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Editors

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Ministry of Agriculture released a document on Accreditation Protocol for Agroforestry Nurseries



Dr. A Arunachalam, Director, ICAR-CAFRI, Jhansi presented the framework of "Accreditation Protocol of Agroforestry Nurseries" on 29 -01-2024. Hon'ble MoA&FW, GoI released the document and appreciated efforts of ICAR. Dr. Himanshu Pathak, Secretary, DARE and Sh. Manoj Ahuja, Secretary, DA&FW also appreciated the efforts. Several international, national institutes, agencies, NGOs participated in the launching program

ICAR-CAFRI, Jhansi celebrated Its 37th Foundation Day on 8th May 2024. Occasion was graced by the presence of Dr. SK Chaudhari (DDG NRM, ICAR, New Delhi), Dr. AK Singh (VC, RLBCAU, Jhansi), QRT Chairman and Members, Director (IGFRI, Jhansi) and Director (CAFRI, Jhansi) and various agroforestry stakeholders. Also, a Kisan Gosthi was organized by involving more than 120 farmers in the institute.



- For the year 2024, the Training Calendar; Events Calendar; Days to be Observed and the Institute Meetings Calendar were notified.



- On 01-01-2024 ICAR-CAFRI launched the One Month One Laboratory and One Month One District initiatives to dedicate the services of the laboratories for common man and also to resolve the issues and challenges in the field level programs in different districts, respectively.

- On the eve of New Year 2024, ICAR-CAFRI signed a MoU with The Genomics Foundation, New Delhi for high-end research in agroforestry.

- On 1st January, 2024, Shri Prabhat Pandey, RTO visited the CAFRI premises in Jhansi and appreciated the efforts of the Institute for putting up eco-friendly measures of CAFRI for enabling a carbon-neutral campus



- On 5th January, 2024, Director, ICAR-CAFRI, Jhansi participated in the review meeting of RKVY-Agroforestry organized by the Ministry of Agriculture & Farmers Welfare, GoI. The nodal officers from all the states participated and presented their progress. Director, CAFRI also presented the guidelines for agroforestry nursery accreditation

- On 5th of January, 2024, ICAR-CAFRI reviewed the NABARD supported Pomegranate project in the Jhansi District of Uttar Pradesh; Officials from NABARD, Jhansi. Administration, UP Horticulture Department, Punjab National Bank and farmer representatives were present in the meeting.



- Shri GP Sharma, Joint Secretary (Finance), ICAR HQ visited ICAR-CAFRI, Jhansi on 22 January 2024 and discussed various finance and accounts related matters.

- On 25th January 2024, a GIZ Team led by Dr Sanjay Tomar visited ICAR-CAFRI and discussed various HRD options for the agroforestry sector.



- The Agroforestry Extension program of CAFRI successfully completed the One Month One Laboratory program on 31-01-2024 and concluded its activity of Agroforestry Extension with a series of day-to-day events organized in the Institute and in farmer's field.

- An exclusive program for nursery accreditation for nursery growers was organized by ICAR-CAFRI, Jhansi during 2-3 February, 2024; About 16 participants were made aware of the accreditation criteria and indicators.

- On 12th February 2024, Director ICAR-CAFRI Jhansi participated in the launch program of G.R.O.W. project report and the Agroforestry planning module in Bhuvan portal of NRSC-ISRO. The work was led by NITI Aayog in association with NRSC, CAFRI and many others.



- Dr. J.M.S. Tomar, Head (Plant Sciences), ICAR-IISWC, Dehradun addressed the employees of ICAR-CAFRI on 14th February, 2024. He appraised the role of agroforestry and raised research opportunities for Institutional Collaboration.

- ICAR-CAFRI and WNO jointly organized the Neem Summit and Global Neem Trade Fair in New Delhi on 19-20 February 2024. The Summit was inaugurated by Dr Himanshu Pathak, Secretary DARE and DG ICAR. Dr PK Singh, APC, GoI and Justice Tated graced the function as Guests of Honor. 250 participants from 10 countries participated in the Summit and 21 companies showcased their neem products in the trade fair.



- On 20th February 2024, ICAR-CAFRI Jhansi signed a MoU with World Resources Institute India (WRI) for collaboration and cooperation in the areas of food, agriculture, agroforestry and ecosystem management. Dr Ruchika Singh from WRI India and Dr A Arunachalam Director ICAR-CAFRI exchanged the MoU during the Neem Summit on 20th February in the NASC complex, New Delhi.



- Prof NP Melkania, Dean (Academics), Gautam Buddha University addressed the employees of ICAR-CAFRI, Jhansi and gave an account of Rajbhasha in working environment on 27-04-2024.



- On 07-05-2024, the Quinquennial Review Team of ICAR-CAFRI visited the Institute and reviewed for the period of 2018-2023. During the meeting CAFRI on-going research activities were reviewed and field visited by the team members. In addition, individual scientists and programme leaders were reviewed by the team.



Central Agroforestry Research Institute ICAR-CAFRI Jhansi have signed a MoU with Walnut and Other Nut Fruit Growers Association of India (WANGAI) on International Walnut Day 17th May, 2024.

- ICAR-CAFRI, Jhansi, on Agroforestry Day i.e. 8th May, distributed the vermicompost bags to various farmers under SC-SP scheme of the Govt. of India.



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“पस्ती भूमि की बहाली, कृषिवानिकी से हो हरियाली”

- Director, ICAR-CAFRI & Project Coordinator, AICRP-Agroforestry Dr A Arunachalam, Nodal Scientist Dr A K Handa visited Research Trials of AICRP-Agroforestry SKAUST-Jammu (7-8 March 2024) and SKAUST-Kashmir, Srinagar in 28-29 May 2024
- A MoU agreement was signed between ICAR-CAFRI, Jhansi and Corporate TEO VENTURES for improving soil health on 37th Foundation Day of ICAR-CAFRI, Jhansi.
- Dr. C.L. Acharya, the veteran Agricultural Scientist visited ICAR-CAFRI and discussed research opportunities with the CAFRI Scientists. Also, he blessed the participants of the Training Program on Basic Statistical Tools in Agroforestry, Soil and Water Conservation Research being organized by ICAR-CAFRI for 3 days w.e.f. 8-4-2024 to 10-4-2024.



Training Programs

- Secretary, ICFRE Sh. Arun Kumar, IFS inaugurated the 2-day Training Program on Agroforestry and QPM for the FPS of Uttar Pradesh on 1 March 2024.
- Training Program on Basic Statistical Tools in Agroforestry, Soil and Water Conservation during 8-10 April, 2024 under the ICAR-CAFRI Mandate (Dr. A. Arunachalam - Course Director; Dr. Bijoy Chanda – Course Coordinator)
- A 3-day Residential Training of Trainers Program on Agroforestry and Nursery Accreditation began today at ICAR-CAFRI, Jhansi, the Nodal Agency notified by the Ministry of Agriculture & Farmers' Welfare, Govt. of India; Sh. K.K. Singh, IFS, the Chief Conservator of Forests, Jhansi Region graced the event as the Chief Guest during the Inaugural Session. The program will be up to 8th June 2024; About 30 Forest Officers of Maharashtra and Karnataka participated in the program.
- On 26-06-2024 five-day training programme for the farmers of Begusarai from Bihar on “किसानों की आजीविका सुरक्षा हेतु कृषिवानिकी तकनीकियां”. This program is being organized by the Indian Society of Agroforestry (ISAF), Jhansi, Uttar Pradesh in collaboration with ICAR-CAFRI, Jhansi with financial support from ATMA office, Begusarai Bihar.



Days and Weeks Observed

- ICAR-CAFRI, Jhansi celebrated Republic Day by involving all of its employees, project staff, security staff and local villagers/farmers. Director CAFRI Dr. Ayyanadar Arunachalam hoisted the National Flag and addressed the gathering.
- On the eve of World Wetlands Day i.e. 2 February 2024, Scientists of ICAR-CAFRI's Agricultural Extension Research Program led by Dr. R.P. Dwivedi was declared the Team of the Month by the Institute Management and the Certificate for the same was conferred by Dr. A.K. Singh, Hon'ble Vice Chancellor, RLBCAU, Jhansi in the presence of Director, ICAR-CAFRI and Officials of UP Forest Department.
- Dr. Badre Alam being a coordinator of the programme to celebrate the National Science Day on 28-02-2024, organized a programme in the Institute
- On the eve of International Women's Day, the Director, ICAR-CAFRI Jhansi visited SKAUST Jammu and reviewed the AICRP-AGROFORESTRY activities.
- On the eve of Earth Day 2024, on the 22nd of April 2024, Dr. A. Arunachalam, Director, ICAR-CAFRI, Jhansi graced the celebrations of Gautam Buddha University, Greater Noida as the Chief Guest and delivered a keynote address on Agroforestry for Human Wellbeing.
- Dr Sanjeev Saxena, Former ADG, ICAR gave World IP Day Lecture at ICAR-CAFRI, Jhansi.
- On 01-05-2024 ICAR-CAFRI, Jhansi celebrated the Labour Day and to mark the occasion the Institute organized a Training Program on Drone Applications in Agroforestry; Farmers from nearby villages participated; The agricultural labourers working in the Institute also joined the celebrations.
- On the eve of the World Environment Day 2024, Dr. A. Arunachalam, Director, ICAR-CAFRI gave a keynote address on Ecosystem Restoration in Rani Lakshmi Bai Central Agricultural University, Jhansi.
- On 21-06-2024 International Yoga Day was celebrated at ICAR-CAFRI Jhansi.



Events

- On 01-01-2024 ICAR-CAFRI launched the One Month One Laboratory initiative beginning with agroforestry extension and science communication.
- ICAR-CAFRI Jhansi initiated the One Month One Laboratory program on 31-01-2024 and concluded its activity of Agroforestry Extension with series of day-to-day events organized in the Institute and in farmers' field.
- Dr. Badre Alam being a Nodal Scientist along with a team of scientists namely Dr. Venkatesh YN and Dr. Priyanka Singh visited Krishi Vigyan Kendra (KVK) and Forest Department of Hamirpur district in Uttar Pradesh under One Month- One District (OM-OD) programme of the institute on 20th April 2024.
- On 14-6-2024 ICAR-CAFRI, Jhansi organised IP Awareness as part of the ICAR's Initiative for NRM Institutes in particular. The theme for today was Copyright under the Intellectual Property regime. Dr Ashwini Siwal from Delhi University and Dr Rajendra Prasad, IASRI, New Delhi gave useful tips and guidance on copyright registration.
- On the 27th Foundation Day of Indian Society of Agroforestry, ICAR-CAFRI Jhansi organized 2 Days 18th & 19th June National Conference on “Agro-ecological Basis of Agroforestry Interaction, Innovation and Incubation” supported by GIZ India, in presence of Chief guest Dr. U.S. Gautam (DDG, Extension, ICAR) & Guest of Honor Dr. Pankaj Kaushal (Director, ICAR-IGFRI, Jhansi).
- The 24th Institute Management Committee meeting of ICAR-CAFRI Jhansi held on 25-06-2024 under the Chairmanship of Dr A Arunachalam, Director of the Institute in hybrid mode. After welcoming the members in the meeting, the Director presented the institute progress report. The Administrative officer placed the agenda of the meeting, which was adopted anonymously by all the members.
- Under the “One Month One Lab program” program of ICAR-CAFRI Jhansi, the Horticulture lab organized a workshop on Processing, value-addition, Packaging, and Marketing of the Agroforestry Produce for better income in Bundelkhand Region.



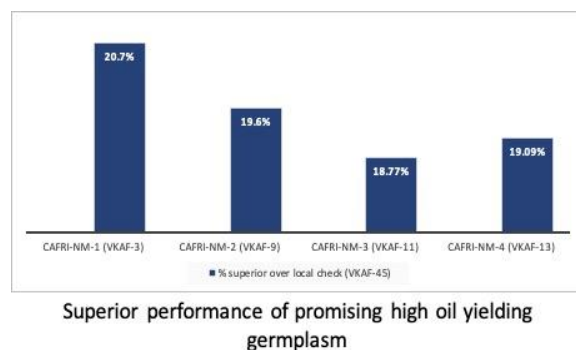
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Research

- **Seasonal variability in gum exudation in *Butea monosperma*:** A study was conducted at ICAR-Central Agroforestry Research Institute, Jhansi to investigate the variability in gum exudation and gum yield in different months and seasons of the year for suggesting best gum tapping month or season. Findings revealed that maximum gum yield was obtained in the month of December (42.5g sq ft⁻¹ stem area) followed by January (37.5g) and February (26.1g). From December to June the gum yield declined. Minimum gum yield was obtained in the months of July and August. Winter season (November- February) yielded the maximum gum (123.4g), followed by summer season (March-June) while the rainy season (July- October) the least (8.1g). During rainy months/ season the exuded gum washed away with the rainwater and hence the negligible gum yield obtained. Conclusively, months of December and January of winter season are the best time to tap butea trees for maximum gum yield.
- **Distribution of soil organic carbon and available NPK in soil profile of Agroforestry systems:** Variations in soil organic carbon and available N, P and K in deep layers (at 0-15, 15-30, 30-45, 45-60, 60-75, 75-90 and 90-100 cm soil depth) of soil profile of five viz. *Acacia senegal*, *Acacia nilotica*, *Dalbergia sissoo*, *Hardwickia binata* and *Azadirachta indica* based agroforestry systems was assessed. The findings revealed that the distribution of organic carbon, available N, P and K in different layers of soil profile varied from species to species and with age of the trees. In general, SOC declined with increase in soil depth except for a few oscillations in all the studied agroforestry systems. Among the systems, *A. indica* accumulated maximum SOC in surface layers and *A. senegal* the least. In general, available N, P and K in soil decreased with soil depth with few exceptions for P and K. In surface soil, maximum available N was recorded in *A. senegal* followed by *A. indica* and the least in *H. binata*. The top layer of *A. indica* recorded maximum available P followed by *H. binata* and the least in *A. nilotica*. Similarly, top layers of *H. binata* had maximum K followed by *A. indica* and least in *D. sissoo*. The variability in SOC, available N, P, and K among different tree-based agroforestry may be attributed to the genetic make-up of the species and pattern of litter production and its decomposition. Further, the inherent soil characteristics also own some variation in distribution of nutrients in the soil profile of different agroforestry systems.
- **Prominent neem germplasm for high oil yield**
As part of our institutional research on tree improvement, we have evaluated 170 neem germplasms for their high oil yield and associated traits. This comprehensive study has led to the identification of four promising germplasms: VKAF-3, VKAF-9, VKAF-11, and VKAF-13. These genotypes have consistently performed superiorly as compared to the local check, VKAF-45, in terms of oil content.



Participation and organizing in Training/Workshop/Meetings/Symposia, Conferences and HRD

- Dr. Rajendra Prasad delivered an online lecture on Agroforestry for adaptation and mitigation of climate change: A way forward to achieve resilience in production system in training “Agroforestry Model in Tasar Culture organized by Central Tasar Research & Training Institute, Ranchi on 4 January 2024.
- Dr. Ashok Yadav organized and attended the project implementation and monitoring meeting (PIMC) on January 5, 2024, under the NABARD-funded pomegranate project, i.e. “Development and evaluation of pomegranate-based agroforestry systems in Bundelkhand region for higher productivity and economic returns in the farmer’s field.

- Dr. Ashok Yadav successfully completed the ICAR-sponsored 21-day Winter School on Application of Weather Information for climate resilient farming organized by ICAR-CRIDA-AICRPM from 23rd January to 12 February 2024.
- Dr. K Rajarajan, Dr. Badre Alam and Dr. A Arunachalam organized a Hands-On Training in Plant Biotechnology and Biochemistry Techniques during 01-03 February, 2024 at ICAR-CAFRI, Jhansi.
- Dr. Priyanka Singh worked as coordinator for conducting the Photo Exhibition/Talk on Wetlands/Visit to CAFRI Waterbodies/Introducing CAFRI Boat club/Training of Nursery Growers on 2-3, February, 2024 on the occasion of World Wetlands Day being organized by ICAR-CAFRI, Jhansi.
- Dr. Bijoy Chanda Exhibited stall during “*Takniki and machinery pradarshini mela*” at ICAR-IGFRI, Jhansi on 13th February, 2024.
- Dr. K Rajarajan acted as an organizing secretary in the WNO Neem Summit 24 (2nd WNO Seminar & 3rd Global Neem Trade Fair), on February 19-20, 2024 in New Delhi, India.
- Dr. Priyanka Singh worked as Organizing secretary of National Conference on “Agro-ecological basis of Agroforestry: Interaction, Innovation and Incubation”, 18-19 June, 2024 organized by Indian Society of Agroforestry in association with ICAR-CAFRI, Jhansi.
- Dr. Priyanka Singh Exhibited stall during “*Uttar kshetriya kisan mela and krishi pradarshini*” at RLBCAU, Jhansi from 8th to 10th February 2024.
- Dr. Priyanka Singh exhibited stall during “*Takniki and machinery pradarshini mela*” at ICAR-IGFRI, Jhansi on 13th February, 2024.
- Dr. Ashok Yadav attended the FSPF-DPR Review Meeting with Project Implementing Agencies (PIA’s) organized by NABARD Regional office Lucknow on 15 February 2024.
- Dr. Badre Alam being a coordinator of the programme to celebrate the National Science Day on 28-02-2024, organized a programme in the Institute.
- Dr. Asha Ram delivered lecture on Diversification through agroforestry for building climate resilience to the state government functionaries during conference on “Technology for Drought” on 4th March 2024 at Lucknow. This conference was organized by the Relief Commissioner, Uttar Pradesh.
- Dr. Asha Ram delivered lecture on Turmeric Cultivation in Agroforestry systems in Bundelkhand conditions on 12th March 2024 in a farmer training program organized by KVK Bharari, Jhansi.
- Dr. Ashok Yadav organized and attended the project implementation and monitoring meeting (PIMC) on March 28, 2024, under the NABARD-funded pomegranate project, i.e. “Development and evaluation of pomegranate-based agroforestry systems in Bundelkhand region for higher productivity and economic returns in the farmer’s field.
- Dr. Sovan Debnath participated in One day workshop on ‘Soil Health: Measurement and Modelling’ organized by Indian Institute of Remote Sensing (IIRS), Dehradun held on March 28, 2024
- Dr. Sovan Debnath participated in Basic Statistical Tools in Agroforestry, Soil and Water Conservation Research organized by ICAR-Central Agroforestry Research Institute, Jhansi held on April 8-10, 2024.
- Suresh Ramanan participated in Cutting edge tool webinar series of International Association for Vegetation Science on 31.05.2024
- Dr. Bijoy Chanda Organized training programme on “*Basic Statistical Tools in Agroforestry, Soil and Water Conservation Research*” at ICAR-CAFRI, Jhansi during 08-10 April 2024.
- Dr Ashok Yadav delivered the lecture on “Fruit and vegetable crops suitable for apiculture” on 2nd May 2024 in three days of training on beekeeping organized by RLBCAU, Jhansi, U.P. from 1-3rd May 2024.
- Dr. Ashok Yadav delivered the lecture on “Fruit crops in agroforestry” in the three days training program i.e. Training of Trainers on Agroforestry Assessment and Accreditation” organized by ICAR-CAFRI Jhansi from 06-08 June 2024.
- Suresh S Ramanan participated in training of trainers on Nursery assessment and accreditation for Maharashtra on 6-8 June, 2024
- Dr. Ashok Yadav organized a Kissan Goshti on “Fruit-based agroforestry system in Bundelkhand” at Magarwara village of Bangra block in the three days training program i.e. Training of Trainers on Agroforestry Assessment and Accreditation” organized by ICAR-CAFRI Jhansi from 06-08 June 2024
- Dr. Asha Ram coordinated training on “Improved agricultural practices organized at ICAR-CAFRI, Jhansi

from 10-25 June, 2024.

- Dr. Ashok Yadav attended an eight-day online training awareness Week programme organized by IP&TM ICAR New Delhi, from 12 - 19th June 2024
- Dr. R.P. Dwivedi organized three days training programme on Ber Pruning by ICAR- Central Agroforestry Research Institute, Jhansi at Village- Shivrampur-Ubaura, District- Niwari (M.P.) during 12-14 June, 2024.
- Dr. Rajendra Prasad delivered a lecture on Nutrient management in agroforestry systems in Two days' farmers training on Improved Agricultural Practices organized by Indian Society of Agroforestry at ICAR-CAFRI, Jhansi during 13-14 June 2024.
- Dr. Ashok Yadav delivered the lecture on "Crop diversification through agri-horti-system" in the two days training program i.e. Training of Trainers on Agroforestry Assessment and Accreditation" organized by ICAR-CAFRI Jhansi from 10 to 11 June 2024 (Date: 11.06.2024)
- Dr. Sovan Debnath delivered lecture on 'Nutrient management in changing climate and soil health' during a farmers training program on Improved Agricultural Technologies organized by Indian Society of Agroforestry (ISAF), Jhansi and Haritika, Jhansi on June 11, 2024
- Suresh S Ramanan participated in IP awareness week programme from 12-19th June 2024 organised in collaboration with IISWC, Dehradun (IPTM Unit)
- Dr. Sovan Debnath Intellectual Properties (IP) Awareness Week organized by ICAR-Indian Institute of Soil and Water Conservation and IP&TM Unit, ICAR during June 12-19, 2024.
- Dr. Ashok Yadav delivered the lecture on "Crop diversification through agri-horti-system" in the two days training program i.e. Training of Trainers on Agroforestry Assessment and Accreditation" organized by ICAR-CAFRI Jhansi from 13-14th June 2024 (Date: 14.06.2024)
- Dr. Asha Ram delivered lecture on "Government schemes and policies for farmers' welfare" on 14th June 2024 for two days farmers training on Improved Agricultural Practices (13-14 June 2024)
- Dr Asha Ram participated and presented paper (oral) entitled "Drone application in agriculture and agroforestry" in National Conference on "Agro-ecological Basis of Agroforestry: Interaction, Innovation and Incubation" held during 18-19 June, 2024 and organized by Indian Society of Agroforestry & ICAR-Central Agroforestry Research Institute, Jhansi-284003, Uttar Pradesh, India
- Dr. Ashok Yadav, Sandeep Garg, Asha Ram, Badre Alam, and A. Arunachalam presented an oral presentation on "Effect of humic acid, fulvic acid, and their derivatives-based biostimulants on the vegetative, fruit, and yield traits of strawberry at national conference on Agro-ecological Basis of Agroforestry: Interaction, Innovation and incubation on 18-19 June 2024 held at ICAR-CAFRI Jhansi, U.P.
- Dr. Badre Alam participated in the National Conference on "Agro-ecological Basis of Agroforestry: Interaction, Innovation and Incubation" organized by ISAF held during June 18-19, 2024 at ICAR-CAFRI, Jhansi and presented research paper as a Lead Speaker.
- Dr. Bijoy Chanda Participated and presented poster on "Reviewing methodologies for valuation of ecosystem services" during National Conference on Agro-ecological basis of Agroforestry: Interaction, Innovation and Incubation, 18-19 June, 2024 organized by Indian Society of Agroforestry in association with ICAR-CAFRI, Jhansi.
- Prasad M Sonwalkar, Ashok Yadav, Badre Alam, Pradyumna Deshmukh, and Sandeep Garg presented the poster on "Chironji – A multipurpose tree" at a national conference on Agro-ecological Basis of Agroforestry: Interaction, Innovation, and Incubation on 18-19 June 2024 at ICAR-CAFRI Jhansi, U.P.
- Dr. Priyanka Singh participated and presented paper on "Determinants of adoption of sustainable land management practices in Bundelkhand, the semi-arid tropics" during National Conference on Agro-ecological basis of Agroforestry: Interaction, Innovation and Incubation, 18-19 June, 2024 organized by Indian Society of Agroforestry in association with ICAR-CAFRI, Jhansi.
- Dr. Priyanka Singh worked as Organizing secretary of National Conference on "Agro-ecological basis of Agroforestry: Interaction, Innovation and Incubation", 18-19 June, 2024 organized by Indian Society of Agroforestry in association with ICAR-CAFRI, Jhansi.
- Dr. Rajendra Prasad attended National Conference on Agro-ecological Basis of Agroforestry: Interaction, Innovation and Incubation organized by Indian Society of Agroforestry during 18-19 June 2024 at ICAR-CAFRI Jhansi, India.

- Dr. Sovan Debnath participated in National Conference on Agro-ecological Basis of Agroforestry: Interaction, Innovation and Incubation organized by Indian Society of Agroforestry (ISAF), Jhansi and ICAR-Central Agroforestry Research Institute, Jhansi held on June 18-19, 2024.
- Dr. Sushil Kumar participated and presented an oral in the *National Conference on Agro-ecological Basis of Agroforestry: Interaction, Innovation and Incubation* held at ICAR-CAFRI, Jhansi, Uttar Pradesh on June 18-19, 2024).
- Sukumar Taria delivered an oral presentation on “Prospective of Mango Tree for Food and Nutritional Security Through Agroforestry Systems” during the National Conference on Agro-ecological Basis of Agroforestry: Interaction, Innovation and Incubation held on 18-19 June, 2024, organized by ISAF
- Dr. Sushil Kumar participated and presented an oral presentation at the *National Conference on Agro-ecological Basis of Agroforestry: Interaction, Innovation and Incubation* held at ICAR-CAFRI, Jhansi, Uttar Pradesh (June 18-19, 2024).
- Dr. Asha Ram coordinated training on “किसानों की आजीविका सुरक्षा हेतु कृषिवानिकी तकनीकियाँ” organized at ICAR-CAFRI, Jhansi from 26-30 June, 2024.
- Dr. Priyanka Singh delivered a lecture on “Government schemes and policies for farmers’ welfare” on 24th June 2024 for two days farmers training on Improved Agricultural Practices (24-25th June 2024).
- Dr Rajendra Prasad delivered a lecture on “Introduction to carbon market in the context of agroforestry” in Master Trainer Orientation Program on Agroforestry systems and Forest Policies under TOFI organized during June 24-28, 2024 in RLBACU, Jhansi
- Suresh S Ramanan participated in an online workshop on Accreditation Protocol for Agroforestry Nurseries on 24.06.2024 – 30 participants
- Dr. Sovan Debnath delivered a lecture on ‘Nutrient management in changing climate and soil health’ during a farmers training program on Improved Agricultural Technologies organized by Indian Society of Agroforestry (ISAF), Jhansi and Haritika, Jhansi on June 25, 2024.
- Dr. Naresh Kumar, Dr. Asha Ram, and Dr. Ashok Yadav organized a five-day training program on “Kissano ki Aajivika Surkasha Hetu Krishivaniki Taknikiya” from 26-30 June 2024 which was organized by Indian Society of Agroforestry with financial support from ATMA, Begusarai Bihar
- Dr. Sovan Debnath delivered lecture on ‘Soil health and nutrient management’ during a five days farmers training-cum-exposure program on *Kisano Ki Aajibika Suraksha Hetu Krishivaniki Taknikiyan* organized by Indian Society of Agroforestry (ISAF), Jhansi and ATMA, Begusarai, Bihar on June 29, 2024.
- Dr Ashok Yadav attended the online meeting of “Viksit Bharat meeting (Horticulture Crops)” on 1st May 2024 at 10.30 AM organized by ICAR-DARE New Delhi.
- Suresh S Ramanan gave a invited lecture on TOF certification for Master Trainers under TOFI program on 26.06.2024 with 86 participants.
- Suresh Ramanan participated in Cutting edge tool webinar series of International Association for Vegetation Science on 31.05.2024.

Publications

In Journals

- Alam B, Taria S, Kumar S and Arunachalam A. 2024. Unravelling the critical insights on the physiological and biophysical constraints for the impact of different intensity of shade in pigeonpea *Cajanas cajan* (L.). *Agroforestry Systems*, published online 7th June 2024. <https://doi.org/10.1007/s10457-024-01017-3>.
- Arunachalam, A., Ramanan S.S., and Handa, A.K. 2024. Amendment to National Biological Diversity Act: loaded provisions and a few concerns, *Current Science* 126 (11: 1319-1320).
- Bishwa Bhaskar Choudhary, Priyanka Singh, Inder Dev, Purushottam Sharma, Ramesh Singh, Khem Chand. 2024. Determinants of adoption of multiple natural resource management practices: a case study from semi-arid tropics of Central India. *Environment, Development and Sustainability*.<https://doi.org/10.1007/s10668-024-04995-7>

- Debnath, S., Saha, S., Biswas, T., Mal, S., Batabyal, K., Sarkar, D., Yadav, S.L., Bhattacharjee, T., Chakraborty, M., Chattopadhyay, A., Mandal, B. 2024. Trace elements profiling of hyacinth bean (*Lablab purpureus* var. *typicus* L.): A rational screening of the breeding lines for biofortification programs. *South African Journal of Botany* 167: 40-47. <https://doi.org/10.1016/j.sajb.2024.02.010>.
- Dhiman, R., Arunachalam, A., Dhyani, S.K., Rizvi, A.H., Singh, A., Kumar, R., Biradar, C.M. and J. Rizvi (2024) Circular economy of Poplar-based agroforestry in India. *Indian Journal of Agroforestry* 26(1): 12-22.
- Kumar S., Misra AK and Venkatesan K. 2024. Traditional fodder storage systems used in India's western hot arid zone as a drought-proofing mechanism. *Indian Journal of Traditional Knowledge* 23(6): 594-599. <https://doi.org/10.56042/ijtk.v23i6.2016>
- Meena, S.N., Sharma, S.K., Singh, P., Meena, B.P., Ram, A., Meena, R.L., Singh, D., Meena, R.B., Nogiya, M., Jain, D., Kumar, K., 2024. Comparative analysis of soil quality and enzymatic activities under different tillage based nutrient management practices in soybean–wheat cropping sequence in Vertisols. *Scientific Reporter* 14, 1–16. <https://doi.org/10.1038/s41598-024-54512-z>
- Maurya AC., Verma SK., Kumar S., Shekhar S., Taria S., Alam B., Yadav A and Banjara, TR.2024. Agronomic management: irrigation scheduling, mulching and integrated nutrient management influences growth, yields, quality, and economics of summer groundnut in a subtropical condition of India. *Journal of Plant Nutrition*, doi: 10.1080/01904167.2024.2308191
- Pandey, L., Arunachalam, A. and N. Joshi (2024) Biomass, productivity and monetary efficiency of various cropping systems in the Almora district of the Indian Himalaya, *Geografisk Tidsskrift-Danish Journal of Geography* (published online <https://doi.org/10.1080/00167223.2024.2354346>)
- Patel, N., Sethi, T., Bhandari, R.J., Sharma, S.A., Arunachalam, A., Ravishankar, T., Raj, A., Vagen, T.G. and R. Prabhu (2024) Agroforestry Site Suitability for Wasteland Greening - A case study of selected districts of various agroclimatic zones. *Journal of Geomatics* (ISSN 0976-1330) 18(1):50-66.
- Prasad, R., Arunachalam, A., Shukla, A. et al. 2023. Field management practices in agroforestry systems influence organic carbon and biological properties of soil. *Agroforest Systems* 97, 1375–1390. <https://doi.org/10.1007/s10457-023-00861-z>
- Priyadarsini, P., Pal, M., Pandey, R., Gopalakrishnan, S., Sehgal, V. K., Chinnusamy, V., Taria, S., Kumar, P., Padaria, J., Lal, M. K. 2024. Photosynthesis and radiation use efficiency at anthesis in relation to biomass accumulation and yield in basmati rice (*Oryza sativa* L.). *Plant Physiology Reports*. <https://doi.org/10.1007/s40502-024-00784-6>
- Priyanka Singh, BB Choudhary, P Sharma, S Kumar, I Dev, R Singh, KK Garg, K Chand, A Ram, N Kumar and A Arunachalam. 2024. Impacts of soil and water conservation measures on farm technical efficiency in the semi-arid tropics of central India. *Environmental Conservation*, page 1 of 8. <https://doi.org/10.1017/S0376892924000146>
- Rajarajan, K., Sahu, S., Handa, A.K. et al. 2024. Genetic diversity and population structure of *Azadirachta indica* using simple sequence repeat (SSR) markers for genetic resource conservation and utilization. *Genet Resour Crop Evol*. <https://doi.org/10.1007/s10722-023-01841-z>
- Ramanan S.S. and A. Arunachalam. 2024. Dashboard to facilitate *Melia* research. *Indian Journal of Agroforestry* 26(1): 110-111
- Ramanan, S.S., Arunachalam, A., Sahoo, U.K. and K. Upadhaya. 2024. Exploring research trends and priorities of genus *Melia*. *Scientific Reporter* 14, 6265. <https://doi.org/10.1038/s41598024-53736-3>
- Ramanan, S.S., A. Arunachalam and R. Singh. 2024. Horizons of medicinal and aromatic plants (MAPs) cultivation under agroforestry: Insights from India. *Medicinal Plants* 16(1):15-28.
- Ramanan S.S., A. Arunachalam, U.K. Sahoo, K. Upadhaya and R. Rashmi. 2024. Phytochemical properties of genus *Melia*: A comparative review, *Medicinal Plants*, 16(1): 58-65.
- Reddy, M.K., Asthana, R., Debnath, S., Ray, P., Mandal, N., Arunachalam A., Koduru, J.R. 2024. Nanofertilizers for sustainable crop production: A comprehensive review. *BioNanoScience* 14: 1918–1939. <https://doi.org/10.1007/s12668-024-01413-0>
- Rizvi, J., Dhyani, S.K., Arunachalam, A., Rouge, J.C. and A. Singh (2024) The National Agroforestry Policy in India, transforming Indian agriculture landscape and inspiring other nations: The role of ICRAF and its partners. *Indian Journal of Agroforestry* 26(1): 1-11.

- Shuraik Kader, Owais Bashir, Shabir Bangroo, Shahid Shafai, Tajamul Shah, Lizny Jauffer, Nicola Senesi, Alban Kuriqi, Negar Omidvar, Soora Naresh Kumar, Ayyanadar Arunachalam, Ruby Michael, Mohamed Ksibi, Velibor Spalevic, Paul Sestras, Slobodan Marković, Paolo Billi, Sezai Ercişli and Artan Hysa (2024) Mathematical vs. machine learning models for particle size distribution in fragile soils of North-Western Himalayas. *Journal of Soils and Sediments* (DOI: 10.1007/s11368-024-03820-y)
- Singh, P., Choudhary, B.B., Sharma, P., Kumar, S., Dev, I., Singh, R., Garg, K.K., Chand, K., Ram, A., Kumar, N., Arunachalam, A., 2024. Impact of soil and water conservation measures on farm productivity and income in the semi-Arid tropics of Bundelkhand, central India. *Environmental Conservation* <https://doi.org/10.1017/S0376892924000146>
- Venkatesh, Y. N., M. Ashajyothi, K. Rajarajan, Sakshi Sahu, Varsha Chaturvedi, P. T. Prathima, M. Muthamilarasan, A. K. Handa, and A. Arunachalam. "Transcriptional and physio-chemical responses of *Tectona grandis* L. triggered by teak defoliator" *Plant Stress* 12 (2024): 100468.

Institute Publications

- ICAR-CAFRI. 2023. Accreditation Protocol for Agroforestry Nurseries. ICAR-Central Agroforestry Research Institute, Jhansi, Uttar Pradesh; 29 pages.
- CAFRI (2023) Promising Agroforestry Models for Odisha. ICAR-Central Agroforestry Research Institute, Jhansi; 18p.
- CAFRI (2024) Promising Agroforestry Models for Maharashtra. ICAR-Central Agroforestry Research Institute, Jhansi; 26p.
- CAFRI (2024) Promising Agroforestry Models for Karnataka. ICAR-Central Agroforestry Research Institute, Jhansi; 26p.

Books/Monographs

- Arunachalam, A., Ramanan S, S. and A.K. Handa. 2024. Foresighting National Agroforestry Policy for Fostering Green Development. Policy Paper # 02/2024, ICAR Central Agroforestry Research Institute, Jhansi 284003, Uttar Pradesh, India; 18 pages. ISBN: 978-81-971641-1-8
- Prasad, R. and A. Arunachalam (2024) *Acacia senegal* (A multipurpose gum yielding tree for agroforestry). ICAR-Central Agroforestry Research Institute, Jhansi; 100 pages (ISBN 9788196525823)
- Punam, Rameshwar, Handa, A.K. and A. Arunachalam (2024) Soapnut (*Sapindus mukorossi*), AICRP-Agroforestry, CSKHPKV, Palampur (HP); 110 p.

Book Chapter

- Lata., S, Yadav, A., Kumar P and Joshi A.K. (2024). Nano-Fertilizers for Sustainable Crop Production Under Changing Climate: A Global Perspective. In book: Smart Technologies in Sustainable Agriculture Current and Future Prospects Publisher: CRC
- Rajarajan, K., Meenakshi Jadhav, C. Varsha, Sakshi Sahu, R. Ambika Rajendran, A. K. Handa, and A. Arunachalam. "Peptide Hormone with Emphasis on Abiotic Stress Tolerance in Plants." In *Phytohormones in Abiotic Stress*, pp. 151-161. CRC Press, 2024.

Action Plan

- Arunachalam, A., Dey, D., Sharma, V.K., Handa, A.K. and Suresh Ramanan S (2023) TEEB AgriFood Learning Landscape – Action Plan for Assam. ICAR-Central Agroforestry Research Institute, Jhansi 284003, Uttar Pradesh, India; 30 p.

Policy Paper

- Arunachalam, A. (2024) Scientific Social Responsibility in Agroforestry. Policy Paper # 1, ICAR-Central Agroforestry Research Institute, Jhansi 284003, Uttar Pradesh, India; 17 p. (ISBN: 9788196525842)
- Arunachalam, A., Ramanan, S.S. and A.K. Handa (2024) Foresighting National Agroforestry Policy for Fostering Green Development. Policy Paper # 2, ICAR-Central Agroforestry Research Institute, Jhansi; 18p.

Technical Bulletins

- Arunachalam, A., Ramanan S, S. and A.K. Handa. 2024. Reviewing National Agroforestry Policy. CAFRI Discussion Paper # 01/ 2024, ICAR-Central Agroforestry Research Institute, Jhansi 284003, Uttar Pradesh, India; 16 pages.
- Rajarajan, R., Handa, A.K. and A. Arunachalam (2024) Neem Field Gene Bank – Provisioning Opportunities for Conservation and Utilization. Technical Bulletin CAFRI/2024/1; ICAR-Central Agroforestry Research Institute, Jhansi 284003, Uttar Pradesh, India; 31 p.
- Priyanka Singh, Arunachalam A, Handa AK, Dwivedi RP, Kumar S and Ramanan S. 2024. Agroforestry Success Stories (transforming livelihood and ecosystem restoration). Technical bulletin CAFRI/2024/3. ICAR-Central Agroforestry Research Institute, Jhansi 284003, 80p.
- Priyanka Singh, Suresh Ramanan, Bijoy Chanda, Sushil Kumar, AK Handa and RP Dwivedi. 2024. Souvenir-cum-Abstracts/Proceedings Book, National Conference on Agro-ecological basis of Agroforestry: Interaction, Innovation and Incubation, 18-19 June, 2024; Indian Society of Agroforestry, Jhansi, Uttar Pradesh, India; 156 pages
- द्विवेदी, रघुनन्दन प्रसाद एवं अरुणाचलम, ए. (2024) कृषिवानिकी सारथी । तकनीकी बुलेटिन के.कृ.अनु.सं. /2024 /02, भाकृअनुप-केन्द्रीय कृषिवानिकी अनुसंधान संस्थान, झाँसी 284003, उत्तर प्रदेश; 56 पृष्ठ ।
- Handa, A.K., Arunachalam, A., Kumar, N., Ram, A. and A. Dogra (2024) Livelihood diversification through agroforestry interventions – Bamboo-based agroforestry system. Deutsche Gesellschaft fur Internationale (GIZ) GmbH; 17 p.
- Arunachalam, A. Handa, A.K., Kumar, N., Ram, A. and A. Dogra (2024) Livelihood diversification through agroforestry interventions – Teak-based agroforestry system. Deutsche Gesellschaft fur Internationale (GIZ) GmbH; 20 p.
- Arunachalam, A., Handa, A.K., Ram, A., Kumar, N. and A. Dogra (2024) Livelihood diversification through agroforestry interventions – Aonla-based agroforestry system. Deutsche Gesellschaft fur Internationale (GIZ) GmbH; 21 p.
- Kumar, N., Ram, A., Handa, A.K., Arunachalam, A. and A. Dogra (2024) Livelihood diversification through agroforestry interventions – Mango-based agroforestry system. Deutsche Gesellschaft fur Internationale (GIZ) GmbH; 18 p.
- Ram, A., Handa, A.K., Kumar, N., Arunachalam, A. and A. Dogra (2024) Livelihood diversification through agroforestry interventions – Citrus (acid lime)-based agroforestry system. Deutsche Gesellschaft fur Internationale (GIZ) GmbH; 18 p.
- Ram, A., Kumar, N., Handa, A.K., Arunachalam, A. and A. Dogra (2024) Livelihood diversification through agroforestry interventions – Guava-based agroforestry system. Deutsche Gesellschaft fur Internationale (GIZ) GmbH; 20 p.
- Kumar, N., Handa, A.K., Ram, A., Arunachalam, A. and A. Dogra (2024) Livelihood diversification through agroforestry interventions – Ber-based agroforestry system. Deutsche Gesellschaft fur Internationale (GIZ) GmbH; 20 p.

Popular Articles

- Lata., S, Yadav, A., and Bandana (2024). Nutritional and medicinal properties of underutilized fruit: citron (*Citrus medica* Linn.). Agri Journal-World 4 (5):16-19
- Meena, S., Yadav, S., Bansal, R. and Taria S. 2024. SPEED BREEDING: Revolutionizing Plant Breeding for Global Food Security and Sustainable Agriculture. *Dream* 2047, pp 14-16.
- Meena, S., Bansal, R., Das, M., Taria, S. and Sangwan, S. 2024. Seaweed: An Environmental Superhero Driving Sustainable Development. *Global Agriculture*, 1(10), 48-49.
- Ramanan, S.S. and Arunachalam, A. 2024. Exploring Palmyrah for Agroforestry. *NESA Newsletter*, 27(6): 14-15.
- Yadav A., Garg, A., Alam B., and Arunachalam A. 2024. Status and Prospects of Stingless Bee in Jhansi District of Bundelkhand Region. *NESA Newsletter*. Eversion June 2024, 3-4

Project Reports

- A Arunachalam, Vijay Kuma Sharma, AK Handa, Suresh Ramanan S, D Dey, U Kumar, R Debbaruah and K Bordoloi (2023) Synthesis Report: The Economics of Ecosystems and Biodiversity (TEEB) - AgriFood Initiative in Assam, India. ICAR-Central Agroforestry Research Institute, Jhansi 284003, Uttar Pradesh, India; 22 pages.
- A Arunachalam, Vijay Kumar Sharma, AK Handa, Suresh Ramanan S, D Dey, U Kumar, R Debbaruah and K Bordoloi (2023) Project Completion Report: The Economics of Ecosystems and Biodiversity (TEEB) - AgriFood Initiative in Assam, India. ICAR-Central Agroforestry Research Institute, Jhansi 284003, Uttar Pradesh, India; 223 pages.

Awards/Invited Talk

Awards

- Dr. A. Arunachalam elected as a Fellow of the Society for Agroenvironmental Sustainability, Haridwar

Invited Talk

- Dr. A. Arunachalam gave a Keynote Address on Agroforestry for Human Wellbeing on 22 April 2024 in Gautam Buddha University, Greater Noida on the eve of the Earth Day.
- Dr. A. Arunachalam gave a Lead Lecture on Agroforestry-Tree based solutions to environmental and livelihood securities on 22 June, 2024 in National Conference on Living with Nature: Soil, water and society in ecosystem conservation (LNSWSEC-2024) organized by Indian Association of Soil and Water Conservationists (IASWC), Dehradun in collaboration with ICAR-IISWC, Dehradun.

Personnel

New Personnel

- Sh. Bijoy Chanda, Scientist (Agricultural Statistics) – 1 February 2024
- Sh. Gulshan Kumar, T1 (Technician) – 7 May 2024

Retirement

- Sh. Jagdish Singh, Skilled Supporting Staff (SSS) - 28 February, 2024
- Sh. Ram Bahadur, ACTO - 30 June, 2024.
- Sh. Om Prakash, (PS) - 30 June, 2024.



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