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Harold G. Marshall  
Award for Distinguished Service to Oat Improvement



Dr. Marshall spent his entire professional career working on oat improvement for ARS-USDA, and was located in the Department of Agronomy at The Pennsylvania State University. He retired from ARS-USDA in 1987, but continues to do oat breeding in a private program at his farm near University Park, Pa. His research accomplishments are well documented in the literature though numerous journal articles and several book chapters.

Dr. Marshall was born May 7, 1928, and grew up on a hilly farm near Selvin in southern Indiana. His first memorable experience with oats was sowing a field of Forkeddeer with a drill drawn by a three horse hitch on a very hot day and having his favorite horse drop dead. He grew up cutting oats with a horse drawn binder and worked in the community "threshing ring". After graduation from high school in a class of four boys, he attended Purdue University where he received his B.S. degree in Agronomy in 1952. He then moved on to Kansas State University as a graduate assistant on the wheat improvement project, married Barbara Parsons, and earned his M.S. degree under the direction of Dr. John Schmidt. During the summer of 1953, Dr. Marshall began working toward a Ph.D. degree at the University of Minnesota. That effort, however, was interrupted by a two year stint in the U.S. Army during the Korean conflict. He returned to the University of Minnesota in 1956 as a teaching assistant in genetics, cytogenetics, and plant breeding. His thesis research was with interspecific hybrids in oats under the direction of Dr. W. M. Myers, and he received his Ph. D. degree in the spring of 1959.

Dr. Marshall's initial ARS-USDA assignment at Penn State was to develop winter oat germplasm with improved levels of winter hardiness and to combine that complex trait with other desirable characteristics, frequently through introgression of winter and spring oat germplasm. He developed elite germplasm that was shared with other oat breeders through both formal and informal releases. His most noteworthy cultivar is Pennwin which has a high level of winter hardiness combined with high yield potential and good lodging resistance. He developed a crown freezing technique that is precise enough to select individual plants with elite freezing resistance. One resulting line, Pennline 40, has winter hardiness well above the previous upper limit of that trait. Dr. Marshall also used the crown freezing technique to convert spring oat semidwarfs to winter types by backcrossing crown freeze survivors to the semidwarf. In addition to freeze-test technology, he also made substantial contributions to winter oat breeding methodology and to knowledge about changes in winter oat populations while under natural selection pressure for winter survival.

Starting in 1974, Dr. Marshall devoted part of his time to improvement of spring oat germplasm with particular emphasis on lodging resistance. That effort led to some of the most lodging resistant germplasm available, and his semidwarf germplasm is being used in several programs. He also developed Hercules, a tall, lodging resistant cultivar that is extensively grown in the Northeastern USA where straw yield is important but lodging is likely to be a serious problem.

Dr. Marshall also is widely known for his work with naked-seeded oats and the development of Pennnuda cultivar which has excellent groat characteristics, high protein, and exceptional lodging resistance. Development of Pennnuda was cited before Congress as one of eight major ARS accomplishments during 1986. Dr. Marshall serves as coordinator of the Cooperative Naked Oat Test which he initiated in 1991. That test now is grown at 10 locations in the USA and one location in Canada, and has provided valuable information about the adaptation and productivity of current naked oat germplasms and about variation in the expression of the naked-seeded trait in different environments.

Dr. Marshall served as secretary of the American Oat Workers Conference during 1974-86. He was the primary author of the operating charter of the AOWC and served on many committees including the Legislative Subcommittee, the National Oat Improvement Council, and the task force that prepared the first National Oat Strategic Plan. In 1982, at The Pennsylvania State University, Dr. Marshall organized and hosted a joint meeting of AOWC and the First International Oat Conference. In addition to these activities, Dr. Marshall was coordinator of the various uniform regional winter oat nurseries from 1963 through 1987, National Technical Advisor for oat research from 1976 to 1981, chairman of the Oat Registration subcommittee of the Crop Science Society for many years, and ARS representative on the National Variety Review Board for several terms. He was sponsoring scientist, 1968-72, on PL-480 Project Israel which collected much valuable wild oat germplasm, ARS-USDA representative on the NCR-IS Regional Committee, 1976-80, and ARS-USDA member of a two man winter hardiness

team that spent 6 weeks in the USSR during 1977.

Dr. Marshall is a member of Sigma Xi, Gamma Alpha Scientific Fraternity, Gamma Sigma Delta, and is a fellow of the American Society of Agronomy and the Crop Science Society of America. He has served on several major committees of the latter societies and as an associate editor of Crop Science. With able assistance from a co-editor and an editorial committee, he recently completed the gargantuan task of editing a new monograph, Oat Science and Technology.