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Arka White and Arka Pink: Novel Gerbera hybrids

Novel gerbera hybrids, viz. Arka White and Arka Pink were developed through hybridization using half-sib method of breeding where improved line/hybrid, IIHR9 and Arka Ashwa, were crossed with pollen mixed from different varieties. These hybrids were evaluated for flower quality traits for two years under naturally-ventilated polyhouse. The Arka White (White group, NN155A) and Arka Pink (Red purple group, 65A) have novel flower colour with semi-double and double type of flowers, respectively. These hybrids are suitable for cut-flower and flower arrangement purposes. These hybrids will prove useful for developing more gerbera hybrids with novel traits.

GERBERA (*Gerbera jamesonii* Bolus ex. Hooker F.), of the family Asteraceae, is one of the important cut-flowers grown for domestic and export markets. In India, during 2018-19, total area under floriculture in India was 313,000 ha, with cut-flower production of 807 lakhs. Gerbera was grown in 1,180 ha with production of 212 lakhs of cut flowers, amounting to the fourth most important cut-flower in India during 2017-18. The gerbera is in great demand, particularly in European markets during the winter season, and almost around the year in India. The gerbera is used in flower decorations especially during marriages. All the present varieties are imported with paying huge royalty, hence the planting material is very expensive. In view of this, during 2019, ICAR-Indian Institute of Horticultural Research, Bengaluru released two novel hybrids of gerbera, Arka White and Arka Pink and evaluated with commercial checks for flower quality traits. The plants were multiplied in large quantity *in vitro* and hardened plants were grown under naturally-ventilated polyhouse. The brief description of these hybrids is given hereunder.

Arka White

It has semi-double type of white colour flowers (White group NN155A). It was developed through hybridization (Half-sib) between IIHR9 and mixed pollen of different varieties followed by selection. It performs well under polyhouse with 50% shadenet and at par with commercial varieties. It produces average flower diameter (11.89 cm), flower stalk length (61.39 cm), flower stalk diameter (5.79 mm) and 2.87 numbers of flowers per month. Its flower quality traits are at par with commercial checks. It is suitable for cut flower and flower arrangement (Table 1).

Arka Pink

It has double type pink colour flowers (Red purple group 65A). It was developed through hybridization (Half sib) between Arka Ashwa and mixed pollen of different varieties followed by selection. It performs well under polyhouse with 50% shadenet and at par with commercial varieties. It produces average flower diameter (12.89 cm), flower stalk length (65.64 cm), flower stalk diameter (5.77

Table 1. Salient characteristics of Arka White with parent and commercial checks

Character	Arka White	IIHR9 (Parent)	Arka Ashwa (Check)	Susan (Commercial check)
Flower diameter (cm)	11.89	11.46	11.86	12.04
Flower stalk length (cm)	61.39	61.19	61.10	62.81
Flower stalk diameter (mm)	5.79	5.80	6.64	6.62
No. of flowers/plant/month	2.87	2.43	2.56	2.69
Vase life (days)	7.74	7.29	7.42	7.59
Flower colour (RHS colour chart)	White group NN155A	Red purple group 69A	Red purple group 68D	White group NN155C
Flower form	Semi-double	Semi-double	Semi-double	Semi-double

Table 2. Salient characteristics of Arka Pink with parent and commercial checks

Character	Arka Pink	Arka Ashwa (Parent & check)	Bismark (Commercial check)
Flower diameter (cm)	12.89	11.86	12.12
Flower stalk length (cm)	65.64	61.10	62.93
Flower stalk diameter (mm)	5.77	6.64	6.21
No. of flowers/plant/month	2.85	2.56	2.73
Vase life (days)	7.00	7.42	7.26
Flower colour (RHS colour chart)	Red purple group 65A	Red purple group 68D	Red group 45B
Flower form	Double	Semi-double	Semi-double

mm) and 2.85 of flowers per month. Its flower quality traits are at par with commercial checks. It is suitable for cut flower and flower arrangement (Table 2).

CULTIVATION

Growing environment

Gerbera is commercially grown in polyhouse or shade house to meet the quality standards for exports and domestic market. Day temperature of 22-25°C and night temperature of 12-16°C is ideal for growth and flower production.

Growing medium

Well drained loamy soil, rich in organic matter, having adequate moisture holding capacity with soil pH of 5.5-6.5 and EC less than 1 dS/cm^2 is ideal. The beds should be raised to atleast 30 cm height, and prepared by mixing of FYM (8-10 kg/m^2) and sand (3-4 kg/m^2) and added to prepared beds or beds may be prepared by mixing FYM, sand and cocopeat in 2:1:1 ratio.

Disinfection of soil

It minimizes infestation of soil borne pathogens. The beds should be drenched with commercial formalin diluted to 10 times (1-2 litres/m^2) and immediately covered with polyethylene film for 7-10 days. Soon after, treated beds should be watered well before planting to drain out the chemicals.

Use of biofertilizers

Biofertilizers like *Pseudomonas fluorescens* (5 kg), *Paecilomyces lilacinus* (5 kg) and *Trichoderma harzianum* (5 kg) may be mixed with 1 tonne of neem cake with optimum moisture. After 20 days, well mixed 250 g neem cake/m^2 may be applied in beds before planting as preventive measure against nematode infestation.

Planting technique

The tissue cultured plug plants (4-5 leaves) should be planted in such a way that their crown is 2-3 cm above the soil. Planting can be done on raised beds at a spacing of 40 cm between rows and 30 cm between

Arka White

Arka Pink

plants accommodating 6-7 plants/m^2. Immediately after transplanting, watering should be done using overhead sprinklers up to one month. Thereafter, gradually change to drip irrigation. On an average, water requirement may be 500 to 700 mL/plant/day (4.5-6.0 litres/day/m^2).

Nutritional requirement

During first three months of planting, apply 10:15:20g NPK/m^2 and 15:10:30 g NPK/month/m^2 from fourth month onwards (when flowering starts) in two splits at 15 days interval is good for establishment, better growth and increased flower production or water soluble fertilizer like NPK may be dissolved at 2 g/L and give through drip twice. Magnesium and copper @ 0.15% once in a month is desirable for obtaining good quality flowers.

Harvesting and yield

Gerbera flowers should be harvested by bending and pulling of the flower stalk when outer two rows of disc florets have fully developed or when outer row of disc florets are perpendicular to the stalk. After harvesting of flowers, basal 5-6 cm portion of flower stalk should be cut using sharp knife before placing in harvesting bucket. Properly managed healthy plants provide cut flowers for 2-3 years. Well maintained gerbera plants produce 36-40 flowers/plant/year.

Plant protection

Whitefly, mites and thrips are serious insect-pests of gerbera. White fly can be managed by spraying acephate 75 SP @ 1.5 g/L or imidacloprid 17.8 SC @ 0.5 ml/L or diafenthiuron 50 SC @ 0.75 ml/L followed by pongamia or neem oil 10 ml/L against nymphs; dichlorvos 76 EC @ 1 ml/L or lambdacyhalothrin 5EC @ 1 ml/L against adults.

Leaf miner can be managed by spraying of abamectin 1.9 EC @ 0.5 ml/L followed by pongamia or neem oil 1% (10 ml/L) or deltamethrin 2.8 EC @ 1 ml/L at 15 days interval. Drench the beds with chlorpyriphos 20EC @ 5 ml/L for killing pupae. Install yellow sticky traps for adults.

Thrips can be managed by spraying of imidacloprid 17.8 SC @ 0.5 ml/L or fipronil 5 EC@1.5 ml/L or acephate 75 SP @ 1.5 g/L in combination with 0.2 % (2 ml/L) of pongamia or neem oil. Drench the beds with chlorpyriphos 20 EC @ 5 ml/L.

Mite can be managed by spray of jet of water which dislodges the mites. This should be followed by application of diafenthiuron 50 SC @ 0.75 ml/L or flufenoxuron 10 EC @ 1 ml/L or fenazaquin 10 EC @ 1.5 ml/L followed by pongamia oil 1% (10 ml/L).

Among diseases, foot rot, wilt, root rot, blight or grey mold and powdery mildew are also causing damage to the crop. Suitable IDM strategies may be followed for managing these diseases.

For further interaction, please write to:
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