

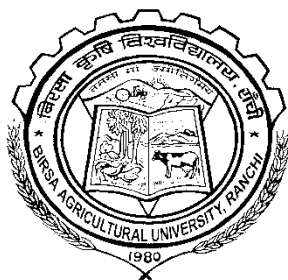
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**ANNUAL PROGRESS REPORT
(2015-16)**

All India coordinated Research Project

On

**FLORICULTURE
(ICAR)**



By

**Dr. Punam Horo
Jr. Scientist**

**Department of Horticulture
DIRECTORATE OF RESEARCH
Birsa Agricultural University
Ranchi – 834006, JHARKHAND**

Basic Information

- a. Name of the scheme - All India Co-ordinated Research on Floriculture
b. Officer Incharge - Dr. K.K.Jha
Chairman, Deptt. of Horticulture
Birsa Agricultural University
Kanke, Ranchi-6
Ph. No.09431325719
c. Principal Investigator - Dr. (Mrs) Punam Horo
Jr. Scientist cum Asstt. Prof. (Hort.)
d. Location - Horticultural Experimental Area
Birsa Agricultural University, Kanke,
Ranchi-6 (Jharkhand)

2. Staff Position

Name of Post	Sanctioned	Date of Joining
Asstt. Floriculturist*	1	19.07.2004

*Dr. (Mrs.)Punam Horo

3. Present Salary Statement:

Pay in pay band	Grade Pay	DA	HRA	MA	Transportation	Gross
26740=00	7000-00	42175=00	6748=00	300=00	3600=00	86563=00

ALLOCATION OF FUNDS FOR THE YEAR 2015-16

XII Plan Approved out lay

Sl.No.	Particulars	ICAR Share (Rs.inLakh)	State Share	Total
1.	Pay & Allowances	6.80	--	6.80
2.	T.A	0.15	--	0.15
3.	Contingencies			
	a. Recurring	1.05	--	1.05
	b. Non-Recurring (Equipments)	0.00	--	0.00
4.	TSP	10.60	---	--

Note: five Installments.**EXPENDITURE STATEMENT FOR THE YEAR 2015-16**

Sl.No.	Particulars	ICAR Share (In lakh)	ICAR share of expenditure (In Rs)
1.	Pay & Allowances	6.80	9,68,180=00
2.	T.A	0.15	14,670=00
3.	Contingencies		
	a. Recurring	1.05	60,414=75
	b. Non-Recurring	0.00	00=00
4.	TSP	10.60	7,04,002=00

BACK GROUND INFORMATION

Under the All India Coordinated Research Project on Floriculture the Ranchi Center was sanctioned by ICAR in the year 2001 at XV Group Meeting of the project held at RPRC, Bhubneshwar. The center started functioning since 1.5.2001.

Objective of the Project

1. To collect, maintain and evaluate the protected Gerbera from different resources to popularize cultivars under the agro climatic condition of this plateau region.
2. Assessment of these germplasm for vase life, keeping quality, flower colour, form etc
3. To see the effect of herbicides in commercial rose cultivation.
4. To standardize the glycerinization for increasing shelf life of cut foliage.

.Brief description of the location:

Birsa Agricultural University Kanke, is situated at 23 17 'north latitude and 85 19' east longitude with an altitude of about 625 mm above mean sea level. The soil is mostly red lateritic, with pH value below normal (5.0 to 6.0), poor in fertility and low in water retentive capacity. The normal annual precipitation is around 1300 mm, 80 to 85% of which is recorded in four months (June to September). Winter rains are almost sure but the intensity is generally low. The experimental area is in the Floriculture section of Department of Horticulture.

Table No. 1: Meteorological Data during 2015-16

Month	Temperature (0°c)		R.H %		Wind Velocity (km/hr)	Rain (mm)
	Max.	Min.	7.00 am	2.00 pm		
June 15	33.3	22.3	80.0	54.5	4.8	146.0
July 15	29.6	20.3	83.2	61.7	4.3	170.7
August 15	30.2	21.2	83.0	62.5	4.8	290.6
September 15	32.2	21.6	82.7	62.6	3.0	31.0
October 15	29.0	18.9	82.7	63.8	1.9	115.1
November 15	27.0	13.7	83.5	65.7	1.7	00.0
December 15	23.1	9.7	83.2	67.6	2.1	3.2
January 16	26.81	11.48	80.48	30.55	5.9	0.37
February 16	31.89	18.40	76.11	30.55	6.37	0.14
March 16	34.39	22.39	72.12	29.50	7.03	00.0
April 16	39.50	25.75	67.00	28.00	7.52	00.0

Soils:

The experimental area is more or less representative of the region. The soil of experimental area are yellow colour, moderately acidic to neutral in reaction and light to medium in texture. The soil analysis of the experimental plots revealed characteristics as follows:-

pH : 5.5 (Before Lime application)
pH : 6.1 (After Lime application)
Available N : 168 kg ha Organic Carbon: 0.22%
Available P₂O₅ : 44 kg ha Available K₂O : 22 kg ha

Weather Condition

The prevailing weather condition during the period of experimentation (2015-16) was recorded at the Meteorological Observatory of Ranchi Agricultural College, Kanke, are presented in Table 1.

Experimental Layout

The study was conducted during Rabi season. (Sept.2015-April.2016). Field plot size was kept variable according to the requirement of plant. The recommended dose of manures and fertilizers as well as standard cultural practices was followed as per schedule for growing of these flowers. The details of experimental layout are given along with the experimental findings.

Result:**Germplasm Conservation: Gerbera:**

Project No. 1.8.1: Collection, evaluation and maintenance of Gerbera germplasm at Ranchi centre during 2015-16.

	Gerbera
	Tissue cultured-18
Planting Date	10.12.2009 and 12.04.2014, 10.10.15
Plot Size	1.0 m X 2.0 m and 1.0 m X 1.0 m
Spacing	25cmX25cm
No. of Plants/plot	10 and 8

Germplasm consisting of 18 tissue cultured plants were collected from KF Bioplants Pune Now all are maintaining and evaluated for different morphological characters (table no. 1.8.1). Three cultivars of tissue cultured Gerbera were collected from KF bioplants during March 2015 named as Salvador, Winter Queen, Balance.

The maximum number of leaves were noted in the cultivar Julia (27.10) followed by Quote (22.00). The maximum leaf length was recorded in the cultivar Quote ie 28.30 while the breadth was found maximum in cv. Salvador (7.50). The N-S and E-W plant spread was noted maximum in cv. Quote ie 33.20 cm and 33.50 cm respectively. Cultivar Quote showed the maximum height of the plant of about 64.25 cm. The maximum number of flowers (36.10) observed in the cv. Salvador followed by cv. Julia (36.00) and Quote (36.00). Maximum Stalk length (73.20 cm) and stalk diameter (4.65cm) was also noted in the Cv. Salvador followed by Cv. Julia ie 72.30 cm and 4.60 cm respectively The diameter of flower was found to be maximum in the Cv. Julia (12.30 cm) followed by the cultivar Quote ie 12.00 cm. Vase life was observed maximum in the cultivar Salvador (10.75 days) followed by Julia 10.70 days. The length of ray floret was found maximum in the Cv. salvador (5.15cm) followed by the Cv. Julia (5.00cm) and breadth of Ray floret was noted maximum in the Cv. Julia (1.20 cm). The maximum diameter of disc floret was observed in the cultivar Julia (7.15cm).

Collection of some important cultivars of gerbera for protected condition



cv. Quote



cv. Salvador



cv. Julia



cv. Figaro



cv. Balance

cv. Serena



Cv. Elite

Cv. Tecta

Cv. Amlet

Expt. No. 3.1.1: Effect of pre and post emergence herbicides in rose (open) at Ranchi centre during 2015-16.

The experiment on herbicide in rose Cv. Raktgandha was conducted second year during the Rabi season of 2015-16. Significant results were obtained. On the basis of data (table no.3.1.1), the minimum number of weed 42.20/sq. mt. was noted in the treatment Pendimethalin pre emergence @ 1.0 kg a.i/ha followed by post emergence ethoxysulfuron @ 20 g a. i/ha was at par with the treatment Atrazine pre emergence 1.0 @ kg a.i. followed by post emergence ethoxysulfuron 20 kg a.i/ha.ie 51.65 /sq.mt while the maximum number of weed was found in control ie 160.00. The fresh and dry weight of weed was also found minimum in the treatment Pendimethalin pre emergence @ 1.0 kg a.i/ha followed by post emergence ethoxysulfuron @ 20 g a. i/ha. ha was at par with the treatment Atrazine pre emergence 1.0 @ kg a.i. followed by post emergence ethoxysulfuron 20 kg a.i/ha.ie 51.65 /sq.mt The highest plant (80.25 cm) was noted under the treatment Pendimethalin pre emergence @ 1.0 kg a.i/ha followed by post emergence ethoxysulfuron @ 20 g a. i/ha which was at par with the treatment Atrazine pre emergence 1.0 @ kg a.i. followed by post emergence ethoxysulfuron 20 kg a.i/ha T₂ (78.10cm). The number of branches 14.15 and flowers 35.60 was counted maximum in the treatment Pendimethalin pre emergence @ 1.0 kg a.i/ha followed by post emergence ethoxysulfuron @ 20 g a. i/ha. The flower diameter of about 14.10 cm and vase life (8.20 days) was found to be maximum in the treatment Pendimethalin

pre emergence @ 1.0 kg a.i/ha followed by post emergence ethoxysulfuron @ 20 g a. i/ha. at par with weed free treatment (13.50 cm and 7.80 days) and in the treatment Isoproturon pre emergence @ 1.0 kg 2.a.i/ha.followed by hand weeding (13.15 cm and 7.32 days) respectively. There were some weed floras like *Cyperus rotendus*, *Cynodon doctyledon*, *Daucus carota* and *Oxalis corniculata* noted during the trial.

Expt. No. 5.5.1: Standardization of glycerinization for increasing shelf life of cut foliage.

This experiment was conducted during 2015-16 in which Pipal (*Ficus religiosa*) was taken as cut foliage for drying. The experiment was conducted in Randomized Block Design having seven treatments along with check with three replications. On the basis of observations, the minimum time taken for perfect drying was found 96 hrs by dip method at 20% and 10% glycerin solution. The leaf area was found maximum at control (6.11 cm and 10.55 cm) by both dip and uptake method respectively. The texture (1-5 scale) was found maximum 4.24 and 2.46 at 20% glycerin solution by dip and uptake method which was at par with 40% solution by dip and uptake method respectively. The shape retention (1-5 scale) was found maximum 4.41 by dip and 3.92 by uptake method at 40% glycerin solution. The brittleness (1-5 scale) was observed minimum 1.10 and 3.50 at 40% glycerin solution by dip and uptake method respectively which was at par with glycerin 20% solution ie 1.22 in dip and 3.85 by uptake method. The minimum change in colour of foliage was noted at 40% glycerin solution by dip method. Hence, the overall acceptability (1-5 scale) was noted at 40% solution of glycerin by dip method.

Salient research achievements (2015-16):

Germplasm Conservation:

Project No. 1.8.1: Collection, evaluation and maintenance of Gerbera germplasm at Ranchi centre during 2015-16.

Similarly trials on evaluation of various accessions and varieties of Gerbera are on progress. Based on the five years research performance under field condition, Among the tissue cultured gerbera, cvs, Salvador, Quote and Julia are very popular varieties of this state having more numbers of flowers, good stalk length, stalk diameter, large flower diameter and long vase life .

Expt. No. 3.1.1: Effect of pre and post emergence herbicides in rose (open) at Ranchi centre during 2015-16.

On the basis of two years data, it has been concluded that the Pendimethalin pre emergence @ 1.0 kg a.i/ha followed by post emergence ethoxysulfuron @ 20 g a. i/ha gave good result to reduce weed which helpful to increase the vegetative growth as well as reproductive characters of rose plant.

Expt. No. 5.5.1: Standardization of glycerinization for increasing shelf life of cut foliage.

On the basis of one year data, the minimum time taken for drying of cut foliage, maximum texture, minimum brittleness as well as minimum changes in colour of foliage was noted at 40% glycerin solution by dip method.

Utility of the centre among the flower growers:

1. Eight farmers training programme on commercial cultivation were conducted during December 2015 to March 2016 under TSP, AICRP on Floriculture at Lohardaga and Ranchi district of Jharkhand. Field demonstration on Marigold and Gladiolus was conducted in the same district in 4 acres area of farmer's field. 200 farmers benefited by the training programmes.
2. Flower growers of different district like Ranchi, Gumla, Lohardaga, etc brought planting materials of Gerbera, Gladiolus and Marigold, from the centre and started flower cultivation in their villages. The planting material have been supplied through AICRP (flori.) Ranchi district.
3. Corms of gladiolus are also supplied to the farmers of Kanke, Namkum block of Ranchi district.
4. Florists of Ranchi city take cut flowers of Rose, Gerbera and Marigold from the centre to sell among customers.
5. Time to time TV talk and Radio talk on flowers has been telecasted

Table no. 1.8.1: Collection, evaluation and maintenance of Gerbera germplasm during 2015-16 at Ranchi centre.

Name of cultivars	Colour	Form of flower head	No. of leaves	Leaves length (cm)	Leaves breadth (cm)	Plant ht. (cm)	Plant spread (cm) N-S	Plant spread (cm) E-W	No. of suckers
Balance	White with green disc	Double	18.10	26.50	6.25	56.00	29.00	30.25	4.25
Palm Beach	Yellow with green disc	double	20.00	25.20	6.00	50.00	27.00	28.00	3.00
Dune	Orange	double	13.80	20.00	6.25	54.00	28.00	27.20	4.25
Naike	Pink with black disc	Semi double	14.17	26.20	6.80	48.50	28.10	27.10	5.25
Elite	Orange	Semi double	18.00	22.00	6.10	58.20	28.25	29.50	3.25
Salvador	Magenta	double	22.00	28.00	7.50	64.00	33.00	33.00	6.20
Rosaline	Pink with black disc	double	20.20	28.00	7.25	61.00	33.10	31.75	4.25
Amlet	Red with black disc	double	18.20	27.15	6.90	55.25	28.20	29.00	3.10
Julia	Red	double	27.10	28.00	7.10	60.00	31.75	31.65	4.00
Pasto	Yellow	double	20.10	27.45	7.00	60.20	29.50	32.50	3.80
Figaro	Cream	double	17.10	28.00	7.10	50.00	31.75	31.65	4.00
Sonata	Red orange	double	19.20	22.30	6.25	48.00	28.00	26.75	2.00
Serena	Pink	Semi double	18.00	23.00	6.00	49.25	24.80	28.00	3.00
mandalion	Mix red	Semi double	17.50	24.30	6.50	50.00	28.00	27.30	3.50
Viviane	White	double	16.30	23.00	6.00	47.50	27.75	25.50	2.75
Tecta	Yellow with black centre	double	18.30	22.00	6.00	48.25	28.10	26.80	2.30
Quote	Magenta	double	22.00	28.30	7.48	64.25	33.20	33.50	6.50

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Name of cultivars	Number of flowers per plant	Stalk length (cm)	Diameter of flower stalk (cm)	Flower diameter (cm)	Days to first flower	Vase life in days	Length of ray (cm)	Breadth of ray (cm)	Disc diameter (cm)
Balance	21.20	62.00	3.60	10.00	58.00	8.50	4.50	0.80	5.90
Palm beach	22.25	65.20	4.00	10.25	68.00	9.75	3.25	1.00	5.00
Dune	32.75	72.00	4.50	10.00	63.00	7.30	3.90	0.90	5.00
Naike	20.20	65.00	4.10	9.75	62.00	6.50	4.00	1.00	3.20
Elite	21.20	71.00	4.10	11.50	68.20	9.25	4.25	1.00	5.10
Salvador	36.00	73.20	4.65	12.30	68.10	10.75	5.15	1.15	6.90
Rosaline	31.50	70.10	4.20	11.00	65.00	10.70	4.90	1.10	7.10
Amlet	25.20	68.25	4.00	10.10	67.00	10.50	4.25	1.00	5.60
Julia	36.10	72.30	4.60	12.30	68.10	10.70	5.00	1.20	7.15
Pasto	20.20	70.00	3.60	11.00	61.20	9.50	4.60	1.10	6.00
Figaro	21.30	66.00	3.90	10.00	60.25	9.25	4.00	1.00	3.50
Sonata	16.75	64.20	3.70	9.00	72.00	7.50	3.90	0.80	3.00
Serena	22.00	72.00	3.90	12.00	68.00	8.00	4.50	1.00	3.60
mandalion	22.30	66.00	4.00	10.00	69.00	10.00	4.00	0.90	4.00
Viviane	15.00	60.25	3.45	9.00	73.25	8.25	3.80	0.75	3.00
Tecta	21.00	64.75	4.00	10.00	62.00	9.30	3.75	1.00	3.00
Quote	36.00	72.00	4.60	12.00	67.90	10.25	5.00	1.10	6.90
Winter Queen	20.75	72.00	4.50	10.00	63.00	7.30	3.90	0.90	5.00

Table: 3.1.1: Effect of pre and post emergence herbicides in rose (open) at Ranchi centre during 2015-16.

Treatments	Weed count per sq. mt. at 25 days interval destructive sample	Fresh wt of weed at 25 days interval (g) (Av.)	Dry wt. of weed at 25 days interval (g) (Av.)	Plant ht of first flower bud app. stage	Number of branches per plant	Days to flowering	Flowering duration	No of flowers/plant
Atrazine pre emergence 1.0 @ kg a.i. followed by post emergence ethoxysulfuron 20 kg a.i/ha.	51.65	43.25	23.30	78.10	10.75	72.54	15.00	34.60
Pendimethalin pre emergence @ 1.0 kg a.i/ha followed by post emergence ethoxysulfuron @ 20 g a. i/ha.	42.20	35.00	15.23	80.25	14.15	72.20	17.00	35.60
Imazythapyr @ 100g/ha pre emergence followed by hand weeding	99.00	86.80	50.75	61.20	9.80	71.10	13.10	28.10
Isoproturon pre emergence @ 1.0 kg 2.a.i/ha.followed by hand weeding.	70.13	66.00	40.75	69.00	9.50	69.70	14.70	30.00
Oxyflourfen pre-emergence 0.250 kg a.i./ha followed by hand weeding	87.30	78.60	46.30	68.00	9.80	70.00	14.00	26.00
Weedy check	160.00	104.00	52.00	70.00	9.90	70.00	10.80	17.10
Weed free check	51.43	44.70	25.50	67.20	8.70	80.70	14.20	25.00
SEm	3.10	2.80	3.35	0.80	0.25	0.73	0.82	0.90
CD@5%	9.80	8.50	10.10	2.30	0.78	2.15	2.55	3.00

Treatments	Flower diameter (cm)	Length of flower bud(cm)	Vase life (day)	Weed Floras
Atrazine pre emergence 1.0 @ kg a.i. followed by post emergence ethoxysulfuron 20 kg a.i/ha.	12.22	4.00	6.66	<i>Cyperus rotendus</i> <i>Cynodon doctyledon</i> <i>Daucus carota</i> <i>Oxalis corniculata</i>
Pendimethalin pre emergence @ 1.0 kg a.i/ha followed by post emergence ethoxysulfuron @ 20 g a. i/ha.	14.10	5.60	8.20	
Imazythapyr @ 100g/ha pre emergence followed by hand weeding	12.00	3.98	6.60	
Isoproturon pre emergence @ 1.0 kg 2.a.i/ha.followed by hand weeding.	13.15	4.90	7.80	
Oxyflourfen pre-emergence 0.250 kg a.i./ha followed by hand weeding	12.50	4.10	7.00	
Weedy check	10.00	3.00	6.10	
Weed free check	13.50	4.20	7.32	
SEm	0.45	0.23	0.30	
CD@5%	1.35	0.78	0.89	

Table :5.5.1: Standardization of glycerinization for increasing shelf life of cut foliages at Ranchi centre during 2015-16

Treatments	Time taken for perfect drying(hr)											
	24hr		48hr		72hr		96hr		120hr		144hr	
	Dip	uptake	dip	uptake	dip	uptake	dip	uptake	dip	uptake	dip	uptake
Glycerine (10%)	11.11	12.90	13.58	8.50	12.34	-25.88	7.40	-44.12	1.23	-26.15	-8.89	-25.00
Glycerine (20%)	8.51	-9.85	13.82	12.30	14.89	16.20	0	14.10	-3.48	11.25	-3.48	10.10
Glycerine (40%)	1.16	4.24	9.30	8.60	6.97	0	10.63	2.80	7.44	4.30	7.44	7.35
Control	0	-2.45	4.4	0	2.22	-12.40	2.22	-35.30	-8.89	-46.00	1.23	-67.80
S.Em (±)	0.27	0.28	0.26	0.20	0.27	0.34	0.27	0.32	0.27	0.30	0.12	0.21
CD at 5%	0.86	0.85	0.83	0.78	0.84	1.01	0.8	0.94	0.84	0.89	0.38	0.70

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Treatments	Leaf Area (cm)		Texture (1-5)		Shape retention (1-5)		Brittleness (1-5)		Colour (RHS Colour chart)				Over all acceptability(1-5)	
	Dip	Uptake	Dip	Uptake	Dip	Uptake	Dip	Uptake	Dip		Uptake		Dip	Uptake
									Before	After	Before	After		
Glycerine (10%)	2.27	1.02	4.02	2.02	4.1	3.21	1.9	3.90	RHS 137A	RHS 152B	RHS 137A	RHS 152B	3.07	2.46
Glycerine (20%)	2.37	1.31	4.24	2.46	4.05	3.2	1.22	3.85	RHS 137A	RHS 199A	RHS 137A	RHS 152B	4.47	3.07
Glycerine (40%)	2.30	1.85	4.22	2.5	4.41	3.92	1.10	3.50	RHS 137A	RHS 137C	RHS 137A	RHS 152B	4.70	3.55
Control	6.11	10.55	2.15	1.5	3.82	3.0	3.90	4.00	RHS 137A	RHS 152B	RHS 137A	RHS 152B	2.2	1.07
S.Em(±)	0.81	0.85	0.14	0.15	0.17	0.24	0.12	0.26					0.05	0.03
CD at 5%	2.51	2.67	0.44	0.49	0.50	0.76	0.38	0.80					0.17	0.11