

Dr. Patrick F. Byrne

Curriculum Vitae

RANK: Professor

DATE OF APPOINTMENT: 1997

EDUCATION:

Ph.D. 1987 University of Missouri-Columbia, Agronomy
M.S. 1978 University of Missouri-Columbia, Horticulture
A.B. 1970 Washington University (St. Louis), Biology

AREAS OF EXPERTISE:

Plant breeding and genetics, quantitative trait locus analysis, international agriculture, biotechnology risk assessment

SELECTED PUBLICATIONS AND/OR CREATIVE WORKS (2010-2017):

- Stromberger, M.E., I. Abduelafez, P. Byrne, M. Moragues Canela, A.A. Elamari, D.K. Manter, and T. Weir. 2017. Genotype-specific enrichment of 1-aminocyclopropane-1-carboxylic acid deaminase-positive bacteria in winter wheat rhizospheres. *Soil Science Society of America Journal* (In press).
- Dao, H.Q., P.F. Byrne, S.D. Reid, and S.D. Haley. 2017. Validation of quantitative trait loci for grain quality-related traits in a winter wheat mapping population. *Euphytica* 213:5. doi: 10.1007/s10681-016-1793-0
- Tan, C.-T., S. Assanga, G. Zhang, J.C. Rudd, S.D. Haley, Q. Xue, A. Ibrahim, G. Bai, X. Zhang, P. Byrne, M.P. Fuentealba, and S. Liu. 2017. Development and validation of KASP markers for wheat streak mosaic virus resistance gene *Wsm2*. *Crop Science* 57:340–349. doi: 10.2135/cropsci2016.04.0234
- Kim, K.S., J.D. Anderson, M.A. Newell, S.M. Grogan, P.F. Byrne, P.S. Baenziger, and T.J. Butler. 2016. Genetic diversity of Great Plains hard winter wheat germplasm for forage. *Crop Science* 56:2297–2305. doi: 10.2135/cropsci2015.08.0519
- Grogan, S.M., J. Anderson, P.S. Baenziger, K. Frels, M.J. Guttieri, S.D. Haley, K.-S. Kim, S. Liu, G.S. McMaster, M. Newell, P.V. Vara Prasad, S.D. Reid, K.J. Shroyer, G. Zhang, E. Akhunov, and P.F. Byrne. 2016. Phenotypic plasticity of winter wheat heading date and grain yield across the U.S. Great Plains. *Crop Science* 56:2223-2236. doi: 10.2135/cropsci2015.06.0357
- Grogan, S.M., G. Brown-Guedira, S.D. Haley, G.S. McMaster, S.D. Reid, J. Smith, and P.F. Byrne. 2016. Allelic variation in developmental genes and effects on winter wheat heading date in the U.S. Great Plains. *PLoS ONE* 11(4): e0152852. doi:10.1371/journal.pone.0152852
- Becker, S.R., P.F. Byrne, S.D. Reid, W.L. Bauerle, J.K. McKay, and S.D. Haley. 2016. Root traits contributing to drought tolerance of synthetic hexaploid wheat in a greenhouse study. *Euphytica* 207:213-224. DOI 10.1007/s10681-015-1574-1/

- El-Feki, W.M., P.F. Byrne, S.D. Reid, and S.D. Haley. 2015. Registration of CO940610/'Platte' wheat doubled haploid mapping population. *Journal of Plant Registrations* 9:419–423.
- Edae, E.A., P.F. Byrne, S.D. Haley, M.S. Lopes, and M.P. Reynolds. 2014. Genome wide association mapping of yield and yield components of spring wheat under contrasting moisture regimes. *Theoretical and Applied Genetics* 127:791–807.
- Edae, E.A., P.F. Byrne, H. Manmathan, S.D. Haley, M. Moragues, M.S. Lopes, and M.P. Reynolds. 2013. Association mapping and nucleotide sequence variation in five drought tolerance candidate genes in spring wheat. *The Plant Genome* vol. 6, issue 2, doi:10.3835/plantgenome2013.04.0010.
- El-Feki, W.M., P.F. Byrne, S.D. Reid, N.L.V. Lapitan, and S.D. Haley. 2013. Quantitative trait locus mapping for end-use quality traits in hard winter wheat under contrasting soil moisture levels. *Crop Science* 53:1953-1967.
- Enjalbert, J.-N., S. Zheng, J.J. Johnson, J.L. Mullen, P.F. Byrne, and J.K. McKay. 2013. Brassicaceae germplasm diversity for agronomic and seed quality traits under drought stress. *Industrial Crops and Products* 47:176-185.
- Econopouly, B.F., J.K. McKay, P. Westra, S.D. Reid, A.L. Helm, and P.F. Byrne. 2013. Phenotypic diversity of jointed goatgrass (*Aegilops cylindrica*) accessions from the western United States under irrigated and dryland conditions. *Agriculture, Ecosystems and Environment* 164:244-251.
- Comas, L., S. Becker, M.V. Cruz, P.F. Byrne, and D.A. Dierig. 2013. Root traits contributing to plant productivity under drought. *Frontiers in Plant Science* doi: 10.3389/fpls.2013.00442.
- J.S. Boyer, P. Byrne, K.G. Cassman, M. Cooper, D. Delmer, T. Greene, F. Gruis, J. Habben, N. Hausmann, N. Kenny, R. Lafitte, S. Paszkiewicz, D. Porter, A. Schlegel, J. Schussler, T. Setter, J. Shanahan, R.E. Sharp, T.J. Vyn, D. Warner, J. Gaffney. 2013. The U.S. drought of 2012 in perspective: A call to action. *Global Food Security* 2:139-143.
- Matthews, S.B., M. Santra, M.M. Mensack, P. Wolfe, P.F. Byrne, and H. Thompson. 2012. Metabolite profiling of a diverse collection of wheat lines using ultraperformance liquid chromatography coupled with time-of-flight mass spectrometry. *PLoS One* Vol. 7, Issue 8, Article e44179, DOI: 10.1371/journal.pone.0044179.
- Valdez, V.A., P.F. Byrne, N.L.V. Lapitan, F.B. Peairs, A. Bernardo, G. Bai, and S.D. Haley. 2012. Inheritance and genetic mapping of Russian Wheat Aphid resistance in Iranian wheat landrace accession PI 626580. *Crop Science* 52:676-682.
- Lu, H., R. Kottke, R. Devkota, P. St. Amand, A. Bernardo, G. Bai, P. Byrne, T.J. Martin, S.D. Haley, and J. Rudd. 2012. Consensus mapping and identification of markers for marker-assisted selection of *Wsm2* in wheat. *Crop Science* 52:720-728.
- Econopouly, B., J. McKay, P. Westra, N. Lapitan, P. Chapman, and P. Byrne. 2011. Backcrossing provides an avenue for gene introgression from wheat to jointed goatgrass (*Aegilops cylindrica*) in the U.S. Great Plains. *Weed Science* 59: 188-194.
- Zheng, S., P.F. Byrne, S.D. Haley, X. Shan, and S.D. Reid. 2010. Glutenin allelic variation and 1AL.1RS effects on dough mixing properties of wheat grown in irrigated and rainfed environments. *Euphytica* 176:357-369.

Econopouly, B., P. Byrne, and M.A. Johnson. 2010. Incorporating case studies into a world food and population course. *Journal of Natural Resources & Life Sciences Education* 39:79-83.

RECENT RESEARCH GRANTS:

Validation, characterization, and deployment of QTL for grain yield components in wheat. PI: J. Dubcovsky. CSU Co-PI's: S. Pearce, S. Haley, P. Byrne. USDA-NIFA-AFRI. 2016-2021. \$432,852 (CSU portion).

Exploring the Microbiome of Root, Rhizosphere, and Leaf of Wheat and Its Relatives. PI: P. Byrne, Co-PI: K. Broders. Colorado Wheat Research Foundation. 2015-2016. \$13,020

Plant Breeding for Improved Water Productivity, PI: P. Byrne, Co-PI's: M. Brick, L. Comas, S. Haley, C. Jahn, N. Lapitan, J. McKay, and A. Seshadri. USDA-NIFA-National Needs Fellowship Program. 2014-2019. \$220,500.

I/UCRC for Area Wheat Genetics. PI: B. Gill, Kansas State University. Co-PIs at Colorado State University: P. Byrne, S. Haley. National Science Foundation, Industry & University Cooperative Research Program. 2013-2018. Colorado State University portion: \$60,000/year.

Improving Ethiopian wheat for Russian Wheat Aphid resistance. PI: F. Peairs. Co-PIs: P. Byrne, F. Azerefegne. USDA-SCRIP. 2013-2015. \$40,000.

Improving barley and wheat germplasm for changing environments.

PI: J. Dubcovsky, UC-Davis. Co-PIs at Colorado State University: P. Byrne, S. Haley. USDA-AFRI. 2011-2016. Colorado State University portion: \$608,000.

Interdisciplinary Graduate Research for the Production and Marketing of Oilseed Biofuel Products. PI: P. Byrne. Co-PIs: J. Johnson, D. Olsen. USDA-AFRI. 2009-2014. \$500,000.

Enhancing education and research capacity in plant breeding for drought tolerance.

PI: P. Byrne. Co-PIs: J. McKay, S. Baenziger, B. Martin. USDA-National Research Initiative. 2008-2013. \$499,382.

Russian wheat aphid resistance, stress tolerance, and quality enhancement of wheat.

PI: P. Byrne. Co-PI's: S. Haley, N. Lapitan. USDA-CSREES Special Research Grant. 2003-2011. Annual appropriations totaling \$2,014,606.

Estimating the frequency and impact of transgene introgression from wheat to jointed goatgrass.

PI: P. Byrne. Co-PI's: J. McKay, N. Lapitan, P. Westra. USDA-CSREES Biotechnology Risk Assessment Grants Program. 2007-2012. \$388,221.

COURSES TAUGHT:

SOCR 430 Applications of Plant Biotechnology (co-instructor)
SOCR 460 Plant Breeding
SOCR 530 Scientific Writing (co-instructor)

SOCR 725 Quantitative Inheritance in Plant Breeding
SOCR 730 Topics in Plant Breeding and Genetics
SOCR 570 Plant Breeding for Drought Tolerance (online)

SELECTED SERVICE AND/OR OUTREACH ACTIVITIES:

Since 2000, Dr. Byrne has conducted a public outreach program on the benefits and risks of genetically engineered (GE) crops. He has published Fact Sheets and given talks on this topic throughout Colorado, nationally, and internationally.

AWARDS:

Fellow, American Association for the Advancement of Science, 2013.

Fellow, Crop Science Society of America, 2012.

Fellow, American Society of Agronomy, 2011.

Fulbright Senior Lecturing Award, Cukurova University, Adana, Turkey, Sept. 2005-January 2006.

Charles N. Shepardson Teaching Award, College of Agricultural Sciences, Colorado State University, 2002.

Certificate of Excellence, Educational Materials Awards Program, American Society of Agronomy, Madison, WI, for web site "Transgenic Crops: An Introduction and Resource Guide", 2001, and "Bio-Pharming" Fact Sheet, CSU Cooperative Extension, 2004.

Superior Performance Award, USDA Agricultural Research Service, Plant Genetics Research Unit, Columbia, MO, 1996.

PREVIOUS EMPLOYMENT:

1992-97 Assistant Curator, Maize Genome Database, USDA-ARS Plant Genetics Research Unit, Columbia, MO

1987-92 Head, International Maize Testing Unit (2 years) and Post-doc (3 years) CIMMYT, Mexico City

1979-82 Agricultural Project Manager, Agency for International Development, Washington, D.C. and Cape Verde Islands, West Africa

1973-75 U.S. Peace Corps Volunteer, Nepal