

**Myron A Bruce, PhD**

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Manhattan, KS 66506

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**Education:**

**2005-2011 PhD, Plant Pathology, Colorado State University, Fort Collins, CO**

Advisor: Dr. Jan E. Leach

**1998-2003 BS, Microbiology, Kansas State University, Manhattan, KS**

Advisor: Dr. James E. Urban

**Employment:**

**2018-pres. Research Assistant Professor, Dept of Plant Pathology, Kansas State University, Manhattan, KS**

Department head: Dr. Megan Kennelly

**2018-2018 Assistant Research Professor, Montana State University, Bozeman, MT**

Department head: Dr. Michael Giroux

**2016-2018 Post Doctoral Research Fellow, Montana State University, Bozeman, MT**

Supervisor: Dr. Jessica L. Rupp

**2011-2015 Post Doctoral Research Associate, USDA-ARS-HWWGRU, Manhattan, KS**

Supervisor: Dr. John P. Fellers

**2005-2011 Graduate Research Assistant, BSPM, Colorado State University, Fort Collins, CO**

Advisor: Dr. Jan E. Leach

**2003-2004 Research Assistant, Dept of Plant Pathology, Kansas State University, Manhattan, KS**

Supervisor: Dr. Marietta Ryba

## Publications:

Ranabhat, N., **Bruce, M. A.**, Fellers, J.P., and Rupp, J.L.S. A reproducible methodology for absolute viral quantification and viability determination in mechanical inoculations of *Wheat streak mosaic virus*. Tropical Plant Pathology. Submitted 2021.

Smith, V., **Bruce, M.**, Rupp, J.L.S, and Kephart, K. Utilization of lattice design structures for sugarbeet varietal assessment to *Rhizoctonia solani*. In preparation.

**Bruce, M.**, Rupp, J.L. Viral diseases of hemp. Invited book chapter. Compendium of Hemp Diseases. APS Press. Accepted, in review. KAES:20-066B.

Mangel, D., **Bruce, M.**, Davis, M., DeWolf, E., and Rupp, J.L., (2021) Evaluation of foliar fungicides for control of tan spot of spring wheat, 2020. Plant Disease Management Report (PDMR), CR179.

Mangel, D., **Bruce, M.**, Davis, M., Fritz, A., Zhang, G., and Rupp, J.L., (2021) Reaction of Kansas Intrastate Nursery winter wheat accessions to Fusarium head blight, 2020. Plant Disease Management Report (PDMR), CF178.

Ranabhat, N., **Bruce, M.**, Davis, M., Baenzinger, P.S., Wegulo, S., Halley, S., and Rupp, J.L., (2021) Reaction of Kansas, Colorado, and Nebraska winter wheat accessions to Fusarium head blight (FHB), 2020. Plant Disease Management Report (PDMR), CF207.

Mangel, D., **Bruce, M.**, Davis, M., Carver, B., Rudd, J., Ibrahim, A., and Rupp, J.L., (2021) Reaction of Oklahoma and Texas winter wheat accessions to Fusarium head blight, 2020. Plant Disease Management Report (PDMR), CF205.

Beyer, N., **Bruce, M.**, Davis, M., Seghal, S., Marias, G., Cook, J., Bruckner, P., and Rupp, J.L., (2021) Reaction of Montana, North Dakota, and South Dakota winter wheat cultivars to Fusarium head blight (FHB), 2020. Plant Disease Management Report (PDMR), CF206.

Mangel, D., Davis, M., **Bruce, M.**, Fritz, A., and Rupp, J.L., (2021) Reaction of Kansas Interstate Nursery winter wheat accessions to tan spot, 2020. Plant Disease Management Report (PDMR), 15:CF091.

Mangel, D., Davis, M., **Bruce, M.**, DeWolf, E., and Rupp, J.L., (2021) Evaluation of foliar fungicides for control of tan spot of winter wheat, 2020. Plant Disease Management Report (PDMR), 15:CF092.

Ranabhat, N., **Bruce, M.**, Fritz, A.K., Guttieri, M., and Rupp, J.L., (2021) Reaction of selected Kansas winter wheat cultivars to Wheat streak mosaic, 2020. Plant Disease Management Report (PDMR), 15:CF093.

Ranabhat, N., **Bruce, M.**, Davis, M., Fritz, A.K., Zhang, G., and Rupp, J.L., (2021) Reaction of selected Kansas winter wheat cultivars to Barley yellow dwarf, 2019. Plant Disease Management Report (PDMR), 15:CF094.

Mangel, D., Davis, M.A., **Bruce, M.**, Fritz, A.K., and Rupp, J.L.S. (2020) Reaction of Kansas Interstate Nursery winter wheat accessions to tan spot, 2020. Plant Disease Management Report (PDMR) Accepted.

Mangel, D., Davis, M.A., **Bruce, M.**, DeWolf, E., and Rupp, J.L. (2020) Evaluation of foliar fungicides for control of tan spot of spring wheat, 2020. Plant Disease Management Report (PDMR) Accepted.

Ranabhat, N.B., **Bruce, M.A.**, Davis, M.A., Fritz, A.K., Zhang, G., and Rupp, J.L. (2020) Reaction of selected Kansas winter wheat cultivars to Barley yellow dwarf, 2020. Plant Disease Management Report (PDMR) Accepted.

Ranabhat, N.B., **Bruce, M.A.**, Fritz, A.K., Guttieri, M., and Rupp, J.L. (2020) Reaction of selected Kansas winter wheat cultivars to Wheat streak mosaic, 2020. Plant Disease Management Report (PDMR) Accepted.

Ranabhat, N.B., **Bruce, M.**, Davis, M., and Rupp, J.L., (2020) Reaction of Kansas and Nebraska winter wheat accessions to Fusarium head blight (FHB), 2019. Plant Disease Management Report (PDMR).

Mangel, D., **Bruce, M.**, Davis, M., and Rupp, J.L., (2020) Evaluation of foliar fungicides for control of tan spot of spring wheat, 2019. Plant Disease Management Report (PDMR).

Mangel, D., **Bruce, M.**, Davis, M., and Rupp, J.L., (2020) Reaction of Kansas Intrastate Nursery winter wheat accessions to Fusarium head blight, 2019. Plant Disease Management Report (PDMR).

Ranabhat, N., **Bruce, M.**, Davis, M., and Rupp, J.L., (2020) Reaction of selected Kansas winter wheat cultivars to Barley yellow dwarf, 2019. Plant Disease Management Report (PDMR).

**Bruce, M.**, and Rupp, J.L.S., (2019) Rhizoctonia seed, seedling and root rot of lentil. Lentil Disease Diagnostic Series, NDSU Extension Publications.

**Bruce M.A.**, Rupp J.L.S (2019) Agrobacterium-Mediated Transformation of Solanum tuberosum L., Potato. In: Kumar S., Barone P., Smith M. (eds) Transgenic Plants. Methods in Molecular Biology, vol 1864. Humana Press, New York, NY.

**Bruce, M.**, Crutcher, F., and Rupp, J.L. (2018) Pulse Crop Fungal Disease Management. Crops and Soils Magazine. Vol 51, No. 3.

Cuomo, C.A., Bakkeren, G., Khalil, H.B., Panwar, V., Joly, D.L., Linning, R., Sakthikumar, S., Song, X., Adiconis, X., Fan, L., Goldberg, J.M., Levin, J.Z., Young, S., Zeng, Q., Anikster, Y., **Bruce, M.**, Wang, M., Yin, C., McCallum, B., Szabo, L.J., Hulbert, S., Chen, X., Fellers, J.P. (2017) Comparative analysis highlights variable genome content of wheat rusts and divergence of the mating loci. Genes Genomes Genetics, 7:2.

Segovia, V., **Bruce, M.**, Rupp, J.L.S., Huang, L., Bakkeren, G., Trick, H.N., Fellers, J.P. (2016) Two small secreted proteins from *Puccinia triticina* induce reduction of  $\beta$ -glucoronidase

transient expression in wheat isolines containing Lr9, Lr24 and Lr26. *Canadian Journal of Plant Pathology*, 38:1.

**Bruce, M.**, Neugebauer, K., Joly, D.L., Migeon, P., Cuomo, C.A., Akhunov, E., Wang, S., Bakkeren, G., Fellers, J.P. (2016) Using transcription of six *Puccinia triticina* races to identify the effective secretome during infection of wheat. *Frontiers in Plant-Microbe Interactions*, 134:502.

Fellers, J.P., Soltani, B.M., **Bruce, M.**, Lilling, R., Cuomo, C.A., Szabo, L.J., Bakkeren, G. (2013) Conserved loci of leaf and stem rust fungi of wheat share synteny interrupted by lineage-specific influx of repeat elements. *BMC Genomics*, 14:60.

Manosalva, P.M.\*, **Bruce, M.\***, Leach, J.E. (2011) Rice 14-3-3 protein (GF14e) negatively affects cell death and disease resistance. \*authors contributed equally. *The Plant Journal*, 68:5.

Davidson, R.M., Manosalva, P.M., Snelling, J., **Bruce, M.**, Leung, H., Leach, J.E. (2010) Rice germin-like proteins: allelic diversity and relationships to early stress responses. *Rice*, 3:1.

Leach, J.E., Davidson, R., Mauleon, R., Carrillo, G., Jahn, C., Snelling, J., **Bruce, M.**, Heuberger, A., Ishihara, H., Tanger, P., Stephens, J., Vera Cruz, C., Leung, H. (2010) Genome analysis to understand durable disease resistance in rice. Pages 73-79 in *Genome-enabled integration of research in plant pathogen systems*. T. Wolpert, T. Shiraishi, J. Glazebrook, eds. APS Press, Minneapolis, MN.

**Bruce, M.**, Hess, A., Bai, J., Mauleon, R., Diaz, M.G., Sugiyama, N., Bordeos, A., Wang, G.L., Leung, H., Leach, J.E. (2009) Detection of deletions in rice using oligonucleotide microarrays. *BMC Genomics*, 10:129.

Leach, J.E., Davidson, R., Liu, B., Manosalva, P., Mauleon, R., Carrillo, G., **Bruce, M.**, Stephens, J., Diaz, M.G., Nelson, R., Vera Cruz, C., Leung, H. (2007) Understanding broad-spectrum, durable disease resistance in rice. Pages 191-209 in *Rice Genetics V*. D.S. Brar, D Mackill, B Hardy, eds. World Scientific Publishing Co, Singapore.

Leach, J.E., Liu, B., Manosalva, P., Wu, C., Wu, J., Bordeos, A., Bai, J. Lee, S., Ryba-White, M., **Bruce, M.**, Hulburt, S., Hopkins, C., Vera Cruz, C., Leung, H. (2004) Dissection of durable resistance in rice. Pages 167-173 in *Genomic and Genetic Analysis of Plant Parasitism and Defense*. S. Tsuyumu, J. Leach, T. Shiraishi, T. Wolpert, eds. APS Press, Minneapolis, MN.

#### **Presentations (presenter in bold):**

**Mangel, D.**, Bruce, M., De Wolf, E., Rupp, J. (2021). Race structure of necrotrophic effectors in the Kansas *Pyrenophora tritici-repentis* population. *Plant Health 2021, The American Phytopathological Society*.

**Ranabhat, N.**, Bruce, M., Fellers, J., and Rupp J., (2021) *Viral quantification and viability*

determination in mechanical inoculation of Wheat streak mosaic virus, Plant Health 2021, research on-demand presentation, America Phytopathological Society Meeting, August 2-6, 2021.

**Ranabhat, N.,** Fellers, J., Bruce, M., and Rupp J., (2021) Characterization of Kansas wheat virus populations using nanopore sequencing. North Central America Phytopathological Society, Division Meeting, June 15-16, 2021.

**Ranabhat, N.,** Bruce, M., Fellers, J., and Rupp J. (2021). Wheat streak mosaic virus prevalence in Kansas winter wheat fields. Kansas Academy of science, 153rd Annual Meeting, April 10, 2021.

**Ranabhat, N. B.,** Bruce, M., Fellers, J., and Rupp J. L. (2021), A method of accurate viral quantification and viability determination in mechanical inoculation of Wheat streak mosaic virus. K-State GRAD Forum, March 31, 2021.

**Ranabhat, N. B.** 2021. How does tracking a plant virus help to control it? Kansas State University Three Minute Thesis Competition, Manhattan KS, Feb. 19, 2021.

**Mangel, D.J.L.,** Bruce, M., Davis, M.A., Rupp, J.L. (2020) Fungicide efficacy for control of Fusarium Head Blight under field nursery conditions, 2020 National Fusarium Head Blight Forum, December 7-11, 2020, virtual.

**Ranabhat, N.B.,** Bruce, M., Fellers, J., Rupp, J. (2020) Prevalence and characterization of *Wheat streak mosaic virus* in the Kansas winter wheat. American Phytopathological Society Annual meeting, August 10-14, 2020, virtual.

**Mangel, D.,** Bruce, M., De Wolf, E.D., Bowden, R.L., Rupp, J. (2020) *ToxA* presence and haplotype diversity in the Kansas *Bipolaris sorokiniana* population. American Phytopathological Society Annual meeting, August 10-14, 2020, virtual.

**Mangel, D.,** Bruce, M., Davis, M., and Rupp, J.L. (2019) Impact of Environmental Conditions on fungicide ability to control Fusarium head blight under field nursery conditions, 2019 National Fusarium Head Blight Forum, December 8-10, 2019, Milwaukee, WI.

**Smith, N.,** Mangel, D., Beyer, N., Ranabhat, N., Davis, M., Bruce, M., and Rupp, J.L., (2019) Exploring root rot pathogens in wheat-pea rotations in Kansas, REEU Poster session, July 25, 2019, Kansas State University, Manhattan, KS.

**Smith, V.,** Bruce, M., Kephart, K., and Rupp, J.L.S. (2018) Comparison of Fungicides for the Control of *Rhizoctonia solani* in sugarbeets, Poster P-55, Joint Meeting of the American Phytopathological Society, Pacific Division and Conference on Soilborne Plant Pathogens, June 25-27, 2018, Portland, OR.

Bruce, M., Mangel, D., and **Rupp, J.L.**, 2017. AG MAPSS: Autonomous Guidance Modular Aerial Plant Survey System, Crop-Loss Assessment Poster P-135, American Phytopathological Society, San Antonio, TX.

**Bruce, M.**, Kephart, K., Rupp, J.L. 2017. Sugarbeet Reporting Session, Strategies for Seasonal Control of *Rhizoctonia* Crown and Root Rot in Sugarbeet. Sugarbeet Research and Education Board, Fargo, ND.

**Bruce, M.**, Neugebauer, K., Wang, S., Akhunov, E., Fellers, J.P. 2013. Transcriptome analysis of six wheat leaf rust races. Invited short presentation. Keystone Symposium – Plant Immunity: Pathways and Translation. Big Sky, MT.

**Bruce, M.**, Manosalva, P., Leung, H., Leach, J.E. 2010. A 14-3-3 protein negatively regulates cell death and resistance. Poster presentation. 5<sup>th</sup> International Rice Blast Conference. Little Rock, AR.

**Bruce, M.**, Hess, A., Bai, J., Mauleon, R., Diaz, M.G., Sugiyama, N., Bordeos, A., Wang, G.L., Leung, H., Leach, J.E. 2008. Detection of genomic deletions in rice using oligonucleotide microarrays. Poster presentation. 6<sup>th</sup> International Symposium on Rice Functional Genomics. Jeju, South Korea.

**Bruce, M.**, Coughlan, S., Zhu, T., Bordeos, A., Wu, C., Leung, H., Leach, J.E. 2005. Expression profiling and gene localization of rice lesion mimic mutant *sp11*. 5<sup>th</sup> International Rice Genetics Symposium and 3<sup>rd</sup> International Rice Functional Genomics Symposium. Manila, Philippines.

#### **External funding as co-principle investigator:**

Rupp, J.L., Fritz, A., **Bruce, M.**, Friebe, B., Zhang, G., Andersen Onofre, K., (2021) Disease Phenotyping: Determining the reaction of wheat lines to Important Diseases, Kansas Wheat Commission, KWC/KSU 2022-11, (7/1/21-6/30/22, \$41,204.00. Rupp Lab allocation: \$41,204.00.

Rupp, J.L.S., **Bruce, M.**, and Turner, K., (2021) Improving disease resistance in the perennial grain Kernza to protect the value of the grain and the environment, North Central Research and Education Grant, SARE, 11/1/20-10/31/2023, \$167,433.00. Rupp Lab allocation: \$106,847.

Rupp, J.L., and **Bruce, M.**, (2020) Development of Scab Resistant Wheat Cultivars for Kansas, U.S. Wheat and Barley Scab Initiative, USDA-ARS, 59-0206-0-154, 5/15/20-5/14/23 \$135,570.00 Rupp Lab allocation: \$135,570.00.

Rupp, J., **Bruce, M.**, Fritz, A., Zhang, G., Bai, G., Guttieri, M., Bowden, R., Friebe, B. (2020) Disease Phenotyping: Determining the Reaction of Wheat Lines to Important Diseases, Kansas Wheat Commission, \$40,470.

Rupp, J. and **Bruce, M.** (2020) Development of Scab Resistant Cultivars for Kansas, U.S. Wheat and Barley Scab Initiative, \$33,893.

Rupp, J.L. and **Bruce, M.**, (2019) Disease Phenotyping: Determining the reaction of wheat lines to Important Diseases, Kansas Wheat Commission, \$33,390.00.

Rupp, J.L. and **Bruce, M.**, (2019) Increasing the capacity of mist irrigation systems for inoculated nurseries in Hard Winter Wheat region. U.S. Wheat and Barley Scab Initiative, \$11,000.

Rupp, J.L. and **Bruce, M.**, (2018) Disease Phenotyping: Determining the reaction of wheat lines to Important Diseases, Kansas Wheat Commission, \$32,000.00.

Rupp, J. L., **Bruce, M.**, (2018) Potato virus Y phenotyping studies and continued precision genome editing in potato, Montana Department of Agriculture, \$32,628.00

Rupp, J.L., **Bruce, M.**, Smith, V., and Kephart, K., (2017) Western Sugar Variety Trials for Rhizoctonia Crown and Root Rot: Evaluation using multispectral imaging, \$7,500.00.

Rupp, J.L., **Bruce, M.** Western Sugar, Precision Genome Editing in Sugarbeet using CRISPR/Cas9, \$8,500

Rupp, J.L., **Bruce, M.**, Beet Sugar Development Foundation, Precision Genome Editing in Sugarbeet using CRISPR/Cas9, \$9,500

Rupp, J.L., **Bruce, M.**, Kephart, K., and Western Sugar, Strategies for the control of *Rhizoctonia* Crown and Root Rot in Montana, \$15,000.

Rupp, J.L., **Bruce, M.** USDA Specialty Crop Block Grant (Farm Bill), Early Detection of Economically Important Specialty Crop Pathogens by Multispectral Imaging, \$57,470.

### **Contract Research:**

Testing phosphite products for antifungal and disease suppression properties in wheat, 2019, Compass Minerals, \$14,040.00

Sugarbeet Storage Experiments, 2018, Syngenta, \$4,500

Sugarbeet Foliar Fungicide Trial, 2016, Nichino, \$4,500

Sugarbeet Storage Experiments, 2016, Syngenta, \$8,000

Sugarbeet Foliar Fungicide Trial, 2017, Syngenta, \$2,000

Pinto Bean Foliar Fungicide Trial, 2017, Dow AgroSciences, \$13,000

Sugarbeet Seed Treatment Trial, 2017, Valent, \$8,500.00

Sugarbeet Storage Experiments, 2017, Syngenta, \$8000.00

Elemental Enzymes Biocontrol Assays, 2017, Elemental Enzymes, \$11,000

Sugarbeet Storage Experiments, 2018, Syngenta, \$8000.00

### **Pending funding:**

Rupp, J.L., and Bruce, M., (2021) Development of Scab Resistant Wheat Cultivars for Kansas—Evaluating Advanced Kansas Breeding Lines for their reaction to fungicides, U.S. Wheat and Barley Scab Initiative, 05/22-05/26, \$279, 816.00.

### **Grants not funded:**

Toomajian, C., Rupp, J.L., Andersen Onofre, K., Leslie, J., Bruce, M., USDA NIFA, 12/1/21-11/20/24, Genetic mapping of traits related to Fusarium head blight in wheat using a diverse set of Fusarium graminearum isolates, \$749, 192.00

Rupp, J. and Bruce, M. (2020) Exploring conditional resistance and tolerance to *Wheat streak mosaic virus* in wheat. USDA-AFRI, \$495,936.

Rupp, J.L., and Bruce, M., (2019) Detecting the “undetectable”—Identifying viral pathogens in symptomatic pea not detected by traditional methods, US Dry Pea and Lentil Council, \$18,135.00

Rupp, J.L., Dratz, E., Bruce, M., Sands, D., Pilgeram, A., Zinego, E., and Carr, C., (2018) MARSGREENS: Microgreens Assessment for a Rapid, Safe, Great-tasting, Resilient, and Efficient Exploration Nutrition System, TRISH-BRASH, Phase 2, Rupp Lab allocation \$400,000.

Rupp, J.L., and Bruce, M., (2018) Integrated Management Strategies for the Control of Wheat streak mosaic virus in Wheat, North Central SARE, letter of intent submitted October 16, 2018. Not invited to proceed.

### **Professional society memberships:**

The American Phytopathological Society. 2018-present

North Central American Phytopathological Society. 2018-present

### **Service:**

KSU Plant Pathology Safety Committee, Manhattan, KS, 2020-present

KSU Plant Pathology Website and Media Outreach Committee, Manhattan, KS, 2019-2020.



Rocky Ford Plant Pathology Experiment Station Co-coordinator, Manhattan, KS, 2019-present.

Mentor to KSU Plant Pathology graduate students in the Applied Wheat Pathology lab, Manhattan, KS 2018-present.

Advisor to two Wamego Middle School students' Science Fair project, Wamego, KS 2018.

Invited speaker, UAVs in Agriculture. MSU Northern Area Research Center Field Days, Havre, MT 2017.

Outreach to 140 7<sup>th</sup> grade students – How can we use drones in agriculture? MSU Northern Area Research Center, Havre, MT 2017.

Mentor to MSU Department of Plant Science and Plant Pathology graduate students, Bozeman, MT, 2016-2018.

Contributor to MSU Department of Plant Science and Plant Pathology Graduate Student Journal Club, Bozeman, MT, 2016-2018.

Peer review for Functional and Integrative Genomics, New Phytologist, *In Vitro Cellular and Developmental Biology – Plant* (2019 – 2, 2020 -1), Genetics, The Plant Journal, *Plant Health Progress* (2019 – 1), *Crop Science* (2020 – 1).