Chapter I

INTRODUCTION

In floriculture, swift changes are occurring around the globe as cut flower production has moved from traditional growers, such as Netherlands, Germany and France to some of the Asian and African countries which are bestowed with better climatic conditions and cheaper production cost (Zhao and Wen, 2008). In India, there has been a dynamic shift from sustenance production to commercial production of flowers with 191 thousand ha of area under floriculture during 2011-12 with a production of 1031 Mt of loose flowers and 6902.7 million (numbers) of cut flowers (Mistry et al., 2012). The crops which have received larger attention include rose, gladiolus, chrysanthemum, orchid, jasmine, tuberose, aster, marigold etc. India's total export of floriculture was Rs.286.45 crores in 2010-11. The major importing countries are USA, Pakistan, Netherlands, Germany, Italy, Belgium and United Kingdom. More than 50 per cent of the floriculture units are based at Karnataka, Andhra Pradesh and Tamil Nadu. With the technical collaborations from foreign companies, the Indian floriculture industry is poised to increase its share in world trade. Though Tamilnadu contributes 25 per cent of floriculture production in India, its share in cut flowers is very less.

The gladiolus (*Gladiolus grandiflorus*), popularly called “queen of bulbous” belongs to the family Iridaceae and sub family Ixoideae has its elegant flower spikes which have rich variation of colors and long vase life is commercially grown for its fascinating flowers which are used as the most preferred line flowers in floral
arrangements worldwide. Gladiolus is cultivated in most of the tropical and subtropical countries of the world. The major producing countries are the United States (Florida and California) Holland, Australia, Japan, Italy, France, Poland, Iran, India, Brazil, etc. In India its cultivation dates back to 19th century and has attained considerable importance as cut flower in the states like West Bengal, Uttar Pradesh, Himachal Pradesh, Maharashtra, Karnataka and in some parts of Tamilnadu and Andhra Pradesh. In small scale level this crop is cultivated in some parts of Krishnagiri, Dharmapuri, Dindigul, The Nilgiris and Coimbatore districts. However, this crop can be cultivated and spread length and breadth of the country as it has good adaptability in wide range of agro-climatic conditions.

In any cut flower crop the thrust till recently had been on crop improvement, standardization of agro-techniques including improved propagation methods, plant protection and post harvest management. In view of the fact that gladiolus production is being done under open field conditions, the research efforts revolve around the agro-techniques in open cultivation. Gladiolus is grown on all types of soils having good structure and drainage. It is a winter season crop but can be grown during rainy season in low rainfall areas with mild climate. Hence, in Tamilnadu, this crop can be extended in other areas where mild climatic conditions occur provided the agro-techniques like proper spacing, season and corm size and season are standardized. Further, crop management practices for the production of marketable spikes and quality planting material need to be evolved.
Influence of seasons was conspicuous over the performance of gladiolus varieties for most of the growth characters. However, most of the varieties performed better during winter prevailing with mild weather conditions particularly cool nights and optimum temperature favour for luxuriant vegetative growth and flowering (Ramachandrudu and Thangam, 2009). Date of planting plays an important role in regulating growth and quality of gladiolus (Khan et al., 2008). Vegetative growth and quality of spikes are improved by proper planting time which also satisfies the consumer's demand (Zubair et al., 2006). Planting schedule vary because of differences in photoperiods, temperatures and light intensity. Production of big size daughter corms and cormels depends on the season of planting as climatic factors play a major role in partitioning of assimilates towards underground storage structures. Further, quality of propagation materials i.e. corms and cormels, also influence the production, out of which size of mother corms play important role in gladiolus production (Singh and Doahre, 1994; Hartman et al., 1990; Ziv and Lilien-Kipnis, 1990; Sharma and Gupta, 2003).

Besides the season and corm size, the plant spacing plays important role in growth, yield and quality of flowers and corms (Yadav and Tyagi, 2007). Optimum plant population is to be maintained for providing good open position for sunlight, availability of moisture and nutrients as these factors are vital for successful crop production aimed at higher yield and quality. Increase in plant spacing increased the plant spread, leaf area, flower number, flower weight and dry matter production. The planting in wider spacing increased the plant growth vigorously with more number of leaves (Shiraj Anwar and Maurya, 2005; Jamil Ahmed et al., 2010).
Besides these agro-techniques, crop management practices like application of growth regulators and bio fertilizers need to be studied to increase the quality of spike and production of daughter corms when the crop is introduced in a new locale. In general the plant growth regulators play an important role and are being used for breaking dormancy and production of quality corms and spikes in gladiolus (Bhattacharjee, 1984). Poor multiplication rate and lack of planting material impairs year round production of gladiolus. This also results in high cost of corms, which is often higher than the sale price of the spike produced by that corm. Application of GA, (Panwar et al., 2006) NAA and Kinetin (Dual et al., 1984) were found best in early initiation of spike and for higher spike yield. Dipping of corms in the CCC solution, breaks the dormancy and promotes the sprouting of lateral buds resulting in increased number of corms and cormels per plant (Dataram et al., 2001; Maurya and Nagda, 2002; Roy and Chowdhuri, 1989 and Ravidas et al., 1992). Further, the crop need to be supported for increased nutritional requirement augmented by the physiological changes caused due to growth regulator application. Bio-fertilizers offer more economical and eco-friendly option of fertilization to gladiolus. Among the bio-fertilizers PSB (phosphorus solubilizing bacteria), VAM (vesicular arbuscular mycorrhiza) and Azotobacter are found effective in gladiolus (Chandar, et al., 2012). To augment the spike and corn yield combination of both phosphorus mobilizing and nitrogen fixing bio-fertilizers are tried and found better in gladiolus (Dongardive, 2007).

The above facts and conditions necessitate need to optimize the crop management practices like plant spacing, corm size, time of planting, application of growth regulators and biofertilizer to bring this cut flower crop under commercial scale in coastal Tamilnadu condition. Hence, the present investigation entitled “Studies on crop management practices in gladiolus (Gladiolus grandiflorus L.)” was carried out with the following objectives.
• To study the influence of planting season on growth, flowering and corm yield of two varieties of (G. grandiflorus L.).

• To study the correlation between weather parameters and growth of (G. grandiflorus L.).

• To study the effect of corm size and spacing on growth, flowering and corm yield of (G. grandiflorus L.)

• To study the effect of growth regulators on growth, flowering and corm yield of (G. grandiflorus L.).

• To study the effect of humic acid and bio-fertilizer treatments on growth, flowering and corm yield of (G. grandiflorus L.) and

• To standardize optimum dose of growth regulator, humic acid and bio-fertilizer treatments for the production quality spikes and corms in (G. grandiflorus L.).