

VITA – JENNIFER G. KLING

Position Title: Plant Breeder and Geneticist
Rank: Professor/Senior Research
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EDUCATION

Degree	Institution	Year Granted
Ph.D. — Genetics	North Carolina State University, Raleigh, NC	1988
M.S. — Agronomy/Plant Breeding	University of Nebraska, Lincoln, NE	1983
B.S. — Crop Science	Oregon State University, Corvallis, OR	1980

EMPLOYMENT HISTORY

Position	Employer	Years
Agricultural Consultant/Breeder	Self	since 2016
Professor/Senior Research	Crop & Soil Science, Oregon State Univ.	since 2001
Research Associate	Forest Ecosystems & Society, Oregon State Univ.	2016–2020
Maize Breeder	IITA, Ibadan, Nigeria	1990–2000
Post-Doctoral Research Fellow	IITA, Ibadan, Nigeria	1988–1990
Graduate Teaching Assistant	Genetics, North Carolina State Univ.	1987–1988
Graduate Research Assistant	Genetics, North Carolina State Univ.	1983–1987
Graduate Research Assistant	Agronomy, Univ. of Nebraska - Lincoln	1981–1983

CAREER OBJECTIVES

- Breed specialty crops for niche markets in Oregon – I currently collaborate with local growers' organizations on meadowfoam, flax, corn and oats
- Provide consulting services on experimental design and analyze data for agricultural research projects
- Develop curriculum and training materials to support online learning for diverse audiences in plant breeding and related fields

RESEARCH (since 2005) Oregon State University

- Conducted quantitative genetic analyses for the [Pacific Northwest Tree Improvement Research Cooperative \(PNWTIRC\)](#) (2016–2020)
 - Analysis of 100-year-old Heredity study in Douglas-fir to determine relationships between climate variables and site x provenance interactions
 - Assisted in developing genetic markers and methods for genomic selection in Douglas-fir
- Developed improved cultivars of meadowfoam (*Limnanthes alba* Benth.), with better disease and pest resistance and higher oil yield, to increase the productivity and profitability of meadowfoam as a crop in the Willamette Valley of Oregon (2006–2015)
- Developed high-oil, spring oat germplasm for irrigated environments in Oregon (2013–2015)

- Data Curator, Barley CAP (2006–2011) – Monitored quality of phenotypic and pedigree data received from collaborators; applied standardized formats for uploading into The Hordeum Toolbox database

TEACHING

Oregon State University

- Completed a professional development course on “Developing an Online Course” offered by Ecampus at OSU (Fall, 2014)
- Developed CROP 590 “Experimental Design in Agriculture” for online delivery
- Developed course material and a website for teaching CSS 330 “World Food Crops” as an online course (2003)

Course No.	Title	Term(s)
<i>Courses Taught</i>		
CROP 590	Experimental Design in Agriculture (online)	Spring 2017–2020
CROP 590	Experimental Design in Agriculture	Winter 2007–2016
PBG 650	Advanced Plant Breeding and Quantitative Genetics	2005–2015 (odd years), 2019
HORT/CROP 407	Senior Seminar	Spring 2013–2014
CSS 490/590	Field Plot Technique	Winter 2003–2006
CSS 505/605	Current Literature in Plant Genetics	Spring 2006
CSS 330	World Food Crops (online)	Spring 2003–2006
CSS 405	R&C — Specialty Crops for Niche Markets	Fall 2003
CSS 499/599	Issues in Sustainable Agriculture (distance course)	2001–2002

Guest lectures

CROP/HORT 480	Case Studies in Cropping Systems Management	Spring 2020
PBG 430	Plant Genetics	Winter 2018
PBG 450/550	Plant Breeding	Spring 2003–2016
CSS 330	World Food Crops	2003–2016
PBG 519	Current Topics in Plant Breeding	Spring 2013
CSS 599/699	Association Genetics and Breeding	Winter 2009
CSS 621	Genetic Mapping	Fall 2004
CSS 630	Current Topics in Plant Breeding	Spring 2002, 2004

International Institute of Tropical Agriculture

- Lectured and conducted a two-day field trip in Nigeria for a course on Breeding for Stress Tolerance in Maize (1999)
- Research coordinator and lecturer for three training courses on Maize Research and Technology Transfer (8–10 weeks each, 1989–1992)
- Coorganized and taught a one-week training course on the use of MSTATC to analyze breeding experiments (1991)

GRADUATE STUDENT COMMITTEES

- Co-advisor for Jun Zhang, who completed his PhD in 2016 (funded by the Berger Endowment, OSU)
- Served as a committee member for 16 PhD students and 15 MS students in 8 departments at OSU
- Supervised research for 6 PhD students and 3 MSc students at IITA

RESEARCH (1988-2000) International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria

- Developed maize inbred lines, hybrids, and varieties adapted to West and Central Africa, with tolerance to abiotic stresses and resistance to prevalent disease and insect pests
- Senior Maize Breeder (1996–2000) — Provided leadership for maize breeding activities which were carried out by a team of 7 international scientists and 40 locally-recruited staff
- Coordinator, Maize/Grain Legume Systems Project (1999) — Organized planning meetings and monitored research activities for a team of 12 international scientists of various disciplines, compiled annual reports, and made presentations on behalf of the project at workshops and Institute reviews
- Coordinator, Project on Conservation and Utilization of Plant Biodiversity (1998) — Project activities included germplasm conservation and characterization for six IITA mandate crops, research on genetic diversity, development of source germplasm, and exchange of disease-tested planting materials

EXTENSION

- Developing an online learning module on Seed Saving for the Small Farms Program at OSU
- Multiplied improved maize inbred lines, hybrids, and varieties for testing and distribution to national research programs and farmers in West and Central Africa (1988–2000)

PROFESSIONAL ACTIVITIES

- Member Crop Science Society of America (CSSA) & American Society of Agronomy (ASA)
- Member National Association of Plant Breeders (NAPB)
- Served on four NIFA grant review panels (2011—2015)
- Reviewed the CGIAR Mega Program Proposal entitled “WHEAT — Global Alliance for Improving Food Security and the Livelihoods of the Resource-poor in the Developing World” as a consultant for Bioversity International (2010)
- Prepared a review chapter on “Varietal Development” for major food crops in Africa in a study conducted by ICIPE for the Bill and Melinda Gates Foundation (2006)
- Chairperson of the ASA International Awards Committee (2004/2005)

Consultant, Rockefeller Foundation

- Member of a Scientific Advisory Committee for a Rockefeller Foundation program entitled “Biotechnology, Breeding, and Seed Systems for African Crops” (2002–2007)
- Conducted reviews of national maize breeding programs and seed projects funded by the Rockefeller Foundation in Zimbabwe, Malawi and Kenya (Sept. 8–18, 2003)

- Coordinated and lectured in a training workshop in Bellagio, Italy on “Biotechnology, Breeding and Seed Systems for African Crops” (September 9–20, 2002)
- Member of a team that reviewed the Kenya Maize Breeding Program (June 16–20, 1998)

AWARDS AND HONORS

International Institute of Tropical Agriculture

- Received three awards from the Training Program for contributions to training
- Received a ten-year service award from the West and Central Africa Maize Research Network for contributions to training and development of training materials, 1997

Awards Received as a Student

Outstanding Teaching Assistant Award, 1987
 Member Gamma Sigma Delta, Sigma Xi, Phi Kappa Phi
 G.R. Hyslop Memorial Foundation Scholarship
 Oregon Seed Trade Association Scholarship
 Pennsylvania Higher Assistance Agency Scholarship

GRANTS AND CONTRACTS (since 2005)

1. OMG Meadowfoam Oil Seed Growers Cooperative/ARF, 2012–2015. Developing Spring Oat Cultivars with High Oil Content for the Willamette Valley (Principal Investigator) (\$119,339)
2. OMG Meadowfoam Oil Seed Growers Cooperative/ARF, 2008–2014. Enhancing the Genetics and Productivity of the Oilseed Crop Meadowfoam (Principal Investigator) (\$111,400)
3. OSU Agricultural Research Foundation, 2012–2013. Breeding Dual-Purpose Flax Varieties for Emerging Textile Markets in Oregon (Principal Investigator) (\$12,425)
4. OSU General Research Fund, 2011–2012. Bee pollinators for increased oilseed yield of meadowfoam in the Willamette Valley (Co-PI on a project directed by Sujaya Rao) (\$10,000)
5. USDA Barley Coordinated Agricultural Project, 2006–2011 (0.25 FTE for role as Data Curator)
6. USDA-CSREES/NIFA, Special Research Grants Program, 2010. Enhancing the Genetics and Productivity of the Oilseed Crop Meadowfoam (Principal Investigator) (\$167,520)
7. USDA-CSREES, Special Research Grants Program, 2009. Enhancing the Genetics and Productivity of the Oilseed Crop Meadowfoam (Principal Investigator) (\$167,812)
8. USDA-CSREES, Special Research Grants Program, 2008. Enhancing the Genetics and Productivity of the Oilseed Crop Meadowfoam (Principal Investigator) (\$178,716)
9. USDA-CSREES, Special Research Grants Program, 2006. Enhancing the Genetics and Productivity of the Oilseed Crop Meadowfoam (Principal Investigator) (\$168,276)
10. USAID/ALO Rural Livelihoods Consortium, 2005 (0.15 FTE for training activities in Southern Africa)

CULTIVAR AND GERMLASM RELEASE (since 2005)

Kling, J.G. 2013. Release of ‘Crane’ meadowfoam. Report and presentation approved by the Varietal Release Committee, Oregon Agricultural Experiment Station.

Kling, J.G. 2017. Plant variety protection certificate for ‘Crane’ meadowfoam (PVPO #201600012). USDA, Washington, DC.

CONFERENCE PROCEEDINGS, WEBINARS, EXTENSION BULLETINS (since 2006)

- Kling, J.G., K. Jayawickrama, S. Lipow, A. Magnuson, and G. Howe. 2019. PNWTIRC/NWTIC genomic selection research: preliminary results from the NARA plantation. Presentation at the Pacific Northwest Tree Improvement Research Cooperative Annual Meeting, Oct. 29, 2019, Milwaukie, Oregon.
- Kling, J.G., M. Trappe, S. Kolpak, T. Ye, K. Jayawickrama, and G. Howe. 2016. Validation of SNP data for genomic selection in Douglas-fir. Presentation at the Pacific Northwest Tree Improvement Research Cooperative Annual Meeting, Oct. 19, 2016, Portland, Oregon.
- Sagili, Ramesh, and Jennifer Kling. 2015. Pollination and seed set in meadowfoam. OSU Extension Bulletin EM8666. Replaces EC1360.
- Kling, J.G. 2013. Lattice Designs Webinar. Available on eXtension: <https://plant-breeding-genomics.extension.org/lattice-designs-webinar>
- Kling, J.G., and H.L. Merk. 2011. Introduction to the Augmented Experimental Design Webinar. Available on eXtension: <https://plant-breeding-genomics.extension.org/introduction-to-augmented-experimental-design>
- Kling, J.G., C. Mallory-Smith, J.F. Stevens, M.B. Slabaugh, R. Reed, J. Zhang, S. Intanon, and G. Hoffman. 2010. Progress in breeding meadowfoam as a crop with unique oil quality and seedmeal properties. Poster presented at the American Society of Agronomy Meetings, Long Beach, CA.

REFEREED PUBLICATIONS (since 2001)

- Kling, J.G. 2021. Meadowfoam breeding. *In* Irwin Goldman (ed.) Plant Breeding Reviews, Volume 44: 187-245, First Edition, John Wiley & Sons, Inc.
- Cicek, H., S. Ates, G. Ozcan, M. Tezel, J.G. Kling, M. Louhaichi, and G. Keles. 2020. Effect of nurse crops and seeding rate on the persistence, productivity and nutritive value of sainfoin in a cereal-based production system. *Grass Forage Sci.* 75: 86–95.
- Howe, G.T., K. Jayawickrama, S.E. Kolpak, J. Kling, M. Trappe, V. Hipkins, T. Ye, S. Guida, R. Cronn, S.A. Cushman, and S. McEvoy. 2020. An Axiom SNP genotyping array for Douglas-fir. *BMC Genomics* 21: 9.
- St. Clair, J.B., G.T. Howe, and J.G. Kling. 2020. The 1912 Douglas-fir heredity study: long-term effects of climatic transfer distance on growth and survival. *Journal of Forestry* 118: 1–13.
- Kolawole, A.O., A. Menkir, E. Blay, K. Ofori, and J.G. Kling. 2019. Changes in heterosis of maize (*Zea mays* L.) varietal cross hybrids after four cycles of reciprocal recurrent selection. *Cereal Research Communications* 47: 145–156.
- Kolawole, A.O., A. Menkir, M. Gedil, E. Blay, K. Ofori, and J.G. Kling. 2017. Genetic divergence in two tropical maize composites after four cycles of reciprocal recurrent selection. *Plant Breeding* 136: 41–49.
- Cuesta-Marcos, A., J. G. Kling, A. R. Belcher, T. Filichkin, S. P. Fisk, R. Graebner, L. Helgerson, D. Herb, B. Meints, A. S. Ross, P. M. Hayes, and S.E. Ullrich. 2016. Barley, genetics and breeding. *In* H. Corke, J. Faubion, K. Seetheraman, and C. Wrigley (eds.), *Encyclopedia of Food Grains* 2nd ed. Elsevier Limited, Oxford, UK.
- Slabaugh, M.B., L. Cooper, V.K. Kishore, S.J. Knapp, and J.G. Kling. 2015. Genes affecting novel seed constituents in *Limnanthes alba* Benth.: Transcriptome analysis of developing embryos and a new genetic map of meadowfoam. *PeerJ* 3: e915.
- Ajala, S.O., J.G. Kling, and A. Menkir. 2012. Full-sib family selection in maize populations for tolerance to low soil nitrogen. *J. of Crop Improvement* 26: 581–598.
- Blake, V.C., J.G. Kling, P.M. Hayes, J.-L. Jannink, S.R. Jillella, J. Lee, D.E. Matthews, S. Chao, T.J. Close, G.J. Muehlbauer, K.P. Smith, R.P. Wise, J.A. Dickerson. 2012. The Barley Coordinated Agricultural Project genotype and phenotype resource. *Plant Genome* 5: 81–91.

- Velasco, P., M.B. Slabaugh, R. Reed, J. Kling, V.K. Kishore, J.F. Stevens, and S.J. Knapp. 2011. Glucosinolates in the new oilseed crop meadowfoam: natural variation in Section *Inflexae* of *Limnanthes*, a new glucosinolate in *L. floccosa*, and QTL analysis in *L. alba*. *Plant Breeding* 130: 352–359.
- Hamblin, M.T., T.J. Close, P.R. Bhat, S. Chao, J.G. Kling, K.J. Abraham, T. Blake, W.S. Brooks, B. Cooper, C.A. Griffey, P.M. Hayes, D.J. Hole, R.D. Horsley, D.E. Obert, K.P. Smith, S.E. Ullrich, G.J. Muehlbauer, and J.-L. Jannink. 2010. Population structure and linkage disequilibrium in U.S. barley germplasm: implications for association mapping. *Crop Sci.* 50: 556–566.
- Yallou, C.G., A. Menkir, V.O. Adetimirin, and J.G. Kling. 2009. Combining ability of maize inbred lines containing genes from *Zea diploperennis* for resistance to *Striga hermonthica* (Del.) Benth. *Plant Breeding* 128: 143–148.
- Castro, A.S. Petrie, A. Budde, A. Corey, P. Hayes, J. Kling, and K. Rhinhart. 2008. Variety and N management effects on grain yield and quality of winter barley. *Crop Management*, Nov. issue. Online <http://www.plantmanagementnetwork.org/>
- Menkir, A., and J.G. Kling. 2007. Response to recurrent selection for resistance to *Striga hermonthica* (Del.) Benth in a tropical maize population. *Crop Sci* 47: 674–682.
- Badu-Apraku, B., A. Menkir, J.G. Kling, and M.A.B. Fakorede. 2006. Registration of 16 striga resistant early maturing tropical maize inbred lines. *Crop Sci* 46: 1410–1411.
- Menkir, A., J.G. Kling, B. Badu-Apraku, and O. Ibikunle. 2006. Registration of 26 tropical maize germplasm lines with resistance to *Striga hermonthica*. *Crop Sci* 46: 1007–1009.
- Richardson, K.L., M.I. Vales, J.G. Kling, C.C. Mundt, and P.M. Hayes. 2006. Pyramiding and dissecting disease resistance QTL to barley stripe rust. *Theor. Appl. Gen.* 113: 485–495.
- Kling, J.G. 2005. Review of “Women and plants: gender relations in biodiversity management and conservation” by Patricia Howard (ed.). *Agricultural Systems* 83: 337–339.
- Menkir, A., I. Ingelbrecht, B. Badu-Apraku, and J.G. Kling. 2005. Molecular marker-based genetic diversity assessment of *Striga*-resistant maize inbred lines. *Theor. Appl. Gen.* 110: 1145–1153.
- Karsai, I., P.M. Hayes, J. Kling, I.A. Matus, K. Meszaros, L. Lang, Z. Bedo, and K. Sato. 2004. Genetic variation in component traits of heading date in *Hordeum vulgare* subsp. *spontaneum* accessions characterized in controlled environments. *Crop Sci.* 44: 1622–1632.
- Kling, J.G., P.M. Hayes, and S.E. Ullrich. 2004. Barley: genetics and breeding. In C. Wrigley, H. Corke, and C. Walker (eds.), *Encyclopedia of Grain Science*. Elsevier Limited, UK. Vol 1: 27–38.
- Ajala, S.O., J.G. Kling, S.K. Kim, and A.O. Obajimi. 2003. Improvement of maize populations for resistance to downy mildew. *Plant Breeding* 122: 328–333.
- Baloch, D.M., R. S. Karow, E. Marx, J.G. Kling, and M.D. Witt. 2003. Vernalization studies with Pacific Northwest wheat. *Agron. J.* 95: 1201–1208.
- Gungula, D.T., J.G. Kling, and A.O. Togun. 2003. CERES-Maize Predictions of Maize Phenology under Nitrogen-Stressed Conditions in Nigeria. *Agron. J.* 95: 892–899.
- Hayes, P.M., A. Castro, L. Marquez-Cedillo, A. Corey, C. Henson, B.L. Jones, J. Kling, D. Mather, I. Matus, C. Rossi, and K. Sato. 2003. Genetic diversity for quantitatively inherited agronomic and malting quality traits. In R. von Bothmer, H. Knüpffer, T. van Hintum, and K. Sato (eds.), *Diversity in Barley (Hordeum vulgare L.)*. Elsevier Science Publishers, Amsterdam.
- Kamara, A.Y., J.G. Kling, A. Menkir, and O. Ibikunle. 2003. Agronomic performance of maize (*Zea mays* L.) breeding lines derived from a low nitrogen maize population. *Journal of Agricultural Science* 141: 221–230.
- Kim, S.K., S.O. Ajala, and J.G. Kling. 2003. Combining ability of tropical maize germplasm in West Africa. IV. Inheritance of resistance to downy mildew (*Peronosclerospora sorghi*) infection. *Maydica* 48: 9–14.

- Matus, I., A. Corey, T. Filichkin, P. M. Hayes, J. Kling, W. Powell, O. Riera-Lizarazu, K. Sato, M.I. Vales , and R. Waugh. 2003. Development and characterization of recombinant chromosome substitution lines (RCSLs) using *Hordeum vulgare* subsp. *spontaneum* as a source of donor alleles in a *Hordeum vulgare* subsp. *vulgare* background. *Genome* 46: 1010–1023.
- Oikeh, S.O., R.J. Carsky, J.G. Kling, V.O. Chude, W.J. Horst. 2003. Differential N uptake by maize cultivars and soil nitrate dynamics under N fertilization in West Africa. *Agriculture, Ecosystems and Environment* 100: 181–191.
- Schulz, S., M.A. Hussaini, J.G. Kling, D.K. Berner, F.O. Ikie. 2003. Evaluation of integrated *Striga* control technologies under farmer management. *Experimental Agriculture* 39: 99–108.
- Botanga, C.J., J.G. Kling, D.K. Berner, and M.P. Timko. 2002. Genetic variability of *Striga asiatica* (L.) Kuntz based on AFLP analysis and host interaction. *Euphytica* 128: 375–388.
- Brown, R.L., Z.Y. Chen, A. Menkir, T.E. Cleveland, K. Cardwell, J. Kling, and D.G. White. 2001. Resistance to aflatoxin accumulation in kernels of maize inbreds selected for ear rot resistance in West and Central Africa. *J. Food Prot.* 64: 396–400.
- Gudrups, I., S. Floyd, J.G. Kling, N.A. Bosque-Pérez, and J.E. Orchard. 2001. A comparison of two methods of assessment of maize varietal resistance to the maize weevil *Sitophilus zeamais* Motschulsky, and the influence of kernel hardness and size on susceptibility. *Journal of Stored Products Research* 37: 287–302.