



Volume 3; January-June 2017

# Flori News



An Official Half Yearly Newsletter of  
**ICAR-Directorate of Floricultural Research**  
(An ISO 9001 :2008 institute)  
College of Agriculture Campus, Shivajinagar, Pune



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*The modest Rose puts forth a  
Thorn.*

*The humble Sheep a threat'ning  
Horn.*

*While the Lily white shall in  
love delight.*

*Nor a Thorn nor a threat stain  
her beauty bright.*

– William Blake

(Songs of Innocence and Experience)

## From Director's Desk

I have great pleasure in presenting the third volume of the Flori News of ICAR- Directorate of Floricultural Research, Pune. In Crop Improvement Programme 11 marigold cultivars were evaluated for their anther dehiscence pattern, promising open pollinated progeny of tuberose are evaluated.

In Crop Protection, survey was undertaken to study the incidence of insect pests affecting the commercial flower crops grown in Maharashtra, Goa and Karnataka. Among the insect pests affecting the commercial flower crops, bud borer was the most prevalent on the crops grown under open field condition. In crops grown under polyhouse, leaf miner, whitefly, thrips and red spider mite were found to infest the commercial flower crops.

Fungal pathogens from infected samples of tuberose, gerbera, chrysanthemum and amaryllis were isolated and have been identified up to genus level. Nematode manifestations in major commercial flower crops are documented and strategies for the management of root-knot nematode in tuberose and chrysanthemum have been attempted.

Efforts have been made to understand the etiology of various virus infections like symptoms observed in Chrysanthemum, Gerbera, Tuberose, Gladiolus, Duranta, Petunia and Crossandra, the leaves were subjected to ELISA for Cucumber mosaic virus with positive signals from some.

Floricultural crops offer widest range of pigments that possess unique nutraceutical properties. A large number of value added products are made from grapes. However the consumer preference is more for value added products from coloured grapes. In order to fortify the products from green grapes an inter-institutional project was developed in collaboration with ICAR-National Research Centre on grapes. As part of the new initiative, total phenolics from Rose and Marigold are estimated to establish their anti oxidant properties.

Owing to the fact that floriculture sector is a small sector; the extent of mechanization in floriculture is minimum. To address this critical gap ICAR-DFR started a new project on Development of Gadgets and Tools for Floricultural Crops. Under the project a bulb planter that is suitable for any bulbous planting material is designed and tested.

DFR was privileged to receive Honorable Secretary, DARE and DG, ICAR, Dr. Trilochan Mohapatra during April 2017. His towering presence was a great inspiration to all the members of the DFR. Hon'ble DG has reviewed the progress of work carried out by the scientific staff and offered very valuable suggestions for improvement. ICAR-DFR organized a number of outreach programmes that included Celebration of National Productivity Week and National Science Day. Support and timely help from all the scientific, administrative and finance staff is fittingly acknowledged.

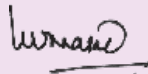
Happy reading!

Pune, 30<sup>th</sup> June 2017



**Dr. K.V. Prasad**

Director ICAR-DFR, Pune

  
(K.V. Prasad)

## Research Updates

### CROP IMPROVEMENT

#### Evaluation of Open Pollinated (OP) Lines of Tuberose

Open pollinated seedlings of Arka Nirantara, Phule Rajani, Sikkim Selection and Mexican Single were evaluated for growth and flowering traits. Among the 37 Open Pollinated population of Arka Nirantara evaluated, the plants AN 34 (64.43 cm) and AN 5 (64.17 cm) recorded maximum plant height followed by AN 2 (59 cm). The spike of AN 2 was observed to be of maximum length (178 cm) followed by AN 1 (130cm), AN 28 (125cm). Also the rachis length was observed to be maximum in AN 2 (64 cm) followed by AN 28 (36 cm)(Fig.1a). Number of flowers per plant was maximum in AN 3 (64) followed by AN 28 (52), AN 2 (48). Flower diameter was maximum in AN 28 (3.8cm) followed by AN 4 (3.5cm), AN3 (3.2cm) and AN 5 (3.2cm).



Fig. 1 Flowering spike of OP seedling AN- 28 and PR-9

Among the sixteen OP population of cultivar Phule Rajani evaluated, the lines namely PR-1 (Greenish tinge buds), PR-3 (Greenish tinge buds), PR-4 (Greenish tinge buds), PR-9 (Greenish tinge buds)(Fig.1b), PR-11 (Greenish tinge buds), PR-13 (Pinkish tinge buds) and PR-30 (Greenish tinge buds) were found to exhibit dwarf character. The analysis of data on plant height revealed that PR-13 was tall among the selected lines. Maximum spike length was found in PR-13 (57.33cm), followed by PR-4 (46.66cm), PR-30 (46.40cm), PR-1 (41.0 cm), PR-3 (38.5cm) and PR-9 (32.2 cm). Rachis length is an important parameter for judgement of quality flowering spike. In the present study PR-13 was found to bear maximum rachis length

(28.66cm), followed by PR-4 (28.33cm). Maximum number of flowers was found in PR-30 (25.1), followed by PR-1 (22), PR-3 (21.75).

Among 118 OP lines evaluated of Sikkim Selection, only SS-26 (Greenish tinge buds) exhibited dwarf character with plant height (48.5 cm), spike length (39.5cm), rachis length (19.5cm), number of flowers (24.5), flower length (6.0 cm) and flower diameter (3.0 cm).

#### Comparative study of Anther Dehiscens Pattern in Marigold

In marigold, the pattern of anther dehiscence based on visual observations (Table 1) at different stages (Bud stage, half

**Table 1. Pattern of anther dehiscence in marigold at different flower development stages**

| Sl. No. | Genotypes                               | Stage |           |            |
|---------|---|-------|-----------|------------|
|         |   | Bud   | Half Open | Fully Open |
| 1       | Pusa Narangi Gaiinda (African Marigold) | x     | *         | **         |
| 2       | Pusa Basanti Gaiinda (African Marigold) | x     | *         | **         |
| 3       | Bidhan Marigold 1 Yellow                | -     | -         | -          |
| 4       | Bidhan Marigold 2 Orange                | -     | -         | -          |
| 5       | Local Selection 1 (French Marigold)     | x     | **        | ***        |
| 6       | Local Selection 2 (French Marigold)     | x     | ***       | -          |
| 7       | Local Selection 3 (French Marigold)     | x     | ***       | -          |
| 8       | Thuljapur local A (French Marigold)     | x     | ***       | -          |
| 9       | Thuljapur local B (French Marigold)     | x     | ***       | -          |
| 10      | Thuljapur local C (French Marigold)     | x     | **        | ***        |
| 11      | Thuljapur local D (French Marigold)     | x     | **        |            |

x : No dehiscence; \* : Anther dehiscence observed in 1/3 of the flowers  
\*\* : Anther dehiscence observed in 2/3 of the flowers; \*\*\* : Anther dehiscence observed in all the flowers



opened and full opened flowers) of flower development was recorded in all the 11 genotypes. None of the genotypes, recorded anther dehiscence at bud stage. However, in genotypes, Local Selection 2, Local Selection 3, Thuljapur Local A and Thuljapur Local B anther dehiscence occurred at half opened stage. Stigma receptivity was not noticed in initial two stages of anther dehiscence.

### Evaluation of Chrysanthemum Cultivars for their Disease Reaction to Root-Knot Nematode, *Meloidogyne incognita*

Twenty one chrysanthemum cultivars were evaluated for their disease reaction to *Meloidogyne incognita*. Resistance reaction of these genotypes for root-knot nematode was recorded on the basis of number of root-galls per plant on each genotype. Based on root-gall rating, resistance reaction is categorised as 1 - Susceptible genotypes (root-knot index 4 with number of galls from 31 to 100): Panchoo, Winter Queen, Lalima, Basanti, Ravi Kiran and Red Stone; 2 - Moderately susceptible genotypes (root-knot index 3 with number of galls from 11 to 31) Mother Teresa, Autumn Joy, Sabita, Vasantika, OPCh 9-4-1011, OPCh 9-2-1011, Haldi Ghati, OPCh 25-3-1112, Sadwin Yellow, Anmol, Pusa Aditya, Lal Pari and Dolly Orange; 3 - Moderately resistant genotypes (root-knot index 2 with number of galls from 3 to 10): Pusa Chitraksha and Mallika Yellow.

### Profiling of Total Phenols from Rose and Marigold

Flower samples from marigold and rose were processed for extraction of natural pigments in 80% Methanol by 2-3 hours shaking at room temperature. After centrifugation at 14000g, the crude extracts were separated and stored at -20°C. Crude methanol extracts of both rose and marigold were subjected to total phenol, total flavonoids and antioxidant assays.

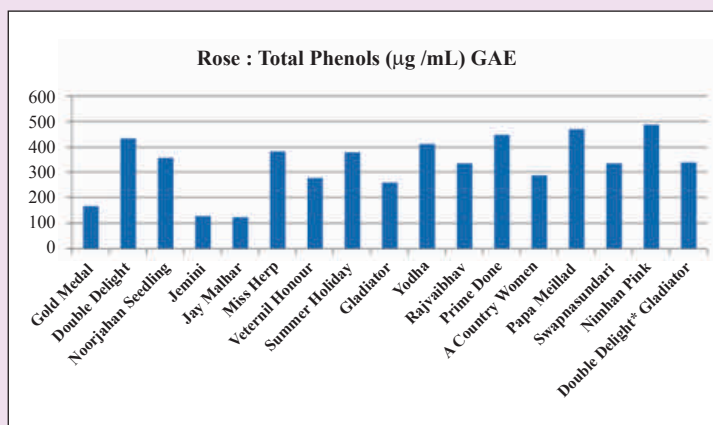


Fig. 2. Total Phenol content in 17 Rose Accessions.

Screening of flower petals from different rose accessions (17 nos.) revealed that the hybrid Nimhan Pink recorded maximum phenol content (487.98 µg/mL GAE) followed by Papa Meilland (469.46 µg/mL GAE), Double Delight (434.62 µg/mL GAE) and Yodha (411.53 µg/mL GAE). Whereas Jay Malhar (123.69 µg/mL GAE) contained the lowest phenolics content (Fig.2).

In case of marigold, freshly collected flowers of seven accessions were dried in two conditions (a) Oven dried at 40-45°C (b) Shade dried and were analysed separately for total phenol content. It was observed that shade dried marigold samples have shown higher levels of total phenolics content in comparison with oven dried samples. Among the shade dried samples of marigold, accession Arka Alankara (229.3 µg/mL GAE) contained highest total phenolic content followed by Agni (220.91 µg/mL GAE) and Arka Bangara (210.3 µg/mL GAE) while lowest was found in BMG-1 (145.3 µg/mL GAE) (Fig. 3).

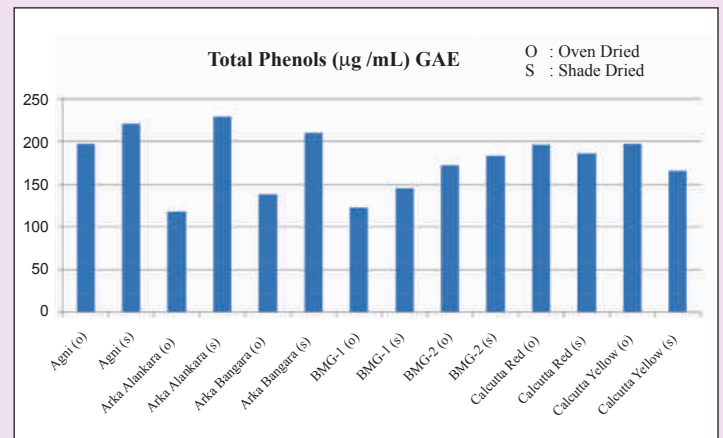


Fig.3. Total Phenolics content in Seven Marigold Accessions.

## Crop Protection

### Borer Pests in Flower Crops: An Increasing Threat

Survey was undertaken in Maharashtra, Andhra Pradesh, Goa and Karnataka to document the incidence of bud borer, *Helicoverpa armigera* (Fig. 4); cutworm, *Spodoptera litura* and jasmine bud borer, *Hendecasis duplifascialis* both under polyhouse and open field conditions. Incidence of bud borer, *Helicoverpa armigera* was very less during the period of survey. The incidence in rose (10 – 15%), followed by China aster (10 – 15%), carnation (5 – 10%), marigold (5 – 10%), gaillardia (5 – 10%) and tuberose (3 – 5%) (Fig. 5-9) was documented.





Fig. 5a. Bud borer egg on China aster Fig. 5b. Bud borer egg on rose



Fig. 6. Bud borer damage in China aster Fig. 7. Bud borer damage in rose



Fig. 8. Bud borer damage in tuberose Fig. 9. Bud borer damage in gaillardia



Fig. 10. Cutworm, *Spodoptera litura* damage in gerbera

Common cutworm (*Spodoptera litura*) was found to be damaging the flowers of gerbera grown under polyhouse in different polyhouses surveyed in Maharashtra. The damage was to the tune of 25–30 per cent in gerbera affecting the commercial production (Figure 10).

Minor incidence (< 1%) of Jasmine bud borer, *Hendecasis duplifascialis* was recorded in one field (Shindawane, Pune district).

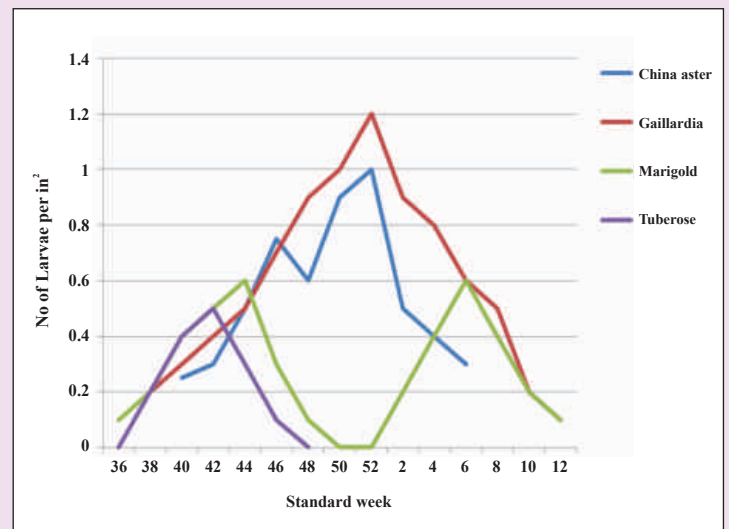


Fig. 4. Incidence of *Helicoverpa armigera*

### Isolation of Fungal Pathogens from Infected Samples of Tuberose, Gerbera, Chrysanthemum and Amaryllis

Leaf samples from tuberose, gerbera, chrysanthemum and amaryllis were collected from ICAR-DFR field. Fungal pathogens showing characteristic visible symptoms like spots, blights, anthracnose, wilts, rots, etc. were isolated in PDA media supplemented with Tetracycline or Chloramphenicol, at the rate of three to five pieces of tissues per petriplate and incubated at room temperature (25–27°C) that favour the pathogen development. A portion of mycelium developing on the nutrient medium was transferred to the agar slants for purification and storage for further examination.



Fig. 11. Pure culture of fungal pathogens isolated from (a) Tuberose, (b) Amaryllis and (c) Gerbera



The fungus has been sub-cultured at regular intervals to maintain its vigour for various studies. The petridishes were incubated at temperature that favour spore germination. The dishes were examined under the microscope at regular intervals and the location of germinating spores were marked. The marked germinating spores along with a small amount of medium were individually transferred to agar slants for development of colonies from the germinating spores (Fig. 11).

### Detection of Cucumber Mosaic Virus from Marigold, Gladiolus and Petunia

To study the etiology of various virus infection like symptoms observed in chrysanthemum (mosaic and ringspots), gerbera (yellowing and vein banding), tuberose (mottling), gladiolus (leaf streak and flower colour break), duranta (leaf curl and little leaf), petunia (yellowing and mild mosaic) and crossandra (leaf yellowing), the leaves were subjected to ELISA for Cucumber mosaic virus and the result is represented in the (fig. 12).

Marigold, gladiolus and petunia samples have tested positive for *Cucumber mosaic virus* with a higher absorbance value (three times or more) than the healthy value. The symptoms in other crops may be due to other species of viruses which needs to be investigated. Cucumber virus is found to be a common virus infecting many of the herbaceous ornamentals and to clearly understand the strain level information, further molecular studies are in progress.

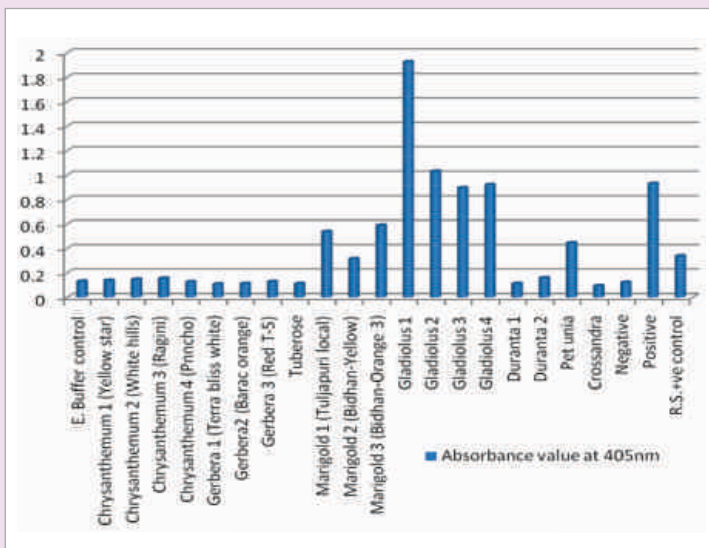


Fig. 12. Graph showing the average absorbance value at 405nm.

### Incidence and Severity of Root-Knot Nematode, *Meloidogyne* spp. in Flower Crops

Survey was undertaken during 2016-17 and Seventy-five soil and/ root samples were collected from flower crops grown in protected and open field conditions. The surveyed region includes 4 districts in Maharashtra (Pune, Ahmednagar, Nashik and Satara), 4 districts in Karnataka (Davanagere, Shimoga, Dharwad and Belgaum), 2 districts in Goa (North and South Goa). About 15 soil and root samples were also collected from the nursery units of Kadiyam Mandal in East Godavari District of Andhra Pradesh. The absolute and relative density, absolute and relative frequency and prominence value of each nematode were determined. The GPS location of some of the sample, variety, previous crops/cropping system were also recorded.

The studies revealed variations in the incidence and severity of root-knot nematodes in different flowers grown in different districts. Based on above ground symptoms like stunted growth

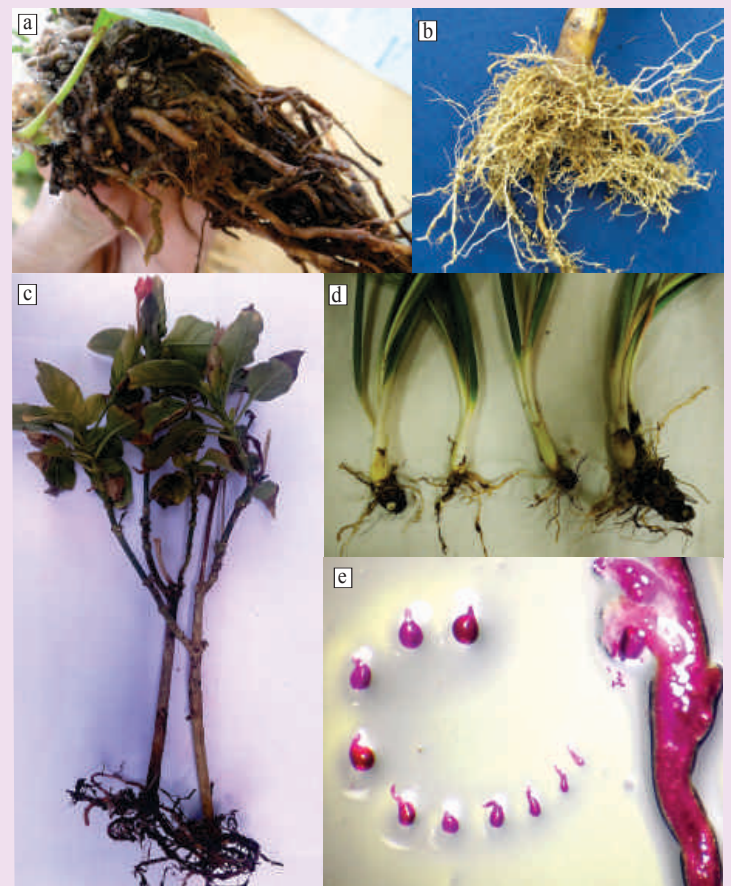


Fig. 13. Galls due to root-knot nematodes on the roots of a) Gerbera, b) China aster, c) Crossandra and d) Tuberose. e) Different life cycle stages of root-knot nematode recovered from the roots of tuberose.



with patchy appearance and reduced plant growth characteristics and number of galls on the roots (Fig. 13), the incidence and severity was recorded. The root-knot nematode incidence ranged from 15-45% with severity range of 50-80% in tuberose grown in Maharashtra. Up to 15% incidence of root-knot nematode was recorded in gerbera grown under protected cultivation with severity range from 10-30% in Ahmednagar, Pune (Maharashtra), Shimoga, Davanagere (Karnataka) district and Goa region. The 2-3% incidence was also recorded in crossandra with severity range from 15-30% in Shimoga district of Karnataka.

## Post Harvest Management

### Design and Development of Hand Held Bulb Planter

Bulbs/Corms of some flower crops like Gladiolus, Tuberose etc are planted on raised beds or ridges. The depth and spacing between the bulbs depends on variety and type of flower crop. In general, the planting depth of bulbs is three times the height



Fig. 14. Prototype of hand held bulb planter

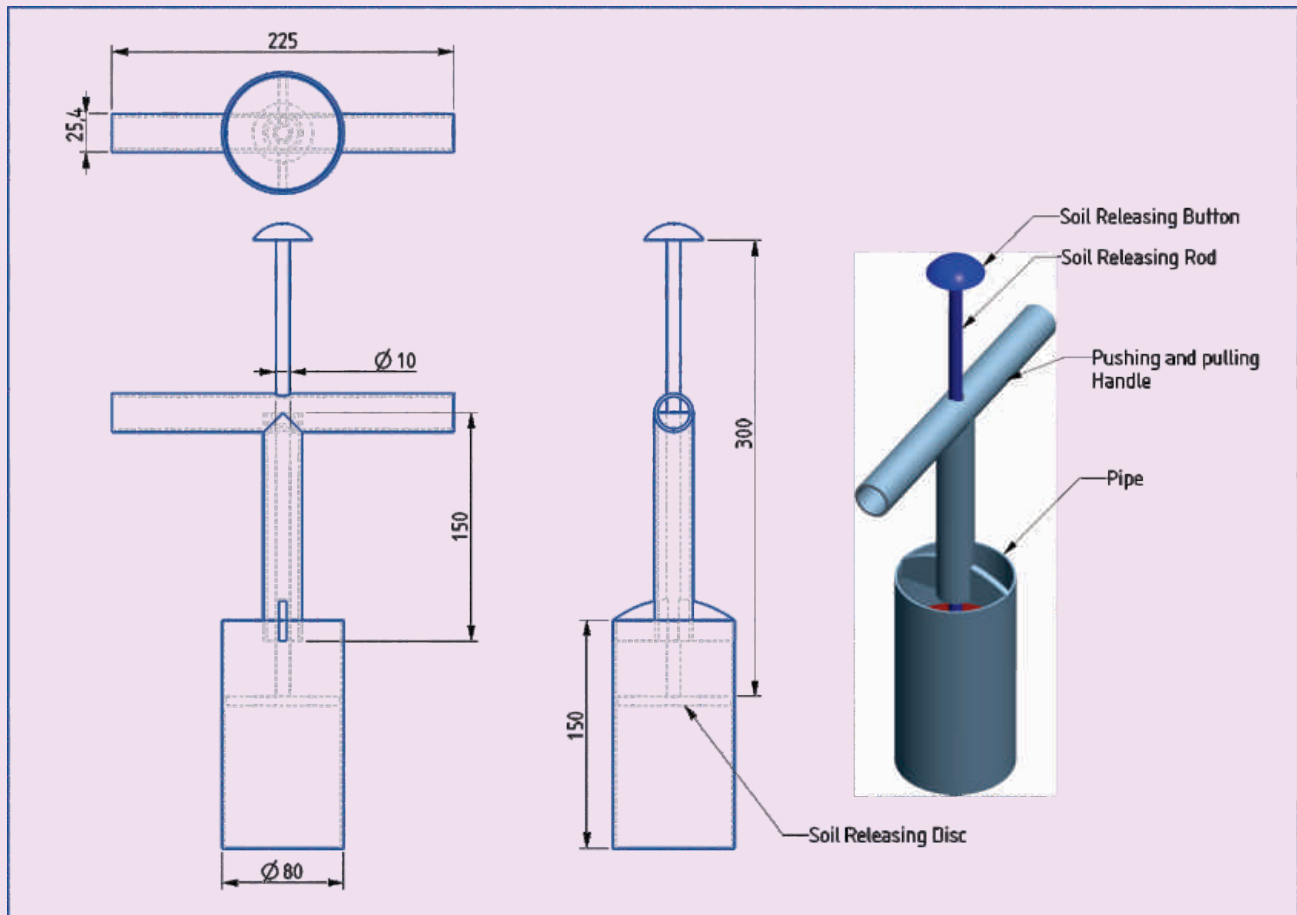


Fig. 15. 3D drawing of Hand held Planter



of bulbs. It is to be ensured that the bulbs/corms are planted deeply enough (approx. 10 cm.). Planting of these bulbs or corms is often done manually. When planting of bulbs is done manually, it is difficult to maintaining proper depth of planting of bulbs or corms. The process requires more number of man power. Cheap labour would no longer be assured in years to come due to acute shortage of labour owing to migration and availability of more lucrative avenues for skilled labour. Inadequate mechanization and availability of labor are the major constraints to carry out planting of bulbs or corms in India. To overcome all these constraints ICAR-DFR designed and developed a prototype of bulb or corm planter (Fig. 14) to plant the bulbs of various flower crops to minimize the dependence on labour to economize on time by reducing the cost of production for enhanced floriculture income. The developed hand held planter has mainly three parts (Fig. 15), cylindrical shaped shaft which is inserted into the soil to make hole for planting of bulbs or corms, soil releasing system and handle for

pushing and pulling of planter into soil. Diameter and height of cylindrical shaft is 8 cm and 15 cm respectively. The soil releasing system consist of handle with concave shaped plate attached at bottom of this handle. The length of handle of this system is 15 cm and diameter of concave shaped plate is 7 cm. The length and diameter of top handle is 22.5 cm and 2.5 cm respectively. The overall height of planter is 32.5 cm. The working of hand held bulb planter is very simple (Fig. 16). Firstly push the planter down into the ground, twist the planter 3 to 4 times. After that lift and remove from the ground and place bulb in the hole, then simply press the soil releasing button to eject the soil from the planter back into the hole. It gives efficiency, precision and timeliness in operations. Hand held planter for planting of bulbs of flower crops is an important tool for profitable and competitive floriculture. This planter will save the time and money. Hand held planter can be used for planting of bedding plants.

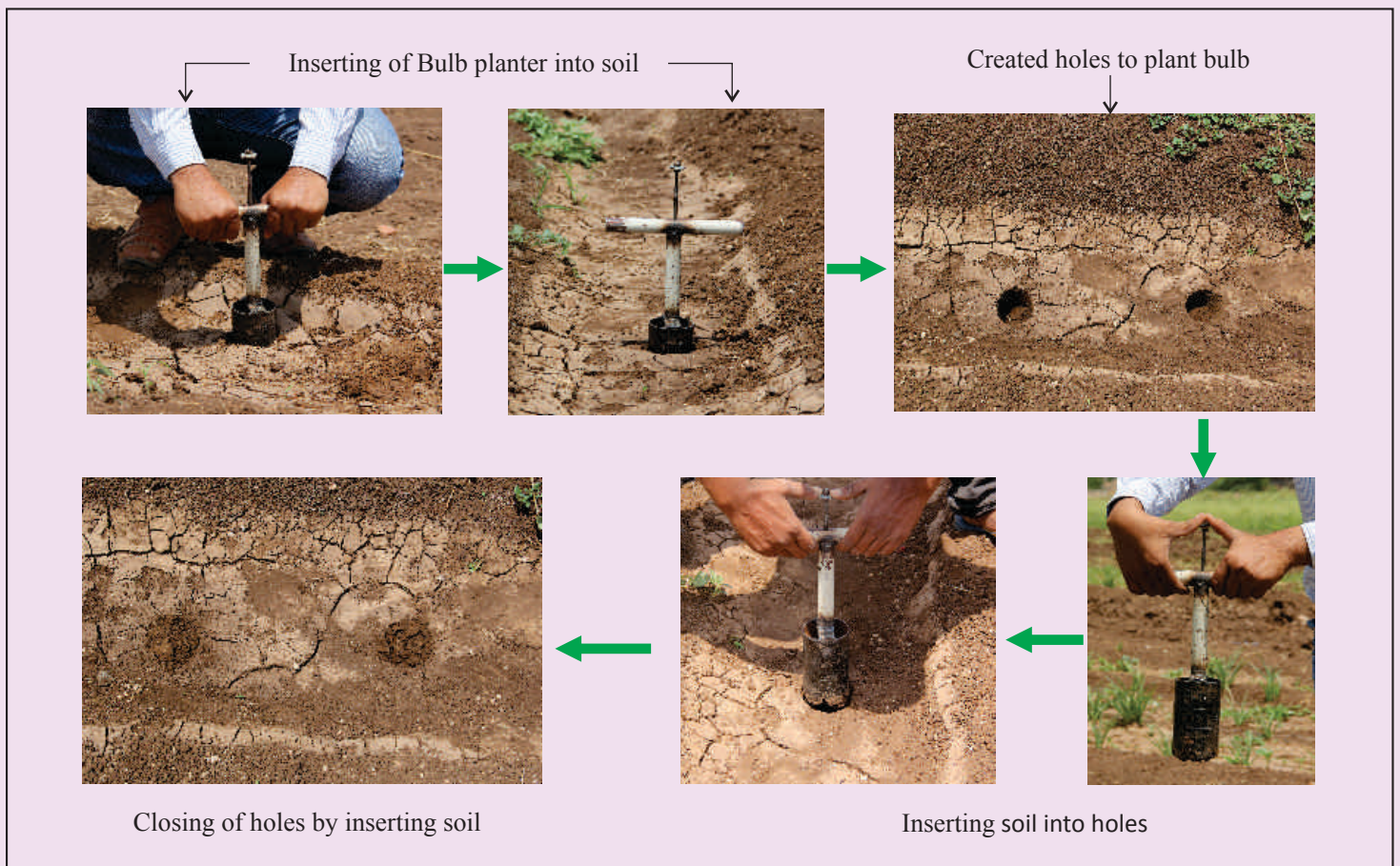


Fig. 16. Working of hand held bulb planter



## Extension Activities

### Extension Activities

#### ICAR-DFR Gets Appreciation Certificate for Best Display during Krishi Unnati Mela 2017

Krishi Unnati Mela 2017 was organized by ICAR – Indian Agricultural Research Institute, New Delhi from 15-17<sup>th</sup> March, 2017. ICAR–Directorate of Floricultural Research, Pune has participated and Dr. Ganesh B. Kadam and Mr. Girish K. S. represented the Directorate in the event. The event was a grand success with huge participation of farmers, amateurs and students who were benefited by the event. Various dignitaries from ICAR and SAU have visited ICAR-DFR Stall like Dr. A. K. Singh, DDG (Horticultural Science), Dr. T. Janakiram, ADG-II (Horticultural Science), Principal Scientists of Horticultural Science Division, ICAR, flower growers, amateurs and students.



Fig. 17. Dr. A.K. Singh, DDG Horticulture Science (In charge) visiting the DFR stall.



Fig. 18. ICAR-DFR team receiving 'Appreciation Certificate' in ICAR Stall category

Most of the visitors appreciated the effort of the Directorate in generating the novel technologies in commercial flower cultivation. The Directorate's stall was also awarded with "Appreciation Certificate" in the ICAR institutes section for display of technologies developed by the Directorate.

### Other Happenings

#### National Science Day Celebrated at ICAR-DFR

National Science Day with a theme "Science and Technology for Specially Abled Persons" was celebrated at ICAR-DFR, Pune on 27<sup>th</sup> February, 2017, essay writing competition was conducted on the topic "Designing a Garden for Specially Abled Persons". There was active participation from ICAR-DFR, College of Agriculture and College of Horticulture, MPKV, Pune in the competition.



Fig. 19. Dr. K.V. Prasad, Director and scientific staff of ICAR-DFR explaining skill development in floriculture at Mukh-Vadhi Sikshan Sansodha Vikas Kendra, Apte Road, Pune for specially abled persons.





On 28<sup>th</sup> February, 2017 Science Day was celebrated at Mukh-Vadhi Sikshan Sansodha Vikas Kendra, Apte Road, Pune for specially abled persons. The organization specializes in imparting skills in repairing of electrical appliances, computers, DTP, handy craft, paper bag making etc to adolescent dumb and deaf children of 16-17 years. Team DFR explained to about 40 students about the possibility of skill development in floriculture. Dr. K.V. Prasad, Director briefed about the history and importance of National Science Day. He mentioned that every year 28<sup>th</sup> February is celebrated as science day to commemorate the discovery of the Raman Effect by the great Indian physicist Sir C.V. Raman on the same day in 1928. For this, he was awarded and honored with the Nobel Prize in the Physics in 1930. He also made brief pictorial presentation on opportunities and scope in floriculture sector.

### National Productivity Week Celebrated at ICAR-DFR

National productivity week with a theme 'From Waste to Profits through Reduce, Recycle and Reuse' was celebrated from 12-18 February, 2017 at ICAR-DFR, Pune, in order to increase the



Fig. 20. Students actively participating in the productivity week celebrations

awareness on enhancing the productivity through modern methods, technologies, better materials and applying waste minimizing techniques.

On 16<sup>th</sup> February, 2017 essay writing and painting competitions were organized on the theme of National Productivity Week-2017 for the students of College of Agriculture, MPKV, Pune. About six students participated in the essay writing and four students participated in the painting competition.

On 17<sup>th</sup> February, 2017, open discussion on “Enhancing the Productivity of Farming Sector Through Integrated Approach” was organised. The programme started with a brief introduction of National Productivity Week and its objective by Dr. K. V. Prasad, Director followed by an open discussion. The scientific staff from ICAR-IARI, Regional Station, Pune; ICAR-IVRI, Regional centre; Associate Dean, College of Horticulture; AICRP staff from MPKV; all the scientists, SRFs, Young professionals and Assistants of ICAR-DFR, Pune; actively participated in this event.

On 18<sup>th</sup> February, 2017, ICAR-DFR organized a guest lecture on the theme “From Waste to Profits-through Reduce, Recycle and Reuse” with special emphasis on Waste to Wealth: Making of Petal and Leaf Embedded Handmade Paper by Mr. Sanjiv Shewale, Director of Handmade Paper Institute, Maharashtra State Khadi Development Board. He explained the rich heritage of the paper recycling efforts and the science behind the recycling. He dwelt in detail the process involved in paper making and also exhibited various samples that are made by the paper recycling institute.





Fig. 21. Dr. Bhilegoankar, In-charge, TEC, IVRI, Dr. K. V. Prasad, Director, ICAR-DFR, Dr. Sunil Masalkar, Associate Dean, College of Horticulture, MPKV and Dr. S. K. Sharma, Head, IARI-RS, Pune (a) interacting with participants (b).



Fig. 22. Dr. K. V. Prasad welcoming the participants and chief guest (a) Mr. Sanjiv Shewale delivering the lecture(b)

### International Day of Yoga Celebrated at ICAR-Directorate of Floricultural Research, Pune

ICAR – Directorate of Floricultural Research, Pune celebrated International Day of Yoga on 21<sup>st</sup> June 2017 (Wednesday). A “Yoga Workshop” was organized in the premises of ICAR-DFR, College of Agriculture Campus, Shivaji Nagar, Pune in association with Agricultural Technology Application Research Institute (ICAR-ATARI), Pune and TEC-Indian Veterinary Research Institute (ICAR-IVRI), Regional Station, Pune. The International Day of Yoga Celebrations, 2017 was attended by Scientists, Technical staff, Administrative staff and Project Assistants from ICAR–Directorate of Floricultural Research, Pune, Agricultural Technology Application Research Institute (ATARI), Pune and Indian Veterinary Research Institute (IVRI), Regional Station, Pune. Yoga expert Mr. S. S. Wange from Regional Station, Indian Agricultural Research Institute, Pune, conducted the “Yoga Workshop” and also demonstrated



Fig. 23. Staff of ICAR Institutes performing Yoga

important *Asanas* for the benefit of all the participants. The programme commenced with Common Yoga Protocol followed by Mass Yoga Performance. Shri S. S. Wange, explained the importance of yoga, benefits of different *Asanas*, how the



different Asanas have to be performed and science behind each Asana. All the staff performed various Asanas, such as Tadasana, Chakratadasana, Makarasana, Praanayams, Anulom, Vilom etc. Later Dr. Lakhan Singh, Director, Agricultural Technology Application Research Institute(ATARI), Pune, urged the employees to perform Yoga regularly and adopt healthy lifestyle for better health and wellbeing. Dr. K. V. Prasad, Director of ICAR-Directorate of Floricultural Research (DFR), Pune enlightened the gathering about the unique contribution of India to the mankind in terms of its contribution to Yoga, Mathematics, Astronomy and many more scientific fields.

## Distinguished Visitors

### Hon'ble Secretary, DARE & Director General, ICAR Dr. T. Mohapatra, visited ICAR-DFR Farm

Dr. Trilochan Mohapatra, Hon'ble Secretary, DARE and Director General, Indian Council of Agricultural Research, visited research farm of ICAR-Directorate of Floricultural Research, located at Hadapsar, Pune on 29<sup>th</sup> April, 2017 on way to NRC Pomegranate, Solapur

Dr. K.V. Prasad, Director, ICAR-DFR presented an overview of the progress at ICAR-DFR and explained the whole master plan of ICAR-DFR to DG, ICAR. He interacted with all the scientists of ICAR-DFR. He went around research farm recently acquired by ICAR-DFR from MPKV. He advised to test the river water passing through ICAR-DFR land before using for irrigation. He suggested to include water filtration/treatment plant in the master plan. He suggested to cover the research farm by green fencing. He also advised to renovate the old structures located at farm and use for official purpose. He also advised to take picture of all the developments of ICAR-DFR including regional center before and



Fig. 24. Dr. K.V. Prasad explaining about the master plan of ICAR-DFR to Hon'ble DG, ICAR.

after the development that would be useful for making institute profile documents in future. He encouraged all the scientists to fulfill the action points discussed during his previous visit on 21<sup>st</sup> October 2016. He was accompanied by Dr. R. K. Pal, Director, NRCP, Solapur, Dr. S. D. Sawant, Director, NRCG, Pune. He enquired about the financial position of ICAR-DFR and plan provisions made in the next three years.

### Shri. S. K. Singh, Hon'ble Additional Secretary (DARE) & Financial Advisor (ICAR) visited ICAR-DFR, Research Farm, Pune

Shri. Sunil Kumar Singh, Additional Secretary & Financial Advisor (DARE/ICAR) visited ICAR-Directorate of Floricultural Research, Pune on 13<sup>th</sup> April, 2017. Dr K. V. Prasad, Director, ICAR-DFR briefed about the recent initiatives taken by the institute to operationalize the ICAR-DFR farm at Hadapsar. He explained hon'ble Financial Advisor about the draft master plan. He went around research farm of ICAR-DFR located at Hadapsar, Pune. He expressed his satisfaction on the piece of land acquired by ICAR-DFR. Dr. S. D. Sawant, Director, ICAR-NRCG and Dr. V. Mahajan, Director, DOGR, Rajgurunagar accompanied him.



Fig. 25. Dr. K.V. Prasad explaining about the functioning of ICAR-DFR to Hon'ble Additional Secretary (DARE) & Financial Advisor (ICAR).

### Dr. T. Janakiram, Assistant Director General (HS-I) Visited ICAR-DFR

Dr. T. Janakiram, ADG (HS-I) visited ICAR-DFR on 4<sup>th</sup> February 2017 to review the progress of ICAR-DFR. He interacted with the Scientists and enquired about the progress of research work carried out by them. Dr, K.V. Prasad, Director, DFR presented an overview of the progress at ICAR-DFR. The Administrative Officer and the Assistant Finance and Account Officer apprised





Fig. 26. Dr. T. Janakiram, ADG (HS-I), interacting with scientists and administrative staffs of ICAR-DFR.

him about the progress of ERP and the budget position. He has reviewed the progress of various works to be undertaken at ICAR-DFR. The draft master plan prepared by the CPWD was reviewed by him.

### Padma Shri Dr. K. L. Chadha, Former DDG (Hort. Science), ICAR visited ICAR-DFR

The ICAR-DFR felt privileged on the maiden visit of Padma Shri Dr. K L Chadha, former DDG (Hort. Science, ICAR) to ICAR-DFR, Pune on 07<sup>th</sup> April 2017. On this occasion he first visited the research farm of ICAR-DFR located at Hadapsar. He expressed his satisfaction on the piece of land acquired by ICAR-DFR. Dr. K.V. Prasad, Director, DFR presented an overview of the progress at ICAR-DFR. Dr. K. L. Chadha and Dr. S.D. Sawant, Director, NRCG participated in tree plantation at Hadapsar farm of ICAR-DFR. He shared his experience on how to create new institutions. He emphasized to create separate blocks for ornamentals like flowering trees, avenue trees, climbers, shrubs, edging plants, annuals, bulbs crops etc. He interacted

with the Scientists and discussed about the research work carried out by them and gave valuable suggestions and inputs. He suggested to undertake in depth research in ornamental breeding, Post-harvest Technology of flowers, integrated insect-pest and disease management and other areas for bringing excellence in flower production in the country. He released second issue of ICAR-DFR Flori News. He appreciated the progress of various works undertaken at ICAR-DFR.



Fig. 27. Padma Shri Dr. K. L. Chadha along with Director, ICAR-DFR, Director, ICAR-NRCG and ICAR-DFR staff during his visit to ICAR-DFR

## Personalia



**Dr. P. Naveen Kumar**  
(Principal Scientist)

**Dr. P. Naveen Kumar** joined team ICAR-DFR on 12<sup>th</sup> June 2017. Previously he worked as Principal Scientist at ICAR-Indian Institute of Oil Palm Research, Pedavegi. He has rich experience and international exposure in Floriculture discipline.

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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>

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