

DIVISION OF FLORICULTURE AND LANDSCAPING
ICAR- INDIAN AGRICULTURAL RESEARCH INSTITUTE
NEW DELHI- 110012

AICRP ANNUAL REPORT- 2015-16

Rose

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

Significant Achievements

During the period under report three varieties (Sweet Surrender, Snow Winter and Fire Fighter) were collected and added to the germplasm. *Rosa banksiae* was collected from Katrain and added to the germplasm. A germplasm of 273 varieties and 15 species is being maintained in the Division.

The varieties viz., Pusa Gaurav, Pusa Ajay, Raktima, Raktagandha and Pusa Baramasi were performing well under Delhi conditions.

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

Significant achievements

The weedicides reduced the weed count, fresh weight and dry weight of weeds significantly. T₁ (Atrazine 1.0 kg a.i/ha + ethoxysulfuron 20g a.i/ha) was the best treatment and it significantly reduced the weed count, fresh weight and dry weight of weeds/m² in comparison to weedy check in rose cv. Raktagandha. The weedicides did not affect the plant height, number of branches per plant, flowering duration, days to flowering, number of flowers per plant, length of flower bud and vase life significantly.

The weed flora observed were *Chenopodium album*, *Chenopodium murale*, *Cyperus rotundus*, *Daucus carota*, *Poa annua*, *Polygonum plebejum*, *Rumex dentatus*, *Trigonella sp.*

Table -1: Effect of pre and post-emergence weedicides on weed and vegetative characters in rose

Treatment	Weed count/m²	Fresh weight/m²	Dry weight/m²	Plant height At first flower appearance	Number of branches /plant
T1 (Atrazine 1.0 kg a.i/ha + ethoxysulfuron 20g a.i/ha)	21.67	19.67	7.46	86.00	3.67
T2 Pendimethalin 1.0 kg a.i/ha + ethoxysulfuron 20g a.i/ha	61.33	571.33	197.90	88.33	4.67
T3 Imazethapyr 100 g a.i./ha	22.67	88.33	27.23	94.33	4.00
T4 Oxyflourfen 0.25kg a.i/ha	173.33	816.33	274.92	87.00	4.33
T5 Weedy Check	288.33	1627.00	539.66	95.67	4.00
T6 Weed free check	130.00	494.00	147.80	83.67	4.33
CD (0.05)	14.72	39.32	44.88	NS	NS

Table 2 : Effect of pre and post-emergence weedicides on floral characters in rose

Treatment	Days to flowering	Flowering duration	Number of flowers/plant	Flower diameter (cm)	Length of flower Stalk (cm)	Vase life (day)
T1 (Atrazine 1.0 kg a.i/ha + ethoxysulfuron 20g a.i/ha)	44.33	107.33	42.00	7.40	68.33	6.00

T2 Pendimethalin 1.0 kg a.i/ha + ethoxysulfuron 20g a.i/ha	42.33	111.33	46.00	7.77	66.33	6.33
T3 Imazethapyr 100 g a.i./ha	45.33	109.00	44.00	7.93	68.67	6.00
T4 Oxyflourfen 0.25kg a.i/ha	44.33	108.33	43.00	7.97	66.33	6.00
T5 Weedy Check	42.00	113.33	40.67	7.40	68.33	6.00
T6 Weed free check	47.33	105.00	42.67	7.83	64.67	6.67
CD (0.05)	NS	NS	NS	NS	NS	NS

Gladiolus

Project No. 1.2.1: Collection, evaluation and maintenance of gladiolus germplasm

Significant achievements

Eight new gladiolus cultivars were collected during this year and evaluated for flowering traits along with other germplasm. The new cultivars were: Arka Ayush, Arka Sindur, Arka Sapna, Arka Sagar, Arka Nazrana and Arka Gold. A total of 180 varieties are being maintained in the germplasm at the centre.

Table 1: Performance evaluation of collected germplasm and maintenance of gladiolus

S.No.	Genotypes	Plant height (cm)	Days taken to flowering	Spike length (cm)	Rachis length (cm)	Diameter of second floret (cm)	Number of florets remained open at a time	Number of florets per spike
1	Arka Ayush	93.33	105.66	83.00	42.00	7.03	5.00	16.33
2	Arka Sindur	87.00	108.00	78.33	37.00	9.45	5.00	16.66
3	Arka Sapna	96.33	96.33	86.66	50.00	9.00	6.00	16.33
4	Arka Sagar	111.66	107.33	101.66	64.33	8.06	5.66	17.66

5	Arka Nazrana	96.00	106.33	76.33	48.33	8.93	5.66	15.66
6	Arka Gold	103.00	116.00	91.66	41.00	9.00	5.33	12.66
7	Trader Horn	95.00	114.00	85.00	44.00	8.80	5.60	16.66
8	Georgia Peach	69.33	84.33	61.00	30.00	7.46	5.00	14.00
9	Jyotsna(check)	120.00	99.66	105.00	62.00	9.00	7.33	20.33
	C D at 5 %	1.10	1.38	1.43	8.13	0.82	0.88	0.82

Table 2: Corm and cormels of new gladiolus germplasm

S.No.	Genotypes	Number of corms per plant	Number of cormels per plant
1	Arka Ayush	2.00	27.00
2	Arka Sindur	1.33	10.00
3	Arka Sapna	1.66	7.00
4	Arka Sagar	2.00	32.00
5	Arka Nazrana	1.66	15.00
6	Arka Gold	2.00	18.00
7	Trader Horn	1.33	19.00
8	Georgia Peach	2.00	10.00
9	Jyotsna (check)	3.66	29.66
	C D at 5 %	0.32	2.29

Project No. 2.1.1 Testing of new genotypes of gladiolus.

Significant achievements

7 new varieties of gladiolus viz., Arka Naveen, Pusa Manmohak, Pusa Red Valentine, Pusa Srijana, Pusa Unnati, Pusa Vidushi, Punjab Glad-1 were tested along with check cv. White Prosperity. Among the varieties tested, Pusa Manmohak recorded superior performance in terms of number of florets per spike. The varieties viz., Arka Naveen, Pusa Manmohak, Pusa Srijana and Pusa Unnati were significantly superior to check in corm and cormel production.

Table 1: Growth and flowering characteristics of new gladiolus genotypes

S.N.	Genotypes	Plant height (cm)	Days taken to flowering	Spike length (cm)	Rachis length (cm)	Diameter of second floret (cm)	Number of florets remained open at a time	Number of florets per spike	Reaction to pest and disease
1	Arka Naveen	97.33	106.00	85.33	45.33	8.00	5.33	17.00	Free from <i>fusarium wilt</i>
2	Pusa Manmohak	111.33	105.33	102.00	60.00	7.00	6.66	21.00	Free from <i>fusarium wilt</i>
3	Pusa Red Valentine	117.33	106.00	108.33	47.00	8.50	6.66	18.33	Free from <i>fusarium wilt</i>
4	Pusa Srijana	103.66	75.00	84.66	47.00	9.96	5.10	17.00	Free from <i>fusarium wilt</i>
5	Pusa Unnati	146.99	107.66	126.33	56.83	10.45	6.16	19.16	Free from <i>fusarium wilt</i>
6	Pusa Vidushi	107.19	80.00	90.00	51.33	9.19	5.44	15.11	Free from <i>fusarium wilt</i>
7	Punjab Glad-1	61.00	106.00	50.00	31.00	5.03	4.66	11.66	-----
8	White Prosperity(check)	114.33	109.66	100.66	70.66	10.00	6.00	17.00	Free from <i>fusarium wilt</i>

C D at 5 %	3.99	1.63	7.55	4.47	1.84	0.96	1.46	
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Table 2: Corm and cormels of new gladiolus genotypes

S.N.	Genotypes	Number of corms per plant	Number of cormels per plant	Reaction to pest and disease of corms
1	Arka Naveen	2.66	21.00	Free from <i>fusarium wilt</i>
2	Pusa Manmohak	2.66	49.33	Free from <i>fusarium wilt</i>
3	Pusa Red Valentine	2.33	28.34	Free from <i>fusarium wilt</i>
4	Pusa Srijana	3.10	27.33	Free from <i>fusarium wilt</i>
5	Pusa Unnati	2.88	49.78	Free from <i>fusarium wilt</i>
6	Pusa Vidushi	2.33	37.00	Free from <i>fusarium wilt</i>
7	Punjab Glad-1	2.00	19.00	-----
8	White Prosperity (check)	1.66	19.33	Free from <i>fusarium wilt</i>
	C D at 5 %	0.97	2.41	

Project No. 1.4.1: Collection, evaluation and maintenance of germplasm of chrysanthemum

Significant achievements

During the period under report three varieties (Mahatma Gandhi, Snowdon White, Snowdon Yellow) were collected and added to the germplasm. A germplasm of 71 varieties is being maintained at our centre.

The varieties viz., Pusa Centenary, Pusa Kesari, Pusa Arunodaya (standards); Pusa Aditya, Pusa Chitraksha (spray); Pusa Anmol and Pusa Sona (Pot mums) performed well under Delhi conditions. Pusa Sona was earliest and it bloomed during October. The varieties Maghi White

and Gauri were late types and bloomed during April. The variety Discovery was very late and bloomed during May.

Project No. 1.15.2: Collection and evaluation of turf grasses

Significant achievements

The following varieties of two grass species viz., *Cynodon dactylon* and *Paspalum notatum* were collected during the period.

1. Doob grass (*Cynodon dactylon* -Selection -1, Palma, Panama, Panam, Bargusto, Tif Dwarf-419)
2. Paspalum (*Paspalum notatum*)

Research Papers

Gunjeet Kumar, Kanwar Pal Singh, K. V. Prasad, Nidhi Verma, Namita and Sapna Panwar (2015). Characterization of chrysanthemum (*Chrysanthemum grandiflorum*) varieties using ISSR markers. *Indian Journal of Agricultural Sciences*, **85** (2): 566-70.

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Swaroop, K. and Chaudhary, N. (2016). Response of Bio-fertilizers on gladiolus for corm attributing characters and soil fertility. *International Journal of Horticulture, Agriculture & Plant Sciences*, **4** (1):57-62.

Popular Articles

M. K. Singh, S.S. Sindhu and D.V.S. Raju (2016). Gulab Ki Sanrakshit Kheti Ki Taknic. *Vyavsayik Pushp avan Alankrit Poudhon Ke Utpadan Ki Unnat Taknikiyan*. Publish by ICAR, pp. 109-116.

M.K. Singh and D.V.S. Raju (2015). Production and processing techniques of Damask Rose. Souvenir Winter Rose Show. Published by the Rose Society of India. Pp. 14-18.

M. K. Singh, S.S. Sindhu and Gunjeet Kumar, 2016. Guldaudi ki Sanrakshit Kheti. Phal Phool (1): 3-9.

Raju, D.V.S., M. K. Singh and A.S. Dhama (2015). Striped varieties of rose. *Souvenir Winter Rose Show*. Published by the Rose Society of India. Pp. 5-8.

Swaroop, K. Singh, Kanwar P. and Kumar, Prabhat (2015). New flower crop varieties, Pusa Srijana and Pusa Unnati released. *IARI, News*, October-December, **31** (4):3

Book Chapters

Gunjeet Kumar and Vanlalruati. 2016. Guldaudi Ki Vyavasayik Kheti. In: Vayavasayik Pushp Evam Alankrit Podhon Ke Utpadan Ki Unnat Taknikiyan by S.S. Sindhu, Babita Singh and M.K. Singh, Division of Floriculture and Landscaping, IARI, New Delhi. pp. 16-22.

Gunjeet Kumar 2016. Rajnigandha. In: Vayavasayik Pushp Evam Alankrit Podhon Ke Utpadan Ki Unnat Taknikiyan by S.S. Sindhu, Babita Singh and M.K. Singh, Division of Floriculture and Landscaping, IARI, New Delhi. pp. 59-67.

Kanwar Pal Singh, Gunjeet Kumar and Sapna Panwar. 2016. Production of loose flowers. In: Ornamental Horticulture Eds. S. S. Sindhu published by New India Publishing Agency, New Delhi. Pp. 349-388.

Training manual chapters

Gunjeet Kumar and Vanlalruati. 2016. Commercial Cultivation of Chrysanthemum. In Training Manual "Production Technology of Flower Crops", Division of Floriculture and Landscaping, IARI, New Delhi. pp. 74-78.

Raju, D.V.S., M.K. Singh and Namita (2016). Protected cultivation of rose. *Production Technology of Flower Crop*. Published by Division of Floriculture and Landscaping, ICAR-IARI, New Delhi. pp. 6-12.

Raju, D. V. S. and M.K. Singh (2016). Gulab. *Good Agriculture Practices on Flowers (Rose and Marigold) and Vegetable (Broccoli, Red Cabbage, Lettuce and PusaBathua)*. Published by Centre Agricultural Technology Assessment and Transfer. ICAR-IARI, New Delhi. pp. 16-20.

Pamphlets

Guldaudi 2016. Gunjeet Kumar, Vanlalruati and S. S. Sindhu, Krishi Gyan Prabandhan Nideshalay, Bhartiya Krishi Anusandhan Parishad, Pusa New Delhi-110012

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Sindhu, S.S., Babita Singh Avan M.K. Singh (2016). *Vyavsayik Pushp avan Alankrit Poudhoun Ke Utpadan Ki Unnat Taknikiyan*. Publish by ICAR.

Sindhu, S.S., M.K. Singh and Namita (2016). *Production Technology of Flower Crop*. Published by Division of Floriculture and Landscaping, ICAR-IARI, New Delhi.

Awards

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