

Status and Prospect of Gerbera Cultivation in Bangladesh

AZM Shafiullah Prodhan^{1*}, Md. Nazirul Islam Sarker², Md. Shahidul Islam³, Md. Arshad Ali⁴

¹Department of Horticulture, Bangabandhu Sheikh Mujibur Rahman Agricultural University, Gazipur, Bangladesh.

² School of Public Administration, Sichuan University, Chengdu, China.

³Department of Plant Pathology, Bangladesh Agricultural University, Mymensingh, Bangladesh.

⁴Department of Environmental Science and Technology, Shimane University, Matsue, Japan.

Abstract— The present study is undertaken to explore importance, present status, research achievements, production techniques, post harvesting handling and the prospect of Gerbera flower in Bangladesh. It also described the constraints of Gerbera cultivation and recommendations for overcoming the constraints. The study is done based on content analysis. Gerbera flower has huge demand as cut flower in the whole country. Deficiency of mother stock and their high cost, cost of fertilizer and pesticides, absence of scientific knowledge & training, attack by pest & disease, absence of extension work came out as significant financial and technical issues of the plant farm owners while insufficient & not developed transportation & communication program, low rate, absence of industry details, unstructured industry are among significant industry related issues. On the other hand promotion intermediaries specified cost uncertainty, the absence of adequate industry details, lacking storage space facilities, unsold plant, insufficient shop-space, demand variation, strikes as their issues and constraints. Pertinent recommendations for assisting plant production and developing an improved promotion program in Bangladesh include a concentrated effort by government entities and non-government agencies to offer appropriate classes to farm owners and traders, to offer appropriate production assistance and storage space facility & to build nationwide permanent trading infrastructure.

Keywords—Gerbera, Cultivation, marketing, prospect, technology

I. INTRODUCTION

Gerbera (*Gerbera jamesonii* L.) connected to close family *Asteraceae*, a well-known cut flower grown all over the world in a variety of weather circumstances. It is famously known as 'Barberson daisy' or 'Transvaal daisy'. Genus *Gerbera* L. comprises of 30 varieties, which are of Asiatic and Southern African-American source. Among the different varieties, *Gerbera jamesonii* is the only varieties under farming. Modern gerbera occurred from

Gerbera jamesonii hybridized with *Gerbera viridifolia* and possibly other varieties (Leffring, 1973). The Gerbera Flower is an evergreen plant. This Daisy is a wonderful plant to design flowers with as it can be the focus or a highlight. The Flower is actually an evergreen herb local to Southern African-American. The Gerbera Flower is also known as the African-American Flower, Transvaal Flower, Gerb, and Barberson Flower. It is one of the most famous cut flowers. The gerbera daisy has large vibrant flowers, which has made it a popularity with flower lovers. There is a wide range of variation available in this flower. On an average, the annual flower is 20-35 flower stick per plant and it directly related to the cultivar (Li Zhang *et al.* 2008, Singh and Mandhar 2004). Gerbera is very fashionable and widely used as a decorative garden flower or cut flowers (Kanwar *et al.*, 2008). Gerbera is an evergreen and herbaceous blooming plant producing different colors of plant. It is under *Asteraceae* family. The genus *Gerbera* comprises of approximately forty varieties. Though it is local to Southern America, African-American, and exotic Asiatic areas, it is harvested across the entire globe in a variety of weather circumstances. Plants are soft herbs with a height up to 18 to 24 inches and 4 to 10 inches in size of flowers. It is also used as a model flower in studying plant development, generally known as African-American daisy which generates very attractive smells. It has a massive requirement in the flower industry as cut plant as well as plants in pots due to its beauty and long container life which rated at fifth among the top ten cut flowers in the entire globe (Parthasarathy *et al.*, 1999). It has high market value in the western countries, Malaysia, Philippines, and India; also it has become a well-known decorative plant in Bangladesh and needs for this plant is ever-increasing particularly in towns. Though Bangladesh has a great weather condition for Gerbera of international standard, the supply of Gerbera plantlets is not adequate to meet up with the local requirement. Gerbera can be spread by both sexual and asexual methods. Seed reproduction is not always sufficient since impurity of

stress is significant amounts of difference. Also, this method is too slow for commercial reasons. Gerbera is mainly supplied to all over Bangladesh from the from the commercial perspective growing plant centers at Gathkhali in Jessore. Therefore, the existing study was performed to understand more about Importance, existing position, research success, production techniques, post growing handling and the prospects of Gerbera flower in Bangladesh.

II. IMPORTANCE OF GERBERA FLOWER

Flowers have been regarded as the icon of beauty and a food for our sight. They are used on all spiritual event events. Flowers are given as birthday celebration, wedding presents or while conference fed up individuals and even at memorials. Most women conform their hairstyle with flowers i.e. Gajara and Veni and it is one of the important plant decorations which will and style to their beauty. All the individuals regardless of their source, competition, sex and cadre love flowers. Generally, flowers are provided by enthusiasts in Forehead, Gurudwara, Cathedral and Masjids. Flowers are used as a plant design. Even dry flowers are also used in plant art or agreement of garlands and flowers are ready and provided to welcome the dignitaries. When cut flowers are used for container design that will be an outstanding piece of inside design. The significance of flowers is not limited up to the beautification, design or planning of Gajra, Garland, Veni or Arrangements but also have the commercial significance too. Some flowers like Increased, Jasmine, Tuberose, Nevada, Bakul are used for removal of essential natural oils which is a platform for the planning of fragrances, fragrances or attar. From Rose Gulkand, Increased water etc. products are also ready. Flowers are the icon of beauty and Bangladesh is the nation of natural charm. Many flowers are available regionally. Getting an associated with the professional farming of flowers as flowers have the great financial value and trade potential. But nowadays professional farming reducing day by day because of accelerating rate of food nourish production to give the increasing inhabitants, the absence of quality plant-wide range, the absence of appropriate knowledge and absence of technical progression.

2.1 General significance of Gerbera flowers

Flowers help to get out of sickness through emotional charm. Flower landscapes increase the elegance of the house or an organization. Scent and Fragrances are purchased the perfume of flowers e.g. Atar. It is the origin of motivation to the romantics and authors. The flower is a nationwide icon. Flower boosts the visual sense of human being and meets the requirement of heart feelings.

Its elegance and perfume give pleasure to all regardless of age and prosperity. It is the major component of public functions and wedding anniversaries and also substantially used for design. Flower farming is an excellent method of passing spare time and help to keep great health.

2.2 Public Significance of Gerbera flowers

- Public Function: Wedding, interior design, worshipping, spiritual and self-adornment, flower flowers, kids wedding parties, pleasant friends or family members.
- Financial contribution
- Sale of flowers
- Removal of essential sebum and
- Making of monetary products like perfume

2.3 Financial significance of Gerbera flowers production

Perfume sectors can be established in the country which can help enhance the nationwide economic system. Flowers can be a resource of getting huge forex by dispatching them.

- Flowers can be considered as an industrial product. Professional plant production may be helpful in increased making of the farmer.
- Establishment of plant production plants and perfume sectors can help fixing the lack of employment problem to a large level.
- It provides an opportunity to bring more rarely used land under plant farming.

2.4 Aggressive advantage of Gerbera flowers

There is a great market requirement for plant throughout the year. Besides greater productivity and trade perspective is favoring floriculture in Bangladesh. Further investment in developing floriculture is very fulfilling and valuable due to the following reasons:

- Accessibility of baby's room plants and seeds
- Dirt and environment suitable for plants production
- Easy production technology and great yield
- Aggressive price and great profit
- Export potential

III. PRESENT STATUS OF GERBERA CULTIVATION AND RESEARCH ACHIEVEMENTS IN BANGLADESH

The total area under floriculture in Bangladesh is estimated to range from 4250 to 4570 ha. Of which 3210 to 3450 ha of land is filled with different flowers and estimated property under baby's room generating decorative vegetation was found to be 1040 to 1120 ha. Among the flowers grown in Bangladesh Improved, Tuberose, Gladiolus, Marigold, Gerbera and Jasmine are the main. Different decorative flowers are Gerbera,

Croton, Rangan, Thuja, Hands, Auraria, Musaenda, Exotic, Ferns, Dracaena, China box, Century place, Bromeliads, Hydrangea etc. Dhaka, Chittagong, Cox's Bazar, Jessore, Chuadanga, Jhenidah, Bogra, Rangpur, Kushtia, and Mymensingh are the most significant production straps of flowers. The other areas like Barisal, Panchagarh, Gazipur, Khulna, Manikganj, Khagrachhari, Bandarban, Dinajpur, Rangamati and Tangail have begun growing flowers. The significant production strips of decorative vegetation are Chittagong, Nature, Khulna, Pirojpur, Dhaka and Mymensingh regions. The other areas such as Chapai Nawabgonj, Rajshahi, Gazipur, Tangail, Bandarban, Rangamati and Khagrachhari are also considered to be prospective for creating decorative vegetation. Approximately 1200 to 1500 traders are associated with place company. Dhaka, Chittagong, Jessore, Feni, Rangpur, Nature, Bogra, and Mymensingh are the most significant marketplaces of floriculture items. The number of place stores has been improving in different City/District towns of the nation. Currently even at Upazilla level to obtain stores are available for place company with the improve in place stores, the marketplace size is also improving. Currently, the annual sale of flower sector in Bangladesh is more than Tk. 1000 million. Approximately about 100,000 to 120,000 individuals are either directly or ultimately associated with floriculture industry.

In Bangladesh, gerbera was presented recently and it is becoming more popular. It has a great risk of regional as well as trade industry. A variety of colors available has grown to include a big selection of light shades. Plant breeder has done a wonderful job of creating outstanding place shades, including violet, rose, pink, white, and various bicolor and presented dual and semi-double blooming forms, adding to the beauty of this place. Cultivation of gerbera has grown considerably recently in Bangladesh but very few research works related to development and place production of Gerbera have been carried out in our nation. Under this consideration, the existing study was conducted to observe the varietal activities of gerbera in Bangladesh as pot farming.

The place farming is a significant and successful company in the Agricultural sector of Bangladesh. The place under floriculture is increasing day by day, particularly in the place nearby to big cities. In fact, place farming is work intense as compared to other Farming plants particularly vegetables rather, it lies in between the two ends with the skilled employees and modern techniques, it has been proved that the investment in this industry results in preferred tax treatment for the gardeners. It is evident from the improve variety of plant centers, greenhouses, place marketplaces and place auction centers and the production of flowers convert out

to be about 8000 to 10,000 tons yearly (BBS, 2008). In decorative vegetation, especially those that have fragrant flowers or leaves have essential oil; few are used commercially in fragrances, flavor or cosmetic sectors. In all the fragrances used today day, oil of rose and jasmine are the most delicate fragrances used since the beginning of human society. Although it is very difficult to give exact figures of rose oil production, it is believed that about ten shades of rose oil produced the entire globe nowadays, of which Location produces more than five shades followed by Poultry and The other agents (Chadha et al, 1992). In Bangladesh, rose h₂o is prepared from flowers. Improved h₂o is substantially used in flavor foods, confectionery, and memorial events. While the phrase Jasmine comes from Persia term, "Yasmine". Although there are several species of Jasmine that have fragrant flowers and which are used for making garlands and Attars. Flowers have become a symbol of emotions and a significant portion of spiritual and public events. Professional production of place in Bangladesh began from the mid-1980s at Jessore region. Now around 10,000 hectares are under place farming (Siddika, 2004). The significant production is focused at Godkhali in Jessore which covered about 60 percent of complete place production. At existing approximately 8000 farm owners are engaged in floriculture (Mou, 2006). Due to the varied agro-climatic conditions and relatively low cost of production, Bangladesh has tremendous opportunities not only to fulfill nearby requirements of both traditional and cut flowers but also a great risk of the trade. Lack of company, technical know-how, consistent methods of accelerating and growing of decorative flowers of worldwide acceptable great quality, the problem of packaging and transportation has been a significant obstacle in recognizing this goal. Farmers involve extremely in floriculture practice as it is more successful than other plants and the need for the place has been improving day by day. As an outcome, there exists a competition excellent place production. Production areas are focused in the non-urban environments, but the consumption is focused on the locations. There is no organization or association for marketing and submission of flowers. The flowers, being extremely disposable, require special publish collect control. But improved publish collect handling has not yet been started in Bangladesh. Ineffective postharvest control declines the great high quality of place and as an outcome farm owners are limited to getting expected price of the place. So the great quality control over the place is of utmost essential of getting greater profits.

Floriculture, with its ability to generate greater economic profits per unit place, is slowly getting ground in the variation plan in farming. The possibility of practicing an

industrial activity on a small farm, mainly utilizing household labor reinforced by increasing requirements for the floriculture items in creating domestic industry under floriculture has grown substantially in the past. Bangladesh has achieved impressive benefits in the production of meals grains in the last Two-and-a-half decades, but meals security still remain a critical concern because of the low purchasing power and thereby limited access to meals especially for the non-urban poor. Multiplied farming development through plants variation offers considerable opportunity for expanding income and employment of non-urban individuals. Bangladesh is experiencing a place flower with shop opening all over the capital and some grain areas are moving to place production. Although floriculture in Bangladesh is comparatively a new venture, it has now become an inseparable portion of our culture. People usually use place in all their events in public, political and historical occasions. Floral arrangements and garlands have been getting an extensive reputation among almost all the individuals of the nation. The universal usage has created a real trend of production place on an industrial basis to fulfill its improving need for services in the marketplace.

IV. GERBERA PRODUCTION TECHNOLOGY

Gerbera (*Gerbera jamesonii* Bolus) is a profitable plant which is a member of the *Asteraceae* family and can be spread by plant seeds or by asexual techniques (Kanwar and Kumar, 2008). Commercial cultivars are designed mainly for creating cut flowers, and in-vitro micropropagation using shoot tips as explants and the principal technique for the commercial reproduction of these varieties due to the big amount of plantlets created a small place and time and the inherited stability of plantlets extracted from this system (Bhatia et al., 2009). It requires 24 to 30 weeks for maturity and vegetative growth. Gerbera flower can be collected after 7 to 8 weeks of the plantation. It is easily grown by good inputs, irrigation, greenhouse and proper management.

4.1 Techniques or Start Field Cultivation

To grow Gerbera as professional venture it is better to increase the vegetation under poly/green home. An acre of the area is around 4000 sqm of greenhouse place. Techniques place of 4000 sqm is enough to draw out real benefits out of this business. We can easily place 24000 nos of Gerbera vegetation.

Playhouse development requires 25-30 times such as base and h₂o set up requires a week, bed planning and basal treatment requires two weeks and then Farmville farm rely on the region. So roughly it requires around less than two months to set up everything. Gerbera can be harvested completely the season.

4.2 Soil

The ground should be highly permeable to have better main growth and well-cleared transmission of origins. Exotic loam with good water flow and drainage potential having a pH of 5.5 – 6.5 is more appropriate for Gerbera farming.

It is crucial to sterilize the ground to reduce the attack of ground carried infection like Phytophthora, Fusarium, and Pythium which could otherwise eliminate the vegetation absolutely. The mattresses should be saturated/fumigated with 2% substances (100 ml formalin in 5 liters h₂o / m² area) or methyl bromide (70 g/m²) and then protected with a plastic material piece for the lowest period of 2 to 3 times. The mattresses should be consequently well watered thoroughly to empty the harmful substances before growing. Well developed cells lifestyle vegetation having 4 -6 results in can be placed strongly without burying the top.”

4.3 Climate

The temperature should be within the range of 25° C – 27°C to avoid bud abortion/scorching inside the garden greenhouse.

4.4 Irrigation

Drip watering is done once in 2 – 3 times @ 3.75 liter/drip/plant for 15 – 20 minutes is adequate for Gerbera farming. Regular h₂o need is about 500 – 700 ml/day/plant. Water quality should be like the pH 6.5 – 7.0, EC should be <0.7mS/cm, Solidity <200ppm and T.D.S. < 450 ppm.

4.5 Season of Blooming and Harvesting

When flowers absolutely open, growing is done. Plant stalk is saturated in Salt hypochlorite solution (5-7 ml/lit of water) for 4-5 hours to improve container life. “In the 1st season production we can collect 1080000 nos of cut flowers,” says Mr. Sunil.

4.6 Reproduction and Planting

It can be spread through lollipops and cells lifestyle plantlets. Elevated boxes with 4 ft. size and 40 cm size are established at a period of 60 cm and growing is done in a space of 30 x 30 cm.

4.7 Natural Manure

Basal or Natures neem dessert 2.5 ton/ha, P – 400 g/100 sq.ft. , MgSo₄ – 0.5 kg/100 sq.ft. can be used for best results.

4.8 Growth Regulators

For smaller sized bins like 4-inch containers, implement B-Nine (daminozide) at 2,500 ppm seven to 10 times after planting. Do not implement B-Nine once pals are noticeable because this will cause reduced place arises. When pea-sized pals are noticeable, the vegetation will place in roughly three weeks.

4.9 Plant Protection

1. To control Nematode – Carbofuran 7-8 kg/ha is used at the time of growing.

2. Foliage spot – Carbendazim 2 g/lit or Mancozeb 2 g/lit is used on the other hand.

3. Foliage miner – Chlorpyrifos 20 EC 2 ml/lit.

4. Glasshouse whitefly – Monocrotophos 36 WSC 2 ml/lit or Natures neem oil 3 ml/lit.

4.10 Intercultural operations

1. Hand weeding is done whenever necessary.

2. Eliminate to obtain pals up to 2 months and then allow for flowering

3. " rake " the ground once in 15 times to accomplish easy consumption of standard water, manure and to provide air to the origins.

4. Eliminate older results in to accomplish new leaf growth and good cleanliness.

4.11 Yield

The vegetation results in 2 arises / place / 1 month. Collect begins from 3rd 30 times of growing and ongoing up to two years. Under the open situation, 130 -160 flowers / m² / season and under greenhouse situation, 175 – 200 flowers /m² / season can be found.

V. POST HARVEST MANAGEMENT

Harvesting is done when external 2-3 series of disk florets are vertical with respect to the stalk. The rearfoot for the stalk should be cut about 2-3 cm above the base and kept in fresh chlorinated standard water. Flowers should be evaluated and categorized out inconsistent groups. Flowers loaded independently in poly punches and then put into carton containers on two levels.

Bushiness: A problem recognized by numerous results in, short petioles and small laminae, which gives some cultivars of gerbera a furry overall look known as bushiness. Nodes are not clearly recognized and no internode elongation is seen.

Stem Break: It is a common postharvest problem in cut gerberas. This is mainly due to standard water instability. It could be ethylene managed and associated with beginning senescence due to standard water stress.

Yellowing and violet margin: Nitrogen lack of causes soiling and beginning senescence of results in. Phosphorus lack of causes light yellow-colored color with a violet edge. The increase in levels of nitrogen and phosphorus were found to enhance the development of lollipops and improve blooming in gerbera.

Grading: Based on control length and size, flowers are evaluated in A, B, C, and D.

Demand and Price: Gerbera is an important commercial place vegetation expanded throughout the world in a wide array of weather circumstances and is required all season long both in the household as well as worldwide industry. "Average cost all season long is Tk. 5.0/stick,"

6.0 Challenges on flower production in Bangladesh

The following constraints are recognized in place export:

- Production technology is still at low stage and for this reason it is not possible to generate trade quality products.
- Lack of proper post harvest technological innovation.
- An assortment of types is old-fashioned or of the low requirement in the trade industry.
- Lack of direct journey to all potential locations.
- The absence of chilling features.
- The absence of an effective awesome sequence of the production facilities.
- Inadequate interaction system of the production places.
- Underdeveloped link streets in the production areas.
- Lack of supportive company.
- Inadequate government support.

VI. CONCLUSION AND RECOMMENDATIONS

Flowers have a pious place in the minds of human beings all over the world and they are linked with human civilization and social fabric everywhere. Without flowers, the world would not have been so beautiful, as charming and as cherishing today. For its beauty, demand for the flower is increasing day by day. The tree has to be cleaned and given fertilize regularly. One tree survives five to six years. Gerbera tree is a long-surviving tree. Gerbera flower is like sunflower and its leaves are like red spinach. There are 30 kinds of gerbera flowers are available in the world. Among them there some attractive colors like red, yellow, orange, white, pink and violet. Though gerbera is a foreign flower it has a huge demand in Bangladesh. One tree gives 60 to 70 flowers. In many programs like a wedding, New Year, gerbera flower has huge demand. To meet this rising demand, floriculture becomes popular and in recent days it has emerged as one of the most lucrative professions in all over the world. The future scope of Gerbera flowers is increasing demand for cut flowers, live plants, quality seed production, the sale of garden tools, pots and others, perfumery products, Bonsai development etc. The study suggests the following recommendations:

1. Study related to floriculture value chain especially for Gerbera flowers should be conducted by Department of Agriculture Extension (DAE) for developing comprehensive information in flower research. Research and development system should be strengthened through training and study visits. Improve scientific post-harvest technologies should be developed and disseminated to the farmers' level.
2. A quality planting materials supply system should be developed like (BARI—>DAE/BADC/Private Sector/Large NGO—>Flower Farmers) for

- increasing flower production. Market infrastructure should be established for developing marketing chain of the flower. Women should be involved more in the floriculture industries.
- The private sector should be encouraged by the government for developing and disseminating flower cultivation technology and market to the farmers' level. Jessore is a main area of flower cultivation. So, BARI regional center Jessore should be focused on floriculture and a link should be established with Bangladesh Agriculture Development Corporation (BADC) Jessore for increasing production of quality seed.
 - A strong coordination should be established between research organization and extension agencies for disseminating suitably advanced technology to farmers level. Senior officials of Department of Agricultural Extension (DAE) should be designated for an extension, coordination, and monitoring of floricultural, especially for Gerbera flowers activities.
 - All the imported inputs should be made available for farmers with no taxes or minimum taxes. Floriculture loan should be arranged for the farmers with a low rate of interest.
 - Specialized cold storage should be established for flower, especially for Gerbera flowers seeds. Identification of marketing constraints (backward and forward linkage) and designing inventions to overcome such constraints.
 - Gerbera Flower should be included under crops and develop variety wise production target at Upazila level in order to plan and make available the required planting materials, inputs and technologies.
 - A national guideline should be developed on Floriculture especially for Gerbera flowers Industry. Introduce new/ modern varieties of flowers from abroad and establish their multiplication facilities at HDTC units of DAE. Undertaking or proposing any post-harvest investment should investigate the cost effectiveness otherwise the cost might be higher than the sale price.
 - To reduce the production cost of gerbera appropriate (quality) polyethylene should be manufactured. BARI should develop a low-cost cooling system for corm (rhizome), especially for Gerbera flowers. Arrange construction of packaging and storage shade for unsold flowers. Freight policy in Bangladesh is not favorable towards exporting Gerbera flowers; government should change the policy to make it favorable to small flower farmers.

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