## Jagdeep S. Sidhu


CONTACT INFORMATION

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EDUCATION

**The Pennsylvannia State University (PSU)**, University Park, PA, USA

Ph.D., Plant Science, Minor - Statistics, ABD - March 2023

- Dissertation: *Climate change resilient roots: exploring root phenes regulating root metabolic cost*
- Advisor: Dr. Jonathan Lynch
- GPA: 4.00

**South Dakota State University (SDSU)**, Brookings, SD, USA

M.S., Plant Science, June 2018

- Thesis: *Exploiting the genetic diversity of wild ancestors and relatives of wheat for its improvement*
- Advisor: Dr. Sunish Sehgal
- GPA: 3.82

**Punjab Agricultural University (PAU)**, Ludhiana, PB, India

B.S., Agriculture, June 2015

- Major: *Plant Breeding, Genetics, and Biotechnology*
- Advisor: Ravinder K. Dhaliwal
- GPA: 3.99

WORK EXPERIENCE

**Graduate Research Assistant**, The Pennsylvania State University — 2018 to present
Department of Plant Science

- **Lynch Lab farm coordinator:** managed the field experiments for the Lynch lab researchers (>10) at Russell E. Larson Agricultural Research Center.

**Graduate Research Assistant**, South Dakota State University — 2015 to 2018
Department of Plant Science

- **Student lead:** managed the breeding trails for SDSU Winter wheat breeding team and helped release 2 high yielding varieties.

AWARDS AND FELLOWSHIPS

**GRANTS**

- *CAS Graduate Student Competitive Grants Program, PSU*. PI: **Sidhu JS** & Lynch JP. Project: Deciphering how cell size regulates the metabolic cost. $3000
- *Annei's Sustainable Agriculture program*. PI: **Sidhu JS** & Sehgal SK. Project: Exploiting wild relatives of wheat for nitrogen fixation. not awarded $1000

**EXTERNAL AWARDS**

- 2022 **Best poster/ rapid talk** in the C08 - Plant germplasm division of the Crop Science Society of America annual conference $250
- 2022 **Gerald O. Mott Award** by the American Society of Agronomy.
- 2019 **AASIO Outstanding Agricultural Graduate Student Award** by the Association of Agricultural Scientists of Indian Origin. $1000
- 2018 **Best poster** at the third SDSU Edgar S. McFadden Symposium poster contest. $100
- 2017 **Travel award at Field-based High Throughput Phenotyping Workshop** by The University of Arizona. $500
- 2016 **Graduate Student Leadership Award** at ASA, CSSA, and SSSA International Annual Meeting.

**INTERNAL AWARDS**

- 2021 **Paul Hand Award for Graduate Student Research Achievement** by the College of Agricultural Sciences, PSU. $1000
- 2018-2022 **Walter Thomas Memorial Scholarship** by the College of Agricultural Sciences, PSU. $2000
- 2018 **Third place in the SDSU Three Minute Thesis (3MT®) Competition** by SDSU. $100
- 2017 **Third place in Gamma Sigma Delta Honor Society of Agriculture Poster Contest** by SDSU. $50
- 2011-2015 **Gurdit Singh Kang Scholarship for merit** by PAU. $200
- 2010-2011 **Tagra and Batra Scholarship for merit** by PAU. $200
- 2009-2011 **University Merit Scholarship** by PAU. $200

## TEACHING EXPERIENCE

**Head Teaching Assistant**, The Pennsylvania State University — Fall, 2020-2022
HORT 402: Plant Nutrition

**Graduate Teaching Assistant**, The Pennsylvania State University — Fall, 2018-2019
AGRO 28: Principles of crop management

**Graduate Teaching Assitant,** South Dakota State University — Fall, 2016
PS 223: Principles of Plant Pathology

## MENTORING SUPERVISION

Mentored one visiting scholar and five undergraduate students (including two women and two persons of color). Out of five undergrads, one is pursuing MS, three are research assistants and one is currently working with me. For more details please visit: **Jagdeepideas.com/teaching**

## INVITED TALKS

[1] Invited seminar speaker (2022) at the Department of Plant Science, University of British Columbia, Canada

[2] Graduate Keynote Speaker for the Scholarship and Awards Celebration (2022) organized by College of Agriculture, The Pennsylvania State University, USA

[3] Speaker for the Center for Root and Rhizosphere Biology seminar (2022) at The Pennsylvania State University, USA

[4] Speaker at Graduate Student Competitive Grants Workshop (2021) organized by College of Agriculture, The Pennsylvania State University, USA

[5] Lecturer for INTAG 100 (International Agriculture), The Pennsylvania State University, USA (Fall 2018, Spring 2019).

[6] Invited seminar speaker (2018) at the Department of Plant breeding and genetics, Punjab Agricultural University, India.

## CONFERENCE TALKS

[1] **Sidhu JS**, Walker S, Lopez-Valdivia I, Gill HS, Ajmera I, Rangarajan H, Sehgal S, & Lynch JP (2022) Ploidy regulates root metabolic cost. ASA, CSSA, and SSSA International Annual Meeting, Baltimore, MD, USA.

[2] **Sidhu JS**, Lopez-Valdivia I, Schneider H, Strock C, & Lynch JP (2022) Root cortical cell wall thickness regulates root metabolic cost in Maize. ASA, CSSA, and SSSA International Annual Meeting, Baltimore, MD, USA.

[3] **Sidhu JS**, Schneider H, Strock C, & Lynch JP. Root cortical cell wall thickness regulates root metabolic cost in Maize (2021) 11th Symposium of the International Society of Root Research, Columbia, Missouri, US.

[4] **Sidhu JS**, Ramakrishnan SM, Ali S, Bai G, Abdullah S, & Sehgal SK (2017) Accessing diversity in rye (*Secale cereale* L.) and its potential for crop improvement. Gamma Sigma Delta Honor Society of Agriculture Poster Contest, College of Agricultural and Biological Sciences, South Dakota State University, SD, USA.

[5] Ramakrishnan SM, **Sidhu JS**, Kaur N, Ali S, Sehgal SK (2017) Association Mapping of Bacterial leaf streak in Winter Wheat. International Plant & Animal Genome XXVI, San Diego, CA, USA.

[6] **Sidhu JS**, Ramakrishnan SM, Sehgal SK (2016) Capturing the genetic diversity of wild ancestors of bread wheat. Annual Meeting of ASPB Midwestern Section, Brookings, SD, USA.

[7] **Sidhu JS**, Ramakrishnan SM, Ali S, Bai G, Abdullah S, Sehgal SK (2016) Accessing diversity in rye (*Secale cereale* L.) and its potential for crop improvement. ASA, CSSA, and SSSA International Annual Meeting, Phoenix, AZ, USA.

## Manuscripts in Preparation

[1] **Sidhu JS**, Schneider HM, Strock CF, Lopez-Valdivia I & Lynch JP. Cortical cell wall thickness regulates root metabolic cost and improves plant performance under drought stress

[2] **Sidhu JS** & Lynch JP. Cortical cell size regulates root metabolic cost

[3] **Sidhu JS**, Walker SC, Lopez-valdivia I, Gill HS, Rangarajan H, Sehgal SK, & Lynch JP. Polyploidy induced root anatomical changes impact plant performance under edaphic stress conditions

[4] **Sidhu JS**, Strock CF, & Lynch JP. Pleitrophy of root and shoot anatomical traits

[5] Strock CF, **Sidhu JS**, Depew CL, & Lynch JP Variation in perforation plates affects water use in maize (*Zea mays* L.) under drought stress

## Publications in Peer-Review

[6] **Sidhu JS**, Ajmera I, Arya S, & Lynch JP. (2022) RootSlice: a novel functional-structural model for root anatomical phenotypes. bioRxiv. DOI: https://doi.org/10.1101/2022.06.29.498145

[7] Qiu Y, Gu L, Shengni T, **Sidhu JS**, Gibbons J, Van Den Top T, Gonzalez-Hernandez J, & Zhou R. (2019) Developmentally Regulated Genome-size Reduction Editing in Nitrogen-Fixing Heterocysts of Anabaena cylindrica ATCC 29414. bioRxiv. 629832. DOI: https://doi.org/10.1101/629832

## Refereed Journal Publications

[8] Lynch JP, Strock CF, Schneider HM, **Sidhu JS**, Ajmera I, Galindo-Castañeda T, Hanlon MT. (2021) Root anatomy and soil resource capture. Plant and Soil. 466(1): 21-63. DOI: https://doi.org/10.1007/s11104-021-05010-y

[9] Vanhees DJ, Schneider HM, **Sidhu JS**, Loades KW, Bengough AG, Bennett MJ, & Lynch JP. (2021) Soil penetration by maize roots is negatively related to ethylene-induced thickening. Plant, Cell & Environment. 45(3): 789-804. DOI: https://doi.org/10.1111/pce.14175

[10] Al Tameemi R, Gill HS, Ali S, Halder J, **Sidhu JS**, Ayana G, Gill US, Turnipseed B, Gonzalez Hernandez JL, Sehgal SK. (2021) Genome-wide association analysis permits characterization of Stagonospora nodorum blotch (SNB) resistance in hard winter wheat. Scientific Reports. 11(1). DOI: https://doi.org/10.1038/s41598-021-91515-6

[11] Lin P, Chen Y, Chaverra-Rodriguez D, Heu CC, Zainuddin NB, **Sidhu JS**, Peiffer M, Tan C, Helms A, Kim D, Ali A, Rasgon JL, Lynch JP, Anderson CT, & Felton GW. (2021) Silencing the alarm: an insect salivary enzyme closes plant stomata and inhibits volatile release. New Phytologist. 230(2): 793-803. DOI: https://doi.org/10.1111/nph.17214

[12] Schneider HM, Strock CF, Hanlon MT, Vanhees DJ, Perkins AC, Ajmera IB, **Sidhu JS**, Mooney SJ, Brown KM, & Lynch JP. (2021) Multiseriate cortical sclerenchyma enhance root penetration in compacted soils. Proceedings of the National Academy of Sciences. 118(6): e2012087118. DOI: https://doi.org/10.1073/pnas.2012087118

[13] Burridge JD, Black CK, Nord EA, Postma JA, **Sidhu JS**, York LM, & Lynch JP. (2020) An analysis of soil coring strategies to estimate root depth in maize (Zea mays) and common bean (Phaseolus vulgaris). Plant Phenomics. DOI: https://doi.org/10.34133/2020/3252703

[14] **Sidhu JS***, Singh D*, Gill HS*, Brar, NK, Qiu Y, Halder, J, Al Tameemi R, Turnipseed B, & Sehgal, SK. (2020) Genome-Wide Association Study Uncovers Novel Genomic Regions Associated With Coleoptile Length in Hard Winter Wheat. Frontiers in Genetics. 10:1345.DOI: https://doi.org/10.3389/fgene.2019.01345 *Equal contribution

[15] Halder J, Zhang J, Ali S, **Sidhu JS**, Gill HS, Talukdar SK, Kleinjan J, Turnipseed B, & Sehgal SK. (2019) Mining and genomic characterization of resistance to tan spot, Stagonospora nodorum blotch (SNB), and Fusarium head blight in Watkins core collection of wheat landraces. BMC Plant Biology. 19(1): 1-15. DOI: https://doi.org/10.1186/s12870-019-2093-3

[16] Gill HS, Li C, **Sidhu JS**, Liu W, Wilson D, Bai G, Gill BS, & Sehgal SK. (2019) Fine mapping of wheat leaf rust resistance gene Lr42. International journal of molecular sciences. 20(10): 2445. DOI: https://doi.org/10.3389/fgene.2019.01345

[17] **Sidhu JS**, Ramakrishnan SM, Ali S, Bernardo A, Bai G, Abdullah S, Ayana G, & Sehgal SK. (2019) Assessing the genetic diversity and characterizing genomic regions conferring Tan Spot resistance in cultivated rye. PLoS One. 14: e0214519. DOI: https://doi.org/10.1371/journal.pone.0214519

[18] Ramakrishnan SM, **Sidhu JS***, Ali S, Kaur N, Wu J, & Sehgal SK. (2019) Genome wide association mapping of Bacterial leaf streak resistance in Winter Wheat. PeerJ. 7: e7276. Sidhu JS and Ramakrishnan contributed equally to this work. DOI: http://doi.org/10.7717/peerj.7276 *Equal Contribution

[19] Ayana GT, Ali S, **Sidhu JS**, Gonzalez-Hernandez JL, Turnipseed B, & Sehgal SK. (2018) Genome-Wide Association Study for Spot Blotch Resistance in Hard Winter Wheat. Frontiers in Plant Science. 9: 926. DOI: https://doi.org/10.3389/fpls.2018.00926

## Professional Service

**Professional Society Service**

- *Founding member*, Punjab Association for AgroEcosystem Health and Longevity (PAEHL) (2021).
- *Judge* at the ASA, CSSA and SSSA International Annual Meeting for a poster session on Research and Development of Precision Agriculture Tools for Agriculture Sustainability Oral (2018).
- *Vice president*, Plant Science Graduate Student Association, SDSU (2017).

**Referee Service**: Reviewed >10 articles for

- *Annals of Botany*
- *Plant and Soil*
- *Frontiers in genetics*
- *Plant Signaling & Behavior*

PROFESSIONAL MEMBERSHIPS

- Association of Agricultural Scientists of Indian Origin (2016 - Present)
- Crop Science Society of America (2015 - Present)
- American Society of Plant Biologists (2015 - 2016)

MEDIA

Multiple peer reviewed publications and awards have been covered by local and national news outlets. For example: "Newly discovered trait helps plants grow deeper roots in dry, compacted soils" covered by Science Daily. For more details please visit: **jagdeepideas.com/Media**

REFERENCES

- **Dr. Jonathan Lynch**, *University Distinguished Professor*, Department of Plant Science, PSU, Email: jpl4@psu.edu; Phone: (814) 863-2256; Relationship: Mentor, Major Advisor in Ph.D., and Teaching Supervisor.
- **Dr. Sunish Sehgal**, *Associate Professor*, Department of Plant Science, SDSU, Email: sehgal.sunish@sdstate.edu; Phone: (605) 688-5709; Relationship: Mentor and Major Advisor in MS.
- **Dr. Armen Kemanian**, *Professor of Production Systems and Modelingt*, Department of Plant Science, PSU, Email: kxa15@psu.edu; Phone: (814) 863-9852; Relationship: Ph.D. committee member, and Teaching Supervisor