



# Pearl Millet News



ICAR- All India Coordinated Research Project on Pearl Millet  
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Number: 9

March, 2020

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## From Coordinator's Desk....

Pearl millet [*Pennisetum glaucum* (L.) R. Br.] is the most widely grown staple food of majority of poor and small land holders in Asia and Africa. It is also consumed as feed and fodder for livestock. It accounts for almost half of global millet production. It is the sixth most important cereal crop in the world next to maize, rice, wheat, barley and sorghum. In India, pearl millet is the fourth most widely cultivated food crop after rice, wheat and maize. It occupies an area of 6.93 million ha with an average production of 8.61 million tonnes and productivity of 1243 kg/ha (Directorate of Millets Development, 2020; Project Coordinator Review, 2020). The major pearl millet growing states are Rajasthan, Maharashtra, Uttar Pradesh, Gujarat and Haryana contributing 90% of total national production. Most of Pearl millet in India is grown in rainy (*kharif*) season (June / July – September / October). It is also cultivated during summer season (February – May) in parts of Gujarat, Rajasthan and Uttar Pradesh; and during the post-rainy (*rabi*) season (November – February) at a small scale in Maharashtra and Gujarat. Pearl millet excels all other cereals due to its unique features - C<sub>4</sub> plant with high photosynthetic efficiency, high dry matter production capacity and is grown under the most adverse agro-climatic conditions where other crops like sorghum and maize fail to produce economic yields. It is critically important for food and nutritional security as it possess several advantages such as early maturing, drought tolerance, require minimal purchase inputs and mostly free from biotic and abiotic stresses.

Pearl millet has special health benefiting properties for people suffering from life style diseases like diabetes, obesity etc. Nutritional value of pearl millet is better in comparison to wheat, rice, maize and sorghum. It is a good source of energy, carbohydrate, fat (5-7%), ash, dietary fibre (1.2g/100g),  $\alpha$ -amylase activity, quality protein (9-13%), vitamin A and B, minerals (2.3mg/100g), antioxidants such as ferulic acid and



coumaric acids with better fat digestibility (Poshan, 2019). It is called as the “*Powerhouse of Nutrition*” as it consists of most of the important nutrients in good quantity and quality which is required for maintaining healthy and nutritious life. Pearl millet has the higher contents of macronutrients and micronutrients such as iron, zinc, calcium, magnesium, copper, manganese, phosphorous, folic acid and riboflavin. It is rich source of unsaturated fatty acids (75%). It has high proportions of slowly digestible starch (SDS) and resistant starch (RS) which contribute to low glycemic index (GI) and is the need of the transforming diets, food habits and the food industry. Pearl millet is gluten free and retains its alkaline properties even after being cooked which is ideal for gluten allergy and people suffering from acidity. Due to the excellent nutritional properties and resilience to climate change, pearl millet along with other millets is renamed as *nutri-cereals* (Gazette of India, No. 133 dtd 13<sup>th</sup> April, 2018) for production, consumption, trade and was included in Public distribution system. The MSP of pearl millet is increased to Rs. 2000 per quintal (raised by Rs. 50 which is 2.6 %) which is higher than previous year. To bring millets into mainstream for exploiting the nutritional rich properties and promoting their cultivation, Govt. of India has declared Year 2018 as the “Year of Millets” and the Year 2021 was declared as “International Year of Millets” by FAO Committee on Agriculture (COAG) forum.

Apart from the conductance of mandated coordinated multi location trials and evaluation of test entries, ICAR- AICRP on Pearl millet is committed to pearl millet improvement through research, technology generation and transfer. Till date, a total of 175 hybrids and 62 varieties were identified and released for cultivation in different agro ecological zones of the country through AICRP on Pearl millet. A number of production and protection technologies specific to different agro-ecological regions which will prove useful in enhancing the productivity of improved cultivars to commercial farming scales and increase the profitability of pearl millet growers were developed through this system. Website and Information System of ICAR-AICRP on Pearl millet was developed and launched through Krishi Portal with support of IASRI, New Delhi by Dr. Trilochan Mohapatra, Secretary (DARE) and DG, ICAR, New Delhi on 10<sup>th</sup> December, 2019.

ICAR-AICRP on Pearl millet is actively collaborating as technology and knowledge partner in several new research initiatives like UNEP-GEF project on “Mainstreaming agricultural biodiversity conservation and utilization in agricultural sectors to ensure ecosystem services and reduce vulnerability”, “Millet mission” by NFSM, Niche area of excellence (NAE) programme from ICAR on “Development of biochemical and physical processing technology to arrest oxidation of lipids/flavones to enhance the shelf-life of pearl millet flour”, ICAR-BMGF project on “Application of next-generation breeding, genotyping, and digitalization approaches for improving the genetic gain in Indian staple crops”. Under the NFSM, high iron/zinc pearl millet hybrids were demonstrated on large number of farmer's fields. Along with yield improvement, focus on the nutritional improvement was also given in Pearl millet. Biofortified varieties/hybrids with Fe and Zn were taken up as a priority area due to which mainstreaming of biofortification happened in pearl millet and now is a routine affair.

Development of high yielding, dual purpose disease resistant cultivars for low rainfall areas i.e. A<sub>1</sub> zone is of utmost priority for increasing pearl millet productivity at national level. Refinement of technologies for processing of grain, development of value added products along with development of sound extension support for popularization of these technologies and products, spread of pearl millet cultivation in nontraditional areas and pearl millet hybrid seed production in North - Western part of the country is the need of the hour. These changes will certainly add to the national efforts of doubling the farmer's income.





## 54<sup>th</sup> Annual Group Meeting of ICAR-AICRP on Pearl Millet

The 54<sup>th</sup> Annual Group Meeting of ICAR-All India Coordinated Research Project on Pearl Millet was held at Dr. B.P. Pal Auditorium, ICAR-IARI, New Delhi during 15-17<sup>th</sup> March, 2019. Dr. Trilochan Mohapatra, Secretary (DARE) & DG (ICAR) inaugurated the meeting and in the inaugural address he emphasized that contributions made in the research work by each and every individual is important and urged the researchers to give due importance to the contributions made by their co-workers.



The Director General emphasized that the scientists from various agricultural and allied sciences' backgrounds must maintain a proper record of their valuable researches by promptly documenting them. He urged the young scientists to gain knowledge from the experiences of their senior colleagues and then start their action plans in the designated directions. He also stated that scientists

must come out with prompt action plans in the course of research to maintain and retain the nutritional values of the crops along with enhancing the productivity of crops. He mentioned about the phenomenal changes happening in the climatic conditions of the country and stressed that plenty of opportunities exist which can be utilized in these fields of research.

Dr. A.K. Singh, DDG (Agricultural Extension) & Director, IARI highlighted that around 16 hybrids/composites of bajra (Pearl millet) were developed by IARI. He said that it is the sole responsibility and duty of the scientists and researchers to maintain the quality of the crop.

Dr. R.B. Singh, Former President, NAAS stated that Pearl Millet is the real Pearl for the farmers of the country. He stressed that malnutrition is one of the major problems of the country and requires prompt attention to address it. He said nutrient rich millet is necessary for having a good and healthier life. Dr. Singh also applauded the ICAR-AICRP's efforts and initiatives for the promotion of the crop.

Dr. C. Tara Satyavathi, Project Coordinator, ICAR-AICRP on Pearl Millet, Jodhpur highlighted the nutritional values of pearl millet and its health-related advantages. She said that Pearl Millet is one of the first crops where MAS strategies and tools have been applied for developing the "Improved HHB - 67". She underlined that the ICAR-AICRP on Pearl Millet has been actively collaborating as the technology and knowledge partner in several new research initiatives in Pearl millet.

### Notification of Release of New Hybrids and Varieties during 2019-20

- Eight pearl millet hybrids were notified and released for cultivation for various agro-ecologies of the country during 2019-20:

| Hybrids                               | Notification number | Notification Date | Area of adaptation   |
|---------------------------------------|---------------------|-------------------|--|
| PB 1852 (MH 2224)                     | S.O 3220(E)         | 06.09.2019        | Rajasthan, Gujarat, Haryana, Madhya Pradesh, Uttar Pradesh, Punjab and Delhi |
| JKBH 1326 (MH 2228)                   | S.O 3220(E)         | 06.09.2019        | Rajasthan, Gujarat, Haryana, Madhya Pradesh, Uttar Pradesh and Punjab        |
| RHB 234 (MH 2174)                     | S.O 3220(E)         | 06.09.2019        | Rajasthan, Haryana, Gujarat, Punjab, Delhi Maharashtra, and Tamil Nadu       |
| RHB 233 (MH 2173)                     | S.O 3220(E)         | 06.09.2019        | Rajasthan, Haryana, Gujarat, Punjab, Delhi Maharashtra, and Tamil Nadu       |
| DHBH 1397 (MH 2114)                   | S.O 3220(E)         | 06.09.2019        | Rajasthan, Gujarat, Haryana, Madhya Pradesh, Uttar Pradesh, Punjab and Delhi |
| AHB 1269Fe (MH 2185)                  | S.O. 1498(E)        | 01.04.2019        | Rajasthan, Gujarat, Haryana, Punjab, Delhi, Maharashtra, and Tamil Nadu      |
| PROAGRO 9450 (Bayer 9450)             | S.O. 1498(E)        | 01.04.2019        | Uttar Pradesh  |
| Phule Mahashakti (DHBH 1211)(MH 2078) | S.O. 1498(E)        | 01.04.2019        | Maharashtra  |

- Three hybrids viz. BHB 1602 (MH 2192), PB 1852 (MH 2224), JKBH 1326 (MH 2228) were identified for cultivation for various agro-ecologies of the country during 54<sup>th</sup> Annual Group Meeting.

### Information System of ICAR- AICRP on Pearl millet

Website and Information System of ICAR-AICRP on Pearl millet was developed through Krishi Portal with support of IASRI, New Delhi and was launched on 10<sup>th</sup> December, 2019 by Dr. Trilochan Mohapatra, Secretary (DARE) and DG, ICAR in the inaugural Session of 4<sup>th</sup> National Workshop of Officer Incharge Data Management at NASC Complex, New Delhi.



### Quinquennial Report of ICAR-AICRP on Pearl millet

The Indian Council of Agricultural Research (ICAR) constituted the Quinquennial Review Team (QRT) to review the work done by the ICAR-All India Coordinated Research Project on Pearl Millet for the period 2012-2017. The team including Dr. P. Raghava Reddy, Chairman and members Dr. O.P. Govila (Plant Breeding), Dr. M.L. Lodha



(Biochemistry), Dr. R.K. Pannu (Agronomy), Prof. H.S. Shekhar Shetty (Plant Pathology), Dr. D.C. Uprety (Plant Physiology) who visited different centres and reviewed the progress. The chairman submitted QRT Report to DG, ICAR, New Delhi on 5<sup>th</sup> September, 2019.



### MoUs

- CCS HAU, Hisar has given non exclusive license for seed production and marketing of newly developed high iron pearl millet hybrids HHB 299 and HHB 311 on 8<sup>th</sup> January, 2020 to M/s. Sampoorana Seeds (P) Ltd., Adoni, Andhra Pradesh and on 20<sup>th</sup> January, 2020 to Sri Laxmi Venkateswara Seeds, Kurnool, Andhra Pradesh.
- University of Mysore and CortevaAgri Science, USA has signed a MoU during January, 2020 for Seed health testing for Pearl millet, Rice, Maize and other major food crops.
- A MoU was signed between Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani and Maharashtra State Seed Corporation Ltd, Akola for non-exclusive license for the seed production, marketing and commercialization of ABPC-4-3 and AHB-1200 Fe in Maharashtra.

### Material and technology development for A<sub>1</sub> zone

A series of meetings and interaction sessions were held for developing material and technologies for A<sub>1</sub> zone.

- First meeting was held at PC Unit, ICAR- AICRP on Pearl millet, Jodhpur on 9<sup>th</sup> April, 2019 with the pearl millet breeders working in Rajasthan.
- A brainstorming session for development of material and technologies of pearl millet for A<sub>1</sub> zone was organized jointly by PC Unit, ICAR-

AICRP on Pearl millet and SKRAU, Bikaner on 22<sup>nd</sup> May, 2019.



- Another meeting was held at PC Unit, ICAR- AICRP on Pearl millet, Jodhpur to discuss survey and monitoring plan as a follow up of meeting held on 22<sup>nd</sup> May, 2019 in Bikaner to develop a roadmap for pearl millet genetic improvement targeting A<sub>1</sub> zone on 7<sup>th</sup> August, 2019.
- On 24<sup>th</sup> January, 2020, a meeting was held at ICRISAT, Patancheru in which issues were discussed for the implementation of material development for A<sub>1</sub> zone under ICAR-ICRISAT partnership trials.

### Interaction Sessions / Trainings / Workshops / Seminars / Symposia Organized

- Training cum Awareness Programme on PPV & FR Act, DUS testing in Pearl millet with farmers, scientists, officials of state agricultural department and state seed corporation was organized on 1<sup>st</sup> October, 2019 at PC Unit, ICAR- AICRP on Pearl millet, Jodhpur



- PMRS, JAU, Jamnagar organized special trainings on “Varietal characterization & seed production technology in pearl millet” on 25<sup>th</sup> July, 2019 and 1<sup>st</sup> August, 2019





- NARP, Aurangabad conducted 12 local training programmes (on and off campus) during the year 2019-20 including training on “Package of practices of pearl millet; Varietal improvement in pearl millet; Pearl millet-based cropping system; Pest and disease management of pearl millet.”
- ICAR-AICRP on Pearl millet, Mysore organized two national workshops on “Scientific equipments: application and data analysis in advanced research” during 17<sup>th</sup> - 23<sup>rd</sup> September, 2019; “Application of digital PCR and SE3 cell sorter in life science research” for researchers, scientists and teachers of University/Institutes during 21<sup>st</sup> -22<sup>nd</sup> November, 2019.
- Bajra Section, Department of Genetics & Plant Breeding, CCS HAU, Hisar organized a national workshop on “Production, processing & value addition of nutri-cereals (millets) in India” sponsored by Directorate of Millet Development, GOI, Jaipur on 16<sup>th</sup> September, 2019.
- ICAR-AICRP on Pearl millet, Ananthapuramu

organized three trainings on “Scope for establishment of millet processing plant, present and future area of the millets” in the district on 19<sup>th</sup> October, 2019; “Design and implementation of plant breeding trials, selfing and crossing techniques in pearl millet” on 7<sup>th</sup> November, 2019 and “Varietal improvement in pearl millet” on 19<sup>th</sup> November, 2019.



### Field Days/Kisan Mela

- PC Unit, ICAR-AICRP on Pearl millet, Jodhpur participated and demonstrated various pearl millet hybrids/varieties and technologies to the farmers during Kisan Mela and Farmers Innovation Day organized at Central Arid Zone Research Institute (CAZRI), Jodhpur on 16<sup>th</sup> September, 2019.





- Three days Krishi mela was organized by College of Agriculture, Regional Agricultural System, Vijayapur from 4-6<sup>th</sup> January, 2020 at Hittinhalli Farm, Vijayapur.



- Regional Agricultural System, Vijayapur participated in three days Krishi mela organized by UAS, Dharwad from 18-20<sup>th</sup> January, 2020 at Dharwad and displayed the information on pearl millet.



- “Pearl millet field day” was organized by ICAR-AICRP on Pearl millet, Bikaner on 3<sup>rd</sup> October, 2019 at Kalyanpura village of Sardarsahar Tehsil in Churu District in which approx. 50 farmers participated to get benefits of improved practices of pearl millet cultivation for higher yields.
- ICAR- AICRP on Pearl Millet, Dhule demonstrated Pearl millet hybrid “Phule Aadishakti” during field day and farmers rally at Village-Vaghode, Tal-Shindakheda, Dist-Dhule on 7<sup>th</sup> October, 2019.



- NARP, Aurangabad conducted a “Field day on pearl millet” at Lakhegaon and Padali village tq. Paithan, Dist. Aurangabad under FLD programme on 30<sup>th</sup> September, 2019 in which 78 farmers were benefitted.



- A university level Kisan Mela was organized during 11-12<sup>th</sup> September, 2019 at CCS HAU, Hisar where more than 40,000 farmer's participated.
- ICAR-AICRP on Pearl Millet, Ananthapuramu organized a “Pearl millet field day” and an awareness programme for millets promotion on



13<sup>th</sup> December, 2019 at A. Kondapuramu Village, Puttluru Mandal, Ananthapuramu and Acharya N.G. Ranga Agricultural University organized a district level Kisan Mela at Agricultural Research Station, Kadiri, Ananthapuramu on 21<sup>st</sup> November, 2019.



### Other Activities

- An awareness and pledge programme on 'Swachhata hi Seva' as component of Swachhata Abhiyaan was held at PC Unit, ICAR-AICRP on Pearl millet, Jodhpur on 28<sup>th</sup> September, 2019 and “Swachhata Abhiyaan” was held on 30<sup>th</sup> September, 2019 and 13<sup>th</sup> November, 2019.



- 150<sup>th</sup> Birth anniversary of Mahatma Gandhiji was celebrated at PC Unit, ICAR-AICRP on Pearl millet, Jodhpur on 2<sup>nd</sup> October, 2019.



- Vigilance Awareness Week 2019 was celebrated from 28<sup>th</sup> October-2<sup>nd</sup> November, 2019 at PC Unit, ICAR-AICRP on Pearl millet, Jodhpur.

### Appointments

- Shri R.T. Suryawanshi, Assistant Professor, Agronomy joined ICAR-AICRP on Pearl millet, Dhule w.e.f. 2<sup>nd</sup> May, 2019.
- Prof. H.H. Bhadarge was appointed as pearl millet breeder at NARP, Aurangabad w.e.f. 15<sup>th</sup> July, 2019.

### Trainings/Workshops/Seminars/Symposia/Conferences Attended

- Dr. S.K. Parmar, Assistant Research Scientist, JAU, Jamnagar attended CAFT training on “Biotic and abiotic stress tolerance in plants under changing climatic conditions” organized by Department of Genetics and Plant Breeding, PAU, Ludhiana during 6-26<sup>th</sup> August, 2019.
- Dr. A.C. Detroja, Assistant Research Scientist, JAU, Jamnagar, JAU, Jamnagar attended ICAR-short course on “Renewable energy for



- environment protection & energy conservation" sponsored by ICAR and organized by Department of Renewable Energy Engineering, College of Agricultural Engineering and Technology, AAU, Godhara during 14<sup>th</sup>-23<sup>rd</sup> October, 2019.
- Mr. Manoj Kumar, Assistant Professor (Agronomy) AICRP on Pearl Millet, Mandor, Jodhpur attended ICAR sponsored winter school on "Advance technologies for biofertilizers and biopesticides production for profitable and sustainable agriculture" at RCA, MPUA&T, Udaipur, Rajasthan from 8-28<sup>th</sup> November, 2019.
  - Dr. I. Johnson, Assistant Professor (Plant Pathology) attended training on "Recent advances in endosymbionts of plants and insects" during 27<sup>th</sup> November-17<sup>th</sup> December, 2019 at Tamil Nadu Agricultural University, Coimbatore.
  - Dr. Vikas Khandelwal and Dr. C. Tara Satyavathi attended technical workshop of BMGF project during 24-25<sup>th</sup> April, 2019 and kharif workshop for DUS centres at PPV&FRA on 26<sup>th</sup> April, 2019 at NASC Complex, New Delhi.
  - Dr. Supriya, Assistant Professor (Biotechnology), PC Unit, ICAR-AICRP on Pearl millet, Jodhpur participated in Workshop on "Digitalization of breeding programs and data management" at ICRISAT, Hyderabad during 9-12<sup>th</sup> July, 2019
  - Dr. Vikas Khandelwal and Dr. C. Tara Satyavathi attended ICAR-BMGF Workshop on "Improving genetic gains in crops" during 12-15<sup>th</sup> August, 2019 at ICRISAT, Patancheru.
  - Mr. Manoj Kumar attended workshop on "Value chain development for heirloom crops and varieties" of UN-Environment GEF Project "Mainstreaming agricultural biodiversity conservation and utilization in agricultural sector to ensure ecosystem services and reduce vulnerability" at ICAR-NBPGR, New Delhi from 19-21, August 2019.
  - Dr. S.K. Pahuja, Dr. Anil Kumar, Dr. L.K. Chugh, Dr. Virender Malik, Dr. Dev Vart, Dr. K.D. Sehrawat and Dr. Vinod Kumar Malik attended one day national workshop on "Production, processing & value addition of nutri-cereals (millets) in India" at CCS HAU, Hisar on 16<sup>th</sup> September, 2019.
  - Dr. H.M Bhuva., Associate Research Scientist, JAU, Jamnagar attended one day karyashala on "Natural farming system of subhash palekar" held at Mahatma Mandir, Gandhinagar on 4<sup>th</sup> September, 2019 and a seminar on "Biodynamic Farming" jointly organized by Zonal Chapter GAAS, BACA Alumni Association and AAU, Anand at AAU, Anand on 9<sup>th</sup> December, 2019.
  - Dr. D. L. Kadvani, Associate Research Scientist, attended two seminars on "Pak sarankshan-pesticides, chemistry residue and limitations" at JAU, Junagadh on 5<sup>th</sup> September, 2019 organized by Bayer and JAU, Junagadh; "Krushiane bagayati pakomaa pravartman pak sarakshan prashnoane nirakaran" on 8<sup>th</sup> November, 2019 organized by PPAG, AAU, and Gujarat Horticultural Mission, Gandhinagar.
  - Dr. Vinod Kumar Malik attended two national symposiums on "Mitigation of emerging plant diseases under changing climate scenario" held at TNAU, Coimbatore on 16-17<sup>th</sup> December, 2019 and on "Plant disease management for food security under climate change scenario" at IIWBR, Karnal during 9-10<sup>th</sup> January, 2020.
  - Dr. G.M Parmar attended national symposium on "Pragmatic perspectives of agricultural development programmes in present scenario" held at NAU, Navsari during 8-9<sup>th</sup> June, 2019.
  - Dr. Supriya, Assistant Professor (Biotechnology), PC Unit, ICAR-AICRP on Pearl millet, Jodhpur attended 21<sup>st</sup> international conference on genetic engineering and biotechnology (ICGEB-2019) held at Singapore on 28-29<sup>th</sup> March, 2019 and chaired a technical session on biomedical and biological genetic engineering.
  - Mr. Manoj Kumar, Assistant Professor (Agronomy) attended "VII-Rajasthan Science congress held at MLSU, Udaipur (Rajasthan) from 14-16<sup>th</sup> October, 2019.
  - Dr. Supriya, Assistant Professor (Biotechnology) and Dr. R.C. Meena, Assistant Professor (Plant Physiology), PC Unit, ICAR-AICRP on Pearl millet, Jodhpur attended 5<sup>th</sup> international conference on "Plant genetics and genomics-germplasm to genome engineering" held at

- ICAR-NASC Complex, New Delhi from 17-18<sup>th</sup> October, 2019.
- Dr Anil Kumar, Dr. K.D. Sehrawat and Dr. Vinod Kumar Malik attended golden jubilee international conference on “New millennia agriculture- novel trends and future scenario” at CCS HAU, Hisar on 6-8<sup>th</sup> November, 2019.
  - Dr L.D. Sharma and Mr. Manoj Kumar, Assistant Professor (Agronomy) attended international conference on “Innovations in plant and animal sciences for sustainable agriculture and rural development” held during 7-9<sup>th</sup> December, 2019 at Rajasthan Agricultural Research Institute, SKNAU, Jaipur.
  - Dr. R.C. Meena, Assistant Professor (Plant Physiology), PC Unit, ICAR-AICRP on Pearl millet, Jodhpur attended national conference on “Plant physiology challenges in plant productivity and stress management” at Kerala Agricultural University, Thrissur from 19<sup>th</sup>-21<sup>st</sup> December, 2019.
  - Dr. C. Tara Satyavathi, Project Coordinator (Pearl millet) delivered a plenary lecture in session 21 on “Pearl millet for nutritional security and rural development” in 107<sup>th</sup> Indian Science Congress-2020” at the University of Agricultural Sciences, GKVK, Bangaluru on 7<sup>th</sup> January, 2020.
  - Dr. S.B. Pawar, Associate Director Research, NARP, Aurangabad delivered a lecture on “Varietal development and production technology of pearl millet” and Dr. G. P. Jagtap, pearl millet plant pathologist delivered lecture on “Disease and pest management of pearl millet” at Marathwada Revenue Training Academy, Aurangabad organized by State Agriculture Department, Aurangabad on 26<sup>th</sup> June, 2019.
  - Dr. C. Tara Satyavathi delivered lectures on “Nutritional benefits of iron rich pearl millet: development and promotion” on 23<sup>rd</sup> August, 2019 at Division of Agricultural Extension, IARI, New Delhi; “Pearl millet: nutritionally rich crop for one health” at Division of Biochemistry, ICAR-IARI, New Delhi on 20<sup>th</sup> September, 2019; “Biochemical properties and nutritional benefits of pearl millet” at Division of Biochemistry, ICAR-IARI, New Delhi on 19<sup>th</sup> October, 2019.
  - Dr. K.D. Mungra, Associate Research Scientist, JAU, Jamnagar delivered lecture on “Biofortification achievements in context to pearl millet” in ICAR summer school on “Innovative tools and techniques for biofortification” organized by SDAU, SKNagar, Gujarat on 4<sup>th</sup> October, 2019 and attended a workshop on “Genetic enhancement of pearl millet in collaboration with public sector - defining priorities for product development” organized by ICAR-IIMR, Hyderabad on 22<sup>nd</sup> January, 2020.
  - Dr. C. Tara Satyavathi acted as a panelist for the discussion on “Neglected and underutilized crop species for food nutrition, energy and environment” during first national conference on 2<sup>nd</sup> August, 2019 at NIPGR, New Delhi; “Millet grains: key supplement to staple” on 19<sup>th</sup> August, 2019 at Division of Biochemistry at ICAR-IARI, New Delhi; “Role of millets in preventing the degradation and desertification of arid lands” during united nation convention to combat desertification (UNCCD) conference of the parties (COP14) on 5<sup>th</sup> September, 2019 at New Delhi; “Way forward for genomics in climate resilient crops” under the chairmanship of Prof. Swapan Datta Ex-DDG(CS), ICAR at ICRISAT as part of an international training on next generation genomics for improving climate resilient crops on 15<sup>th</sup> February, 2020.
  - Dr. S.P. Singh interacted with CAFT trainees of Division of Biochemistry at pearl millet field on 12<sup>th</sup> September, 2019 and delivered a lecture on “Current status of hybrid development in pearl millet” on 22<sup>nd</sup> October, 2019 in the training on “Biochemical methods to assess the nutritional quality in pearl millet” held at Division of Biochemistry, IARI New Delhi under Niche Area of Excellence (NAE) program.
  - Dr. S.P. Singh delivered a lecture on 22<sup>nd</sup> October, 2019 on “Current status of hybrid development in pearl millet” in the training “Biochemical methods to assess the nutritional quality in pearl millet” held in Division of Biochemistry, IARI New Delhi during 10<sup>th</sup>-23<sup>rd</sup> October, 2019 under Niche Area of Excellence (NAE) program; “Principles and practices of seed production in



pearl millet” on 6<sup>th</sup> November, 2019 in the capacity building training program on “Seed production and quality evaluation” for participants from AARDO member countries during 4-15<sup>th</sup> November, 2019 at Division of Seed Science and Technology, ICAR-IARI, New Delhi.

- Dr. C. Tara Satyavathi, Project Coordinator (Pearl millet) participated in the CRP-GLDC science meeting during 25-29<sup>th</sup> November, 2019 at Nairobi, Kenya.
- Dr. D.M. Lomte, Pearl millet Agronomist, NARP, Aurangabad delivered a lecture to dealers under diploma in Agricultural Extension Services for Input Dealers (DAESI) on importance of pearl millet under contingent crop planning.
- Dr. C. Tara Satyavathi participated in brainstorming sessions on “Development of material and technologies of pearl millet for A<sub>1</sub> zone” at SKRAU, Bikaner on 22<sup>nd</sup> May, 2019; on "Technological innovations and strategies for farmers' prosperity in Rajasthan" under chairmanship of Sh. Kailash Choudhary, Hon'ble Minister of State on 13<sup>th</sup> July, 2019 at NASC Complex, Pusa, New Delhi and on "Speed breeding” organized by ISGPB in the wheat workshop on 25<sup>th</sup> August, 2019 at Indore.
- Dr. Chandra Nayaka attended 85<sup>th</sup> Annual Meeting of the Indian Academy of Sciences held on 8-10<sup>th</sup> November, 2019 at Central University Hyderabad and Indian Science Congress Association-2020 at University of Agricultural Sciences, Bangalore during 3<sup>rd</sup>-7<sup>th</sup> January, 2020.



- Dr. R. Narasimhulu Scientist (Plant Breeding) delivered two radio talks on “Quality seed production techniques in Pearl millet” on 5<sup>th</sup> August, 2019 and Importance of millets in dry land agriculture and management techniques in cultivation” on 24<sup>th</sup> August, 2019.
- Dr. R. Narasimhulu Scientist (Plant Breeding) participated in a TV programme on “Importance of millets in rain fed cultivation and the activities of the AICRP on Pearl millet at ARS, Ananthapuramu” on 22<sup>nd</sup> October, 2019.

### Awards and Nominations

- ICAR-AICRP on Pearl millet, Jodhpur was awarded certificate of “*Outstanding partnership for NARS Biofortification Research and establishing first global minimum standard for micronutrient in the cultivar release policy*”.



- Dr. C. Tara Satyavathi was honored with MS Swaminathan Outstanding Woman Scientist Award-2019 by Indian Society of Genetics and Plant Breeding, New Delhi on 15<sup>th</sup> December, 2019.



- National Agricultural Research Project, Aurangabad (VNMKV, Parbhadhpurni) received “KRISHI SANSTHA SAMMAN” from Mahindra Samriddhi India Agri Awards 2019 under category of best public sector institutions with the auspicious hands of Sh. Amitabh Kant, CEO, NITI Aayog, Sh. Pawan Kumar Goenka, MD, Mahindra & Mahindra, Secretary DARE & DG, ICAR Dr. Trilochan Mohapatra and Dr. Ashok Dalwai, CEO, National Rainfed Area Authority (NRAA) on 18<sup>th</sup> March, 2019.



- Dr. Chandra Nayaka received Millennium Plaques Honor (Prime Minister Award for Contribution in the field of Science & Technology) by Indian Science Congress Association-2019.



- Dr. Supriya got best oral presentation award during 21<sup>st</sup> international conference on “Genetic engineering and biotechnology (ICGEB-2019)” at Singapore on 28-29<sup>th</sup> March, 2019 for oral presentation on “Biotechnological interventions for crop improvement in nutriceal pearl millet”.
- Dr. B.K. Athoni won best poster presentation award (1<sup>st</sup> prize) in ISMPP 40<sup>th</sup> annual conference

& national symposium on “Microbial based strategies for improvement of soil and plant health, organized by Karnataka University, Dharwad and ISMPP, Udaipur during 24-26<sup>th</sup> September, 2019 at KUD, Dharwad for the research work on “Development of high yielding Pearl millet variety promising to blast disease [*Pennisetum glaucum* (L.) R. Br.] for northern dry zone of Karnataka”.

- Dr. B.K. Athoni won best poster presentation award (1<sup>st</sup> prize) in international conference on “Global research initiatives for sustainable agriculture & allied sciences (GRISAAS-2019)” organized by Astha Foundation, Meerut and UAHS Shivamogga during 20<sup>th</sup>-22<sup>nd</sup> October, 2019 at ICAR-NAARM, Hyderabad, Telangana for research work on “Identification of high yielding pearl millet hybrid [*Pennisetum glaucum* (L.) R. Br.] for Zone-3 of Karnataka”.
- Dr. Dev Vart, in collaboration with Dr. Rattan Yadav, Aberystwyth University, Aberystwyth, United Kingdom received the prestigious DUO-INDIA FELLOWSHIP (PROFESSORS) - 2020 from ASEM-DUO, South Korea and he also attended three months training in international pedagogy at IBERS, Aberystwyth University, Aberystwyth, United Kingdom under NAHEP-IDP Project of ICAR funded by World Bank from 11<sup>th</sup> April - 10<sup>th</sup> July, 2019.

### Visits

- Shri Kailash Choudhary, Hon'ble Minister of State (MoS) visited IARI, New Delhi Pearl millet fields on 12<sup>th</sup> October, 2019.





- Dr. Trilochan Mohapatra, Secretary, Department of Agricultural Research and Education & Director General, ICAR, New Delhi visited IARI, New Delhi Pearl millet field on 16<sup>th</sup> September, 2019.



- Dr. M.P. Pandey, Ex- Vice Chancellor and RAC Chairman, Indian Institute of Millet Research visited ICAR-AICRP on Pearl millet, Jodhpur on 30<sup>th</sup> January, 2020.



- Mr. Mahender Bishnoi, MLA and Member BOM, Agriculture University, Jodhpur visited ICAR-AICRP on Pearl millet, Jodhpur on 11<sup>th</sup> October, 2019.



- Dr. Lakhan Singh, Director of ATARI, Zone – VIII, ICAR, Pune visited summer nursery and

varietal demonstration of pearl millet at PMRS, JAU, Jamnagar on 29<sup>th</sup> April, 2019.



- Dr. AK Vyas, ADG (HRM), ICAR and member of BOM, SKNAU, Jobner visited field of AICRP on Pearl millet, RARI, Durgapura on 21<sup>st</sup> September, 2019.



- Dr. Subhash, Director, Directorate of Millets and Dr. Raj Bhandari, Member, Technical Committee, NITI Aayog visited field of ICAR-AICRP on Pearl millet, RARI, Durgapura on 13<sup>th</sup> August, 2019.



- Dr. Rattan S. Yadav, Reader, Aberystwyth University, Institute of Biological, Environmental



and Rural Sciences (IBERS) Aberystwyth, Wales, United Kingdom visited field of AICRP on Pearl millet, RARI, Durgapura on 13<sup>th</sup> August, 2019.



- Dr. H. L. Nadaf, Director of Research, University of Agricultural Sciences, Dharwad visited the summer breeding programme plots during Summer, 2019.
- Sh. Haribhau Bagade, Speaker, State Assembly, Maharashtra, Sh. Ghodele, Hon'ble Mayer, Aurangabad Corporation, Sh. Satish Chavan, MLA, Graduate Assembly, Smt. Deviyani Dongawankar, President Jilla Parishad, Aurangabad, Dr. A.S. Dhawan, Hon'ble Vice Chancellor, VNMKV, Parbhani, Sh. Uday Chaudhari, Hon'ble Collector, Aurangabad, Dr. P.G. Ingole, Director of Extension Education VNMKV, Parbhani and Sh. T.G. Mote, District Superintendent Agricultural Officer, Sate Agriculture Dept., Aurangabad visited pearl millet Hybrid AHB-1200Fe demonstration on 3<sup>rd</sup> August, 2019.



- Dr. D. P. Waskar, Director of Research, VNMKV, Parbhani visited research trial of Pearl millet and guided on various aspects on pearl millet research on 28<sup>th</sup> August, 2019.

- Dr. A. Vishnuvardhan Reddy, Director, IIOR, Hyderabad, visited the AICRP on Pearl Millet, ARS, Rekulakunta and discussed about breeding activities of the pearl millet and their impact on 10<sup>th</sup> October, 2019.



### Research Papers

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Published by

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