



# IARI News

Vol. 30, No. 4

October-December, 2014

## RESEARCH

### New Bread and *Durum* Wheat Varieties Released

Two new wheat varieties, namely, HD 3118 (Pusa Vatsala) and HI 8737 (Pusa Anmol) were released by Central Sub-Committee on Crop Standards, Notification and Release of Varieties for Agricultural Crops.

Bread wheat variety HD 3118 (Pusa Vatsala) was released for commercial cultivation in irrigated late sown conditions of North Eastern Plains Zone. It showed an average yield of 4.17 t/ha with genetic potential of 6.64 t/ha. It is moderately resistant against foliar blight, FHB and foot rot, and has shown high levels of resistance against stripe and leaf rusts. The variety has higher



A field view and grains of *durum* wheat variety HI 8737

value of bread loaf volume (cc), bread quality score, protein content, grain appearance and other quality traits.

*Durum* wheat variety HI 8737 (Pusa Anmol) was released for cultivation under irrigated, timely

sown conditions of Central Zone comprising of the states of Madhya Pradesh, Chhattisgarh, Gujarat, Rajasthan (Kota and Udaipur Divisions) and Uttar Pradesh (Bundelkhand region). It is rich in  $\beta$ -carotene and essential micro-nutrients like iron and zinc with a high overall acceptability. It showed significant yield superiority over the *durum* checks MPO 1215 and HI 8498 with high levels of resistance to stem and leaf rusts and Karnal bunt.



A field view and grains of wheat variety HD 3118

### New Chickpea Variety Identified

A new *Kabuli* chickpea bold seeded variety Pusa 3022 was identified by the All India Co-



A bold seeded *Kabuli* chickpea var. Pusa 3022

ordinated Chickpea Research Programme. Pusa 3022 has shown a mean yield superiority of 56.18 % over all ruling checks and 10.4 % yield superiority over the best check JGK 1 with an average grain yield of 1782 kg/ha. It recorded a high yield potential (3056 kg/ha). It has extra bold attractive beige coloured seeds with a mean 100-seed weight of 36 g and mean maturity of 150 days. It is moderately resistance to dry root rot, stunt, wilt and *Ascochyta* blight.

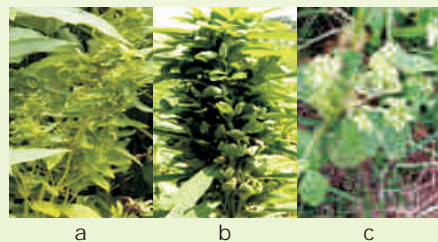
### Varietal Diversification and Precise Nitrogen Management in Pigeonpea-Wheat Cropping System

A field experiment conducted for two years revealed that out of three pigeonpea cultivars (Pusa 2001, ICPL 88039 and SKFA 970), Pusa 2001 with an average yield of 1.66 t/ha and net returns exceeding of ₹41,000/ha showed better prospects for inclusion in pigeonpea-wheat cropping system. Fortifying nutrient supply in pigeonpea through two foliar applications of 2% di-ammonium phosphate (DAP) + 1% sulphate of potash (1st during vegetative and

2nd at flowering stage) met the in-season nutrient demand and increased average seed yield by 17%. Yields of wheat varieties, WR 544 and HD 2894 grown in sequence with pigeonpea were similar. Chlorophyll meter based (SPAD value  $\pm$  42) N application significantly improved succeeding wheat yield, net returns and B:C ratio compared to soil based N application. Overall, pigeonpea variety Pusa 2001-wheat (vars. WR 544 or HD 2894) with a system productivity of > 8 t/ha (wheat eq. yield) and net returns of about ₹1.0 lakh/ha was a better option and hence suggested as an alternative to rice-wheat cropping system in low water availability areas.

### Sesame Phyllody Phytoplasma and Alternate Host

Two phytoplasma groups, viz., *Candidatus Phytoplasma asteris* and Peanut witches broom group belonging to three subgroups (16Sr I-B, 16Sr II-C and -D) were identified and characterized with sesame phyllody (SP) from nine states of India. A weed, *Sclerocarpus africanus* Jacq. (SA) of family Asteraceae, was confirmed as natural alternate host and the leafhopper, *Hishimonus phycitis* (Distant) was identified as potential vector of SP *Phytoplasma*.



Little leaf and phyllody on sesame (a,b); and witches broom on *Sclerocarpus africanus* (c)

### New Durum Wheat Germplasm Registered

*Durum* wheat genotype HI 8708 (INGR 14042) was registered as a genetic stock for leaf rust resistance by the Plant Germplasm Registration Committee of ICAR.

## EDUCATION

### National Agricultural Education Day Lecture 2014

The Institute organized the National Agricultural Education Day Lecture in the memory of late Dr. Maulana Abul Kalam Azad, a great freedom fighter, an eminent educationist and the first Union Minister of Education, Government of India on November 13, 2014 at Dr. B.P. Pal Auditorium. Dr. R.K. Jain, Dean & Joint Director (Education) welcomed the guests present on the occasion and highlighted the significance of the Education Day and the lecture series. Dr. Ravinder Kaur, Acting Director, IARI introduced the speaker and chairman of the function. On this occasion, Dr. Anupam Varma, Adjunct Professor, IARI, New Delhi delivered an impressive and informative lecture on the topic "Agricultural Education in India: Imaging Possibilities to Meet Challenges in the Changing Environment".

Shri B.N. Navalawala, former secretary, Ministry of Water Resources and Advisor to the Hon'ble Chief Minister, Gujarat presided over the function. In his remarks Shri Navalawala fully



Shri B.N. Navalawala, Advisor to the Hon'ble Chief Minister, Gujarat and Chairman, National Education Day function addressing the audience

endorsed the views of the speaker Dr. Varma. Dr. K.V. Prabhu, Joint Director (Research), IARI, New Delhi presented the vote of thanks.

### Peer Review Team, ICAR Visited IARI for Its Accreditation

A Peer Review Team (PRT) of ICAR comprising of Dr. P.L. Gautam, former Vice Chancellor, GBPUA & T, Pantnagar; Dr. B. Mishra, former Vice-Chancellor, SKUAST, Jammu; Dr. B.L. Jalali, former Director (Research), CCSHAU, Hisar; Dr. C.L. Acharya, former Director (Extension), CSKHPKV, Palampur; Dr. Pitam Chandra, former Director, CIAE, Bhopal; and Dr. G. Venkateshwarlu, ADG (Education), ICAR visited IARI from November 24 to 26, 2014 for its accreditation.



Interaction of PRT members with IARI team

The Team visited various divisions, IARI Farm, Phytotron Facility, Centre for Protected Cultivation Technology (CPCT), Agricultural Technology Information Centre (ATIC), IARI Library, PG Hostels, and sister Institutes of IARI located in Pusa campus, and examined the facilities and infrastructure available for teaching, research and extension activities.

## EXTENSION

### Participation in Extension Activities

The Institute participated and put up stalls to display its products/technologies in the following exhibitions/melas:

- ❖ “All India Farmers’ Fair and Agro-industrial Exhibition” at SVBPUA&T at Meerut from October 16 to 18, 2014. IARI stall received first prize.
- ❖ India International Trade Fair (IITF), 2014 organized by Indian Trade Promotion Organization (ITPO) at Pragati Maidan, New Delhi from

November 14 to 27, 2014. The theme of the fair was “Women’s Role in Agricultural Growth”.

- ❖ Central India’s Agri-summit “6th Agro-vision” organized by Agrovision and MMACTIV from December 4 to 7, 2014 at Reshimbag Ground, Nagpur.
- ❖ “2nd International Cocoa, Coffee & Cashew Trade Fare – SICA, 2014” held from December 18 to 20, 2014 at Grand Hotel, Vasant Kunj, New Delhi.
- ❖ “Durum Wheat Cultivation: Production Technology and Value Addition”, organized by the Krishi Vigyan Kendra, Kasturba Gram, Indore on November 22, 2014. Dr. S.V. Sai Prasad, Head & Principal Scientist, IARI Regional Station, Indore delivered the lead talk.



IARI stall at Pragati Maidan in IITF, 2014

### Frontline Demonstrations

IARI Regional Station, Indore conducted 38 frontline demonstrations on 8 new wheat varieties, namely, HI 1500, HI 1531, HD 2987, HI 1544 & HD 2932 of bread wheat, and HI 8627, HI 8663 & HI 8713 of durum wheat during 2013-14 in 16.35 ha in 8 villages of Dewas, Dhar and Khargone districts of Madhya Pradesh using recommended package of practices. Overall increase in yield was 2.3 t/ha in these

demonstrations compared to check varieties grown with farmers' cultivation practices.

### Extension Activities Organized by KVK, Shikohpur

**Field Days:** Four field days on “Pearl millet”, “Cauliflower”, “Paddy” and “Arhar” crops in Daboda, Khanpur and Teekli villages. In these field days, 159 farmers participated. KVK, Shikohpur also organized another four field days on “Rice”, “Marigold”, “Lemon” and “Animals” under OFT programme in Daboda, Mankrola, and Shikohpur villages in which 148 farmers participated.

**Animal Health Days :** Two Animal health days were organized on October 28 and November 20, 2014 in Iqbalpur and Daboda villages of Gurgaon District, respectively. In the both programmes, 199 animals were diagnosed & treated.

**World Food Day :** The World Food Day was organized on October 16, 2014 in Daboda village of Gurgaon district in which 69 farmers/farm women participated.

**Women in Agriculture Day :** A women in Agriculture Day was organized on December 4, 2014 in Sakatpur village of Gurgaon District in which 40 farm women participated.

## CAPACITYBUILDING

### Trainings

The Institute's Krishi Vigyan Kendra at Shikohpur organized six vocational training courses on: “Dress Designing and Tailoring” from October 4 to December 4, 2014 (25 farm women participated);

“Production Technology on Button Mushroom Cultivation” from October 8 to 18, 2014 (20 rural youth participated); “Nutri-farm” from October 13 to 20, 2014 (20 farm women participated); “Value Addition of Soybean and Pearl millet” from November 10 to 15, 2014 (25 rural women participated); “Dairy Farming” from November 13 to 24, 2014 (41 rural youth from Gurgaon, Rewari and Palwal districts participated); and “Motor Winding” from November 17 to 26, 2014 at the Division Agricultural Engineering (12 rural youth from Gurgaon and Mewat districts participated). The Krishi Vigyan Kendra, Shikohpur also organized three training programmes for Extension personnel on: “Integrated Plant Nutrient Management” on October 10, 2014 (23 agriculture development officers of Haryana agriculture department participated); “Animal Production & Management” on November 26, 2014 (8 veterinary livestock development assistants from animal husbandry department, Gurgaon participated); and “Advancement in Protected Cultivation of Vegetables and Flowers” on December 19, 2014 (25 agriculture development officers of Department of Agriculture, Haryana from Gurgaon participated).



A training on “Motor Winding”

The Division of Plant Pathology organized two training programmes on “Genomics of Plant Virus for Diagnostics and Utilization as Gene Expression Tools” from October 15 to November 6, 2014 (19 persons participated) and “Eco-friendly Management of Major Diseases of Crops” from October 27 to November 3, 2014.

The Institute organized a training programme on “Improved Horticultural Technologies” from October 27 to 31, 2014. The training was sponsored by Horticultural Mission for North East and Himalayan states for 18 horticultural officers of Himachal Pradesh.

The Institute also organized a training programme on “Functional Genomics and Proteomics - Techniques and Tools for Crop Improvement” from November 12 to December 2, 2014 under the aegis of Centre for Advanced Faculty Training (CAFT), Division of Biochemistry. Twenty three scientists, researchers and teachers from ICAR institutes and SAUs participated in the training programme.

### Workshops

Two workshops were organized to review the performance of the crops /technologies under demonstrations during *rabi* 2013-14 and *kharif* 2014 and to decide the future course of action. First IARI-VO Workshop on October 15, 2014 (23 representatives of VO partners and 33 IARI officials participated), and second national extension programme review workshop on October 16, 2014 (11 nodal officers of partner ICAR Institutes/SAUs and 33 IARI officials attended).

A workshop on “Training and Dissemination of Green Technologies - Bio Pesticides, Cattle Feed & Fodder Management and Rapid Composting” was organized by IIT, Delhi in collaboration with KVK, Shikohpur from December 9 to 11, 2014 at KVK campus. Seventy five farmers and farm women from different villages of Gurgaon district participated in this workshop.

## MISCELLANEOUS

### New Externally Funded Projects Sanctioned

- ❖ “Metabolic engineering for the development of high is of lavone soybean with improved nutritional and flavor characteristics” funded by DBT. Principal Investigator: Dr. Anil Dahuja, Division of Biochemistry.
- ❖ “Scaling up the productivity of Darjeeling mandarin through identification, multiplication and supply of healthy superior clones for improving rural livelihood in Darjeeling hills” funded by Directorate of Horticulture (DFPI&H). Principal Investigator: Dr. Dipak Nayak, IARI Regional Station, Kalimpong.
- ❖ “Support for entrepreneurial and managerial development of SMEs through incubators” funded by MSME. Principal Investigator: Dr. Neeru Bhooshan, ZTM & BPDU.
- ❖ “Validating crop specific DUS Testing guidelines for cucumber (*Cucumis sativus*), bottle gourd (*Lagenaria sinceraria*), bitter melon (*Momordica charantia*), pumpkin (*Cucurbita moschata*) and pointed gourd (*Trichosanthes dioica*)” funded by PPV & FRA through IIVR, Varanasi. Principal Investigator: Dr. T.K. Behera, Division of Vegetable Science.
- ❖ “Identification and characterization of peptides in selected wheat cultivars which are less immunogenic to patients with celiac disease” funded by DBT. Principal Investigator: Dr. Anju M. Singh, Division of Genetics.
- ❖ “Entrepreneurship development and financial empowerment of rural women through value addition in ornamentals” funded by DST. Principal Investigator: Dr. Ritu Jain, Division of Floriculture and Landscaping.
- ❖ “Genetic divergence analysis and DNA fingerprinting of Indian bred roses” funded by DBT. Principal Investigator: Dr. Raju V.S. Dantuluri, Division of Floriculture and Landscaping.
- ❖ “Assessing water, carbon and nitrogen footprints of major crops in some selected sites of the Indo-Gangetic plains” funded by DST. Principal Investigator: Dr. Bidisha Chakrabarti, CESCRA.

### Patent Renewed

Novel superabsorbent hydrogel/s and the method of obtaining the same

### Patent Filed

A novel formulation of the plant growth promoting Rhizobacteria with enhanced shelf-life and the method of its preparation

### Trademark Renewed

“PUSA”

## Contract Service Projects

- ❖ “Agronomic studies of phosphate solubilizing fungi (PSF) based product, jumpstart in wheat and mustard” with Novozymes South Asia Pvt. Ltd., Bengaluru.
- ❖ “Residues of Zineb in tobacco leaf and cropped soil at harvest following application of Zineb 75% WP product” with M/s Indofil Industries Ltd., Mumbai.
- ❖ “Agronomic studies of phosphate solubilizing fungi (PSF) based product, jumpstart in wheat” with Novozymes South Asia Pvt. Ltd., Bengaluru.
- ❖ “Evaluation of companion (Carbendazim 12% + Mancozeb 63% WP) against diseases in apple” with Indofil Industries Ltd., Mumbai.
- ❖ “Efficiency of seed + Crop XL (Aura XL) for enhancement of yield in wheat (two seasons trial)” with Cytozyme laboratories Inc., Gurgaon, Haryana.

## Collaboration

An agreement for collaboration was signed between IARI and DUVASU, Mathura for Quality Seed Production.

## Technologies Commercialized

Sixteen IARI Technologies including seed varieties, i.e., wheat varieties HD 3086, HD 3090 and HD 2967, and mustard varieties PM 26, PM 27, PM 28, PM 29 and PM 30; Bio fertilizer technologies, i.e., VAM Technology, Compost Inoculant Technology, PSB, and Azotobacter; and Post harvest



MoA with Malwa Enterprise, Punjab for Mustard variety PM 30

technologies, i.e., Amla Cookies, Beet Root Cookies and Pusa Nutri Cookies were licensed to 11 Industry Partners and generated a revenue of ₹ 8.05 lakhs.

### Agribusiness Incubation Activities

Under MSME scheme entitled “Support for Entrepreneurial and Managerial Development of SMEs through Incubators”, five incubates of ZTM& BPD unit were selected for grant-in-aid of ₹ 26.89 lakh for the year 2014-15. First installment of ₹ 8.06 lakh was released to the selected incubates to start their venture. The selected incubates are:

- ❖ Mr. Jaideep Pareek of M/s Jai Biotech & Research Centre, Rajasthan
- ❖ Mr. Kundan Kumar of M/s KAD Bioresources Pvt. Ltd., Gujarat
- ❖ Mr. L.K. Pandey of M/s Ananya Seeds Pvt. Ltd., Karnataka
- ❖ Ms. Tuba Siddiqui of M/s Nature’s Lap, Uttar Pradesh
- ❖ Mr. Bhopinder Mehta of Society for Farmer Development, Himachal Pradesh

### Corporate Membership

In this quarter, 22 new members were registered and 12 members

renewed their registration raising the membership to a total of 588 as on December 31, 2014.

## HINDI AWARENESS ACTIVITIES

### Annual Hindi Prize Distribution Function

The Institute celebrated its Annual Hindi Prize distribution Function on October 18, 2014 at Dr. B.P.Pal Auditorium. Dr. Ravinder Kaur, Acting Director, IARI presided over the function. Dr. K.V. Prabhu, Joint Director (Research) and Chairman, Institute Official Language Implementation Committee gave the welcome address. Mrs. Seema Chopra, Deputy Director (OL) presented the Institute Official Language Progress Report. Shri Laxmi Shankar Vajpai, Deputy Director General, All India Radio who was the Chief Guest released *Rajbhasha Patrika*, *Pusa Surbhi* and gave away the prizes to the winners of different competitions organized during the year and Hindi Chetna Maas. A hassay kavi sammelan was

also organized at this occasion which brought cheers and smiles to the audience.

### Power Point Presentation Competition in Hindi and Workshop

The Institute organized a Power Point Presentation Competition on “*Tikau Krishi* (Sustainable Agriculture)” in Hindi for the scientists and technical officers on December 5, 2014 at CESCRA Auditorium. Dr. K.V. Prabhu, Joint Director (Research) inaugurated the programme. The winners were awarded cash prizes of ₹ 5,000, ₹ 3,000 and ₹ 2,000 to the first, second and third positions, respectively.

A workshop was also held on the same topic in the second session. Dr. R.P. Singh, Executive Secretary, Indian Agricultural Universities Association, New Delhi discussed the concept and basics of the *Tikau Krishi*. Shri A.K. Dubey, former Editor (Hindi), IARI discussed about the difficulties in power point presentation in Hindi. Thirty five scientists participated in the workshop.



Shri Laxmi Shankar Vajpai, Deputy Director General, All India Radio giving certificate to one of the winner of the competitions

## The Institute Participated in the Swachh Bharat Mission

The Institute observed the Swachh Bharat Mission at its various establishments on 2nd October 2014. The employees of IARI took *Swachhta Shapath* (Cleanliness Oath) and cleaned the premises of their establishments.



The staff of IARI taking Swachhta Shapath on October 2, 2014

## Awards/Honours

- ❖ Dr. Rashmi Aggarwal, Head, Division of Plant Pathology was honoured as Fellow of Society of Biocontrol Advancement (FSBA), Bengaluru.
- ❖ Dr. S.S. Sindhu, Principal Scientist, Division of Floriculture and Landscaping & Incharge, Publication Unit (English) received the Fellowship of the Horticultural Society of India for his significant contributions in the field of horticulture.
- ❖ Ms. Veda Krishnan, Scientist, Division of Biochemistry received the Young Scientist Award 2014 in the international conference on "Radiation Biology" organized by the Society of Radiation Biology, New Delhi.
- ❖ Dr. Sweta Kumari, Scientist, Division of Biochemistry received the Young Scientist Award 2014 in the international conference on "Life Science and Bioengineering" organized by



The Hon'ble members of the Parliamentary Standing Committee on Agriculture interacting about IARI technologies with IARI team

the Institute of Applied Medicine and Research, Ghaziabad.

## The Parliamentary Standing Committee on Agriculture Visited the Institute

Hon'ble Parliamentary Standing Committee on Agriculture visited ICAR-Indian Agricultural Research Institute, New Delhi on November 7, 2014. The Hon'ble members had a glimpse of IARI technologies displayed at Agricultural Techno-

logy Information Centre and interacted with the faculty of IARI. The Committee also visited the Eco-Friendly Waste Water Treatment Facility, Vegetable Demonstration Unit, Climate Change Facility, Golden Rice Transgenic Screen House. The Hon'ble members of the Committee also had detailed discussion with the scientists/representatives of IARI and ICAR on various agricultural issues at the Conference Hall of Central Library.

## Visitors from Abroad

During the period, October-December 2014, two delegations one each from Mexico & Uganda, and Indo-German Bilateral Cooperation members visited the Institute. The Mexican delegation was led by Mr. Raul Urteaga Trani, Coordinator General for International Affairs.



The Mexican delegation interacting with IARI officials

## Dr. Ravinder Kaur Joins as Director (Acting)



Dr. Ravinder Kaur, Project Director, Water Technology Centre, IARI, joined as Director (Acting), Indian Agricultural Research Institute, New Delhi on October 1, 2014. Born in New Delhi on January 19, 1965, she obtained her B.Sc. Physics (Hons.) from Delhi University in 1986 and M.Sc. (Agril. Physics) and Ph.D. (Agril. Physics) in 1988 and 1991, respectively, from IARI, New Delhi. Dr. Kaur started her professional career on 21st January 1992 as Scientist (Soil Physics and Soil & Water Conservation) in the ICAR and was posted at Central Soil Salinity Research Institute, Karnal (Haryana). She joined IARI, New Delhi in 1995 at the Division of Environmental Sciences. Dr. Kaur is currently holding the position of the Project Director, Water Technology Centre since February, 2012.

Dr. Kaur has developed several novel indigenous environmental impact assessment tools such as IMPASSE©, Usar© and DROP for assessing impacts of a range of geo-hydrologic conditions and resource management plans on the physical and chemical degradation of agricultural lands and waters and for proposing optimal land use and conservation practice plans. Dr. Kaur has also developed novel multi-spectral/ hyper-spectral techniques (such as Img2Info© and Ref2Info©) for precise resource characterization/discrimination from satellite/airborne platforms and a spatial decision support tool (viz. ResourCeS©) for assessing regional water use/water productivity; soil/water/ vegetation health; bench marking canal irrigation performance and targeting pollution contributing sources in National Capital Region. In 2007 she developed interest in wastewater management, treatment and recycling that led to the development of an innovative eco-friendly urban wastewater treatment facility (of 2.2 MLD capacity) associated with less than 1% energy, zero-chemicals, no skilled manpower and 50-65% lower treatment cost than a comparable conventional wastewater treatment technology for the first time in the country.

Throughout her career, Dr. Kaur has been honored with several prestigious national/ international awards (viz. ICAR Young Scientist Award in 1998; IHELP fellowship at Iowa State University, USA in 2000; ICAR Punjab Rao Deshmukh Women Agricultural Scientist Award in 2001; ICAR National Fellow position in 2005; Fulbright fellowship at Florida, USA in 2009; Visiting Scientist position at National Taiwan Ocean University, Taipei in 2010; Environmental Leadership Award in 2011 and Bharat Jyoti Award in 2012) and has a number of copyrights and patent to her credit.

## Dr. J.P. Sharma Takes over as Joint Director (Extension)



Dr. J.P. Sharma joined as Joint Director (Extension), Indian Agricultural Research Institute, New Delhi on October 1, 2014. Previously, he was working as Head, Division of Agricultural Extension and Director, Centre for Advanced Faculty Training (Extension), IARI, New Delhi. He earned his Doctoral degree from IIT, Delhi and Post Graduation from GB Pant University of Agriculture and Technology, Pantnagar, and was awarded Fellowships from IIT and UNDP.

He has a vast experience of 28 years conducting strategic research, guiding & teaching post graduate students, and carrying out agricultural extension activities in the farmers' fields. He has to his credit researches on highly relevant topics like assessment, refinement of agricultural technologies, peri-urban agriculture and entrepreneurship development conducted as part of funded projects from reputed national/international organizations. Many models, strategies and extension approaches as a result of these studies have now been incorporated in the present extension system. He has published more than 300 papers in reputed journals, magazines and newspapers, published 30 books, bulletins and is editor of journals of repute like Journal of Community Mobilization for Sustainable Development.

Dr. Sharma is member of various national & International professional committees and was invited as consultant/expert by various organizations. He contributed a lot as Secretary, International Federation for Women in Agriculture, and Founder President, Society for Community Mobilization for Sustainable Development. He received more than 60 awards/ recognitions including some international awards for making outstanding contributions for the upliftment of the farming community.

Published quarterly by the Publication Unit on behalf of the Director, Indian Agricultural Research Institute (IARI), New Delhi 110 012, and printed at Venus Printers and Publishers, B-62/8, Naraina Industrial Area, Phase II, New Delhi - 110 028.

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