

## Research Highlights

# Floricultural research and development of new varieties of flowers, ICAR-Indian Agricultural Research Institute (IARI), Pusa, New Delhi

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In India, Floriculture is considered as one of the most diversified and potential sector for commercialization. It is one of the fastest growing sectors in domestic and international trade considering higher return per unit area than most of the field crops. ICAR- Indian Agricultural Research Institute is pioneer in scientific research on floricultural crops spearheaded by luminaries like Dr. B.P. Pal who laid a foundation for scientific breeding of flower crops in late 50's. Since then, ICAR-IARI has been instrumental in the development of many new varieties of floricultural crops, mainly rose, chrysanthemum, marigold, gladiolus etc. Various breeding methods were employed for the development of the new varieties. Subsequently, these were put under all India coordinated trial for assessing their performance and released as new varieties for further commercialization.

### Development of New Varieties:

The work on development of new varieties of flower crops was initiated in the Division of Genetics and later in

the Division of Horticulture. Ever since establishment of Division of Floriculture and Landscaping in the year 1983, comprehensive research programmes on crop improvement using conventional and biotechnology tools were taken up followed by production in open and protected environments besides dissemination of technology to the farmers.

In recent times, many varieties were developed from the division for commercial production of flowers.

### Some Recent Varieties:

#### ROSE

'Pusa Shatabdi' – A hybrid variety ('Jadis' × 'Century Two'), with very attractive light pink coloured flower having 35-40 thick petals. Each plant produces 20-30 flowers in winter and 35-40 flowers in spring season, mildly fragrant, suitable for cut flower and exhibition purposes.

'Pusa Ajay' – A cross between 'PinkParfait' × 'Queen Elizabeth'. Foliage pigmented, glossy; flower dark pink. Each

Sl. No.	Flowers Crops	Breeding Methods
1.	Lilium	Hybridization (Inter-specific, inter-generic, Interrogation) and Mutation breeding
2.	Tulip	Spontaneous mutation, induced inter-specific hybridization and selection
3.	Daffodils	Spontaneous mutation & induced inter-specific hybridization and selection
4.	Nargis	Mutation spontaneous, induced inter-specific hybridization and selection
5.	Dahlia	Mutation breeding (spontaneous and induced)
6.	Freesia	Selection, mutation and hybridization
7.	Orchid	Polyploidy, Radiation, Mutation
8.	Bougainvillea	Polyploidy and Mutation breeding
9.	Rose	Hybridization, Bud spot mutation
10.	Gladiolus	Selection in hybridization and Mutation
11.	Chrysanthemum	Selection, radiation hybridization and Mutation
12.	Marigold	Hybridization, Selection and Production of double haploid

plant produces 15-20 flowers in winter and 35-40 flowers in spring season, mildly fragrant, suitable for cut flower and exhibition purpose.

**'Pusa Mohit'** - It is a hybrid variety ('Suchitra' × 'Christian Dior'), thorn less. Flowers have red petals with lighter shade on the reverse side. Each plant produces 20 flowers in winter and 45 flowers in spring season.

**'Pusa Arun'** - A hybrid, crossed between an exotic variety 'Queen Elizabeth' and indigenous variety 'Jantar Mantar'. Flower buds pointed, dazzling dark red on opening, large sized, double blooms on strong and long shoots. It produces 20-30 flowers during winter and 35-40 flowers during spring season.

**'Pusa Komal'** - A hybrid variety ('Pink Parfait' × 'Suchitra'). Highly floriferous bushy variety, floribunda group, completely thornless. Stems strong with multiple flower buds arranged in different heights, open in a sequential manner, produces 60 flowers, mostly in clusters. Flowers pink, attractive having vase life of 6-7 days.

**'Pusa Mahak'** - Hybrid Tea variety, tall, vigorous reaching 1.00 - 1.20 m. Flowers dark pinkish in colour, large and semi-double with 22-23 petals, highly fragrant. A recurrent bloomer, floriferous, produces on an average 50-60 flowering shoots in a season. The variety is ideal for garden display and for floral arrangements.



'Pusa Shatabdi'



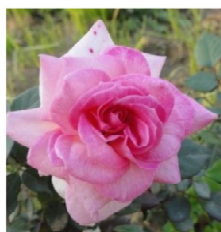
'Pusa Ajay'



'Pusa Mohit'



'Pusa Arun'



'Pusa Komal'



'Pusa Mahak'

## MARIGOLD

**'Pusa Narangi'** - African type, a hybrid of 'Cracker Jack' and 'Golden Jubilee'. It produces deep orange flowers with ruffled florets, big head. Flowering starts 125-135 days after transplanting. Petals contain carotenoids, widely used in

poultry, food, pharmaceutical and nutraceutical industries. It can be grown throughout India. The average fresh flower yield of the variety is 25-30 tonnes / ha and 100-125 kg seed / ha.

**'Pusa Basanti'** - African marigold, hybrid variety ('Golden Yellow' × 'Sun Giant'). It produces medium sized lemon yellow flowers in 135-145 days after transplanting. Variety is ideal for garden display and pot culture. The average fresh flower yield is 20-25 tonnes / ha and 75-100 kg seed / ha.

**'Pusa Bahar'** - An open pollinated variety, African type, produce flowers in 90-100 days after transplanting. Plants vigorous reaching 75-85 cm in height, produces compact, flattened, attractive, large size flowers (8-9 cm in dia.), 50-60 flowers per plant of yellow colour, floriferous. In northern plains, ideal time for seed sowing is mid October to mid November. The main flowering time is mid January to March. It is suitable for bedding purpose as well as floral decorations.

**'Pusa Arpita'** - It is a selection from heterozygous population of French marigold. It produces medium sized, light orange flowers during mid December to mid February in north Indian plains. The average fresh flower yield is 18-20 tons / ha.

**'Pusa Deep'** - An early flowering variety of French marigold, flowers in 85-95 days after transplanting. Medium statured spreading plants having 55-65 cm plant height and 50-55 cm plant spread; produces compact and medium sized flowers in dark red colour. The variety is very floriferous and produces on average 80-90 flowers per plant resulting in high flower yield (18-20 ton. / ha). In Northern plains, it flowers during October-November and suitable for loose flower production specially during festive season.



'Pusa Narangi'



'Pusa Basanti'



'Pusa Bahar'



'Pusa Arpita'



'Pusa Deep'

## CHRYSANTHEMUM

**'Pusa Anmol'** - A Gamma ray induced mutant of 'Ajay', highly floriferous, bushy with yellowish pink flowers. The variety is a thermo and photo insensitive and produces three flower flushes in a year (October-November, February-March and June-July). Ideal for loose flowers and spary.

**'Pusa Centenary'** - A Gamma ray induced mutant of 'Thai Chen Queen', growth vigorous, flowers very big, yellow. The variety blooms in 100-110 days after transplanting, ideal for cut flower production.

**'Pusa Arunodaya'** - It is a gamma ray induced pink coloured mutant of 'Thai Chen Queen', which was orange in colour; medium in height (50-55 cm), spreading type (60-65 cm); Flowers semi double (7-8 cm diameter) with incurving ray florets. The variety is suitable as a cut flower and pot culture for exhibition purposes.

**'Pusa Kesari'** - A gamma ray induced red coloured mutant of Thai Chen Queen, which is orange in colour. The plants are tall in height (65-70 cm) with good spread (60-65 cm). Flowers semi double, big (9-10 cm dia.) with incurving ray florets. The variety is suitable for cut flower and pot culture.

**'Pusa Aditya'** - An open pollinated seedling of 'Jaya'. Plants bushy, medium in height with moderate spread; spray type, produces star shaped semi-double flowers resembling flowers of Gazania, unique in chrysanthemum. Flowers yellow at the periphery and orange red at the centre; suitable as a cut flower and as a potted plant.

**'Pusa Chitraksha'** - It is an open pollinated seedling of 'Lal Pari'. The Plants bushy, spray type, produces single flowers that are deep magenta in colour. The disc florets are yellow that provide a very good contrast. The variety is suitable as a potted plant and for garden display.

**'Pusa Sona'** - An open pollinated seedling of 'Sadbhawana'. Plants bushy, extremely dwarf in height with excellent spread. The variety is a spray type that produces single flowers yellow in colour. The variety is ideally suited for pot mums.

**'Pusa Guldasta'** - An open pollinated seedling of 'Lalpari'. Growth upright, very sturdy and branches do not droop down. Flowers semi-double, medium sized (3.8 cm) with orange red ray florets and yellow disc. It is suitable for spray and pot culture purposes.

**'Pusa Shwet'** - An open pollinated seedling of 'Lalpari'. The plant is of semi-spreading growth habit. It bears semi double medium sized flowers (6.0 cm) with white ray florets and yellow disc. This variety is suitable for pot culture and garden display purposes.



## GLADIOLUS

**'Pusa Kiran'** - A selection from open pollinated population of the variety 'Ave'. The florets are white in colour, 16-18 per spike with ray like red colour markings on throat, spike length 90-95 cm.; suitable for vase decoration and bouquet.

**'Pusa Shubham'** - A hybrid variety, selection from the cross of 'Lucky Shamrock' and 'Green Lilac'. Florets cream or light yellow in colour with red-purple markings on yellow base of the throat. Spikes 85 cm in length containing 14 numbers of florets; suitable for vase decoration and floral arrangements.

**'Pusa Unnati'** - Florets are purple red/pink in colour with white stripe on inner two tepals. Spikes are very long about 126 cm in length with 16-20 florets.

**'Pusa Man Mohak'** - A selection from the cross of 'Mayur' x 'Hunting Song'. Florets saffron red with thin whitish stripes on the throat of two oppositely placed lower tepals. Spikes 93.00 cm in length, 19-21 florets per spike, excellent for vase decoration and bouquet preparation.

**'Pusa Red Valentine'** - A selection among the open pollinated population of the variety 'Regency'. Florets are brick or blood red in colour with sun ray like small lines on the lower tepals which makes them more attractive; very good for vase decoration as well as for bouquet preparation.

**'Pusa Vidushi'** - A selection among the progeny obtained from the cross of 'Melody' x 'Berlew'. Florets are purplish white in colour with grayed purple spots on the base of the throat. Compact arrangement of florets on one side of the spike coupled with 5-6 florets remaining open at a time makes

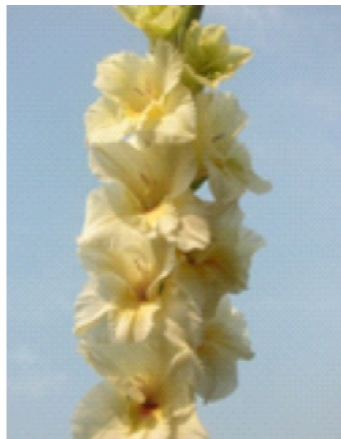
the spikes excellent for vase decoration as well as floral arrangements.

'Pusa Sindoori' - It is a selection from the open pollinated

seedlings of the variety 'Little Fawn'. Florets base colour is bright red, two yellowish spots on base of inner tepals with red coloured rainbow type stripes on throat.



'Pusa Kiran'



'Pusa Shubham'



'Pusa Unnati'



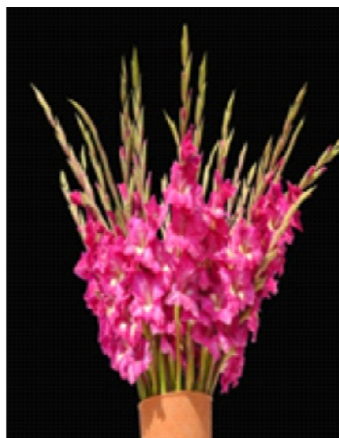
'Pusa Man Mohak'



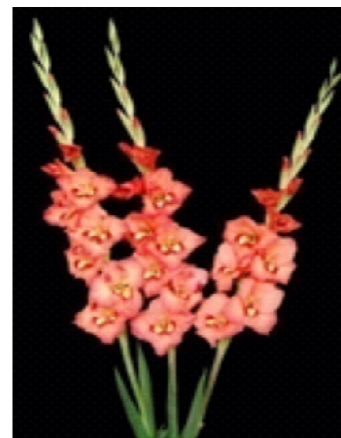
'Pusa Red Valentine'



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