



SOYBEAN NEWS

सोयाबीन समाचार

भा.कृ.अनु.प.- भारतीय सोयाबीन अनुसंधान संस्थान

I.C.A.R.-INDIAN INSTITUTE OF SOYBEAN RESEARCH

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निदेशक की कलम से

प्रिय पाठकगण,

सोयाबीन विश्व में एवं भारत में एक अति महत्वपूर्ण तिलहनी फसल है। यह कुल तिलहनों का 45 % और देश में उत्पादित कुल खाद्य तेल का लगभग 25 % योगदान देता है। सोयाबीन के बीज में 40 % प्रोटीन और 20 % तेल होता है और यह अच्छी गुणवत्ता वाली प्रोटीन का सबसे किफायती स्रोत है। इसमें खनिज और उपयोगी न्यूट्रास्यूटिकल जैसे आइसोफ्लेवॉस, टोकोफेरॉल भी शामिल हैं, जो स्वास्थ्य हेतु अत्याधिक लाभदायक होते हैं। इसलिए, सोयाबीन में पोषण सुरक्षा प्रदान करने और देश में बढ़े पैमाने पर प्रोटीन कुपोषण को खत्म करने की क्षमता है।

विगत 40 वर्षों के दौरान सोयाबीन के क्षेत्र और उत्पादन में अभूतपूर्व वृद्धि के बावजूद, वर्तमान उत्पादकता स्तर विश्व औसत और फसल की जलवायु क्षमता से बहुत नीचे है। बदलते हुए जलवायु परिदृश्य में खाद्य-पदार्थ के रूप में, खाद्य-तेल, पशु चारा और सीधी खपत के लिए कई गुना सोयाबीन की मांग में बढ़ोत्तरी को पूरा करना सोयाबीन वैज्ञानिकों के लिए बड़ी चुनौती है। मध्य और दक्षिण भारत के लिए उपयुक्त सोयाबीन किस्मों का विकास करना इस संस्थान की प्राथमिकता रहा है तथा इस संबंध में महत्वपूर्ण प्रगति भी की गई है। जलवायु परिवर्तन जैसी स्थिति का सामना करने के लिए सूखा, उच्च तापमान और जल-भराव प्रतिरोधक सोयाबीन किस्मों का विकास इस संस्थान की प्रमुख प्राथमिकताएँ हैं।

मुझे भा.कृ.अनु.प.- भारतीय सोयाबीन अनुसंधान संस्थान, इन्दौर द्वारा "सोयाबीन समाचार" की वर्तमान अंक को प्रस्तुत करते हुए अत्यंत हर्ष की अनुभूति हो रही है। यह अंक जनवरी-जून 2017 की अवधि के दौरान समस्त समाचार तथा घटनाओं एवं प्रमुख अनुसंधान उपलब्धियों की झलक प्रस्तुत करेगा।

From the Director's Desk

Dear Readers,

Soybean is an important oilseed crop of the world as well as India. It accounts for 45% of the total oilseeds and about 25% of the total edible oil produced in India. Soybean seed contains 40% protein and 20% oil, and it is the most economical source of good quality protein. It also contains minerals and useful nutraceuticals like isoflavones, tocopherols, which provide immense health benefits. Therefore, the crop has a potential to provide nutritional security and eradicate rampant protein malnutrition in the country.

Despite phenomenal growth in area and production of soybean during the past 40 years, the current productivity levels are much below the world average and the climatic potential of the crop. The bigger challenge for soybean scientists is to meet the manifold increase in demand of soybean for edible oil, animal feed and direct consumption as a food in the face of changing climatic scenario. Development of soybean varieties suitable for central and southern India has been a research priority of this institute and significant progress has been made in this regard. Furthermore, climate-resilient soybean crop varieties to withstand drought, high temperature and water-logging conditions constitute major research priorities of the institute.

I am glad to present the current issue of "Soybean News" from ICAR-Indian Institute of Soybean Research (ICAR-IISR), Indore. It will provide glimpses of news and events, salient research achievements for the period January-June 2017.





Salient Research Achievements

- Genome wide identification of Single Nucleotide Polymorphism (SNPs) markers from rust resistant accession EC 241780 was performed by comparative analysis with Williams 82 reference genome sequence. Genomic annotation of SNPs in this genotype revealed that majority of the SNPs and InDels falls in the inter-genic region. Further, five SNPs near rust resistant gene were identified
- NRC 127 Kunitz trypsin inhibitor free soybean developed by introgressing null allele of kunitz trypsin inhibitor in JS 97-52 entered AVT I trial under AICRPS 2017.
- Two advanced breeding lines, namely, NRC 140 and NRC 141 exhibiting high oleic acid (about 60%) content have been developed
- Estimation of Kunitz trypsin inhibitor (KTI) and Bowman-Birk inhibitor (BBI) through densitometry and enzyme-linked immunosorbent assay (ELISA), respectively, was standardized and total trypsin inhibitor estimated through regular spectrophotometric method was found significantly higher than the summation of KTI and BBI.
- A large number of soybean germplasm accessions (2303) and 326 advanced breeding (F_5 - F_7) lines were screened, which led to the identification of 198 accessions (~10%) and 155 lines with drought tolerance, based on delayed senescence, canopy temperature, differential, SPAD-502 Chlorophyll meter readings and electrolyte leakage traits
- Survey of 90 soybean germplasm accessions using dCAPS (Cleaved amplified polymorphic sequences) marker for recessive allele of E2 - which confers early maturity- resulted in identification of IC 15089 for earliness
- Nano zinc and magnesium application @ 100, 150 and 200 mg per kg of soybean seed improved seedling growth and vigour over control. Approximately 24% increase in dry weight of seedling was recorded due to nano zinc and magnesium application @ 200mg/kg seed.
- Web-based Data Management System for Soybean Insects was developed. The data on scientific name, morphology, distribution, damage detail, economic impact, management, photos and videos were entered for 20 soybean insects. Preliminary design of the user interface of the Decision Support System for identification of these 20 Insects and their Management was also developed.



Fig 1 The main web-page of the Decision Support System for Identification of Soybean Insects and their Management



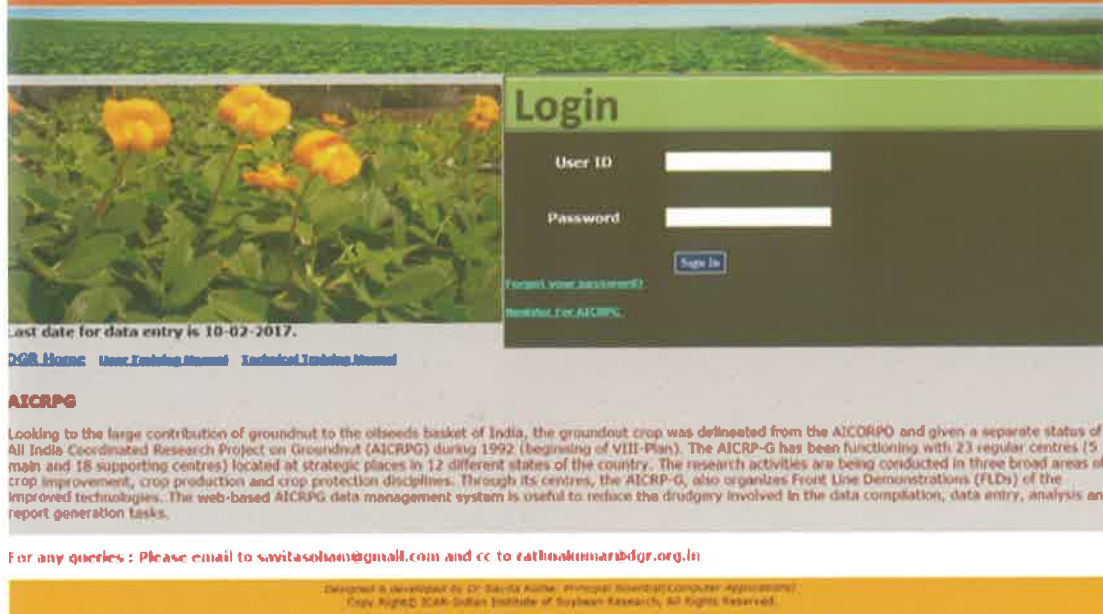
Fig 2 Web-page showing the data entry form of soybean insect data management system

- The On-line Data Management System for AICRPS trial developed by ICAR-IISR was configured as per the need and use for the on-

line data management of AICRP on Groundnut also. The software is hosted on IISR server and is used by AICRP in-charges of Groundnut.



Data Management System For Plant Breeding



Login

User ID

Password

[Forgot your password?](#)

[Register for AICRPG](#)

[Sign In](#)

Last date for data entry is 10-02-2017.

[DGR Home](#) [User Login/Menu](#) [Technical Login/Menu](#)

AICRPG

Looking to the large contribution of groundnut to the oilseeds basket of India, the groundnut crop was delineated from the AICORPO and given a separate status of All India Coordinated Research Project on Groundnut (AICRPG) during 1992 (beginning of VIII-Plan). The AICRPG has been functioning with 23 regular centres (5 main and 18 supporting centres) located at strategic places in 12 different states of the country. The research activities are being conducted in three broad areas of crop improvement, crop production and crop protection disciplines. Through its centres, the AICRPG, also organizes Front Line Demonstrations (FLDs) of the improved technologies. The web-based AICRPG data management system is useful to reduce the drudgery involved in the data compilation, data entry, analysis and report generation tasks.

For any queries : Please email to savitasonam@gmail.com and cc to ratnakumar@dgrr.org.in

Designed & developed by Dr. Savita Sonam, Principal Scientist (Computer Applications)
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Online data entry system for Groundnut

- Among the different substrate combinations, soil-sand mix amended with soybean hulls and vermi-compost was found to be the most optimum substrate sustaining higher production of Arbuscular Mycorrhizal Fungi (AMF), indicating that this combination has the potential for mass production of AMF using sorghum as trap plant.
- Cropping sequence of soybean-chickpea maintained significantly higher microbial biomass carbon and AMF biomass over soybean-wheat and soybean-mustard
- Study on factors determining farm yield variability of soybean indicated that farmers harnessing higher yield (> 21.7 qt/ha) followed the recommended production practices, procured seeds from government / cooperative sources and were in constant contact with extension agencies.
- The range of efficiency of soybean farmers, as indicated by technical efficiency index, ranged from 31 to 96%, with an average of 72 %, which showed that soybean output of the 'average farmer' could be increased by 28% by adopting the technology followed by the 'best practice' farmers.
- Tractor drawn disc harrow and tractor power take-off (PTO) operated rotary weeding



machine (three point assembly system on tractor) for vertisols were developed.

- Osmodehydration of freshly shelled green seeds of NRC 105 carried out through different concentration of sugar solution showed that 40% sugar solution caused the least changes in appearance and the least time taken for rehydration.

News and Events:

- **XLVII Annual Group meeting of All India Coordinated Research Project on Soybean (AICRPS)**

47th AGM of AICRP on Soybean was organized by ICAR-Indian Institute of Soybean Research, Indore and G.B. Pant University of Agriculture & Technology, Pantnagar (Uttarakhand) from May 2-4, 2017, which was attended by 101 soybean scientists and Agricultural development officials from various states of the country. The meet was inaugurated by Dr. J. Kumar, H'ble Vice Chancellor, GBPUA&T, Pantnagar with Dr. S.K. Chaturvedi, Asst. Director General (O&P), ICAR as the Chief Guest. Dr. V.S. Bhatia, Director, ICAR-IISR, Indore briefed on the global and Indian soybean production scenario. He emphasized the need for improvement in soybean productivity through breeding approaches in different soybean growing regions. He explained the impact of climate change on soybean productivity. He emphasized the need for developing climate resilient soybean varieties and development of appropriate management of these abiotic stresses. Chief guest Dr. S.K. Chaturvedi in his speech appreciated the AICRP on Soybean for their

efforts to expand the soybean growing areas and increase national production. He urged all the centres to intensify their work to tackle emerging challenges of climate change and biotic-abiotic stresses. He emphasized the need of formulating one mega project on Breeder Seed production and submission to ICAR/ DAC. Dr. J. Kumar, Vice Chancellor, GBPUA&T, Pantnagar and Chairman of programme recalled the journey of soybean research initiated during late 1960's at this university and afterwards at ICAR-IISR, Indore. He congratulated all those involved in soybean research and development for such a phenomenal progress made in soybean and urged to keep up the momentum of the research work as newer challenges are emerging.



47th AICRP workshop at G.B. Pant Agriculture University

20th Research Advisory Committee (RAC) Meeting

The 20th RAC meeting was held at ICAR-IISR, Indore on 19th April 2017. At the outset Director, IISR extended welcome to all the members. In his opening



remarks, the Chairman, Dr. Tiwari appreciated the achievements made by the IISR comprising research and commercialization of certain lines as specialty soybeans. He stated that in view of the dynamic and changing global soybean R&D scenario, we have to embrace new technologies and innovative research endeavours. He stressed for further modernization and adoption of new technologies. A trident of (a) genome editing, along with (b) computational biology, and (c) use of microbes (use of plant microbiomes as a new source of additional genes) may be desirably resorted to. Methods like CRISPR (Clustered Regularly Interspaced Short Palindromic Repeat) with associated systems like Cas-9 or other associated systems may be used as feasible. Dr. S.K. Chaturvedi, emphasized on pre-breeding that could be accelerated by using the off-season nursery. Dr. D.M. Hegde stressed upon good agricultural practices and high yield (more than 2 tons/ha) to be aimed in FLDs. Dr. S.K. Rao, emphasized on development of varieties suitable for abiotic stress and wider adaptability. Drought in the early stages followed by incessant rains, and terminal drought led to heavy depression in yield in last 3 years.

Dr. V.S. Bhatia, Director, IISR presented the current scenario of soybean and the research highlights of the IISR. Action taken report on the recommendations of 19th RAC was presented by the Member Secretary, Dr. Billore. He also presented the feed-back on research problems and priorities as received from different sections viz., industry, seed association of Madhya Pradesh, farmers etc. This was followed by section-wise presentations of research

achievements and highlights for the year 2016-17 by respective heads viz. Crop Improvement by Dr. Sanjay Gupta, Crop Production by Dr. S.D. Billore and Crop Protection by Dr. M.M. Ansari. The committee appreciated the achievements made by the institute.



Research Advisory Committee meeting

31st Institute Research Council (IRC) meeting

The 31st Annual Institute Research Council Meeting of the Institute was held during May 18-22, 2017. The meeting was chaired by the Director, Dr. V.S. Bhatia and was attended by the members. At the outset, Dr. S.D. Billore, Secretary, IRC welcomed the Chairman and all the members of IRC. In his welcome remarks, he requested all the members to participate in the discussion and offer constructive suggestions for strengthening of the ongoing and newly proposed research programmes. Dr. V.S. Bhatia, Chairman IRC and Director in his opening address, expressed satisfaction over the yield levels of soybean obtained during 2016 compared to previous year. He further





informed that the weekly soybean advisory issued from the institute was appreciated by all the stakeholders which helped a lot in solving the problems of farmers in time. About the research activities of IISR, he expressed his concern over the planning and execution of new as well as ongoing research programmes and emphasized that all the suggestions made by the RAC and other higher authorities of ICAR should be included in the formulation of the research programmes. Dr. S.D. Billore, Secretary, IRC presented the action taken report on the decisions of the 30th IRC held during 1-2, June 2016. During the concluding remarks, the Chairman appreciated the research achievements made during the year and for nice presentations by the scientists. The outcome of the new as well as ongoing research projects should be farmers' utility oriented. Chairman also narrated that each team of *Mera Gaon Mera Gaurav* (MGMG) will conduct 10 front line demonstrations (FLDs) in their respective villages. The external member of IRC Dr. S.V. Sai Prasad, Head, IARI Regional Station, Indore emphasized that the breeding programmes of the institute should be aimed at development of new soybean varieties. He further stressed that the promising breeding lines should be tested at institute level and then very good lines should be promoted to IVT and AVT trials. He also suggested that the zone wise pre-breeding programme should be included in the technical programmes of AICRPS and eventually pre-breeding material should be distributed to breeders in the respective zone. The meeting ended with the vote of thanks to the chair and all concerned

by Dr. A N Sharma.

Swachh Bharath Abhiyan

The institute is regularly organizing cleanliness drives on last Saturday of every month and taking up the activities for cleanliness and maintenance of Office Building, Laboratories, Canteen, Farm section Buildings, Residential Campus and various roads located in IISR campus. Under the programme, various activities as outlined in the Annual as well as Five Year Plan are being conducted especially organization of *Swachhata Pakhwara*, public rally, cleanliness programme at public/tourist places, digitization and weeding out old office records, use of bio-degradable waste for compost making etc.



Swachhata Abhiyan carried out at IISR campus

Transfer of Technology

- ***Mera Gaon Mera Gaurav (MGMG)*** : The programme is being implemented in 25 villages of Indore districts in which five



multidisciplinary teams of scientists are maintaining close contact with farmers. Besides soybean, the scientists are facilitating information flow of other agricultural commodities and the agricultural/developmental schemes launched by Government of India for the overall development of rural masses

- **One day training programme:** During January-June 2017, the institute organized 50 one day training programmes on Improved Soybean Production Technology involving 1770 farmers and farm women. Similarly, 12 one day training programmes were organized on “Processing and Utilization of Soybean for Food Uses” with total participation of 400 women belonging to Madhya Pradesh and Rajasthan.



Training program organised at ICAR-IISR Indore

- **Trainers’ Training Programme :** The institute organized a trainers’ training programme on Good Agricultural Practices on 1st June 2017 in which a total of 31 field officers participated.

Award

Dr. B U Dupare received Best Research Paper Award during National Conference on “Revisiting Agricultural Extension Strategies for Enhancing Food and Nutritional Security, Sustainable Livelihoods & Resilience to Climate Change” organized at Professor Jayashankar Telangana State Agricultural University, Hyderabad during 22-24 April, 2017 for his research paper entitled “Educating the rural women for domestic utilization of soybean for household nutritional security”



Best Research Paper awarded to Dr. B.U. Dupare



External Grant

- Food Safety and Standards Authority of India sanctioned the project entitled “Kunitz trypsin inhibitor & phytic acid in soybean: Assessment of various methods of estimation & profiling of commercial varieties, and soy-based products in India” for a grant of Rs 37.8 lakhs for a period of 2 years with Dr. Vineet Kumar as Principal Investigator.

Personalia

Appointments

Joining of Scientist/administrative at IISR, Indore

Dr. Maharaj Singh joined as Principal Scientist (Plant Physiology)

Dr. Neeta Khandekar joined as Principal Scientist (Agricultural Extension)

Dr. Vennampally Nataraj joined as Scientist (Genetics and Plant Breeding)

Shri Sanjeev Kumar joined as Scientist (Plant pathology)

Shri Ravindra Kumar joined as Finance and Accounts Officer.

Promotion

Er. (Dr.) D.V.Singh, Senior Scientist to Principal Scientist (Farm machinery & Power)

Transfer

Dr. K.M. Anes, Scientist (Senior Scale) (Nematology) was transferred to ICAR-CPCRI, Kasargod.

Shri Ajay Kumar Maheshwari, Finance and Account Officer was transferred to ICAR-Indian Institute of Rice Research, Hyderabad.

Dr. Mamta Arya, Scientist (Genetics) was transferred to ICAR-NBPGR, New Delhi

Obituary

Shri Bhav Singh, SSGII on 22nd June 2017



संस्थान में जनवरी-जून 2017 के दौरान राजभाषा-कार्यान्वयन संबंधी विभिन्न गतिविधियाँ

राजभाषा विभाग, गृह मंत्रालय, भारत सरकार के दिशा-निर्देश के अनुसार भा.कृ.अनु.परि - भारतीय सोयाबीन अनुसंधान संस्थान, इंदौर में भी इस दिशा में राजभाषा के प्रसार-प्रचार हेतु अनेकानेक कार्यक्रम किए जा रहे हैं। जिनके फलस्वरूप भारतीय सोयाबीन अनुसंधान संस्थान में राजभाषा कार्यान्वयन के क्षेत्र में उत्तरोत्तर प्रगति के साथ अनेक आधारभूत कार्य हुए हैं, जो राजभाषा के प्रगामी प्रयोग में अत्यंत

सार्थक सिद्ध हो रहे हैं। इस क्षेत्र में किए जा रहे क्रियाकलापों का संक्षिप्त विवरण निम्नवत् है :

क) **हिन्दी कार्यशालाएं** : संस्थान में हिन्दीमय वातावरण विनिर्मित करने हेतु प्रत्येक तिमाही में कम से कम एक हिन्दी कार्यशाला का आयोजन किया जा रहा है। जिसमें संस्थान के सभी सवंगों को आमंत्रित किया जाता है तथा संबंधित विषयानुसार कार्यशालाएं सम्पन्न की जाती हैं। जनवरी-जून 2017 में अब तक 02 कार्यशालाओं का आयोजन किया गया, जिसकी सूची निम्नानुसार है :

क्र.	दिनांक	विषय	अतिथि वक्ता
1.	06 मार्च 2017	हिन्दी का सरलता पूर्वक उपयोग	श्री मोहन लालजी शर्मा, सेवानिवृत्त प्राध्यापक (हिन्दी), इंदौर
2.	07 जून 2017	हिन्दी भाषा: स्तरीय स्वरूप एवं आवश्यकता	डॉ. शोभा चतुर्वेदी सहायक प्राध्यापक हिन्दी, शासकीय निर्भय सिंह पटेल विज्ञान महाविद्यालय, इन्दौर।

ख) **प्रशिक्षण** : संस्थान में राजभाषा के प्रचार-प्रसार हेतु कृषको एवं प्रशिक्षणार्थियों को प्रशिक्षण संबंधित सारी सामग्रियाँ हिन्दी में भी प्रदान की जा रही है। इस दृष्टिकोण से मार्च 2017 निम्न प्रतियाँ प्रदान की गई :-

- (1) प्रसार फोल्डर-10,000 प्रतियाँ
- (2) प्रसार बुलेटिन - 8,000 प्रतियाँ
- (3) कैलेण्डर - 500
- (4) प्रदर्शन-पटल - 19

ग) **अनुवाद द्विभाषी प्रपत्र** : संस्थान में कार्यालयीन कार्य में प्रयुक्त होने वाले विभिन्न पत्रों, प्रपत्रों आदि का

अनुवाद कार्य भी प्रगति पर है, जिससे दैनिकी के साथ ही प्रायः प्रयुक्त होने वाले सभी प्रकार के पत्रों, प्रपत्रों का द्विभाषी मुद्रित रूप सम्मिलित है। यह कार्य राजभाषा कार्यान्वयन की दिशा में स्थाई एवं आधारभूत उपलब्धि है।

घ) **मौलिक लेखन कार्य का प्रादुर्भाव** : संस्थान में राजभाषा संबंधी विभिन्न क्रियाकलापों के साथ मौलिक लेखन कार्य को द्रुतगामी आयाम प्रदान करने में अधिकारियों एवं कर्मचारियों की रुचि अद्वितीय है। विभिन्न प्रतिष्ठित संस्थानों द्वारा इनकी लेखनी को स्थान प्राप्त होते हैं।



- ड) **शब्दकोश में वृद्धि** : संस्थान में प्रतिदिन हिन्दी एवं अंग्रेजी में एक शब्द को द्विभाषी रूप में "आज का शब्द" के रूप में प्रदर्शित किया जा रहा है, ताकि कर्मचारियों, अधिकारियों एवं वैज्ञानिकों के हिन्दी शब्द ज्ञान में वृद्धि करने के साथ ही साथ हिन्दी के कार्यालयीन उपयोग में भी सहायता प्रदान कर सके ।
- च) **राजभाषा कार्यान्वयन समिति की तिमाही बैठक**
- प्रथम बैठक : दिनांक 06 जनवरी 2017
 - द्वितीय बैठक : दिनांक 06 अप्रैल 2017
- छ) **राजभाषा तिमाही रिपोर्ट का प्रेषण** : संस्थान में राजभाषा हिन्दी से संबंधित समस्त कार्यों का विवरण



'अप्रैल – जून 2017' के तिमाही हिन्दी कार्यशाला में संस्थान के अधिकारियों एवं कर्मचारियों को संबोधित करती हुई अतिथि वक्ता डॉ. शोभा चतुर्वेदी ।

तिमाही हिन्दी रिपोर्ट के माध्यम से संबंधित विभागों को ऑनलाइन एवं द्रुतगामी डाक सेवा से प्रेषित किया जाता है । इस कार्य को धरातलीय रूप प्रदान करने में संस्थान के समस्त संबंधित अनुभाग का सक्रिय एवं सराहनीय योगदान होता है ।

राजभाषा कार्यान्वयन के क्षेत्र में भा.कृ.अनु.परि - भारतीय सोयाबीन अनुसंधान संस्थान की प्रगति आख्या का एक स्वर्णिम झलक आपके समक्ष प्रस्तुत है । उपरोक्त गतिविधियों पर यदि दृष्टिपात करें तो ज्ञात होता है कि संस्थान में राजभाषा कार्यान्वयन की दिशा में एक सकारात्मक एवं सार्थक कार्य हो रहा है, जो संस्थान में हिन्दी के सुनहरे भविष्य का आभास कराती है ।



'हिन्दी पखवाड़ा – 2017' के दौरान निबंध प्रतियोगिता में सम्मिलित संस्थान के प्रतिभागीगण ।



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