

JAGDEEP SINGH SIDHU

Graduate Research Assistant, Department of Plant Science,
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EDUCATION:

M.Sc. [South Dakota State University (SDSU), Brookings, SD, USA.] *May 2018*

- Specialization: Plant breeding and genetics.
- Master's thesis: "Exploiting the diversity of wild ancestors and relatives of wheat."
- Major Advisor: Dr. Sunish Sehgal
- Grade Point Average: 3.82/4.0

B.Sc. Agriculture [Honors] [Punjab Agricultural University (PAU), Ludhiana, India]. *June 2015*

- Major: Plant Breeding, genetics, and biotechnology
- Grade Point Average: 3.99/4.0

RESEARCH EXPERIENCE:

Graduate Research Assistant – SDSU, Brookings. *Aug 2015 – current*

- Evaluated a minicore set of tetraploid wheat (*Triticum turgidum* spp.) for valuable agronomic traits and biotic stress tolerance. Developed Synthetic Hexaploid wheat lines
- Analyzed genetic and geographic diversity in a global collection of rye and mapped tan spot resistant loci using GWAS
- Conducted a wheat – diazotroph interaction study and identified wild emmer (*Triticum dicoccoides*) and wild einkorn (*Triticum boeoticum*) lines with an efficient association with diazotrophs (N₂ fixing bacteria)

Winter Wheat breeding program – SDSU, Brookings. *Aug 2015 – current*

- More than 800 hrs. field work experience from planning, planting, recording phenotypic observations, harvesting of winter wheat breeding trials and further analysis
- Selection for best plants in segregating generation.

Undergrad – PAU, Ludhiana, India. *Aug 2009 – June 2015*

- Practical training for embryo culture of rice and micropropagation of sugarcane.
- Internship with Dr. Johar Singh Saini: Wet lab basic molecular techniques
- Internship with Dr. Dharminder Pathak: Confirmation of cotton tetraploid synthetics using SSR markers

Family Farming Operation - Bathinda, Punjab, India.

- Crop production: Wheat, Rice, Potato, vegetables, and fodder

TEACHING:

- Teaching assistant with Dr. Marie A. C. Langham: Lab for Plant Science 223 – Principles of Plant Pathology Laboratory (Fall 2016)

STANDARDIZED TEST SCORES:

- GRE (Aug 7th, 2014)
310/340 ; Quantitative: 158/170 (69th percentile); Verbal : 152/170 (56th percentile); Analytical Writing : 2.0/6.0 (2nd percentile)
- TOEFL (November 8th, 2014)
103/120 ; Reading : 29/30; Listening : 24/30; Writing : 27/30 ; Speaking : 23/30

PUBLICATIONS:

- Ayana, G. T., Ali, S., **Sidhu, J. S.**, Gonzalez-Hernandez, J. L., Turnipseed, B., and Sehgal, S. K. (2018). “Genome-Wide Association Study for Spot Blotch Resistance in Hard Winter Wheat.” *Front. Plant Sci.* 9, 926. (link)
- **Sidhu, J.S.**, Ramakrishnan, S.M., Ali, S., Bernardo, A., Bai, G., Abdullah, S., Ayana, G., Sehgal, S.K., 2019. Assessing the genetic diversity and characterizing genomic regions conferring Tan Spot resistance in cultivated rye. *PLoS One* 14, e0214519. (link)
- Ramakrishnan S*, **Sidhu J.S***, Kaur N., Ali S., Sehgal S. (2018) “*Genome wide association mapping of Bacterial leaf streak resistance in Winter Wheat.*” (Under review – PeerJ)
*Equal contribution
- Gill, H.S., Li, C., **Sidhu, J.S.**, Liu, W., Wilson, D., Bai, G., Gill, B.S., Sehgal, S.K., (2019) “*Fine mapping of wheat leaf rust resistance gene Lr42.*” (Under review – *IJMS*)
- Qiu Y., Gu L., Gibbons J., Gonzalez-Hernandez J., **Sidhu J.S.**, Zhou R. (2019) “*Developmentally Regulated Genome-size Reduction Editing in Nitrogen-Fixing Heterocysts of Anabaena cylindrica ATCC 29414.*” (In preparation)
- **Sidhu J.S.**, Ramakrishnan S., Sehgal S. (2016) “*Capturing the genetic diversity of wild ancestors of bread wheat.*” Annual Meeting of ASPB Midwestern Section, Brookings, SD, USA. (Poster)
- **Sidhu J.S.**, Ramakrishnan S., Sehgal S., Ali S., Bai G., Abdullah S. (2016) “*Assessing diversity in rye (Secale cereale L.) and its potential for crop improvement.*” ASA, CSSA, and SSSA International Annual Meeting, Phoenix, AZ, USA. (Poster)
- Ramakrishnan S., **Sidhu J.S.**, Kaur N., Ali S., Sehgal S. (2017) “*Association Mapping of Bacterial leaf streak in Winter Wheat.*” International Plant & Animal Genome XXVI, San Diego, CA, USA. (Poster)

AWARDS:

- Best poster in the “*third SDSU Edgar S. McFadden Symposium poster contest*” (May 2, 2018).

- Third place in “SDSU Three Minute Thesis (3MT®) Competition” (February 6th, 2018).
- Received honorable mention in CSSA 2017 annual photo contest.
- Third place in “Gamma Sigma Delta Honor Society of Agriculture Poster Contest” (April 3rd, 2017)
- Travel award at “Field-based High Throughput Phenotyping” University of Arizona Maricopa Agricultural Center Maricopa, AZ, USA (March 13-17, 2017)
- Third place in “SDSU Three Minute Thesis (3MT®) Competition” (February 7th, 2017).
- Graduate Student Leadership Award at ASA, CSSA and SSSA International Annual Meeting, Phoenix, AZ, USA (Nov 6-9, 2016)
- “Sr. Gurdit Singh Kang Scholarship” for session 2011-2015 (Single student per batch)
- “Tagra and Batra Scholarship” for session 2010-2011 (Single student per batch)
- “University Merit Scholarship” for session 2009-2010 (Top 10 students per batch)

TRAINING AND WORKSHOPS

- *Demo writing* of exploratory research proposal to Agriculture and Food Research Initiative Competitive Grants Program (2017). Title: *Genetic variability in wheat for an efficient association with diazotrophic microbiota and N-absorption.*
- “Field-based High Throughput Phenotyping” University of Arizona Maricopa Agricultural Center Maricopa, AZ, USA (March 13-17, 2017)
- “Nitrogen: at the nexus between food security and sustainability, a virtual symposium” Samuel Roberts Noble Foundation and Washington State University, USA (March 8-9, 2017)
- “BioSNTR Bioinformatics Workshop” University Center, Sioux Falls (May 10-11, 2016)
- “National Symposium on Agricultural Diversification for Sustainable Livelihood and Environment Security” Indian Society of Agronomy, IARI, New Delhi and Punjab Agricultural University, Ludhiana (November 18-20, 2014)

RESEARCH SKILLS:

Genetics:

- Gene mapping: Biparental mapping and GWAS (*Mapmaker, QTL cartographer, TASSEL, and GAPIT*)
- Cytogenetics: Karyotyping, chromosome staining, and FISH
- Phylogenetic analysis: NGS data based phylogenetic trees (*iTOL and Mega*)
- Diversity analysis: Cluster defining and mini core extraction (*Structure and Powercore*)

Plant breeding:

- Wide hybridization: Synthetic Hexaploid Wheat and Triticale
- High throughput phenotyping: Spectrophotometer, IRT, laser and ultrasonic distance sensor. Geotagging using RTK gps. (*Agisoft, QGIS, and Imagej*)
- Disease screening: Fungal (Stripe rust, leaf rust, and tan spot) and Bacterial (BLS)
- Tissue culture: Embryo rescue, tiller culture, and micro propagation

Bioinformatics:

- NGS based DNA and RNA assemblies (*CLC workbench and MUMMER*)
- *Ab initio* (*FGENESH and HMMER*) and extrinsic gene prediction (*BLAST and TopHat*)

- Genome wide comparison (*Circos and MUMMER*)
- Differential gene expression analysis (*Cyverse*).

Plant – microbe interaction:

- Wheat – diazotrophic interactions
- N¹⁵ dilution technique
- Mass spectroscopy
- Root phenotyping for root hair density and root angle

Computational:

- Programming languages: R and python
- Operating system: Linux, Windows and Mac OS

PROFESSIONAL MEMBERSHIPS:

- Plant Science Graduate Student Association, SDSU (2016 - Present) – Vice President
- Crop Science Society of America (2015 - Present) - Graduate Student Member
- American Society of Plant Biologist (2015 - 2016) – Graduate Student Member

REFERENCES:

Dr. Sunish Sehgal (sunish.sehgal@sdstate.edu)

Assistant Professor

South Dakota State University

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Dr. Shaukat Ali (shaukat.ali@sdstate.edu)

Associate Professor

South Dakota State University

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Dr. Darshan Singh Brar (darshanbrar@pau.edu)

Adjunct Professor of Biotechnology,

Punjab Agricultural University.

Former Head of Plant Breeding, Genetics and Biotechnology Division,

IRRI, Philippines

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