Gerald Seiler

Research Botanist

Sunflower Research Unit, Red River Valley Agricultural Research Center

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Education

1967-1971 North Dakota State University, Fargo, ND, B.A. in Botany

1971-1973 North Dakota State University, Fargo, ND, M.S. in Systematic Botany

1977-1980 North Dakota State University, Fargo, ND, Ph.D. in Biosystematic Botany

Work Experience

1971-1973 Graduate Research Assistant, NDEA Graduate Fellow, Systematic Botany, Department of Botany, North Dakota State University, Fargo, ND

1973-1974 Graduate Research Assistant, State Biological Survey of Kansas, University of Kansas, Lawrence, KS

1974-1980 Research Technician, USDA, ARS, Sugarbeet Research Unit, Fargo, ND

1980-1988 Research Botanist, USDA, ARS, Sunflower Unit, Conservation and Production Research Laboratory, Bushland, TX

1988--present Research Botanist, USDA, ARS-Sunflower Unit, Northern Crop Science Laboratory, Fargo, ND

Recent Accomplishments

Gerald Seiler has worked with the wild sunflower species for over 27 years, providing leadership and expertise in an interdisciplinary unit working on sunflower germplasm improvement. He has established an internationally recognized research program on collection and utilization of the wild sunflower species to increase the genetic diversity of the cultivated sunflower. His research focuses on the improvement of sunflower production and quality through incorporation of desirable agronomic traits from wild sunflower species. He brings extensive knowledge of the potentially available genetic diversity in the genus Helianthus. He has led 17 explorations for wild sunflower species and has added over 1800 accessions to the USDA-ARS NPGS wild species germplasm collection, which is the largest and most complete extant collection of Helianthus in the world. Specific research successes include the identification of several useful agronomic traits from the wild species, including pest resistance, cytoplasmic male sterility, and oil content and composition. He subsequently transferred the traits into cultivated sunflower using novel and experimental hybridization techniques. Significant research accomplishments include the development, registration, and release of 60 interspecific germplasms representing twelve annual

and five perennial species which incorporated genes from wild species for pest resistance, oil content and quality, new cytoplasms, and salt tolerance. He also developed an effective germination priming technique for use with wild sunflower seeds to overcome their high dormancy. He has authored or co-authored 225 publications and abstracts and is regularly invited to make presentations about his research by national and international organizations and institutions. He currently coordinates the FAO-ESCORENA International Sunflower Working Group on wild sunflower species, and chairs the NPGS Sunflower Crop Germplasm Committee. He serves on the Executive Board of the International Sunflower Association as the U. S. representative. He is also a member of several professional societies and is an adjunct professor in the Department of Plant Sciences at North Dakota State University.

Recent Peer-reviewed Publications:

Linder, C. R., I. Taha, G. J. Seiler, A. A. Snow, and L. H. Rieseberg. 1998. Long-term introgression of crop genes into wild sunflower populations. Theor. Appl. Genet. 96:339-347.

Seiler, G. J. 1998. Seed maturity, storage time, and media treatments effects on germination of two wild sunflowers. Agron. J. 90:221-226.

Seiler, G. J. 1998. Biodiversity in trust: conservation and use of plant genetic resources in CGIAR centers. Crop Sci. 38:1115-1116.

Seiler, G. J. 1998. Influence of temperature on primary and lateral root growth of sunflower seedlings. Environ. Exper. Bot. 40:135-146.

Snow, A. A., P. Moran-Palma, L. R. Rieseberg, A. W. Szelaki, and G. J. Seiler. 1998. Fecundity, phenology, and seed dormancy of F1 wild-crop hybrids in sunflower. Am. J. Bot. 85:794-801.

Seiler, G. J. 1998. Oil concentration and fatty acid composition of achenes of Helianthus (Asteraceae) species from Canada. Econ. Bot. 53:273-280.

Rieseberg, L. H., M. J. Kim, and G. J. Seiler. 1999. Introgression between the cultivated sunflower and a sympatric wild relative, Helianthus petiolaris (Asteraceae). Int. J. Plant Sci. 160:102-108.

Seiler, G. J. 1999. FAO Working Group Report: Evaluation of wild Helianthus species progress report. Helia 22:180-192.

Seiler, G. J., and M. E. Brothers. 1999. Oil concentration and fatty acid composition of achenes of Helianthus species (Asteraceae) from Canada. Econ. Bot. 53:273-280.

Seiler, G. J. 2000. Registration of ten interspecific germplasms derived from wild perennial sunflower. Crop Sci. 40:587-588.

Miller, J. F., T. J. Gulya, and G. J. Seiler. 2002. Registration of five fertility restorer sunflower germplasms. Crop Sci. 42:989-990.

Rashid, K. Y., and G. Seiler. 2002. Resistance to Sclerotinia wilt in wild sunflower species. Can. J. Plant Pathol. 24:395.

Miller, J. F., and G. Seiler. 2003. Registration of five oilseed maintainer (HA 429-HA 433) sunflower germplasm lines. Crop Sci. 43:2313-2314.

Seiler, G. J. 2004. Wild Helianthus annuus, a potential source of reduced palmitic and stearic fatty acids in sunflower oil. Helia 27:55-62.

Seiler, G. J., and L. G. Campbell. 2004. Genetic variability for mineral element concentrations of wild Jerusalem artichoke forage. Crop Sci. 44:289-292.

Maiti, R. K., P. Vidyasagar, S. Shahapur, and G. J. Seiler. 2005. Genotypic variability in seed dormancy in sunflower (Helianthus annuus L.) genotypes and the effects of priming in breaking dormancy and improving seedling vigour. Crop Res. 30:291-298.

Jan, C. C., J. F. Miller, G. J. Seiler, and G. N. Fick. 2006. Registration of one cytoplasmic male-sterile and two fertility restoration sunflower genetic stocks. Crop Sci. 46:1835.

Jan, C. C., J. F. Miller, B. A. Vick, and G. J. Seiler. 2006. Performance of seven new cytoplasmic male-sterile sunflower lines from induced mutation and a Native American variety. Helia 29:47-54.

Seiler, G. J., and L. G. Campbell. 2006. Genetic variability for mineral concentration in the forage of Jerusalem artichoke cultivars. Euphytica 150:281-288.

Seiler, G. J. 2007. Wild annual Helianthus anomalus and Helianthus deserticola as potential sources of improved oil concentration and quality in sunflower. Ind. Crop. Prod. 25:95-100.