

From the Oat Newsletter, volume 44, 1998:

Donald E. Harder  
Award for Distinguished Service to Oat Improvement



Dr. Don Harder has been a productive participant in Agriculture and Agri-Food Canada's rust research team for all of his 25 year career at the Cereal Research Centre, Winnipeg, Manitoba. Don originated the research in cereal rust electron microscopy at Winnipeg, resulting in a multidisciplinary team effort which led to the development and use of improved electron microscopy and cytochemical techniques to investigate structural components at the host/rust fungal interface. The studies have provided significant new insights into the role of haustoria, not only as metabolite absorbing organs, but as specialized structures interacting with the host protoplasts to lead to host resistance or susceptibility. Don has authored and co-authored numerous scientific publications, invited book chapters and symposium papers on the subject.

Don began his career in oat rust pathology in 1973 when he took over the oat crown rust program at CRC. Through screening of wild exotic oat germplasm for rust resistance and isolation of numerous new crown rust resistance genes, Dr. Harder established himself as an international authority on oat crown rust early in his career. In 1981 he assumed responsibility for the stem rust program, isolated the adult plant oat stem rust resistance gene *Pg17*, and characterized gene *Pg10*, indicating its usefulness as a source of stem rust resistance in oat breeding. He has participated directly in the release of ten oat cultivars by collaborating with breeders and has contributed to all wheat, oat and barley programs in western Canada by evaluation of stem rust

resistance in pre-registration trials. He currently has responsibility for stem rust in oat, wheat, and barley.

In other studies, Don conducts annual surveys to closely monitor the incidence and virulence of the cereal rusts. He has recently re-identified all oat and wheat stem rust isolates collected over the past 50 years. By relating these virulences to rust surveys published since 1921 he was able to analyse historic changes in virulence, enabling clearer predictive strategies for deployment of stem rust resistance sources in oat, barley and wheat breeding programs. He continues to study the structure of pathogen populations and the nature, effectiveness, and deployment of resistance sources.

Don's work on the cereal rusts has had local, national and international impact. He has worked closely with other plant pathologists and cereal breeders to establish effective guidelines which identify the necessary level of genetic resistance to key diseases which advanced breeding lines must possess to be eligible for registration in Canada. He has worked with North American counterparts to strengthen rust gene deployment strategies. His work has contributed to the genetic stability of stem rust resistance in cereal cultivars. By multidisciplinary collaboration with cereal breeders he has contributed to the enviable 45 year record of negligible losses from cereal rusts. The research has led to the protection of Canadian cereal crops worth \$6-8 billion annually. Among his numerous publications and reviews, he views as most significant the chapter on Oat Diseases and Pathological Techniques for the monograph Oat Science and Technology, and a major work on *Puccinia graminis* (on all hosts) for the Commonwealth Agricultural Bureau International Crop Protection Compendium (on CD-ROM).

Don received his B.Sc. (1962) and M.Sc. (1964) degrees from the University of Alberta and his Ph.D. (1968) from Washington State University prior to joining Agriculture & Agri-Food Canada at Winnipeg in 1973. He conducted Post Doctorate work at the University of Manitoba, and worked in Kenya (1969-1973) on a CIDA/University of Manitoba project to develop improved rust resistance in cereals in East Africa.

Since 1991 Don has been Assistant Director of the Cereal Research Centre, Winnipeg, and has provided expertise to the management of research programs and to the upgrading of plant gene resource phytotron facilities and laboratories at the Centre.