

SAJJAD RAO, Ph.D., P. Ag.

Contact Information:

Russ Edwards School of Agriculture and Environment

Assiniboine College, Brandon, Manitoba. Canada.

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ACADEMIC DEGREES

Doctor of Philosophy 1994-1997

Agricultural Sciences, The University of Liverpool, England, United Kingdom

Master of Science (Honours) 1989-1990

Plant Breeding & Genetics, University of Agriculture, Faisalabad, Pakistan.

Bachelor of Science (Honours) 1984-1988

Agriculture, University of Agriculture, Faisalabad, Pakistan.

SPECIALIZED EDUCATION/TRAININGS

Certificate in Adult Education 2014-2016

Red River College, Winnipeg Manitoba, Canada

Ministry of Education, Govt. of Manitoba, Canada

Licensed Seed Crop Inspector 2013-2013

Canadian Food Inspection Agency, Canada

Certificate Problem-Based Learning 2012-2012

Assiniboine College, Brandon, Manitoba, Canada

Training Certificate in Supervisor Essentials 2012-2012

Assiniboine College, Brandon, Manitoba, Canada

PROFESSIONAL DISCIPLINES

ACADEMICS: Strategic Planning & Curriculum Development, Program Development, Student Access & Success, Academic-Research-Industry Partnership, Hands-on Technology-Based Learning, Accreditation and Articulation of Programs.

RESEARCH & INNOVATION: Climate Changing Agriculture, Digital Agriculture Technology, Controlled Environment Agriculture, Passive Solar Greenhouse Technology, Sustainable Innovations, Novel Crop Genetics Development, Crop Diversification, Technology Commercial Acceptance.

PROJECT/MANAGEMENT: Community Economic Development, People & Project Management, Team Building, Mentoring, Capacity Building, Coordination & Collaboration, Grant Management.

EMPLOYMENT SUMMARY

Research Faculty	Assiniboine College, Canada	(2011- Present)
Adjunct Professor	Brandon University, Canada	(2013-2016)
Consultant Plant Breeder	Ag-Quest Inc. Minto MB Canada	(2011-2014)
Plant Breeder-Research Scientist	Ag-Quest Inc. Minto MB Canada	(2010-2011)

ACADEMIC KNOWLEDGE TRANSLATION *(Last 10 Years)*

ACADEMIC PROGRAM DEVELOPED:

1: Sustainable Food Systems

School: Russ Edwards School of Agriculture and Environment, Assiniboine College.

Program Description: The Advanced Diploma in Sustainable Food Systems emphasizes innovation in food production, food security, and post-harvest management. This program equips graduates to address the aforementioned issues in creative and innovative ways through hands-on industry- and community-responsive projects that are integrated into the proposed curriculum through both formal course work and guided independent study. Unique / innovative characteristics: • Classroom training integrated with hands-on lab, greenhouse and field experience • Work practicum • Research opportunities with Professors/Instructors/Researcher • Reflect advances in knowledge and anticipate emerging provincial and national needs.

2: Horticultural Production

School: Russ Edwards School of Agriculture and Environment, Assiniboine College.

Program Description: In this certificate program, student understanding of food production will evolve. Focusing on three key sectors—fruits and vegetables, greenhouse productions, and nurseries—your view of food and the skills required for a bountiful harvest will be transformed. Unique / innovative characteristics: • Classroom training integrated with hands-on lab, greenhouse and field experience • Work practicum • Program focus on food production.

POST-GRADUATE EXAMINER *(Last 10 Years)*

External Examiner-PhD. Thesis: (2024) Aliya Errum, Quaid-I-Azam University

External Examiner-PhD. Thesis: (2023) Safeena Inam, Quaid-I-Azam University

External Examiner- PhD. Thesis: (2019) Abdul Aziz Mirani, Shah Abdul Latif University

External Examiner- PhD. Thesis: (2019) Tahira Jatt, Shah Abdul Latif University Khairpur

External Examiner- PhD. Thesis: (2018) Khalil Ahmad Ansari, Shah Abdul Latif University Khairpur

External Examiner- PhD. Thesis: (2015) Wazir Ali Maitlo, Agriculture, Shah Abdul Latif University Khairpur

External Examiner- PhD. Thesis: (2014) Ameer Ahmed Mirbahar, Shah Abdul Latif University Khairpur

PUBLIC EDUCATION *(last 10 years)*

Invited Speaker: 2023. “Next Generation Greenhouse Farming”-A Productive and Lucrative Agribusiness Venture-Growing crops and vegetables in a sustainable greenhouse technology in colder climates, protecting crops from extreme weather conditions and from certain pests. @Manitoba Ag Days (**Canada**). Jan 19, 2023. Canada’s Largest Indoor event showcasing every aspect of agricultural production expertise, technology and equipment.

Panelist Speaker: 2022. “WATER & WASTEWATER USAGE” at CULTIVATE Sustainability Conference and Trade Show. September 7, 2022 RBC Convention Centre, Winnipeg, Manitoba, **Canada**.

Invited Lecture: 2021 NAMAL University-Agribusiness Seminar- *Advancing Agriculture to Agri-Business Learning and Innovation*, October 12, 2021

Invited Speaker/Presenter: 9th North American Strawberry Symposium. **Orlando, USA:** Feb 4, 2019.

Invited Speaker Agriculture in the Classroom”. Richardson Farm, Winnipeg, Manitoba, **Canada**: October 25, 2019.

Invited Speaker 2018 Direct Farms Marketing Conference. Brandon, Manitoba, Canada: Feb 10, 2018.

Invited Speaker/Presenter: “Impact of solar energy on greenhouse climate and crop production” GreenSys2017-International Symposium on New Technologies for Environment Control, Energy-Saving and Crop Production in Greenhouse and Plant Factory. **Beijing, China**: August 22, 2017.

Invited Speaker “Effect of Solar Energy on Greenhouse Crop Production” Western Canada Cleantech Innovation Forum. Winnipeg, Manitoba, **Canada**: November 29-30 2017.

Co-organizer and Invited Speaker Field to Fork Symposium. Establishing a Food Security for Rural and Remote Communities Research Network. **Manitoba, Canada**: March, 2016 & 2017.

RESEARCH AND INNOVATION

ORIGINAL PUBLICATIONS: (Full Paper)

Singh, P., **Rao, S.**, Bisht, V., and Gonsalves, T. (2023). Direct-seeded versus transplanted onions: Varietal Performance in Canadian Prairies. *International Journal of Vegetable Science* (under review).

Singh, P. and **Rao, S.** (2024). Effect of curing methods on *Botrytis* neck rot disease of onions in the Canadian prairies. *Acta Horticulturae*. 1398, 171-178. <https://doi.org/10.17660/ActaHortic.2024.1398.23>

Rao, S.A and Singh, P. (2023)., Sustainable Passive Solar Greenhouses: A viable option for propagating sweet potato (*Ipomoea batatas* L.) slips for colder climate regions. *Sustainable Agriculture Research* Vol. 13, # 1.pp 50-60. DOI:[10.5539/sar.v13n1p50](https://doi.org/10.5539/sar.v13n1p50)

Rao, S.A., Hendricks B., Gray A. and Singh P (2022). Culinary Treatments Affect Sensory Attributes and Consumer Preference for Sweet Potato Cultivars. *J. of Food Research*. Vol. 12 (1). p1-8. DOI:[10.5539/jfr.v12n1p1](https://doi.org/10.5539/jfr.v12n1p1)

Rao, S.A., Singh, P and Gonsalves, T. (2022). Black plastic mulch affects soil temperature and yield of sweet potato under short season temperate climates. *International Journal of Vegetable Science*. DOI: [10.1080/19315260.2022.2111625](https://doi.org/10.1080/19315260.2022.2111625)

Rao, S. A. (2022): Impact of planting dates on yield and pod quality traits of snap bean under short-temperate season climates. *International Journal of Horticultural Science* 28: 57-63. <https://doi.org/10.31421/ijhs/28/2022/110542020>

Rao, S.A., Mintenko, A., Abbey, L. and Sing, P. (2019). Wintering index and yield traits for early, mid and late season strawberry for colder climates. *Int. J. of Fruit Science*. 20:2, 151-158. <https://doi.org/10.1080/15538362.2020.1774471>

Rao, S.A., Abbey, L. and Khakbazan, M. (2018). Impact of solar energy on greenhouse climate and crop production. *Acta Hortic*. 1227, 151-158. DOI: <https://doi.org/10.17660/ActaHortic.2018.1227.18>

Abbey L., **Rao, S.A.** 2018). “Differential response of plant species to greenhouse microclimate created by design technology and ambient conditions”. *Canadian Journal of Plant Science*, 98: 1–9 (2018). <https://doi.org/10.1139/cjps-2016-0419>.

Rao H., Kauser N., Mirbahar A. A., Kazmi S. K., Khan S. **Rao, S.A.** (2016). “Detection of GM contamination in IRRI-6 variety of rice (*Oryza sativa* L.) grown in Pakistan”. *Int. J. Biotech.*, 13 (4) 523-527.

Abbey L., **Rao, S.A.**, Hodgins L.N and Breit F. (2012). “Drying and rehydration of vermicasts do not affect nutrient bioavailability and seedling growth”. *American J. Plant Nutrition and Fertilization Technology*, 3(1) 12-21.

Akram A., Khan A.I., Awan F.S., Rehman A., Ahmad F., Malik A and **Rao, S.** (2012) “Genetic diversity in Indian Sub-Continental landrace cultivars of the genus *Triticum* L”. *African Journal of Biotechnology* 11(44), pp. 10170-10175.

Muhammad R.W., Anjum R., Liaquat S., Qayyum A., Malik W., Murtaza N., Hussain M., Ahmed B., **Rao S. A.**, and Noor E. Numerical evaluation of local and exotic maize genotypes in arid conditions. *J. Food, Agriculture & Environment* 10: (1) 624-630.

Sohail M. I., **Rao, S.A** and Javaid A. (2006) “Evaluation of hybrid corn (*Zea mays* L)”. *Int. J. Biol. Biotech.*, 3 (2): 391-397.

Khan A.A., **Rao, S.A** and McNeilly T. (2003) “Assessment of salinity tolerance based upon seedling root growth response functions in maize (*Zea mays* L)”. *Euphytica* 131: 81-89.

Rao, S.A and McNeilly T. (1999). “Genetic basis of salt tolerance in maize (*Zea mays* L)”. *Euphytica* 108: 145-150.

Rao, S.A., Khan M. A. and Khan A.A. (1997). “Cause and effect relation of yield and yield component in rice”. *J. Genetics and Breeding* 51: 1-5

Khan A.A., **Rao, S.A**, and Ali, A. (1997). “Estimation of genetics components of variation through diallel analysis of cotton fiber and seed properties”. *J. Genetics and Breeding* 51: 143-147.

RESEARCH CONTRIBUTIONS: (Last 10 Years)

Project #1: (2021): Established and advanced efficient and economical technical growing methodology for producing slips under modified passive solar greenhouse settings that ensure optimum success. **Practical Application:** Slip production methodology under modified passive solar greenhouse settings will provide Canadian seed businesses/propagators an economically feasible process to grow sweet potato slips commercially in greenhouse systems with modified passive solar settings. Using this methodology, local slip producers can provide a higher quality product for growers, impacting crop success and improve yield resulting in further economic gain. Furthermore, local growers will have added control over the availability and quality of planting material. Outcomes published in following Journal/s. Rao, S.A and Singh, P. (2023)., Sustainable Passive Solar Greenhouses: A viable option for propagating sweet potato (*Ipomoea batatas* L.) slips for colder climate regions. Research outcome accepted for publication in *Sustainable Agriculture Research Vol. 12 (3)*. DOI:[10.5539/sar.v13n1p50](https://doi.org/10.5539/sar.v13n1p50).

Project # 2: (2018): Developed sustainable passive solar greenhouse technology and created a strong link between the sustainable management of natural resources like utilizing solar energy into different forms, to supplement the lighting in a low-tech passive greenhouse model in addition to heating and crop production practices for sufficient and nutritious food to remote communities. **Practical Application:** The finding from this research is practically applied at Seven Oaks School Division, a new sustainable greenhouse project almost completed; and a sustainable greenhouse project in place with Nisichawayasihk Cree First Nation, based in Nelson House; Peguis First Nation & Waywayseecappo First Nation. Outcomes published in following Journal/s. Rao, S.A., Abbey, L. and Khakbazan, M. (2018). Impact of solar energy on greenhouse climate and crop production. *Acta Hort.* 1227, 151-158. DOI: 10.17660/ActaHortic.2018.1227.18. Abbey L., Rao, S.A. (2018). "Differential response of plant species to greenhouse microclimate created by design technology and ambient conditions". Research outcome published in *Canadian Journal of Plant Science*, 98: 1–9 (2018). <https://doi.org/10.1139/cjps-2016-0419>

Project # 3: (2020): Identified strawberry varieties having better wintering index for production in colder climates. Research published in *International Journal of Fruit Sciences*. **Practical Application:** Research provides strawberry genetic diversity among the early, mid, and late cultivars, and gives growers a selection of new cultivars with better plant and berry traits that are more suitable to specific environmental conditions. Outcomes published in following Journal/s. Rao, S.A., Mintenko, A., Abbey, L. and Singh, P. (2020). Wintering index and yield traits for early, mid and late season strawberry for colder climates. Research outcome published in *International Journal of Fruit Sciences*. 20:2, 151-158. <https://doi.org/10.1080/15538362.2020.1774471>

Project # 4: (2019): Established a successful research program in crop diversification by commercializing new and novel genetics "Radiance" sweet potato in Canadian Prairies cropping production systems. **Practical Application:** In 2020, vegetable growers started sweet potato commercial production started in Manitoba. This research helped local vegetable growers to take advantage of locally developed superior sweet potato varieties, resulting in higher marketable yields. Outcomes published in following Journal/s. Rao, S.A., Singh, P and Gonsalves, T. (2022). Black plastic mulch affects soil temperature and yield of sweet potato under short season temperate climates. Research outcome published in *International Journal of Vegetable Science*. DOI: [10.1080/19315260.2022.2111625](https://doi.org/10.1080/19315260.2022.2111625)

Project # 5: (2013): Developed general purpose spring wheat variety "WFT 603" for western Canadian growers. Canadian Food Inspection Agency registered #7458. The development of "WFT 603" wheat variety for Canadian Prairies is among my novel accomplishments from my crop genetic improvement program, followed by "WFT 1001" a General-Purpose wheat for Canadian Prairies for wheat growers. **Practical Application:** Western growers are currently growing WFT603 wheat as a value-added variety for their growing conditions, as WFT 603 offers improved *Fusarium* head blight disease resistance. Rated as "resistant" to leaf and stem rust, with "good resistance" to common bunt, and "intermediate" resistance to loose smut plant diseases. *Research outcomes published in Canadian Food Inspection Agency (2014). Plant varieties, Plant Breeder Rights. Wheat (Triticum aestivum) WFT603. Registration # 7458. Breeder: Sajjad Rao. <https://active.inspection.gc.ca/netapp/reqvar/reqvare.aspx?id=4979>*

E-MEDIA PUBLICATIONS & EXTENTION:

Print Media Online Magazine/print News

- 2024 "Warmer summers could mean new plants growing in Manitoba, says Sajjad Rao | CBC News Canada" May 12 2024. [CBC News Link](#)
- 2024 "Advancing horticulture production through research and education". Greenhouse Canada magazine, January 11, 2024. Page 16-19. <https://www.greenhousecanada.com/advancing-horticulture-production-through-research-and-education/>
- 2021 "Warm oasis under glass-photo essay". The Western Producer, Canada. Feb 25, 2021. <https://www.producer.com/news/warm-oasis-under-glass-photo-essay/>
- 2021 "Funding boost for sweet potato research". The Brandon Sun, Canada. Thursday March 18, 2021. <https://www.brandonsun.com/local/funding-boost-for-sweet-potato-research-574013572.html>
- 2020 "Agricultural research gets a leg up". Virden Empire-Advance: Manitoba Canada. May 25, 2020. [Link/agricultural-research-gets-a-leg-up-](#)
- 2020 "MARK MY WORDS: Putting my money on agriculture": Brandon Sun: Canada. May 16 2020. <https://www.brandonsun.com>
- 2018 "Gearing up for Prairie sweet potatoes". Fruit and Vegetable Magazine Canada: March 2018. Volume 74. No. 1. p 18-20. [Link/gearing-up-for-prairie-sweet-potatoes](#)
- 2017 "Brandon Researcher Testing Commercial Viability of Sweet Potatoes": by Cory Knutt: Pembina Valley Online: Manitoba Canada. March 25 2017. [Link/brandon-researcher-testing-commercial-viability-of-sweet-potatoes](#)
- 2017 "Local roots". Winnipeg Free Press. Manitoba Canada. Winter Education Guide Dec 7 2017. p 12
- 2016 "Sweet potato may enter Manitoba rotation". The Manitoba Cooperator. November 16 2016. Volume 74 No.45. p 18. [Link/sweet-potatoes-may-enter-manitoba-rotations/](#)
- 2016 "Sweet potatoes showing promise as a Manitoban crop". The AgriPost Manitoba Canada. Volume 16 Issue 9. p 1-2.
- 2016 "Sweet potato success for ACC researcher". The Brandon Sun Local Edition. Manitoba Canada. October 15 2016. p 1-2.
- 2015 "Greenhouse program to find sustainable options for fresh produce in the North". MB Agriculture Growing News. Manitoba Canada. Volume 2. p 24.
- 2015 "Research boost for students". The Brandon Sun. Manitoba Canada. April 17 2015. A2. p1.
- 2013 "New wheats in the Prairie pipeline". The Manitoba Cooperator: April 4 2013 Volume 71 No. 14 p17.
- 2013 "Farmers to see varietal improvements in several wheat classes". Alberta Farmer. Canada. April 15 2013. Vol 10 No 8. p 25.

TV Show:

- 2016 Guest- interview in Here We Grow TV program with Westman Communication Group TV channel. August 17, 2016 <https://www.wcgtv.ca/here-we-grow-art-and-business>

Radio Talk:

- 2021 "Sweetpotato in prairie production systems" CBC Radio Noon Canada with Marjorie Dowhos MARCH 24, 2021. Radio Noon Manitoba with Marjorie Dowhos. <https://www.cbc.ca/listen/live-radio/1-101-radio-noon-manitoba/clip/15833354-assiniboine-community-college-receives-funding-boost-aid-quest>

E-Virtual Workshops Video: (Education and Extension)

- 2021 Gardening 101 Series- Microgreens. Prairie Healthy Brandon and the City of Brandon. December 13, 2021 Mountain Health YouTube Channel: <https://www.youtube.com/watch?v=hsrUsmPXGhc>

PROFESSIONAL RECOGNITIONS

Business Manager R&D, Academic Lead, & Award Recipient

Professional Agrologist, Stellar Award-Teaching Excellence, Rapid recognition award, Excellence Education Award, 100-Merit Scholarship Award, Canadian Plant Breeder, Research Excellence Award

PROFESSIONAL AFFILIATIONS (Present)

Research Advisor, Prairie Fruit Growers Association, Canada

Member, Horticulture School Planning Committee, Manitoba Agriculture, Canada

Research Advisor, Brandon Fresh Farms, Canada

Advisor, R&D, Ag Quest Inc. Minto Canada

Member, Academic Program Advisory Committee, Assiniboine Community College, Canada

COMMUNITY AND VOLUNTEER EXPERIENCE

Member Board of Directors

2016-Present

Brandon Food Council Manitoba, Canada

- Develop and implement a sustainable community-based food system
- Promotes equity, health, and culture and ensures food security
- Plan and organize fundraising events in Brandon
- Extend network for food security, food production and food systems research

Member Committee

2019-Present

Municipal Heritage Advisory Committee, City of Brandon, Canada.

- Promote public awareness and appreciation of heritage resources
- Develop civic policies and programs to conserve and enhance heritage sites
- Develop incentive programs for heritage conservation
- Provide technical and professional advice to the local community

Member Board of Directors

2019-Present

Brandon General and Museum and Archive, City of Brandon, Canada

- Prepare a plan for the ongoing development of a general museum
- Identify funding sources and a develop plan for the ongoing operation of the museum
- Collect, conserve, study, exhibit and interpret historic and heritage materials
- Make assessment on the possibility of including historic and heritage materials

Member Board of Revision

City of Brandon, Canada

2023-Present

- Hear appeals on property assessments in the city of Brandon
- Ensure complainant (the taxpayer) and the assessor receive a fair and impartial hearing
- Determine property valued or classified correctly
- Make sure if exemptions were properly applied