

CURRICULUM VITAE

NAME

Franck Dayan

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Bioagricultural Sciences and Pest Management
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EDUCATION

1995 Ph D, Auburn University

1992 MS, Stephen F. Austin State University

1988 BS, Stephen F. Austin State University

ACADEMIC POSITIONS

January 1, 2016 - Present Professor, Colorado State University, Fort Collins, CO, United States.

2017-2018 (College of Agricultural Sciences)

2016-2017 (College of Agricultural Sciences)

2015-2016 (College of Agricultural Sciences)

OTHER POSITIONS

October 1, 1996 - December 31, 2015 Plant Physiologist, United Department of Agriculture, Oxford, MS, United States.

September 1, 1995 - September 30, 1996 Post-doctoral Research Associate, Weed Science, United Department of Agriculture, Stoneville, MS, United States.

PUBLISHED WORKS

Books

Dayan, F. E. (2005). *Somatic Mutation-Mediated Evolution of Herbicide Resistance in the Non-Indigenous Invasive Plant Hydrilla (Hydrilla Verticillata)* (vol. 1): BCPC Publications, Hampshire, United Kingdom., Peer Reviewed/Refereed

Reddy, K., Dayan, F. E., Duke, S. (1998). *QSAR analysis of protoporphyrinogen oxidase inhibitors* (pp. 197-233): Taylor and Francis., Peer Reviewed/Refereed

Refereed Journal Articles

- Dayan, F. E., Barker, A. L., Tranel, P. J. (2017). Origins and Structure of Chloroplastic and Mitochondrial Plant Protoporphyrinogen Oxidases: Implications for Evolution of Herbicide Resistance. *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
- Romdhane, S.,** Devers-Lamrani, M., Martin-Laurent, F., Jrad, A. B., Raviglione, D., Salvia, M.-V., Besse-Hoggan, P., Dayan, F. E., Bertrand, C., Barthelmebs, L. (2017). Evidence for photolytic and microbial degradation processes in the dissipation of leptospermone, a natural β -triketone herbicide. *Environmental Science and Pollution Research.*, Peer Reviewed/Refereed
- Głab, L.,** Sowiński, J., Bough, R. A., **Dayan, F. E.** (2017). Allelopathic potential of sorghum (*Sorghum bicolor* (L.) Moench) in weed control: A comprehensive review. *Advances in Agronomy*, 145, 43-95., Peer Reviewed/Refereed
- Chen, X., Berim, A., Dayan, F. E., Gang, D. (2017). A (-)-kolavenyl diphosphate synthase catalyzes the first step of salvinorin A biosynthesis in *Salvia divinorum*. *Journal of Experimental Botany*, 68, 1109-1122., Peer Reviewed/Refereed
- Romdhane, S., Devers-Lamrani, M., Barthelmebs, L., Calvayrac, C., Bertrand, C., Cooper, J.-F., Dayan, F. E., Martin-Laurent, F. (2016). Ecotoxicological impact of the bioherbicide leptospermone on the microbial community of two arable soils. *Frontiers in Microbiology*, 7, 775. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4877392/>, Peer Reviewed/Refereed
- Patil, C., Calvayrac, C., Zhou, Y., Romdhane, S., Salvia, M.-V., Cooper, J.-F., Dayan, F. E., Bertrand, C. (2016). Environmental metabolic footprinting: A novel application to study the impact of a natural and a synthetic β -triketone herbicide in soil. *Science of The Total Environment*, 566–567, 552-558. <http://www.sciencedirect.com/science/article/pii/S0048969716310014>, Peer Reviewed/Refereed
- Corrêa, E. A., Dayan, F. E., Owens, D. K., Rimando, A. M., Duke, S. O. (2016). Glyphosate-resistant and conventional canola (*Brassica napus* L.) responses to glyphosate and aminomethylphosphonic acid (AMPA) treatment. *Journal of Agricultural and Food Chemistry*, 64(18), 3508-3513. <http://dx.doi.org/10.1021/acs.jafc.6b00446>, Peer Reviewed/Refereed
- Silva, F. M. L., Duke, S. O., Dayan, F. E., Velini, E. D. (2016). Low doses of glyphosate change the responses of soybean to subsequent glyphosate treatments. *Weed Research*, 56, 124-136. <http://dx.doi.org/10.1111/wre.12189>, Peer Reviewed/Refereed
- Killeen, D. P., Larsen, L., Dayan, F. E., Gordon, K. C., Perry, N. B., van Klink, J. W. (2016). Nortriketones: Antimicrobial trimethylated acylphloroglucinols from mānuka (*Leptospermum scoparium*). *Journal of Natural Products*, 79, 564-569. <http://dx.doi.org/10.1021/acs.jnatprod.5b00968>, Peer Reviewed/Refereed
- Carbonari, C. A., Latorre, D. O., Gomes, Giovanna L. G. C., Velini, E. D., Owens, D. K., Pan, Z., Dayan, F. E. (2016). Resistance to glufosinate is proportional to phosphinothricin acetyltransferase expression and activity in LibertyLink® and WideStrike® cotton. *Planta*, 243, 925-933. <http://dx.doi.org/10.1007/s00425-015-2457-3>, Peer Reviewed/Refereed
- Travaini, M. L., Sosa, G. M., Ceccarelli, E. A., Walter, H., Cantrell, C. L., Carrillo, N. J., Dayan, F. E., Meepagala, K. M., Duke, S. O. (2016). Khellin and Visnagin, Furanochromones from *Ammi visnaga* (L.) Lam., as Potential Bioherbicides. *Journal of Agricultural and Food Chemistry*, 64, 9475–9487., Peer

Reviewed/Refereed

- Dayan, F. E., Owens, D. K., Corniani, N., Silva, F. M. L., Watson, S. B., Howell, J., Shaner, D. L. (2015). Biochemical markers and enzyme assays for herbicide mode of action and resistance studies. *Weed Science*, 63(sp1), 23-63. <http://dx.doi.org/10.1614/WS-D-13-00063.1>, Peer Reviewed/Refereed
- Duke, S., Dayan, F. E. (2015). Discovery of new herbicide modes of action with natural phytotoxins. *American Chemical Society Symposium Series*, 1204, 79-92., Peer Reviewed/Refereed
- Salas, R. A., Scott, R. C., Dayan, F. E., Burgos, N. R. (2015). EPSPS gene amplification in glyphosate-resistant Italian ryegrass (*Lolium perenne* ssp. *multiflorum*) populations from Arkansas (United States). *Journal of Agricultural and Food Chemistry*, 63(25), 5885-5893. <http://dx.doi.org/10.1021/acs.jafc.5b00018>, Peer Reviewed/Refereed
- Maroli, A. S., Nandula, V. K., Dayan, F. E., Duke, S. O., Gerard, P., Tharayil, N. (2015). Metabolic profiling and enzyme analyses indicate a potential role of antioxidant systems in complementing glyphosate resistance in an *Amaranthus palmeri* biotype. *Journal of agricultural and food chemistry*, 63(41), 9199-9209., Peer Reviewed/Refereed
- Trivella, A., Stawinoga, M., Dayan, F. E., Cantrell, C. L., Mazellier, P., Richard, C. (2015). Photolysis of natural b-triketonic herbicides in water. *Water Research*, 78, 28-36., Peer Reviewed/Refereed
- Ribeiro, D. N., Nandula, V. K., Dayan, F. E., Rimando, A. M., Duke, S. O., Reddy, K. N., Shaw, D. R. (2015). Possible glyphosate tolerance mechanism in pitted morningglory (*Ipomoea lacunosa* L.). *Journal of agricultural and food chemistry*, 63(6), 1689-1697., Peer Reviewed/Refereed
- Dayan, F. E., Owens, D. K., Watson, S. B., Asolkar, R. N., Boddy, L. G. (2015). Sarmentine, a natural herbicide from Piper species with multiple herbicide mechanisms of action. *Frontiers in Plant Science*, 6, doi: 10.3389/fpls.2015.00222. http://www.frontiersin.org/Journal/Abstract.aspx?s=1208&name=plant_metabolism_and_chemodiversity&A_RT_DOI=10.3389/fpls.2015.00222!!!, Peer Reviewed/Refereed
- Alarcón-Reverte, R., García, A., Watson, S. B., Abdallah, I., Sabate, S., Hernández, M. J., Dayan, F. E., Fischer, A. J. (2014). Concerted action of target-site mutations and high EPSPS activity in glyphosate-resistant junglerice (*Echinochloa colona*) from California. *Pest Management Science*, 71, 996-1007., Peer Reviewed/Refereed
- Dayan, F. E., Owens, D. K., Tranel, P. J., Preston, C., Duke, S. O. (2014). Evolution of resistance to phytoene desaturase and protoporphyrinogen oxidase inhibitors—state of knowledge. *Pest management science*, 70(9), 1358-1366., Peer Reviewed/Refereed
- Uddin, M. R., Park, S. U., Dayan, F. E., Pyon, J. Y. (2014). Herbicidal activity of formulated sorgoleone, a natural product of sorghum root exudate. *Pest management science*, 70(2), 252-257., Peer Reviewed/Refereed
- Ribeiro, D. N., Pan, Z., Duke, S. O., Nandula, V. K., Baldwin, B. S., Shaw, D. R., Dayan, F. E. (2014). Involvement of facultative apomixis in inheritance of EPSPS gene amplification in glyphosate-resistant *Amaranthus palmeri*. *Planta*, 239, 199-212., Peer Reviewed/Refereed
- Dayan, F. E., Duke, S. O. (2014). Natural compounds as next-generation herbicides. *Plant physiology*, 166(3), 1090-1105., Peer Reviewed/Refereed
- Rocaboy-Faquet, E., Noguer, T., Romdhane, S., Bertrand, C., Dayan, F. E., Barthelmebs, L. (2014). Novel bacterial bioassay for a high-throughput screening of 4-hydroxyphenylpyruvate dioxygenase inhibitors.

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- Silva, F. M. L., Donega, M. A., Cerdeira, A. L., Corniani, N., Velini, E. D., Cantrell, C. L., Dayan, F. E., Coelho, M. N., Shea, K., Duke, S. O. (2014). Roots of the invasive species *Carduus nutans* L. and *C. acanthoides* L. produce large amounts of aplotaxene, a possible allelochemical. *Journal of Chemical Ecology*, 40, 276-284., Peer Reviewed/Refereed
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- Owens, D. K., Nanayakkara, N. P. Dhammika, Dayan, F. E. (2013). In planta mechanism of action of leptospermane: Impact of its physico-chemical properties on uptake, translocation, and metabolism. *Journal of Chemical Ecology*, 39, 262-270., Peer Reviewed/Refereed
- Yang, S., Hao, G., Dayan, F. E., Tranel, P. J., Yang, G. (2013). Insight into the structural requirements of protoporphyrinogen oxidase inhibitors: Molecular docking and CoMFA of diphenyl ether, isoxazole phenyl, and pyrazole phenyl ether. *Chinese Journal of Chemistry*, 31, 1153-1158., Peer Reviewed/Refereed
- Dayan, F. E., Dayan, E. A. (2013). Les porphyrines: Les couleurs de la vie. *Pour la Science*, 423, 66-72., Peer Reviewed/Refereed
- Dayan, F. E., Zaccaro, Maria Leticia de M. (2012). Chlorophyll fluorescence as a marker for herbicide mechanisms of action. *Pesticide Biochemistry and Physiology*, 102, 189-197., Peer Reviewed/Refereed
- Dayan, F. E., Dayan, E. A. (2012). Ein ring für die Farben des Lebens. *Spektrum der Wissenschaft*, 6/12, 30-38., Peer Reviewed/Refereed
- Salas, R. A., Dayan, F. E., Pan, Z., Watson, S. B., Dickson, J. W., Scott, R. C., Burgos, N. R. (2012). EPSPS gene amplification in glyphosate-resistant Italian ryegrass (*Lolium perenne* ssp. *multiflorum*) from Arkansas. *Pest Management Science*, 68(9), 1223-1230., Peer Reviewed/Refereed
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- Cantrell, C. L., Dayan, F. E., Duke, S. O. (2012). Natural products as sources for new pesticides. *Journal of Natural Products*, 75, 1231-1242., Peer Reviewed/Refereed
- Sumiyanto, J., Dayan, F. E., Cerdeira, A. L., Wang, Y.-H., Khan, I. A., Moraes, R. M. (2012). Oligofractans content and yield of yacon (*Smallanthus sonchifolius*) cultivated in Mississippi. *Scientia Horticulturae*, 148, 83-88., Peer Reviewed/Refereed
- Dayan, F. E., Owens, D. K., Duke, S. O. (2012). Rationale for a natural products approach to herbicide discovery. *Pest Management Science*, 68, 519-528., Peer Reviewed/Refereed

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- Cerdeira, A. L., Cantrell, C. L., Dayan, F. E., Byrd, J. D., Duke, S. O. (2012). Tabanone, a new phytotoxic constituent of cogongrass (*Imperata cylindrica*). *Weed Science*, 60, 212-218., Peer Reviewed/Refereed
- Bajsa, J., Pan, Z., Dayan, F. E., Owens, D. K., Duke, S. O. (2012). Validation of serine/threonine protein phosphatase as the herbicide target site of endothall. *Pesticide biochemistry and physiology*, 102(1), 38-44., Peer Reviewed/Refereed
- Duke, S. O., Evidente, A., Fiore, M., Rimando, A. M., Dayan, F. E., Vurro, M., Christiansen, N., Looser, R., Hutzler, J., Grossmann, K. (2011). Effects of the aglycone of ascaulitoxin on amino acid metabolism in *Lemna paucicostata*. *Pesticide Biochemistry and Physiology*, 100, 41–50., Peer Reviewed/Refereed
- Saadoun, I. S., Bataineh, S., Ababneh, Q., Hameed, K., Schrader, K. K., Cantrell, C. L., Dayan, F. E., Wedge, D. E. (2011). Evaluation of the toxicity of *Streptomyces aburaviensis* (R9) extract towards various agricultural pests. *Agricultural Sciences*, 2, 491-497., Peer Reviewed/Refereed
- Dayan, F. E., Howell, J., Marais, J. M., Ferreira, D., Koivunen, M. E. (2011). Manuka oil, a natural herbicide with preemergence activity. *Weed Science*, 59, 464-469., Peer Reviewed/Refereed
- Duke, S. O., Dayan, F. E. (2011). Modes of action of microbially-produced phytotoxins. *Toxins*, 3, 1038-1064., Peer Reviewed/Refereed
- Dayan, F. E., Watson, S. B. (2011). Plant cell membrane as a marker for light-dependent and light-independent herbicide mechanisms of action. *Pesticide Biochemistry and Physiology*, 101, 182-190., Peer Reviewed/Refereed
- Dayan, F. E., Dayan, E. A. (2011). Porphyrins: One ring in the colors of life. A class of pigment molecules binds King George III, vampires and herbicides. *American Scientist*, 99(3), 236-243., Peer Reviewed/Refereed
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- Baerson, S. R., Schröder, J., Cook, D., Rimando, A. M., Pan, Z., Dayan, F. E., Noonan, B. P., Duke, S. O. (2010). Alkylresorcinol biosynthesis in plants: new insights from an ancient enzyme family? *Plant signaling & behavior!!!*, 5(10), 1286-1289., Peer Reviewed/Refereed
- Cook, D. D., Rimando, A. M., Clemente, T. E., Schröder, J., Dayan, F. E., Nanayakkara, N. P. Dhammika, Pan, Z., Noonan, B. P., Fishbein, M., Abe, I., Duke, S. O., Baerson, S. R. (2010). Alkylresorcinol synthases expressed in *Sorghum bicolor* root hairs play an essential role in the biosynthesis of the allelopathic benzoquinone sorgoleone. *The Plant Cell*, 22, 867–887., Peer Reviewed/Refereed
- Dayan, F. E., Daga, P. R., Duke, S. O., Lee, R. M., Tranel, P. J., Doerksen, R. J. (2010). Biochemical and structural consequences of a glycine deletion in the α -8 helix of protoporphyrinogen oxidase. *Biochimica et Biophysica Acta*, 1804, 1548–1556., Peer Reviewed/Refereed
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- Dayan, F. E., Trindade, M. L., Velini, E. D. (2009). Amicarbazone, a new photosystem II inhibitor. *Weed Science*, 57(6), 579-583., Peer Reviewed/Refereed
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- Duke, S. O., Blair, A. C., Dayan, F. E., Johnson, R. D., Meepagala, K. M., Cook, D., Bajsa, J. (2009). Is (–)-catechin a novel weapon of spotted knapweed (*Centaurea stoebe*)? *Journal of chemical ecology*, 35(2), 141-153., Peer Reviewed/Refereed
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- Dayan, F. E., Cantrell, C. L., Duke, S. O. (2009). Natural products in crop protection. *Bioorganic & medicinal chemistry!!!*, 17(12), 4022-4034., Peer Reviewed/Refereed
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Non-Refereed Journal Articles

Duke, S., Scheffler, B., Dayan, F., Dyer, W. (2002). Genetic engineering crops for improved weed management traits. *Crop biotechnology*, 829, 52-66., Not Peer Reviewed/Refereed

Dayan, F. E., CANEL, C. (2002). National Center for Natural Products Research, The Research Institute of Pharmaceutical Sciences, School of Pharmacy, University of Mississippi, University, MS 38677, USA. *Bioactive Natural Products (Part G)*, 26, 149., Not Peer Reviewed/Refereed

Non-Refereed Proceedings or Transactions

Gimsing, A. L., Dayan, F. E., Locke, M., Bælum, J., Sejerø, L., Jacobsen, C. S. (2011). Mineralization of Sorgoleone, a Phytotoxic Compound Produced by Sorghum, in Soil. *5 th SETAC World Congress, Program Book: Protecting Our Global Environment*: 6th World Congress/SETAC Europe 22nd Annual Meeting of the Society of Environmental Toxicology and Chemistry (SETAC)., Not Peer Reviewed/Refereed

Gimsing, A. L., Dayan, F. E., Bælum, J., Jacobsen, C. S. (2011). Mineralization of Sorgoleone, an Allelochemical Produced by Sorghum, in Soil. *5 th World Congress on Allelopathy: Growing Awareness of the Role of Allelopathy in Ecological, Agricultural, and Environmental Processes*: Proceedings of 5 th World Congress on Allelopathy., Not Peer Reviewed/Refereed

Duke, S. O., Dayan, F. E., Cantrell, C. L., Rimando, A. M., Wedge, D. E., Pan, Z., Baerson, S. R., Meepagala, K. M. (2011). *Phytochemicals and genes for their synthesis in pest management* (vol. 50, pp. 620-620): INFORMA HEALTHCARE TELEPHONE HOUSE, 69-77 PAUL STREET, LONDON EC2A 4LQ, ENGLAND., Not Peer Reviewed/Refereed

Dayan, F. E., Cantrell, C., Duke, S., van Klink, J., Perry, N. (2009). p-Hydroxyphenylpyruvate dioxygenase, a herbicide target site for natural β -triketones. *ENDURE International Conference* (pp. 1-4): proceedings of ENDURE International Conference., Not Peer Reviewed/Refereed

- Kutrzeba, L., Zjawiony, J., Dayan, F. E. (2008). *Salvinorin B as a putative niosynthetic precursor of salvinorin A. Study on O-acetyltransferase in glandular trichomes isolated from Salvia divinorium* (03rd ed., vol. 74, pp. P-30).: Proceedings of the American Society of Pharmacognosy., Not Peer Reviewed/Refereed
- Kutrzeba, L., Zjawiony, J., Dayan, F. E. (2007). Salvinorin B as a putative biosynthetic precursor of Salvinorin A. study on O-acetyltransferase in glandular trichomes isolated from *Salvia divinorium*. *PLANTA MEDICA* (vol. 74, pp. 332-332).: GEORG THIEME VERLAG KG RUDIGERSTR 14, D-70469 STUTTGART, GERMANY., Not Peer Reviewed/Refereed
- Kutrzeba, L., Dayan, F. E., Giner, J., Zjawiony, J. (2006). C-13-and H-2-labeled deoxyxylulose as a tool in study of kinetics and mechanism of salvinorin A biosynthesis. *PLANTA MEDICA* (vol. 74, pp. 331-332).: GEORG THIEME VERLAG KG RUDIGERSTR 14, D-70469 STUTTGART, GERMANY., Not Peer Reviewed/Refereed
- Dayan, F. E., Weete, J. (1995). Mechanism of tolerance to a novel phenyl triazolinone herbicide. *Plant Physiology* (vol. 111, pp. 498-498).: AMER SOC PLANT PHYSIOLOGISTS 15501 MONONA DRIVE, ROCKVILLE, MD 20855., Not Peer Reviewed/Refereed

Book

- Dayan, F. E. (1995). *Physiological and biochemical basis for tolerance to sulfentrazone by soybean and selected weed species*.: Dissertation., Not Peer Reviewed/Refereed

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

- December 2017, "Relationship between glufosinate phytotoxicity, inhibition of glutamine synthetase and ammonia accumulation", North Central Weed Science Society, (Presenter) Takano, H. K., peer-reviewed/refereed.
- 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, "A Study of Cytochrome P450 Mediated Metabolic Resistance in *Kochia scoparia*", Weed Science Society of America.
- 2017, "Cytochrome P450 Modulates 2,4-D Metabolic Resistance in Waterhemp (*Amaranthus tuberculatus*)", Western Society of Weed Science.
- October 2017, "Evolution of resistance to protoporphyrinogen oxidase inhibitors: A structural biology insight", XVI Congreso de la Sociedad Espanola de Malherbologia, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- August 2017, "(-) Kolavenyl diphosphate synthase catalyzes the first step of salvinorin A biosynthesis in *Salvia divinorium*", Phytochemical Society of North America, (Presenter) Chen, X., peer-reviewed/refereed.
- July 2017, "Role of soil persistence and mineralization of sorgoleone on the allelopathic potential of *Sorghum bicolor*", 8th World Congress on Allelopathy, (Presenter) Dayan, F. E., Marseille, peer-reviewed/refereed.
- June 2017, "The search for novel herbicidal natural products", American Society of Plant Biologists, (Presenter) Ooka, J. K., peer-reviewed/refereed.

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.

May 2017, "The role of the mitochondrial PPO gene (PPX2) in resistance to PPO herbicides", Global Herbicide Resistance Challenge, (Presenter) Barker, A. L., peer-reviewed/refereed.

May 14, 2017, "Biochemical markers and enzyme assays for herbicide resistance diagnostics", Herbicide Resistance Methods Workshop, Global Herbicide Resistance Challenge 2017.

March 2017, "Dissipation of soil-applied herbicides under limited irrigation", Western Weed Science Society, (Presenter) Adamson, D. M., peer-reviewed/refereed.

February 2017, "A Depsipeptide from the Pathogenic Fungi *Burkholderia* sp. A396 Targets Plant Histone Deacetylases", Weed Science Society of America, (Presenter) Dayan, F. E., 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, "Resistance to Glufosinate is Proportional to Phosphinothricin Acetyltransferase Expression and Activity in LibertyLink® and WideStrike® Cotton", 7th International Weed Science Congress, (Presenter) Dayan, F. E., peer-reviewed/refereed.

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, "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, "Research on herbicide resistant *kochia* in the Western US and Canada", Weed Science Society of America.

2016, "Functional Expression of Cytochromes P450 in a Yeast System", Western Society of Weed Science.

2016, "Molecular and Genomic Weed Science Research at Colorado State University", Western Society of Weed Science.

November 14, 2016, "Rationale for a Natural Products Approach to Herbicide Discovery", Bayer CropScience USA.

- June 2016, "Mode of action and resistance to PPO herbicides", Bayer CropScience Germany, (Presenter) Dayan, F. E.
- April 2016, "A Natural Route to the Next Generation of Herbicides", Monsanto, (Presenter) Dayan, F. E.
- April 2016, "A functional genomic approach to elucidating sorgoleone biosynthesis", University of Nebraska, (Presenter) Dayan, F. E.
- March 2016, "Sorgoleone and Its Role in Sorghum Allelopathy", University of Massachusett, (Presenter) Dayan, F. E.
- February 2016, "Resistance to Glufosinate is Proportional to Phosphinothricin Acetyltransferase Expression and Activity in LibertyLink® and WideStrike® Cotton", Weed Science Society of America, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2015, "Low dose effects of glyphosate on plant reproduction in Arabidopsis thaliana: A biological and transcriptomics approach", American Chemical Society, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2015, " β -Triketones from *Leptospermum scoparium* as natural herbicides inhibiting p-hydroxyphenylpyruvate dioxygenase", American Chemical Society, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2015, "A Natural Route to the Next Generation of Herbicides", Canadian Weed Science Society, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2015, "Sarmentine, a natural Piper amide herbicide with multiple mechanisms of action", Phytochemical Society of North America, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2015, "A Natural Route to the Next Generation of Herbicides", XV Brazilian Congress of Plant Physiology, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- February 2015, "Sarmentine, a natural herbicide from long pepper (*Piper longum*) fruit with multiple mechanisms of action", Weed Science Society of America, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2014, "Novel Bioassay for the Discovery of Inhibitors of the 2-C-Methyl-d-erythritol 4-Phosphate (MEP) and Terpenoid Pathways Leading to Carotenoid Biosynthesis", Mississippi State University, (Presenter) Dayan, F. E.
- 2014, "Rationale for a natural products approach to herbicide discovery", University of Guelph, (Presenter) Dayan, F. E.
- February 2014, "Manuka Oil, a Natural HPPD Inhibitor", Weed Science Society of America, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2013, "Manuka oil as a potential natural herbicide", California Weed Science Society annual meeting, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2013, "Rationale for a natural products approach to herbicide discovery", California Weed Science Society annual meeting, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2013, "Resistance to inhibitors of protoporphyrinogen oxidase and phytoene desaturase", Global Herbicide Resistance Congress, (Presenter) Dayan, F. E., peer-reviewed/refereed.

- February 2013, "Leaf disc assay to measure early steps of the MEP pathway", Weed Science Society of America, (Presenter) Corniani, N., peer-reviewed/refereed.
- 2012, "Developing manuka oil as natural herbicide", 6th International Weed Science Congress, International Weed Science Society, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2012, "Natural triketones for weed management", 7th International Integrated Pest Management Symposium, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2012, "Natural products as sources for new pesticides – 1997-2010", American Chemical Society, (Presenter) Cantrell, C. L., peer-reviewed/refereed.
- 2012, "Manuka oil, a natural herbicide with preemergence activity", Natural Products and Biocontrol, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2012, "Allelopathy and natural herbicides development", XXVII Congress of Brazilian Weed Science Society, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- February 2012, "Plant cell membrane as a marker for light-dependent and light-independent herbicides", Weed Science Society of America, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2011, "Rationale for a natural products approach to herbicide discovery", Research and Development for Crop Protection Products USA, Informa Life Science, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- February 2011, "Approaches to the use of natural products for herbicide discovery", Weed Science Society of America, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2010, "Natural products in weed management, a review", American Chemical Society, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- February 2010, "Natural products in weed management, a review", Weed Science Society of America, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- August 2009, "Dynamic root exudation of sorgoleone and its in planta mechanism of action", Phytochemical Society of North America, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- February 2009, "In planta mechanism of action of the allelochemical sorgoleone", Weed Science Society of America, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2008, "In planta mechanism of action of the allelochemical sorgoleone", 5th World Congress on Allelopathy, peer-reviewed/refereed.
- 2008, "Cyperin, a pathogenic fungi diphenyl ether phytotoxin, targets plant enoyl (acyl carrier protein)", American Chemical Society, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2008, "p-Hydroxyphenylpyruvate dioxygenase is a herbicide target site for natural β -trienones", American Chemical Society, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2008, "Natural β -triketone inhibitors as potential herbicides in sustainable agriculture", Endure International Conference, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2008, "Inhibition of plant enoyl (Acyl Carrier Protein) reductase by the natural diphenyl ether cyperin", International Weed Science Society, (Presenter) Dayan, F. E., peer-reviewed/refereed.

- 2008, "cDNA library of *Salvia divinorum* glands as a molecular tool for studying biosynthetic pathway of salvinorin A", Phytochemical Society of North America, (Presenter) Kutrzeba, L., peer-reviewed/refereed.
- February 2008, "In planta mechanism of action of the allelochemical sorgoleone", Weed Science Society of America, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2007, "Trichomes and root hairs function as natural pesticide factories", 3rd Chinese Allelopathy Conference, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2007, "Manipulating the lipid resorcinol pathway to enhance plant allelopathy", American Chemical Society, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2007, "Biosynthesis of lipid resorcinols and benzoquinone in isolated secretory root hairs of sorghum bicolor", Phytochemical Society of North America, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2007, "Independent somatic mutations in invasive plant *Hydrilla* lead to resistance to phytoene", Resistance 2007, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- February 2007, "Biosynthesis of the allelochemical sorgoleone in isolated secretory root hairs of *S. bicolor*", Weed Science Society of America, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2006, "Evolution of resistance to phytoene desaturase-inhibiting herbicides", American Chemical Society, peer-reviewed/refereed.
- 2006, "Herbicidal activity of manuka oil is associated with inhibition of HPPD", Phytochemical Society of North America, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- February 2006, "Herbicidal activity of manuka oil is associated with inhibition of p-hydroxyphenylpyruvate dioxygenase by its triketone components", Weed Science Society of America, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2005, "Manipulating the lipid resorcinol pathway to enhance allelopathy in rice", 4th World Congress on Allelopathy, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2005, "Somatic mutation-mediated evolution of herbicide resistance in the non-indigenous invasive plant *hydrilla* (*Hydrilla verticillata*)", British Crop Protection Conference, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2005, "Characterization of the biosynthesis of 5-alkyl resorcinols in rice", Phytochemical Society of North America, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- February 2005, "Evolution of herbicide-resistant phytoene desaturase genes and their potential use in biotechnology", Weed Science Society of America, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2004, "Phytoene desaturase inhibitor-resistant crops", American Chemical Society, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2004, "Understanding the sorgoleone biosynthetic pathway", European Allelopathy Society, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2004, "Biosynthesis of sorgoleone", International Weed Science Society, (Presenter) Dayan, F. E., peer-reviewed/refereed.

- February 2004, "Structure and inhibitory activity of lipid resorcinols and benzoquinones from the root exudate of *Sorghum bicolor*", Weed Science Society of America, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2003, "New herbicide target sites from natural compounds", 3rd Pan Pacific Congress, (Presenter) Duke, S. O., peer-reviewed/refereed.
- 2003, "Studies on the biosynthesis of the novel k-opioid agonist, salvinorin A", American Society of Pharmacognosy, (Presenter) Stewart, J., peer-reviewed/refereed.
- 2003, "Biosynthesis of sorgoleone: Complementary retrobiosynthetic NMR and root hair specific EST analyses", American Society of Plant Biology, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- February 2003, "Elucidation of the biosynthetic pathway of sorgoleone using retrobiosynthetic NMR analysis", Weed Science Society of America, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2002, "Natural products for pest management", American Chemical Society, (Presenter) Duke, S. O., peer-reviewed/refereed.
- 2002, "Structure-activity relationship of natural products on plant p-hydroxyphenylpyruvate dioxygenase", IUPAC, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- February 2002, "The mechanism of action of the fungal phytotoxin 2,5-anhydro-D-glucitol requires bioactivation by glycolytic enzymes", Weed Science Society of America, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2001, "Strategies for improvement of crop allelopathy with transgenes", 2nd Asian Pacific Conference on Chemical Ecology, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2001, "Biosynthesis of sorgoleone", European Allelopathy Society, (Presenter) Dayan, F. E.
- 2001, "Classification and mode of action of herbicides", European Weed Research Society, (Presenter) Duke, S. O., peer-reviewed/refereed.
- February 2001, "The natural product usnic acid is a potent inhibitor of plant p-hydroxyphenylpyruvate dioxygenase", Weed Science Society of America, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2000, "Genetically engineering crops for improved weed management", American Chemical Society, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2000, "Inhibition of asparagine synthetase, the key to the mode of action of cinmethylin", International Weed Science Society, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 2000, "Elucidation of the mode of action of cinmethylin", Weed Science Society of America, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 1999, "Determination of the mode of action of allelochemicals", 2nd World Congress on Allelopathy, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 1999, "Biological activity of amino- and urea-substituted thiazoles", Weed Science Society of America, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 1998, "Prediction the activity of natural and synthetic protoporphyrinogen oxidase-inhibiting phytotoxins", American Chemical Society, (Presenter) Dayan, F. E., peer-reviewed/refereed.

- 1998, "Mode of action of 2,5-anhydro-D-glucitol", IUPAC, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 1998, "Inhibitory activity of sulfentrazone and its metabolic derivatives on soybean (Glycine max) protoporphyrinogen oxidase", Weed Science Society of America, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 1997, "Horseradish peroxidase-catalyzed formation of chlorins", American Society of Plant Biology, (Presenter) Dayan, F. E.
- February 1997, "Overview of protoporphyrinogen oxidase inhibitors", British Crop Protection Conference, (Presenter) Dayan, F. E., peer-reviewed/refereed.
- 1996, "Mechanism of tolerance to a novel phenyl triazolinone herbicide", American Society of Plant Biology, (Presenter) Dayan, F. E.

OTHER ACTIVITIES/ACCOMPLISHMENTS – PUBLICATIONS/SCHOLARLY RECORD

- Baerson, S. R., Pan, Z., Rimando, A. M., Dayan, F. E., Cook, D. "Alkylresorcinol synthase genes of sorghum associated with allelochemical biosynthesis and their use in control of allelopathy." (Approved: September 15, 2011).
- Baerson, S. R., Rimando, A. M., Dayan, F. E., Pan, Z., Polashock, J. J. "Methods for cloning Sorghum root hair-specific OMT3 gene encoding O-methyltransferase and its use in pterostilbene and sorgoleone biosynthesis in transgenic plants." (Approved: June 10, 2008).
- Michel, A., Scheffler, B. E., Netherland, M. D., Dayan, F. E., Arias, R. "Sequences of modified plant phytoene desaturase for generating herbicide-resistant plants." (Application: July 17, 2003).
- Canel, C., Dayan, F. E., Moraes, R. M., Burandt, C. L. "Enhanced yield of podophyllotoxin from natural products through in situ conversion methods/A method of recovering podophyllotoxin from Podophyllum peltatum and Podophyllum emodii." (Approved: November 7, 2000).
- (January 27, 2017 - April 18, 2017). Workshop, "CSU Faculty Institute for Inclusive Excellence," CSU Diversity Education and Training, Fort Collins, CO, United States. Approximate Number of Hours Spent Per Year: 50.
- (January 5, 2017). Workshop, "Grade book and assessment," CSU TTC Workshop, Fort Collins, CO, United States. Approximate Number of Hours Spent Per Year: 2.
- (January 4, 2017). Workshop, "Build a Course in Canvas," CSU TTC workshop, Fort Collins, CO, United States. Approximate Number of Hours Spent Per Year: 2.

TEACHING:

<u>Year</u>	<u>Semester</u>	<u>Course No./Title</u>	<u>Cr. Hrs.</u>	<u>Enrollment</u>
2017	Fall	BSPM581A2 - Plant Biochemistry in Agriculture	3	9
2017	Fall	BSPM698 - Research	77	14
2017	Fall	BSPM798 - Research	67	14
2017	Spring	BSPM698 - Research	28	9
2016	Fall	BSPM509 - Herbicide Selectivity and Action	3	11
2016	Fall	BSPM698 - Research	18	11

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-BSPM500 - Foundations of Bioagricultural Sciences	1	Face to Face
2017	Fall	Bioag'l Sci & Pest Mgmt-BSPM580A4 - Molecular genetics and evolution of pesticide resistance	1	Face to Face
2017	Spring	Bioag'l Sci & Pest Mgmt-BSPM551 - Advanced Integrated Pest Management	1	Face to Face
2017	Spring	Bioag'l Sci & Pest Mgmt-BSPM451 - Integrated Pest Management	1	Face to Face
2016	Fall	Bioag'l Sci & Pest Mgmt-BSPM500 - Foundations of Bioagricultural Sciences	1	
2016	Fall	Bioag'l Sci & Pest Mgmt-BSPM509 - Herbicide Selectivity and Action	4	Face to Face
2016	Spring	Bioag'l Sci & Pest Mgmt-BSPM550 - Molecular Plant-Microbe Interactions	1	Face to Face

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

Development of New Courses

Developed a new graduate level course entitled Plant Biochemistry in Agriculture - BSPM 581A2

Development of New Teaching Techniques

Incorporate computer protein modeling to the lecture

Integration of Service Learning

Conference/Workshop Assessments

Participation in Professional Development Activities Related to Teaching

Attended the Teaching Workshop at 2017 WSSA meeting

Professional Consultation Related to Teaching

Other Evidence

EXTENSION/ENGAGEMENT ACTIVITIES/ACCOMPLISHMENTS

Presentation

Importance of PPO herbicides as a weed management tools. Adult, Denver, CO. Number of times program was made: 1. Total number of participants: 75. Percent Responsible: 100%. 1st Quarter 2017.

PPO herbicides – their modes of action and ways plants can evolve resistance to this chemistry. Adult, Denver, CO. Number of times program was made: 1. Total number of participants: 75. Percent Responsible: 100%. 1st Quarter 2017.

The mode of action of PPO-inhibiting herbicides. Adult, Pelotas. Number of times program was made: 1. Total number of participants: 25. Percent Responsible: 100%. 4th Quarter 2017.

New CSU analytical capabilities for sugar beet growers. Adult, Loveland, CO. Number of times program was made: 1. Total number of participants: 100. Percent Responsible: 5%. 1st Quarter 2016.

New CSU analytical capabilities for colorado wheat growers. Adult, Stratton, CO. Number of times program was made: 1. Total number of participants: 25. Percent Responsible: 25%. 4th Quarter 2015.

Workshop

Evolution of herbicide resistance. Adult, Fort Collins, CO. Number of times program was made: 1. Total number of participants: 15. Percent Responsible: 100%. 2nd Quarter 2017.

Resistant Weed Workshop. Adult, Limon, CO. Number of times program was made: 1. Total number of participants: 50. Percent Responsible: 100%. 2nd Quarter 2016.

Mode of action of herbicides. Adult, Knoxville, TN. Number of times program was made: 3. Total number of participants: 75. Percent Responsible: 25%. 2nd Quarter 2015.

COMMITTEES

Academic affairs committee for CAS, (November 1, 2016 - Present).

Development of Undergraduate Major Committee, (August 2017 - Present).

Faculty Search Committee, (January 1, 2017 - December 30, 2017).

Education Committee, (August 15, 2016 - May 15, 2017).

BSPM Faculty retreat, (January 10, 2017).

PROFESSIONAL AFFILIATIONS AND ACTIVITIES

Phytochemical Society of North America. (January 2006 - Present).

Internatinonal Allelopathy Society. (June 2000 - Present).

International Weed Science Society. (January 1999 - Present).

Weed Science Society of America. (February 1995 - Present).

Editor, Journal Editor, Outlooks on Pest Management. (January 1, 2017 - Present).

Committee Chair, Outstanding Early Career Award committee. (2016 - Present).

Editor, Associate Editor, Pesticide Biochemistry and Physiology. (January 2011 - Present).

Committee Member, Herbicide Resistance Committee. (2010 - Present).

Editor, Associate Editor, Weed Science Journal. (January 2003 - Present).

Program Organizer, 1st International Conference on Organic vs. Conventional Agriculture, Ardabil. (August 16, 2017 - August 17, 2017).

Program Organizer, Glorbal Herbicide Resistance Challenge, Denver, Colorado. (May 14, 2017 - May 18, 2017).

Program Organizer, International Weed Science Society. (June 2016).

Officer, Treasurer, International Weed Science Society. (June 2012 - June 2016).

Program Organizer, Phytochemical Society of North America. (August 2015).

Officer, President/Elect/Past, Phytochemical Society of North America. (August 2014 - August 2015).

Editor, Associate Editor, Allelopathy Journal. (January 2010 - December 2014).

Program Organizer, Weed Science Society of America. (February 2014).

Officer, Treasurer, Phytochemical Society of North America. (August 2006 - August 2012).

Program Organizer, International Weed Science Society. (June 2012).

Program Organizer, Weed Science Society of America. (February 2011).

Session Chair, Weed Science Society of America. (February 2011).

Program Organizer, Weed Science Society of America. (February 2010).

Program Organizer, Weed Science Society of America. (February 2009).

Program Organizer, Phytochemical Society of North America. (August 2006).

Session Chair, Weed Science Society of America. (February 2006).

Session Chair, Weed Science Society of America. (February 2000).
