CURRICULUM VITAE

SARVAJEET SINGH GILL

[M.Sc (Gold Medal, AMU), M.Phil., Ph.D (AMU), Post Doc (ICGEB)]
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Email: ssgill14@yahoo.co.in; ssgill14@mdurohtak.ac.in; ssgill14@gmail.com
http://www.researcherid.com/rid/Q-4021-2017 [Researcher ID: Q-4021-2017]
ORCID: http://orcid.org/0000-0002-8953-7714
https://www.scopus.com/authid/detail.uri?authorId=36097852000
https://loop.frontiersin.org/people/110820/overview

Areas of Research Interest

Plant Molecular Biology and Genetic Engineering, Plant Biotic & Abiotic Stress Tolerance, Reactive Oxygen Species Signaling and Antioxidant Machinery in Plants, Helicases, Transgenics, Nitrogen & Sulfur Metabolism, Plant Fungal Symbiotic Interactions for Crop Improvement

Description of Research/Scientific Activity

Increasing crop production is now the highest agricultural priority because of increasing world population & changing climatic conditions. Abiotic stresses are the primary causes of crop loss worldwide. The main area of research includes Genetic Engineering, Stress Physiology and Molecular Biology (Development of abiotic stress tolerant crop plants, the physiological, biochemical and molecular characterization of agronomically important plants under abiotic stress factors, involvement of mineral nutrients and other biotechnological approaches in the amelioration of abiotic stress effects in crop plants, use of a combination of genetic, biochemical, genomic and proteomic approaches to understand the responses of various components of antioxidant machinery to abiotic stress and stress signaling and stress tolerance in crop plants). Research is undertaken to understand the mechanism of abiotic stress tolerance (heavy metal/salinity/drought) in plants (*Brassica juncea*, *Triticum aestivum*, *Lepidium sativum*, *Oryza sativa & model plants like Nicotiana tabaccum and Arabidopsis thaliana* etc) at molecular & physiological level by studying the response of the components of antioxidant machinery, photosynthetic, nitrogen & sulfur metabolic pathways. Detailed account of reactive oxygen species (ROS) and antioxidant machinery in crop plants has been presented (Plant Physiology & Biochemistry 48(2010): 909-930). It is also presented that Cd at high dose perturbs growth, photosynthesis and nitrogen metabolism while at low dose it up regulates sulfur assimilation and antioxidant machinery in garden cress (Plant Science 182(2012), 112-120). Research is also undertaken for the development of abiotic stress (heavy metal/high salinity/drought/cold) tolerant crops including rice by transgenic approach. Together with Dr. Narendra Tuteja (ICGEB, New Delhi) work on plant helicases for abiotic stress tolerance is going on. The mechanism of stress tolerance by PDH45 in Tobacco and Rice has been explored (). A novel function of plant MCM6 in salinity stress tolerance has also been discovered that will help to improve crop production at sub-optimal conditions (Plant Molecular Biology 76(2011): 19-34 & 2014). Herbicide and salinity stress tolerance (PDH45 + EPSPS) in plants has also been explored (Front. Plant Sci. 8:364; 2017). Salinity tolerant tobacco and rice plants have been developed, without affecting the overall yield. This research uncovers new pathways to plant abiotic stress tolerance and indicates the potential for improving crop production at sub-optimal conditions.

EDUCATIONAL QUALIFICATIONS:

S. No.	Degree	University	Year	Subjects	Percentage
1.	Post-Doc	ICGEB	2008-2010	Genetic Engineering & Plant Molecular Biology	
2.	Ph.D	AMU., Aligarh	2008	Botany (Stress Physiology)	Awarded
3.	M.Phil	AMU., Aligarh	2003	Botany (Stress Physiology)	80.0%
4.	M.Sc	AMU., Aligarh	2001	Botany (Stress Physiology)	75.25% **(GOLD MEDAL)**
5.	B.Sc	CSJM, Kanpur University	1998	Botany, Chemistry, Zoology	75.2%

PROFESSIONAL RECOGNITION, AWARDS, FELLOWSHIPS, TRAINING RECEIVED:

- ✓ Guest Editor of Genes (ISSN 2073-4425) Special issue: Genetic Regulation of Abiotic Stress Responses (2017) https://www.mdpi.com/journal/genes/special_issues/genetic_regulation?view=compact&listby=type
- ✓ Editorial Board Member-Biochemistry & Molecular Biology Journal (2016)
- ✓ http://biochem-molbio.imedpub.com/editors.php
- ✓ Editorial Board Member-Journal of Advanced Research in Agriculture Science & Technology (2016)
  http://science.adrpublications.com/index.php/JoARAST/about/editorialTeam
- ✓ Editorial Board Member-Journal of Advanced Research in Bioscience and Biotechnology (2016)
  http://science.adrpublications.com/index.php/JoARBSBT/about/editorialTeam
- ✓ Guest Editor, Special issue: Functional Genomics Approaches to Decipher Plant Resilience to Environmental Stresses (International Journal of Plant Genomics)
  http://www.hindawi.com/journals/ijpg/si/375937/cfp/
- ✓ Associate Editor, Frontiers in Plant Science, Section-Plant Physiology (Topic Title: Recent insights into the double role of hydrogen peroxide in plants)
  http://www.frontiersin.org/Journal/SpecialTopics/ViewTopicDetails.aspx?SRID=11
- ✓ Associate Editor, Frontiers in Plant Science, Section-Crop Science and Horticulture (Topic Title: The Brassicaceae - agri-horticultural and environmental perspectives)
  http://www.frontiersin.org/Journal/SpecialTopics/ViewTopicDetails.aspx?SRID=11
- ✓ Associate Editor, Frontiers in Plant Science, Section-Environmental Toxicology (Topic Title: Phytotoxicity of high and low levels of plant-beneficial heavy metal ions)
  http://www.frontiersin.org/Journal/SpecialTopics/ViewTopicDetails.aspx?SRID=11
- ✓ Guest Editor of BioMed Research International Special Issue (Plant Stress & Biotechnology)
  http://www.hindawi.com/journals/bmri/si/797210/
- ✓ Routine reviewer of Plant Signaling and Behaviour, Journal of Plant Growth Regulation, Gene, Physiologia Plantarum, Annals of Botany, Chemosphere, Ecotoxicology, Environmental Science and Pollution Research, International Journal of Phytoremediation, Journal of Plant Nutrition and Soil Science, Ecotoxicology & Environmental Safety, Plant Physiology and Biochemistry, Protoplasma, Australian Journal of Crop Science, Molecular Biology Reports, PloS One, Annals of Botany, Environmental Science & Pollution Research, Frontiers in Plant Science, Nature Scientific Reports etc.
- ✓ Reviewer of International Grants
  SDE/GWIS Fellowship, USA (Graduate Women in Science Fellowships)
  GACR, Czech Science Foundation Grant (Project ID 13-15229S)

Agency/Organization which gave the award/fellowship	Award/fellowship	Nature of the award
Web of Science, Clarivate Analytics	INDIA Research Excellence & Citation Award - 2017	Research Contribution and Citations on Web of Science
Department of Science & Technology (DST), Govt. of India	Young Scientist Award-(2014-2017)	Research Contribution
National Environmental Science Academy, New Delhi	Junior Scientist of the year Award-2008	Recognition of Scientific Contribution
Aligarh Muslim University, Aligarh	Gold Medal	**Gold Medal** for standing First class First in the M.Sc. Exam
CSIR, New Delhi	Senior Research Fellowship	Research
Research Associate	ICGEB, New Delhi	Research
Senior Research Fellow	ICGEB, New Delhi	Research
Senior Research Fellow (Extended)	CSIR/A.M.U., Aligarh	Research
Senior Research Fellow	CSIR/A.M.U., Aligarh	Research
University Fellowship (SRF)	A.M.U., Aligarh	Research
University Fellowship (JRF)	A.M.U., Aligarh	Research

Teaching Activity

Teaching M.Sc. Agriculture Biotechnology and M.Sc. Biotechnology

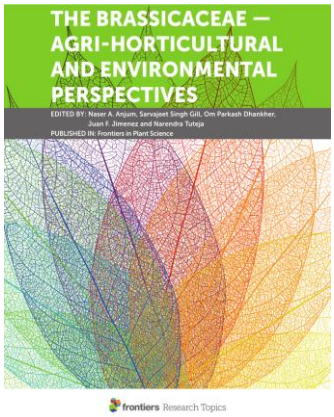
M.Sc/Ph.D students guided	
Ph.D students	**01 awarded, 01 (Submitted), 03 Registered**
M.Sc Dissertation	**35 (Guided), 06 (Presently doing)**
Project Students	**08 (Guided)**

Details of Projects being completed/ongoing as principal investigator/along with its silent features

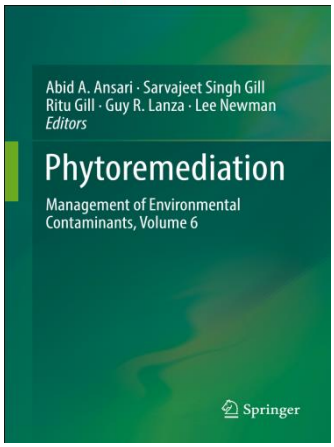
S. No.	Project title	Funding agency	Silent feature
1.	Zero budget agriculture	MDU, Rohtak	Natural agriculture
2.	Plant-microbe interaction studies for salt induced oxidative stress management of maize (*Zea mays* L.) by the root endophyte	RKF Fund	Sustainable cultivation under salinity stress
3.	Development of salinity and/or drought stress tolerant Indian mustard (*Brassica juncea* L.) plants by overexpression of p68 (Ddx5) RNA helicase gene	CSIR, New Delhi	Overexpression of p68 (Ddx5) RNA helicase gene in *B. juncea* for salinity and/or drought tolerance
4.	A symbiotic approach for the improvement of salt tolerance of mustard (*Brassica juncea* L.) through *Piriformospora indica*: Role of antioxidant machinery	UGC, New Delhi	*Piriformospora indica* led salinity stress tolerance in *B. juncea*
5.	Salt induced oxidative stress tolerance of rice (*Oryza sativa* L.) cultivars differing in tolerance potential by the root endophyte *Piriformospora indica*: Significance of ascorbate-glutathione pathway	DST, New Delhi	*P. indica* amelioration of salt induced oxidative stress in Rice

LIST OF PUBLICATIONS

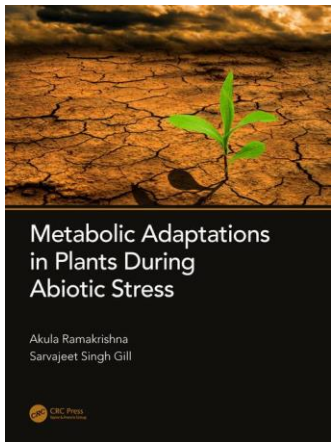
BOOKS PUBLISHED



Anjum NA, Gill SS, Dhankher OP, Jiminez JF, Tuteja N (2018) The Brassicaceae-Agri-Horticultural and Environmental Perspectives. Lausanne: Frontiers Media SA. ISSN 1664-8714, ISBN 978-2-88945-645-1, DOI 10.3389/978-2-88945-645-1
https://www.frontiersin.org/research-topics/3959/the-brassicaceae---agri-horticultural-and-environmental-perspectives
This e-book is an effort to provide a common platform to agronomists, horticulturists, plant breeders, plant geneticists/molecular biologists, plant physiologists and environmental plant scientists exploring major insights into the role of important members of the plant family Brassicaceae (the mustard family, or Cruciferae) in agri-horticultural and environmental arenas.

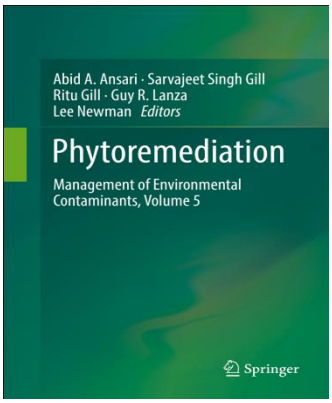


Ansari AA, Gill SS, Lanza GR, Newman L (2018) Phytoremediation Management of Environmental Contaminants, Volume 5. Springer Science + Business Media, LLC 233 Spring Street, New York, NY 10013, USA ISBN 978-3-319-99651-6
https://www.springer.com/us/book/9783319996509
Volume 6 of Phytoremediation: Management of Environmental Contaminants continues the series. Taken together, the six volumes provide a broad–based global synopsis of the current applications of phytoremediation using plants and the microbial communities associated with their roots to decontaminate terrestrial and aquatic ecosystems. Many chapters highlight and compare the efficiency and economic advantages of phytoremediation and nano-phytoremediation to currently practiced soil and water treatment practices

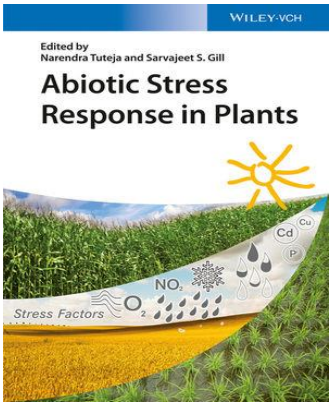


Ramakrishna A, Gill SS (2018) Metabolic Adaptations in Plants During Abiotic Stress, 1st Edition. CRC Press ISBN 9781138056381 - CAT# K33263 https://www.crcpress.com/Metabolic-Adaptations-in-Plants-During-Abiotic-Stress/Ramakrishna-Gill/p/book/9781138056381
Serves as a cutting-edge resource for researchers and students who are studying plant abiotic stress tolerance and crop improvement through metabolic adaptations Presents the latest trends and developments in the field of metabolic engineering and abiotic stress tolerance. Addresses the adaptation of plants to climatic changes. Gives special attention to emerging topics such as the role of secondary metabolites, small RNA mediated regulation and signaling molecule responses to stresses. Provides extensive references that serve as entry points for further research

Prasad R, Gill SS, Tuteja N (2018) Crop Improvement through Microbial Biotechnology. Elsevier B.V. USA ISBN: 978-0-444-63987-5
https://www.sciencedirect.com/science/book/9780444639875
Crop Improvement through Microbial Biotechnology explains how certain techniques can be used to manipulate plant growth and development, focusing on the cross-kingdom transfer of genes to incorporate novel phenotypes in plants, including the utilization of microbes at every step, from cloning and characterization, to the production of a genetically engineered plant. This book covers microbial biotechnology in sustainable agriculture, aiming to improve crop productivity under stress conditions.

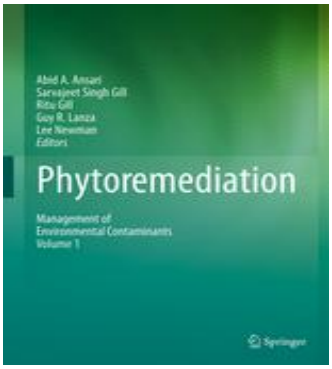


Ansari AA, Gill SS, Lanza GR, Newman L (2017) Phytoremediation Management of Environmental Contaminants, Volume 5. Springer Science + Business Media, LLC 233 Spring Street, New York ISBN 978-3-319-52381-1 http://www.springer.com/gp/book/9783319523798
This text details the plant-assisted remediation method, "phytoremediation", which involves the interaction of plant roots and associated rhizospheric microorganisms for the remediation of soil contaminated with high levels of metals, pesticides, solvents, radionuclides, explosives, crude oil, organic compounds and various other contaminants. Many chapters highlight and compare the efficiency and economic advantages of phytoremediation to currently practiced soil and water treatment practices.

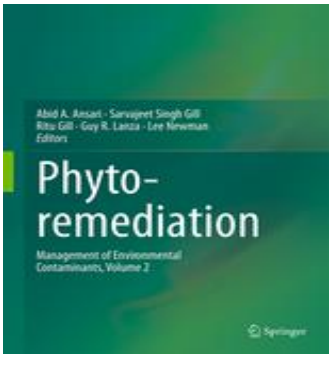


Tuteja N, **Gill SS** (2016) *Abiotic Stress Response in Plants*, Wiley Wiley-VCH Verlag GmbH & Co. Weinheim, Germany ISBN 978-3-527-33918-1
http://as.wiley.com/WileyCDA/WileyTitle/productCd-3527339183.html
Understanding abiotic stress responses in plants is critical for the development of new varieties of crops, which are better adapted to harsh climate conditions. The new book by the well-known editor team Narendra Tuteja and Sarvajeet Gill provides a comprehensive overview on the molecular basis of plant responses to external stress like drought or heavy metals, to aid in the engineering of stress resistant crops.
After a general introduction into the topic, the following sections deal with specific signaling pathways mediating plant stress response. The last part covers translational plant physiology, describing several examples of the development of more stress-resistant crop varieties.

Ansari AA, **Gill SS,** Lanza GR, Newman L (2016) ***Phytoremediation Management of Environmental Contaminants***, **Volume 3**. Springer Science + Business Media, LLC 233 Spring Street, New York, NY 10013, USA ISBN 978-3-319-40148-5
http://www.springer.com/us/book/9783319401461
This book details the plant-assisted remediation method, "phytoremediation", which involves the interaction of plant roots and associated rhizospheric microorganisms for the remediation of soil contaminated with high levels of metals, pesticides, solvents, radionuclides, explosives, crude oil, organic compounds and various other contaminants. Each chapter highlights and compares the beneficial and economical alternatives of phytoremediation to currently practiced soil removal and burial practices.

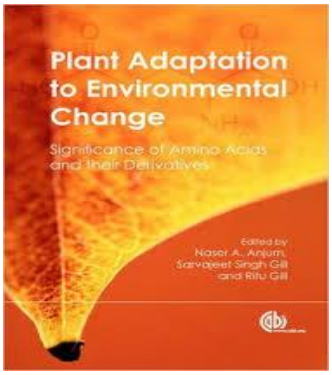


Ansari AA, **Gill SS,** Gill R, Lanza GR, Newman L (2015) ***Phytoremediation Management of Environmental Contaminants***, **Volume 1**. Springer Science + Business Media, LLC 233 Spring Street, New York, NY 10013, USA ISBN: 978-3-319-10968-8 http://www.springer.com/in/book/9783319109688
This book covers state of the art approaches in Phytoremediation written by leading and eminent scientists from around the globe. Phytoremediation: Management of Environmental Contaminants, Volume 1 supplies its readers with a multidisciplinary understanding in the principal and practical approaches of phytoremediation from laboratory research to field application.

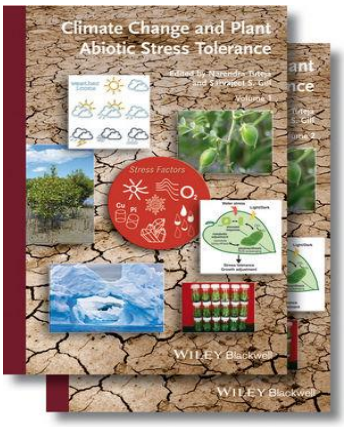


Ansari AA, **Gill SS,** Gill R, Lanza GR, Newman L (2015) ***Phytoremediation Management of Environmental Contaminants***, **Volume 2**. Springer Science + Business Media, LLC 233 Spring Street, New York, NY 10013, USA ISBN: 978-3-319-10394-5 (Print) 978-3-319-10395-2 (Online)
http://link.springer.com/book/10.1007/978-3-319-10395-2
This text details the plant-assisted remediation method, "phytoremediation", which involves the interaction of plant roots and associated rhizospheric microorganisms for the remediation of soil

contaminated with high levels of metals, pesticides, solvents, radionuclides, explosives, crude oil, organic compounds and various other contaminants. Each chapter highlights and compares the beneficial and economical alternatives of phytoremediation.

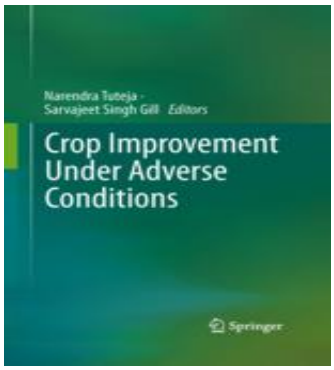


Anjum NA, **Gill SS**, Gill R (2014) ***Plant Adaptation to environmental Change: Significance of Amino Acids and their derivative*****.** CABI International, UK ISBN: 9781780642734
http://www.cabi.org/bookshop/book/9781780642734
Plants constantly cope with unfavourable ecosystem conditions, which often prevent them reaching their full genetic potential in terms of growth, development and productivity. This book covers plants' responses to these environmental changes, namely, the modulation of amino acids, peptides and amines to combat both biotic and abiotic stress factors. Bringing together the most recent developments, this book is an important resource for researchers and students of crop stress and plant physiology.

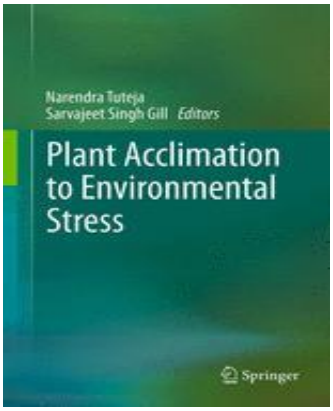


Tuteja N, **Gill SS** (2013) ***Climate Change and Plant Abiotic Stress Tolerance*** **(Volume 1 & 2).** Wiley Wiley-VCH Verlag GmbH & Co. Weinheim, Germany ISBN 978-3-527-33491-9

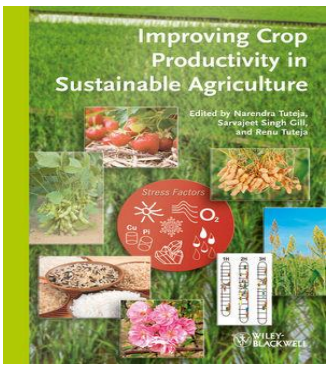
http://as.wiley.com/WileyCDA/WileyTitle/productCd-3527334912.html
In this ready reference, a global team of experts comprehensively cover molecular and cell biology-based approaches to the impact of increasing global temperatures on crop productivity.
The work is divided into four parts. Following an introduction to the general challenges for agriculture around the globe due to climate change, part two discusses how the resulting increase of abiotic stress factors can be dealt with.



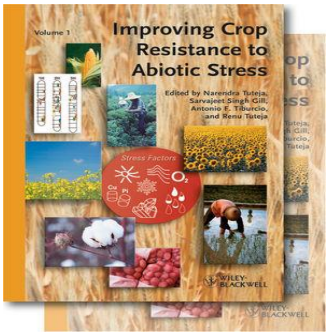
Tuteja N, **Gill SS** (2013) ***Crop Improvement under Adverse Conditions*****.** Springer Science + Business Media, LLC 233 Spring Street, New York, NY 10013, USA ISBN 978-1-4614-4632-3
http://www.springer.com/la/book/9781461446323
Crop Improvement under Adverse Conditions will serve as a cutting-edge resource for researchers and students alike who are studying plant abiotic stress tolerance and crop improvement. The book presents the latest trends and developments in the field, including the impact of extreme events on salt tolerant forest species of Andaman & Nicobar Islands, the overlapping horizons of salicylic acid in different stresses, and fast and reliable approaches to crop improvement through In Vitro haploid production.



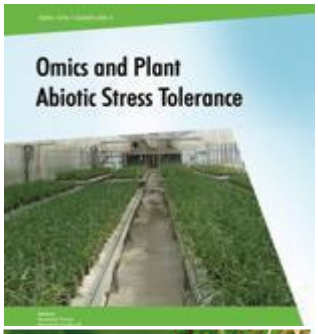
Tuteja N, **Gill SS** (2013) ***Plant Acclimation to Abiotic Stress*****.** Springer Science + Business Media, New York, NY 10013, USA ISBN 978-1-4614-5000-9
http://link.springer.com/book/10.1007%2F978-1-4614-5001-6
The mechanisms underlying endurance and adaptation to environmental stress factors in plants have long been the focus of intense research. Plants overcome environmental stresses by development of tolerance, resistance or avoidance mechanisms, adjusting to a gradual change in its environment which allows them to maintain performance across a range of adverse environmental conditions. Plant Acclimation to Environmental Stress presents the latest ideas and trends on induced acclimation of plants to environmental stresses under changing environment. Written by experts around the globe, this volume adds new dimensions in the field of plant acclimation to abiotic stress factors. Comprehensive and lavishly illustrated.



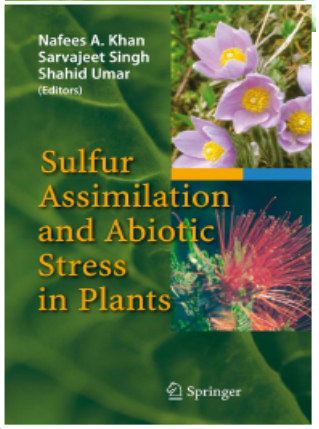
Tuteja N, **Gill SS**, Tuteja R (2013) ***Improving Crop Productivity in Sustainable Agriculture*****.** Wiley Wiley-VCH Verlag GmbH & Co. Weinheim, Germany ISBN: 978-3-527-33242-7
http://as.wiley.com/WileyCDA/WileyTitle/productCd-3527332421.html
An up-to-date overview of current progress in improving crop quality and quantity using modern methods. With a particular emphasis on genetic engineering, this text focuses on crop improvement under adverse conditions, paying special attention to such staple crops as rice, maize, and pulses. It includes an excellent mix of specific examples, such as the creation of nutritionally-fortified rice and a discussion of the political and economic implications of genetically engineered food.



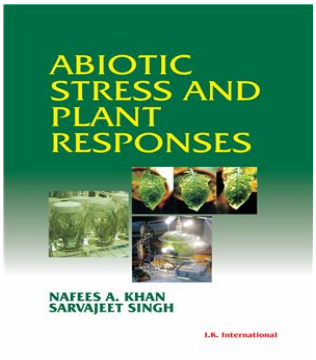
Tuteja N, **Gill SS**, Tiburcio AF, Tuteja R (2011) ***Improving Crop Resistance to Abiotic Stress*** (Vol I & II). Wiley Wiley-VCH Verlag GmbH & Co. Weinheim, Germany ISBN: 978-3-527-32840-6
http://as.wiley.com/WileyCDA/WileyTitle/productCd-3527328408.html
The latest update on improving crop resistance to abiotic stress using the advanced key methods of proteomics, genomics and metabolomics. The well balanced international mix of contributors from industry and academia cover work carried out on individual crop plants, while also including studies of model organisms that can then be applied to specific crop plants.



Tuteja N, **Gill SS**, Tuteja R (2011) ***Omics and Plant Abiotic Stress Tolerance*****.** Bentham Science Publishers, UAE & USA eISBN: 978-1-60805-058-1
http://ebooks.benthamscience.com/book/9781608050581/
The text in this book deals with the importance of -omics approaches like Genomics, Metabolomics and Proteomics in abiotic stress tolerance. Large scale analytical approaches provide detailed information about the structure and complexity of signaling networks, identify subsets of genes or activities that are correlated to given stress factors and reveal unexpected or previously uncharacterized biochemical interactions.



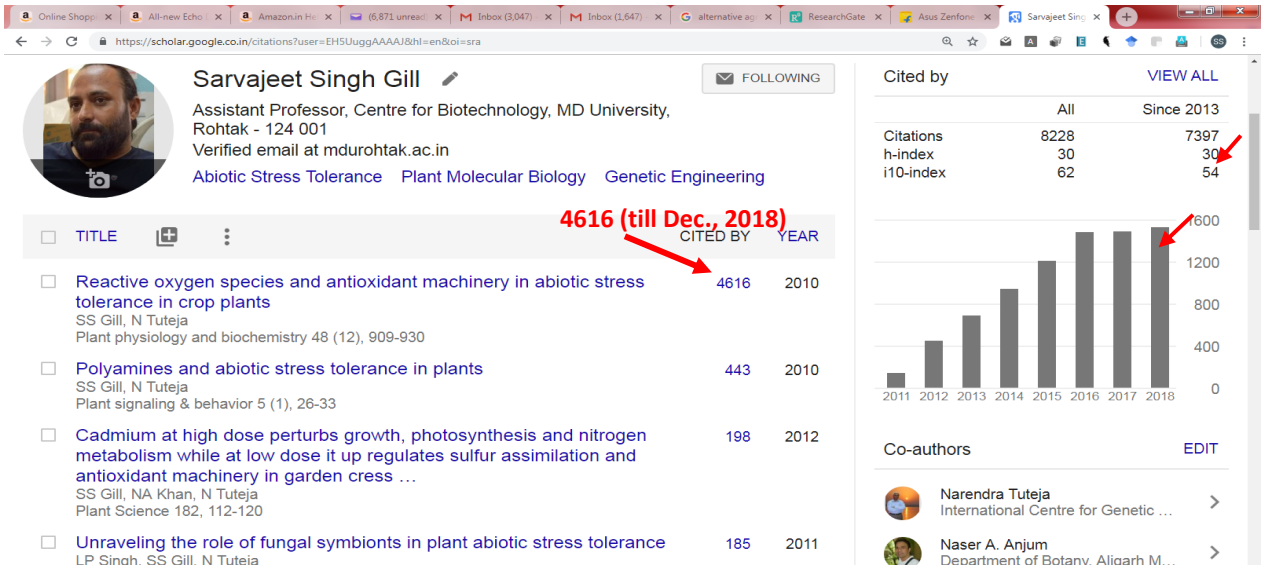
Khan NA, **Singh S** and Umar S (2008) ***Sulfur Assimilation and Abiotic Stress in Plants*****.** Springer-Verlag, New York ISBN 978-3-540-76325-3
http://link.springer.com/book/10.1007%2F978-3-540-76326-0
Sulfur is one of the four major essential elements necessary for the plant life cycle. Its assimilation in higher plants and its reduction in metabolically important sulfur compounds are crucial factors determining plant growth and vigor and resistance to stresses. The range of biological compounds that contain sulfur is wide. The information on sulfur assimilation can be exploited in tailoring for efficient sulfur utilization, and in the applied approaches for the sustenance of agricultural productivity through nutritional improvement and increased stress tolerance. The present book discusses the aspects of sustainable crop production with sulfur, the importance of sulfur metabolites and sulfur metabolizing enzymes in abiotic stress management in plants.



Khan NA and **Singh S** (2008) ***Abiotic Stress and Plant Responses*****.** IK. International Publishing House, New Delhi, India ISBN: 978-818-986695-2 https://www.ikbooks.com/books/book/life-sciences/botany/abiotic-stress-plant-responses/9788189866952/
In this present book the advances in the area of abiotic stress responses and stress management have been included. The information may be useful in elucidating limits and tolerance of a plant to abiotic stress.
The present volume, comprising seventeen chapters by outstanding and eminent specialists across the world, covers the information on abiotic stresses such as salinity, heavy metals, drought and herbicides.

RESEARCH PUBLICATION (Selected)

HIGHLY CITED ARTICLES



1. Yadav S, **Gill SS**, Passricha N, Gill R, Badhwar P, Anjum NA, Juan Francisco JB, Tuteja N (2019) Genome-wide analysis and transcriptional expression pattern-assessment of superoxide dismutase in rice and Arabidopsis under abiotic stresses. Plant Gene 17:100165
2. Ana Isabel CM, Francisco Ignacio JR, Margarita RK, **Gill SS**, Alicia BF, Juan Francisco JB (2018) Down-regulation of arginine decarboxylase gene-expression results in reactive oxygen species accumulation in Arabidopsis. Biochem Biophys Res Commun. 506(4):1071-1077.
3. Anjum NA, **Gill SS**, Dhankher OP, Jiminez JF, Tuteja N (2018) Editorial: The Brassicaceae—Agri-Horticultural and Environmental Perspectives. Fron. Plant Sci 9:1141. doi: 10.3389/fpls.2018.01141
4. Banerjee S, Sirohi A, Ansari AA, **Gill SS** (2017) Role of small RNAs in abiotic stress responses in plants. Plant Gene 11(Part B): 180-189. **(SCI IF: 0.8)**
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BOOK CHAPTERS (Selected)

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