

CURRICULUM VITAE

NAME

Todd Gaines

ADDRESS

Bioagricultural Sciences and Pest Management
College of Agricultural Sciences

1177 Campus Delivery

PHONE

(970) 491-6824

EDUCATION

2009 Ph D, Colorado State University

2006 MS, Colorado State University

2004 BS, Colorado State University

ACADEMIC POSITIONS

January 3, 2014 - Present Assistant Professor, Colorado State University, Fort Collins, CO, United States.

2017-2018 - Assistant Professor (College of Agricultural Sciences)

2016-2017 - Assistant Professor (College of Agricultural Sciences)

2015-2016 - Assistant Professor (College of Agricultural Sciences)

2014-2015 (College of Agricultural Sciences)

PUBLISHED WORKS

Refereed Journal Articles

Maxwel, O., Gaines, T., Amit, J., Stevan, K. (2018). Inheritance of mesotrione resistance in an *Amaranthus tuberculatus* (var. *rudis*) population from Nebraska, USA. *Frontiers in Plant Science.*, Peer Reviewed/Refereed

Kuepper, A., Manmathan, H. K., Giacomini, D., Patterson, E., McCloskey, W., Gaines, T. (2018). Population genetic structure in glyphosate-resistant and -susceptible Palmer amaranth (*Amaranthus palmeri*) populations using genotyping-by-sequencing (GBS). *Frontiers in Plant Science.*, Peer Reviewed/Refereed

Patterson, E., Fleming, M. B., Kessler, K. C., Nissen, S. J., Gaines, T. (2017). A KASP genotyping method to identify northern watermilfoil, Eurasian watermilfoil, and their interspecific hybrids. *Frontiers in Plant Science*, 8, 752. <http://journal.frontiersin.org/article/10.3389/fpls.2017.00752>, Peer Reviewed/Refereed

Oliveira, M., Jhala, A. J., Gaines, T., Irmak, S., Amundsen, K., Knezevic, S. Z. (2017). Confirmation and control of 4-hydroxyphenylpyruvate dioxygenase inhibitor-resistant common waterhemp (*Amaranthus rudis*) in

- Chahal, P. S., Irmak, S., Gaines, T., Amundsen, K., Jugulam, M., Jha, P., Travlos, I., Jhala, A. J. (2017). Control of photosystem (PS) II- and 4-hydroxyphenylpyruvate dioxygenase (HPPD)-inhibitor-resistant Palmer amaranth (*Amaranthus palmeri* S. Wats.) in conventional corn. *Weed Technology*, *In press.*, Peer Reviewed/Refereed
- Vieira, B. C., Samuelson, S. L., Alves, G. S., Gaines, T., Werle, R., Kruger, G. R. (2017). Distribution of glyphosate-resistant *Amaranthus* spp. in Nebraska. *Pest management science.*, Peer Reviewed/Refereed
- Fernández-Escalada, M., Zulet-González, A., Gil-Monreal, M., Zabalza, A., Ravet, K., Gaines, T., Royuela, M. (2017). Effects of EPSPS copy number variation (CNV) and glyphosate application on the aromatic and branched chain amino acid synthesis pathways in *Amaranthus palmeri*. *Frontiers in Plant Science*, 8, 1970. <https://www.frontiersin.org/article/10.3389/fpls.2017.01970>, Peer Reviewed/Refereed
- Patterson, E., Pettinga, D. J., Ravet, K., Neve, P., Gaines, T. (2017). Glyphosate resistance and EPSPS gene duplication: Convergent evolution in multiple plant species. *Journal of Heredity.*, Peer Reviewed/Refereed
- Van Horn, C. R., Moretti, M. L., Robertson, R. R., Segobye, K., Weller, S. C., Young, B. G., Johnson, W. G., Schulz, B., Green, A. C., Jeffery, T., Lesperance, M., Tardif, F., Sikkema, P., Hall, J. C., McLean, M., Lawton, M., Sammons, R. D., Gaines, T. (2017). Glyphosate resistance in *Ambrosia trifida*: Part 1. Novel rapid cell death response to glyphosate. *Pest Management Science.*, Peer Reviewed/Refereed
- Moretti, M. L., Van Horn, C. R., Robertson, R., Segobye, K., Weller, S. C., Young, B. G., Johnson, W. G., Douglas Sammons, R., Wang, D., Ge, X., d'Avignon, D. A., Gaines, T., Westra, P., Green, A., Jeffery, T., Lesperance, M., Tardif, F., Sikkema, P., Hall, J. C., McLean, M., Lawton, M., Schulz, B. (2017). Glyphosate resistance in *Ambrosia trifida*: Part 2. Rapid response physiology and non-target-site resistance. *Pest Management Science.*, Peer Reviewed/Refereed
- Pettinga, D. J., Ou, J., Patterson, E., Jugulam, M., Westra, P., Gaines, T. (2017). Increased Chalcone Synthase (CHS) expression is associated with dicamba resistance in *Kochia scoparia*. *Pest management science.*, Peer Reviewed/Refereed
- Figueiredo, M. R., Leibhart, L. J., Reicher, Z. J., Tranel, P. J., Nissen, S. J., Westra, P., Bernards, M. L., Kruger, G. R., Gaines, T., Jugulam, M. (2017). Metabolism of 2, 4-dichlorophenoxyacetic acid contributes to resistance in a common waterhemp (*Amaranthus tuberculatus*) population. *Pest management science.*, Peer Reviewed/Refereed
- Kuepper, A., Borgato, E. A., Patterson, E., Netto, A. G., Nicolai, M., Carvalho, S. J. d., Nissen, S. J., Gaines, T., Christoffoleti, P. J. (2017). Multiple resistance to glyphosate and acetolactate synthase inhibitors in Palmer amaranth (*Amaranthus palmeri*) identified in Brazil. *Weed Science*, 65(3), 317-326., Peer Reviewed/Refereed
- Giacomini, D. A., Gaines, T., Beffa, R., Tranel, P. J. (2017). Optimizing RNA-seq studies to investigate herbicide resistance. *Pest management science.*, Peer Reviewed/Refereed
- Busi, R., Gaines, T., Powles, S. (2017). Phorate can reverse P450 metabolism-based herbicide resistance in *Lolium rigidum*. *Pest Management Science*, 73, 410-417. <http://dx.doi.org/10.1002/ps.4441>, Peer Reviewed/Refereed
- Sarangi, D., Tyre, A. J., Patterson, E., Gaines, T., Irmak, S., Knezevic, S. Z., Lindquist, J. L., Jhala, A. J. (2017). Pollen-mediated gene flow from glyphosate-resistant common waterhemp (*Amaranthus rudis* Sauer): consequences for the dispersal of resistance genes. *Scientific Reports*, 7, 44913., Peer Reviewed/Refereed

- Beckie, H. J., Blackshaw, R. E., Leeson, J., Stahlman, P. W., Gaines, T., Johnson, E. A. (2017). Seed bank persistence, germination and early growth of glyphosate-resistant *Kochia scoparia*. *Weed Research, In press.*, Peer Reviewed/Refereed
- Kuepper, A., Peter, F., Zöllner, P., Lorentz, L., Tranel, P. J., Beffa, R., Gaines, T. (2017). Tembotrione detoxification in HPPD-inhibitor resistant Palmer amaranth (*Amaranthus palmeri* S. Wats.). *Pest management science.*, Peer Reviewed/Refereed
- Oliveira, M. C., Gaines, T., Dayan, F. E., Patterson, E., Jhala, A. J., Knezevic, S. Z. (2017). Reversing resistance to tembotrione in an *Amaranthus tuberculatus* (var. *rudis*) population from Nebraska, USA with cytochrome P450 inhibitors. *Pest Management Science.*, Peer Reviewed/Refereed
- Brunharo, Caio A. C. G., Patterson, E., Carrijo, D. R., de Melo, Marcel S. C., Nicolai, M., Gaines, T., Nissen, S. J., Christoffoleti, P. J. (2016). Confirmation and mechanism of glyphosate resistance in tall windmill grass (*Chloris elata*) from Brazil. *Pest Management Science*, 72(9), 1758-1764. <http://dx.doi.org/10.1002/ps.4205>, Peer Reviewed/Refereed
- Gaines, T., Barker, A. L., Patterson, E., Westra, P., Westra, E. P., Wilson, R. G., Jha, P., Kumar, V., Kniss, A. R. (2016). EPSPS gene copy number and whole-plant glyphosate resistance level in *Kochia scoparia*. *PLOS ONE*, 11(12), e0168295. <http://dx.doi.org/10.1371/journal.pone.0168295>!!!, Peer Reviewed/Refereed
- Li, Z., Kessler, K. C., Figueiredo, Marcelo Rodrigues Alves de, Nissen, S. J., Gaines, T., Westra, P., Acker, R. C. Van, Hall, C., Robinson, D. E., Soltani, N., Sikkema, P. H. (2016). Halosulfuron absorption, translocation, and metabolism in white and adzuki bean. *Weed Science*, 64(4), 705-711. <http://www.wssajournals.org/doi/abs/10.1614/WS-D-16-00029.1>, Peer Reviewed/Refereed
- Kuepper, A., Borgato, E.A., Patterson, E., Netto, A GONÇALVES, Nicolai, M., Carvalho, S.J.P., Nissen, S. J., Gaines, T., Christoffoleti, P.J. (2016). Multiple resistance to glyphosate and ALS inhibitors in Palmer amaranth (*Amaranthus palmeri*) identified in Brazil. *Weed Science.*, Peer Reviewed/Refereed
- Powles, S. B., Gaines, T. (2016). Exploring the potential for a regulatory change to encourage diversity in herbicide use. *Weed Science*, 64, 649-654., Peer Reviewed/Refereed
- Christoffoleti, P. J., Figueiredo, M., Pereira Peres, L. E., Nissen, S. J., Gaines, T. (2015). Auxinic herbicides, mechanisms of action, and weed resistance: A look into recent plant science advances. *Scientia Agricola*, 72(4), 356-362. <Go to ISI>://WOS:000357631900011, Peer Reviewed/Refereed
- Wiersma, A.T., Gaines, T., Preston, C., Hamilton, J.P., Giacomini, D., Buell, C. R., Leach, J. E., Westra, P. (2015). Gene amplification of 5-enol-pyruvylshikimate-3-phosphate synthase in glyphosate-resistant *Kochia scoparia*. *Planta*, 241, 463-474., Peer Reviewed/Refereed
- Lorentz, L., Gaines, T., Nissen, S. J., Westra, P., Strek, H., Dehne, H.W., Ruiz-Santaella, J. P., Beffa, R. (2014). Characterization of glyphosate resistance in *Amaranthus tuberculatus* populations. *Journal of Agricultural and Food Chemistry*, 62, 8134-8142., Peer Reviewed/Refereed
- Sammons, D. R., Gaines, T. (2014). Glyphosate resistance: State of knowledge. *Pest Management Science*, 70, 1367-1377., Peer Reviewed/Refereed
- Busi, R., Gaines, T., Vila-Aiub, M. M., Powles, S. B. (2014). Inheritance of evolved resistance to a novel herbicide (pyroxasulfone). *Plant Science*, 217, 127-134., Peer Reviewed/Refereed
- Vila-Aiub, M. M., Goh, S. S., Gaines, T., Han, H., Busi, R., Yu, Q., Powles, S. B. (2014). No fitness cost of glyphosate resistance endowed by massive EPSPS gene amplification in *Amaranthus palmeri*. *Planta*, 239,

- Gaines, T., Lorentz, L., Figge, A., Herrmann, J., Maiwald, F., Ott, M., Han, H., Busi, R., Yu, Q., Powles, S. B., Beffa, R. (2014). RNA-Seq transcriptome analysis to identify genes involved in metabolism-based diclofop resistance in *Lolium rigidum*. *The Plant Journal*, 78, 865-876., Peer Reviewed/Refereed
- Busi, R., Vila-Aiub, M. M., Beckie, H. J., Gaines, T., Goggin, D. E., Kaundun, S. S., Lacoste, M., Neve, P., Nissen, S. J., Norsworthy, J. K., Renton, M., Shaner, D. L., Tranel, P. J., Wright, T., Yu, Q., Powles, S. B. (2013). Herbicide-resistant weeds: from research and knowledge to future needs. *Evolutionary Applications*, 6(8), 1218-1221., Peer Reviewed/Refereed
- Gaines, T., Wright, A.A., Molin, W.M., Lorentz, L., Riggins, C. W., Tranel, P. J., Beffa, R., Westra, P., Powles, S.B. (2013). Identification of genetic elements associated with EPSPS gene amplification. *PLOS One*, 8(6), e65819., Peer Reviewed/Refereed
- Gaines, T., Cripps, A., Powles, S. B. (2012). Evolved resistance to glyphosate in junglerice (*Echinochloa colona*) from the tropical Ord River region in Australia. *Weed Technology*, 26(3), 480-484., Peer Reviewed/Refereed
- Gaines, T., Ward, S. M., Bukun, B., Preston, C., Leach, J. E., Westra, P. (2012). Interspecific hybridization transfers a previously unknown glyphosate resistance mechanism in *Amaranthus* species. *Evolutionary Applications*, 5, 29-38., Peer Reviewed/Refereed
- Busi, R., Gaines, T., Walsh, M. J., Powles, S.B. (2012). Understanding the potential for resistance evolution to the new herbicide pyroxasulfone: field selection at high doses versus recurrent selection at low doses. *Weed Research*, 52, 489-499., Peer Reviewed/Refereed
- Gaines, T., Shaner, D. L., Ward, S. M., Leach, J. E., Preston, C., Westra, P. (2011). Mechanism of resistance of evolved glyphosate-resistant Palmer amaranth (*Amaranthus palmeri*). *Journal of Agricultural and Food Chemistry*, 59, 5886-5889., Peer Reviewed/Refereed
- Gaines, T., Zhang, W., Wang, D., Bukun, B., Chisholm, S. T., Shaner, D. L., Nissen, S. J., Patzoldt, W. L., Tranel, P. J., Culpepper, A. S., Grey, T. L., Webster, T. M., Vencill, W. K., Sammons, R. D., Jiang, J.M., Preston, C., Leach, J. E., Westra, P. (2010). Gene amplification confers glyphosate resistance in *Amaranthus palmeri*. *Proceedings of the National Academy of Sciences of the United States of America*, 107(3), 1029-1034., Peer Reviewed/Refereed
- Bukun, B., Gaines, T., Nissen, S. J., Westra, P., Brunk, G. R., Shaner, D. L., Sleugh, B. B., Peterson, V. F. (2009). Aminopyralid and clopyralid absorption and translocation in Canada thistle (*Cirsium arvense*). *Weed Science*, 57(1), 10-15., Peer Reviewed/Refereed
- Westra, P., Wilson, R. G., Miller, S. D., Stahlman, P. W., Wicks, G. W., Chapman, P. L., Withrow, J., Legg, D., Alford, C., Gaines, T. (2008). Weed population dynamics after six years under glyphosate-and conventional herbicide-based weed control strategies. *Crop Science*, 48(3), 1170-1177., Peer Reviewed/Refereed

Refereed Chapters in Books

- Gaines, T., Tranel, P., Fleming, M. B., Patterson, E., Kuepper, A., Ravet, K., Giacomini, D., Gonzalez, S., Beffa, R. (2017). Applications of Genomics in Weed Science. In Mithila Jugulam (Ed.), *Biology, Physiology and Molecular Biology of Weeds*.: CRC Press., Peer Reviewed/Refereed
- Knezevic, S., Jhala, A., Gaines, T. (2017). Herbicide Resistance and Molecular Aspects. *Encyclopedia of Applied Plant Sciences* (vol. 3, pp. 455-458).: Elsevier., Peer Reviewed/Refereed

Non-Refereed Journal Articles

- Gaines, T., Brien Henry, W., Byrne, P. F., Westra, P., Nissen, S. J., Shaner, D. L. (2008). Jointed goatgrass (*Aegilops cylindrica*) by imidazolinone-resistant wheat hybridization under field conditions. *Weed Science*, 56(1), 32–36., Not Peer Reviewed/Refereed
- Gaines, T., Preston, C., Byrne, P. F., Henry, W. B., Westra, P. (2007). Adventitious presence of herbicide resistant wheat in certified and farm-saved seed lots. *Crop Science*, 47(2), 751–754., Not Peer Reviewed/Refereed
- Gaines, T., Byrne, P. F., Westra, P., Nissen, S. J., Henry, W. B., Shaner, D. L., Chapman, P. L. (2007). An empirically derived model of field-scale gene flow in winter wheat. *Crop Science*, 47(6), 2308–2316., Not Peer Reviewed/Refereed
- Broderick, S., Chapman, P. L., Byrne, P. F., Gaines, T. (2007). Tolerance Intervals for Gene Flow Rates from Transgenic to Non-Transgenic Wheat and Corn Using a Logistic Regression Model with Random Location Effects., Not Peer Reviewed/Refereed
- Gaines, T., Byrne, P. F., Westra, P., Nissen, S. J., Henry, W. B., Hanson, B., Belles, D., Shaner, D. L. (2005). Estimating Landscape Level Gene Flow in Wheat and Jointed Goatgrass. *Parameters*, 1(1.6), 1–8., Not Peer Reviewed/Refereed

AES Report/Bulletin

- Johnson, J. J., Haley, S. D., Jones, S., Asfeld, E., Meyer, R. F., Trujillo, W., Kaan, D. A., Roesch, K., Larson, K., Vigil, M. F., Pettinger, B. T., Novak, R. A., Peairs, F. B., Broders, K. D., Byrne, P. F., Gaines, T., Westra, P., Walker, T., Erker, B. (2017). *TR17-4: Making Better Decisions, 2017 Colorado Winter Wheat Variety Performance Trials*.: Colorado Agricultural Experiment Station. PO Box 967, Not Peer Reviewed/Refereed
- Byrne, P. F., Seshadri, A., Gaines, T. *GM Crops: Environmental Benefits and Concerns*.: CSU Agricultural Experiment Station., Peer Reviewed/Refereed
- Westra, P., Gaines, T. (in press). Weed Management in Colorado Corn. *Best Management Practices for Colorado Corn*.: CSU Agricultural Experiment Station. waterquality.colostate.edu/cornbook.shtml, Peer Reviewed/Refereed
- Byrne, P. F., Gaines, T., Westra, P., Henry, W. B., Nissen, S. J., Chapman, P., Harrington, J. E. (2008). *Estimating gene flow from wheat to wheat and wheat to jointed goatgrass (Aegilops cylindrica)* (vol. TB08-03) : CSU Agricultural Experiment Station., Peer Reviewed/Refereed

PAPERS PRESENTED/SYMPOSIA/INVITED LECTURES/PROFESSIONAL MEETINGS/WORKSHOPS

- January 16, 2018, "International Weed Genomics Consortium: Update and Discussion", Plant and Animal Genome XXVI, (Presenter) Gaines, T.
- 2017, "A novel mechanism that confers reduced glyphosate sensitivity in *Kochia scoparia*", Global Herbicide Resistance Challenge.
- 2017, "Characterizing the phenotypic response to Fluroxypyr in Putative Resistant *Kochia scoparia*", Global Herbicide Resistance Challenge.
- 2017, "Chemical, biochemical and physiological interactions between glyphosate and 2,4-D", Global Herbicide Resistance Challenge.

- 2017, "Crop safety and winter annual grass weed control in mutagenesis-derived ACCase-resistant winter wheat lines", Global Herbicide Resistance Challenge.
- 2017, "Decreased dicamba transport due to increased flavonoid biosynthesis: a candidate dicamba resistance mechanism", Global Herbicide Resistance Challenge.
- 2017, "Distinct mechanisms contribute to dicamba resistance in *Kochia scoparia* from Kansas and Colorado", Global Herbicide Resistance Challenge.
- 2017, "Distribution of glyphosate-resistant Palmer amaranth (*Amaranthus palmeri*) and common waterhemp (*Amaranthus rudis*) in Nebraska", Global Herbicide Resistance Challenge.
- 2017, "Genome sequencing and assembly for *Kochia scoparia*", Global Herbicide Resistance Challenge.
- 2017, "Global Herbicide Resistance Challenge 2017: Challenge Accepted.", Global Herbicide Resistance Challenge.
- 2017, "Glyphosate-resistant *Ambrosia trifida*: Non-target site resistance mechanisms and physiology of rapid tissue death response", Global Herbicide Resistance Challenge.
- 2017, "International Weed Genomics Consortium": An initiative to coordinate and enable research in weed genomics", Global Herbicide Resistance Challenge.
- 2017, "Investigating the 2,4-D resistance mechanism in *Sisymbrium orientale* (Indian Hedge Mustard) from Australia using RNA-Seq", Global Herbicide Resistance Challenge.
- 2017, "*Kochia scoparia* Resistance to Auxin Herbicides", Global Herbicide Resistance Challenge.
- 2017, "Metabolic resistance to the HPPD-inhibitor tembotrione in Palmer amaranth (*Amaranthus palmeri*)", Global Herbicide Resistance Challenge.
- 2017, "Multiple resistance to glyphosate and ALS inhibitors in Palmer amaranth (*Amaranthus palmeri*) identified in Brazil", Global Herbicide Resistance Challenge.
- 2017, "Next generation sequencing validation requested to reveal non-target-site herbicide resistance mechanisms in *Lolium rigidum*", Global Herbicide Resistance Challenge.
- 2017, "A Qualitative Assay for Detecting Palmer Amaranth and its Hybrids Amongst Pigweed Species", North Central Weed Science Society.
- 2017, "Genome-wide analysis of copy number variation in *kochia*", North Central Weed Science Society.
- 2017, "Inheritance of Mesotrione in a Waterhemp Population from Nebraska", North Central Weed Science Society.
- 2017, "Investigation of Mechanisms and Genetic Basis of Dicamba Resistance in *Kochia* from Kansas and Colorado", North Central Weed Science Society.
- 2017, "Weed Exposure to Sublethal Rates of Herbicides as a Result of Pesticide Drift", North Central Weed Science Society.
- 2017, "Decreased Intercellular Transport Due to Increased Flavonoid Biosynthesis: A Candidate Dicamba

- Resistance Mechanism", Plant and Animal Genome.
- 2017, "Investigating the 2,4-D Resistance Mechanism in Indian Hedge Mustard (*Sisymbrium orientale*) from Australia Using RNA-Seq", Plant and Animal Genome.
- 2017, "Quick Genotyping for an ACCase Herbicide Resistance Gene in Wheat Using KASP Assay", Plant and Animal Genome.
- 2017, "The Draft Genome of *Kochia scoparia* : A Foundation for Studying Adaptive Evolution and Its Impacts on Genome Architecture", Plant and Animal Genome.
- 2017, "A Novel Mechanism that Confers Reduced Glyphosate Sensitivity in *Kochia scoparia*", Weed Science Society of America.
- 2017, "A Study of Cytochrome P450 Mediated Metabolic Resistance in *Kochia scoparia*", Weed Science Society of America.
- 2017, "Barnyardgrass or Junglerice: Using KASP for *Echinochloa* Species Identification", Weed Science Society of America.
- 2017, "Exploring the Potential for a Regulatory Change to Encourage Diversity in Herbicide Use", Weed Science Society of America.
- 2017, "Halosulfuron Absorption, Translocation, and Metabolism in Dry Bean", Weed Science Society of America.
- 2017, "Investigating the 2,4-D Resistance Mechanism in Indian Hedge Mustard (*Sisymbrium orientale*) from Australia using RNA-Seq", Weed Science Society of America.
- 2017, "A Draft Genome for *Kochia scoparia*", Western Society of Weed Science.
- 2017, "Characterizing the Phenotypic Response to Fluroxypyr in *Kochia scoparia*", Western Society of Weed Science.
- 2017, "Control Dicamba-Resistance in *Kochia* from Colorado and Kansas", Western Society of Weed Science.
- 2017, "Cytochrome P450 Modulates 2,4-D Metabolic Resistance in Waterhemp (*Amaranthus tuberculatus*)", Western Society of Weed Science.
- 2017, "Integrated Weed Management of Winter Annual Grasses in Wheat using Harvest Weed Seed Control", Western Society of Weed Science.
- 2017, "The Basis of Glyphosate Resistance in "Rapid Necrosis" Giant Ragweed Populations", Western Society of Weed Science.
- 2017, "Use of SSR Markers to Track the Evolutionary Trajectory of Glyphosate Resistant *Kochia* in North America", Western Society of Weed Science.
- 2017, "Viability Assessment of Mutagenesis-derived ACCase Resistant Wheat Lines as a New System for Control of Winter Annual Grasses", Western Society of Weed Science.
- October 23, 2017, "Using molecular tools to understand and combat herbicide resistance", American Society of Agronomy, (Presenter) Gaines, T.

- May 2017, "A novel mechanism that confers reduced glyphosate sensitivity in *Kochia scoparia*", Global Herbicide Resistance Challenge, (Presenter) Soni-Castillo, N., peer-reviewed/refereed.
- May 2017, "Cytochrome P450 modulates 2,4-D metabolic resistance in waterhemp (*Amaranthus tuberculatus*)", Global Herbicide Resistance Challenge, (Presenter) Figueiredo, M. R.A., peer-reviewed/refereed.
- May 2017, "Investigating metabolic resistance to the ALS herbicide *Kochia scoparia*", Global Herbicide Resistance Challenge, (Presenter) Todd, O. E., peer-reviewed/refereed.
- May 2017, "Non-target site resistance in the HPPD-resistant waterhemp from Nebraska", Global Herbicide Resistance Challenge, (Presenter) Oliveira, M. C., peer-reviewed/refereed.
- February 2017, "Investigations into target-site and non-target-site resistance mechanisms in HPPD-resistant waterhemp from Nebraska", Weed Science Society of America, (Presenter) Oliveira, M. C., peer-reviewed/refereed.
- February 2017, "Using the genome of *Kochia scoparia* to inform crop improvement research", Weed Science Society of America, (Presenter) Westra, P., peer-reviewed/refereed.
- 2016, "An in vitro system for predicting herbicide subcellular partitioning", 7th International Weed Science Congress.
- 2016, "Confirmation and mechanism of glyphosate resistance in tall windmill grass (*Chloris elata*) from Brazil", 7th International Weed Science Congress.
- 2016, "Next generation sequencing validation requested to reveal non-target-site herbicide resistance mechanisms", 7th International Weed Science Congress.
- 2016, "Using multiple sequencing platforms to assemble the genome of *Kochia scoparia*", 7th International Weed Science Congress.
- 2016, "Weed genomes as potential sources of new, adaptive agronomic traits: a summary of *Kochia scoparia* research in North America", 7th International Weed Science Congress.
- 2016, "Population genomics of glyphosate-resistant Palmer amaranth (*Amaranthus palmeri*) using genotyping-by-sequencing (GBS)", 7th International Weed Science Congress:
- 2016, "Using RNA-Seq to Explore Dicamba Resistance Mechanisms in *Kochia scoparia*", American Society of Plant Biologists Western Meeting.
- 2016, "Human selection on the genome of the invasive agronomic weed, *Kochia scoparia*", Genomics of Adaptation to Human Context.
- 2016, "A Comparative Analysis of the Palmer Amaranth and Waterhemp Transcriptomes", North Central Weed Science Society.
- 2016, "A draft genome of *Kochia scoparia*", North Central Weed Science Society.
- 2016, "Implications for Glyphosate Resistant Palmer Amaranth and *Kochia* which Now Commingle in Colorado", North Central Weed Science Society.
- 2016, "Investigations into Target-Site and Non-Target-Site Resistance Mechanisms in HPPD Resistant

- Waterhemp from Nebraska", North Central Weed Science Society.
- 2016, "Modelling Pollen-Mediated Gene Flow from Herbicide-Resistant Weeds: Common Waterhemp as an Example", North Central Weed Science Society.
- 2016, "Population genomics of glyphosate-resistant Palmer amaranth (*Amaranthus palmeri*) using genotyping-by-sequencing (GBS)", Plant and Animal Genome.
- 2016, "Crop safety assessment of mutagenesis-derived ACCase resistant wheat lines", Weed Science Society of America.
- 2016, "Determining seed retention of key annual weeds at wheat harvest, and the potential for harvest weed seed control", Weed Science Society of America.
- 2016, "Detoxification of herbicides in rye-grass. On the way to characterize key molecular elements", Weed Science Society of America.
- 2016, "Developing genomics resources for *Kochia scoparia*", Weed Science Society of America.
- 2016, "Evaluating the physiological basis of 2,4-D tolerance in hybrid watermilfoil (*Myriophyllum spicatum* x *sibiricum*)", Weed Science Society of America.
- 2016, "Herbicide programs to control HPPD-resistant common waterhemp in Nebraska", Weed Science Society of America.
- 2016, "Pollen-mediated resistance transfer from HPPD-resistant waterhemp to Palmer amaranth in Nebraska", Weed Science Society of America.
- 2016, "Population genomics of glyphosate-resistant Palmer amaranth (*Amaranthus palmeri*) using genotyping-by-sequencing (GBS)", Weed Science Society of America.
- 2016, "Relationship between EPSPS copy number and glyphosate resistance level in *Kochia scoparia* collected from sugarbeet fields", Weed Science Society of America.
- 2016, "Research on herbicide resistant kochia in the Western US and Canada", Weed Science Society of America.
- 2016, "Using RNA-Seq to explore dicamba resistance mechanisms in *Kochia scoparia*", Weed Science Society of America.
- 2016, "An in vitro System for Predicting Herbicide Subcellular Partitioning", Western Society of Weed Science.
- 2016, "Crop Safety Assessment of Mutagenesis-Derived ACCase Resistant Wheat Lines", Western Society of Weed Science.
- 2016, "Determining seed retention of key annual weeds at wheat harvest, and the potential for harvest weed seed control", Western Society of Weed Science.
- 2016, "Developing Simple Sequence Repeat (SSR) Markers for *Kochia Scoparia*", Western Society of Weed Science.
- 2016, "Functional Expression of Cytochromes P450 in a Yeast System", Western Society of Weed Science.
- 2016, "Metabolic Resistance to Chlorsulfuron in *Kochia scoparia*", Western Society of Weed Science.

- 2016, "Molecular and Genomic Weed Science Research at Colorado State University", Western Society of Weed Science.
- 2016, "Palynology of Weedy Species", Western Society of Weed Science.
- 2016, "Population Genomics of Glyphosate-Resistant Palmer Amaranth (*Amaranthus palmeri*)", Western Society of Weed Science.
- 2016, "Understanding the Genetic Evolution of Glyphosate Resistance in *Kochia scoparia* Populations", Western Society of Weed Science.
- 2016, "Using Multiple Sequencing Platforms to Assemble the *Kochia scoparia* Genome", Western Society of Weed Science.
- 2016, "Using RNA-Seq to Explore Dicamba Resistance Mechanisms in *Kochia scoparia*", Western Society of Weed Science.
- 2016, "Biology and management of herbicide-resistant Palmer amaranth in U.S. cotton", World Cotton Conference 6, peer-reviewed/refereed.
- December 12, 2016, "A tale of two weeds: Functional weed genomics, adaptive gene duplication, and the evolution of glyphosate resistance", Rothamsted Research, Pesticide Resistance Group, Rothamsted Research.
- November 2016, "Molecular mechanisms of target-site herbicide resistance: Mutations and gene amplification", XXXI Argentine Plant Physiology Congress.
- November 29, 2016, "Understanding P450s to Better Manage Resistance", WeedSmart Webinar, WeedSmart, Online.
- April 13, 2016, "Herbicide-resistant weeds: Molecular mechanisms and impacts", American Chemical Society AGRO division Webinar, American Chemical Society AGRO division.
- February 3, 2016, "Creating a sustainable food future in the face of increasing environmental stress", College of Agricultural Sciences Research Seminar Series.
- January 2016, "Population genomics of glyphosate-resistant Palmer amaranth (*Amaranthus palmeri*) using genotyping-by-sequencing (GBS)", Plant and Animal Genome XXIV.
- 2015, "A proposed center for ecology, evolution and management of pesticide resistance", 8th International IPM Symposium.
- 2015, "Physiological and molecular characterization of multiple herbicide resistance in *kochia*", 8th International IPM Symposium.
- 2015, "Molecular Weed Science – Down the rabbit hole of big data", Canadian Weed Science Society 69th Annual Meeting.
- 2015, "Evolution of herbicide resistance in weeds", The Ohio State University- Department of Horticulture and Crop Science, The Ohio State University.
- 2015, "Genomic and Molecular Findings in *Kochia* (*Kochia scoparia*)", North Central Weed Science Society.

- 2015, "Herbicide programs for control of atrazine- and HPPD inhibitors-resistant Palmer amaranth in glufosinate-resistant corn", North Central Weed Science Society.
- 2015, "HPPD resistance in Waterhemp from Nebraska: Evidence for multiple genes conferring enhanced metabolism", North Central Weed Science Society.
- 2015, "Vision for Weed Science Research at Colorado State University", Limagrain.
- 2015, "Evolution of herbicide resistance in weeds", Weed control group seminar, The Scotts Company, (Presenter) Gaines, T., Marysville, OH.
- 2015, "The road ahead for resistance diagnostics", Weed Resistance Global Symposium, Bayer CropScience.
- 2015, "Background, history, and current status of dicamba resistant kochia in the Western US and Canada", Weed Science Society of America.
- 2015, "Transcriptomic approaches to study herbicide resistance in weeds", Weed Science Society of America, (Presenter) Gaines, T., Lexington, KY.
- 2015, "Development of a Rapid In Vitro Dose Response Assay for Kochia", Western Society of Weed Science.
- 2015, "EPSPS Gene Amplification in Kochia from Sugar Beet Fields", Western Society of Weed Science.
- 2015, "Genomic Variability in Kochia and its Potential Impact on Weediness", Western Society of Weed Science.
- 2015, "Glyphosate-Resistant Kochia Management in Canola", Western Society of Weed Science.
- 2015, "Population Genetics of Glyphosate-Resistant Palmer Amaranth", Western Society of Weed Science.
- 2015, "The History and Status of Herbicide Resistance in Kochia in North America", Western Society of Weed Science.
- 2014, "Evolution of herbicide resistance in weeds", Crop Science Society of America, C05 Turfgrass Science, (Presenter) Gaines, T., Long Beach, CA.
- 2014, "Evolution of herbicide resistance in weeds", Department of Agronomy seminar, Kansas State University, (Presenter) Gaines, T., Manhattan, KS.
- 2014, "Improving herbicide resistant weed diagnostic tools using bioinformatics and molecular biology approaches", F. Dan Hess Endowment Weed Science Seminar, University of California - Davis, (Presenter) Gaines, T., Davis, CA.
- 2014, "Developing novel herbicide resistance traits in wheat", Herbicide Biology Group, Bayer CropScience, (Presenter) Gaines, T., Frankfurt am Main, Germany.
- 2014, "Metabolism-based herbicide resistance in *Lolium rigidum*: Using RNA-Seq transcriptome analysis to identify resistance-endowing genes", Herbicide Resistance Working Group Workshop, European Weed Research Society, (Presenter) Gaines, T., Frankfurt am Main, Germany.
- 2014, "Genomic approach to reveal non-target-site herbicide resistance mechanisms", IUPAC International Congress of Pesticide Chemistry, American Chemical Society, Division of Agrochemicals.
- 2014, "Update on EPSPS gene amplification in glyphosate-resistant weeds", IUPAC International Congress of

- Pesticide Chemistry, American Chemical Society, Division of Agrochemicals, (Presenter) Gaines, T., San Francisco, CA.
- 2014, "HPPD resistance in Nebraska's waterhemp: Enhanced metabolism or target site mutation", North Central Weed Science Society.
- 2014, "Association of mobile genetic elements with EPSPS gene duplication", Plant and Animal Genome XXII, (Presenter) Gaines, T., San Diego, CA.
- 2014, "Genomics of non-target-site herbicide resistance", Plant and Animal Genome XXII.
- 2014, "Metabolism-based herbicide resistance in *Lolium rigidum*: Using RNA-Seq transcriptome analysis to identify resistance-endowing genes", Weed Science Society of America, (Presenter) Gaines, T., Vancouver, BC.
- 2014, "Metabolism-based herbicide resistance in *Lolium rigidum*: Using RNA-Seq transcriptome analysis to identify resistance-endowing genes", Western Society of Weed Science, (Presenter) Gaines, T., Colorado Springs, CO.
- September 18, 2014, "Update on herbicide resistant kochia research at CSU", Weed Management Academic Summit, Monsanto, (Presenter) Gaines, T., St. Louis, MO.
- March 2014, "On the discovery of genes involved in metabolism-based resistance to herbicides using RNA-Seq transcriptome analysis in *Lolium rigidum*", German Conference on Weed Biology and Weed Control.
- 2013, "Herbicide resistance in U.S. and Australian weed species", Dicle University, Faculty of Agriculture.
- 2013, "Glyphosate resistance endowed by EPSPS gene amplification does not attract a fitness cost in *Amaranthus palmeri*", Global Herbicide Resistance Challenge.
- 2013, "Identifying differential expression in non-target site herbicide resistance genes in *Lolium rigidum* using high-throughput sequencing", Global Herbicide Resistance Challenge.
- 2013, "Miniature inverted-repeat transposable elements (MITEs) associated with EPSPS gene amplification in *Amaranthus palmeri*", Global Herbicide Resistance Challenge.
- 2013, "Multiple quantitative trait loci (QTL) confer polygenic non-target-site herbicide resistance in *Lolium rigidum*", Global Herbicide Resistance Challenge.
- 2013, "Rapporteur: Biochemical & molecular basis of resistance", Global Herbicide Resistance Challenge.
- 2013, "Studies on resistance mechanism of rigid ryegrass (*Lolium rigidum*) to a herbicide, pyroxasulfone", Global Herbicide Resistance Challenge.
- 2013, "Weed resistance diagnostic technologies to detect herbicide resistance: review and perspectives", Global Herbicide Resistance Challenge.
- 2013, "Metabolism-based herbicide resistance in *Lolium rigidum*: Using RNA-Seq transcriptome analysis to identify resistance-endowing genes", Pesticide Resistance Workshop 2013, Curtin University.
- 2013, "Unraveling non-target-site herbicide resistance: Applying transcriptomics in weed science", University of California – Davis, Weed Science seminar group.

- 2013, "Genetic relationship of southeastern United States herbicide resistant *Amaranthus palmeri* populations", Weed Science Society of America.
- 2013, "Identifying differential expression in non-target site herbicide resistance genes in *Lolium rigidum* using high-throughput sequencing.", Weed Science Society of America.
- 2013, "Miniature inverted-repeat transposable elements (MITEs) associated with EPSPS gene amplification in *Amaranthus palmeri*", Weed Science Society of America.
- 2012, "The use of biotechnology in weed science", Brazilian Weed Science Congress.
- 2012, "Examining EPSPS: Assays, Westerns, and mutants", Weed Science Society of America.
- 2012, "The evolution of glyphosate-resistant weeds. Weed Science Society of America Proceedings", Weed Science Society of America.
- 2012, "Time dependent binding of pyroxasulfone, dimethenamid and metolachlor to four Australian soils", Weed Science Society of America.
- 2011, "Potential for evolution of resistance to pyroxasulfone in *Lolium rigidum* populations", Bayer CropScience, Herbicide Biology.
- 2011, "Characterization of EPSPS gene amplification in glyphosate-resistant Palmer amaranth (*Amaranthus palmeri*)", Plant and Animal Genome XIX.
- 2011, "Glyphosate resistance due to EPSPS gene amplification in Palmer amaranth (*Amaranthus palmeri*)", Rothamsted Resistance 2011.
- 2011, "Glyphosate resistance due to EPSPS gene amplification in Palmer amaranth (*Amaranthus palmeri*)", Syngenta, Herbicide Discovery Group.
- 2011, "Glyphosate resistance evolution in the U.S. and Australia", University of Western Australia, School of Plant Biology.
- 2011, "Characterization of EPSPS gene amplification in glyphosate-resistant Palmer amaranth (*Amaranthus palmeri*)", Weed Science Society of America.
- 2011, "Inheritance of EPSPS gene amplification in Palmer amaranth", Weed Science Society of America.
- 2011, "Potential for evolution of resistance to pyroxasulfone in *Lolium rigidum* populations", Weed Science Society of America.
- 2010, "The molecular basis of resistance to glyphosate: A novel mechanism in Palmer amaranth (*Amaranthus palmeri*)", 12th IUPAC International Congress of Pesticide Chemistry.
- 2010, "Mechanism of resistance of evolved glyphosate-resistant Palmer amaranth (*Amaranthus palmeri*)", American Chemical Society Abstracts.
- 2010, "Herbicide resistance in Western Australia's broadacre cropping industry", Colorado State University, Department of Bioagricultural Sciences and Pest Management.
- 2010, "Selection for resistance at low and high pyroxasulfone (KIH-485) rates in susceptible annual ryegrass (*Lolium rigidum*) populations", Weed Science Society of America.

- 2010, "Update on novel glyphosate resistance mechanism in Palmer amaranth. (*Amaranthus palmeri*)", Weed Science Society of America.
- 2009, "A novel glyphosate resistance mechanism in Palmer amaranth", Monsanto Company.
- 2009, "Molecular biology and genomics of glyphosate resistance in Palmer amaranth", Plant and Animal Genome.
- 2009, "A novel glyphosate resistance mechanism in a weed population of Palmer amaranth", University of Western Australia, School of Plant Biology.
- 2009, "A novel mechanism of resistance to glyphosate in Palmer amaranth (*Amaranthus palmeri*)", Weed Science Society of America.
- 2009, "Herbicide resistance in Australian *Lolium rigidum*: Low herbicide rates can accelerate evolution of herbicide resistance", Weed Society of Western Australia.
- 2008, "Molecular genetics of glyphosate resistance and gene flow in *Amaranthus palmeri*", 5th International Weed Science Congress.
- 2008, "Molecular methods to study glyphosate-resistant Palmer amaranth (*Amaranthus palmeri*)", Weed Science Society of America.
- 2008, "Mechanisms of resistance and gene flow in glyphosate resistant Palmer amaranth", Western Society of Weed Science.
- 2008, "Testing drought tolerant corn under a USDA/APHIS permit", Western Society of Weed Science.
- 2007, "Molecular methods to study herbicide resistant weeds and inter-specific gene flow", National Scientific Conference – Convergence of genomics and the land-grant mission: Emerging trends in the application of genomics in agricultural research.
- 2007, "Commercial-scale pollen-mediated gene flow in winter wheat in the Central Western Great Plains", North Central Weed Science Society.
- 2007, "Estimating pollen-mediated gene flow in Colorado corn fields with the blue kernel trait", North Central Weed Science Society.
- 2007, "Hybridization between jointed goatgrass and imidazolinone-resistant winter wheat", North Central Weed Science Society.
- 2007, "Seed-mediated gene flow in certified and farm-saved seed lots", North Central Weed Science Society.
- 2007, "Transfer of glyphosate resistance from Palmer amaranth to related *Amaranthus* species", Southern Weed Science Society.
- 2007, "Landscape level gene flow from Clearfield winter wheat to conventional wheats and jointed goatgrass", Weed Science Society of America.
- 2007, "Feral rye control with imazamox in Clearfield winter wheat", Western Society of Weed Science.
- 2007, "Glyphosate resistance mechanism in Palmer amaranth", Western Society of Weed Science.

- 2006, "Adventitious presence of herbicide resistant wheat in certified and farm-saved seed lots", Crop Science Society of America.
- 2006, "Molecular methods to study glyphosate-resistant Palmer amaranth", North Central Weed Science Society.
- 2006, "Landscape-level Clearfield winter wheat gene flow to conventional wheats in commercial fields", Weed Science Society of America.
- 2006, "Gene flow in wheat and jointed goatgrass at the landscape level", Western Society of Crop Science.
- 2006, "Leakage of Clearfield wheat to certified and farmer-saved seed lots", Western Society of Weed Science.
- 2006, "Gene flow in wheat and jointed goatgrass at the landscape level", Western Society of Weed Science.
- 2005, "Estimating landscape-level gene flow in wheat and jointed goatgrass", Crop Science Society of America.
- 2005, "Detecting imidazolinone-resistant wheat in conventional wheat varieties", North Central Weed Science Society.
- 2005, "Landscape-level gene flow from Clearfield winter wheat to conventional wheat over three years", North Central Weed Science Society.
- 2005, "Hybridization between a herbicide tolerant wheat variety and jointed goatgrass in the Central Great Plains", Weed Science Society of America.
- 2005, "Estimating landscape-level gene flow in wheat and jointed goatgrass", Western Society of Weed Science.
- 2005, "Jointed goatgrass by winter wheat hybrid dynamics in Colorado wheat fields", Western Society of Weed Science.
- 2005, "Local adaptation of Canada thistle to resource availability", Western Society of Weed Science.
- 2004, "Evaluating genetic diversity in Canada thistle using greenhouse trials and ISSRs", American Society of Agronomy.
- 2004, "Hybridization between a herbicide tolerant wheat variety and jointed goatgrass in the Central Great Plains", North Central Weed Science Society.
- 2003, "Use of polyacrylamide to stabilize fire affected soils", American Society of Agronomy.

OTHER ACTIVITIES/ACCOMPLISHMENTS – PUBLICATIONS/SCHOLARLY RECORD

- Kessler, K. C., Patterson, E., Fleming, M. B., Gaines, T. "High throughput method to genotype plants," Assigned to: Colorado State University Research Foundation. (Application: November 16, 2017).
- Gaines, T., Patterson, E. "Diagnosing Amaranthus species in seed mixture using KASP," Assigned to: CSU Ventures. (Application: February 22, 2017).
- Pettinga, D. J., Gaines, T., Westra, P. "Dicamba Resistance Conferred by Upregulation of Chalcone Synthase." (Application: October 26, 2016).
- Hildebrandt, C. M., Gaines, T., Westra, P. "Herbicide safener combinations for Acetyl Co-enzyme A Carboxylase

herbicide resistant plants," Assigned to: Colorado Wheat Research Foundation. (Application: February 8, 2016).

Gaines, T., Westra, P. "Develop Novel Traits in Sunflower Using Mutagenesis." (Submitted: February 10, 2015).

(August 2017 - December 2017). Continuing Education Program, "Man: Educate Yourself," The Women & Gender Collaborative, Colorado State University, Fort Collins, CO, United States.

(February 2017 - March 2017). Workshop, "Canvas Training Workshops," Colorado State University, Fort Collins, CO, United States.

(August 18, 2014). Workshop, "New Faculty Orientation," CSU, Fort Collins, CO, United States.

(June 23, 2014 - June 24, 2014). Conference Attendance, "NSF Grant Conference," NSF, Denver, CO, United States.

(April 24, 2014). Workshop, "New Employee Orientation," CSU, Fort Collins, CO, United States.

(January 29, 2014). Individual meeting, "CSU Ventures orientation meeting," CSU Ventures, Fort Collins, CO, United States.

TEACHING:

<u>Year</u>	<u>Semester</u>	<u>Course No./Title</u>	<u>Cr. Hrs.</u>	<u>Enrollment</u>
2017	Fall	BSPM580A4 - Molecular Genetics and Evolution of Pesticide Resistance	3	8
2017	Fall	BSPM798 - Research	67	14
2017	Spring	BSPM798 - Research	86	16
2017	Spring	BSPM784 - Supervised College Teaching	3	2
2016	Fall	BSPM509 - Herbicide Selectivity and Action	3	11
2016	Fall	BSPM698 - Research	18	11
2016	Fall	BSPM798 - Research	18	18
2016	Spring	BSPM698 - Research	18	12
2016	Spring	BSPM798 - Research	18	14
2016	Spring	BC499A - Thesis-Laboratory Research-Based	3	11
2015	Fall	BSPM580A4 - Molecular Genetics and Evolution of Pesticide Resistance	3	10
2015	Fall	BSPM698 - Research	18	10
2015	Summer	BSPM798 - Research	18	1
2015	Spring	BSPM792 - Seminar	2	13
2014	Fall	BSPM792 - Seminar	2	10
2014	Summer	BSPM798 - Research	18	2

Guest Lectures:

<u>Year</u>	<u>Semester</u>	<u>Course No./Title</u>	<u># of Guest Lectures</u>	<u>Delivery Mode</u>
2017	Fall	Bioag'l Sci & Pest Mgmt-BSPM581A2 - Plant Biochemistry in Agriculture	1	Face to Face
2017	Fall	Soil & Crop Sciences-SOCR421 - Senior Capstone	1	Face to Face
2017	Spring	Food Technology-FTEC574 - Food Biotechnology	1	Face to Face

2017	Spring	Bioag'l Sci & Pest Mgmt-BSPM451/551 - Integrated Pest Management	1	Face to Face
2016	Fall	Soil & Crop Sciences-SOCR430 - Applications of Plant Biotechnology	1	Face to Face
2016	Fall	Bioag'l Sci & Pest Mgmt-BSPM308 - Ecology and Management of Weeds	1	Face to Face
2016	Fall	Bioag'l Sci & Pest Mgmt-BSPM500 - Foundations of Bioagricultural Sciences	1	Face to Face
2016	Fall	Bioag'l Sci & Pest Mgmt-BSPM509 - Herbicide Selectivity and Action	3	Face to Face
2015	Fall	Bioag'l Sci & Pest Mgmt-BSPM308 - Ecology and Management of Weeds	1	Face to Face
2015	Fall	Bioag'l Sci & Pest Mgmt-BSPM - Fundamentals of BSPM	1	Face to Face
2015	Fall	Soil & Crop Sciences-SOCR460 - Plant Breeding	1	Face to Face
2015	Spring	Bioag'l Sci & Pest Mgmt-BSPM451/551 - Integrated Pest Management	1	Face to Face
2014	Fall	Soil & Crop Sciences-SOCR430 - Applications of Plant Biotechnology	1	Face to Face
2014	Fall	Bioag'l Sci & Pest Mgmt-BSPM - Fundamentals of BSPM	2	Face to Face
2014	Fall	Bioag'l Sci & Pest Mgmt-BSPM509 - Herbicide Selectivity and Mode of Action	2	Distance
2014	Fall	Soil & Crop Sciences-SOCR730 - Topics in Plant Breeding	1	Face to Face

Evidence of Teaching Effectiveness (Annual Input)

Student Course Surveys

Fall 2016, BSPM 509–Herbicide Selectivity and Action

[BSPM 509 Student Comments Fall 2016-1.pdf](#)

Fall 2015, BSPM 580A4–Molecular Genetics and Evolution of Pesticide Resistance
Student comments from the first offering of this course as an experimental course, FA 2015.

[BSPM 580 A4 Student Comments Fall 2015-1.pdf](#)

Fall 2015, BSPM 580A4–Molecular Genetics and Evolution of Pesticide Resistance
Summary of student course survey scores for this course, FA2015.

[BSPM 580 A4 FA 2015 Course Survey Report-1.pdf](#)

Tenure and Promotion Evidence of Teaching Effectiveness (Tenure and Promotion Input)

Development of New Courses

I developed and taught two times a new graduate level course on the evolution, molecular genetics, and management of pesticide resistance.

Development of New Teaching Techniques

Integration of Service Learning

Conference/Workshop Assessments

Participation in Professional Development Activities Related to Teaching

Professional Consultation Related to Teaching

Other Evidence

COMMITTEES

Cell and Molecular Biology Graduate Program, (November 2017 - Present).

CAS Partnerships with University of Western Australia, (September 2017 - Present).

Colorado Commodity Group Research Forum Planning Team, (2017 - Present).

Bioinformatics Consultant Search Committee, (June 2017 - December 2017).

CAS Delegation to University of Western Australia, (September 2017).

CAS Recruitment Team, (December 4, 2014 - May 2015).

Crop Functional Genomics position Search Committee, (October 2014 - April 2015).

State FFA Officer Information Session, (October 13, 2014).

Developing Undergraduate Major Committee, (August 2017 - Present).

BSPM Education Committee, (August 2016 - Present).

BSPM Strategic Vision Committee, (October 2015 - May 2016).

BSPM Department Head Search Committee, (September 2015 - May 2016).

BSPM Program Coordinator Search Committee, (January 15, 2015 - May 2015).

Explore CSU Info Fair, (October 10, 2014).

BSPM Weed Science faculty ad-hoc, (March 6, 2014).

PROFESSIONAL AFFILIATIONS AND ACTIVITIES

Western Society of Weed Science. (February 2014 - Present).

International Weed Science Society. (2012 - Present).

American Chemical Society Agrochemical Division. (2010 - Present).

Weed Science Society of America. (February 2008 - Present).

KSIR.

Greeley Tribune.

Chairperson, North American Kochia Working Group. (October 2017 - Present).

Committee Member, International Weed Genomics Consortium. (June 2016 - Present).

Committee Member, WSSA Herbicide Resistance Education Committee. (February 2016 - Present).

Reviewer, Journal Article, Invited Peer Reviewer. (January 2017 - December 2017).

Conference-Related, Global Herbicide Resistance Challenge Conference 2017, Denver, CO. (October 2014 - December 2017).

Committee Member, WERA-60 Coordinating Committee. (February 2, 2014 - December 2017).

Reviewer, Grant Panel, National Science Foundation, Arlington, VA. (April 19, 2017 - April 21, 2017).

Committee Member, Regional Herbicide Resistance Listening Session Great Plains Committee. (June 2016 - February 2017).

Reviewer, Journal Article, Invited Peer Reviewer. (January 2016 - December 2016).

Attendee, Meeting, Meeting with DuPont/Pioneer scientists and CSU VPR team, Des Moines, Iowa. (October 3, 2016 - October 4, 2016).

Reviewer, Grant Proposal, Invited Expert Reviewer. (July 2016 - August 2016).

Conference-Related, International Weed Science Congress, Prague. (July 2015 - June 2016).

Session Chair, Western Society of Weed Science. (March 2015 - March 2016).

Reviewer, Journal Article, Invited Peer Reviewer. (January 2015 - December 2015).

Session Chair, Western Society of Weed Science. (March 2014 - March 2015).

Reviewer, Journal Article, Invited Peer Reviewer. (January 2014 - December 2014).

Attendee, Meeting, Monsanto and regional kochia academic researchers, Denver, CO. (April 9, 2014 - April 11, 2014).

Session Chair, Weed Science Society of America. (February 2013 - February 2014).

Session Chair, Weed Science Society of America. (February 2012 - February 2013).

Committee Member, Global Herbicide Resistance Challenge Conference 2013, Perth, Western Australia. (March 2010 - September 2011).

OTHER ACTIVITIES/ACCOMPLISHMENTS – SERVICE/OUTREACH

Curator for EPSPS mutation database, International Survey of Herbicide Resistance. (2014 - Present).

Interaction with Industry, Western Sugar Cooperative Joint Grower Research Committee, Loveland, CO. (January 23, 2018).

Interaction with Industry, Global Herbicide Resistance Action Committee. (December 2017).

Interaction with Industry, Arysta LifeScience, Cary, NC. (October 24, 2017).

Interaction with Industry, Bayer CropScience, Research Triangle Park, NC. (August 7, 2017 - August 8, 2017).

Invited expert lecturer, Tennessee Weed Science Short Course, Knoxville, TN. (July 2017).

Interaction with Industry, CWRP Research Board, Fort Collins, CO. (April 6, 2017).

Interaction with Industry, UPI, Fort Collins, CO. (January 31, 2017).

Interaction with Industry, Western Sugar Cooperative Joint Grower Research Committee, Billings, MT. (January 17, 2017).

Interaction with Industry, CWRP Research Board, Wiggins, CO. (November 30, 2016).

Interaction with Industry, Bayer CropScience, Fort Collins, CO. (August 24, 2016 - August 25, 2016).

Interaction with Industry, CWAC Board Research Review, Fort Collins, CO. (April 7, 2016).

Interaction with Industry, CWRP Research Board, Fort Collins, CO. (April 7, 2016).

Interaction with Industry, Western Sugar Cooperative Joint Grower Research Committee, Loveland, CO. (January 25, 2016).

Interaction with Industry, Dow AgroSciences, Fort Collins, CO. (January 14, 2016).

Interaction with Industry, Bayer CropScience, Urbana, IL. (August 18, 2015).

Interaction with Industry, BASF, Research Triangle Park, NC. (July 28, 2015).

Invited expert lecturer, Tennessee Weed Science Short Course, Knoxville, TN. (June 2015).

Interaction with Industry, CWAC Board Research Review, Fort Collins, CO. (April 2, 2015).

Interaction with Industry, CWRP Research Board, Fort Collins, CO. (April 1, 2015).

Interaction with Industry, Western Sugar Cooperative Joint Grower Research Committee, Billings, MT. (January 19, 2015).

Interaction with Industry, CWRP Research Board, Denver, CO. (December 1, 2014).

Interaction with Industry, Monsanto Graduate Student Forum, Fort Collins, CO. (October 24, 2014 - October 25, 2014).

Interaction with Industry, NSF I/UCRC Planning Meeting, Lincoln, NE. (September 29, 2014 - October 1, 2014).

Interaction with Industry, Monsanto Weed Management Academic Summit. (September 17, 2014 - September 19, 2014).

Interaction with Industry, Bayer CropScience Respect the Rotation Advisory Board. (August 20, 2014 - August 22, 2014).

Interaction with Industry, CWRP, Limagrain, Albaugh, Fort Collins, CO. (April 7, 2014).

Interaction with Industry, CWAC Board Research Review, Fort Collins, CO. (April 2, 2014).

Interaction with Industry, Monsanto field development team, Fort Collins, CO. (March 7, 2014).

Interaction with Industry, Western Sugar Cooperative Joint Grower Research Committee, Loveland, CO. (January 21, 2014).

CSU AES Technical Report contributor, CO Wheat Field Days. (2017).

Public service to test corn sample for transgene, Farmer submitted sample. (August 2017 - September 2017).

Herbicide resistance testing, Herbicide resistance testing, Fort Collins, CO. (January 2017 - September 2017).

Guest Speaker, Farming Evolution No-till Conference, Holyoke, CO. (February 16, 2017).

Guest Speaker, Colorado Wheat Organizations, Colorado. (January 10, 2017 - January 12, 2017).

CSU AES Technical Report contributor, CO Wheat Field Days. (2016).

Guest Speaker, Blackgrass Resistance Initiative Workshop, Harpenden. (December 14, 2016).

Guest Speaker, National Association of Wheat Growers, Denver, CO. (November 4, 2016).

Guest Speaker, Pest Management in the Intermountain West, Fort Collins, CO. (October 28, 2016).

Guest Speaker, Grower presentation, Haxtun, CO. (April 4, 2016).

Herbicide resistance testing, Herbicide resistance testing, Fort Collins, CO. (January 2016 - March 2016).

Guest Speaker, Western Colorado Pest Management Workshop, Montrose, CO. (February 17, 2016).

Guest Speaker, Rocky Mountain Agribusiness Association, Denver, CO. (January 13, 2016).

Guest Speaker, Independent Agriculture Consultants of Colorado, Denver, CO. (January 11, 2016).

Guest Speaker, CSU Extension Crop Production Clinic, Fort Morgan, CO. (January 6, 2016).

CSU AES Technical Report contributor, CO Wheat Field Days. (2015).

Guest Speaker, Colorado Wheat Ag Classic meeting, Loveland, CO. (December 9, 2015).

Guest Speaker, CSU Extension Crop Clinic, Fort Morgan, CO. (December 2, 2015).

Guest Speaker, Colorado Agricultural Aviation Association Convention, Loveland, CO. (November 11, 2015).

Guest Speaker, Greeley Chamber of Commerce, Greeley, CO. (November 10, 2015).

Guest Speaker, Pest Management in the Intermountain West, Loveland, CO. (October 28, 2015).

Guest Speaker, Club 20 Annual Meeting, Grand Junction, CO. (March 28, 2015).

Guest Speaker, Club 20 Agricultural Policy Committee, Grand Junction, CO. (February 25, 2015).

Workshop Organizer, Agronomists and retailers, Fort Collins, CO. (February 18, 2015).

CSU AES Technical Report contributor, CO Wheat Field Days. (2014).

Guest Speaker, Crop Quest Information Quest, Colorado Springs, CO. (November 6, 2014).

Public service to test corn sample for transgene, Farmer submitted sample. (August 2014 - October 2014).

Workshop Organizer, Harvest weed seed control workshop, Akron, CO. (August 21, 2014).

Guest Speaker, Industry Innovation Symposium, Loveland, CO. (November 21, 2013).

Guest Speaker, Western Australia Agribusiness Crop Updates, Perth, Western Australia. (February 2011).

Guest Speaker, Grower Field Days, York and Kununurra, Western Australia. (2010).

Guest Speaker, Agronomists and retailers, Perth, Western Australia. (2009).

Guest Speaker, Rocky Mountain Agribusiness Association, Denver, CO. (January 2008).
