CHAPTER: I
INTRODUCTION

Flowers are the most alluring gift of the God to mankind they make our mind refreshed and give happiness to one and all. Flowers are the symbol of beauty, love and tranquillity. The flowers are soul of garden and convey the message of nature to man. No ceremony or special function can be considered complete without use of flowers. They are most appealing form of human expression as they devote beauty, purity, honesty and divinity. Appreciation of flowers transcends the boundaries of race, religion and countries and symbolizes of human’s communication with nature. Flowers not only enliven our surroundings but also help in ameliorating the polluted environment. Flower is the symbol of beauty and an important feature for human civilization. Without flowers the world would not have been so beautiful, as charming and as cherishing as it is today. For its beauty, the demand for flower is increasing day by day all over the world. 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.

Floriculture includes the cultivation of flowering and ornamental plants for sales or for use as raw materials in cosmetic, perfume and pharmaceutical sector. Trades in floriculture involve mainly cut flowers, foliage plants, dry flowers, propagules of ornamental plants, and production inputs like agro chemicals, growing media, pots, etc. Floriculture has become one of the important high valued agricultural industries in many countries of the world. Due to globalization and the effect on income enhancement in different region of the world, a growing per capita consumption of floricultural products is witnessed in most of the countries. Floriculture, with its ability to yield higher economic returns per unit area is slowly gaining ground in the diversification plan in agriculture. The possibility of practicing a commercial activity on a small sized farm, mainly utilizing household labor supported by growing demands for the floriculture products in developing domestic market, the area under floriculture has increased substantially in the recent past.

In India, floriculture has attained new height of popularity in the modern agriculture. It is fast emerging as a profitable enterprise in India due to the varied agro-climatic conditions prevailing in the country. It has emerged as a viable economic option
in the diversification of agriculture in the last decades. The commercial importance of flowers, particularly cut flowers has been realized throughout the world and today, floriculture has developed into an intensive form of agriculture.

The total area under flower crops in India is estimated around 2.43 lakh hectares and production of flowers is estimated to be 15.45 Lakh tonnes of loose flowers and 6.19 lakh tonnes of cut flowers (Anon., 2016), which included traditional flowers such as Marigold, Jasmine, Aster, Rose, Chrysanthemum, Tuberose and modern flowers like Carnation, Gerbera, Gladiolus and Anthurium. In Gujarat total area for flower crops is around 19.67 thousand hectares and production of loose flower is 1.84 lakh tonnes (Anon., 2016).

There are more than 300 export-oriented floriculture units in India. Out of them, 50% units are in south zone mainly in Karnataka, Andhra Pradesh and Tamil Nadu. West Bengal, Maharashtra and Rajasthan have also large areas under floriculture. The domestic flower consumption is increasing annually at 10%.

The cut flowers like Rose, Gerbera, Gladiolus, Tuberose, Chrysanthemum, Carnation, Orchid, Anthurium, Lilies, etc. have commonly and frequently used for many purposes in both the local as well as international market. Among them, gladiolus (Gladiolus sp.) is one of the most important cut flower not only due to its wide range, attractive spikes, but also easy cultivation and wide adaptability to varying soils and agro-climatic conditions. It occupies a place of pride in Indian floriculture industry for its beauty, better keeping quality and suitable for cut flower. It is also a popular cut flower, not only for use in arrangement, but also for the individual florets that can provide attractiveness to bouquets.

Gladiolus is a popular flowering plant grown all over the world. The name gladiolus was derived from the Latin word “gladius”, which means sword, because of its sword-like leaves, it is popularly known as sword lily. It was introduced into cultivation at the end of the 16th century (Parthasarathy and Nagaraju, 1999). The modern hybrids are botanically known as Gladiolus hybrida belonging to family Iridaceae. Gladiolus could be grown in any type of soil provided it is well drained. For good performance, it prefers a sandy loam soil, rich in organic matter. It is widely cultivated for the garden, in herbaceous borders, beddings, rockeries, pots and for cut flowers. Besides having aesthetic value, it represents and reflects the glory of collectivism, a ‘symbol of beauty, love and tranquillity’ (Swarup, 1967) in its arrangement as inflorescence on the spike,
resulting and opening an avenue of immense commercial value in the present era of globalised economy.

Apart from ornamental value, gladiolus have extensively utilized in medicines for headache, lumbago, diarrhoea, rheumatism and allied pains (Bhattacharjee and De, 2010). Flower and corm of some gladiolus are used as food in many countries (Khan, 2009). The flowers of different gladiolus sp. are used as uncooked salad by nipping of their anthers.

In India, gladiolus is commercially cultivated in West Bengal, Himachal Pradesh, Sikkim, Karnataka, Uttar Pradesh, Tamil Nadu, Punjab and Delhi. In the eastern states like Tripura, Assam, Manipur, Meghalaya and Nagaland, this flower has established itself as a commercial proposition. There is a sizeable area under gladiolus in Jammu-Kashmir, Andhra Pradesh and Gujarat also.

The successful commercial cultivation of crops depends mainly on two factors viz., genetic and cultivation factors. In recent years, scientists have been giving more attention towards the regulation of plant growth, yield and quality of flowers by using some plant growth regulators. There are many factors which can affect plant growth and economic cultivation of gladiolus such as variety, size of corm and cormel, depth of planting, application of fertilizer etc. The number of florets per spike, longest spike and rachis length, flower quality, corm and cormel production etc. were found related to corm size (Bhattacharjee and De, 2010 ). Sudhakar and Kumar (2012) reported that plants raised from large size corm had the greatest plant height, maximum length of spike, longest rachis, highest number of florets per spike, maximum percentage of flowering, heaviest corm and highest number of cormels per plant.

Development after the discovery of growth regulators and their application in agriculture and more especially in horticulture are significant. Regulation of plant growth and development using natural plant growth regulators for greater production has received the almost attention. Plant growth regulators have been used to manipulate the yield, size, shape and overall quality of floricultural crops. In many cases bedding plants are treated with plant growth regulators to promote compactness and to maintain quality prior to sale.

Plant growth regulators (PGRs) are the organic chemical compounds, which modify or regulate physiological process in appreciable measure in plants. PGRs consist of numerous compounds including gibberellins, auxins, cytokinins, abscisic acid and
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ethylene. The use of plant growth regulators is a successful approach for improvement of various traits, including, number of flower buds (Boyle, 1992), induction of early flowering (Sakai et al., 1979), delay flowering (Paulin and Muloway, 1979), flower development (Irish, 2009) and increase yield (Malabug et al., 2010). PGRs have been used in the commercial production of ornamental plants (Rademacher, 1991) but their efficiency depends on different plant species (Dole and Wilkins, 1999). In gladiolus pre-plant corm treatment of growth regulators was found to improve the growth and flowering of cut spikes (Raju et al., 2008).

Among the growth regulators cytokinines which is an important growth promoters has been reported to stimulate the growth of axillary buds in plants. Benzyl adenine is also a cytokinin and its application is reported in different ornamental bulbous plants including tulips (De Munk and Gijzenberg, 1977), lilies (Ranwala and Miller, 1998) and calla bulbs (Naor et al., 2005) benzyl adenine or BA is a first-generation synthetic cytokines that elicits plant growth and development responses, setting blossoms and by stimulating cell division.

Practical utility of the research problem

Gladiolus is grown commercially from corms both for the flowering spikes and for corm production. Being a cormous plant, it is principally propagated by the natural multiplication of new corms and cormels. (Hartman et al., 1990; Ziv and Lilien-Kipnis 1990). However, owing to their low rate of multiplication and to a high percentage of spoilage of corms during storage, there is an insufficient supply of planting material (Singh and Dohare 1994). A mother corm normally produces one new daughter corm each season along with several cormels.

For commercial cultivation, conventional methods of propagation are insufficient to meet the demand for planting material. The minimum control over vegetative and floral traits is another drawback of conventional system, which is not in favour of meeting the market demands. Owing to the unavailability of corms in sufficient quantity, corm cost is also increased. The control over flowering time and floral characteristics according to the demand of market has been achieved in many cut flowers by adopting modern production techniques.
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The increase in popularity of gladiolus in turn increased the demand of the planting material tremendously. The unavailability of sufficient amount of planting material of a desirable cultivar is one of the major limitations of gladiolus cultivation on a commercial scale. Among the various other cultural factors, application of different physical treatments on corms and manipulating its growth with application of growth regulators like BA can overcome the above limitation to a certain extent.

In this present study we focus on two major physical treatments on corms they are removal of terminal sprout and corm slit treatments. In gladiolus at the end of the dormant period, buds begin to grow and form sprouts. Generally, the apical bud begins to sprout first marking the beginning of apical dominance stage. Planting corms with apical dominance often results in plants with single stems and hence reduced yields. Removal of the terminal sprout leads to the initiation of lateral sprouting in the corms which in turn increase the yield. By corm slit treatment we aim at increasing the production of spikes by giving a slit on the corms diagonally through the sprout so that one sprout can be divided into two and each divided part can develop into a productive tiller.

The application of PGRs has become the part of their cultural practices in many ornamental plants to modify their vegetative and floral traits. There are different application methods of PGRs including foliar application, pre-plant soaking and drenching is being practiced in ornamental plants. Soaking of bulbs in solution of plant growth regulators has been used (Larson et al., 1987) and it is an efficient method for obtaining good results and also have advantages over other methods in terms of time, labour saving and accurate dosage (Ranwala et al., 1998). Keeping in view the efficiency of this method, Pre-plant dipping of corms in a chemical solution is now becoming a popular method among commercial growers.

Being an easily grown and producing nearly important flowers, even though it is not widely cultivated by the farmers in India like other flower crops. The major reasons for that is high cost of planting material, single spike emergence from a single corm and one plant can produce only one corm. Through this research we are aiming to increase the number of spike and number of corm from a plant through different physical and chemical treatment on corms.
Objectives

1. To find out the effect of physical treatments of corms on sprouting, growth, flowering and corms production of gladiolus.

2. To ascertain the effect of different levels of Benzyl Adenine pre-soaking treatments on sprouting, growth, flowering and corms production of gladiolus.

3. To find out the interaction effect of treatments on sprouting, growth, flowering and corms production of gladiolus.