

CURRICULUM VITAE

December 2020

I. PERSONAL INFORMATION

Name: Shuyu Liu
Rank: Associate Professor
Unit: Texas A&M AgriLife Research at Amarillo
Department: Soil and Crop Sciences
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II. EDUCATION

Ph.D., Plant Breeding and Genetics, University of Missouri-Columbia, Columbia, MO, USA.
12/2003.

Dissertation: *Genetic studies of Fusarium head blight resistance in the winter wheat cultivar Ernie*. Major Professor: Anne L. McKendry

M.S., Plant Breeding and Genetics, Colorado State University, Fort Collins, CO, USA.
8/1998.

Thesis: *Chromosome location of Russian wheat aphid resistance genes in wheat germplasms PI 372129, PI 243781, PI 220127*. Major Professor: James Quick

B.S., Crop Science, Shandong Agricultural University, Tai'an, Shandong, China. 7/1988.

Thesis: *Multi-crop management system with wheat and alfalfa*. Major professor: Yuhai Chen

M.S. Candidate, Bioinformatics, completed 21 credit courses, University of Missouri-Columbia, MO, USA. 12/2003.

III. PROFESSIONAL EXPERIENCE

Sep. 2016-Present, Associate Professor, Wheat Genetics and Genomics, TAMUS-Amarillo, 100% research full time, Project Leader

My genetic program has pursued experiments to address the following research objectives: **(1) understanding genetic mechanisms of improved tolerance to drought and other stresses in wheat cultivars; (2) identifying new sources of tolerance to various stresses and locating molecular markers tightly linked to the target genes/loci conditioning these tolerances; (3) developing genetic and genomic tools for marker-/genomic-assisted selection and breeding; and (4) accelerating the development of germplasm and cultivars with tolerance to multiple stresses using techniques such as the doubled-haploid pure line development pipeline that shortens timeline of cultivar release by three years**. Some of my research is conducted as part of a multidisciplinary team with wheat breeders, physiologists, geneticists, agronomists, plant pathologists, entomologists, and bioinformatic scientists.

Accomplishes: 1) Developed medium throughput Kompetitive allele specific PCR (KASP) markers for several major genes important for wheat production; 2) Understand the wheat core parents through bi-parental mapping and association analyses by dissecting G × E; 3)

Integrated wheat doubled haploid development of pure lines by shortening 3-4 years and genomic prediction into breeding practice, >3,000 DH lines were developed in three years for the two Texas breeding programs; 4) Train next generation plant breeders, Chair/co-chair 6 Ph.D. and 3 MS, committee members in 4 Ph.D. and 7 MS; 4) Apply marker-/genomic-assisted selection to increase selection efficiencies and accuracies; 5) Transfer new sources of resistance to pest into adapted cultivar TAM 114; 6) Work on two USDA-NIFA federal projects as PD and Co-PD (WheatCAP), leading PI on BASF sponsored collaborative projects, Monsanto Beachell-Borlaug International Scholarship, and Texas Wheat Producers Board and TAMUS support with total funding of \$14M, of which \$2.03 M to my wheat genetic program; 7) Published 27 peer reviewed articles and participated the release of 2 wheat cultivars; 8) Applied equipment funding from Multi-state Hatch project to renovate the molecular lab for high throughput genotyping using KASP.

Skills: 1) Using various software to analyze mapping and association panel data to identify significant marker-trait associations as well as genomic prediction and selection then apply in wheat breeding practice; 2) Established medium throughput development of doubled haploid wheat lines and integrate it into breeding process; 3) Soft skills to manage employees and communication with supervisors and collaborators to make all the projects well accomplished.

Aug. 2010-Aug. 2016, Assistant Professor, Small Grain Genetics and Genomics, TAMUS-Amarillo, 79106. 100% research full time, Project Leader

Accomplishes: 1) Trained next generation plant breeders, Chair/co-chair 3 Ph.D. and 1MS, committee members in 6 Ph.D. and 6 MS; 2) Developed a new protocol to screen wheat curl mite resistance that have been widely use by US and other researchers, mapped the TAM 112 wheat curl mite resistance and developed KASP markers for it and *Gb3*, *Gb7* and *H32*; 3) Work on a multi-Million project with Bayer CropScience (BASF now) combining genetics, genomics, bioinformatics and breeding to understand Texas wheat germplasm and synthetic derived wheat lines; 4) Leading PI on Monsanto Beachell-Borlaug International Scholarship, USAID, and Texas Wheat Producers Board and TAMUS support with total funding of \$7.3M, of which \$1.02 M to my wheat genetic program; 7) Published 24 peer reviewed articles and participated the release of 2 wheat cultivars.

Dec. 2012-Present, Adjunct Professor, Dept. of Agricultural Sciences, West Texas A&M University, Canyon, TX 79016.

Train and supervise graduate and undergraduate students on research projects and theses, give guest lectures in plant breeding and genetics, and Biology. Co-chair two and committee in one MS students and supervised 12 student workers.

Aug. 2007-Jul. 2010, Research Scientist, Small Grain Breeding and Genomics, Department of Crop and Soil Environmental Sciences, Virginia Tech, Blacksburg, VA, 24060, USA. 100% research full time, Co-PI

Accomplishes: 1) Understood how the plant height and awn were associated with FHB resistance in native sources Massey, Ernie, and VA00W38; 2) Helped the breeders to select and release FHB moderate resistance cultivars; 3) Worked on funded FHB projects from USDA-National Wheat Scab Initiative and Virginia Small Grain Board and University as PI/Co-PI for a total of US\$558,874; 4) Published 7 peer reviewed articles in the FHB resistant QTL with a meta-analyses QTL paper cited 205 so far; 5) Participated the release of 10 wheat cultivars (7 soft red, two hard red, and one durum), two wheat germplasm lines, two barley cultivars, and two wheat mapping populations; 6) Supervised 7 graduate/undergraduate student workers. Trained them for the lab techniques, like DNA extraction, PCR, gene/QTL linkage and association analyses etc.

Skills: 1) Point inoculation in greenhouse and field spray inoculation of Fusarium spores and spread infected corn seeds into the field nursery to obtain reliable incidence, severity, damaged kernel and toxin evaluation to differentiate the resistant wheat lines; 2) Mapped FHB resistant QTL in native sources of resistance.

Jan.-Aug. 2007, Biologist; Jan. 2004-Dec. 2006, Visiting Fellow, Greenhouse Processing Crops Research Center, Agriculture and Agri-Food Canada (AAFC), Harrow, N0R, 1G0, ON, Canada, 100% research full time, major investigator

Accomplishes: 1) Developed germplasm lines with multiple disease resistances and released one bean germplasm line HR67; 2) Published 5 peer reviewed articles on marker development and major loci cloning for common bacterial blight resistance; 3) Completed research projects funded by Agriculture Agri-Food Canada and Ontario bean Producer Board for a total of CA\$786,000 as a major investigator.

Skills: 1) Worked with Bacterial artificial chromosome (BAC) library from a resistant cultivar to clone a major QTL for common bacterial blight resistance; 2) Ran 2-D gel to separate the enzyme digested BAC clones to build BAC contig for the major QTL for CBB.

Aug. 1998-Dec. 2003, PhD Research Assistant, Plant Science Unit, University of Missouri-Columbia, Columbia, 65211, MO. USA. Half time research, Team Member

Accomplishments: 1) Got Ph.D. degree in Plant breeding and genetics and finished all MS courses for Computer science; 2) Understood the native resistance for Fungal FHB in wheat; mapped loci for FHB incidence, severity, damaged kernel and toxin in a popular soft winter wheat Ernie, named after Dr. Ernie Sears, a cytogeneticist of USDA-ARS at Columbia, MO; 3) Published three peer reviewed articles for FHB resistance with google citation of 184.

Skills: 1) Point inoculation of FHB spores on heads in the greenhouse using pipet for severity of FHB spread rating; 2) learned computer skills to set up analyses software in Linux, Windows etc; 3) QTL analyses using QTL Cartographer etc.

Sep. 1996-Aug. 1998. Visiting Scholar and Research Assistant, Soil and Crop Science, Colorado State University, Fort Collins, 80523, CO, USA, Half time research, Team Member

Accomplishments: 1) Used Gamma ray irradiation to induce favorable mutation for RWA resistance; 2) Used monosomics to locate RWA resistance in three alien lines; 3) Finished 22 credits of courses in one year and obtained MS degree; 4) Published one paper for new RWA resistance.

Skills: 1) Using gamma ray irradiation to induce favorable mutants and stabilize the RWA resistance faster; Infested RWA and rated for wheat lines resistance.

July 1988-Sep. 1996, Wheat breeder, Shandong Academy of Agricultural Sciences, Jinan, 250100, Shandong, China. 100% research, full time, Team Member

Accomplishments: 1) Selected superior lines based on pedigree and single plant selection for higher yield, resistance to powdery mildew; 2) Released a new cultivar “Lumai 20” from Gamma ray irradiation; 3) Finished MS courses in Plant Genetics at Shandong University; 4) Selected to be trained aboard based on my research merits; 5) Promoted from Research Assistant faculty to Research Associate Faculty; Published 12 peer reviewed articles in Chinese journals.

Skills: 1) Mutant breeding induced favorable mutants; 2) Field selection of plants with superior yield and disease resistance.

IV. INTELLECTUAL PROPERTIES (17 cultivars, 3 germplasm lines and 2 populations)

- 1) **Cultivar or Germplasm Released in TAMU (4):**
 - a. **TAM 115 (TX12A001295) and TAM 205 (TX12V7415) Winter Wheat Cultivars-2019.**
 - b. **TAM 114 (TX07A001505) and TAM 204 (TX06V7266) Winter Wheat Cultivars-2014. Widely planted in the US High Plains.**
- 2) Wheat and Barley releases in Virginia Polytechnic and State University: 7 soft red, 2 hard red, and 1 durum winter wheat cultivar, 2 germplasm lines, and 2 mapping populations.
- 3) Bean release in Agriculture Agri-Food Canada: 1 dry bean germplasm.

V. AWARDS AND HONORS

1. Awards to Shuyu Liu

- 1) **2019 Vice Chancellor Award in Excellence for Team Collaboration in Wheat Genomics.** I am the major bridge faculty linking the genomic and bioinformatic applications in wheat breeding. There was only one team award, and my multi-disciplinary team received it by conducting excellent research at TAMUS.
- 2) **2019 Research Faculty Award in Soil and Crop Science Dept., Texas A&M University.** Integrated wheat doubled haploid (DH) developing pipeline and genomic prediction in breeding. The DH technique shortens pure germplasm line development by 3 years compared with conventional breeding methodology. Only award to faculty who has conducted excellent research in the last three years.

- 3) **2015 TAMU College of Agriculture and Life Science Dean's Outstanding Research Achievement Award for Interdisciplinary Research Team, Wheat Improvement Team.** Successfully conducted a public-private collaborative project with more than \$7.7 M wheat breeding and genetic research.
 - 4) **Visiting Fellowship from Agriculture and Agri-Food Canada awarded by Natural Sciences and Engineering Research Council of Canada** from 2004 to 2007.
 - 5) **Tak Tsuchiya Graduate Student Achievement Award from 1997 to 1998** at Colorado State University.
 - 6) **Visiting scholarship from Shandong Higher Education Committee in 1996-1997.**
 - 7) **Awarded 3rd progress prize by Evaluation Committee for Progress Prize of Science and Technology of Shandong Province** as one of the major researchers for "Development and release of late-sowed and super early-maturing wheat variety LuMai 20" in 1997.
 - 8) **Awarded the 3rd progress prize by the Chinese Ministry of Agriculture** for participation in the study "The Study of Comprehensive Technology and Application in Improving Crops through Irridiation" in 1992.
2. **Awards and recognitions of Liu supervised students and staff (31 since 2012; 15 since 2016)**
- 1) Ph.D. student Zhen Wang (2019-Present)
 - a. Excellent student award from **Association of Chinese Soil and Plant Scientist of North America**, Nov. 11, 2020.
 - 2) Ph.D. student Jorge L Valenzuela-Antelo (2017-Present)
 - a. was selected as a **student speaker award on the Texas Plant Breeding Symposium** at College Station, Texas on Feb 20, 2020.
 - b. Received **2nd student poster competition during Texas Plant Protection Association** during Dec 10-11, 2019, College Station TX.
 - c. Received **Research and Presentation Travel Award from Office of Graduate and Professional Studies** in 2019.
 - d. Joined the WheatCAP graduate student training workshops and symposium in Cornell University and San Diego Plant Breeding symposium.
 - 3) Ph.D. student, Smit Dhakal (2014-2018)
 - a. Received **Tom B. Slick Fellowship**, \$33,010. Jan. 2018-Dec. 2018
 - b. Received **First place poster award in Plant Breeding Symposium** at College Station, Feb 2015.
 - c. Received the **Excellence Fellowship from College of Agriculture and Life Science**, TAMU, 2014-2015.
 - d. Received **Texas A&M AgriLife Research Amarillo Fund for Excellence** for graduate student, 2012-2014.
 - 4) Ph.D. student, Yan Yang (2014-2018)
 - a. Received **Tom B. Slick Fellowship**, \$32,696. Sep. 2017-Aug. 2018.
 - b. Received **excellent Student Award from Association of Chinese Soil and Plant Scientists of North America**, Tampa, FL, Oct 23, 2017.
 - c. Received **3rd place in poster presentation in DuPond Pioneer Plant Breeding Symposium** on Feb. 15, 2017

- d. Received **Dudley Smith Travel Award from Dept of soil and crop science**, Texas A&M University. \$1,800. Travel to USDA-ARS at Manhattan, KS to learn genotyping-by-sequencing and data analyses. May 2015.
 - e. Participated **2015 Student Operation Connection for the 132nd Convention, American Seed Trade Association**, Washington, DC, June 17-20, 2015.
 - f. Received **Monsanto Beachell-Borlaug International Scholarship**. 2015-2017. \$99,368.
 - g. Received **student speaker award in Plant Breeding Symposium** at College Station sponsored by DuPond-Pioneer, Feb. 2015,
- 5) Ph. D. student, Silvano Ocheya Assanga (2012-2016)
 - a. Received **first place poster Award in DuPond Pioneer Plant Breeding Symposium** on Feb 18, 2016.
 - b. Received the **excellent graduate research award from the Dept. of Soil and Crop Sci.** in TAMUS in 2015.
 - c. Received student **speaker award on research in Plant Breeding Symposium** at College Station sponsored by DuPond-Pioneer, Feb. 2015.
 - d. Received the **outstanding graduate student award from Texas Plant Protection Association** in 2014.
 - e. Received **The Norman E. Borlaug Leadership Enhancement in Agriculture Program (LEAP) of the US government's Feed the Future Borlaug 21st Century Leadership Initiative by USAID**, Sep. 2014-Aug. 2015. \$19,512.
 - f. Received **International Travel Bursary award as an invited international participant on Tomorrow's Leaders Forum on Food, Feed, Fiber, and Fuel security as climate changes at the Agricultural Biosciences International Center**, Oct. 5-9, 2014, Saskatoon, SK, Canada.
 - g. Received **Borlaug Next Generation Delegate by Chicago Council**, May 2014.
 - h. Received **Monsanto Beachell-Borlaug International Scholarship**, 2013-2016. \$180,000.
 - 6) Scientist Chenggen Chu received the **Research Collaboration Award from Soil and Crop Science Dept**, Texas A&M University.
 - 7) Scientist Chenggen Chu received the **2019 Vice Chancellor Excellence Team Award in Wheat Genomics**.
 - 8) Research Assistant and undergraduate Jaqueline Avila Moore received the **Amarillo Center Excellence award** in 2019.
 - 9) Research Associate Lisa Garza got the 2017 Texas A&M AgriLife Research and Extension **Amarillo Center Team Build Award**, the most honorable award in the center.
 - 10) Ph. D. students, Silvano Assanga, Smit Dhakal, and Yan Yang got the **McFaddenn Conference Scholarship** to participate the Joint Edgar McFadden Symposium/ Hard Winter Wheat Workers Workshop. April 17-20, 2016. San Antonio, Texas.
 - 11) Research Scientist, Chor Tee Tan got the **Research Collaboration award from the Dept. of Soil and Crop Sci.** in TAMUS in 2015.
 - 12) Srirama Krishna Reddy, Assistant Research Scientist, **Research Collaboration Award from Soil and Crop Science**, TAMU, 2012.

VI. COMPUTER SKILLS

- 1) Set up and work with various software under Windows, Unix (linux), and MAC.
- 2) Genomic prediction of genome estimated breeding values using rrBLUP combining high throughput phenotyping data to select better germplasm.
- 3) Analyze genotype data from 90K SNP array using GenomeStudio and genotyping-by-sequencing as well as association analyses using STRUCTURE, TASSEL, GAPIT, BLINK etc.
- 4) Remove outliers for both phenotypic and genotypic genotyping-by-sequencing SNP data.
- 5) Construct genetic maps of important traits using JoinMap 4.0. Map QTL using QTL Cartographer 2.5 or MapQTL for traits from single environment, and QTLnetwork, GeneStat, and IciMapping for traits from multiple environments to analyze epistasis and QTL by environmental interactions.

VII. LABORATORY TECHNIC SKILLS

- 1) Optimize PCR conditions and analyze AFLP, SSR, STS, SCAR and KASP SNP markers.
- 2) Design primers to amplify specific target bands using Primer 3, GENERUNER 3.0, and PolyMarker.
- 3) Target band cloning and DNA sequencing. Compare sequences using BLAST, Vector NTI, or other software.
- 4) Screen positive clones using BAC pooling and PCR. Physical mapping of target QTL. Analyze restriction enzyme digestion patterns of BAC clones using Image 3.10b and assemble contigs using FPC 4.7.
- 5) Extract and purify RNA and study gene expression. Northern and Southern blot analyses of target band or cDNA clones.

VIII. Graduate Students Summary

Degree	Since 2016		Career	
	Chair/Co-chair	Member	Chair/Co-chair	Member
Ph.D.	6	4	6	7
Master of Science	3	7	4	8
Other students	2 International Ph.D. students conducted research in my laboratory			

I am in the graduate faculty committee in Soil and Crop Science and Molecular Environmental Plant Science in TAMU as well as Plant Soil and Environmental Science in WATMU since 2010: Chair/co-chair of committees for 6 PhD and 4 MS (6 PhD and 3 MS since 2016), committee members of additional 7 PhD and 8 MS since 2010. In addition, I have supervised full time employees including three scientists, two postdocs and four research Assistants/Associates, as well as 17 undergraduate part-time student workers.

All the three scientists received the most prestigious award from Soil and Crop Science-research collaboration award. My chaired Ph.D. students were awarded as student speakers or poster presenters at the TAMU Plant Breeding Symposiums seven times from 2015 to 2020. The number is far higher than the average for off campus AgriLife faculty. One student received the Excellent Graduate Student award from the Texas Plant Protection Association (TPPA) and SCSC department; two received the Tom B. Slick Fellowship from the College of Agriculture and Life Sciences; and two received the prestigious Monsanto Beachell-

Borlaug International Scholarships. One participated in the American Seed Trade Association student convention and another acted as the Borlaug Next Generation Delegate, received the Borlaug Leadership Enhancement in Agriculture Program support by USAID, and was invited to the International Forum for Tomorrow's Leaders on Food, Feed, Fiber and Fuel Security as Climate Change in Canada. Of my three chaired Ph.D. students, one is a corn breeder with Bayer CropSciences, one is a bioinformatic scientist at Stanford University, and one is a wheat research scientist in a private company. One co-chaired Ph. D. student graduated in 2020 and joined Bayer CropSciences as a breeder lead in Mexico.

3. Graduate students-Chair/Co-chair (Total-10; 9-since 2016: 6 Ph.D., 3M.S.)

Name	Degree	Univ.	Period	Current position
Mr. Kyle Parker	Ph.D.	TAMU	2020-present	Ph.D. student
Mr. Jorge Luis Valenzuela Antelo	Ph.D.	TAMU MEPS SCSC	2017-2020	Ph.D. student/ poster award of TPPA, PBS speaker award in 2020, graduate office travel award
Mr. Zhen Wang	Ph.D..	TAMU SCSC	2019-present	Ph.D. student/ Excellent student award from ACSPSNA
Mr. Mustafa Cerit	M.S.	TAMU SCSC	2019-present	M.S. student
Ms. Kaycee Sebastiani	M.S.	WTAM U	2019-present	M.S. student
Mr. Mehmet Dogan	M.S.	TAMU SCSC	2018-2020	Ag. Worker in Turkey
Mr. Smit Dhakal	Ph.D.	TAMU SCSC	2014-2018	Postdoc in U. of Illinois/ PBS 1st poster award, College Fellowship
Ms. Yan Yang	Ph.D.	TAMU SCSC	2014-2018	Scientist in Stanford U/ PBS speaker and poster award, MBBIS, SCSC travel award, America Seed Trade student convention, College fellowship
Mr. Silvano Assanga Ocheya	Ph.D.	TAMU SCSC	2012-2016	Corn breeder in Bayer/ Borlaug Next Generation Delegate, excellent student awards of SCSC and TPPA, MBBIS, BLEAP, PBS speaker and 1st poster, Travel Bursary for Rood Security Leader Forum in Canada.
Mr. Smit Dhakal	M.S.	WTAM U	2012-2014	Amarillo excellent graduate student

TAMU, Texas A&M University; WTAMU, West Texas A&M University; SCSC, Soil and Crop Science; TPPA, Texas Plant Protection Association; PBS, TAMU Plant Breeding Symposium sponsored by DuPont-Pioneer/Corteva; MBBIS, Monsanto Beachell-Borlaug International

Scholarship; BLEAP, The Norman E. Borlaug Leadership Enhancement in Agriculture Program by USAID; ACSPSNA, Association of Chinese Soil and Plant Scientists of North America.

4. Graduate students-Committee (Total-15; 12-since 2016: 5 Ph.D., 7 M.S.)

Name	Degree	Univ.	Period	Current position
Mr. ZeTian Fang	Ph.D.	TAMU MEPS	2019-present	Ph.D. student
Mr. Travis Meyer	M.S.	TAMU Distance	2019-present	MS student
Ms. Ellen Melson	M.S.	TAMU Distance	2020 Spring-present	MS student
Mr. Anil Adhikari	Ph.D.	TAMU SCSC	2016-2020	Postdoc in U. of Wisconsin.
Ms. Sara Ajayi	Ph.D.	TAMU	2014-2018	
Ms. Xiangkun Gu	Ph.D.	TAMU	2013-2017	Scientist
Ms. Yuanyuan Chen	Ph.D.	TAMU	2014-2016	Scientist
Mr. Bharath Reddy	Ph.D.	TAMU	2010-2015	Vegetable breeder
Ms. Padmarathi Sengodan	Ph.D.	TAMU	2010-2015	Scientist in Bayer CropSciences
Ms. Fatma Betul Sade	M.S.	TAMU	2017-2019	Ag. Worker in Turkey
Ms. Tessa Rose Ries	M.S.	TAMU	2014-2018	
Ms. Xi Chen	M.S.	TAMU	2012-2017	
Ms. Sabahat Zahra	M.S.	TAMU	2015-2017	Ag. Worker in Turkey
Mr. Brandon J. Gerrish	M.S.	TAMU	2014-2015	Postdoc
Mr. Mahendra Bhandari	M.S.	WTAMU	2014-2016	Postdoc

5. Other graduate students training in my laboratory (2)

Name	Degree	Period	University/activity
Mr. Xiaolong Yang	Ph.D.	2016-2017	HZAU, trained genetic research
Ms. Rabia Maswood	Ph.D.	2016-2017	HU, conducted Ph.D. research

HZAU, Huazhong Agricultural University, China; HU, Hazara University, Pakistan.

6. Postdocs and Scientists (Total -5; 4- since 2016)

Name	Period	Current position	Employer
Dr. Xiaoxiao Liu	2018- present	Postdoc	AgriLife Research
Dr. Chenggen Chu	2017-2020	Scientist	USDA-ARS, Fargo, ND/SCSC Collaboration award, Team award of Vice-Chancellor
Dr. Silvano Assanga Ocheya	2012-2016	Breeder	/Monsanto/Bayer CropSciences
Dr. Chor Tee Tan	2013-2017	Postdoc/Assist/As soc. Res. Scientist	Ag. Worker in Australia/ SCSC Collaboration award

Dr. Srirama Krishna Reddy	2011-2014	Scientist	SCSC Collaboration award
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7. Research Assistant/Associate, current student workers (8-career; 7-since last promotion)

Name	Period	Position & Affiliation
Jaqueline Avila	2016-present	Undergraduate student worker, Amarillo College/ Amarillo center excellent research award
Brittany M. Ehrlich	2019-present	Undergraduate student worker, WTAMU
Reagan Blair Heinrich	2020-present	Undergraduate student worker, WTAMU
Lyanna De Leon	2020-present	Undergraduate student worker, WTAMU
Ms. Kele Hui	2017-present	Research Assistant
Ms. Lisa Garza	2015-2018	Research Associate/ Center Team Builder Award in 2017
Ms. Hangjin Yu	2015-2017	Research Associate
Ms. Maria Pilar Fuentealba	2011-2015	Research Associate

8. Graduate and Undergraduate student workers supervised (Total-15, 7 since 2016):

WTAMU: Ms. Reagan Blair Heinrich (2020-present), Ms. Lyanna De Leon (2020-present), Ms. Brittany M. Ehrlich (2019-present), Ms. Kila Andrews (2017-2018), Ms. Theresa Albrecht (2015), Mr. Jay Martin (2012-2013), Ms. Serina Nelson (2011-2012), Mr. Benjamin Brooks (MS, 2011), Mr. Jared Suhr (2010-2011), Mr. Zac Badrow (MS, 2010-2011). Mr. Cameron Skees (2016), Mr. Julio Rocha (2016-2017); Amarillo College: Ms. Jaqueline Avila (2016-present), Mr. Cody Shachter (2011-2014); TTU: Ms. Ashley Holms (2014).

9. Chaired/Co-chaired graduates and their thesis titles

- 1) Kyle Parker, Ph.D., 2020-2014, **biparental, association mapping and genomic prediction to improve wheat.**
- 2) Zhen Wang, Ph.D. candidate, 2018-2022, **QTL mapping, association analyses, genomic-assisted breeding for improved yield, components, and end-use quality.**
- 3) Mustafa Cerit, M.S., 2018-2021. **Genetic mapping of loci for yield components.**
- 4) Kaycee Sebastiani, M.S., 2019-2020. **Allele differentiation for wheat curl mite resistance in wheat cultivar TAM 1112 and germplasm OK05312.**
- 5) Jorge Luis Valenzuela Antelo, Ph.D., 2017-2020, **Mapping of traits adaptive to the U.S. Southern and Central Great Plains in a TAM 204/Iba population and developing superior pre-harvest sprouting tolerant hard white winter wheat version of TAM 114 using CRISPR-Cas9 gene editing.**
- 6) Mehmet Dogan, M.S., 2018-2020, **QTL analysis of end-use quality in a mapping population from two Texas wheat.**
- 7) Smit Dhakal, Ph.D., 2014-2018, **Genetic dissection of grain yield, agronomic traits and end-use quality in Texas wheat using linkage and association study.**

- 8) Yan Yang, Ph.D., 2014-2018, **Characterization of yield and yield components using bi-parental and association mapping of Texas popular cultivars and synthetic wheat.**
- 9) Silvano Assanga Ocheya, Ph.D., 2012-2016, **Genetic mapping and phenotypic characterization of wheat for yield, yield components and agronomic traits.**
- 10) Smit Dhakal, M.S., 2012-2014, **Wheat curl mite resistance screening and mapping of resistance in wheat cultivar TAM 112.**

10. Committee graduate students and their thesis titles

- 1) ZeTan Fang, Ph.D., TAMU MEPS, Fall 2019-present.
- 2) Travis J. Meyer, MS, Plant breeding (PLBR), TAMU Soil and Crop Science (SCSC). Spring 2019-present. Hemp breeding
- 3) Sarah O. Olanrewaju, Ph.D., AGRO, SCSC, Spr 2014-Spr 2018. Development and Evaluation of Remote Sensing Techniques for Assessing Winter Wheat Growth and Yield.
- 4) Yuanyuan Chen, Ph.D. PLBR, MEPS. Sum 2013-Fall 2016. High-Density Linkage Map Construction, Mapping of Agronomic Traits in Tropical Maize (*Zea mays* L.) and Validating SNPs Controlling Maize Grain Yield and Plant Height in Southern Hybrid Testcrosses.
- 5) Xiangkun Gu, Ph.D., PLBR, MEPS, Sum 2013-Sum 2017. Dissection of the Genetic Basis Underlying Wax Biosynthesis in Hexaploid Wheat Using Bi-Parental Linkage Mapping and Genome-wide Association Study.
- 6) Fatma B. Sade, MS, PLBR, Spring 2017-Sum 2019. Genotype-By-Floral Characteristics Interaction for Hybrid Wheat (*Triticum aestivum* L.) Production in Texas.
- 7) Anil Adhikari, Ph.D. PLBR, SCSC, Sum 2016-Spr 2020. Development of Genetic and Genomic Resources for Hybrid Wheat (*Triticum aestivum* L.) Development in the US Great Plains.
- 8) Tessa R. Mahmoudi, MS, PLPA, Sum 2015-Fall 2017. Bacterially Mediated Water-Stress Tolerance in Wheat Conferred by Phenazine-Producing Rhizobacteria.
- 9) Sabahat Zahra, MS, PLBR, Spr 2015-Sum 2017. Characterization of a Wheat Mapping Population for Growth Pattern and Studying Staygreen Wheat Canopy Using Multispectral UAV Images.
- 10) Brandon J. Gerrish, MS, PLBR, Sum 2014-Fall 2015. Screening Texas A&M Germplasm and Environments for Hybrid Wheat Potential.
- 11) Xi Chen, MS, PLBR, Spr 2015-Spr 2018. No thesis option.
- 12) Mahendra Bhandari, M.S., Agronomy, PSES, WTAMU. 2014-2016. Use of infrared thermal imaging for estimating canopy temperature in wheat and maize.
- 13) Bharath Reddy, Ph.D., PLBR, SCSC, TAMU. 2010-2015. Enhancing yield potential of hard red winter wheat (*Triticum aestivum* L.) via use of improved synthetic backcrosses.
- 14) Padmarathi Sengodan, Ph.D., PLBR, SCSC, TAMU. 2010-2015. Influence of epicuticular wax on heat and drought tolerance in TAM 112 x TAM 111 populations.

11. Seminars, activities, and guest lectures to graduate/undergraduate students (10 TAMUS, 9 National, 4 International):

- 1) Workshop for graduates and postdocs on using META-R and IciMapping and the results interpretations for publications. SCSC Department, College Station, TX. Jan 8, 2020.

- 2) Guest lecture for Advanced Plant Breeding course PSS6322 for graduate students in Texas Tech University, Lubbock, TX. April 4, 2019.
- 3) Guest lecture for Biology students in BIOL4401 in West Texas A&M University, Canyon, TX. April 11, 2019.
- 4) Mentor of ASA-CSSA-SSSA golden opportunity scholar, Jason Wigen, a senior BS student in Agricultural Biotechnology from Washington State University, September 2019-August 2020.
- 5) Student poster judge at National Association of Plant Breeders at Pine Mountain, GA. August 25-30, 2019.
- 6) Student poster judge at 1st International Wheat Congress for the Expert works group on pathogen and insect resistance at Saskatoon, SK Canada, July 22-26, 2019.
(International)
- 7) Student poster judge for C-8 Plant Genetic Resources at International ASA-CSSA-SSSA Annual Meeting. Nov 10-13, 2019.
- 8) **Liu, S.-Y.** Texas Wheat breeding and genetic research. Invited seminar talk to MSU students, staff, and faculty in plant breeding and genetics, Montana State University, Bozeman, MT. July 16, 2019.
- 9) Workshop on linkage and association analyses using IciMapping, TASSEL and GAPIT in SCSC department with 25 onsite and 15 web meeting graduate students. College Station, TX. January 10, 2019.
- 10) **Liu, S.-Y.**, Tan, C.T., S. Assanga, S. Dhakal, Y. Yang, J.C. Rudd, Q. Xue, A. Ibrahim, R. Metz, S. wang, C.D. Johnson, G. Zhang, X. Xu, G. Bai, M. Chen, R. Devkota, H. Yu, L. Garza. 2018. Application of 90K Array and GBS SNPs in Wheat Genomic Breeding in the US High Plains. Presented in Crop Productions and Physiology Studies Session at **The 4th International Conference on Agricultural and Biological Sciences** in Hangzhou, Zhejiang, China, June 26-29, 2018. (Invited). Similar seminars were presented in **Shandong Academy of Agricultural sciences in Jinan and Shandong Agricultural University in Taian**, China in July 2018. **(International)**
- 11) Plant Breeding and Genetics Circle in SCSC Dept. Present oral “Application of array and GBS SNPs in Texas wheat genetics and breeding”. College Station, TX. Nov 17, 2017.
- 12) Texas A&M AgriLife Research Wheat Field Day. May 17, 2017. Bushland, TX. Presented research application of markers and genomics in wheat genetics and breeding.
- 13) Organized a workshop for “Association analyses of Genotypes and phenotypes using GAPIT and TASSEL 5.0” with Dr. Shichen Wang at the AgriLife Conference. More than 40 graduate students, postdocs, and faculty joined. Jan. 12, 2017.
- 14) Texas A&M AgriLife Mini-Symposium: Grand networks for Grand Challenges. Invited talk to insect transmitted viral diseases. College Station, Texas. May 18-19, 2016.
- 15) Poster and scholarship chair for graduate presentation in Joint Edgar McFadden Symposium/Hard Winter Wheat Workers Workshop. April 17-20, 2016. San Antonio, Texas.
- 16) **Liu, S.-Y.** 2015. Wheat genetic research in Texas High Plains. Scientific research seminar presented to more than 40 biology students at Amarillo College. Apr. 9. **(Invited)**
- 17) **Liu, S.-Y.** et al. 2015. KASP SNP markers development and application in marker-assisted breeding in wheat. **The 8th Annual World Congress of Industrial Biotechnology**. Apr. 25-28. Nanjing, China. **(Invited)**. Similar contents were presented in **Shandong Academy of Agricultural sciences in Jinan, Jiangsu Academy of**

Agricultural sciences and Nanjing Agricultural University in Nanjing during the China visit. (**International**)

- 18) Guest lecture for grad- and undergraduate students in Plant Breeding and Genetic class at Department of Agricultural sciences, WTAMU, Canyon, Texas (2010-2014)
- 19) **Liu, S.-Y.** 2014. Wheat genetic research on important traits in the High Plains. Soil and Crop Science departmental seminar, Oct. 8. College Station, TX.
- 20) **Liu, S.-Y.** 2014. Wheat Research for Important Traits in the U.S. High Plains. University of North Texas, Aug. 11. Denton, TX.
- 21) **Liu, S.-Y.** 2014. Software demo: JoinMap 4.0 for genetic map construction, MapQTL 6.0 for QTL mapping, QTLnetwork 4.0 for QTL by environment interaction analyses, TASSEL for association mapping. Aug 11, College Station, Soil and Crop Science Department.
- 22) **Liu, S.-Y.** 2013 Detection of epistasis and QTL by environmental interactions using QTLNetwork 2.0. Triticeae Coordinated Agricultural Project-webinar recorded. Plant Breeding Training Network. Sep. 25.
- 23) **Liu, S.-Y.** 2011. The U.S. wheat production and research progress. Presented at Shandong Agricultural University on Nov. 2, Taian, Shandong. And same topic presented at Shandong Academy of Agricultural Sciences on Nov. 4, Jinan, Shandong. (**International**)

IX. AFFILIATIONS (35)

1. Professional Society members (4)

- 1) Crop Science Society of America since 2003
- 2) American Society of Agronomy since 2009
- 3) National Association of Plant Breeders since 2019
- 4) International Wheat Initiative Expert Working Groups: Breeding methods and strategies, wheat phenotyping, control of pathogen and pest. Since 2014
- 5) Association of Chinese Soil and Plant Scientists of North America Since 2003

2. Leadership role and volunteer experience (16)

- 1) **Chair Elect/Chair/Past Chair of C-8 Plant Genetic Resources officers** of ASA-CSSA-SSSA (A-C-S), 1/1/2020-12/31/2022: *Organize the symposiums, invite speakers and arrange program plans in 2021 and help to organize in other years.*
- 2) **C - Ron Phillips Plant Genetics Lectureship** Committee member, 1/1/2020-12/31/2020.
- 3) **Member/Chair-Elect/Chair of C - Calvin Sperling Memorial Biodiversity Lectureship** Committee, 1/1/2020-12/31/2022. *Propose and invite speaker and arrange the lectureship.*
- 4) **ACS - Student Research Symposium Contest Committee** member, 1/1/2020-12/31/2020, Co-Chair 1/1/2021-12/31/2020.
- 5) **Member and Ex Officio of C - Frank N. Meyer Medal for Plant Genetic Resources Committee**, 1/1/2021-12/31/2021.
- 6) **C - Program Planning Committee Chair in Div. C-8**, 1/1/2021-12/31/2021.
- 7) **C - Nominations for President-Elect Committee Chair** in Div. C-8, 1/1/2021-12/31/2021.

- 8) **C - Div. C-8, Plant Genetic Resources Officers**-member, 1/1/2023-12/31/2023.
 - 9) **Mentor for Golden Opportunity Scholar**, ASA-CSSA-SSSA, 2019-2020.
Communicate with an undergraduate student, Jason Wigen, a senior BS student in Agricultural Biotechnology from Washington State University, September 2019-August 2020.
 - 10) **Secretary/president-elect/president -The Association of Chinese Soil & Plant Scientists in North America (ACSPSNA)**, 2015-2018: *Organize annual meeting of the association and chair the committees to award for excellent graduate, young scientists, and distinguished career. Share experience with young generation scientists. Invited ACS award winners to share their experiences in their careers.*
 - 11) **Joined Expert working groups in Wheat Initiative for breeding methods and strategies, wheat phenotyping, control of pathogen and pest** since Sep. of 2014.
 - 12) CSSA-C454: Young Scientist (Early Career) Award Committee (1/1/2014-12/31/2015)
 - 13) ASA-A45: Tengtou Ag Sci Award Committee member 1/1/2012-12/31/2013
 - 14) CSSA-C451: Crop Science Research Award Committee member, CSSA, 1/1/2009-12/31/2010.
 - 15) Graduate Faculty, Soil Crop Science and Molecular Environmental Plant Sciences of Texas A&M University and Plant Soil and Environmental Sciences of West Texas A&M University.
 - 16) Adjunct Professor, West Texas A&M University.
- 3. Editorial Board and Reviewer (15)**
- 1) **Associate Editor-Frontiers in Genetics-Plant Genomics**, 2020-present.
 - 2) **Guest editor of Frontiers in Plant Science for topic “Genomics-enabled Triticeae Improvement”, 2020-2021.**
 - 3) **ACS320: Book and Multimedia Publishing Committee, Chair** (1/1/2017-12/31/2019), member (1/1/2020-112/31/2022, 1/1/2013-12/31/2016): *Lead the > 10 committee members to provide scientific suggestions and comments on submitted book proposals from three societies.*
 - 4) **Associate Editor-Crop Science** (2017-2019), ASA-CSSA-SSSA. *Responsible for more than 10 manuscripts per year to assign reviewers, summarize suggestions and comments and make final recommendations.*
 - 5) ACS321: **Editorial Policy Coordination Committee**, Books Editor 1/1/2017-12/31/2019.
 - 6) **Editorial Board-The Crop Journal**, Since 2014, ScienceDirect Publisher. *Reviewed at least 3 manuscripts per year, assign reviewers, and provide suggestions and recommendations for publication. (International).*
 - 7) **C655.2: National Small Grain Variety Review Board**, Liaison (1/1/2016-12/31/2017) and Member (1/1/2014-12/31/2015): *Review the release proposals for 20-30 small grain varieties including wheat, sorghum, durum, barley, rye etc and provide suggestions and comments.*
 - 8) **NSF Reviewer 2020**: *Reviewed 25 proposals and provided suggestive positive comments.*

- 9) **Poster judge for graduate student posters in National Association of Plant Breeders**, GA August 2019. *Reviewed posters, talked to the students, and provided suggestions and scores to the committee to select winner.*
- 10) **Poster judge for student posters in the 1st International Wheat Congress**, Saskatoon, SK, Canada, July 2019. *Reviewed > 30 posters, talked to the students, and provided suggestions and scores to choose a winner. (International)*
- 11) **Program Chair of Crop Productions and Physiology Studies Session at The 4th International Conference on Agricultural and Biological Sciences** in Hangzhou, Zhejiang, China, June 26-29, 2018. *Preside the workshop and led the questions and discussion. (International)*
- 12) Reviewer-USDA-ARS external peer review; Proposal review for USDA-Ogallala Program.
- 13) Reviewer-University Hatch Project review.
- 14) **Project reviewer-National Natural Science Foundation of China, The United States-Israel Binational Agricultural Research and Development Fund (BARD)**. *Score and provided comments as required. (International)*
- 15) **Reviewer of Journal Articles (145):** Over 30 international journals for 13-29 reviews/year since 2014.

X. GRANTS AND CONTRACTS AWARDED

1. Grant Summary

I have written and assisted in the development of many successful proposals and contracts from various agencies and sources including Federal, state, commodity, TAMUS, International, and Industry in the research areas of my expertise. From 2011 to 2020, these proposals and contracts have garnered **\$21.21M (\$13.95M since 2016)**, of which **\$3.05M (\$2.03M since 2016)** went to my wheat genetic research program.

Fig. 1. Total Grants and Funding to LIU in Texas A&M AgriLife Research (2011-2021)

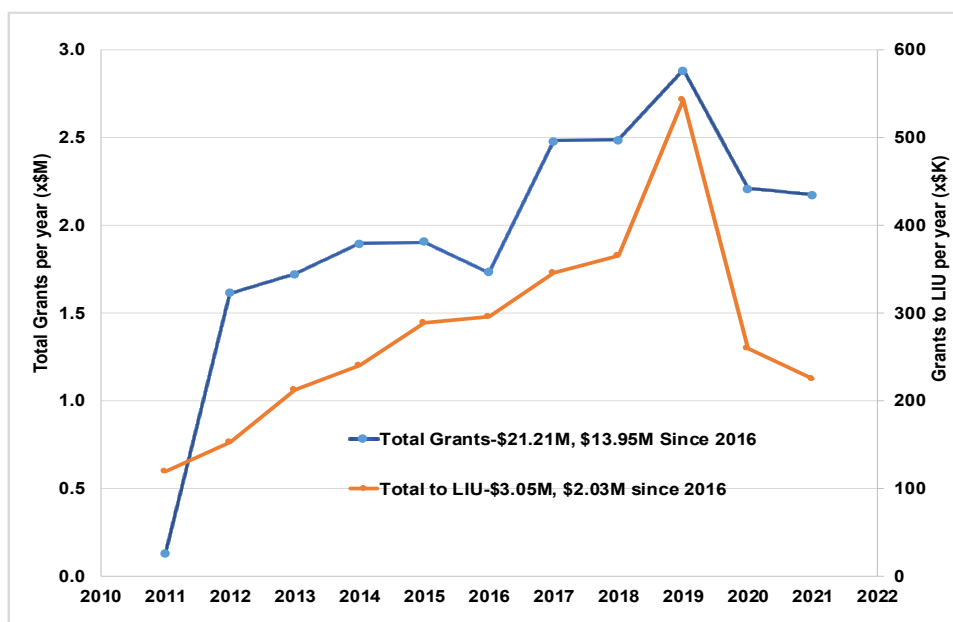


Fig. 2. Total Grants and Funding to LIU as Co-PI in Texas A&M AgriLife Research (2011-2021)

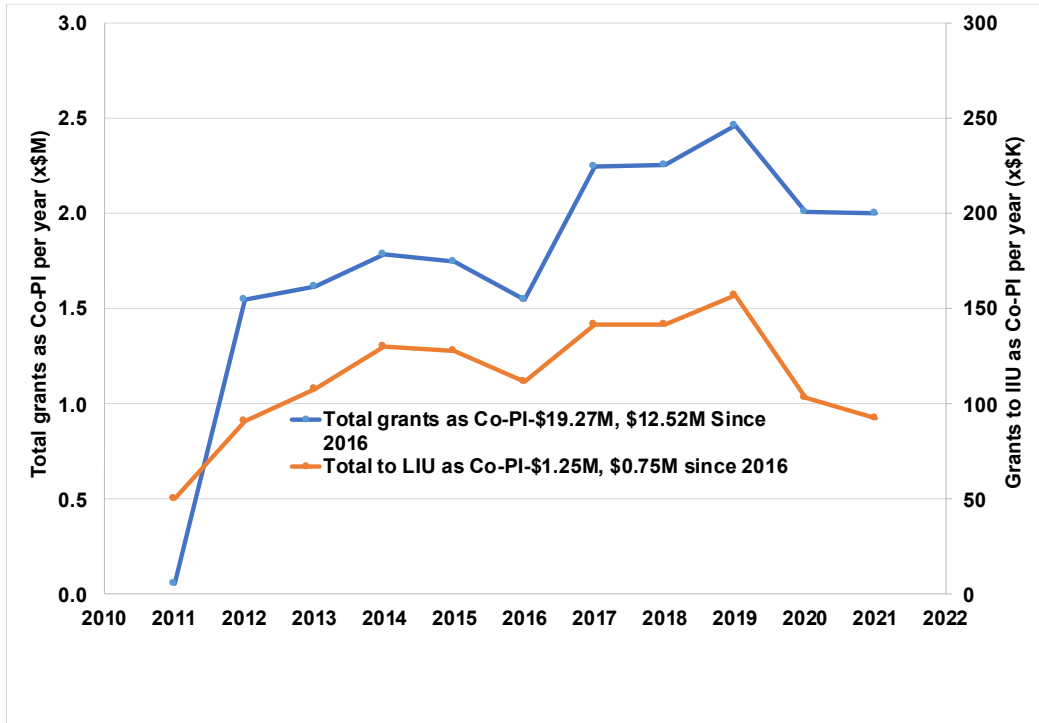


Fig. 3 Total Grants and Funding to LIU as PI in Texas A&M AgriLife Research (2011-2021)

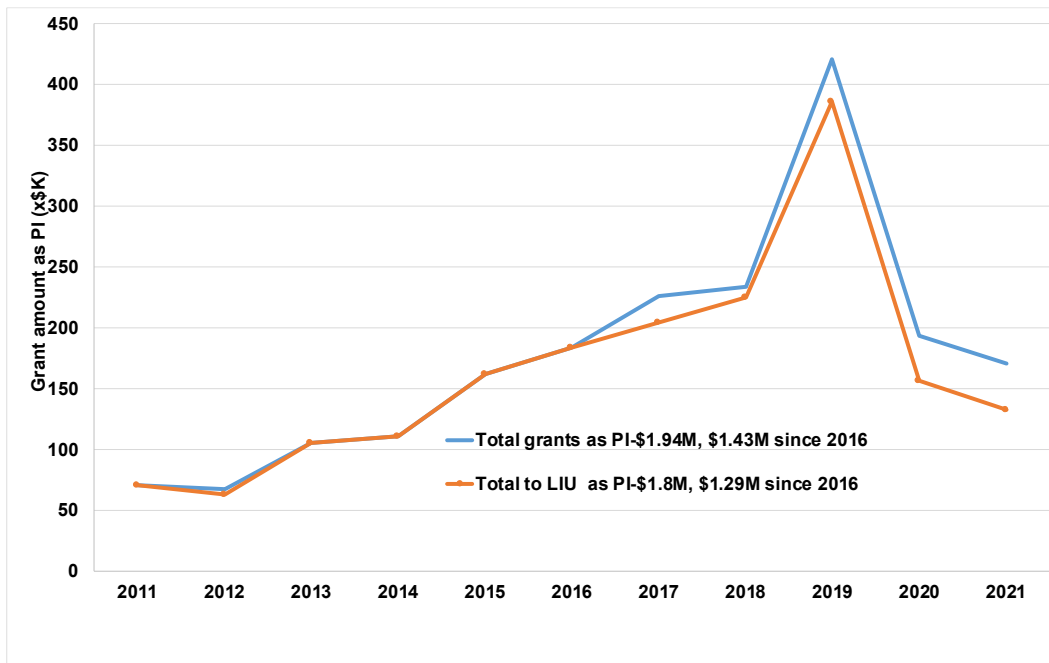
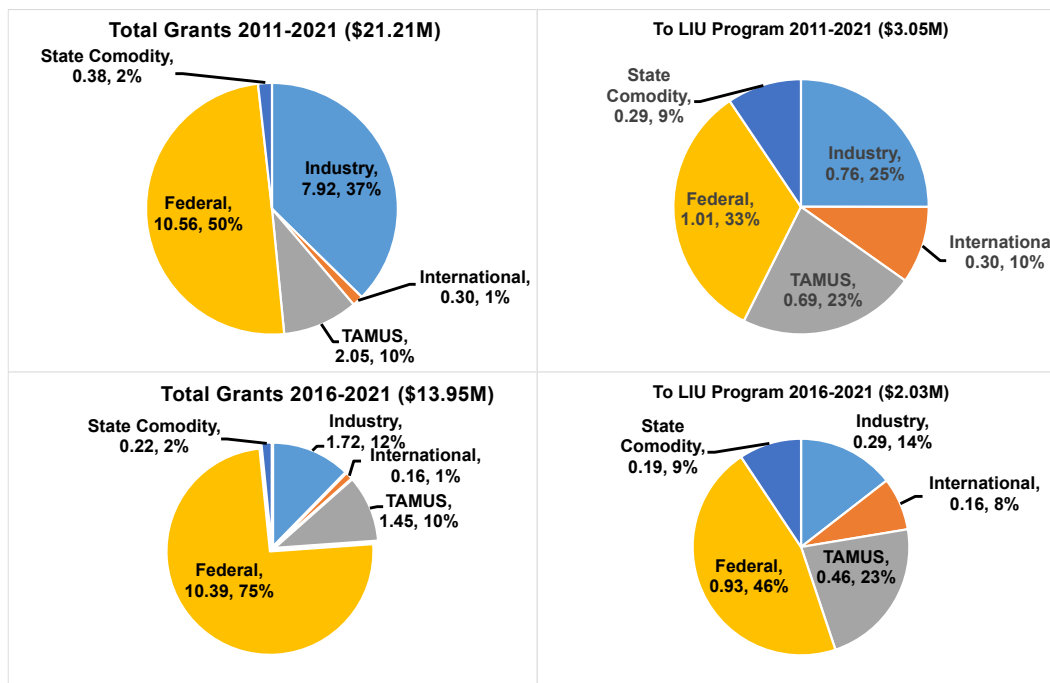


Fig. 4. Total Grants and To LIU Program Distribution Chart in 2011-2021 and 2016-2021**Summary Table of Grants and Contracts Received.**

Type and Role	Since Last Promotion (2016-2021)		Career in AgriLife (2011-2021)	
	Total to all PIs	To LIU Program	Total to all PIs	To LIU Program
	External Competitive			
PI	\$1,019,629	\$910,705	\$1,331,399	\$1,222,475
Co-PI	\$9,740,800	\$443,485	\$9,947,360	\$503,485
Total (PI + Co-PI)	\$10,760,429	\$1,354,190	\$11,278,759	\$1,725,960
Internal Competitive				
PI	\$403,287	\$372,751	\$606,348	\$571,031
Co-PI	\$1,245,331	\$193,250	\$1,645,331	\$226,250
Total (PI + Co-PI)	\$1,648,618	\$566,001	\$2,251,679	\$797,281
Contracts from Bayer & BASF				
PI	\$3,155	\$3,072	\$3,155	\$3,072
Co-PI	\$1,535,845	\$111,696	\$7,679,225	\$525,173
Total (PI + Co-PI)	\$1,539,000	\$114,768	\$7,682,380	\$528,245
Total	\$13,948,047	\$2,034,959	\$21,212,818	\$3,051,486

2. List of Funded Projects (Federal, Industry and Commodity) (2010-2021)

Research Projects (Total funded \$21.21M and \$3.05M to genetic program since 2011; total funded \$13.95M since 2016 with \$2.03M to genetic program)

1) Federal Competitive

- “CULTIVAR DEVELOPMENT: Accelerated introgression of synthetic hexaploid derived diversity into an applied hard winter wheat breeding program” funded by **USDA-NIFA Foundation**. **PD: Jackie Rudd**; Co-PD: Amir Ibrahim, Shuyu Liu, Qingwu Xue, Audrey Girard. 2021-2024. \$300,000. To my program: \$10,362.
- “Developing Hard Winter Wheat Germplasm with New Resistance to Multiple Arthropods Using Primary Synthetics and Exome Capture” funded by **USDA-NIFA Foundation 2019-67013-29172**. **PD: Shuyu Liu**; Co-PD: Jackie Rudd, Chenggen Chu, Amir Ibrahim, Qingwu Xue, Shichen Wang, Ada Szczepani, 2019-2022. \$500,000. To my program: \$368,072.
- “Validation, Characterization and Deployment of QTL for Grain Yield Components in Wheat” Coordinated Agricultural Project (WheatCAP), funded by **USDA-NIFA-IWYP 2017-67007-25939**. PD Jorge Dubcovsky. Total fund \$9.7 M. **Co-PD: Shuyu Liu**, subaward to TAMUS, \$432,685. 2016-2021. All to my program. Liu is Leading the TAMU effort on this subaward project. (with **International collaboration**).
- “Wheat Genetic and Genomic Equipment on High Throughput Genotyping” proposal funded by **Multi-State Hatch project** equipment funding \$98,855. **PI**. 2019-2020. All to my program.
- “Vector Biology Equipment Proposal Submitted by Vector Biology Research Team-Amarillo” funded by **Multi-State Hatch project** equipment funding \$97,831. **Co-PI**. 2019-2020. \$9,500 to my program.
- “Identification of Single Nucleotide Polymorphic Markers Linked to Drought Tolerance QTL in Texas Wheat and Introgression of the QTL into Spring Wheat adapted to Africa”. **The Norman E. Borlaug Leadership Enhancement in Agriculture Program (LEAP)** of the US government’s Feed the Future Borlaug 21st Century Leadership Initiative, **USAID**, For Ocheya’s thesis research, **PI**, \$19,512. Sep. 1, 2014-Aug. 31, 2015. All to my program.
- “Impact of Deficit Irrigation on Host Resistance, Disease Incidence and Water Use Efficiency of Wheat”. Charles M. Rush, S. O’Shaughnessy, **S.-Y. Liu**. **USDA-ARS Ogallala Aquifer Research Initiative**. **Collaborator**, US\$96,000. Sep. 2012-Aug. 2013, To my program.: \$10,000.
- “Identification of Molecular Markers Linked to Water Use Efficiency in A Drought Tolerant Wheat Cultivar”. **USDA-NIFA-CSREES funded Triticeae Coordinated Agricultural Project**, University of Minnesota. **PI**, US\$20,000. Jul. 2011-Jun. 2013. All to my program.

2) Industry (Competitive if not labelled as non-competitive)

- “2019 Greenhouse Trial Agreement (Curl Mite and Greenbug Insect Screening)” funded by **BASF Corporation**. 2019-2020. **PI**, \$3,155. To Liu program: \$3,072. (**non-competitive**)
- “Finishing What We Started; a Graduate Student Project” funded by **Bayer CropScience LP**, 2017-2019, **PI**, \$180,000. To reanalyze the data and identify target loci for yield and bread making quality that can be used for both TAMUS and Bayer. All to my program. (**non-competitive**)
- “Application of Next Generation Sequencing to Identify Expressed Genes for Drought Tolerance and to Develop New Germplasm Lines in Wheat”. **Liu, S.-Y.**, A.M. Ibrahim, J.C. Rudd, Q. Xue. **Monsanto Beachell-Borlaug International Scholarship Program** for Ph. D. Student, Yan Yang. **PI**, Total: \$99,368. 2015-2017. All to my program. **About 12 projects were funded internationally. Collaborated with wheat scientist in CIMMYT-China. (International competitive)**
- “Identification of SNP Markers for Drought Tolerance and Developing Drought Tolerant Spring Wheat Germplasm Using Marker-Assisted Breeding”. **Liu, S.-Y.**, A.M. Ibrahim, J.C. Rudd, Q. Xue, C. Johnson, P. Njau. **Monsanto Beachell-Borlaug International Scholarship Program** for Ph. D. Student, Silvano Assanga Ocheya. **PI**, Total: \$180,000. 2013-2016. All to my program. **About 11 projects were funded internationally. Collaborated with wheat scientist in CIMMYT-Kenya. (International competitive)**
- “An Accelerated Pipeline to Develop Superior Commodity and Identity Preserved Hard Winter Wheat Varieties. Bayer Crop Science” funded by **Bayer CropScience**. 2011-2016. Rudd, J. C., A. Ibrahim, D. R. Hays, J. Awika, R. W. Duncan, Q. Xue, **S.-Y. Liu** and C.D. Johnson. **Co-PI**. Total \$7,679,233. To my Program: \$524,137. (**non-competitive**)
- 3) **Commodity Competitive**
- “Molecular Marker Identification, Validation, and Application in Genomic-Assisted Breeding to Improve Multiple Stress Tolerances in Texas Wheat” funded by **Texas Wheat Producer Board and Association, PI**, \$25,000. 2020-2021. All to my program.
- “Using Doubled Haploid to Accelerate Developing New Germplasm Lines with Increased Genetic Diversity for Wheat Improvement” Funded by **Texas Wheat Producer Board and Association, Co-PI**, \$10,000. 2020-2021. All to my program.
- “A rapid, reliable and cost-efficient method to phenotype wheat for plant-beneficial interactions with plant-associated microorganisms” funded by **Texas Wheat Producer Board and Association**, \$32,000. 2020-2021. **Collaborator**.
- “Molecular Marker Identification, Validation, and Application in Marker-Assisted Breeding to Improve Multiple Stress Tolerances in Texas Wheat” funded by **Texas Wheat Producer Board and Association, PI**, \$24,750. 2019-2020. All to my program.
- “Using Doubled Haploid (DH) Technique to Accelerate Developing Breeding Lines with High Grain Yield and Excellent Quality” funded by **Texas Wheat Producer Board and Association, Co-PI**, \$10,800. 2019-2020. All to my program.

- “Developing Superior Pre-harvest Sprouting Tolerant Hard White Winter Wheat Using CRISPR-Cas9 Gene Editing” funded by **Texas Wheat Producer Board and Association, Co-PI**, \$12,000. 2017-2018. (PI, Michael Thomson)
- “Marker-assisted Pre-breeding to Improve Wheat Germplasm Lines with Multiple Stress Tolerances and Good End-use Quality in TX” funded by **Texas Wheat Producer Board and Association, PI**, US\$217,500. Sep. 2010-Aug. 2019. All to my program for average \$2-2.5K per year.
- 4) **TAMUS Competitive (if not labelled as non-competitive)**
- “Host/Pathogen/Vector Interactions, with Emphasis on Mite-Vectored Virus Diseases of Wheat and Zebra Chip of Potato” funded by Texas A&M AgriLife Research Insect Vector Diseases Grant Program. PI: Charlie Rush. **Co-PI: Shuyu Liu** and Jackie Rudd. \$187,500. 2018-2021. \$18,750 to my program.
- Tom B. Slick Fellowship** to Ph. D student Yan Yang. 2018-2019. College of Agriculture and Life Sciences. **PI**, \$32,696 to my program.
- Tom B. Slick Fellowship** to Ph. D student Smit Dhakal. 2018-2019. College of Agriculture and Life Sciences. **PI**, \$33,010 to my program.
- “Enhancing Bread-baking Quality of Wheat Carrying the 1BL.1RS Wheat-rye Translocation by Knocking Out the Secalin Protein” funded by Texas A&M AgriLife Research Genome Editing Seed Grant Program. **Co-PI**. \$30,000. 2018-2019.
- “Utilizing the T1AL·1RS Wheat-Rye Translocation in TAM 112 as A Delivery System For Introduced or Edited Genes” funded by Texas A&M AgriLife Research Genome Editing Seed Grant Program. **Co-PI**. \$30,000. 2018-2019.
- “Exploiting Wheat Relatives as a Source of Superior Traits to Improve Wheat Cultivars” by **Texas A&M AgriLife Research Crop Improvement Program**, 2017-2019. \$140,000. **PI: Shuyu Liu**, Co-PI: Jackie Rudd, Amir Ibrahim, Chenggen Chu, Shichen Wang, Qingwu Xue, Charlie Johnson. To my program: \$109,464.
- “Accelerated Cultivar Development in the TAM Wheat Breeding Program” by **Texas A&M AgriLife Research Director’s office**. \$900,000. **2016-2019. Co-PI**. To LIU program: \$165,000. (**non-competitive**)
- “Speed Wheat Breeding via a Doubled Haploid System and a High Throughput Sequencing Platform”. **Liu, S.-Y.**, J.C. Rudd, A. Ibrahim, C.-T., Tan, Q. Xue, D.B. Hays, J. Awika. **Texas A&M AgriLife Research Monocot Improvement Program. PI**. Total: \$80,000. 2015-2017. All to my program.
- “Texas A&M Genomics Seed Grant Program for Plant Water Use” funded by Texas A&M AgriLife Research. 2016. **PI**, \$9,998.40. All to my program.
- “Wheat Royalty Equipment Funding” from Texas A&M AgriLife Research. 2018. \$8,728, **PI**. All to my program.
- “Mapping QTL for Yield and Its Components in Hard Red Winter Wheat TAM 111”. **The Borlaug International Scholars programs** from College of Agriculture and Life Sciences, Texas A&M University System. **Liu, S.-Y.** and A. Ibrahim. **PI**, \$60,000. 2012-2015. All to my program.
- “Growth Chamber Equipment” by Texas A&M AgriLife Research and Texas Small Grain Advisory Committee Royalty Fund, \$30,000. **PI**. 2014-2015. All to my Program.

Excellence Scholarship from College of Agriculture and Life Science. \$13,533. (For Smit Dhakal scholarship and tuition). **Liu, S.-Y.** and A.M. Ibrahim. 2014-2015. **PI**.
“Freezer Equipment”. Texas A&M AgriLife Research and Texas Small Grain Advisory Committee Royalty Fund, \$12,028. \$7247 to my Program. **Liu, S.-Y.**, C. Rush. 2012-2013.
“Development of Wheat Germplasm Lines for Texas and High Plains”. **Texas A&M AgriLife Research, PI**, \$87,500. 2010-2013. All to my program. (**non-competitive**)
“Developing Winter Small Grain-Cool-Season Perennial Grass Forage Cropping Systems for Texas”. Rudd, J.C., D. Malinowski, C. Neely, A. Ibrahim, **S.-Y. Liu**, Q. Xue, D. Drake. 2013-2015. **Texas AgriLife Research Cropping System Program. Co-PI**, \$300,000. Funded. To my program: \$33,000. 2014-2015.
“Developing Hybrid Wheat for Texas and the Broader US Great Plains” funded by **Texas A&M AgriLife Research Monocot Program**. Ibrahim, A., J.C. Rudd, C. Johnson, **S.-Y. Liu**, D. Hays. 2013. US\$ \$80,000. **Co-PI**. 2014-2015.

5) **Other competitive grants and contracts before TAMUS**

“Improving FHB Resistance in SRW Wheat and Barley via Integrated Mapping, Phenotypic and MAS” Griffey C.A. and **S.-Y. Liu**. **USDA through US Wheat and Barley Scab initiative, Co-PI**. US\$515,374. May 2007-Apr. 2011.
“Accelerated Breeding for Scab Resistance in Soft Red Winter Wheat”. Griffey C.A. and **S.-Y. Liu**. **Virginia Small Grain Board, Co-PI**. US\$36,000. Jul. 2007-Jun. 2010.
“Mapping Fusarium Head Blight Resistance QTL in Virginia Wheat Variety Massey” and “Sequence Analyses of Fusarium Head Blight QTL from Different Resistant Sources”. Funded by **College of Agriculture and Life Science, Virginia Tech**, Mini-Teaching Grant to let undergraduate student join research. \$7,500. **PI**. Jan.-Jun. 2008.
“Marker-assisted Selection to Breed Multiple Resistant Variety in Common Bean” Funded by **Improving Farming System Practice Initiative for pesticide reduction strategy in Agriculture Agri-Food Canada**. Collaborated with AAFC Morden and Lethbridge Research Centers. CA\$200,000 per year for three years. **I am the major scientist who conducted this project**. Jan. 2004-Aug. 2007.
“Development of Bean Varieties for Disease Resistance Including CBB, Bean Mosaic Virus, Anthracnose, Root Rot and White Mold with Good Cooking Quality and High Yield”. Awarded by **Ontario White Bean Producers’ Marketing Board and Ontario Colored Bean Growers’ Association** with CA\$15,000 per year. **I am the major scientist who conducted this project**. Jan. 2004-Aug. 2007.
Visiting fellowship granted to Shuyu Liu by Canadian National Science and Engineer Resource Council. 2004-2007. CA\$141,000.

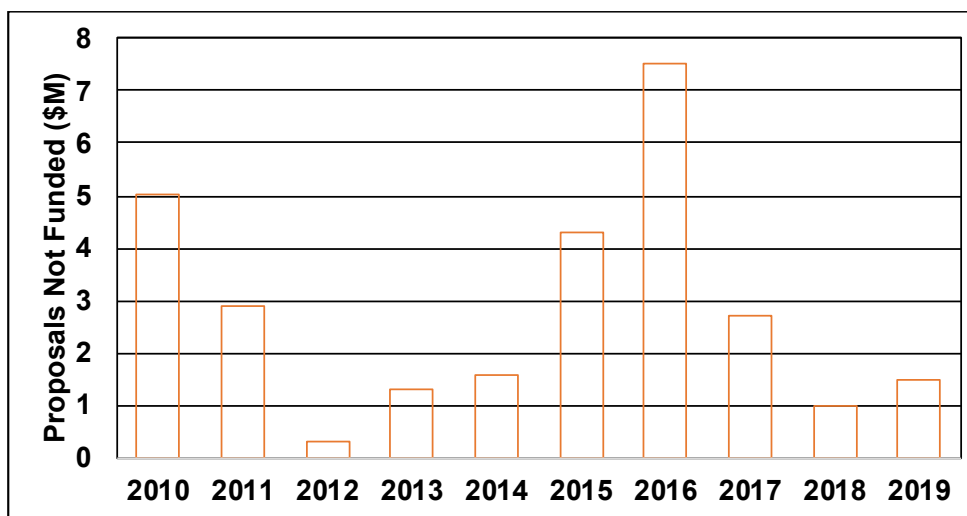
6) **Proposals submitted but not funded**

“Discovering the Amino Acid Transporters and Their Regulators Involved in Grain Filling of Wheat” submitted to **USDA-NIFA Foundation**, US\$500,000. **Co-PI**.
“Cheaper Roots for Bigger Shoots: Breeding Wheat for Reduced Metabolic Burden of the Root System” submitted to **USDA-NIFA Foundation**, US\$500,000. **Co-PI**.

“MRI: Acquisition of a MALDI-TOF-MS for Research/Education/Extension Service in Agriculture and Sciences” submitted to **National Science Foundation**, US\$264,678. **Co-PI.**

“Developing New Primary Triticale Lines with High Potential of Providing Healthy, Safe and Sustainable Food for Jersey Cattle” submitted to **American Jersey Cattle Club Research Foundation Fund**. US\$15,000. **Co-PI.**

7) **Proposals submitted but not funded**



XI. PUBLICATIONS AND PROFESSIONAL OUTPUTS (most recent - oldest)

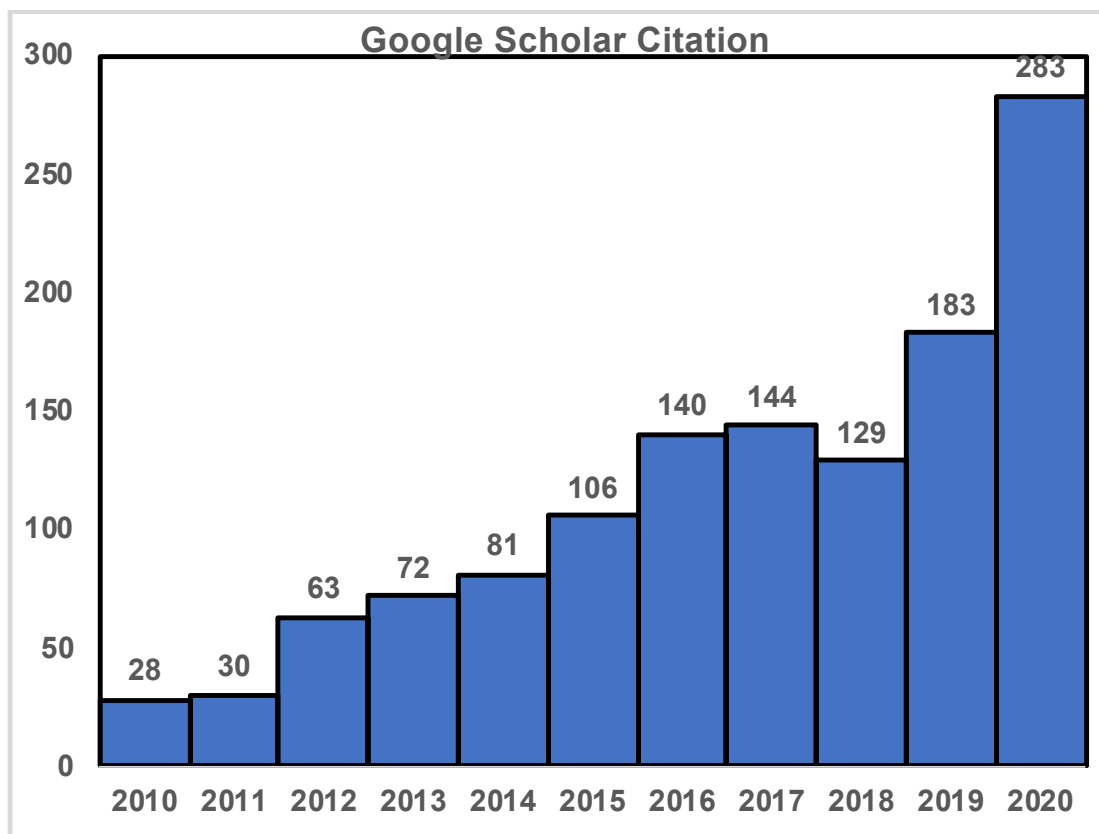
[In the following sections, underlined names are post-doctoral scientists, research staff under Liu’s supervision while chaired/co-chaired/mentored graduate students have underlined and italicized names; (*) indicates the research conducted at the Texas A&M AgriLife Research wheat genetic program at Amarillo and Liu was the corresponding author or supervisor; corresponding author design the experiment, supervise, collect and analyze data, interpret the results and prepare the manuscript with the first author to make it published; the orders as co-authors do represent the contribution on the research if not as the first/corresponding authors]

1. **Publications and Scholarly Work Summary**

	Last five years (2016-2020)	AgriLife Research (2010-2020)	Career
Peer-reviewed Journal	27	56	79
Oral presentations	54	84	95
Poster presentations	43	96	132
Popular Press	14	43	47

Book Chapters	1	1	3
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2. **Refereed Journal Articles (79-career, google citation 1349, h-index 21, i-10 index 35; 56-since joined AgriLife Research; 27-since 2016; google citation since 2015 is 994, h-index 17, i-10 index 32 by Dec. 23, 2020)**



- 1) Yang, Y., S. Dhakal, C. Chu, S. Wang, Q. Xue, J.C. Rudd, A.M.H. Ibrahim, K. Jessup, J. Baker, M.P. Fuentealba, R. Devkota, S. Baker, C.D. Johnson, R. Metz, S.-Y. Liu*. 2020. Genome wide identification of QTL associated with yield and yield components in two popular wheat cultivars TAM 111 and TAM 112, **PLOS ONE** 15(12) e0237293. (Cited 1 time, IF: **2.74**)
- 2) Dhakal, S., X. Liu, A. Girard, C. Chu, Y. Yang, S. Wang, Q. Xue, J.C. Rudd, A.M.H. Ibrahim, J.M. Awika, K.E. Jessup, J.A. Baker, L. Garza, R.N. Devkota, S. Baker, C.D. Johnson, R.P. Metz, S.-Y. Liu*. 2020. Genetic dissection of end-use quality traits in two widely-adapted wheat cultivars ‘TAM 111’ and ‘TAM 112’. **Crop Sci.**
- 3) Maulana, F., K-S. Kim, J.D. Anderson, M.E. Sorrells, T.J. Butler, **S.-Y. Liu**, P.S. Baenziger, P.F. Byrne, and X-F. Ma. 2020. Genomic Selection of Forage Agronomic Traits in Winter Wheat. **Crop Science.**
- 4) Thapa, S., Q. Xue, K. E. Jessup, J. C. Rudd, **S.-Y. Liu**, R. N. Devkota, and J. A. Baker. 2020. Soil water extraction and use by winter wheat cultivars under limited irrigation in a semi-arid environment. *J. Arid Environ.* 174, 104046. (cited 4 times, IF: **1.825**) (data analyses and interpretation)

- 5) Seethepalli, A., H. Guo, X. Liu, M. Griffiths, H. Almtarfi, Z. Li, **S.-Y. Liu** et al. 2020. RhizoVision Crown: An integrated hardware and software platform for root crown phenotyping. **Plant Phenomics** 2020: 15. Doi:10.34133/2020/3074916. (cited **5** times) (provide research materials, data analyses and interpretation, draft review and editing)
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- 3. Book Chapter** ((career-3; since joining AgriLife-1; since last promotion-1)
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- 4. Manuscripts in Review or Preparation (13, 5 submitted, 8 in preparation)**
- 1) Gill B.K., D.L. Klindworth, M.N. Rouse, J.Zhang, Q. Zhang, J.S. Sharma, C Chu, Y. Long, S. Chao, P.D. Olivera, T.L. Friesen, S. Zhong, Y. Jin, J.D. Faris, J.D. Fiedler, E.M. Elias, **S.-Y. Liu**, X. Cai, S.S. Xu, 2020. Function and evolution of allelic variation of *Sr13* conferring resistance to stem rust in tetraploid wheat (*Triticum turgidum* L.). Submitted to The Plant Journal.
 - 2) Gaurav, K., S Arora, P Silva, J. Sánchez-Martín, R. Horsnell, ... **S.-Y. Liu (37)**, ... C. Uacy, M. Mascher, A.R. Bently, B. Keller, J. Poland, B.B.H Wulff. 2020. Evolution of the bread wheat D subgenome and enriching it with diversity from *Aegilops tauschii*. To be submitted to Nature Biotechnology.
 - 3) **Chu, C.**, S. Wang, J.C. Rudd, Q. Xue, A.M.H. Ibrahim, R. Metz, C.D. Johnson, and **S.-Y. Liu***. 2020. RNA-seq analysis reveals different drought tolerance mechanisms in broadly adapted wheat cultivars ‘TAM 111’ and ‘TAM 112’. Nature Scientific Reports. Under revision.
 - 4) Zhao L., **S.-Y. Liu**, N.R. Abdelsalam, B.F. Carver, G. Bai. 2020. Characterization of wheat curl mite resistance gene Cmc4 in OK05312. Submitted to TAG.
 - 5) Abrouk M., N. Athiyannan, T. Müller, Y. Pailles, C. Stritt, A.C. Roulin, C. Chu, **S.-Y. Liu**, L. Adhikari, S. Wu, J. Raupp, H. Handa, T. Morita, J. Poland, B. Keller, S.G. Krattinger.

2020. Extensive haplotype and copy number variation at the red glume *Rgl* locus in wheat. Submitted.
- 6) Yang Y., S. Dhakal, C. Chu, S. Wang, Q. Xue, J. C. Rudd, A.M.H. Ibrahim, J. Baker, K. Jessup, L. Garza, R. Devkota, S. Baker, G. Opena, C. Johnson, R. Metz, and S.-Y. Liu*. 2020. Utilization of wheat primary synthetics in Association analyses and genomic prediction to improve wheat yield and end-use quality. In preparation.
 - 7) Assanga, S.O., M.P. Fuentealba, S. Vader, J. Awika, A. Ibrahim, J.C. Rudd, Q. Xue, G. Zhang, C.-T. Tan, J. Baker, K. Jessup, H. Yu, L. Garza, and S.-Y. Liu*. Genetic mapping of end-use quality quantitative trait loci in hard red winter wheat. In preparation.
 - 8) Dogan, M., J.L. Valenzuela-Antelo, S. Dhakal, A. Girard, C. Chu, X. Liu, J.A. Avila, B.M. Ehrlich, K. Hui, P.S Amand, G. Bai, S.Wang, J. Baker, S. Baker, R. Devkota, G. Opena, B. Simoneaux, Q. Xue, A.M.H. Ibrahim, J.C. Rudd and S.-Y. Liu*. 2020. QTL analysis of end-use quality in a mapping population from two Texas wheat. In preparation.
 - 9) Liu X., C. Chu, J.L. Valenzuela-Antelo, M. Dogan, J.A. Avila, B.M. Ehrlich, K. Hui, J.A. Baker, S. Baker, R.N. Devkota, J.C. Rudd, A.M.H. Ibrahim and S.-Y. Liu*. 2020. Mapping quantitative trait loci for seed traits in a winter wheat population. In preparation.
 - 10) Valenzuela-Antelo, J.L., C. Chu, X. Liu, M. Dogan, J.A. Avila, B.M. Ehrlich, K. Hui, S. Wang, R. Metz, C. Johnson, J. Baker, S. Baker, R. Devkota, G. Opena, B. Simoneaux, Q. Xue, A.M.H. Ibrahim, J.C. Rudd and S.-Y. Liu*. 2020. Mapping traits adaptive to the U.S. Southern and Central Great Plains in a 'TAM204'/Iba' population. In preparation.
 - 11) Cerit, M., Z. Wang, J.L., Valenzuela-Antelo, M. Dogan, C. Chu, X. Liu, J.A. Avila, B.M. Ehrlich, K. Hui, S. Wang, R. Metz, C. Johnson, J. Baker, S. Baker, R. Devkota, G. Opena, B. Simoneaux, Q. Xue, A.M.H. Ibrahim, J.C. Rudd and S.-Y. Liu*. 2020. QTL for yield and yield components in Texas and Oklahoma wheat using TAM 113/Gallagher. In preparation.
 - 12) Wang, Z., M. Cerit, J.L., Valenzuela-Antelo, M. Dogan, C. Chu, X. Liu, J.A. Avila, B.M. Ehrlich, K. Hui, S. Wang, R. Metz, C. Johnson, J. Baker, S. Baker, R. Devkota, G. Opena, B. Simoneaux, Q. Xue, A.M.H. Ibrahim, J.C. Rudd and S.-Y. Liu*. 2020. QTL for yield and yield components in Texas and Oklahoma wheat using TAM 112/Duster. In preparation.

5. Presentations:

a) **Oral: 97-career; 86-since joined AgriLife Research; 56-since last promotion, 33 of 56 from Liu program**

	Oral and poster presentations since 2016		
Type	Invited oral	Oral + poster	Total
International	4	21+29	54
National	6	0+16	22
State and Regional	3	22+0	25
Total	13	88	101

International (25 since 2016, 4 invited)

- 1) **Liu, S.-Y.**, S. Dhakal, Y. Yang, X. Liu, C. Chu, J.A. Avila, K. Hui, Q. Xue, J.C. Rudd, A. Ibrahim, S. Wang, R. Metz, C. Johnson, K. Jessup, J. Baker, R. Devkota, S. Baker. 2020. Identify favorable alleles from Texas popular cultivars and synthetic wheat using bi-parental and association analyses. **ASA-CSSA-SSSA International Annual Meeting**. Nov 8-11, Pheonix, AZ.
- 2) Cerit, M., Z. Wang, J.L. Valenzuela-Antelo, M. Dogan, C. Chu, X. Liu, J.A. Avila, B.M. Ehrlich, K. Hui, S. Wang, R. Metz, C. Johnson, J. Baker, S. Baker, R. Devkota, G. Opena, B. Simoneaux, Q. Xue, A.M.H. Ibrahim, J.C. Rudd and **S.-Y. Liu***. 2020. QTL mapping for Hessian fly resistance and yield component in hexaploid wheat. **ASA-CSSA-SSSA International Annual Meeting**. Nov 8-11, Pheonix, AZ. Also presented in the Texas Plant Protection Association oral and poster on Dec 8-10, 2020.
- 3) Wang, Z., M. Cerit, J.L. Valenzuela-Antelo, M. Dogan, C. Chu, X. Liu, J.A. Avila, B.M. Ehrlich, K. Hui, S. Wang, R. Metz, C. Johnson, J. Baker, S. Baker, R. Devkota, G. Opena, B. Simoneaux, Q. Xue, A.M.H. Ibrahim, J.C. Rudd and **S.-Y. Liu***. 2020. QTL for yield and yield components in Texas and Oklahoma wheat using TAM 112/Duster. **ASA-CSSA-SSSA International Annual Meeting**. Nov 8-11, Pheonix, AZ. Also presented in the Genome Editing Symposium organized by Soil and Crop Science graduates on Oct 22, 2020.
- 4) Xue, Q., S. Thapa, K. Jessup, **S.-Y. Liu**, J.C. Rudd, J.M. Bell, S. Baker, J.A. Baker and R.N. Devkota. 2020. Genetic improvement contributed to increased yield and water use efficiency in wheat under water-limited conditions - a long-term study. **ASA-CSSA-SSSA International Annual Meeting**. Nov 8-11, Pheonix, AZ.
- 5) Dogan, M., J.L. Valenzuela-Antelo, S. Dhakal, A. Girard, C. Chu, X. Liu, J.A. Avila, B.M. Ehrlich, K. Hui, P.S Amand, G. Bai, S.Wang, J. Baker, S. Baker, R. Devkota, G. Opena, B. Simoneaux, Q. Xue, A.M.H. Ibrahim, J.C. Rudd and **S.-Y. Liu***. 2019. QTL analysis of end-use quality in a mapping population from two Texas wheat. **ASA-CSSA-SSSA International Annual Meeting**. Nov 10-13., San Antonio, TX. Also presented in the Texas Small Grain Workers Meeting on August 28, 2019 in College Station Texas.
- 6) Liu X., C. Chu, J.L. Valenzuela-Antelo, M. Dogan, J.A. Avila, B.M. Ehrlich, K. Hui, J.A. Baker, S. Baker, R.N. Devkota, J.C. Rudd, A.M.H. Ibrahim and **S.-Y. Liu***. 2019. Mapping quantitative trait loci for seed traits in a winter wheat population. **ASA-CSSA-SSSA International Annual Meeting**. Nov 10-13., San Antonio, TX.
- 7) Valenzuela-Antelo, J.L., C. Chu, X. Liu, M. Dogan, J.A. Avila, B.M. Ehrlich, K. Hui, S. Wang, R. Metz, C. Johnson, J. Baker, S. Baker, R. Devkota, G. Opena, B. Simoneaux, Q. Xue, A.M.H. Ibrahim, J.C. Rudd and **S.-Y. Liu***. 2019. Mapping traits adaptive to the U.S. Southern and Central Great Plains in a ‘TAM204’/‘Iba’ population. **ASA-CSSA-SSSA International Annual Meeting**. Nov 10-13., San Antonio, TX. Also presented in the Texas Small Grain Workers Meeting on August 28, 2019 in College Station Texas.
- 8) Valenzuela-Antelo, J.L., A.M.H. Ibrahim, M.J. Thomson, **S.-Y. Liu** and J.C. Rudd. 2019. Developing a superior hard white winter wheat ‘TAM 114’ using gene editing. **ASA-CSSA-SSSA International Annual Meeting**. Nov 10-13., San Antonio, TX. Also presented in the Texas Small Grain Workers Meeting on August 28, 2019 in College Station Texas.
- 9) Chu, C., S. Wang, H. Dong, R.N. Devkota, J.A. Baker, S. Baker, X. Liu, J.C. Rudd, A.M.H. Ibrahim, Q. Xue, Z.S. Zhang and **S.-Y. Liu***. 2019. Association analysis in Texas elite breeding lines to identify gene and loci affecting grain yield and resistance to

- arthropods. **ASA-CSSA-SSSA International Annual Meeting**. Nov 10-13., San Antonio, TX. Also presented in the Texas Small Grain Workers Meeting on August 28, 2019 in College Station Texas.
- 10) **Liu, S.-Y., C. Chu**, J.C. Rudd, A. Ibrahim, Q. Xue, X. Xu, M.-S. Chen, S. Wang, R. Metz, C. Johnson, J. Baker, R. Devkota, **J.A. Avila, K. Hui**, S. Baker and **X. Liu**. Transfer new sources of resistance to three pest resistance simultaneously into local adapted cultivar TAM 114. **ASA-CSSA-SSSA International Annual Meeting**. Nov 10-13., San Antonio, TX. Also presented in the Texas Small Grain Workers Meeting on August 28, 2019 in College Station Texas.
 - 11) **Adhikari A.**, B.R. Basnet, A.M.H. Ibrahim, J.C. Rudd, P.S. Baenziger, S. Dresigacker, N. Subramanian and **S.-Y. Liu**. 2019. Exploring the genetics of fertility restoration in cytoplasmic male-sterility-based seed production system of hybrid wheat. **ASA-CSSA-SSSA International Annual Meeting**. Nov 10-13., San Antonio, TX.
 - 12) Rudd J.C., A.M.H. Ibrahim, Q. Xue, **S.-Y. Liu**, A. Girard and J. Awika. 2019. Development of high yielding synthetic-derived winter wheat in Texas. **ASA-CSSA-SSSA International Annual Meeting**. Nov 10-13., San Antonio, TX. **(Invited)**.
 - 13) **Liu, S.-Y., C. Chu**, J.C. Rudd, A. Ibrahim, Q. Xue, X. Xu, M.-S. Chen, S. Wang, R. Metz, C. Johnson, Y. Yang, S. Dhakal, J. Baker, R. Devkota, **L. Garza, X. Liu**. 2018. Utilization of primary synthetics in winter wheat genomic breeding. **ASA-CSSA-SSSA International Annual Meeting**. Baltimore, MD. Nov. 4-7, 2018.
 - 14) **Liu, S.-Y., Tan, C.T., S. Assanga, S. Dhakal, Y. Yang**, J.C. Rudd, Q. Xue, A. Ibrahim, R. Metz, S. wang, C.D. Johnson, G. Zhang, X. Xu, G. Bai, M. Chen, R. Devkota, **H. Yu, L. Garza**. 2018. Application of 90K Array and GBS SNPs in wheat genomic breeding in the US High Plains. Presented in Crop Productions and Physiology Studies Session at **The 4th International Conference on Agricultural and Biological Sciences** in Hangzhou, Zhejiang, China, June 26-29, 2018. The similar contents were also presented in the **Shandong Agricultural University, Shandong Academy of Agricultural Sciences** in July of 2018 and **(Invited)**
 - 15) **Chu C.**, S. Wang, Q. Xue, J.C. Rudd, A.M.H. Ibrahim, and **S.-Y. Liu***. 2018. RNAseq analysis to identify genes responsible to drought tolerance in wheat cultivars TAM 111 and TAM 112. **ASA-CSSA-SSSA Annual International Meeting**, Baltimore, MD. Nov. 4-7, 2018. Also in **Texas Small Grain Workers Meeting**, College Station, Texas. Aug. 1-2, 2018.
 - 16) **Dhakal S., Y. Yang, C. Chu**, S. Wang, J. Baker, R. Devkota, S. Baker, G. Opena, J. Awika, J. C. Rudd, A.M.H. Ibrahim, Q. Xue, and **S.-Y. Liu***. 2018. Association analysis of end-use quality in synthetic derived winter wheat. **ASA-CSSA-SSSA Annual International Meeting**, Baltimore, MD. Nov. 4-7, 2018.
 - 17) **Yang Y., S. Dhakal, C. Chu**, S. Wang, Q. Xue, J. C. Rudd, A.M.H. Ibrahim, J. Baker, K. Jessup, **L. Garza**, R. Devkota, S. Baker, G. Opena, C. Johnson, R. Metz, and **S.-Y. Liu***. 2018. Association analyses for yield and yield components in synthetic derived winter wheat lines. **ASA-CSSA-SSSA Annual International Meeting**, Baltimore, MD. Nov. 4-7, 2018.
 - 18) Xue Q., S. Thapa, K. Jessup, **S.-Y. Liu**, J.C. Rudd, J. Baker, S. Baker, and R. Devkota. 2018. Improving wheat drought tolerance and water use efficiency in the Texas High Plains. **ASA-CSSA-SSSA Annual International Meeting**, Baltimore, MD. Nov. 4-7, 2018.

- 19) Thapa S., J.C. Rudd, Q. Xue, K. Jessup, **S.-Y. Liu**, J. Baker. 2018. Use of NDVI for characterizing winter wheat genotypes in the Texas High Plains. **ASA-CSSA-SSSA Annual International Meeting**, Baltimore, MD. Nov. 4-7, 2018.
- 20) **Liu, S.-Y.**, J.C. Rudd, A.M.H. Ibrahim, Q. Xue, X. Xu, M-S. Chen, S. Wang, R. Metz, C. Johnson, Y. Yang, S. Dhakal, J. Baker, R.N. Devkota, H. Yu, X. Yang and L. Garza. 2017. Discovering pest resistances in primary synthetics using genotyping-by-sequencing and their application in winter wheat breeding. **ASA-CSSA-SSSA International Annual Meeting**. Oct. 22-25, Tampa, FL USA. **(Invited)**
- 21) Thapa S., G.P. Pradhan, K.E. Jessup, J.C. Rudd, **S.-Y. Liu**, J.R. Mahan, R.N. Devkota, J. Baker, J. Zhao and Q Xue. 2017. Winter wheat canopy temperature at grain filling correlates to yield in the Texas High Plains. **ASA-CSSA-SSSA International Annual Meeting**. Oct. 22-25, Tampa, FL USA.
- 22) Xue Q., K.E. Jessup, G.P. Pradhan, S. Ajayi-Olanrewaju, X. Hou, J.C. Rudd, **S.-Y. Liu**, A. Ibrahim, R.N. Devkota. 2017. Evaluation of physiological traits associated with wheat yield in the Southern High Plains. **ASA-CSSA-SSSA International Annual Meeting**. Oct. 22-25, Tampa, FL USA.
- 23) **Liu, S.-Y.**, Tan, C.T., S. Assanga, S. Dhakal, Y. Yang, J.C. Rudd, Q. Xue, A. Ibrahim, G. Zhang, X. Xu, G. Bai, M. Chen, R. Devkota, M.P. Fuentealba, H. Yu, L. Garza. 2017. Application of array SNP and GBS in genetics and breeding of hard red winter wheat. **Plant and Animal Genome Conference XXV**. Jan. 14-18, San Diego, CA USA. Same presentation was done at College Station in Soil and Crop Science and Amarillo Research Center in Jan 2017. **(Invited)**
- 24) Tan, C.T., S. Assanga, S. Dhakal, Y. Yang, J.C. Rudd, Q. Xue, A. Ibrahim, G. Zhang, X. Zhang, G. Bai, M. Chen, R. Devkota, M.P. Fuentealba, H. Yu, L. Garza, and **S.-Y. Liu***. 2016. Developing KASP markers for biotic stress tolerances in wheat. **ASA-CSSA-SSSA International Annual Meeting**. Nov. 6-9, Phoenix, AZ USA.
- 25) Xue, Q., J. Zhao, X. Lin, T.H Marek, S.-Y. Liu, and J.C. Rudd. 2016. Crop yield and water-use efficiency responses to climatic variability in the U.S. Southern Great Plains. ASA-CSSA-SSSA, 2016 International Annual Meetings, November 6-9, 2016, Phoenix, AZ

National (6 since 2016, 6 invited)

- 26) Valenzuela-Antelo, J.L., A.M.H. Ibrahim, M. Thomson, J.C. Rudd and **S.-Y. Liu**. 2020. Developing a superior hard white winter wheat version of 'TAM 114' using gene editing. Texas A&M Plant Breeding Symposium-Corteva Agricultural Sciences Plant Science Symposia Series. Feb 20, 2020. **(Invited with student speaker awards)**
- 27) Ibrahim, A.M.H., Valenzuela-Antelo, J.L., M. Thomson, **S.-Y. Liu** and J.C. Rudd. 2019. Developing a superior HWWW version of 'TAM 114' via gene editing. North Corallina State University, Apr 19, 2019. **(Invited)**
- 28) Dhakal S., C. Chu, **S.-Y. Liu***, A. Ibrahim, J.C. Rudd. 2019. The progress of QTL cloning for thousand kernel weight on 2BS of TAM 111. **USDA-NIFA-IWYP annual report**. San Diego. CA. Jan. 14. **(Invited)**
- 29) **Liu, S.-Y.** Texas Wheat breeding and genetic research. July 16, 2019. **Montana State University**, Bozeman, MT. **(Invited)**
- 30) Ibrahim, A.M.H., J.C. Rudd, **S.-Y. Liu**, Q. Xue, D. Hays, J. Jung, M. Maeda, J. Landivar, C. Neely, X. Dong, C. Johnson, M. Thomson, N. Rajan, A. Thomson, B. Auvermann, H.

Neely, and J. Awika. 2018. Current trends in genomics and phenomics in wheat breeding at Texas A&M. **Cornell University**, Ithaca, NY. Feb 2018. **(Invited)**

- 31) Ibrahim, A., J.C. Rudd, **S.-Y. Liu**, *S. Assanga*, B.R. Baset, R. Singh. 2016. Breeding for durable disease resistance in wheat. **Joint Edgar McFadden Symposium/ Hard Winter Wheat Workers Workshop**. April 17-20, San Antonio, Texas. **(Invited)**

State and Regional (25 since 2016, 3 invited)

- 32) **Liu, S.-Y.** 2020. Wheat genetic research in Amarillo. Texas Small Grain Workers meeting. Aug 4-5. Online zoom meeting.
- 33) **Chu, C., S.-Y. Liu.** 2019. Wheat Doubled haploid research in Texas A&M AgriLife Research-Amarillo. Dec. 3. Amarillo, Texas. **Texas Wheat Producer Board and Association invited presentation at their board meeting. > 20 board members participated and discussed.**
- 34) **Liu, S.-Y., C. Chu, Y. Yang, S. Dhakal, J. Antelo, L. Garza, and X. Liu.** 2018. Update on wheat genetic research in Amarillo. **Texas Small Grain Workers Meeting**, College Station, Texas. Aug. 1-2, 2018.
- 35) **Chu C., X. Liu, L. Garza, S. Dhakal, J.C. Rudd, A.M.H. Ibrahim, R. Devkota, G. Opena, and S.-Y. Liu*.** 2018. Wheat doubled haploid (DH) production and its application in genetics and breeding. **Texas Small Grain Workers Meeting**, College Station, Texas. Aug. 1-2, 2018.
- 36) *Valenzuela-Antelo J.*, Amir M.H. Ibrahim, **S.-Y. Liu***, J.C. Rudd and M. Thomson. 2018. Genetic mapping of QTL linked to greenbug resistance and gene editing in Wheat. **Texas Small Grain Workers Meeting**, College Station, Texas. Aug. 1-2, 2018.
- 37) *Dhakal S., Y. Yang, C. Chu, S. Wang, J. Baker, R. Devkota, S. Baker, G. Opena, J. Awika, J. C. Rudd, A.M.H. Ibrahim, Q. Xue, and S.-Y. Liu*.* 2018. Association analysis of end-use quality in synthetic derived winter wheat. **Texas Small Grain Workers Meeting**, College Station, Texas. Aug. 1-2, 2018. Orally presented in ASA-CSSA 2018 Annual International Meeting, Baltimore, MD. Nov. 4-7, 2018.
- 38) Xue, Q., S. Thapa, K. E. Jessup, J. C. Rudd, **S.-Y. Liu**, J. Bell, S. Baker, J. Baker, and R. N. Devkota. 2019. Effect of climatic variability on irrigated wheat yield in the U.S. Southern Great Plains. **Texas Small Grains Workers Meeting**, August 28-29, 2019, College Station, Texas.
- 39) *Yang Y., S. Dhakal, C. Chu, S. Wang, Q. Xue, J. C. Rudd, A.M.H. Ibrahim, J. Baker, K. Jessup, L. Garza, R. Devkota, S. Baker, G. Opena, C. Johnson, R. Metz, and S.-Y. Liu*.* 2018. Association analyses for yield and yield components in synthetic derived winter wheat lines. **Texas Small Grain Workers Meeting**, College Station, Texas. Aug. 1-2, 2018. Orally presented in ASA-CSSA 2018 Annual International Meeting, Baltimore, MD. Nov. 4-7, 2018.
- 40) *Sade F.B.,* A.M.H. Ibrahim, J.C. Rudd, and **S.-Y. Liu.** 2018. Genotype-by-floral traits interaction for hybrid wheat production in Texas. **Texas Small Grain Workers Meeting**, College Station, Texas. Aug. 1-2, 2018.
- 41) Ibrahim AMH., J.C. Rudd, **S.-Y. Liu**, et al. Cutting-edge tools in wheat genomics, phenomics, and biotechnology at Texas A&M University. 2018. **Texas Small Grain Workers Meeting**, College Station, Texas. Aug. 1-2, 2018.
- 42) Xue Q., S. Thapa, K. Jessup, J.C. Rudd, **S.-Y. Liu**, S. Baker, J. Baker, and R. Devkota. 2018. Evaluation of physiological traits wheat drought tolerance-what we learned from

- two extreme drought years? **Texas Small Grain Workers Meeting**, College Station, Texas. Aug. 1-2, 2018.
- 43) Thapa S., Q. Xue, K. Jessup, J.C. Rudd, **S.-Y. Liu**, S. Baker, J. Baker, and R. Devkota. 2018. Stem reserve remobilization in winter wheat genotypes in the Texas High Plains. **Texas Small Grain Workers Meeting**, College Station, Texas. Aug. 1-2, 2018.
- 44) Pierson E., L. Pierson, and **S.-Y. Liu**. 2018. Approach to improve wheat productivity in Texas using microbes that confer water stress tolerance. **Texas Small Grain Workers Meeting**, College Station, Texas. Aug. 1-2, 2018.
- 45) **Liu, S.-Y.** Application of array and GBS SNPS in Texas wheat genetics and breeding. 2017. **Plant Breeding and Genetics Circle**. Nov. 17, 2017. College Station, TX. **(Invited)**
- 46) Ajayi-Olanrewaju S., N. Rajan, A. Ibrahim, J.C. Rudd, **S.-Y. Liu**, R. Sui, and Q. Xue. 2017. Ground-based and aerial manned systems to monitor the performance of wheat genotypes. **Texas Small Grain Workers Meeting**. Aug. 10-11, Amarillo, TX USA.
- 47) Ding M., S. Thapa, K.E. Jessup, **S.-Y. Liu**, J.C. Rudd, and Q. Xue. 2017. Remobilization of stem carbon reserve in winter wheat under dryland and irrigated condition. **Texas Small Grain Workers Meeting**. Aug. 10-11, Amarillo, TX USA.
- 48) **Liu, S.-Y.**, J. C. Rudd, A.M.H. Ibrahim, Q. Xue, Y. Yang, S. Dhakal, S. Assanga, K. Jessup, S. Wang, R. Metz, C. Johnson, J. Baker, R.N. Devkota, H. Yu, X. Yang and L. Garza. 2017. Wheat genic and genomic research using array and GBS SNPs. **Texas Small Grain Workers Meeting**. Aug. 10-11, Amarillo, TX USA.
- 49) Dhakal S., C-T. Tan, H. Yu, L. Garza, J.C. Rudd, Q. Xue, A.M.H. Ibrahim, and **S.-Y. Liu***. 2017. Genetic mapping and KASP markers development for wheat curl mite resistance in TAM 112. **Texas Small Grain Workers Meeting**. Aug. 10-11, Amarillo, TX USA.
- 50) Yang Y., S. Dhakal, J. C. Rudd, Q. Xue, A.M.H. Ibrahim, Y. Yang, J. Baker, K. Jessup, L. Garza, S. Wang, R. Metz, C. Johnson, S. Baker, R.N. Devkota, H. Yu, X. Yang, and **S.-Y. Liu***. 2017. Genome-wide association mapping for yield and yield components in synthetic derived wheat. **Texas Small Grain Workers Meeting**. Aug. 10-11, Amarillo, TX USA.
- 51) **Liu, S.-Y.** Texas A&M AgriLife Research Wheat Genetics, genomics and breeding. Seminar at **Texas A&M AgriLife Research Center at Dallas**, Texas. July 14, 2017. **(Invited)**
- 52) Tan C.T., H. Yu, Y. Yang, L. Garza, J.C. Rudd, A. Ibrahim, Q. Xue, M. Chen, X. Xu, **S.-Y. Liu***. 2016. Double haploids production and genetic mapping of *Gb7* for greenbug resistance and *H32* for hessian fly resistance in wheat. **Texas Small Grain Workers Meeting**, August 4, College Station, Texas.
- 53) Ajayi, S., Q. Xue, N. Rajan, S. K. Reddy, J. C. Rudd, A. Ibrahim, **S.-Y. Liu**, R. Sui, and K. Jessup. 2016. Normalized Difference Vegetation Index as a selection tool for drought tolerant winter wheat genotypes. **Texas Small Grain Workers Meeting**, College Station, Texas, August 4, 2016.
- 54) Bhandari, M., S.K. Reddy, Q. Xue, J.C. Rudd, **S.-Y. Liu**, and Amir Ibrahim. 2016. Use of remote sensing for field phenotyping in wheat breeding program. **Texas Small Grain Workers Meeting**, College Station, Texas, August 4, 2016.

- 55) Xue, Q., S. Thapa, K. Jessup, G. Pradhan, X. Hou, J. C. Rudd, **S.-Y. Liu**, T. Marek. 2016. Physiological Responses of Wheat to Different Irrigation Levels in the Texas High Plains. **Texas Small Grain Workers Meeting**, College Station, Texas, August 4, 2016.
- 56) **Liu, S.-Y.** Breeding approaches to disease control in small grains. 2016. **Texas A & M AgriLife Mini-Symposium: Grand networks for Grand Challenges**. May 18-19, College Station, Texas. (**Invited**)

Before 2015 (41, 7 invited)

- 57) **Liu, S.-Y.**, *S.O. Assanga*, *S. Dhakal*, *Y. Yang*, *P. Fuentealba*. 2015. Wheat disease and insect management through host plant resistance. Global agronomy for Innovative Approaches and Technologies in Soil and Crop Management. **ASA-CSSA-SSSA International Annual Meeting**. Nov. 15-18, Minneapolis, MN USA. (**Invited**).
- 58) *Assanga, S.O.*, *S. Dhakal*, *C-T., Tan*, J.C. Rudd, G. Zhang, A. Ibrahim, Q. Xue, R. Devkota, S. Haley, J. Chen, *M. P. Fuentealba*, S. Baker, J. Baker. **S.-Y. Liu***. 2015. Identification of QTL for yield and yield components and SNP development. **ASA-CSSA-SSSA International Annual Meeting**. Nov. 15-18, Minneapolis, MN USA.
- 59) *Reddy, B.*, A.M.H. Ibrahim, J.C. Rudd, **S.-Y. Liu**. 2015. Synthetic derived wheat: a hope for breaking the yield barrier in the U.S. Great Plains. **ASA-CSSA-SSSA International Annual Meeting**. Nov. 15-18, Minneapolis, MN USA.
- 60) *Ocheya, S. Assanga*, *M. P. Fuentealba*, *C. T. Tan*, *S. Dhakal*, J. C. Rudd, G. Zhang, Q. Xue, A. M. H. Ibrahim, R. N. Devkota, S. D. Haley, J. Chen, S. Baker, J. Baker, and **S.-Y. Liu***. 2015. Genetic mapping for drought tolerance in TAM 111 and Wsm2 in CO960293-2 using 90K SNP array. **Texas Small Grain Workers Meeting**, Aug.12, Amarillo TX.
- 61) *Dhakal, S.*, R. N. Devkota, J. Baker, S. Baker, *Y. Yang*, Q. Xue, A. M. H. Ibrahim, **S.-Y. Liu***, and J. C. Rudd. 2015. QTL associated with yield in TAM 111 and TAM 112 and their interactions with environment. **Texas Small Grain Workers Meeting**, Aug.12, Amarillo TX.
- 62) *Yang, Y.*, K. Joseph, *M. P. Fuentealba*, *S. Dhakal*, Q. Xue, J. C. Rudd, A. Ibrahim, R. N. Devkota, J. Baker, and **S.-Y. Liu***. 2015. QTL associated with yield components in TAM 111 and TAM 112 and their interactions with environments. **Texas Small Grain Workers Meeting**, Aug.12, Amarillo TX.
- 63) *Tan, C. T.*, *M. P. Fuentealba*, *S. Ocheya*, *S. Dhakal*, J. C. Rudd, Q. Xue, G. Zhang, G. Bai, X. Zhang, S. D. Haley, and **S.-Y. Liu***. 2015. Validation and application of single nucleotide polymorphism in marker-assisted breeding for host plant resistance in wheat. **Texas Small Grain Workers Meeting**, Aug.12, Amarillo TX.
- 64) *Gu, X.K.*, Y.L. Li, T. Huggins, **S.-Y. Liu**, D.B. Hays. 2015. Dissection of quantitative trait loci underlying wax biosynthesis in hexaploid wheat. **Texas Small Grain Workers Meeting**. Aug.12. Amarillo, Texas, USA.
- 65) *Ajayi, S.O.*, Q. Xue, N. Rajan, A. M. H. Ibrahim, S. K. Reddy, J. C. Rudd, **S.-Y. Liu**, R. Sui, and K. E. Jessup. 2015. Remote sensing techniques for assessing growth and performance of wheat genotypes: preliminary results. **Texas Small Grain Workers Meeting**, Aug,12, Amarillo TX.
- 66) **Liu, S.-Y.** et al. 2015. Genetic and genomic studies on important traits of Texas wheat. **Texas Small Grains Workers Meeting**. Aug. 12. Amarillo, Texas.

- 67) **Liu, S.-Y.** et al. 2015. KASP SNP markers development and application in marker-assisted breeding in wheat. **The 8th Annual World Congress of Industrial Biotechnology**. Apr. 25-28. Nanjing, China. **(Invited)**. Similar contents were presented in Shandong Academy of Agricultural sciences in Jinan, Jiangsu Academy of Agricultural sciences and Nanjing Agricultural University in Nanjing during the China visit.
- 68) **Liu, S.-Y.** 2015. Wheat genetic research in Texas High Plains. Scientific research seminar presented to more than 40 biology students at Amarillo College. Apr. 9. **(Invited)**
- 69) **Ocheya, S.A., C.-T. Tan, S.-Y. Liu***, G. Zhang, J. Rudd, A. Ibrahim, Q. Xue, R. Devkota, J. Chen, H. Scott, G. Bai, S. Chao, J. Baker, S. Baker, **S. Dhakal, M.P. Fuentealba**. 2015. Identification of SNP markers linked to *Wsm2* and QTL for yield and yield components. **Texas A&M Breeding Symposium**. Feb. 19. College Station, TX. <http://plantbreedingsymposium.com/2015-symposium> **(Invited as student speaker)**
- 70) **Yang, Y., B. Basnet, S.-Y. Liu***, A.M.H. Ibrahim, J.C. Rudd, Q. Xue, C. Johnson. 2015. Analysis of QTL by environment interactions for stripe rust resistance in TAM 111 using saturated genetic maps with SNP and RADseq markers. **Texas A&M Breeding Symposium**. Feb. 19. College Station, TX. <http://plantbreedingsymposium.com/2015-symposium> **(Invited as student speaker)**
- 71) **Liu, S.-Y.** 2014. Wheat genetic research on important traits in the High Plains. Soil and Crop Science departmental seminar, Oct. 8. College Station, TX. **(Invited)**
- 72) **Yan Yang,** et al. 2014. QTL by environment interactions for stripe rust resistance in TAM 111 using saturated genetic maps from SNP markers. **Texas Small Grain Workers Meeting**, Aug. 12-13. College Station (Ph D student).
- 73) **Smit Dhakal.** 2014. Resistance to wheat curl mite in hard red winter wheat lines. **Texas Small Grain Workers Meeting**, Aug. 12-13. College Station (Ph D student).
- 74) **Silvano Ocheya Assanga.** 2014. Identification of SNP markers for drought tolerance in wheat and mapping of *Wsm2*. **Texas Small Grain Workers Meeting**, Aug. 12-13. College Station (Ph D student).
- 75) **Chor-Tee Tan.** 2014. Validation and application of SNP markers for host resistance in wheat. **Texas Small Grain Workers Meeting**, Aug. 12-13. College Station (Postdoc Research Associate).
- 76) **Liu, S.-Y.** 2014. The wheat research update at Amarillo. **Texas Small Grain Workers Meeting**. Aug. 12-13. College Station.
- 77) **Liu, S.-Y.** Wheat research for important traits in the U.S. High Plains. **University of North Texas**, Denton, TX. Aug. 11, 2014.
- 78) **Liu, S.-Y.** Detection of epistasis and QTL by environmental interactions using QTLNetwork 2.0. 2013. Triticeae Coordinated Agricultural Project-webinar recorded. **Plant Breeding Training Network**. Sep. 25, 2013 **(Invited)**
- 79) **Liu, S.-Y.** The wheat research progress at Amarillo Center. 2013. **Texas Small Grain Workers Meeting**. Aug. 6-7. Amarillo, TX.
- 80) **Ocheya, S.A.** 2013. Identification of SNP Markers for Drought Tolerance in Wheat. **Texas Small Grain Workers Meeting**. Aug. 6-7. Amarillo, TX (Ph D student).
- 81) **Dhakal, S.** 2013. Study of mite resistance in TAM112. **Texas Small Grain Workers Meeting**. Aug. 6-7. Amarillo, TX (MS student).

- 82) **Liu, S.-Y.** The wheat research progress at Amarillo Center. 2012. **Texas Small Grain Workers Meeting**. Aug. 1-2. College Station, TX.
- 83) **Liu, S.-Y.** The U.S. wheat production and research progress. 2011. Presented at Shandong Agricultural University on Nov. 2, Tanan, Shandong, and Shandong Academy of Agricultural Sciences on Nov. 4, Jinan, Shandong.
- 84) **Liu, S.-Y.** 2011. The research progress in wheat genetics at Amarillo Center. **Texas Small Grain Workers Meeting**. Aug. 2-3. Vernon, TX.
- 85) **Liu, S.-Y., C.A. Griffey, M.D. Hall, A.L. McKendry, J. Chen, W.S. Brooks, G. Brown-Guedira, D. Van Sanford.** 2010. Linkage between scab resistance and morphological traits in soft red winter cultivar in the U.S. **ASA-CSSA-SSA International Annual Meeting**. Oct. 31-Nov. 3, Long Beach, CA.
- 86) **Liu, S.-Y.** 2010. Research plan of wheat genetics at Amarillo Research Center. **Texas Small Grain Workers Meeting**. Aug. 2-3. Commerce, TX.
- 87) **Liu, S.-Y., M.D. Hall, C.A. Griffey, A.L. McKendry, J. Chen, G. Brown-Guedira, J.P. Murphy and D. Van Sanford.** 2009. Identification of diagnostic markers for scab resistance in US wheat cultivars. **ASA-CSSA-SSA International Annual Meeting**. Nov. 1-5. Pittsburg, PA.
- 88) **Liu, S.-Y., C.A. Griffey, A.L. McKendry, J. Chen, M.D. Hall, G. Brown-Guedira, D. Van Sanford.** 2009. Marker saturation of QTL for scab resistance in native sources and its application in marker-assisted breeding. **The International Plant and Animal Genome Conference**. Jan. 10-14. San Diego, CA.
- 89) **Liu, S.-Y.** Molecular characterization of a major QTL for common bacterial blight resistance in common bean. 2008. Plant breeding faculty and students in **Virginia Tech**, Apr. 5. Blacksburg, VA.
- 90) **Liu, S.-Y.** Update on marker-assisted breeding for multiple resistances in bean. **Agriculture Agri-Food Canada**, Harrow, ON CA. May 2007. Plant breeding scientists, postdocs, and students at **Agriculture Agri-Food Canada**, May 10. Harrow, ON CA.
- 91) **Liu, S.-Y., K. Yu, M. Haffner, and S.J. Park.** Physical mapping of a major QTL for common bacterial blight resistance in common bean. 2006. **ASA-CSSA-SSA International Annual Meeting**, Nov. 12-16. Indianapolis, IN.
- 92) **Liu, S.-Y., K. Yu, S.J. Park, R.L. Conner, P. Balasubramanian, H-H. Mündel and F.A. Kiehn.** 2006. Development of common bean varieties with multiple disease resistances using MAS. **ASA-CSSA-SSA International Annual Meeting**, Nov. 12-16. Indianapolis, IN.
- 93) **Liu, S.-Y., K. Yu, M. Haffner, and S.J. Park.** Toward the cloning of a major QTL conditioning common bacterial blight resistance in common bean. **The International Plant and Animal Genome Conference**. San Diego, CA USA. Jan. 14-16, 2006.
- 94) **Liu, S.-Y., K. Yu, S.J. Park, R.L. Conner, P. Balasubramanian, H-H. Mündel and F.A. Kiehn.** 2006. Breed multiple disease resistant common beans by marker assisted selection and backcrossing. **The International Plant and Animal Genome Conference**. Jan. 14-16. San Diego, CA.
- 95) **Liu, S.-Y., K. Yu, S.J. Park, R.L. Conner, P. Balasubramanian, H-H Mündel and F.A. Kiehn.** 'Pyramiding three disease resistance into common bean cultivars by marker assisted selection' and 'Fine mapping of a major QTL for common bacterial blight resistance' (by Liu, Yu and Park). Reported to **Ontario White Bean Producers'**

Marketing Board and Colored Bean Growers' Association. Feb. 2005, 2006, 2007. London, Ontario, Canada.

96) **Liu, S.-Y.**, K. Yu, S.J. Park, R.L. Conner, P. Balasubramanian, H-H Mündel and F.A. Kiehn. 2004. Pyramiding three disease resistances into common bean cultivars by marker-assisted selection. **5th Canadian Pulse Research Workshop.** Nov. 28-31. London, Ontario, Canada.

97) **Liu, S.-Y.**, H. Lu, T. Musket, A.L. McKendry, G.L. Davis. 2003. QTL associated with scab resistance in soft red winter wheat Ernie. **ASA-CSSA-SSSA International Annual Meeting.** Nov. 2-6. Denver, CO.

b) Proceedings and Poster Abstracts (134-career; 98-since joined AgriLife Research; 45-since last promotion, 28 of 45 from Liu program)

International (29 Since 2016, one 2nd poster award)

- 1) Wang, Z., X. Liu, C. Chu, M. S. Wang, S. Dhakal, Y. Yang, Q. Xue, J.C. Rudd, A.M.H. Ibrahim, D. Hays, J. Baker, K. Jessup, R. Devkota, S. Baker, K. Hui, G. Opena, R. Metz, C. Johnson, and S.-Y. Liu*. 2020. Association analyses for yield components and end-use quality in synthetic derived and adapted winter wheat lines and model selections for genomic prediction. **National Association of Plant Breeders Annual Meeting.** Aug. 16-19, Lincoln, NE. USA. Also presented in the **Texas Plant Protection Association Annual Conference** on Dec. 8-10, 2020.
- 2) Cerit, M., Z. Wang, J.L., Valenzuela-Antelo, M. Dogan, C. Chu, X. Liu, J.A. Avila, B.M. Ehrlich, K. Hui, S. Wang, R. Metz, C. Johnson, J. Baker, S. Baker, R. Devkota, G. Opena, B. Simoneaux, Q. Xue, A.M.H. Ibrahim, J.C. Rudd and S.-Y. Liu*. 2020. QTL mapping for Hessian fly resistance and yield component in hexaploid wheat. **ASA-CSSA-SSSA International Annual Meeting.** Nov 8-11, Pheonix, AZ.
- 3) Wang, Z., M. Cerit, J.L., Valenzuela-Antelo, M. Dogan, C. Chu, X. Liu, J.A. Avila, B.M. Ehrlich, K. Hui, S. Wang, R. Metz, C. Johnson, J. Baker, S. Baker, R. Devkota, G. Opena, B. Simoneaux, Q. Xue, A.M.H. Ibrahim, J.C. Rudd and S.-Y. Liu*. 2020. QTL for yield and yield components in Texas and Oklahoma wheat using TAM 112/Duster. **ASA-CSSA-SSSA International Annual Meeting.** Nov 8-11, Pheonix, AZ.
- 4) Valenzuela-Antelo, J.L., A.M.H. Ibrahim, M. Thomson, J.C. Rudd and S.-Y. Liu. 2020. Developing a superior hard white winter wheat version of 'TAM 114' using gene editing. **Texas A&M Plant Breeding Symposium-Corteva Agricultural Sciences Plant Science Symposia Series.** Feb 20, 2020. (Invited with student speaker awards)
- 5) Maulana F., J.D. Anderson, W. Huang, H.A. Tamir, T. Kumssa, **S.-Y. Liu**, X. Ma. 2020. QTL Mapping of forage yield traits in winter wheat. **International Plant and Animal Meeting XXIII.** Jan. 11-15. 2020.
- 6) Dogan, M., J.L. Valenzuela-Antelo, S. Dhakal, A. Girard, C. Chu, X. Liu, J.A. Avila, B.M. Ehrlich, K. Hui, P.S Amand, G. Bai, S.Wang, J. Baker, S. Baker, R. Devkota, G. Opena, B. Simoneaux, Q. Xue, A.M.H. Ibrahim, J.C. Rudd and S.-Y. Liu*. 2019. QTL analysis of end-use quality in a mapping population from two Texas wheat. **ASA-CSSA-SSSA International Annual Meeting.** Nov 10-13., San Antonio, TX. Also presented in the **Texas Small Grain Workers Meeting** on August 28, 2019 in College Station **Texas and Texas Association of Plant Protection Meeting** on Dec 10, 2019.

- 7) Liu X., C. Chu, J.L. Valenzuela-Antelo, M. Dogan, J.A. Avila, B.M. Ehrlich, K. Hui, J.A. Baker, S. Baker, R.N. Devkota, J.C. Rudd, A.M.H. Ibrahim and S.-Y. Liu*. 2019. Mapping quantitative trait loci for seed traits in a winter wheat population. **ASA-CSSA-SSSA International Annual Meeting**. Nov 10-13., San Antonio, TX.
- 8) Valenzuela-Antelo, J.L., C. Chu, X. Liu, M. Dogan, J.A. Avila, B.M. Ehrlich, K. Hui, S. Wang, R. Metz, C. Johnson, J. Baker, S. Baker, R. Devkota, G. Opena, B. Simoneaux, Q. Xue, A.M.H. Ibrahim, J.C. Rudd and S.-Y. Liu*. 2019. Mapping traits adaptive to the U.S. Southern and Central Great Plains in a 'TAM204'/Iba' population. **ASA-CSSA-SSSA International Annual Meeting**. Nov 10-13., San Antonio, TX. Also presented in the **Texas Small Grain Workers Meeting** on August 28, 2019 in College Station Texas and **Texas Association of Plant Protection Meeting** on Dec 10, 2019. (CSSA oral, TPPA 2nd place poster Award)
- 9) Valenzuela-Antelo, J.L., A.M.H. Ibrahim, M.J. Thomson, S.-Y. Liu and J.C. Rudd. 2019. Developing a superior hard white winter wheat 'TAM 114' using gene editing. **ASA-CSSA-SSSA International Annual Meeting**. Nov 10-13., San Antonio, TX. Also presented in the Texas Small Grain Workers Meeting on August 28, 2019 in College Station Texas and Texas Association of Plant Protection meeting on Dec 10, 2019.
- 10) Liu, S.-Y., C. Chu, J.C. Rudd, A. Ibrahim, Q. Xue, X. Xu, M.-S. Chen, S. Wang, R. Metz, C. Johnson, J. Baker, R. Devkota, J.A. Avila, K. Hui, S. Baker and X. Liu. 2019. Identification of new sources of resistance to biotic and abiotic stresses and linked KASP marker development. **The 1st International Wheat Congress**. July 21-26, Saskatoon, SK Canada.
- 11) Chu, C., X. Liu, K. Hui, J.A. Avila, B. Ehrlich, J.C. Rudd, A. Ibrahim, Q. Xue, S. Wang, A. Szczepaniec, S.-Y. Liu*. Developing hard winter wheat germplasm with new resistance to multiple arthropods using primary synthetics and exome capture. **The 2019 Annual Meeting of National Association of Plant Breeders**, August 25-30, Pine Mountain, GA.
- 12) Rudd, J. C., A.M.H. Ibrahim, Q. Xue, S.-Y. Liu, A. Girard, and J. Awika. 2019. Development of high yielding synthetic-derived winter wheat in Texas. **1st International Wheat Congress**, July 21-26, 2019, Saskatoon, Saskatchewan, Canada.
- 13) Dhakal, S., Y. Yang, C. Chu, S. Wang, J. Baker, R. Devkota, S. Baker, G. Opena, J. Awika, J. C. Rudd, A.M.H. Ibrahim, Q. Xue, and S.-Y. Liu*. 2018. Association analysis of end-use quality in synthetic derived winter wheat. **ASA-CSSA Annual International Meeting**, Baltimore, MD. Nov. 4-7, 2018.
- 14) Yang, Y., S. Dhakal, C. Chu, S. Wang, Q. Xue, J. C. Rudd, A.M.H. Ibrahim, J. Baker, K. Jessup, L. Garza, R. Devkota, S. Baker, G. Opena, C. Johnson, R. Metz, and S.-Y. Liu*. 2018. Association analyses for yield and yield components in synthetic derived winter wheat lines. **ASA-CSSA Annual International Meeting**, Baltimore, MD. Nov. 4-7, 2018.
- 15) Yang, Y., B.R. Basnet, A.M.H. Ibrahim, J.C. Rudd, Q. Xue, S. Wang, C. Johnson, R. Metz, X. Chen, R.L. Bowden, R.E. Mason, D.B. Hays and S.-Y. Liu*. 2017. Study of QTL by environment interactions for stripe rust resistance in TAM 111 using saturated genetic maps with 90K and GBS SNPs. **ASA-CSSA-SSSA International Annual Meeting**. Oct. 22-25, Tampa, FL USA. Also presented in Texas Plant Protection Association Annual Meeting. Dec 5, 2017. Bryan/College Station, TX.

- 16) Dhakal, S., C-T. Tan, H. Yu, M.P. Fuentealba, J.C. Rudd, A.M.H. Ibrahim, Q. Xue and **S-Y. Liu***. 2017. Genetic mapping and KASP markers development for wheat curl mite resistance in TAM 112. **ASA-CSSA-SSSA International Annual Meeting**. Oct. 22-25, Tampa, FL USA. Also presented in Texas Plant Protection Association Annual Meeting. Dec 5, 2017. Bryan/College Station, TX.
- 17) Thapa, S., G.P. Pradhan, K.E. Jessup, J.C. Rudd, **S.-Y. Liu**, J.R. Mahan, R.N. Devkota, J. Baker, J. Zhao and Q. Xue. 2017. Winter wheat canopy temperature at grain filling correlates to yield in the Texas High Plains. **ASA-CSSA-SSSA International Annual Meeting**. Oct. 22-25, Tampa, FL USA.
- 18) Xue, Q., K.E Jessup, G.P. Pradhan, X. Hou, S. Ajayi, J.C. Rudd, **S.-Y. Liu**, A.M.H. Ibrahim and R.N. Devkota. 2017. Evaluation of physiological traits associated with wheat yield in the Southern High Plains. **ASA-CSSA-SSSA International Annual Meeting**. Oct. 22-25, Tampa, FL, USA.
- 19) Xue, Q., J.C. Rudd, **S.-Y. Liu**, T.H. Marek, K.E. Jessup, G. Pradhan, B. Hao, and X. Hou. 2017. Physiological responses of wheat to drought stress in the Texas High Plains. **The 2nd Agriculture and Climate Change Conference**, March 26-28, 2017, Sitges, Spain.
- 20) Xue, Q., A. M. H. Ibrahim, J. C. Rudd, **S.-Y. Liu**, J. J. Mowrer, and A. Somenahally. 2017. Improving winter wheat yield and water use efficiency in the Southern Great Plains of USA. **Conference Internationale sur l'Environnement et l'Agriculture**, April 24-25, 2017, Hammamet, Tunisia.
- 21) Tan, C.-T., **S.-Y. Liu**, S. Assanga, S. Dhakal, Y. Yang, J.C. Rudd, Q. Xue, A. Ibrahim, G. Zhang, X. Xu, G. Bai, M. Chen, R.N. Devkota, H. Yu, and L. Garza. 2017. Developing KASP markers for wheat pest resistance in the US High Plains. **Plant and Animal Genome Conference XXV**. Jan. 14-18, San Diego, CA USA.
- 22) Guttieri, M.J., K. Frels, P. S. Baenziger, S.M. Grogan, P. Byrne, **S.-Y. Liu** and B. F. Carver. 2017. Genome-wide association analysis of kernel weight in hard winter wheat. **Plant and Animal Genome Conference XXV**. Jan. 14-18, San Diego, CA USA.
- 23) **Liu, S.-Y.**, J.C. Rudd, A. Ibrahim, Q. Xue, Y. Weng, S. Xu, J. Baker, R. Devkota, C.-T. Tan, H. Yu, X. Yang, and L. Garza. 2016. Utilization of primary synthetics in winter wheat breeding. **ASA-CSSA-SSSA International Annual Meeting**. Nov. 6-9, Phoenix, AZ USA.
- 24) Tan, C.-T., M. Chen, L. Garza, H. Yu, **S.-Y. Liu***. 2016. Genetic mapping and development of KASP markers for Hessian fly resistance gene *H32* in wheat. **ASA-CSSA-SSSA International Annual Meeting**. Nov. 6-9, Phoenix, AZ USA.
- 25) Ajayi, S. O., Q. Xue, A.M.H. Ibrahim, N. Rajan, S.K. Reddy, J.C. Rudd, **S.-Y. Liu**, R. Sui, and K.E. Jessup. 2016. Non-Destructive sampling for monitoring the growth and performance of winter wheat genotypes. **ASA-CSSA-SSSA International Annual Meetings**, November 6-9, 2016, Phoenix, AZ.
- 26) Bhandari, M., S.K. Reddy, Q. Xue, J.C. Rudd, **S.-Y. Liu**, and A.M.H. Ibrahim. 2016. Assessing physiological characteristics and genotypic variability of wheat genotypes using remote sensing. **ASA-CSSA-SSSA International Annual Meetings**, November 6-9, 2016, Phoenix, AZ.
- 27) Xue, Q., J. Zhao, X. Lin, T.H Marek, **S.-Y. Liu**, and J.C. Rudd. 2016. Crop Yield and water-use efficiency responses to climatic variability in the U.S. Southern Great Plains. **ASA-CSSA-SSSA International Annual Meetings**, November 6-9, 2016, Phoenix, AZ.

- 28) **Liu, S.-Y., C.-T. Tan, S. Assanga, S. Dhakal, Y. Yang, J.C. Rudd, Q. Xue, A. Ibrahim, G. Zhang, X. Xu, G. Bai, M. Chen, R. Devkota, M.P. Fuentealba, H. Yu, L. Garza.** 2016. Development, validation and application of KASP SNPs for biotic and abiotic adaptation in wheat marker-assisted breeding. **The 7th International Crop Science Congress.** August 14-19, Beijing, China.
- 29) **Tan, C.-T., S. Assanga, S. Dhakal, Y. Yang, J.C. Rudd, Q. Xue, A. Ibrahim, G. Zhang, X. Xu, G. Bai, M. Chen, R.N. Devkota, H. Yu, L. Garza, and S.-Y. Liu*.** 2016. Developing high throughput KASP markers for wheat pest and disease resistance in the US High Plains. **Workshop from Wheat Initiative for Achieving Durable Resistance to Wheat Diseases and Pests,** Nov 2-4, Minneapolis, MN.

National (16 Since 2016, one 1st poster award)

- 30) **C. Chu, Z. Wang, Smit Dhakal, J.C. Rudd, A. Ibrahim, and S.-Y. Liu*.** 2020. Cloning and characterization of genes affecting kernel weight on chromosome 2BS. USDA-NIFA-IWYP WheatCAP project annual report. Jan 11. San Diego, CA
- 31) **Dhakal, S., C. Chu, K. Hui, X. Liu, J.A. Avila, J.V. Antelo, J.C. Rudd, A. Ibrahim, and S.-Y. Liu*.** 2019. Cloning and characterization of genes affecting kernel weight on chromosome 2BS. USDA-NIFA-IWYP WheatCAP project annual report. Jan 13. San Diego, CA. Updated progress was presented in **The 2019 Annual Meeting of National Association of Plant Breeders,** August 25-30, Pine Mountain, GA.
- 32) **Liu, S.-Y, J.C. Rudd, A.M.H. Ibrahim, C. Chu, J. Valenzuela-Antelo, and X. Liu.** 2018. Editing awn suppressing gene B1 to develop awned or awnless wheat cultivars. **The 6th Plant Genomics & Gene Editing Congress: USA.** Oct 1-2, 2018. Philadelphia, PA, USA.
- 33) **Valenzuela-Antelo, J., Amir M.H. Ibrahim, M. Thomson, B. Kim, S.-Y. Liu, J.C. Rudd.** 2018. Editing the red grain color homoeologous genes to develop a white grain cultivar. **Genome Editing Symposium.** Oct 4-5, 2018. College Station, Texas.
- 34) **Yang, Y., S. Dhakal, C. Chu, S. Wang, Q. Xue, J. C. Rudd, A.M.H. Ibrahim, J. Baker, K. Jessup, L. Garza, R. Devkota, S. Baker, G. Opena, C. Johnson, R. Metz, and S.-Y. Liu*.** 2017. QTL analyses for yield and yield components in TAM 111 and TAM 112 and their interactions with environments. **TAMU Plant Breeding Symposium.** Feb 19, 2015. **3rd place Poster winner.**
- 35) **Ries, T., S.-Y. Liu, L.S. Pierson III, and E.A. Pierson.** 2016. Understanding selection of beneficial bacteria by drought tolerant winter wheat cultivars TAM 111 and TAM 112. **Joint Edgar McFadden Symposium/ Hard Winter Wheat Workers Workshop.** April 17-20, San Antonio, Texas.
- 36) **Assanga, S.O., M.P. Fuentealba, S. Vader, J.M. Awika, A. Ibrahim, J.C. Rudd, Q. Xue, R. Devkota, J. Baker, S.-Y. Liu*.** 2016. Genetic mapping and QTL analysis for end-use quality in wheat. **Joint Edgar McFadden Symposium/ Hard Winter Wheat Workers Workshop.** April 17-20, San Antonio, Texas.
- 37) **Dhakal, S., C.-T. Tan, M.P. Fuentealba, J.C. Rudd, Q. Xue, B. Blaser, R. Devkota, C. Rush, S.-Y. Liu*.** 2016. Development of high-throughput KASP SNP markers for wheat curl mite resistance and their application in marker-assisted breeding. **Joint Edgar McFadden Symposium/ Hard Winter Wheat Workers Workshop.** April 17-20, San Antonio, Texas.

- 38) Gu, X., D. Hays, **S.-Y. Liu**, T. Huggins, Y. Li. 2016. Dissection of quantitative trait loci underlying wax biosynthesis in hexaploid wheat. **Joint Edgar McFadden Symposium/ Hard Winter Wheat Workers Workshop**. April 17-20, San Antonio, Texas.
- 39) Bhandari, M., **S.-Y. Liu**, Q. Xue, J.C. Rudd, B.A. Stewart. 2016. Infrared thermal imaging for estimating crop canopy temperature. **Joint Edgar McFadden Symposium/ Hard Winter Wheat Workers Workshop**. April 17-20, San Antonio, Texas.
- 40) Ajayi, S., Q. Xue, N. Rajan, S. K. Reddy, J. C. Rudd, A. Ibrahim, **S.-Y. Liu**, R. Sui, K. Jessup. 2016. Remote sensing techniques for monitoring growth of winter wheat genotypes. **Joint Edgar McFadden Symposium/ Hard Winter Wheat Workers Workshop**. April 17-20, San Antonio, Texas.
- 41) **Liu, S.-Y.**, S. Ocheya, S. Dhakal, X. Gu, C.-T. Tan, Y. Yang, J.C. Rudd, D.B. Hays, A.M. Ibrahim, Q. Xue, S. Chao, R. Devkota, C. Shachter, T. Huggins, S. Mohammed, M.P. Fuentealba. 2016. Validation of chromosomal locations of 90K array SNP in US wheat. **Joint Edgar McFadden Symposium/ Hard Winter Wheat Workers Workshop**. April 17-20, San Antonio, Texas.
- 42) Tan, C.-T., S. Assanga, S. Dhakal, J.C. Rudd, Q. Xue, A. Ibrahim, G. Zhang, G. Bai, S. Haley, L. Garza, H. Yu, **S.-Y. Liu**. 2016. Development of high throughput SNPs for host plant resistance in wheat. **Joint Edgar McFadden Symposium/ Hard Winter Wheat Workers Workshop**. April 17-20, San Antonio, Texas.
- 43) Yang, Y., C.-T. Tan, X.Y Xu, J.C. Rudd, Q. Xue, A.M. Ibrahim, **S.-Y. Liu***. 2016. Genetic mapping and KASP SNP markers validation of greenbug resistance gene *Gb7* in wheat. **Joint Edgar McFadden Symposium/ Hard Winter Wheat Workers Workshop**. April 17-20, San Antonio, Texas.
- 44) Assanga, S., M.P. Fuentealba, S. Vader, J.M. Awika, A. Ibrahim, J. Rudd, **Q. Xue**, R.N. Devkota, J. Baker, **S.-Y. Liu***. 2016. Genetic mapping and QTL analysis for end-use quality in wheat. **Texas A&M Plant Breeding Symposium**, College Station, TX, February 18, 2016. (**1st place poster winner**).
- 45) Ajayi, S., Q. Xue, N. Rajan, S. K. Reddy, J. C. Rudd, A. Ibrahim, **S.-Y. Liu**, R. Sui, K. Jessup. 2016. Spectral vegetation indices for estimating growth of winter wheat genotypes. **Texas A&M Plant Breeding Symposium**, College Station, TX, February 18, 2016.

Presentations before 2015 (89)

- 46) Dhakal, S., C.-T. Tan, **S.-Y. Liu***, J.C. Rudd, Q. Xue, B. Blaser, R. Devkota, C.M. Rush, M.P. Fuentealba. 2015. Mapping wheat curl mite resistance gene in TAM 112 and KASP SNP development. **ASA-CSSA-SSSA International Annual Meeting**. Nov. 15-18, Minneapolis, MN USA.
- 47) Tan, C.-T., S. Ocheya, G. Zhang, S. Haley, J.C. Rudd, Q. Xue, G. Bai, X. Zhang, P. Byrne, M.P. Fuentealba, **S.-Y. Liu***. 2015. Development and validation of KASP markers for marker-assisted selection of *Wsm2* in wheat. **ASA-CSSA-SSSA International Annual Meeting**. Nov. 15-18, Minneapolis, MN USA.
- 48) Tan, C.-T., S. Ocheya, S. Dhakal, J.C. Rudd, Q. Xue, G. Zhang, G. Bai, X. Zhang, R. Devkota, M.P. Fuentealba, **S.-Y. Liu***. 2015. Development of high throughput SNPs for host plant resistance. **9th International Wheat Conference**. Sep. 20-25. Sydney, AUS.
- 49) Ocheya, S.A., J.C. Rudd, A. Ibrahim, Q. Xue, G. Zhang, R. Devkota, J. Chen, H. Scott, J. Baker, S. Baker, C.-T. Tan, S. Dhakal, M.P. Fuentealba, **S.-Y. Liu***. 2015. Identification

- of SNP markers linked to QTL for yield and yield components. **ASA-CSSA-SSSA International Annual Meeting**. Nov. 15-18. Minneapolis, MN, USA.
- 50) *Ajayi, S. O.*, Q. Xue, N. Rajan, A. M. H. Ibrahim, S. K. Reddy, J. C. Rudd, **S.-Y. Liu**, R. Sui, and K. E. Jessup. 2015. Evaluating physiological traits of winter wheat genotypes using remote sensing techniques. **ASA-CSSA-SSSA International Annual Meeting**. Nov. 15-18, 2015, Minneapolis, MN.
- 51) *Bhandari, M.*, **S.-Y. Liu**, Q. Xue, J. C. Rudd, and B. A. Stewart. 2015. Infrared thermal imaging for estimating crop canopy temperature. **ASA-CSSA-SSSA International Annual Meeting**. Nov. 15-18, 2015, Minneapolis, MN.
- 52) *Gu, X.K.*, Y.L. Li, T. Huggins, **S.-Y. Liu**, D.B. Hays. 2015. Dissection of genes underlying wax biosynthesis in hexaploid wheat. **Plant Biology American Society of Plant Biologists Meeting**. July 25-30. Minneapolis, Minnesota, USA.
- 53) *Bhandari, M.*, **S.-Y. Liu**, Q. Xue, J. C. Rudd, and B. A. Stewart. 2015. Infrared thermal imaging crop canopies for estimating canopy temperature. West Texas A&M University Student Research Conference, April 16, 2015, Canyon, TX. (**First Prize Winner**).
- 54) *Gu, X.K.*, Y.L. Li, T. Huggins, **S.-Y. Liu**, D.B. Hays. Identification of high-resolution genetic markers linked to wax for wheat breeding using RNA-seq. 2015. **Texas A&M Breeding Symposium**. Feb. 19. College Station, TX, USA.
- 55) *Dhakar, S.*, *C.-T. Tan*, **S.-Y. Liu***, J.C. Rudd, Q. Xue, B. Blaser, R. Devkota, C.M. Rush, *M.P. Fuentealba*. 2015. Development of high throughput KASP SNP markers for wheat curl mite resistance and their application in marker-assisted breeding. **Texas A&M Breeding Symposium**. Feb. 19. College Station, TX, USA. (**1st place in poster competition**)
- 56) *Ocheya, S.A.*, **S.-Y. Liu***, J.C. Rudd, A. Ibrahim, G. Zhang, Q. Xue, D. Hays, R. Devkota, S. Chao, G Bai, S. Haley, J. Chen, *C.-T., Tan*, *M. P. Fuentealba*, S. Baker, J. Baker. 2015. Identification of high throughput SNP markers linked to QTL for drought tolerance and *Wsm2* gene in US hard red winter wheat and applications in breeding. **International Plant and Animal Genome Conference XXIII**, Jan. 10-14, San Diego, CA, USA.
- 57) *Tan, C.-T.*, **S.-Y. Liu***, *S. Ocheya*, *S. Dhakar*, J.C. Rudd, Q. Xue, G. Zhang, G. Bai, X. Zhang, R. Devkota, *M.P. Fuentealba*. 2015. Development of KASPar SNP markers for host plant resistance to biotic stress in wheat. **International Plant and Animal Genome Conference XXIII**, Jan. 10-14, San Diego, CA, USA.
- 58) Wang, S., K. Jordan, S.P. Kiani, M. J. Hayden, **S.-Y. Liu**, P. S. Baenziger, R.L. Bowden, E. Akhunov. 2014. Genetic architecture of quantitative disease resistance revealed by genome-wide association scan in wheat (W377). **International Plant and Animal Genome Conference XXII**, Jan. 10-14, San Diego, CA, USA.
- 59) *Yang, Y.*, B. Basnet, **S.-Y. Liu***, A.M.H. Ibrahim, J.C. Rudd, Q. Xue, C. Johnson. 2014. Analysis of QTL by environment interactions for stripe rust resistance in TAM 111 using saturated genetic maps with SNP and Genotyping-by-Sequencing markers. **Texas Plant Protection Conference**, Dec. 10-11, Bryan, Texas, USA.
- 60) *Dhakar, S.*, **S.-Y. Liu***, J.C. Rudd, Q. Xue, B. Blaser. 2014. Genetic mapping of the wheat curl mite resistance in TAM 112. **Texas Plant Protection Conference**, Dec. 10-11, Bryan, Texas, USA.
- 61) *Ocheya, S.A.*, **S.-Y. Liu***, J.C. Rudd, A. Ibrahim, Q. Xue, R. Devkota, S. Chao, G. Zhang, S. Haley, *C.-T., Tan*, *M. P. Fuentealba*. 2014. Identifying high throughput SNP

- markers linked to QTL for drought tolerance and *Wsm2* gene in US hard red winter wheat and their applications in breeding. **Texas Plant Protection Conference**, Dec. 10-11, Bryan, Texas, USA.
- 62) Ocheya, S.A., S.-Y. Liu*, J.C. Rudd, A. Ibrahim, Q. Xue, R. Devkota, S. Chao, G. Zhang, S. Haley, J. Chen, C-T., Tan, M. P. Fuentelalba. Validating diagnostic SNP markers for *Wsm2* and mapping and introgression of QTL for drought tolerance from hard red winter wheat into Ug99 resistant spring wheat cultivars for African countries. **The First International Conference on Genomics, Traits and Business**, Sep. 21-24, Charlotte, NC USA.
- 63) Tan, C-T., S.A. Ocheya, S.-Y. Liu*, J.C. Rudd, Q. Xue, G. Zhang, G. Bai, X. Zhang, M.P. Fuentelalba. 2014. Validation and application of diagnostic KASP SNP markers for host plant resistance in wheat. **The First International Conference on Genomics, Traits and Business**, Sep. 21-24, Charlotte, NC USA.
- 64) Ocheya, S.A., S.-Y. Liu*, J.C. Rudd, A. Ibrahim, Q. Xue, R. Devkota, S. Chao, G. Zhang, S. Haley, J. Chen, C-T., Tan, M. P. Fuentelalba. Genetic mapping and introgression of QTLs for drought tolerance and *Wsm2* from hard red winter wheat into Ug99 resistant spring wheat cultivars for African Countries. An invited international participant on Tomorrow's Leaders Forum on Food, Feed, Fiber, and Fuel security as climate changes. **The Agricultural Biotechnology International Conference**, Oct. 5-9, 2014, Saskatoon, SK, Canada. **(Invited)**
- 65) Liu, S.-Y.*, S.A. Ocheya, S. Dhakal, D. B. Hays, J.C. Rudd, A.M.H. Ibrahim, Q. Xue, S. Chao, R. Devkota, P. Sengodan, T. Huggins, and S. Mohammed. 2014. Validation of SNP chromosome locations via diverse molecular markers in three wheat mapping populations. **Borlaug Global Rust Initiative**. Mar. 23-25, Cd. Obregon, Sonora, Mexico.
- 66) Liu, S.-Y.*, J.C. Rudd, G. Bai, S. Haley, A. Ibrahim, Q. Xue, D. Hays, R. Devkota, R. Graybosch, P.S. Amand. 2014. Molecular markers for important traits of hard winter wheat production and marketing in the US. **Borlaug Summit on Wheat for Food Security**. Mar. 23-25, Cd. Obregon, Sonora, Mexico.
- 67) Ocheya, S.A., S.-Y. Liu*, J.C. Rudd, A. Ibrahim, Q. Xue, D. Hays, R. Devkota, G. Zhang, J. Chen. 2014. Identifying SNP markers for drought tolerance in wheat. **Borlaug Summit on Wheat for Food Security**, Book of Abstracts. Mexico, Mar. 25-28, 2014. Cd. Obregon, Sonora, Mexico.
- 68) Reddy, S.K., J. Baker, S. Baker, D. Malinowski, C. Neely, A. Ibrahim, S.-Y. Liu, Q. Xue, D. Drake, G. Pradhan, Y. Emendack, R. Devkota, and J. C. Rudd. Phenotyping for biomass and ground cover estimation in wheat and other winter small grains. **Borlaug Summit on Wheat for Food Security**, Book of Abstracts. Mexico, Mar. 25-28, 2014. Cd. Obregon, Sonora, Mexico.
- 69) Dhakal, S., J. C. Rudd, Q. Xue, R. Devkota, M. P. Fuentelalba, B. Blaser, C.M. Rush, S.-Y. Liu*. 2013. Screening wheat curl mite resistance in Texas and Great Plains hard winter wheat. **Texas Plant Protection Association Conference**. Bryan, TX. Dec. 10-11.
- 70) Liu, S.-Y.*, J.C. Rudd, G. Bai, S. Haley, A. Ibrahim, Q. Xue, D. Hays, R. Devkota, R. Graybosch, P.S. Amand. 2014. Validation and application of molecular markers linked to genes important for hard winter wheat production and marketing in the U.S. Great Plains. **ASA-CSSA-SSSA International Annual Meetings**. Nov. 3-6, Tampa, FL, USA. Also presented on **Borlaug Summit on Wheat for Food Security**, Book of Abstracts. Mexico, Mar. 25-28. Cd. Obregon, Sonora, Mexico.

- 71) *Dhakal, S.*, J. C. Rudd, Q. Xue, R. Devkota, *M. P. Fuentealba*, B. Blaser, C.M. Rush, **S.-Y. Liu***. 2013. Screening wheat curl mite resistance in Texas and Great Plains hard winter wheat. **USDA-ARS Ogallala Aquifer Program Workshop**, Mar. 25-26, 2014, Lubbock, TX.
- 72) *Ajayi, S.*, Q. Xue, G. Pradhan, R. Sui, S. K. Reddy, K. E. Jessup, A. Ibrahim, J. C. Rudd, and **S.-Y. Liu**. 2014. Monitoring early plant growth of wheat genotypes using ground-based plant health sensing system. The 26th Annual Texas Plant Protection Conference, December 10-11, 2014, Bryan, TX.
- 73) *Ajayi, S.*, S. K. Reddy, P. Gowda, **S.-Y. Liu**, J. C. Rudd, Q. Xue, and B. A. Stewart. 2014. Use of spectral reflectance for estimating plant parameters of wheat genotypes in the Texas High Plains. **Borlaug Summit on Wheat for Food Security**, March 25-28, 2014, Ciudad Obregón, Mexico.
- 74) Pradhan, G.P., Q. Xue, **S.-Y. Liu**, J.C. Rudd and K.E. Jessup. 2013. Effective use of soil water contributed to high yield in wheat in the U.S. Southern High Plains. *J. of Arid Land Studies*. **Proceed. of the Desert Technology XI**. Nov. 19-22. San Antonio, TX, USA.
- 75) **Liu, S.-Y.**, C.A. Griffey, G. Brown-Guedira. 2013. Molecular characterization of Fusarium head blight resistance in U.S. soft red winter wheat germplasm and cultivars. **ASA-CSSA-SSSA International Annual Meetings**. Nov. 3-6, Tampa, FL, USA.
- 76) *Ocheya, S.A.*, **S.-Y. Liu***, J.C. Rudd, A. Ibrahim, Q. Xue, D. Hays, R. Devkota, G. Zhang, J. Chen. 2013. Identification of SNP markers for drought tolerance in wheat. **ASA-CSSA-SSSA International Annual Meetings**. Nov. 3-6, Tampa, FL, USA; also presented on **Monsanto Beachell Borlaug International Scholar Leadership Training and World Food Prize Activities**, Oct. 11-19, Des Moines, IA, USA; also presented on T-CAP meeting on Jan. 11, 2014 at San Diego, CA, USA.
- 77) Pradhan, G.P., Q. Xue, K.E. Jessup, **S.-Y. Liu**, J.C. Rudd and J.R. Mahan. 2013. Identifying drought tolerant wheat genotypes using wireless infrared thermometers in the US Southern High Plains. **ASA-CSSA-SSSA International Annual Meetings**. Nov. 3-6, Tampa, FL, USA.
- 78) *Reddy, B.*, A. Ibrahim, J.C. Rudd, **S.-Y. Liu**. 2013. Breeding for durable rust resistant in Texas hard red winter wheat using synthetic derived wheat lines and Ug99 resistant genes. **Borlaug Global Rust Initiative Workshop**, Aug. 19-22, New Delhi, India
- 79) *Reddy, S.K.*, **S.-Y. Liu***, A. Akhunova, J. Mahan, Y. Weng, Q. Xue, J.C. Rudd, P. Payton. 2013. Comparative transcriptomics involving greenbug and water-deficit stress responses in hard-red winter wheat. **Plant and Animal Genome XXI**. Jan. 12-16, San Diego, CA, USA.
- 80) **Liu, S.-Y.***, Q. Xue, A.M. Ibrahim, *S. K. Reddy* and J.C. Rudd. 2012. Genetic and physiological evaluation of yield and other important traits of hard red winter wheat in the Texas High Plains. **ASA-CSSA-SSSA International Annual Meetings**. Oct. 21-24, Cincinnati, OH, USA.
- 81) *Reddy, S.K.*, **S.-Y. Liu***, Q. Xue, J.C. Rudd, *M. Fuentealba*, K. Jessup, P. Payton and J. Mahan. 2012. Mechanisms of adaptation to water-stress conditions in widely planted TAM wheat cultivars. **ASA-CSSA-SSSA International Annual Meetings**. Oct. 21-24, Cincinnati, OH, USA.
- 82) *Reddy, B.* A.M. Ibrahim, J.C. Rudd and **S.-Y. Liu**. 2012. Enhancing yield potential of hard red winter wheat via use of synthetic backcrosses. **ASA-CSSA-SSSA International Annual Meetings**. Oct. 21-24, Cincinnati, OH, USA.

- 83) *Ajayi S.*, S. Reddy, **S.-Y. Liu**, P. Gowda, Q. Xue, T. Marek, J.C. Rudd. 2012. Reflectance based characterization of wheat cultivars for identifying drought tolerance. **ASA-CSSA-SSSA International Annual Meetings**. Oct. 21-24, Cincinnati, OH, USA.
- 84) *Reddy, S.K.*, **S.-Y. Liu***, J.C. Rudd., R. Devkota., Q. Xue., P. Payton., J. Mahan., A. Akhunova. 2012. Gene expression profiling of water deficit stress responses in widely adapted wheat cultivars TAM 111 and TAM 112. **American Society of Plant Biologist**. Jul. 20-24. Austin, TX, USA.
- 85) *Reddy, S.K.*, Y. Weng, J. C. Rudd, A. Akhunova, **S.-Y. Liu***. 2012. Transcriptome profiling of defense responses to greenbug feeding in wheat. **Plant and Animal Genome XX**. Jan. 14-18, San Diego, CA, USA.
- 86) **Liu, S.-Y.**, C.A. Griffey, M.D. Hall, A.L. McKendry, J. Chen, G. Brown-Guedira, D. Van Sanford and D. Schmale. 2011. Mapping Fusarium head blight resistance in wheat cultivars Ernie and Massey. **2011 National Fusarium Head Blight Forum**. Dec. 4-6, St. Louis, MO, USA.
- 87) **Liu, S.-Y.**, M.D. Christopher, C.A. Griffey, M.D. Hall, P.G. Gundrum, and W.S. Brooks. 2011. Characterization of Fusarium head blight resistance in soft red winter wheat line VA00w-38. **2011 National Fusarium Head Blight Forum**. Dec. 4-6, St. Louis, MO, USA.
- 88) Berger, G., P. Khatibi, W. Brooks, **S.-Y. Liu**, M.D. Hall, A. Green, C.A. Griffey, and D. Schmale III. 2011. Fusarium head blight resistance and deoxynivalenol accumulation in hulled and hullless winter barley and dried distiller's grain. **2011 National Fusarium Head Blight Forum**. Dec. 4-6, St. Louis, MO, USA.
- 89) *Reddy, S.K.*, Y. Weng, J.C. Rudd, A. Akhunova, **S.-Y. Liu***. 2011. Transcriptome profiling of defense responses to greenbug feeding in wheat. **The 6th International Conference on Genome**. Nov. 12-15, Shenzhen, China. *Corresponding author.
- 90) **Liu, S.-Y.**, C.A. Griffey, M. Hall, A. McKendry, J. Chen, G. Brown-Guedira, D. Van Sanford and D. Schmale. 2011. Are there common QTL for scab resistance in soft red winter wheat cultivars. **ASA-CSSA-SSSA International Annual Meetings**. Oct. 16-19, San Antonio, TX, USA.
- 91) Berger, G., **S.-Y. Liu**, M.D. Hall, W. Brooks, S. Chao, C.A. Griffey and G. Muehlbauer. 2011. Identification of marker-trait associations in the Virginia Tech winter barley program using genome-wide mapping. **ASA-CSSA-SSSA International Annual Meetings**. Oct. 16-19, San Antonio, TX, USA.
- 92) Xue, Q., K. Jessup, J.C. Rudd, **S.-Y. Liu**, S. Baker, R. Devkota and J. Mahan. 2011. Different mechanisms of adaptation to drought stress in two wheat cultivars? **ASA-CSSA-SSSA International Annual Meetings**. Oct. 16-19, San Antonio, TX, USA.
- 93) Azhaugvel, P., Y. Weng, Y. Ma, M.-C. Luo, H. Simkova, J. Safar, J. Dolezel, T. Wicker, M. Saha, H. Rammna, R. Nelson, C. Zhou, T. Ray, Y. Tang, **S.-Y. Liu**, J.C. Rudd. 2011. Cloning and function validation of a NB-ARC-LRR-type candidate gene for the greenbug aphid resistance locus Gb3 in wheat. **Plant and Animal Genome XIX Conference**. Jan. 15-19, San Diego, CA, USA.
- 94) **Liu, S.-Y.***, J. C. Rudd, A.M. Ibrahim, S.D. Haley, G. Bai, C.A. Griffey, and G. Brown-Guedira. 2011. Development and validation of diagnostic markers for wheat stress traits in the Great Plains of North America. **Plant and Animal Genome XIX Conference**. Jan. 15-19, San Diego, CA, USA.

- 95) Berger, G.L., **S.-Y. Liu**, M.D. Hall, W.S. Brooks, S. Chao, C.A. Griffey, G. L. Muehlbauer. 2010. Association mapping of molecular markers linked to key traits in the Virginia winter barley. **The 4th Annual Meeting of National association of Plant Breeders**. Aug. 15, Johnston, IA, USA.
- 96) Green, A.J., G.L. Berger, R.M. Pitman, M. Balota, C.A. Griffey, M. Dm. Hall, S.-Y. Liu, W. E. Thomason, W. S. Brooks. 2010. Yield components, agronomic, and morphological traits associated with soft red winter wheat yield. **The 4th Annual Meeting of National association of Plant Breeders**. Aug. 15, Johnston, IA, USA.
- 97) Christopher, M.D., C.A. Griffey, **S.-Y. Liu**. 2010. Identification and molecular mapping of adult plant stripe rust resistance in soft red winter wheat. **The 4th Annual Meeting of National association of Plant Breeders**. Johnston, Iowa, USA. (Poster and abstracts).
- 98) Berger, G.L., **S.-Y. Liu**, M.D. Hall, W.S. Brooks, S. Chao, C.A. Griffey, G.J. Muehlbauer. 2010. Identification of molecular markers for important traits in winter barley using association mapping. **The International Plant and Animal XVIII Conference**. Jan. 9-13. San Diego, CA USA.
- 99) **Liu, S.-Y.**, W.E. Thomason, C.A. Griffey, M.D. Hall. P.G. Gundry, W.S. Brooks, R. Pitman, M. Vaughn, T. Lewis. and D. Dunaway. 2009. Integrated Management of Scab in Wheat using Resistant Varieties and Fungicide. In: S. Canty, A. Clark, E. Walton, E. Ellis, J. Mundell, and D. Van Sanford (Eds.), **Proceedings of the National Fusarium Head Blight Forum**. Dec. 7-9, Orlando, FL, USA. Lexington, KY: University of Kentucky.
- 100) **Liu, S.-Y.**, W.S. Brooks, S. Chao. C.A. Griffey, M.D. Hall, P.G. Gundry, G.L. Berger, P.A. Khatibi, and D.G. Schmale. 2009. Association analyses of SNP markers with scab resistance in winter feed barley. In: S. Canty, A. Clark, E. Walton, E. Ellis, J. Mundell, and D. Van Sanford (Eds.), **Proceedings of the National Fusarium Head Blight Forum**. Dec. 7-9, Orlando, FL, USA. Lexington, KY: University of Kentucky.
- 101) **Liu, S.-Y.**, C.A. Griffey, A.L. McKendry. M.D. Hall and W.S. Brooks. Saturation mapping of scab resistance QTL in Ernie and identification of diagnostic markers for breeding scab resistance. In: S. Canty, A. Clark, E. Walton, E. Ellis, J. Mundell, and D. Van Sanford (Eds.), **Proceedings of the National Fusarium Head Blight Forum; 2009** Dec. 7-9, Orlando, FL, USA. Lexington, KY: University of Kentucky p134.
- 102) **Liu, S.-Y.**, M.D. Hall, C. A. Griffey, A.L. McKendry, J. Chen, W.S. Brooks, G. Brown-Guand D. Van Sanford. 2009. Saturation mapping QTL for scab resistance in a Virginia wheat cultivar Massey. In: S. Canty, A. Clark, E. Walton, E. Ellis, J. Mundell, and D. Van Sanford (Eds.), **Proceedings of the National Fusarium Head Blight Forum**. Dec. 7-9, Orlando, FL, USA. Lexington, KY: University of Kentucky, p135.
- 103) Hall, M.D., **S.-Y. Liu**, D. Marshall, D. Van Sanford, J. Costa, G. Brown-Guedira, C.A. Griffey. 2009. Molecular detection of QTL associated with adult plant resistance to powdery mildew in two soft red winter wheat populations. **The International Plant and Animal Genome Conference**. Jan. 10-14, San Diego, CA USA.
- 104) O'Boyle, P.D., M.D. Hall, **S.-Y. Liu**, W.S. Brooks, S. Chao, B.J. Steffenson, C.A. Griffey. 2009. Identification and molecular characterization of barley net blotch resistance genes using a diallel mating scheme. **The International Plant and Animal Genome Conference**. Jan. 10-14, San Diego, CA USA.

- 105) Griffey, C.A., W.E. Thomason, J.E. Seago, M.D. Hall, **S.-Y. Liu**, W. S. Brooks, and P.G. Gundrum. 2009. Virginia wheat production and research progress. Annual Wheat Newsletter. Vol. 55.
- 106) **Liu, S.-Y.** C.A. Griffey, A.L. McKendry, M.D. Hall and G. Brown-Guedira. Saturation mapping of scab resistance QTL in Ernie and its application in marker-assisted breeding. In: S. Canty, A. Clark, E. Walton, E. Ellis, J. Mundell, and D. Van Sanford (Eds.), **Proceedings of the National Fusarium Head Blight Forum**. Indianapolis, IN USA. Dec. 2-4, 2008. Lexington, KY: University of Kentucky. p. 180.
- 107) **Liu, S.-Y.** M.D. Hall, C. A. Griffey, A.L. McKendry, J. Chen, and D. Van Sanford. Mapping QTL for scab resistance in the Virginia wheat cultivar Massey. In: S. Canty, A. Clark, E. Walton, E. Ellis, J. Mundell, and D. Van Sanford (Eds.), **Proceedings of the National Fusarium Head Blight Forum**. Indianapolis, IN USA. Dec. 2-4, 2008. Lexington, KY: University of Kentucky. p. 178-179.
- 108) **Liu, S.-Y.** W.S. Brooks, S. Chao, C.A. Griffey, M.D. Hall. Association mapping of barley important traits using abundant SNPs. In: S. Canty, A. Clark, E. Walton, E. Ellis, J. Mundell, and D. Van Sanford (Eds.), **Proceedings of the National Fusarium Head Blight Forum**. Indianapolis, IN USA. Dec. 2-4, 2008. Lexington, KY: University of Kentucky. p. 176-177.
- 109) **Liu, S.-Y.** W.E. Thomason, C.A. Griffey. Scab management through resistant varieties and fungicide. In: S. Canty, A. Clark, E. Walton, E. Ellis, J. Mundell, and D. Van Sanford (Eds.), **Proceedings of the National Fusarium Head Blight Forum**. Indianapolis, IN USA. Dec. 2-4, 2008. Lexington, KY: University of Kentucky. p. 42.
- 110) Griffey, C.A., G. Brown-Guedira, **S.-Y. Liu**, J.P. Murphy, and C. Sneller. Characterization and development of FHB resistant soft winter wheat cultivars in the eastern U.S. In: S. Canty, A. Clark, E. Walton, E. Ellis, J. Mundell, and D. Van Sanford (Eds.), **Proceedings of the National Fusarium Head Blight Forum**. Indianapolis, IN USA. Dec. 2-4, 2008. Lexington, KY: University of Kentucky. p. 162-165.
- 111) Abate, Z., **Liu, S.-Y.** and A.L. McKendry. Validation of QTL associated with Fusarium head blight resistance in the soft red winter wheat Ernie. In: S. Canty, A. Clark, E. Walton, E. Ellis, J. Mundell, and D. Van Sanford (Eds.), **Proceedings of the National Fusarium Head Blight Forum**. Indianapolis, IN USA. Dec. 2-4, 2008. Lexington, KY: University of Kentucky. p. 125-127.
- 112) **Liu, S.-Y.** C.A. Griffey, J.Chen, A.L. McKendry, C.H. Sneller, J. P. Murphy, and G. Brown-Guedira. Breeding and genomics of Fusarium head blight resistance in soft red winter wheat: Research progress and ongoing projects. **2008 Joint Annual meeting of GSA-ASA-CSSA-SSA-GCAGS-HGS**. Houston, TX USA. Oct. 5-9, 2008.
- 113) Hall, M.D., **S.-Y. Liu**, D. Marshall, D. Van Sanford, J. Costa, G. Brown-Guedira and C.A. Griffey. Molecular detection of QTL associated with adult plant resistance to powdery mildew in two soft red winter wheat population. **2008 national Wheat Genomics Conference**. Indianapolis, IN USA. Dec. 5-6, 2008.
- 114) **Liu, S.-Y.** K. Yu, M. Banik, M. Haffner, S.J. Park. Candidate gene study of QTL for common bacterial blight resistance in common bean. **The International Plant and Animal Genome Conference**. San Diego, CA USA. Jan. 12-16, 2008.
- 115) **Liu, S.-Y.** K. Yu, M. Banik, S.J. Park. Characterization of the genomic region containing a major QTL conditioning common bacterial blight resistance in common bean. **Annual Report of Bean Improvement Cooperative**. Vol 51, 2008. pp. 202-203.

- 116) **Liu, S.-Y.** M.D. Hall, C.A. Griffey, and A.L. McKendry. Meta-Analyses of QTL associated with Fusarium head blight resistance in wheat. In: Canty, S.M., Clark, A., Ellis, D., Sanford, D.V. (Eds) **Proceedings of the National Fusarium Head Blight Forum**. Kansas City, MO, USA. Dec 2-4, 2007. East Lansing: Michigan State University. pp195-199.
- 117) **Liu, S.-Y.** D.G. Schmale, W.S. Brooks, P.A. Khabiti and C.A. Griffey. FHB resistance and DON concentration in Virginia barley. In: Canty, S.M., Clark, A., Ellis, D., Sanford, D.V. (Eds) **Proceedings of the National Fusarium Head Blight Forum**. Kansas City, MO, USA. Dec 2-4, 2007. East Lansing: Michigan State University. pp 194
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XII. MAJOR IMPACT OF WHEAT GENETIC PROGRAM

1. Wheat genetics, genomics and breeding

Wheat is one of the major crops in Texas and the U.S. Great Plains. It provides grain for humans and forage for cattle. Especially in Texas and Oklahoma, 50% of the planted 12M acres are used for grazing. My wheat genetic and genomic research has been focusing on

how to improve the productivity of grain and forage in the Texas and U.S. High Plain environments where stresses include drought, high evaporation, insects and their transmitted diseases, wheat curl mite and its transmitted wheat streak mosaic virus, and rusts. **Our goal is to develop better germplasms and cultivars that are resilient to these stresses.** Texas A&M AgriLife Research is well-known for the release of popular cultivars since the 1960s. After I joined Texas A&M AgriLife Research in 2010, **I have developed seven bi-parental mapping populations to identify why the previous and newly released cultivars, TAM 111, TAM 112, TAM 113, TAM 114, and TAM 204, are so popular through studying their yield, yield components, bread-making quality, and resistance to diseases and pests.** In order to have larger and useful diversities for genetic research and cultivar development, we developed primary synthetic (derived from crosses between a set of 49 durum with A and B genomes and 149 *Ae. Tauschii* lines with D genomes) -derived lines to form an association mapping population to identify new genes and loci for these important traits in synthetics. We also developed three multi-parent advanced generation intercross (MAGIC) populations that combined the power of both bi-parental and association analyses to validate and confirm those previously identified genes/loci so that we will apply the knowledge in our next step of designing wheat molecular breeding models. With the next generation genotyping-by-sequencing and whole genome sequencing, we can gather the whole genome loci for superior cultivars at certain chromosome regions and **apply genomic predictions and selections to increase selection efficiency and accuracy.**

I am leading two USDA-NIFA projects currently. One was funded by the International Wheat Yield Partnership (IWYP) as the WheatCAP project, led by Jorge Dubcovsky at UC-Davis, along with 15 other U.S. universities and USDA-ARS centers. **I am leading for the TAMUS subaward as Co-PD to understand the underlining genes that increase kernel weight in TAM 111.** Three PhD students have been trained in this project and we have made great progress in identifying the genes. **The second project was funded by the Foundation program in 2019 to transfer resistance to three pests simultaneously from primary synthetics into the popular cultivar TAM 114, which is led by me as the PD.** We have made doubled haploid lines from a set of nine crosses between TAM 114 and different synthetics. In addition, Bayer CropScience funded two PhD students (supervised and led by me) to demonstrate the private-public collaborative effort in discovering the new genes/loci for better wheat production after the large multi-million collaborative project. Two PhD students under my supervision were awarded the Monsanto Beachell-Borlaug Scholarships although the company only awarded about 11 proposals internationally from many proposals every year from 2011 to 2016.

I led the wheat genetic program and established a medium throughput wheat doubled haploid (DH) developing system. Compared to the traditional breeding procedure to plant winter wheat one generation per year in the field, **this DH system shortens the timeline by three years, allowing us to obtain genetically 100% pure lines for yield trials faster. I have optimized the procedure and integrated the wheat doubled haploid pure line development pipeline into the genetic research and breeding system of TAMUS.** It saves time and money overall since we will release better cultivars to farmers sooner. **We have developed more than 3000 doubled haploid lines from breeding populations from 2018 to 2020. The first set of 500 lines were in yield trials in the field now.** If they were advanced only through the conventional breeding process, lines would require an additional 3 years to become stable lines for yield trials. Many of these 500 DH lines performed very well

in both dryland and irrigated fields and 120 of them were advanced with potentials to be released as germplasm lines or cultivars after intensive yield trials across Texas and surrounding regions.

My wheat genetic program has **developed a high throughput platform for molecular markers linked to those most useful loci in our germplasm pool for breeding and they are being applied in marker-/genomic-assisted breeding. The loci include the resistances to greenbug, hessian fly, wheat curl mite, wheat streak mosaic virus, stripe rust, kernel weight, and better bread-making quality.** These target gene-linked molecular markers have been used by the USDA-ARS genotyping center in Manhattan, KS to genotype breeding lines from the winter wheat regions that include TX, OK, KS, CO and NE. With funding from the Multi-state Hatch project, we have purchased equipment to increase the genetic and genomic high throughput analyzing capacity. Scientific peer-reviewed publications shared all the information about these new high throughput screening markers. **Many wheat breeding programs worldwide are using the markers since these stresses pose major problems in many countries, including the spring wheat regions. These markers greatly increase the target gene selection efficiency and accuracy for germplasm and cultivar development.**

News articles have been published in AgriLife today to educate the public on the importance of molecular technologies in cultivar release and many of them have been broadcasted by other news journals, such as the Southwest Farm Press and Seed Today. We invited Texas Wheat Producer Board members to see how our doubled haploid pipeline was integrated into the breeding process. We also presented our research findings in field days and was invited to discuss with the Texas Wheat Producers Board annual meeting with board members.

2. International impact

In addition to research presentations at the international ASA-CSSA-SSSA meetings held in the U.S., **Our research findings were presented at the international meetings held in other countries, including Australia, Canada, China, Mexico, Spain, and Tunisia.** In the first Wheat Congress in Saskatoon, Canada in July of 2019, I presented research progress for the NIFA project and evaluated student posters on the control of pathogen and pest expert group in wheat Initiative. **I hosted two international Ph.D. students to conduct their thesis research in the wheat genetic lab in Amarillo. One was from Huazhong Agricultural University in Wuhan, China and one was from Hazara University in Manshera, Pakistan.**

I am associate editors of four journals, Crop Science, The Crop Journal, Frontiers in Plant Science, and Frontiers in Genetics; Chair of the ASA-CSSA-SSSA Book and Multi-media Publishing Committee, which are involved with many researchers internationally. **I have helped them to disseminate their research findings to a global audience.** I have also been invited to review proposals from the National Natural Science Foundation of China and The United States-Israel Binational Agricultural Research and Development Fund (BARD). **I have collaborated with wheat scientists in CIMMYT-Kenya, -Turkey and -China, and Kenyan Agricultural Research Institute following Borlaug Legacy. The wheat curl mite screening protocol was requested by many researchers from Australia and Canada. High throughput molecular markers developed for major genes, *Gb3*, *Gb7*, *H32*, and**

mite resistance were requested by the global agricultural company, BASF, to be used for their research worldwide, especially in America and Europe.

Research Profiles

University website: <https://amarillo.tamu.edu/facultystaff/shuyu-liu-ph-d/>

Research gate: https://www.researchgate.net/profile/Shuyu_Liu3

Google scholar: <https://scholar.google.com/citations?user=sw1nRIYAAAAJ&hl=en>

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