

From the Oat Newsletter, volume 42, 1994:

Vernon Douglas Burrows  
Award for Distinguished Service to Oat Improvement



Dr. Vernon Burrows was born in Winnipeg, Manitoba and graduated from the University of Manitoba with a BSA degree (1951) and a MSc degree (1953). He specialized in genetics and plant breeding but developed a strong interest in plant physiology and biochemistry. He obtained a PhD degree in biology (1958) from the California Institute of Technology specializing in physiology and plant biochemistry. After graduation he was employed by the Canadian Department of Agriculture and was stationed at Ottawa. He worked as a physiologist on oats with the oat breeder Dr. Frank Zillinsky until Frank left to work with Dr. Norman Borlaug at CIMMYT in Mexico. Vern was then asked to assume responsibility for the oat program at Ottawa. This gave him the opportunity to apply his knowledge in genetics, plant breeding, physiology and biochemistry to breeding new oat varieties primarily for eastern Canada.

Throughout his career he has attempted to increase the popularity of oats by improving their usefulness for food, feed and industrial purposes. During his career he has bred and registered 9 covered-seeded varieties, Scott (1972), Gemini (1973), Hinoat (1973), Sentinel (1978), Foothill (1978), Donald (1982), Newman (1988), AC Stewart (1991) and AC Hunter (1993), and 5 naked-seeded varieties, Tibor (1985), AC Lotta (1991), AC Hill (1991), AC Percy (1992) and AC Baton (1994). He also developed the concept and experimental strains of "dormoats" which combine the seed dormancy genes from wild oats (*Avena fatua* L.) with the desirable genes from the best commercial varieties of domestic oats. Dormoat remains an experimental crop in Canada but it shows promise

as a crop to meet the specifications of sustainable agriculture especially for marginal soils.

Dr. Burrows has accomplished several firsts in his oat improvement program. He was able to select and commercialize three quite different varieties (Gemini, Hinoat and Foothill) from Frank Zillinsky's interspecific (*A. sativa* x *A. strigosa*) breeding program. Hinoat was Canada's first high protein oat that was grown under contract for General Foods to make the first high protein presweetened breakfast cereal. The variety has also served as a model plant for researchers to study storage protein synthesis in oat. Foothill was Canada's first forage-type oat which is now being grown in Alberta (138,000 acres in 1993) and large seed exports are marketed in Pacific rim countries. Donald was Canada's first daylength insensitive milling-type oat possessing the Di-I gene derived by Vern from an *A. byzantina* accession from Turkey. This gene was used by Burrows to establish a "shuttle" breeding oat program between Ottawa in summer and California in winter. Donald and the related variety Newman have helped develop an oat milling industry in Ontario. The naked varieties AC Lotta and AC Baton also are insensitive meaning high quality "ready to eat" nutritious oats can be grown in most grain growing regions of the world.

Burrows worked diligently to breed superior naked oat varieties. He concluded that in spite of all the effort breeders have devoted to breeding excellent covered-seeded varieties, oat acreages in the world have declined steadily. When the work horse was replaced by petroleum power, the oat hull prevented the covered oat from finding new animal clients to serve. The proper use of hull-less genes results in harvested groats that combine, in the one grain, the metabolizable energy equivalent to corn with enough high quality protein for most pig and poultry diets. Substitution of the oat groat in animal diets for the warm seasoned crops corn and soybean is attractive to farmers in the cooler regions of Canada to reduce transportation and feed costs.

Burrows has cooperated with industrial partners such as General Foods, Dupont of Canada, Quaker Oats, Robin Hood Multifoods and UFL Foods of Canada on specific projects to improve the usefulness of oats. While working on a project to induce secondary dormancy in dormoats, he discovered a water steeping process that could be used to fractionate oat into flour, bran and aqueous components. Working with Drs. R.G. Fulcher, D. Paton and F.W. Collins, patents were obtained which has led to the construction of a processing plant in Saskatoon by Canamino Inc. to process oats for the cosmetic and food trade. Dr. D. Paton, now at the Saskatoon Research Station, Agriculture Canada, played a very major role and was the motive force behind the patenting and commercialization of this industrial process.

Burrows has contributed much to the oat scientific literature and to the development of genetic stocks for specific traits. In addition he has authored three book chapters on oat breeding, the feeding of oats and on biotechnology and oat improvement. He has served on numerous committees dealing with oat and cereal improvement and has performed as a consultant on oats for the general and farm public, the scientific community, and food and industrial processors. For his contribution he was awarded the

prestigious Grindley Medal by the Agricultural Institute of Canada (1975) and has received two certificates of recognition by Agriculture Canada. He was made a Honorary Life Member of the Canadian Seed Growers Association in 1986.