

## William F. Wilcke

Office: University of Minnesota Bioproducts and Biosystems Engineering Department  
120 BioAgEng, 1390 Eckles Ave, St. Paul MN 55108  
phone: 612-625-8205 fax: 612-626-3132 e-mail: wilck001@umn.edu

Home: 1435 Hythe St., St. Paul MN 55108  
phone: 651-646-4402

### Education

B.S., Agricultural Engineering major, Iowa State University, Ames IA, 1976  
M.S., Agricultural Engineering major, Iowa State University, Ames IA, 1980 (M.S. Thesis: Corn drying with an automatically controlled solar-electric low-temperature system)  
Ph.D., Agricultural Engineering major, Energy Systems Engineering minor, Iowa State University, Ames IA, 1985 (Ph.D. Dissertation: Natural-air corn drying with stirring)

### Primary Interests

Sustainable agriculture  
Post-harvest technology (crop cooling, drying, storage, handling and quality evaluation)  
Energy for agriculture (both conventional and alternative sources)  
International development  
Leadership

### Professional Experience

July 2002 - present: Regional Coordinator for the North Central Region Sustainable Agriculture Research and Education (NCR-SARE) Program and Professor and Extension Engineer, Biosystems and Agricultural Engineering Department, University of Minnesota, St. Paul MN  
NCR-SARE is a USDA grant program. For NCR-SARE, I work with a 25-member Administrative Council and a small staff to coordinate a \$3 million per year grant program. The remainder of my time is spent on Minnesota Extension work in post-harvest crop handling, alternative energy, and sustainable agriculture.

April 2000 - January 2002: Acting Administrator for the Minnesota Institute for Sustainable Agriculture

July 1999 - 2002: Professor; July 1993 - June 1999: Assoc. Prof.; July 1989 - June 1993: Assist. Prof.;  
Biosystems and Agricultural Engineering Department, University of Minnesota, St. Paul MN  
75% Extension, 25% Research: Responsible for state extension programs in post-harvest technology and for applied research in post-harvest technology, and for coordination of University of Minnesota Extension Service sustainable agriculture professional development programs from 1996 to 2004.

January 1986 - June 1989: Assistant Professor  
Agricultural Engineering Department, Virginia Polytechnic Institute and State University, Blacksburg VA  
100% Extension: Responsible for state extension programs in post-harvest technology.

May 1980 - December 1985: Instructor  
Agricultural Engineering Department, Iowa State University, Ames IA  
Extension, Teaching: Conducted extension programs and taught courses on crop drying and storage and energy for agriculture; collected data and wrote a report on demonstration solar collectors on livestock buildings.

December 1978 - April 1980: Plan Service Engineer

Midwest Plan Service, Iowa State University, Ames IA

Technical Writing: Co-authored a handbook on solar grain drying and assisted with a handbook on solar livestock housing.

December 1976 - November 1978: Graduate Assistant and Instructor

Agricultural Engineering Department, Iowa State University, Ames IA

Research, Teaching: Taught courses on rural electrification and conducted research on solar crop drying and electronic controls for crop dryers.

### **Extension Experience**

I have served as a statewide Extension specialist in Iowa, Virginia, and Minnesota. I have Extension experience in the following areas:

- Post-harvest handling (cooling, drying, storage) of grains, oilseeds, vegetables, forages and alternative crops
- Alternative energy sources for agriculture
- Sustainable agriculture professional development for agricultural educators (Minnesota only)

### **Research Experience**

- Grain storage: storability of different corn varieties, corn treated with a fungicide, corn exposed to fluctuating temperature conditions, low test weight corn, diseased wheat, and immature soybeans; management of stored grain insects by using low-temperature outdoor air
- Grain drying: solar drying; modeling of natural-air corn drying; stirring grain in natural-air grain drying systems
- Grain quality evaluation: rapid testing methods for aflatoxin in corn; use of machine vision for detection of moldy or broken corn kernels
- Post-harvest vegetable and shiitake mushroom handling
- Hay storage

### **Leadership Experience and Education**

- Regional Coordinator for the North Central Region Sustainable Agriculture Research and Education (NCR-SARE) Program, July 2002 to present
- Acting Administrator for the Minnesota Institute for Sustainable Agriculture (MISA), 2000-02
- Served on the MISA Board of Directors 1994-99; also served as Board Vice-Chair and Chair
- Took *Seven Habits of Highly Effective People* short course, 1996
- Co-Chaired University of Minnesota Small Farm Task Force, 1997-98
- Coordinator for University of Minnesota Extension Service sustainable agriculture professional development programs, 1996 to 2004
- Participated in two-quarter course taught at the Hubert H. Humphrey Institute of Public Affairs, *Leadership for the Common Good*, winter and spring, 1997
- Coordinator for University of Minnesota Extension Service activities related to the Conservation Reserve Program (CRP), 1996-97
- Co-Chaired University of Minnesota Extension Service Crop Systems Specialization, 1994-97
- Chaired University of Minnesota Extension Service Annual Conference, 1996
- Completed one-year leadership development program offered by the Extension Services of the north central region (NELD - National Extension Leadership Development), 1994-95
- Completed three-year leadership development program offered by the University of Minnesota Extension Service (LEAD, Leadership in Extension for Agricultural Development), 1990-93

## **International Experience**

- Studied sustainable agriculture in Cuba, February 4-13, 2001
- Provided grain and potato storage advice to a farm in southern Russia, May 1993
- Studied agricultural leadership in the Netherlands, Germany, Poland, and the Czech Republic, September 8-25, 1993
- Visited Hassan II Institute of Agriculture and Veterinary Medicine in Rabat, Morocco and viewed grain storage research, visited with engineering and food science faculty members, and contacted a potential graduate student, June 23-30, 1991
- Set up a solar onion drying test in Barbados, February 18-25, 1989
- Worked on a USAID Title XII project on onion drying and storage in the eastern Caribbean (Barbados, Montserrat, and St. Kitts), July 24 - August 5, 1988

## **Community Service**

- Board member, Compatible Technology International, 2002 - present
- Volunteer math tutor (1993-96) and science project judge (1993 - present), Murray Junior High, St. Paul
- Member for seven years, president for two years, Story County Housing, Inc., a private, nonprofit organization that helped low-income Iowa families with housing problems, 1978-85
- Member for six years, president for two years, Advisory Board for Story County Community Action, 1979-85

## **Selected Refereed Publications**

Kaliyan, N., M.A. Carrillo, R.V. Morey, W.F. Wilcke, and S. Kells. 2007. Mortality of Indianmeal moth (Lepidoptera: Pyralidae) populations under fluctuating temperatures: Model development and validation. *Environmental Entomology* 36(6): 1318-1327.

Kaliyan, N., R.V. Morey, W.F. Wilcke, M.A. Carrillo, and C.A. Cannon. 2007. Low-temperature aeration to control Indianmeal moth, *Plodia interpunctella* (Hubner), in twelve locations in the United States: a simulation study. *Journal of Stored Products Research* 43: 177-192.

Carrillo, M.A., R. D. Moon, W.F. Wilcke, R.V. Morey, N. Kaliyan, and W.D. Hutchison. 2006. Overwintering mortality of Indianmeal moth (Lepidoptera: Pyralidae) in southern Minnesota. *Environmental Entomology* 35(4): 843-855.

Carrillo, M.A., C. A. Cannon, W.F. Wilcke, R.V. Morey, N. Kaliyan, and W.D. Hutchison. 2005. Relationship between supercooling point and mortality at low temperatures in the Indianmeal moth (Lepidoptera: Pyralidae). *Journal of Economic Entomology* 98(2): 618-625.

Kaliyan, N, R.V. Morey, and W.F. Wilcke. 2005. Mathematical model for simulating headspace and grain temperatures in grain bins. *Transactions of the ASAE* 48(5): 1851-1863.

Carrillo, M.A., N. Kaliyan, C.A. Cannon, R.V. Morey, and W.F. Wilcke. 2004. A simple method to adjust cooling rates for supercooling point determination. *CryoLetters* 25: 155-160.

Morey, R.V., W.F. Wilcke, and D.J. Hansen. 2003. Aeration strategies for reconditioning dry soybeans. *Applied Engineering in Agriculture* 19(4): 433-446.

Ileleji, K.E., W.F. Wilcke, and R.V. Morey. 2003. Relative storability of high-oil and Bt corn compared to conventional hybrids. *Transactions of the ASAE* 46(2): 407-414.

Wilcke, W.F., K.E. Ileleji, P. Gupta, R.V. Morey, and R.A. Meronuck. 2001. Comparison of sample storage and conditioning methods for corn storability tests. *Transactions of the ASAE* 44(2): 369-376.

Wilcke, W.F., P. Gupta, R.V. Morey, and R.A. Meronuck. 2000. Effect of changing temperature on deterioration of shelled corn. *Transactions of the ASAE* 43(5):1195-1201.

Gupta, P., W.F. Wilcke, R.V. Morey, and R.A. Meronuck. 1999. Effect of dry matter loss on corn quality. *Applied Engineering in Agriculture* 15(5): 501-507.

Wilcke, W.F., H.F. Ng, R.A. Meronuck, R.V. Morey, P. Gupta, and J.P. Lang. 1999. Storability of wheat infected with *Fusarium* head blight. *Transactions of the ASAE* 42(3): 733-742.

Ng, H.F., W.F. Wilcke, R.V. Morey, R.A. Meronuck, and J.P. Lang. 1998. Mechanical damage and corn storability. *Transactions of the ASAE* 41(4): 1095-1100.

Ng, H.F., W.F. Wilcke, R.V. Morey, and J.P. Lang. 1998. Machine vision evaluation of corn kernel mechanical and mold damage. *Transactions of the ASAE* 41(2): 415-420.

Ng, H.F., R.V. Morey, W.F. Wilcke, R.A. Meronuck, and J.P. Lang. 1995. Relationship between equilibrium relative humidity and deterioration of shelled corn. *Transactions of the ASAE* 38(4): 1139-1145.

Wilcke, W.F., R.V. Morey, and D.J. Hansen. 1993. Strategies for reducing ambient-air grain drying costs. *Applied Engineering in Agriculture* 9(2): 241-248.

Wilcke, W.F., C.S. Chang, and G.H. Hetzel. 1992. Grain flow through horizontal guarded orifices. *Applied Engineering in Agriculture* 8(1): 65-75.

## **Selected Extension Materials**

### ***Numbered Extension bulletins***

Wilcke, Bill, Ken Hellevang, Joe Harner, Dirk Maier, and Bill Casady. 2004. *Managing Dry Grain in Storage, AED-20*. 24 pp. Ames IA: MidWest Plan Service, Iowa State University. (ASAE Blue Ribbon winner.)

Wilcke, W. and G. Wyatt. 2002. *Grain Storage Tips: Factors and Formulas for Crop Drying, Storage and Handling, FS-M1080*. 2 pp. St. Paul MN: University of Minnesota Extension Service.

Wilcke, Bill, Greg Cuomo, and Cheryl Fox. 1999. *Preserving the value of dry stored hay, FO-7404*. 4 pp. St. Paul MN: University of Minnesota Extension Service.

Maier, Dirk E. and William F. Wilcke. 1998. *Temporary grain storage considerations, GQ-38*. W. Lafayette IN: Purdue University Agricultural Communications.

Hellevang, Ken, Leslie Backer, Roger Brook, Joseph Harner, David Jones, Dirk Maier, Bill Peterson, and William Wilcke. 1997. *Dry grain aeration systems handbook, MWPS-29*. 88 pp. Ames IA: MidWest Plan Service, Iowa State University. (ASAE Blue Ribbon winner.)

Wilcke, William F. and R. Vance Morey. 1995. *Natural-air corn drying in the upper Midwest, BU-6577*. 20 pp. St. Paul MN: Minnesota Extension Service, University of Minnesota. (ASAE Blue Ribbon winner.)

- Wilcke, William F. and Kenneth J. Hellevang. 1992. *Wheat and barley storage, AG-FS-5947 and Wheat and barley drying, AG-FS-5949*. 2 pp each. St. Paul MN: Minnesota Extension Service, University of Minnesota.
- Wilcke, William F. and R. Vance Morey. 1991. *Selecting fans and determining airflow for crop drying, cooling, and storage, AG-FO-5716*. 8 pp. St. Paul MN: Minnesota Extension Service, University of Minnesota.
- Wilcke, William and Herbert Stiles. 1988. *Forced-air produce cooler, 442-060*. 4 pp. Blacksburg VA: Virginia Cooperative Extension Service, Virginia Polytechnic Institute & State University.
- Wilcke, William and VPI&SU Mycotoxin Committee. 1988. *Aflatoxins in corn, 442-059*. 9 pp. Blacksburg VA: Virginia Cooperative Extension Service, Virginia Polytechnic Institute & State University.
- Wilcke, William. 1987. *Managing stored grain, 442-055*. 10 pp. Blacksburg VA: Virginia Cooperative Extension Service, Virginia Polytechnic Institute & State University.
- Wilcke, William and Carl Bern. 1985. *Comparing corn drying energy costs, AE-3025*. 4 pp. Ames IA: Iowa Cooperative Extension Service, Iowa State University.
- Wilcke, William. 1985. *Natural-air corn drying with stirring, AE-3035*. 4 pp. Ames IA: Iowa Cooperative Extension Service, Iowa State University.
- Wilcke, William and Manjit Misra. 1984. *Soybean drying tips, AE-3026*. 2 pp. Ames IA: Iowa Cooperative Extension Service, Iowa State University.
- Wilcke, William F. and Vernon M. Meyer. 1983. *Preheating swine ventilating air with solar energy, Pm-1099*. 4 pp. Ames IA: Iowa Cooperative Extension Service, Iowa State University.
- Midwest Plan Service. 1983. *Solar livestock housing handbook, MWPS-23*. 88 pp. Ames IA: MWPS, Iowa State University. I authored or co-authored several sections of this handbook and wrote the computer program that generated the solar radiation tables.
- Van Fossen, Larry and William Wilcke. 1982. *Temporary corn storage, AE-3000*. 4 pp. Ames IA: Iowa Cooperative Extension Service, Iowa State University.
- Wilcke, William. 1981. *Wind power for farm and home, EES-24*. 7 pp. Ames IA: Iowa Energy Extension Service, Iowa State University.
- Midwest Plan Service. 1980. *Low-temperature & solar grain drying handbook, MWPS-22*. 86 pp. Ames IA: MWPS, Iowa State University. I wrote the solar sections of this handbook and co-authored the grain drying section.

### **Computer program**

Hansen, Deborah J., William F. Wilcke, and R. Vance Morey. 1996. *WINFANS: A computer program for selecting crop drying fans and determining airflow*. St. Paul MN: University of Minnesota Extension Service. (ASAE Blue Ribbon winner.) Can be downloaded free from our website at:

[www.bbe.umn.edu/extens/postharvest](http://www.bbe.umn.edu/extens/postharvest)

The current version of this program is in a compiled programming language; we are working on an Excel spreadsheet version of the program.