

ALL INDIA CO-ORDINATED RESEARCH PROJECT ON FLORICULTURE

ANNUAL REPORT

2015-2016

**BHUBANESWAR CENTRE
ORISSA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY
BHUBANESWAR - 3**

Background information :

All India Co-ordinated Research Project on Floriculture was operating at College of Horticulture, Chiplima, Sambalpur, Odisha, since 01.03.2011, under over all administrative control of the Dean of Research, OUAT (Vide letter no . E-II-IV-21/2010/1383/UAT, dt 20.01.2011). The project has been shifted to Bhubaneswar during January 2015 and is operating at Biotechnology-cum-Tissue Culture Centre, OUAT, Bhubaneswar.

Staff Position of All India Co-ordinated Research Project on Floriculture

Sanctioned post	No. of posts	Approved scale	Name & address of staff	Present pay	Other research projects associated with
Floriculturist	1	Rs.37400-67000 AGP- Rs.9000/-	Dr. S.K. Palai, Floriculturist & O.I.C. AICRP on Floriculture, BTC Centre, OUAT Bhubaneswar-3 aicrpfbsr@gmail.com 9437265849	Rs.20210/-	RKVY Project on Strengthening of Biotechnology-cum-tissue culture centre
Asst. Floriculturist	1	Rs.15600-39100 AGP- Rs.6000/-	Dr. M.R. Nath, Jr. Floriculturist manasranjannath@gmail.com 9937875384	Rs.19870/-	Same as above
Sr. Tech. Asst.	1	Rs.9300-34800 AGP- Rs.4200/-	Ms. Suprity Bhuyan STA 9861322434	Rs.13450/-	-
Mali	2	Rs.4440-14680 GP-Rs.1300/-	1. Sri A. Patra 2. Vacant	Rs.6250/- (cons) -	-

Budget details (2015-16)

Heads	Opening balance	Funds received during this year from ICAR	Amount available for expenditure from ICAR	Total Expenditure incurred during the year (100%)	(Amount in Rupees)	
					ICAR share of expenditure (75%)	Balance
Pay and allowance	6,97,462/-	7,60,000.00	14,57,462.00	20,06,517.00	15,04,888.00	(-)47,426/-
Recurring contingency	-	2,10,000.00	2,10,000.00	2,80,000.00	2,10,000.00	Nil
Travelling Allowance	-	30,000.00	30,000.00	21,035.00	15,776.00	14,224/-
Non-Recurring contingency	Nil	Nil	Nil	Nil	Nil	Nil
Total	6,97,462.00	10,00,000.00	16,97,462.00	23,07,552.00	17,30,664.00	(-)33,202.00

SALIENT ACHIEVEMENTS

Project No. 1.1.1 : : Collection, evaluation and maintenance of rose germplasm.

Hybrid tea rose cultivars like 'Mainu Parle', 'Montezuma', 'Papa Meiland' performed better as cut flower under the climatic conditions of Bhubaneswar. These cultivars produce long stems during winter under open cultivation. Cultivars like 'Pusa Ajay', 'Pigali' were found to be highly suitable for loose flower production. Among the Floribundas, 'Neelambari' was found to be ideal for loose flower production. Floribunda cultivars like, 'Sadabahar', and 'Arunima' were found suitable for borders and garden display.

Project No. 2.2.1 : Testing of new genotypes of chrysanthemum

A. Testing for loose flowers.

The spray type chrysanthemum cultivar, Bidhan Madhuri produced maximum number flowers per plant (395). The yield per plant was also maximum (1085.75g) in this cultivar. Bidhan Madhuri bears attractive purple (78D) flowers with a shelf life of 12 days. Arka Gold developed by IHR also produced attractive yellow (5A) flowers with largest size flowers (7.23cm diameter) among the cultivars tested. The shelf life of Arka Gold was observed to be more than 12 days.

B. Testing for pot culture.

Chrysanthemum cultivar Pusa Aditya is considered suitable to be grown as a pot plant as it produced attractive yellow flowers(3A) with greyed orange (172A) centre. They have also longest flower retention capacity. Arka Pink Star and UHFS-Chr-56 are also considered suitable as a pot plant among the cultivars tried as they produced beautiful flowers and maximum number of flowers per plant.

Project No. 2.4.1 : Testing of new genotypes of marigold for loose flower.

The African marigold cultivar, Bidhan Marigold-2 developed by Kalyani centre produced maximum number of flowers per plant (128flowers/plant) among the cultivars evaluated. The flowers are attractive, orange in colour, compact and found

suitable for making garland. Arka Bangara produced large size flowers (7.8cm diameter) with maximum yield (1.78Kg/plant) but the flowers are less compact.

The French marigold cultivar, IIHR MO – 4 and IIHR FM – 1 developed by Hessarghatta Centre produced attractive flowers, although the yield was less than the check. The French marigold Cv. UHFS FM-Mari-786 developed by Solan centre has prominent disc florets. Since this is the first year of trial no valid conclusion can be drawn.

Project No. 3.1.1 : Effect of pre and post-emergence herbicides in rose (open).

Among different herbicide treatments, the plots treated with Pendimethalin (pre-emergence) @1kg a.i./ha followed by ethoxysulfuron (20g a.i./ha) post emergence) was found to be effective in controlling weeds in rose under Bhubaneswar conditions.

Experiment wise results

GERMPLASM CONSERVATION AND EVALUATION

ROSE

Project No. 1.1.1 : : **Collection, evaluation and maintenance of rose germplasm.**
Duration : Continuing nature
Year of initiation : 2015-16

Result

The rose collection at Bhubaneswar centre comprised of 33 hybrid tea roses, 11 floribunda roses, 3 miniature roses and 1 climber. Ten plants were maintained in each cultivar and observations were taken from three plants. All of these cultivars were evaluated during the period 2015-16 and the results are presented in Table 1.

In the hybrid tea rose category, tallest plants were observed in cv. Lady – X (159.33cm) followed by ‘Black Granada’ (151.67cm) whereas the cultivar ‘Pigali’ recorded the lowest plant height (73.5cm) followed by Konfetti (78.33cm) (Table 1). Among the 11 floribunda rose cultivars evaluated, the maximum plant height (125.83cm) was observed in ‘Cynthia’ followed by ‘Shocking Blue’(102.67cm), whereas the cultivar ‘Tiara’ exhibited the lowest value (65.83 cm) for this character. In the miniature group tallest (92.60cm) and shortest (71.3cm) plants were observed in ‘Rumba’ and ‘Don Don’ respectively.

In the hybrid tea rose category all cultivars exhibited upright growth habit except ‘Appreciation’ which has spreading growth habit. In the floribunda group, all cultivars exhibited upright growth. All miniature cultivars evaluated exhibited spreading growth habit except ‘Rumba’ which exhibited upright growth habit.

With regard to floriferousness, the hybrid tea cultivars like ‘Appreciation’ and ‘Konfetti’ were rated as medium and all other cultivars were rated ‘good’. Among the floribunda cultivars evaluated, cv. Ice Berg was rated as very good and other cultivars were rated good.

The leaf size of all the cultivars of hybrid tea and floribunda were place under ‘large’ category. In the miniature group, all cultivars had small leaves except ‘Rumba’ which had large sized leaves.

In the hybrid tea rose category, the vase life of all the cultivars were studied in tap water under room temperature, without any pulsing treatment. The hybrid tea rose cultivar 'Montezuma' exhibited maximum vase life (7.67 days) followed by 'Mainu Parle' (7.00 days) and the cultivar 'Indian Princess' exhibited lowest vase life (3.33 days) under ambient conditions.

Conclusion

Under the climatic conditions of Odisha, hybrid tea rose cultivars like 'Paradise', 'Mainu Parle', 'Montezuma', 'Papa Meiland' can be grown as cut flower in open. These cultivars produce long stems during winter under open cultivation. Cultivars like 'Pusa Ajay' and 'Pigali' were found to be highly suitable for loose flower production. Among the Floribundas, 'Neelambari' was found to be ideal for loose flower production. Floribunda cultivars like, 'Sadabahar', and 'Arunima' were found suitable for borders and garden display.

CROP IMPROVEMENT

CHRYSANTHEMUM

Project No. 2.2.1 : Testing of new genotypes of chrysanthemum

A. Testing for loose flowers.

Duration : Three years.

Year of initiation : 2015-16

Loose lowers

The experiment was laid out with 9 cultivars of chrysanthemum i.e. HCC-1, HCC-2, HCC-3 (from Hyderabad centre) Bidhan Madhuri, Bidhan Jayanti, Bidhan Purna (from Kalyani centre), Arka Gold and Arka Chandrika from Hessarghatta Centre with cv. Flirt as check. The planting was done following Randomized Block Design with 3 replications. Standard cultural practices were followed to raise the crop successfully. Observations on various growth parameters were recorded and data were presented in Table 2.

Result

All the growth parameters studied varied significantly among the cultivars evaluated. Among the cultivars evaluated, tallest plants were observed in cv. HCC-1 (60.77cm) followed by Bidhan Madhuri (52.17cm) whereas smallest plants were observed in HCC-2(25.7cm). The flower size was maximum in Arka Gold (7.23cm diameter) whereas it was minimum in HCC-2 (2.33cm). Yield of loose flowers/plant was maximum in Bidhan Madhuri (1085.75g) where as minimum value for this character was observed in HCC-2 (152.55g). Maximum (395 flowers/plant)and minimum(85.67 flowers/plant) number of flowers/plant were observed in Bidhan Madhuri and Flirt respectively. The shelf life of the flowers were maximum (15 days) in Arka Chandrika. All the cultivars evaluated were found susceptible to leaf spot and aphids.

Conclusion

The spray type chrysanthemum cultivars like Bidhan Madhuri and Arka Gold produced attractive flowers with good yield. Since this is the first year of trial no valid conclusion can be drawn.

B. Testing for Pot culture

Duration : Three years.

Year of initiation : 2015-16

The experiment was laid out with 10 cultivars of chrysanthemum i.e. Pusa Aditya, Pusa Chitraksha, Bidhan Mum, BCH-14-1, Arka Pink Star, Arka Kirti, Arka Usha Kiran, UHFS-Chr-56, UHFS-Chr-68 and Arun Singar as check. Standard cultural practices were followed to raise the crop successfully. Observations were recorded and data were presented in Table 3.

Result

All the growth parameters varied significantly among the cultivars evaluated. Maximum plant height (49.70cm) and spread (36.47cm) was observed in Bidhan Mum among the cultivars evaluated. Maximum number of spray per plant was observed in Pusa Chitraksha (10.33) followed by Arun Singar (6.0). Maximum number of flowers/plant was observed in UHFS-Chr-56 (247.67) followed by Arka Pink Star (241.67). Largest flowers were observed in Pusa Chitraksha (6.4cm, dia) whereas

smallest flowers were observed in UHFS-Chr-68 (2.97cm, dia). Flower retention on the plant was maximum in Pusa Aditya (52.33 days).

Conclusion

Chrysanthemum cultivar Pusa Aditya produced attractive flowers with longest flower retention capacity. Arka Pink Star and UHFS-Chr-56 also produced beautiful flowers and maximum number of flowers per plant among the cultivars tested. Since this is the first year of trial no valid conclusion can be drawn.

MARIGOLD

Project No. 2.4.1 : Testing of new genotypes of marigold for loose flower.

Duration : Three years.

Year of initiation : 2015-16

African marigold

The experiment was laid out with 6 cultivars of African marigold i.e. Bidhan Marigold-1, Bidhan Marigold-2, Bidhan Marigold-3, developed by Kalyani centre and Arka Agni, Arka Alankar, Arka Bangara developed by IIHR. Pusa Narangi Gaiinda developed by IARI was used as check. Standard cultural practices were followed to raise the crop successfully. Observations on various growth parameters were recorded and data were presented in Table 4.

Result

All the growth parameters varied significantly among the cultivars evaluated. Tallest plants of African marigold were observed in Arka Alankar (57.77cm) with maximum spread (58.77cm X 58.60cm). Early flower bud appearance (48.33 days) and longest duration of flowering (52.33 days) was observed in Arka Bangara. Maximum number of flowers per plant was produced in Bidhan Marigold-2 (128 flowers/plant) which was at par with Arka Bangara(118flowers/plant), Arka Alankar(113.67flowers/plant) and Bidhan marigold – 3(114.33flowers/plant). The yield (1.78Kg flowers/plant) and flower diameter (7.8cm) were maximum in Arka Bangara.

Conclusion

The African marigold cultivar, Bidhan Marigold-2 developed by Kalyani centre produced maximum number of flowers per plant (128flowers/plant) among the cultivars evaluated. The flowers are attractive, orange in colour, compact and found suitable for making garland. Arka Bangara produced large size flowers (7.8cm diameter) with maximum yield (1.78Kg/plant) but the flowers are less compact. Since this is the first year of trial no valid conclusion can be drawn.

French marigold

The experiment was laid out with 4 cultivars of French marigold i.e. IIHR-MO-2, IIHR-MO-4, IIHR-Fm-1 developed by IIHR and UHFS-FM-Mari 786 developed by Solan centre. French marigold Jafri was used as check. Standard cultural practices were followed to raise the crop successfully. Observations on various growth parameters were recorded and data were presented in Table 5.

Result

In case of French marigold, the growth parameters studied, varied significantly among the cultivars evaluated. Tallest plants of French marigold were observed in IIHR MO-2 (33.53 cm) with maximum spread (44.37cm X 43.17 cm). Early flower bud appearance (39.33 days) was observed in cv. Jafri which was at par with IIHR MO-2. Longest duration of flowering (43.67 days) was observed in IIHR MO – 2. The number of flowers per plant were maximum in cv. Jafri (224.67) followed by UHFS FM-Mari-786 (179.67). IIHR-FM-1 produced largest flowers (5.03cm, diameter) followed by UHFS FM-Mari-786 (4.57cm, diameter). Cv. Jafri produced maximum yield (0.54kg/plant) among the cultivars evaluated.

Conclusion

The French marigold cultivar, IIHR MO – 4 and IIHR FM – 1 developed by Hessarghatta Centre produced attractive flowers, although the yield was less than the check. The French marigold Cv. UHFS FM-Mari-786 developed by Solan centre has prominent disc florets. Since this is the first year of trial no valid conclusion can be drawn.

CROP MANAGEMENT

ROSE

Project No. 3.1.1 : Effect of pre and post-emergence herbicides in rose (open).

Duration : Three years.

Year of initiation : 2015-16

The experiment was laid out in open with 7 treatments and 3 replications. The experiment was carried out with hybrid tea cultivar Mainu Parle as plants of cv. Raktagandha were not available. Orders have been placed with M/s Puspanjali Nursery, Jampur, W.B. to supply of Raktagandha plants. This experiment will be conducted again on Raktagandha as soon as plants of Raktagandha are received. Observations of various growth parameters of cv. Mainu Parle were recorded and presented in Table 6.

Result

The weed count/m², fresh weight and dry weight of weed varied significantly between the treatments. Minimum weeds (5.67/m²) were observed in the plots which were treated with Pendimethalin pre-emergence @1kg a.i./ha followed by post emergence ethoxysulfuron (20g a.i./ha).

Growth parameters like plant height at first flower bud appearance, number of branches per plant, days to flowering, duration of flowering, flower diameter, bud length, number of flowers per plant did not vary significantly between the treatments. This may be due to the reason that the crop is in its initial stages of growth.

Conclusion

Herbicide treatment with Pendimethalin pre-emergence @1kg a.i./ha followed by post emergence ethoxysulfuron (20g a.i./ha) is effective in controlling weeds in rose under Bhubaneswar conditions. Since this is the first year of trial no valid conclusion can be drawn.

Technologies developed along with recommendation to flower growers :

- The farmers of Odisha, can grow hybrid tea rose cultivars like 'Mainu Parle', 'Montezuma', 'Papa Meilland' as cut flower and cultivars like 'Pusa Ajay' and 'Pigali' for loose flower production.

Training/Extension activities :

A training programme was organized for the farmers in the University. Nearly 30 young farmers were trained on commercial cultivation of rose, chrysanthemum and marigold. They were also trained to produce planting material for their own field.

Training, Symposia, Seminar, Meeting attended by Project staff :

- (a) National Symposium on Emerging weed problems and their management in major field crops, 8-9 Oct, 2015, OUAT, Bhubaneswar.
- (b) National Seminar on Plant Genomics and Bio-technology : Challenges and opportunities in 21st Century, 23-24 Jan, 2016, OUAT, Bhubaneswar.
- (c) National Seminar on Horticultural Diversity for Prosperity. 10-12 Feb, 2016, OUAT

Research publications of the project staff : nil

NRC items procured – nil.

Monthly average weather data of Bhubaneswar from January 2015 to March 2016

Month	Mean Evaporation (mm)	Rainfall (mm)	Rainy days	Mean Temperature		Relative humidity (%)	
				Max.	Min.	7:00 AM	2:00 PM
Jan	3.4	21.5	2	27.8	14.2	91	43
Feb	3.9	18.4	1	32.5	17.0	94	39
Mar	6.0	24.8	3	35.8	21.5	91	40
Apr	6.6	115.8	6	37.1	24.2	88	50
May	8.9	27.4	5	39.0	27.0	88	52
Jun	6.1	94.8	13	36.2	26.1	88	62
Jul	3.4	223.5	18	32.4	25.0	90	71
Aug	3.3	297.8	16	33.0	25.6	92	77
Sep	3.3	151.5	12	33.0	25.0	91	75
Oct	3.4	75.5	7	33.0	23.5	93	66
Nov	3.6	8.3	3	31.2	20.1	91	55
Dec	3.4	14.8	3	29.2	17.5	86	52
Jan	3.4	0.6	1	30.0	15.7	91	39
Feb	3.7	3.0	2	34.6	21.3	89	42
Mar	5.4	1.5	2	37.0	23.4	86	40

