



# Indian Journal of Agriculture and Allied Sciences

A Refereed Research Journal

## Editorial Board

### Editor-in-Chief

**Ratnesh Kumar Rao**, 194, Karaundi, Banaras Hindu University, Varanasi-221 005, UP, India, E-mail: mrfsw\_kvns@yahoo.com, mahimafound@gmail.com, Website: www.mrfsw.org

### Editors

**Dr. P.K. Sharma**, Department of Soil Sc. & Agricultural Chemistry, Institute of Agricultural Sciences., BHU., Varanasi-221005, E-mail : pkssac@gmail.com

**Dr. M. Raghuraman**, Department of Entomology & Agricultural Zoology, Institute of Agricultural Sciences, BHU, Varanasi, E-mail :raghu\_iari@yahoo.com

### Associate Editors

**Prof. K. Srivastava**, Department of Genetics and Plant Breeding, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, India

**Prof. P.Dwivedi**, Department of Plant Physiology, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, India

**Prof. Ram Mandir Singh**, Department of Farm Engineering, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, India

**Prof. R.K. Patra**, Department of Soil Science, OUA&T, Bhubaneswar

**Prof. J.S. Tripathi**, Department of Kayachikitsa, Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University, Varanasi, India

**Prof. K.R.C. Reddy**, Department of Rasa Shastra, Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University, Varanasi, India

**Dr. Raghendra Singh**, Sr. Scientist (Agronomy), ICAR Research Complex for NEH Region, Sikkim Centre, Tadong, Gangtok-737102, Mob. : 91-9475582991

**Dr. O.P. Mishra**, Department of Extension Education, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, India

**Dr. Y.V. Singh**, Department of Soil Sciences and Agricultural Chemistry, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, India

**Dr. R.N. Meena**, Department of Agronomy, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, India

**Dr. Abhishek Singh**, Department of Farm Engineering, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, India

**Dr. V. Kamalvanshi**, Department of Agricultural Economics, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, India

**Dr. U.K. Paswan**, Department of Animal Husbandry and Dairying, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, India

**Dr. Ram Keval**, Department of Entomology, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, India

**Dr. A.K. Pal**, Department of Horticulture, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, India

**Dr. B.K. Sharma**, Department of Plant Pathology and Mycology, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, India

**Dr. Alok Kumar**, Department of Soil Science, NDU&T, Kumarganj, Faizabad

**Dr. B.P. Dhyani**, Department of Soil Science, SVBUA&T, Modipuram, Meerut

**Prof. V.K. Rao**, Department of Horticulture, GBPUABT, Pantnagar

**Dr. A.K. Sachan**, Department of Soil Science & CS, CSAUA&T, Kanpur

**Dr. P.K. Singh**, Nagaland University, Mezhiphera campus, Nagaland  
**Dr. Santhan Barthwal**, "Scientist F", IIRI, Dehradun, Uttarakhand  
**Dr. A.K. Dwivedi**, Department of Shalya Tantra, Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University, Varanasi, India  
**Dr. Sunita Suman**, Department of Prasuti Tantra, Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University, Varanasi, India  
**Dr. Parameswarappa S. Byadgi**, Department of Vikriti Vigyan, Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University Varanasi, India, E-mail : psbyadgi@rediffmail.com  
**Dr. Mangalagowri V. Rao**, Department of Swasthavritta and Yoga, Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University, Varanasi, India, E-mail : mangowri\_rao@yahoo.co.in  
**Dr. N.S. Tripathi**, Department of Kriya Sharir, Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University, Varanasi, India, E-mail : drnstripathi@yahoo.co.in  
**Dr. Arun A. David**, Associate Professor, Department of Soil Science, Allahabad School of Agriculture, SHIATS-DU, Allahabad 211 007, (U.P.), India.  
**Prof. Shriram Singh**, Programme Co-ordinator, KVK, Institute of Agricultural Sciences, Barkaccha, Banaras Hindu University, Mirzapur, Cell: 09450232889, E-mail : srsinghkvk@rediffmail.com  
**Dr. S.N. Singh**, KVK, Institute of Agricultural Sciences, Barkaccha, BHU, Mirzapur-231001, Cell : 09453791916, E-mail : snsingh.agro@gmail.com  
**Dr. Sanjay K. Shahi**, Department of Agricultural Chemistry and Soil Science, Udai Pratap Autonomous College, Varanasi-221 002, E-mail: ssssupc@gmail.com

#### Guest Editors

**Prof. Bharat B. Aggarwal**, Ransom Horne, Jr., Professor of Cancer Research, Professor of Cancer Medicine (Biochemistry) and Chief, Cytokine Research Laboratory, Department of Experimental Therapeutics, The University of Texas M. D. Anderson Cancer Center, 1901 East Road, Unit 1950, Houston, TX 77054, USA, Phone: 713-794-1817, Email: aggarwal@mdanderson.org  
**Prof. A. Hemantaranjan**, *Formerly Head*, FISPP, Department of Plant Physiology, Institute of Agricultural Sciences, BHU, Varanasi 221 005, INDIA, E-mail: hemantaranjan@gmail.com; Phone: 91-542-6702939 (O); 91-542-2575362 (R); Mobile No. +9415302653  
**Prof. G.C. Mishra**, Department of Farm Engineering, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi  
**Dr. Prashant Srivastava**, Demonstration Programme Coordinator, CRC Care Pty Ltd., CRC for Contamination Assessment & Remediation of the Environment, Buiklding X (Environmental Sciences Building), University of South Australia, Mawson Lakes, SA 5095, Australia  
**Dr. R.S. Jaywardhane**, Institute of Indigenous Medicine, University of Colombo, Rajagiriya, Sri Lanka  
**Dr. Hem Kanti Kultunga**, Institute of Indigenous Medicine, University of Colombo, Rajagiriya, Sri Lanka  
**Dr. R.R. Koirala**, Consultant Ayurveda and Yoga Physician. Nepal Ayurveda Society, Tilingtar, Dhapasi-7, Kathmandu, E-mail: ayurveda@wlink.com.np  
**Dr. Ravi S. Pandey**, RAMA-Prema-Sadan, Belvan Mirzapur UP India, Satya Dham RAMA World center of Truth & Peace India, World Health Piety and Peace Center India, University of Missouri Columbia, USA, Distinguished Scientist, Mahima Research Foundation and Social Welfare BHU Varanasi India, Email: dr.rspandey@yahoo.com  
**Dr. A.A. J. Pushpakumara**, B.A.M.S(Hons), M.S(Ay) India B.H.U,PGDHD (faculty Medicine Colombo), PhD(Scholar), Department of Microbiology, Senior lecturer/consultant surgeon, Head of the Department Shalya Shalakya, Gampaha Wickramarachchi Ayurveda Institute, University of kelaniya, Sri Lanka, E-mail : mrsnhkumara@gmail.com  
**Dr. Simone Hunziker**, President, Verband Schweizer Ayurveda-Mediziner und-Therapeuten, 3000 Bern, Tel: +41(0) 32-313-02, asmta@ayurveda-verband.eu, simone.hunziker@ayurveda-verband.eu  
**Dr. Ajai Kumar Pandey**, Department of Kayachikitsa, Faculty of Ayurveda, IMS, BHU, Varanasi  
**Dr. K.H.H.V.S.S.N. Murthy**, Department of Kayachikitsa, Faculty of Ayurveda, IMS, BHU, Varanasi



# Indian Journal of Agriculture and Allied Sciences

A Refereed Research Journal

---

**Volume: 1**

**No. 3**

**Year: 2015**

---

**Editor-in-Chief**

**Ratnesh Kumar Rao**

194, Karaundi, Banaras Hindu University,  
Varanasi-221 005, UP, India,

E-mail: mrfsw\_kvns@yahoo.com, mahimafound@gmail.com,

Website: www.mrfsw.org

**Editors**

**Dr. P.K. Sharma**

Department of Soil Science & Agricultural  
Chemistry, Institute of Agricultural Sciences,  
Banaras Hindu University, Varanasi-221 005,  
E-mail: pkssac@gmail.com

**Dr. M. Raghuraman**

Department Entomology & Agricultural  
Zoology, Institute of Agricultural Sciences,  
Banaras Hindu University, Varanasi-221 005,  
E-mail: raghu\_iari@yahoo.com



*Published by*

**Mahima Research Foundation and Social Welfare**

194, Karaundi, Banaras Hindu University, Varanasi-221 005, UP, India

Reg. # 643/2007-2008



# Indian Journal of Agriculture and Allied Sciences

A Refereed Research Journal

## Editorial

The very purpose of the Indian Journal of Agriculture and Allied Sciences (IJAAS) is to bring positive thinking towards the Indian Agriculture, so that they can show their performance on a high level and thus contribute towards the development of the Agriculture as well as national GDP.

The New Vision for Agriculture initiative, led by the Consumer Industries Community of the World Economic Forum, works to develop a shared agenda for action and foster multi-stakeholder collaboration to achieve sustainable agricultural growth through market-based solutions. The initiative has defined a vision that highlights agriculture's potential as a positive driver of food security, environmental sustainability and economic opportunity worldwide. Indian Journal of Agriculture and Allied Sciences (IJAAS) believes that achieving this vision will require the leadership and capacity of all stakeholders—government, business, civil society, academia, farmers and consumers.

The very purpose of the Indian Journal of Agriculture and Allied Sciences (IJAAS) is to bring positive thinking towards the social order, so that they can show their performance on a high level as thus contribute towards the development of the society as well as nation. The main objective of the journal is to present the various types of research paper on Agricultural Sciences and Medical Sciences subjects in front of the readers so that they can have the full knowledge of different aspects of the Agricultural Science and Medical Sciences.

We believe that Indian Journal of Agriculture and Allied Sciences (IJAAS) will be in a position to maintain its standard in future too with the help of all scientists working in agriculture and allied sciences. We intend to present research paper focused on science and technology in the next issue. We always respect your kind suggestion and instruction for the elevation of the journal.

We best wishes

**Ratnesh Kumar Rao**

Editor-in-Chief

194, Karaundi, Banaras Hindu University,  
Varanasi-221 005, UP, India

**Volume 1, No. 3**  
**30<sup>th</sup> September, 2015**