



Agroforestry News

कृषिवानिकी समाचार

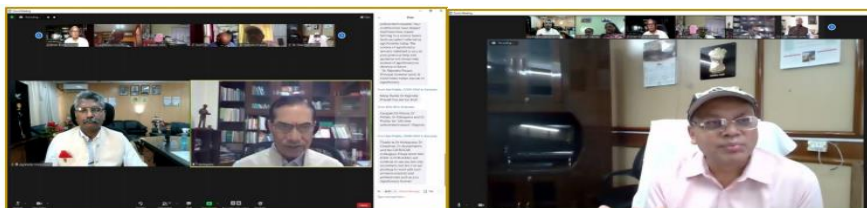
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Editors

Dr. RP Dwivedi
Dr. K Rajarajan
Mrs. Ashajyothi
Sh. J L Sharma
Sh. Birendra Singh

Celebration of 34th Foundation Day of ICAR-CAFRI



Central Agroforestry Research Institute celebrated its 34th Foundation Day along with Foundation Day of ISAF on 18th June, 2021. Foundation Day address was delivered by Dr. Trilochan Mohapatra, Secretary DARE & DG ICAR. Deputy Director General, Natural Resource Management Division, ICAR and ADG (Agronomy, Agroforestry and Climate Change), ICAR were also present in the meeting. Institute publications and media materials were released by DG ICAR, followed by virtual inauguration of the New Training Hostel. On the occasion the Indian Society of Agroforestry conferred Lifetime Achievement Awards to Dr. Trilochan Mohapatra, Dr. Ravi Prabhu, Dr. P S Pathak and Dr. P K Koshla.

Strategic Highlights

New Research Programs introduced to achieve the mandate of the Institute viz., Agroforestry System Research, Tree Improvement Research, Carbon and Climate Change Research and Agroforestry Extension Research.

Hindi version of the “FarmTree” App was launched by ICAR-CAFRI on the 24th January, 2021.

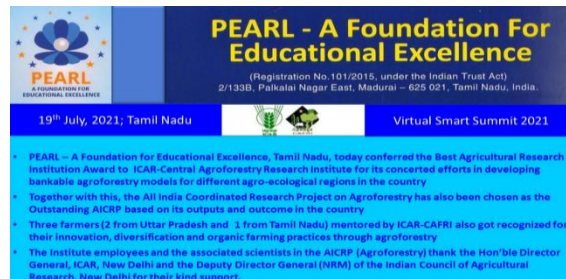
CAFRI celebrated India’s 72nd Republic Day on the 26th January, 2021.

The role of Scientific Social Responsibility at UP Govt. Auditorium in Jhansi on 7th February (Sunday), 2021 was spelt out by Director, CAFRI on the 7th February, 2021 in a program organized by Bundelkhand Educational and Training Council.

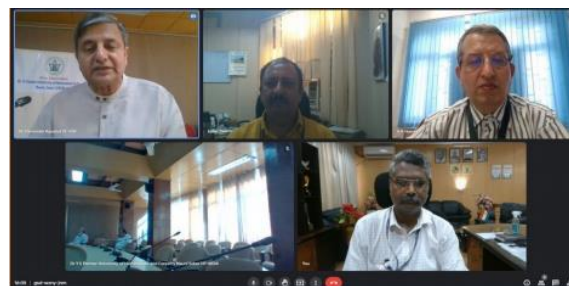
ICAR-CAFRI Jhansi received first rank in mid-term review grading of Network Project on “Harvesting, Processing and Value Addition of Natural Resins and Gums” by ICAR-Indian Institute of Gums and Resin, Ranchi, Jharkhand.



ICAR-CAFRI bagged the Best Agricultural Research Institution Award by PEARL-A Foundation for Education Excellence, Tamil Nadu for efforts in developing bankable agroforestry models for different agro-ecological regions of the country. Together with this AICRP on Agroforestry awarded its outstanding outcomes. Also, a few scientists of this institute (Dr. Sushil Kumar, Dr. Ashok Yadav, Mrs. Ashajyothi) were also conferred the Best Scientists Award for their significant research achievements.



CAFRI signed a MoU with Dr. YS Parmar University of Horticulture and Forestry (YSPUHF), Solan, Himachal Pradesh on 25.06.2021 for cooperation in agricultural research, education and extension to boost agroforestry and allied sector.



CAFRI signed a MoU with Dr. YSR Horticultural University (YSRHU), Andhra Pradesh on 26.06.2021 for cooperation in agricultural research, education and extension to boost agroforestry and allied sector.



Strategic Outreach

Virtual Training Programme on “Business Opportunities in Agroforestry”

ICAR-CAFRI, Jhansi in collaboration with MANAGE, Hyderabad organized a three-day (2-4th March, 2021) Refresher Training Programme on “Business Opportunities in Agroforestry” for around 45 established agripreneurs under AC&ABC scheme. The training was conducted virtually with an intent to acquaint the participants with the untapped potential of agroforestry systems and capitalizing its veiled business opportunities. The agripreneurs had already received 45 days residential training by the National Training Institutes (NTIs) to set up their Agri-ventures.



Online Training Programme on Agroforestry

The CAFRI-MANAGE joint Online Training Programme on Agroforestry for Environmental Sustainability and Climate Resilience (10-12 May, 2021) was attended by 75 participants.



Palmyra Palm Plantation Project Launched in the State of Tamil Nadu

On the eve of World Environment Day, Director, ICAR-CAFRI inaugurated the Palmyra Palm Plantation Project in the State of Tamil Nadu. About 5 lakh palm seedlings were planted in different parts of the State. The first seedling of palmyra palm was planted virtually by Dr. A. Arunachalam in Tirunelveli district. The project is implemented by Thzhuvam along with FPOs and other agencies in the State.



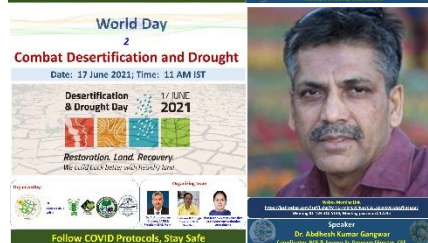
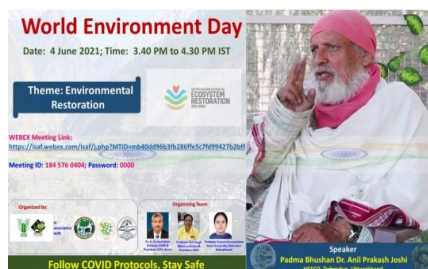
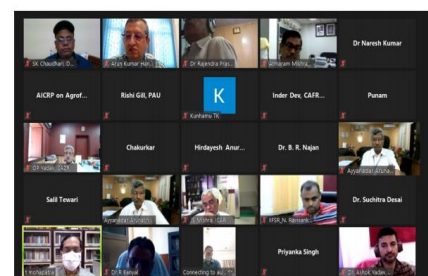
Days and Weeks Observed

- National Science Day on 28.02.2021.
- International Women’s Day on 08.03.2021
- World Sparrow Day on 20.03.2021
- World Forest Day & Tree Day on 21.03.2021
- World Water Day on 22.03.2021
- World Bee Day on 20.05.2021
- International Day of Biological diversity on 22.05.2021
- World Environment Day on 04.06.2021
- International Yoga Day on 21.06.2021 with the theme “Yoga for Wellness”



Events Organized

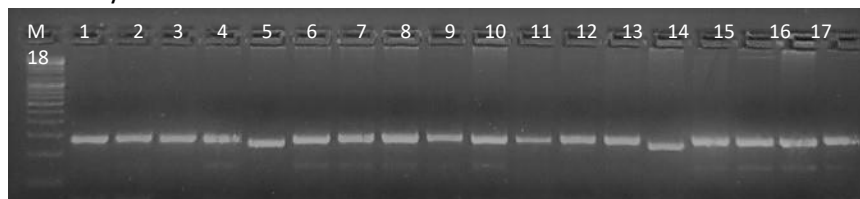
- Organized a Virtual Brainstorming Session on ‘Har Med Par Ped’ on the 26th of April 2021 to discuss the scope and challenges of growing trees on farm bunds and boundaries. DG, ICAR chaired the session as attended by several dignitaries across the country.
- Public Lecture on the eve of World Environment Day 2021 by Padma Bhushan Dr. Anil Prakash Joshi. This year the theme was “Environmental Restoration”.
- Public Lecture on Animal Health and Productivity on 11.06.2021 (Speaker: Dr. A.K. Srivastava, Member, ASRB, Government of India, New Delhi).
- Public Lecture by Dr. Abdesh Kumar Gangwar, Coordinator RCE and Former Senior Programme Director CCE on “Towards a Sustainable Climate Smart and Disaster Resilient Community” on the eve of Day to Combat Desertification and Drought on 17.06.2021.
- CAFRI organized a three-day training programme on ber pruning from 17-19 June 2021 at village Parasai-Bachhauni in Jhansi district of Uttar Pradesh.
- CAFRI organized one-day training for 60 participants on “Tapping of Palas Gum (Kamarkas)” in collaboration with a NGO “Srijan” (Self Reliant Initiatives through Joint Action) at Training Centre of National Rural Livelihood Mission, Sirsaud, block Karera, district Shivpuri (M.P.) on 22 January, 2021.



Research

Pongamia specific SSR marker identification for genetic diversity and population structure study

The assembled transcriptome sequences of *Pongamia* were used for SSR mining and SSR primer design using a Perl script known as MlcrSATellite (MISA, <http://pgrc.ipk-gatersleben.de/misa>). The minimum number of repeats used to select the SSRs was 6 for di-nucleotide repeats, 4 for tri-nucleotide repeats, and 3 for tetra-, penta-, and hexanucleotide repeats. Primer pairs for each SSR were designed using standalone Primer3 (<http://primer3.sourceforge.net/>) according to the following parameters: primer length of 18-27 bp with 23 bp as optimum, predicted product size of 200–400 bp, 40–60% GC, and melting temperature of 55–60 °C. The identified and designed primers arrayed in *Pongamia* genotypes, these primers offered to assess genetic diversity and population structure successfully.

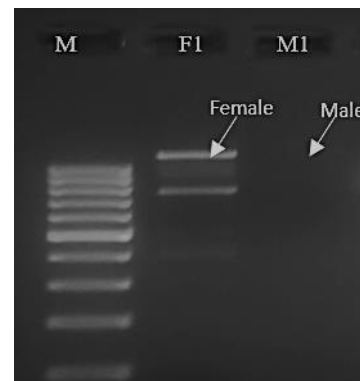


Authors: K Rajarajan¹, A Radhakrishna², AK Handa¹ and A Arunachalam¹.

¹Central Agroforestry Research Institute, ²Indian Grassland and Fodder Research Institute

Identification of female plant by molecular markers

Simarouba glauca DC (Simarubaceae) is one of the most important species for biofuel production apart from its medicinal value. This tree is native to Central and South America. These tree are poly-gamo-dioecious has only 40-50% of female flowers has ability to produce oil seed. However, the major limitation in plantation programs of this species is undifferentiated morphological features of male and female trees species. Therefore, we have identified a molecular marker that could able to distinguish male and female by gender specific amplification. These markers can be utilized in future tree breeding programme to improve the productivity.



Authors: K Rajarajan¹, Sakshi S¹, A Radhakrishna², AK Handa¹ and A Arunachalam¹

¹Central Agroforestry Research Institute, ²Indian Grassland and Fodder Research Institute

Seedling wilt disease caused by Fusarium solani in Melia dubia and its Management

During 2021 in the months of June and July, severe seedling mortality was observed in Malabar neem nursery raised from seed at ICAR – CAFRI. The symptoms include yellowing and withering of leaves, stunted seedling growth, shredding of bark tissue at the seedling collar region. Severely infected seedling topple down just like in case of damping off disease and die. The wilted seedlings collected and used for the isolation of the causal agent to study the etiology. The infected stem tissue adjacent to healthy tissue was surface sterilized with sodium hypochlorite solution (1%), ethanol (75%) and sterile distilled water sequentially each for 1 minute and placed on Potato Dextrose Agar medium after blot dry. The Petri plates were incubated at 28°C for 48 hours and observed for the mycelial growth. Whitish radial mycelial growth was noticed from infected tissue and the same was used for microscopic imaging and further



characterization. The fungal mycelia was hyaline, septate; cylindrical 3-4 septate macro conidia with curved ends and 1-2 celled micro conidia observed and confirmed as *Fusarium solani* (Pandey et al. 2017). Seedling wilt can be a serious threat for *M. dubia* cultivation in both southern and northern India. This disease has been considered as a major reason for *M. dubia* decline in Karnataka. This disease can be avoided by selecting a nursery planting site with adequate drainage; treating the seeds with 2% Benlate or 200ppm salicylic acid before planting and providing regular watering to the planted seedlings. Infected nurseries or plants should be treated with propiconazole (1ml/litre) or Carbendazim (2ml/litre) to save the seedlings.

Authors: M. Ashajyothi¹, Venkatesh YN¹, Jyotsana Tilgam², Vishnu R¹, AK Handa¹

¹Plant Protection Lab, ICAR-Central Agroforestry Research Institute, Jhansi – 284003, ²ICAR-National Bureau of Agriculturally Important Microorganisms, Mau – 275103

Participation in Training/Workshop/Meetings/Symposia

- Dr. Hirdayesh Anuragi participated in one-day seminar on Tree Borne oilseeds (TBO mini mission under National food security mission) organized by Agricultural Department, Jhansi on Jan 16, 2021 at Pt. Deendayal Auditorium, Jhansi.
- Dr. R. Vishnu attended DST sponsored National Online Training Programme on Integrated Nutrient Management and Budgeting through Advanced Models to Improve Crop Productivity from 18th January, 2021 to 22nd January, 2021 conducted by IISWC, Regional Station, Ooty, Tamil Nadu.
- Dr. R. Vishnu participated in NBA-UNDP Webinar series on Biodiversity and Biological diversity Act 2002: Access and Benefit Sharing-Processes and Outcomes on 27th January, 2021.
- Dr. K Rajarajan attended a training programme on “Documentation procedures for NABL accreditation for PTLs and PRLs during 9-10 February, 2021 organized by NIPHM, Hyderabad.
- Dr. R. Vishnu participated in “GIS for Sustainable Agriculture” webinar on 28th January, 2021.
- Dr. Hirdayesh Anuragi participated in “National web conference on Sustaining Pulse Production for Self Sufficiency and Nutritional Security (Pulse WebCon 2021)” organized from 9-11 February 2021 by ICAR-IIPR, Kanpur and ICAR, New Delhi.
- Dr. R. Vishnu participated in “Targeting Sustainability of Forests through Certification and NCCF Standards” organized by The India International Centre (IIC), Delhi on 17th February 2021.
- Mr. Venkatesh Y N attended DST sponsored online Training for Scientists/Technologist in Environmental Science working in Government Sector on “Biodiversity Conservation” on 22-26 February, 2021.
- Dr. R. Vishnu participated in one week Online Training Workshop on “Biodiversity Conservation” from 22-26 February, 2021 at Wildlife Institute of India, Dehradun.
- Mrs. Ashajyothi attended online training on “Role of PT and ILC in maintaining accreditation as per the ISO 17025:2017” organized at National Institute of Plant Health Management (NIPHM), Hyderabad on 2nd March, 2021.
- Dr. R. Vishnu participated in high level ministerial policy webinar on “Bamboo policy: a roadmap for bamboo development” conducted on 9th March 2021.
- Dr. R. Vishnu participated in two days Online International Workshop on “GIS & Remote Sensing for Environmental Assessment” conducted from March 31 to April 1 2021.
- Dr. R. Vishnu participated in stakeholders meeting to discuss Draft National Geospatial Policy-2021 on 4th April, 2021.
- Suresh Ramanan S attended the webinar on Linkages of Joint Forest Management Committees (JFMCs) with Institutions of Community Participation & Panchayati Raj Institutions Organized by TERI on 5 April 2021.
- Suresh Ramanan S attended Topic: Environmental Education in India; organised by ICAR on 22 April, 2021

- Dr. H Anuragi and Suresh Ramanan S participated in Online Training Programme on Agroforestry for Environmental Sustainability and Climate Resilience Organized by ICAR-CAFRI and MANGE on 10-12 May, 2021.
- Dr. H Anuragi and Dr. Ashok Yadav participated and presented on “Manilla Tamarind: A Potential Crop for Ecosystem Restoration and Nutritional Security in Dryland Region through Agroforestry Practice” two day National E-Seminar on “Ecosystem Restoration” on the eve of “World Environment Day” (WED2021) organized by GITAM, Visakhapatnam in association with Society for Science of Climate Change and Sustainable Environment, New Delhi, India on 4th & 5th June 2021.
- Dr. K Rajarajan and Suresh Ramanan S attended the NAARM MDP Training on Biodiversity and Environmental Laws relevant to Agricultural Researchers on 7th -9th June, 2021.
- Suresh Ramanan S attended International Conference on Forest Education, FAO on 22-24th June 2021 and Virtual workshop organized by Sher-e- Kashmir University of Agricultural Sciences of Jammu on 29-30th June, 2021.
- Dr. Sushil Kumar, Dr. H Anuragi, Dr. Ashok Yadav, Mrs.Ashajyothi participated in the National Conference on SMART SUMMIT-2021” at Madurai June 19th, 2021.

Publications

Journal Articles

- Ashajyothi. M., Balamurugan, A., Pandey, N., Agarwal, D.K., Varshney, R.K. and Nayaka, C.S., 2021. First report of pearl millet bacterial leaf blight caused by *Pantoea stewartii* subspecies *indologenes* in India. *Plant Disease*. Doi: <https://doi.org/10.1094/PDIS-03-21-0669-PDN>.
- Banjara T.R., Bohra J.S, Kumar S., Ram A and Pal V. 2021. Diversification of rice–wheat cropping system improves growth, productivity and energetics of rice in the Indo-Gangetic Plains of India. *Agricultural Research*. Doi:<https://doi.org/10.1007/s40003-020-00533-9>.
- Banjara TR., Bohra JS., Kumar S., Singh T., Shori A and Prajapat K. 2021. Sustainable alternative crop rotations to the irrigated rice-wheat cropping system of Indo-Gangetic plains of India. *Archives of Agronomy and Soil Science*. Doi: <https://doi.org/10.1080/03650340.2021.1912324>.
- Dev I., Ram A., Radotra S., Misri BK., Sareen S., Kumar P., Singh D., Kumar S., Kumar N and Singh R 2021. Cereal clover bi-cropping for sustainable forage production in the Himalayan region. *European Journal of Agronomy*, (130): 126354.
- K Rajarajan, K Ganesamurthy, M Raveendran et al. 2021. Differential responses of sorghum genotypes to drought stress revealed by physio-chemical and transcriptional analysis. *Molecular Biology Reports*. 48(3):2453-2462.
- Kumar, N., Anuragi, H., Rana, M., Priyadarshini, P., Singhal, R., Chand, S., Indu, Sood, V.K., Singh, S. and Ahmed, S. (2021). Elucidating morpho-anatomical, physio-biochemical and molecular mechanism imparting salinity tolerance in Oats (*Avena sativa* L.), *Plant Breeding*. Doi:<http://dx.doi.org/10.1111/pbr.12937>
- Kumar, S., Rajendra Prasad, Kumar V. and Krishna, A.K. (2021). Organic source on productivity of pomegranate–lemongrass-based agroforestry system in central India. *Agroforestry Systems*. 95(4) : 615-624.
- Machiwal D., Kumar S., Islam A., Kumar S., Jat SR., Vaishnav M and Dayal D. 2021. Evaluating effect of cover crops on runoff, soil loss and soil nutrients in an Indian arid region. *Communications in Soil Science and Plant Analysis*. Doi: <https://doi.org/10.1080/00103624.2021.1892726>
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- Rajarajan, K., Uthappa, A.R., Handa, A.K. et al. Genetic diversity and population structure of *Leucaena leucocephala* (Lam.) de Wit genotypes using molecular and morphological attributes. *Genet Resour Crop Evol.* Doi:<https://doi.org/10.1007/s10722-021-01203-7>
- Rajendra Prasad, Handa, A.K., Alam, B., Arunachalam, A., Shukla, A., Singh, P. and Prasad, N. (2021). Influence of planting geometry of 8-year-old gum-yielding trees on soil chemical properties in the Bundelkhand region. *Indian Journal of Agroforestry.* 23(1) : 33-40.
- Ramanan, S. S. and Kunhamu, T. K. 2021. Redefining the Logarithmic Spiral Trenching to Understand Root Structure and Distribution of Trees. *Indian Forester*, 147 (2), pp.202–204.
- Singh, N.R., Kumar, D., Handa, A. K., Newaj, R., Prasad, M., Kamini, Kumar, N. Asha Ram, Inder Dev, Bhatt, B.P., Chaturvedi, O.P., Arunachalam, A and Singh, L.N. 2021. Land use effect on soil carbon stocks, microbial biomass and basal respiration in Bundelkhand region of Central India. *Agricultural Research*. Published online on 29.06.2021.

Books, Chapters and Technical Bulletins

- Rajendra Prasad, Handa, A.K., Singh, R., Alam, B., Shukla, A., Singh, P., Tripathi, V.D. and Arunachalam, A. (2021). Economic analysis of gum arabic (*Acacia senegal* (L.) Willd.) based agroforestry model for smallholder farms. Technical Bulletin CAFRI/2021/01, ICAR-Central Agroforestry Research Institute, Jhansi 284003, Uttar Pradesh, India; p. 1-34.
- Sodani, R., Mishra, U.N., Chand, S., Indu, Anuragi, H., Chandra, K., Chauhan, J., Bose, B., Kumar, V., Singh, G.S., Lenka, D. and Singhal, R. K. (2021). Artificial light at night: A global threat to plant biological rhythms and eco-physiological processes. *Light Pollution, Urbanization and Ecology, IntechOpen*, 1-18. doi: <http://dx.doi.org/10.5772/intechopen.96457>
- Somdev Sharma, Vikash Kumar Sharma, Sanjeev Kumar Banyal, Ajay Kumar Banyal, Vikramaditya Pandey, Ashok Yadav, Kumud Jaryal, Rakesh Kumar Sharma.2021..Himachal Pradesh Me Aam Ki Kheti Publisher: YS Parmar University Nauni Solan ISBN: 9788194566441
- Syam Viswanath, Sandeep, S., Sreekumar, V.B., Vishnu, R., and Sanil, M.S. Manual for Bioremediation of River Banks in Kerala. 2021. Published by KSCSTE-Kerala Forest Research Institute, Thrissur, Kerala. ISBN No. 81-85041-97-0. p. 97.

Popular Articles

- Ashok Yadav, Hirdayesh Anuragi, Sushil Kumar, Inder Dev, Arun Kumar Handa, Ayyandar Arunachalam, Naresh Kumar, Vishnu R and Pramendra. 2021. Manilla Tamarind: A Multipurpose Plant Suitable for Dryland Areas. *Agriculture and Environment e-Newsletter* 2 (6): 92-97.
- Ashok Yadav, R.K Tiwari, Sushil Kumar, Asha Ram, H. Anuragi, Arun Kumar Handa and A. Arunachalam. 2021 Horticultural Trees for Live Fencing. *AgriCos e-Newsletter.* 2 (06): 126-130.
- Chand, L, Patidar, J, Anuragi, H, Taria, S, Handa, A.K, Dev, I. and Tewari, R.K (2021). Fig (*Ficus carica*): A potential fruit crop for agroforestry systems in arid and semi-arid regions. *Kerala Karshakan* 8(8):4-11.
- Dev R., Dayal D., Kumar S., Kumar A and Patel S. 2021. Kanta rahat cactus hai mulyawan chara. *Kheti*: 28-29.
- Kumar S., Dev R., Yadav A., Pramendra, Taria S., Anuragi H., Ram A and Dev I. 2021. Invasive Weed “*Prosopis juliflora*” Coal: A Source of Income to Banni Inhabitants of Kachchh. *Agriculture & Environment E-Newsletter* 2(7):37-40.
- Ram A., Dev I., Chaudhary G., Kumar N., Arunachalam A., Kumar S and Kumar J. 2021. *Badalti jalvayu me krishivaniki ka mahatav. Kheti* (June): 7-8.
- Suman Lata, Ashok Yadav, Sushil Kumar, AK Joshi, Maneesh Yadav and Pramendra Kafal (*Myrica esculenta*): an underutilized plant for nutritional security. *Times of Agriculture.* 7: 143-146.

Sushil Kumar, Rahul Dev, Ashok Yadav, Pramendra, Sukumar Taria, Hirdayesh Anuragi, Asha Ram and Inder Dev. 2021. Invasive Weed "*Prosopis juliflora*" Coal: A Source of Income to Banni Inhabitants of Kachchh. Agriculture and Environment e-Newsletter 2 (7): 37-40.

Yadav A., Anuragi H., Kumar S., Dev I., Handa AK., Aruncachalam A., Kumar N., Vishnu R and Pramendra. 2021. Manilla Tamarind: A Multipurpose Plant Suitable for Dryland Areas. *Agriculture & Environment E-Newsletter* 2(6):92-97.

Yadav A., Tiwari RK., Kumar S., Ram A., Anuragi H., Handa AK and Aruncachalam A. 2021. Horticultural trees for live fencing. *AgriCos e-Newsletter* 2(6):126-130.

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Personnel

Promotion

Dr. K Rajarajan, Scientist upgraded to Scientist (Senior Scale)

Sh. J L Sharma promoted as Senior Administrative Officer (SAO)

Sh. Mahendra Kumar promoted as Assistant Administrative Officer (AAO)

New Scientist

Dr. Ashok Kumar, Scientist (Fruit Science)

Transfer

Dr. Aswathi Candrakumar, Scientist transferred to DCR, Puttur

Retirement

Sh. AK Chaturvedi, Private Secretary to Director, CAFRI retired on 30.06.2021

Obituary

We lost Dr. Sudhir Kumar, Principal Scientist (Horticulture) on 7th May, 2021 due to COVID.

New Research Facilities

- Exclusive Horticulture Lab
- Model Nursery

Special Assignments:

- Dr. R.P. Dwivedi, as Institute Spokesperson
- Dr. Badre Alam, as Scientific Coordinator



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“AGROFORESTRY : A LIFE GIVER”



CAFRI pays homage to Dr. Sudhir Kumar

Supervision and Guidance: Dr. A. Arunachalam, Director

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