleague Professor Carl Boothroyd in summer 1968 and funded by the National Science Foundation, to which plant pathology instructors came from all over the USA to learn more about methods of teaching in this field of biology. Millar and Boothroyd presented an array of pedagogical concepts, techniques and materials that had worked well for them. Teachers attending the workshop found it to be highly stimulating. Their appreciation for the workshop, for Millar and Boothroyd, and for the content was amply visible in letters of appreciation they sent after the workshop. Alums from the teaching workshop and from Professor Millar's 'Plant Pathology 501' course adopted many of his innovations in their own teaching. He clearly had an important impact on plant pathology teaching across the USA.

Roy's research was focused on host-pathogen interactions in diseases of forage crops. His students were among the first to explore the role of phytoalexins (pathogen-inhibitory compounds produced by the plants in response to infection). They discovered and characterized the phytoalexins medicarpin, sativan, and vestitol in alfalfa and other forage crops. His group also investigated the importance of hydrogen cyanide as a factor in the interaction between a cyanogenic plant and a pathogen. They confirmed the role of a cyanide-resistant oxidase in pathogens of cyanogenic plants. This oxidase enabled energy production for the synthesis of cyanide hydratase—an enzyme that detoxified cyanide to formamide. He investigated the biology and ecology of soil-borne pathogens of alfalfa and demonstrated that the alfalfa strain of *Verticillium albo-atrum* has limited capacity to survive in field soil and is amenable to control by crop rotation with small grain crops. In contrast, he determined that *Phytophthora megasperma* f. sp. *medicaginis* is remarkably long lived in soil, so crop rotation would have limited efficacy. In collaboration with plant breeders, he contributed to the development of alfalfa cultivars with high levels of resistance to the diseases caused by *Verticillium* and *Phytophthora*.

Roy's passion for plant pathology was wonderfully visible to his colleagues. His accomplishments were recognized nationally when he was made a Fellow of the American Phytopathological Society in 1973—"for his balanced excellence in teaching, research and service"... which "stands as an example for all plant pathologists."

Roy served his colleagues and his discipline extensively. At Cornell, he served as department chair in the late 1970s and early 1980s. For the American Phytopathological Society (APS), he served on numerous committees, perhaps most notably on the teaching committee. He was president of the Northeast Division of the APS in 1975-76 and served on the governing council of the APS as councilor at large in 1976-78. He was senior editor of the journal *Phytopathology* in 1971-72 and editor in chief in 1976-78. He instituted the practice of

grouping like articles with similar or related content in that journal. This practice made searching the journal, which was only available in print form at the time, much easier for readers.

As a Canadian, Roy was particularly susceptible to the 'hockey craze' at Cornell in the late 1960s. He and his colleagues joined hundreds of other enthusiasts waiting in line for hours to obtain season tickets. He celebrated with thousands of Cornell fans over the undefeated season in 1969-70. His sons (Daryl, Craig, Brent and Mark) were avid youth hockey players.

Roy was predeceased by his wife of many years, Dorothy (Dottie) Hayward Millar (formerly of Granum, Alberta) in 1985. Roy retired from Cornell in 1986 and moved to San Diego where he later married the late Nadine Hargrave Millar. He moved to Prairie Village, Kansas, in 2010 to be closer to family.

*Written by William E. Fry, Wayne A. Sinclair and Gary C. Bergstrom*