Volume 11; July - December 2022

Flori News

An Official Half Yearly Newsletter of
ICAR-Directorate of Floricultural Research
(An ISO 9001 :2015 Institute)
College of Agriculture Campus, Shivajinagar, Pune

In the inner pages...

"It was a little budding rose,
Round like a fairy globe,
And shyly did its leaves unclose
Hid in their mossy robe,
But sweet was the slight
and spicy smell
It breathed from its heart invi'bl"

From Director's Desk

Dr. K.V. Prasad
Director ICAR-DFR, Pune

Third advanced estimates of flower production during 2021-22 indicates that the area under flower crops stood at 283270 ha with a production of 22.95 lakh MT of loose flowers and 8.33 lakh tonnes of cut flowers. Loose flower production, which is mainly in the hands of small and marginal farmers, continues to be the backbone of Indian floriculture sector. ICAR-DFR continues to strive to develop new varieties and technologies for the stakeholders.

Gamma rays are the most favoured ionising radiation used for the induction of mutants in many crops. While continuing the use of gamma rays, ICAR-DFR forayed in to use of electron beam radiation for the first time for inducing novel mutants in chrysanthemum that yielded vary unique mutants. Some of the mutants also attract more pollinators owing to more floral rewards. Two promising marigold lines that are ideal for bedding purpose, novel gladiolus and tuberose varieties are identified.

Taking forward the new initiative in genome editing, ICAR-DFR embarked on editing anti florigen genes in chrysanthemum to induce day neutrality and recurrent blooming. Variety specific markers in chrysanthemum, heliconia are identified. ICAR-DFR has made floral rewards as one of the selection criteria of breeding programmes of different flower crops. In this endeavour the institute has identified gladiolus, chrysanthemum, aster varieties that offer greater floral rewards to the pollinators in comparison to other varieties.

Consorted efforts of plant protection group resulted in identification of Bihar hairy caterpillar resistant chrysanthemum lines, bud borer complex in jasmine, foliar nematode menace in chrysanthemum, wilt in spathyphillum, snails and slugs menace in different flower crops. Blossom midge caused by *Contarinia maculipennis* created havoc in recent times across the country forcing the farmers to uproot the crops in many places. ICAR-DFR took the initiative of correctly identifying the pest with the help of taxonomic and molecular tools.

In order to address the glut and offer diversification avenues to rose farmers, ICAR-DFR developed rose syrup, rose burfi which are rich in aroma and nutaceutical pigments.

Higher essential oil content was recorded in flowers when compared to leaves and stem in case of chrysanthemum and higher lutein content in marigold was detected in Pusa Deep.

During the period ICAR –DFR organised a number of trainings, awareness programmes of various topics for the benefit of large number of farmers.

ICAR-DFR developed a value chain led floriculture development plan for the Ministry of Agriculture and Farmers Welfare based on the inputs received from the Additional Secretary Dr. Abhilakha Lekhi during his visit to ICAR-DFR on 30th August 2022.

Happy Reading

(K.V. Prasad)

Research Updates

Crop Imrpovement

Mutation Breeding a Promising Method for Chrysanthemum Improvement


DFR C EB-4

Mutant lines of chrysanthemum developed at ICAR-DFR were evaluated under field condition. On the basis of evaluation, it was inferred that DFR C BS-1 being optimum in height and spread with pompon type flowers is suitable as cut spray/ cut flower. The line DFR C GM-1 with double type yellow flowers is suitable as loose flowers. The lines DFR C EB-1, DFR C EB-2 and DFR C EB-3 with single type flowers that have the ability to attract more pollinators are suitable for garden and pot purpose.

Improvement of Aster for Commercial Traits Initiated at ICAR-DFR

A new project on 'Improvement of aster for commercial traits' started at ICAR-DFR. About 12 varieties/accessions collected from different sources were planted during October, 2022 and were evaluated along with promising DFR accessions for morphological and flowering characteristics.

New Promising Marigold Lines from ICAR-DFR for Bedding Purpose

Two new genotypes that are suitable for bedding purposes, DFR M-12 (cream color) and DFR M-26 (light yellow color), were identified from Half-sib selection from KAU M-46 genotype.


DFR C-12 (Cream)


DFR C-26 (Light yellow)

ISSR Markers for Genetic Diversity Analysis in Chrysanthemum

Ten genotypes of Chrysanthemum (Bidhan Shweta, Bidhan Rajat, Bidhan Agni, Vanity Pink, Coimbatore Semi Double, Charlie, Akitha, Purple Quill, PAU-66-2, TQP-06-01) were used in present study for genetic diversity analysis using 100 ISSR markers. The dendrogram generated with similarity coefficient range of 0.79 to 0.55.

Unique Fingerprints of Heliconia Accessions using SRAP Marker System

Twenty-nine genotypes of heliconia were selected from ICAR-DFR, farm and used as experimental material. The plant genomic DNA was extracted from leaf by modified CTAB method and quantified. 50 combinations of SRAP primers were used for the PCR amplifications and based on its data the dendrogram generated.

Targeted Genome Editing of Anti-florigens in Chrysanthemum for Day Neutrality and Recurrent Flowering.

Chrysanthemum is a typical short day plant (SDP) which limits its production in winter season in India and creates gap condition in the market. An attempt is made to develop knock-out lines of anti-florigen in the commercial chrysanthemum var. Pusa Centenary using genome editing technology. Efficient regeneration protocol for commercial photo sensitive chrysanthemum cv. Pusa Centenary is developed and genome editing by single target and double target for knocking anti-florigensgene has been initiated.

Comparative Transcriptome Analysis of Scented and Non-scented Rose Varieties

Comparative transcriptome analysis of scented Double Delight and non-scented Pusa Bahadur varieties at bud and full bloomed flower was carried out. Using transcriptome sequencing and reference genome mapping resulted in the identification of 1,96,129 DEGs in four combinations viz., Scented Double Delight (Bud) vs Non-scented Pusa Bahadur (Bud), Scented Double Delight (Flower) vs Pusa Bahadur (Flower), Scented Double Delight (Bud) vs Scented Double Delight (Flower) and Pusa Bahadur (Bud) vs Pusa Bahadur (Flower). The primary analysis revealed that 38125 rose transcripts commonly present in both the stages of both the varieties while 1282, 4785, 3119 and 5265 transcripts were observed differentially expressed in respective

combinations. Differentially expressed DEGs involved in anthocyanin biosynthesis, carotenoid biosynthesis, phenylpropanoid biosynthesis and Sesquiterpenoids and triterpenoid synthesis were evidenced in primary analysis.

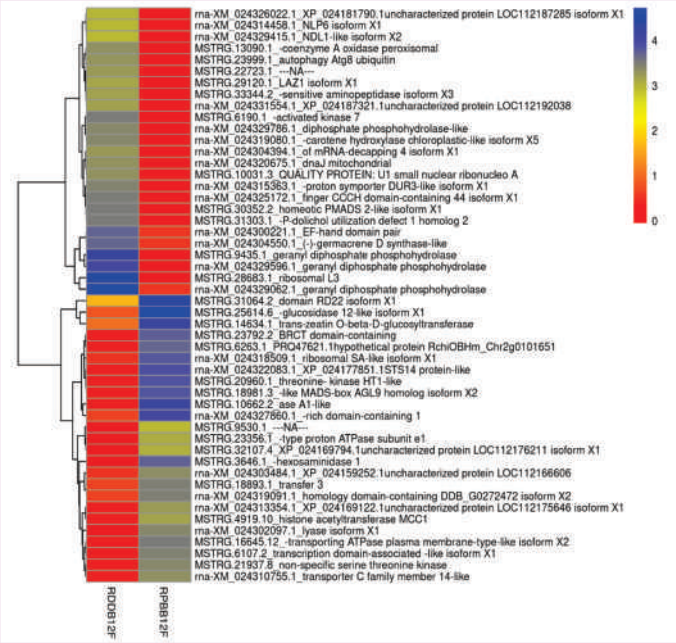


Fig. Heatmap representing 50 upregulated and downregulated genes plotted using log10 base mean values for scented Double Delight RDDB12F-Vs-RPBB12F non-scented Pusa Bahadur, where shades of red represents downregulated genes and shades of blue represents highly expressed genes

Crop Production

Stomatal Finger Print Indicates Better Drought Tolerance in *Epipremnum and Sansevieria*

Opening and closing of stomata during day time is affected by many factors including light, temperature, relative humidity etc. Number of stomata present in adaxial and abaxial portion of the leaf varies under normal and drought conditions. In the study of various indoor plants, *Sansevieria laurentii* had higher number of total stomata (154) in which open stomata were 97 and closed stomata were found as 57 followed by *Epipremnum aureum* in which total stomata were observed to be 128 (open stomata: 80 and closed stomata: 48) under normal moisture condition. In drought conditions, in *Sansevieria laurentii* 24 open stomata and 130 closed stomata were observed and in *Epipremnum aureum* 99 closed and 29 opened stomata were seen.

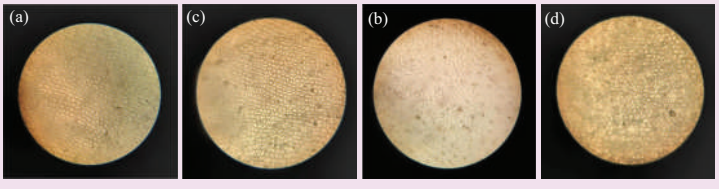


Fig. Stomatal opening and closing through finger printing in: Upper (a) and lower (b) (Normal); Upper (c) and lower (d) (Drought) stomatal finger printing in *Sansevieria trifasciata*

Crop Protection

Blossom Midge *Contariniamaculipennis* Felt: A New Emerging Pest of Tuberose (*Agave Amica*) Flowers in India

Tuberose, *Agave amica* (Medikus) Thiede & Govaerts is a hardy and economically profitable flower crop grown for its flowers and floral essential oil. It is extensively cultivated by small and marginal farmers in several Indian states. In recent years, tuberose growers have faced severe flower yield losses due to large scale deformities and buds rotting (Figure 1). This has created panic situation among tuberose growers in Maharashtra, Telangana and Andhra Pradesh. Based on taxonomic characteristics, the midge species infesting tuberose flowers was identified as *Contariniama culipennis* Felt (Diptera: Cecidomyidae). Species identity was also confirmed by using DNA barcoding technique targeting the mitochondrial Cytochrome oxidase I (*mtCOI*) *gene. DNA* barcode also confirmed that the midge species infesting tuberose (*Agave amica*) buds in India was indeed *C. maculipennis*. This is the first report of a blossom midge infestation of tuberose flowers in the world. In order to determine pest losses caused by this tiny but severe pest, the ICAR-DFR scientists surveyed 44 major tuberose-growing localities spread over three Indian states viz., Maharashtra, Andhra Pradesh and Telangana. There were a few localities that recorded midge fly infestations up to 88%, especially during the late monsoon season (July to October). ICAR DFR scientists investigated the pest's biology and damage to its newly acquired host. *C.maculipennis* completed its egg,

Fig. Midge fly, C. maculipennis infested flower buds of tuberose

larval, and pupal periods in 36-48 hours, 4 to 5 days and 7-10 days, respectively. Adult flies live for 2.5 to 3.5 days and the life cyclegets completed in 13.5 to 17 days. Adult females lay eggs inside young buds to ensure optimal food supply. Eventually, the tuberose florets developed an ugly appearance due to deformation and rotting caused by maggot feeding. It will be easier to design management strategies if this pest can be accurately identified. Pune-based ICAR-DFR urges farmers to take early action to curb pest outbreaks.

Slugs and Snails; A Threat to Ornamental Plants

The Giant African snail (*Lissachatina fulica*), Horntail snail (*Macrochlamys indica*) and Purcell's Hunter Slug (*Eleutherocaulis haroldi*) are becoming the most destructive pests due to continuous rains and climate change. These snails and slugs fed on nursery plants, marigold, chrysanthemum, jasmine and foliage ornamental plants. Snail and slug damage can be confused with feeding by other pests such as caterpillars or other chewing insects. Look for silvery mucous trails to confirm that slugs or snails caused the damage. The Giant African snail (*Lissachatina fulica*), was found to be feeding on Marigold plants followed by foliage ornamentals and nursery plants. Horntail snail (*Macrochlamys indica*) was found to be feeding on potted ornamental plants and nursery plants. Purcell's hunter slug (*Eleutherocaulis haroldi*) was found on Jasmine, Chrysanthemum, Lotus and water lily plants.

Fig. Giant African snail, *Lissachatina fulica*

Fig. Horntail snail, *Macrochlamys indica*

Fig. Purcell's hunter slug, *Eleutherocaulis haroldi*

Fig. *Lissachatina fulica* damage on marigold

Gladiolus Genotype for Ecological Engineering of Pollinator Bees

A total of 45 genotypes of gladiolus were screened at DFR for their preference to the native honey bees. The genotype 'Gunjan' was found to be the most ideal for the honeybee, *Apis florea* (Abundance: 46.6 bees/sqm/ min; foraging rate: 4.4 flowers/min and foraging speed: 11.29 seconds/ flower). Other genotypes viz., Arka Naveen and Punjab Lemon Delight were also found suitable for *A. florea* under field conditions.

Promising Chrysanthemum Genotypes Resistant to Bihar Hairy Caterpillar

A total of 151 chrysanthemum genotypes were screened to determine their reactions to Bihar hairy caterpillar (BHC), *Spilarctia obliqua* under field as well as in laboratory conditions. When BHC reared on different genotypes of chrysanthemum, less than 20% caterpillars survived on DFR C-2, DFR C-3, Sathia and Bidhan Jayanti; whereas the larval duration was significantly extended on DFR C-4, DFR C-6 and Pusa Kesari. Body weight of mature caterpillar was significantly lower in genotype DFR-C4 (0.06g). Pupal weight and pupation (%) have been drastically reduced on DFR C-2.

Bud Borer Complex of Jasmine 'Mogara' (*Jasminum Sambac*)

Studies were conducted to decipher the bud borer complex of mogra, *Jasminum sambac.* More than 8 species of insects were found causing damage to jasmine buds in India. These borer species include *Contarinia* sp., *Hendecasis duplifascialis, Palpita vitrealis, Phycita* sp., *Orgyia* sp., *Lobesia* sp., *Olene mendosa* and *Problepsis* sp. All bud borer species collectively cause 75-80% losses to jasmine buds especially during rainy and post rainy season.

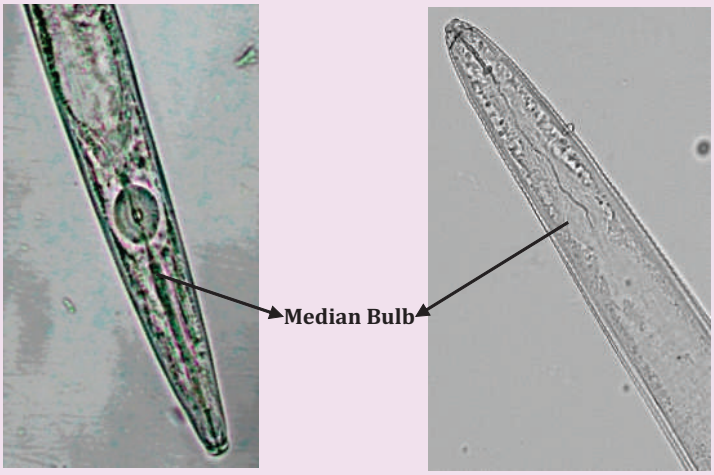
Mealybug an Emerging Pest on Tuberose

A field experiment was planned to study the effect of mealybug, *Dysmicoccus neobrevipes* infestation on physiological parameters of the tuberose variety 'Arka Prajwal'. Observations on physiological parameters were recorded in both vegetative and flowering stage of the crop by using Infra-Red Gas Analyser (IRGA). Overall studies revealed that the mealybug, *Dysmicoccus neobrevipes* infestation on tuberose bulbs and underground part of the plants has significant impact on photosynthesis.

Foliar Nematode; An Emerging Threat in Chrysanthemum

Foliar nematode infestation in chrysanthemum was observed at Regional Station, Vemagiri and in and around areas of Kadiyam. They are migratory ecto-endo parasites and all stages are able to cause infestation in chrysanthemum. Upon infection, the infested leaves usually exhibit elongated angular spots delimited by the principal veins. The discoloration progresses from translucent yellowish and brownish green to dark brown. In infested plants usually, the lower leaves show varying stages of dryness and have finally shed off. They can swim up the surface of plant stems in a thin film of water to infect the upper leaves, buds, and growing points. These nematodes are extremely active for plant-parasitic forms, and can move rapidly over the plant surface when moisture is present.

Fig. Symptoms of Chrysanthemum Foliar Nematode in standing crop



Foliar Nematode, Male **Root-knot Nematode, Male**

Fig Foliar Nematode in Comparision with Tylenchids

Evaluation of Germplasm for Natural Incidence of Leafspot in Marigold

The etiology of the leafspot incidence in marigold was deciphered and it was identified that one of the fungi causing leafspot in marigold as *Alternaria brassicola* (Fig). The incidence of leafspot caused by this pathogen was evaluated among the marigold germplasm lines. The lowest incidence of leafspot was observed in DFR Marigold selections 1 and 2, followed by Arka Bangara and BRM-4.

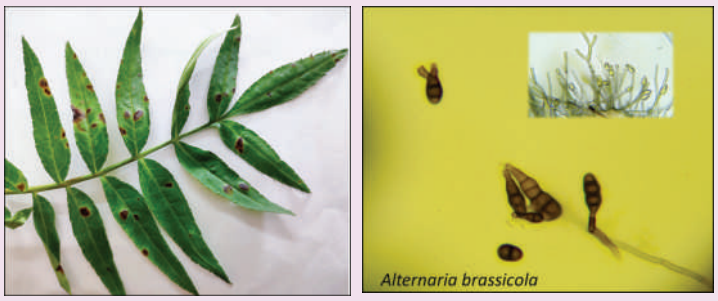


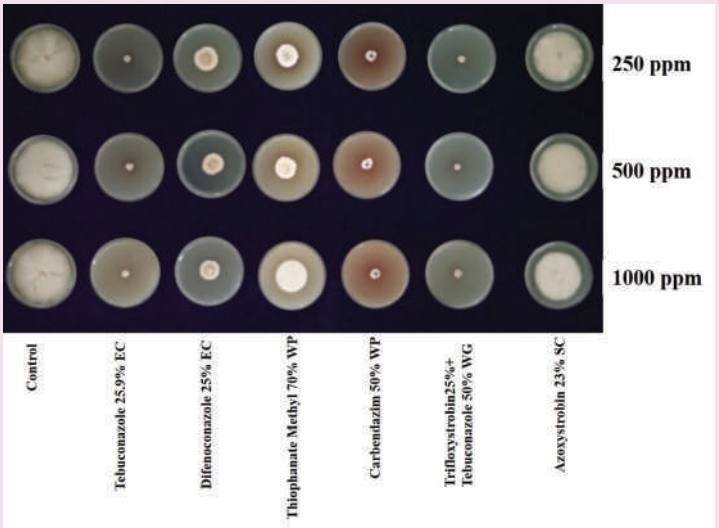
Fig. Leaf Spot Symptoms on Marigold and Microscopic Image of *Alternaria brassicola*

Wilt in *Spathiphyllum*; An Emerging Disease

During 2022, 80-90% incidence of wilt was observed in spathiphyllum plants from the nurseries located at Kadiyapulanka village, Kadiyam Mandal, East Godavari, Andhra Pradesh. Samples were collected from the infected plants and pathogen causing wilt disease in spathiphyllum was isolated and charcterized. The isolated fungus was identified as *Fusarium* species using microscope by observing the hyaline, sickle shaped conidia with multi septation.

New Generation Fungicides Against *Fusarium* sp. Causing Wilt in Spathiphyllum

The fungicides, azoxystrobin, trifloxystrobin+tebuconazole, carbendazim, thiophanatemethyl, fifenconazole and tebuconazole were evaluated for their comparative fungitoxicity against mycelial growth of *Fusarium* sp. *in vitro* at the concentration levels of 250, 500 and 1000 ppm. The results indicated that the fungicides tebuconazole, trifloxystrobin+ tebuconazole and carbendazim were highly effective in suppressing the radial growth of the test fungus.



Standardization of PCR Based Diagnostics for *Begomovirus* and *Cucumber Mosaic Virus* Infecting Marigold

PCR based diagnostics for detection of begomovirus and cucumber mosaic virus from marigold was standardized and further validated. In case of Begomovirus, out of 20 plant samples, 5 samples tested positive for Begomovirus using Deng 1 and 2 primers. In case of CMV, out of 23 samples, 9 samples tested positive for Cucumber Mosaic Virus.

Fig. 1. Begomovirus infected Marigold, 2. Cucumber Mosaic Virus infected Marigold

Post Harvest Technology and Value Addition

Barfi, Syrup and *Tea* from Rose petals developed at ICAR- DFR

The preparation process for making of rose barfi, Rose syrup, Rose tea was standardized at ICAR-DFR.

Petals to Mawa: 4:1 | Petals to Mawa: 2:1 | Petals to Mawa: 4:1

Fig. Rose Petal Barfi

Fig. Rose syrup

Improved version of Loose Flower Plucker from ICAR-DFR

Loose flower plucker has been modified as per the suggestions received from loose flower growers and stakeholders. Considering these suggestions, we modified and developed the loose flower plucker and provided the additional features of metal gruf at upper side of plucker for tightening and loosening of cutting blade.

Fig. Prototype of modified loose flower plucker

Flowers leads in essential oil content compared to other plant parts in Chrysanthemum

The distribution of essential oil content was studied in different plant parts like flowers, leaves and stem. The Line CH-02 was selected for the study.It was observed that highest oil content was observed in flower (0.197%), followed by leaves (0.047%) and stem (0.027%) on fresh weight basis. It revealed that the contribution of essential oil by flowers (73%), leaves (17%) and stems (10%)

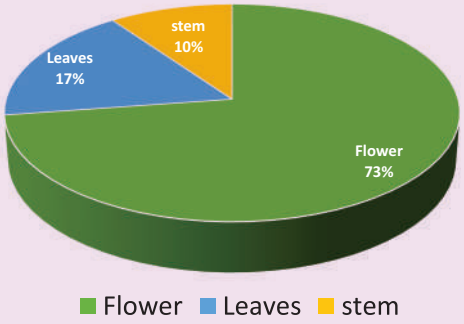


Fig. Essential Oil from Different Plant Parts of Chrysanthemum

Screening of Marigold Lines for Lutein Content

The nineteen lines of marigold were evaluated for their lutein content. The fresh flower were harvested in the month of December 2022. The samples were extracted by organic solvents and saponification by alcoholic potassium hydroxide. The lutein content ranged from 0.010 to 0.116 mg/g on fresh flower weight basis. The lutein content was found highest (6.749 mg/g) in variety Pusa Deep, followed by Arka Shubha (6.10 mg/g), BM-4 (6.09 mg/g). The lowest lutein content was observed in KAUM-46 (0.010 mg/g).

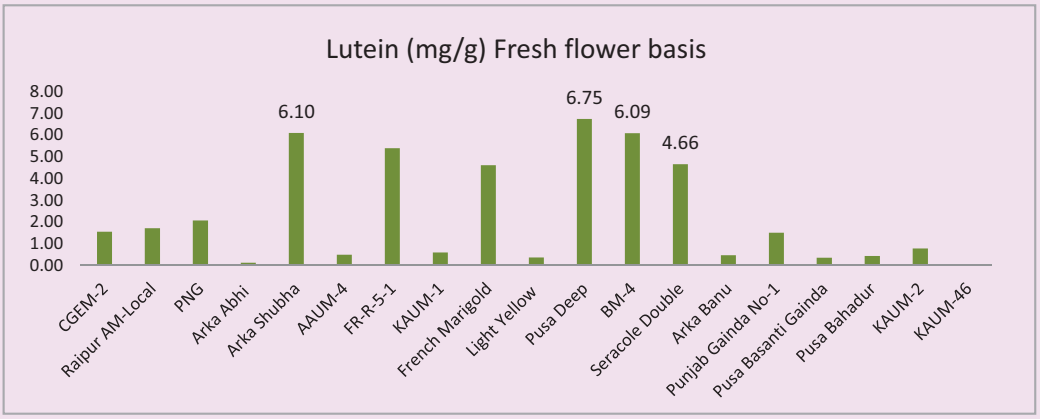


Fig. Lutein Content in Marigold Genotypes (Fresh Flower Basis)

Comparative Gene Expression and Profiling of VOCs from Scented and Non-scented Rose Varieties

Volatile metabolite profiles of six fragrant roses viz., Arka Parimala, Arka Sukanya, Edward, Blue Moon, Christian Dior, Mr. Lincoln and non-fragrant varieties *viz*., Pusa Bahadur, Pusa Arun, Jawani and Moon Stone varieties was accomplished using HS-SPME GCxGC-TOFMS. A total of 253 volatile organic compounds (VOC) were detected, including 40 major compounds. To study the relative fold expression of major scent biosynthetic pathway genes in scented and non-scented roses, qRT-PCR was employed. The expression of *RcGAT* and *RcPAS* gene, catalyzes production of geranylacetate and phenylacetaldehyde respectively have many fold higher expression in Blue Moon which corresponds to abundance of citronellol and phenylacetaldehydes in Blue Moon variety in our VOCs analysis.

Extension & Outreach

Conference-cum- exhibition on the "Expansion of Horticulture Value Chain in India-Potential & Opportunities"

ICAR-DFR Participated in conference-cum- exhibition on the "Expansion of Horticulture Value Chain in India-Potential & Opportunities" (01-02November, 2022)" held at Vaikunth Mehta National Institute of Cooperative Management (VAMNICOM), Pune from 01-02 November, 2022.

KISAN EXPO 2022

ICAR-DFR Participated in exhibition the *"KISAN EXPO 2022"* held at PIECC, Moshi, Pune from 14-18 December, 2022.

MPKV CLIMEX 2022

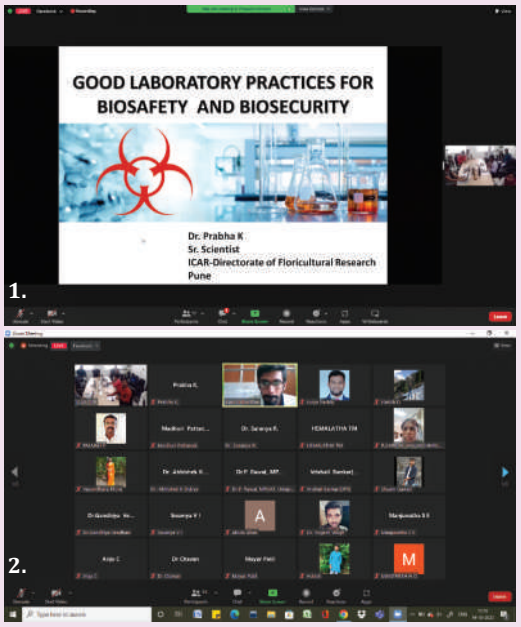
ICAR-DFR Participated in exhibition the "MPKV CLIMEX 2022" held at MPKV, Rahuri from 20-22 December, 2022

MPKV CLIMEX -2022 at MPKV, Rahuri

Training

DST Sponsored Online Training on Molecular Diagnostics of Virus and Phytoplasma organized at ICAR-DFR, Pune.

ICAR-DFR organized a three days training program on "Molecular Diagnostics of Virus and Phytoplasma" under the banner of Scientific Social Responsibility in DST-SERB funded early career project and *Azadi Ka Amrit Mahotsav* from 17 - 19th October 2022. There were lectures and practicals covering entire aspects of plant virus and phytoplasma diagnostics. More than 100 participants attended the training in virtual mode from ICAR and SAUs.

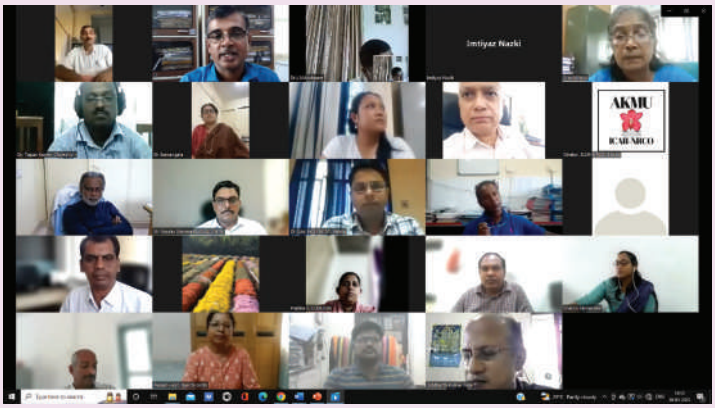


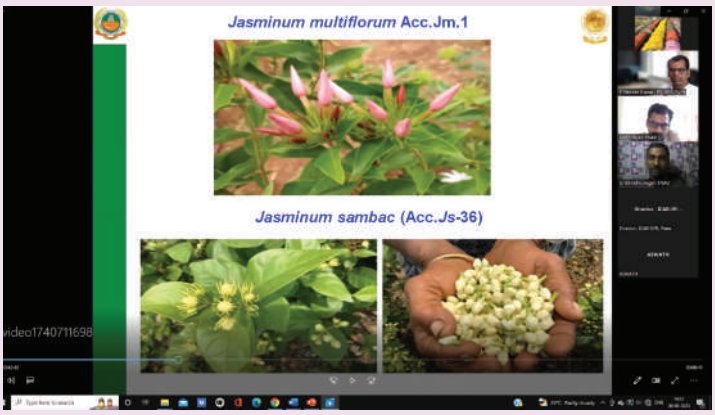
1. Lecture on good laboratory practices
2. Participants in training session by Dr. Kavi Sidharthan

Other Activities

Brainstorming Session on "One District One Product"

ICAR-DFR, under the aegis of Indian Council of Agricultural Research celebrated the Azadi Ka Amrit Mahotsav in its true spirit and exuberance by organizing a Brainstorming Session on "One District One Product" on August 6, 2022. The aim of this programme to identify the potential districts in India where floriculture product can be branded as product.

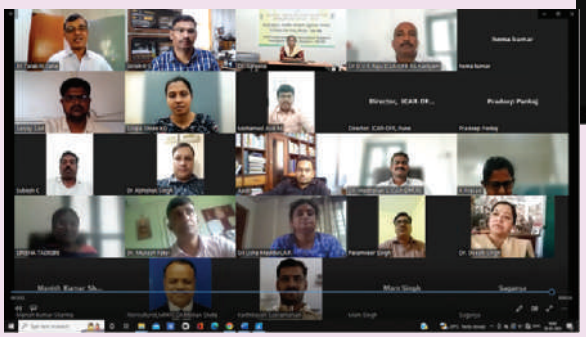




Brainstorming Session on "One District One Product with AICRPs centres

National Webinar on "Vertical Gardening in Ornamentals by ICAR-DFR, Pune

ICAR-Directorate of Floricultural Research, Pune conducted National Webinar on "Vertical Gardening in Ornamentals" on August 12, 2022. The programme was attended by various stakeholders viz, entrepreneurs, farmers, scientist, students etc. Dr. D.V.S. Raju, welcomed the gatherings and the resource persons and briefed about the need vertical farming in present scenario.

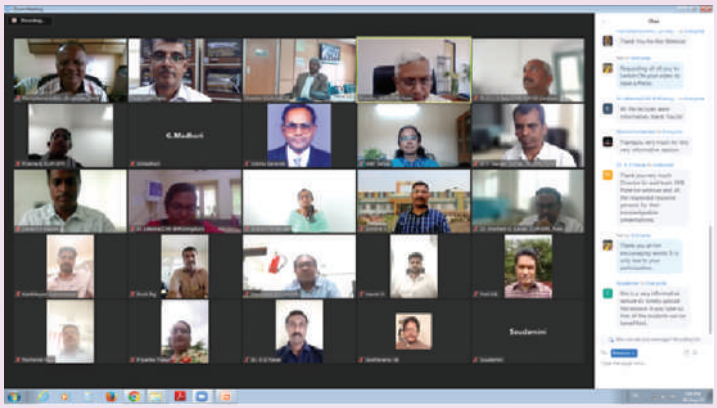


Various stakeholders participation in webinar

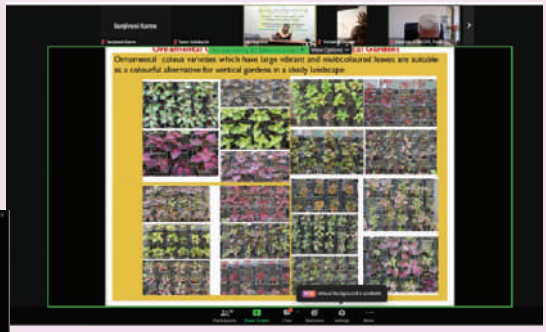
National webinar on "Advances in Production Technologies of Ornamental crops"

ICAR-Directorate of Floricultural Research, Pune conducted National Webinar on "Advances in Production Technology of Ornamental Crops" on August 8, 2022 in a befitting manner for the benefit of the stakeholders. The programme was attended by various stakeholders viz, farmers, scientist, students etc.

Dr. C. Aswath explained Gerbera production technologies



Participants during webinar



Dr Safeena S.A briefed about status of vertical gardening in world

Awareness Programme on Intellectual Property Rights in Flower Crops

ICAR-DFR, Pune organized awareness programme On Intellectual Property Rights in Flower Crops under NAIF-ITMU project on 17th October, 2022 at Yelse village of Maval taluka, Pune district. The programme aimed to create awareness of Protection of farmers varieties and farm innovations and conservation of varieties and different acts in the country. Dr. K.V. Prasad, Director, ICAR-DFR, Pune, and Chief Guest on this occasion emphasized the importance of IPR in Agriculture specially in floriculture sector, also briefed about PPV & FRAs and purpose of the awareness programme and appealed farmers protect their innovations and varieties.

Field Days/ Farmers Day / Kisan Gosthi / National/ International Day

World Soil Day was Celebrated by ICAR-DFR, Pune at Kalangwadi Village, Wai taluka of Satara District

A World Soil Day was celebrated by ICAR-Directorate of Floricultural Research, Pune on 5th December 2022 at Kalangwadi Village, Wai taluka of Satara district in collaboration KVK, Borgaon, Satara and State Agril. Department Wai, Satara. The programme was presided by Sh. Basavraj Birajdar, Joint Director Agriculture, Kolhapur division and he emphasized on improvement of soil health by balanced use of fertilizers according to soil health card reports.

ICAR-DFR, Pune Celebrated of National Farmers Day

The ICAR- Directorate of Floriculture Research, Pune celebrated National Farmers Day on theme under *Azadika Amrut Mahotsav* on 23rd December, 2022 at Sasurve village of Koregaon taluka, Satara district. A total of 50 participants from Sasurve & surrounding villages of Koregaon taluka participated in the programme.

Visited Farmers field in Sangavi village, Phaltan

Tuberose field visits at Sasurve

Awareness Program on Good Nursery Practices for Quality Planting Material

ICAR –DFR under Swaach Bharat Abhiyaan 2.0 on 4th October 2022 organized an awareness program on Good Nursery Practices for Quality Planting material, in Narayangaon, Pune with the sponsorship of DST-SERB scientific Social responsibility program.

Team DFR in Swatchtha Abhiyaan visiting production nurseries for giving awareness about Good Nursery Practices

Other Activities

Swatchtha Abhiyaan in Schools "Young India, Dream a Clean India"

As a part of Swatchtha Abhiyaan, an awareness about the importance of cleanliness was imparted among school children of Ghule Vidyalaya, Manjri Budurk.

Celebration of Indian Constitution Day by ICAR-DFR

ICAR- Directorate of Floricultural Research, Pune has celebrated the Indian Constitution Day on 26th November, 2022 under the subject of "India- the Mother of Democracy" to honour and acknowledge the contribution of Founding Fathers of the Constitution. A workshop was organized at K.K. Ghule School, Manjri Budruk, Pune to sensitize new generation students, and also conducted a quiz competition to ensure the attentiveness of students on Indian Constitution.

ICAR- DFR celebrated its 13th Foundation Day

ICAR-Directorate of Floricultural Research, Pune celebrated its 13th foundation day on 10th December 2022 at its Hadapsar farm with a gathering of progressive farmers and various stakeholders in floriculture. Speaking on the occasion the Chief Guest of the event Dr. P.G. Patil, Honble Vice Chancellor, MPKV, called upon enhanced collaboration between MPKV and ICAR-DFR. Guest of honour, Dr. Sammi Reddy, Director, ICAR-NIASM, Baramati congratulated team DFR for the progress made since its inception. Mr. Vikas Dhakane, Additional Commissioner, Pune Minicipal Commissioner highlighted the importance of involving farmer-producer companies in research and extension programmes for successful dissemination of technologies to the field. Mrs. Mital Hiremath, Joint Development Commissioner, Pune SEZ explained the possibility of crating SEZ for floriculture sector with the help of farmers and SHG. Earlier in the programme, while welcoming the guests, Dr. K.V. Prasad, Director, ICAR-DFR explained the genesis of DFR, Pune and highlighted the major research advancements made by DFR in the last year for the benefit of the stakeholders.

Celebration of 13th DFR foundation day at Hadapsar farm

Visits

Dr. Abhilaksh Likhi, IAS, Addl. Secretary, DAC, MoAFW, New Delhi visited ICAR-DFR, Pune

Dr. Abhilaksh Likhi, IAS, Additional Secretary, Ministry of Agriculture & Farmers Welfare, (Department of Agriculture & Farmers Welfare) visited the ICAR- Directorate of Floricultural Research at Pune, Maharashtra in the afternoon of 30th August 2022 to discuss Five Year Plan for Development of Floriculture in the Country and implementation strategies. The meeting was also virtually attended by Dr. Prabhat Kumar, Horticulture Commissioner, GoI besides officials from Directorate of Marketing and Inspection, GoI, Department of Horticulture, Govt. of Maharashtra, and National Horticulture Board, Pune. Dr. Likhi emphasised that the five-year work plan for increasing

area / production and the implementation strategy to promote floriculture in the country must involve small and marginal farmers with an aim to provide sustainable livelihood. Dr. Prabhat Kumar, Horticulture Commissioner urged ICAR-DFR to identify ornamental Bee Flora besides developing a year-long floral calendar for sustainable apiculture. He advised ICAR-DFR to include all the sub-sectors of floriculture for developing the action plan to ensure overall development of floriculture sector. He emphasized on value chain-based cluster development of floriculture sector in the country.

Rajbhasha

ICAR-DFR Celebrated *Hindi Pakhwada*

ICAR-DFR celebrated Hindi Pakhwada from September 14-29, 2022. Different theme based competitions like hindi word writing, essay, dictation, recitation of poem, quiz, rangoli making, etc were organized at the Directorate. The motto was to celebrate the importance of Hindi language along with creating awareness about its usage in day to day work. A lecture was also

Dr Raj Bahadur, Former Deputy Director (OL) lecture in *Hindi Pakhwada*

AICRP

30th Annual Group Meeting (AGM)

Due to the COVID-19 pandemic which affected the human kind globally and in the light of overall restrictions the XXX Annual Group Meeting of All India Coordinated Research Project (AICRP) on Floriculture was conducted in virtual mode during January 12-14, 2022 to review the research work done at Coordinated Centres (22 nos.) during last year (2020-21). Dr. A. K. Singh, DDG (HS), ICAR was the chief guest and Dr. Vikramaditya Pandey, ADG (HS-1) and Dr. B. K. Pandey, ADG (HS-II) were the guests of honour on this occasion.

Personnel

New Joining

Dr. Shivkumar K.V.
joined as Scientist (Plant Pathology) on 1st September 2022.

Volume 11; July - December 2022

Flori News

An Official half yearly Newsletter of

ICAR-Directorate of Floricultural Research
(A ISO 9001 :2015 Institute)
College of Agriculture Campus, Shivajinagar, Pune-411 005, Maharashtra, India
Phone: 020-25537024, 25537025, E-mail: director.dfr@icar.gov.in, directordfr@gmail.com,
Website: https://dfr.icar.gov.in
https://www.facebook.com/ICAR-Directorate-of-Floricultural Research1126781344008685
https://twitter.com/ICAR_DFR

Published by: Dr. K.V. Prasad, Director, ICAR-DFR, College of Agriculture Campus, Shivajinagar, Pune
Editorial Team: Dr. Prabha. K., Dr. Tarak Nath Saha, Dr. Ganesh Kadam, Rahul Yadav & Poornima Gaikwad
Printed at: Anson Advertising and Marketing :Off.:# 25, Laxminagar Commercial Complex, Laxminagar, Pune 411009, India
Tel.: 020 24213244, 29997230