



Gladiolus- queen of bulbous flowers

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Gladiolus (*Gladiolus grandiflora* L.) is an herbaceous and one of the most cultivated, economically important and common flowering plants worldwide including Pakistan. The genus gladiolus is classified in the family *Iridaceae* and many species of this genus are found in South Africa, Tropical Africa, Madagascar and Eurasia. *Gladiolus Grandiflorus*, generally called “Glad” and originated from South Africa, is a prominent bulbous cut flower plant. It is also known as “queen of the flowers” is one of the popular bulbous ornamental plants. In India

about 3500 ha area is under bulbous ornamental with maximum area come under gladiolus followed by Tuberose (800 ha). Uttarakhand is also one of the important pockets of commercial flower cultivation in India. Foreseeing the potentiality, APEDA has defined Uttarakhand as one of the export zone for floriculture products in the country. Among the cultivated flowers gladiolus ranks first in Uttarakhand with area (89.99 ha), production (121.89 MT) and productivity (1.34 M Tha⁻¹) respectively as compared to other flowers crop like rose, liliium etc. *Gladiolus* is one of the most important bulbous cut flowers in the flower industry. It occupies the fifth position in the International floriculture trade. *Gladiolus* is one of the important bulbous plants which is valued the gardens for its beautiful flower spikes.

Queen of bulbous flower?: Among the different bulbous plants, the gladiolus top the list in its beauty, glamour keeping quality, various colours and shades, shapes, hence it is called as “Queen of Bulb”.

Centre of origin : *Gladiolus (Gladiolus grandiflorus)* is native to Tropical and South Africa; consist of approximately one hundred and fifty known species. It has its natural habitat in the Mediterranean regions and South Africa.

Common name : Sword lily and glad

Botanical Description:

Plant type : Herbaceous plant that bearing underground storage stems known as corms.

Stems: Unbranched, producing 1 to 9 narrow, sword-shaped, longitudinal grooved leaf that enclosed in a sheath.

Shape of leaf blade: Plane or cruciform.

Inflorescence : Spikes.

Flower: Flowers are bisexual each consist two leathery bracts. Because of similar appearance of sepal and petal

are known as tepal. They are united at their base into a tube-shaped structure. Stamen of these flower attached with its base. It consist inferior and trilocular with oblong capsules that contain many, winged brown, longitudinally seed

Placentation arrangement : Axile

Fruit type : Capsule.

Colour of flower : Flowers with brilliant colours, attractive

shapes, varying sizes, excellent keeping quality. The florqts open in sequence over a longer duration and hence, has a good keeping quality of cut spike.

Pink to reddish or light purple with white, contrasting markings, or white to cream or orange to red.

Mode of pollination: Pollinated is carried by bees, sunbirds, moths, flies.

Climate: *Gladiolus* cultivated during the winter season in plains and summer in hills under Indian condition. It is grown round the year under mid climate condition *viz* Bangalore and Karnataka. Optimum temperature is required for better growth of *Gladiolus* is 15°C -20°C. The temperature range of flowering is 25-30⁰ C. It is sensitive to frost condition.

Soil : Soil that absorbs enough moisture from the groundwater during dry periods is essential for the growth of *Gladiolus*. Sandy loam soil with good drainage is more



effective for its development. The optimum pH soil of is 5.5 to 6.5

Preparation of field: Land should be ploughed thoroughly at least a fortnight prior to planting the corms. Recommended dose of manure should be apply prior to the ploughing of soil. Open the furrow with row to row spacing of 20-45 cm and make irrigation channels for drainage prior to the planting.

Verities/Corms: Small corms should be taken for production of cormels and larger corms are used for flower production. During the first stage of production, cormels develop into small corms which were not suitable to produce flowers (the finished size depending on their original size and the vigour typical of that variety). The propagation factor of a certain batch of corms and/or cormels will depend largely on the genetic characteristics of its variety and where it is planted for production purposes. Corms are supplied according to size; corm size indicates the circumference of the corm as measured in centimetres (cm). The corm size is a determining factor in the quality of the flower. Larger corms produce flowers earlier than smaller corms. Larger corms also produce more (and larger) florets per stem and (depending on the cultivar or cultivar group) more flower stems.

Propagation material : Gladiolus grows from corms, which consist of one or more buds. Minimum 5cm corms are required for propagation. Once planted the buds on the corms develop into leaves and flowering spikes. At the same time as the leaves and spikes are extending, a new corm forms at the base of the leaves while at the union of the parent and daughter corm, stolons grow out, terminating in cormels which are used for propagation.

Seed rate : 1,50,000 to 1,60,000 corms /ha.

Planting time: The planting time of gladiolus in plains is between September and October, whereas in the hills the suitable planting time is March and April.

Method of planting: Corms can be planted on raised beds or ridges. Where drip irrigation is used, row planting would be preferable.

Depth of planting: Planting depth depends on several

factors such as soil type, location (greenhouse or field), corm size and planting period. The depth for spring planting, corms is 10cm but this depth can be increased to 10 to 15cm for summer planting, because it provide low soil temperature that encourage good rooting before emergence. Avoid deep planting it may cause decaying of corms in soil.

Irrigation: Number of irrigation is depend on the soil type, weather conditions and stage of the crop. Irrigation is not required in rainy season. In lateritic soils, irrigation should be given once in a week during winter and twice in a week during summer whereas in sandy loam soils once in a week during summer and once in a week or 10 days during winter.

Fertilizer application: Gladiolus requires both macro as well as micronutrients for good growth and flower production. The nutrient deficiency occurred in light sandy soils which can be corrected by the additional supply of the particular nutrient to the plant. Amount of doses for healthy corms apply 20-25 tonne well decomposed FYM at the time of land preparation.

Recommend doses and time of application is given below :

Nitrogen : 120 kg/ha (60kg/ha nitrogen applied as basal dose and remaining 60 kg nitrogen in applied in 2 split dose, 1 month and 2 month after planting)

Phosphrous: 150kg/ha (whole quantity of P_2O_5 apply as basal dose)

Potash : 150kg/ha (whole quantity of K_2O apply as basal dose)

Earthing up: Gladiolus is a shallow rooted crop and need earthing up to prevent lodging of plants due to heavy wind, rain and weight of spike. When plants attain a height of about 30 cm, these should be earthed up and process repeated after 2-3 weeks to get a final height of 15cm and staking should be done after spike emergence or when required. It provides good anchorage or support to plants to sustain its own weight and avoid lodging.

Mulching in gladiolus: Gladiolus base can be mulched with hay or dry material to prevent the water loss and

Table 1 : List of different cultivar based on flower colour

Colours	Cultivars
Yellow	Aldebaron, Jester, Nova Lux, Top Brass, Topaz, Vink's Glory
White	Americian White, White Friendship, White Prosperity
Pink	Friendship Pink, Suchitra, Spic and Span
Red	Americian Beauty, Oscar, Red Majesty
Purple	Blue Lilac, Red Beauty, Interpid, Trader Horn, Mayur, Marvellous

weed control. Mulching creates a cooler growing environment that slows growth, lengthens the stem and flower head and adds distance between the buds. It also provides a more consistent soil moisture level by reducing evaporation from the soil surface. While hoeing and hand-weeding are excellent methods of weed control.

Weeding: Weeds are causes of reduction quantity and quality of floral production which reduce gladiolus production. Weeds can be control by several methods like: herbicides, barriers or mulches, and hoeing and hand-weeding. Weed barriers and mulches prevent weed growth and restrict soil splash on foliage and flowers from rain and irrigation. The greatest benefits in weed control occur early in the growing season while glads are becoming established. Materials such as green hay and sawdust are commonly used in the production of glads.

Insect and disease control: Insects affecting glads are trips, red spider mites, aphids and wireworms these insects should be control of early stage with the use of bio-control agent such as *Tricoderma* and *Corcyra* Major diseases cause the reduction of quantity and quality of gladiolus flowers, also responsible for plant mortality. Such as Botrytis blight, root rots, aster yellows, and storage rots. These can control by spraying of Indofil M-45 (2g/L) in combination with Bavistin (1g/L) at fortnight interval against corm rot throughout the cropping season after plants are 15 cm tall. Similarly spray the crop with Malathion (0.05%) or Nuvan (0.05%) against insect/pests. water).

Harvesting : It take three to four month to produce spike depending upon on variety. For distant markets spikes should be harvest at tight bud stage with two to three leaves remaining on the stem when the lowest bud shows colour. For local market, harvest the spike when lower flower has started opening. Harvest the spikes during morning or evening hours. During harvesting, processing, packaging, storage and transport, it is important to keep the harvested stems upright in all cases. If left in a horizontal or slanted position, the tip of the flower stem will start to bend upward. After a while, this bend in the stem becomes more rigid. Later, when the stem is placed in an upright position again, the tips of the flower spikes will remain crooked. So avoid this by ensuring that the stems are standing up nice and straight even before harvesting by adjusting the level of the support netting in

time.

Yield potential: Yield depend on several factors such as plant age, soil type, variety, climate and crop management practices.

Yield of spike : 2 to 3 lakhs spike /ha

Yield of corms: 18000 to 20,000 corms/ha

Packaging: Tube light boxes or gunny bags and wooden tray are used for the packaging of cut-flowers in ten spike bunch. Size of cardboard or wood is 33x33x120 cm. After packaging should be store at 5-10°C temperature to maintain the freshness of flowers.

Precaution during post harvest :

- Grade by stem length, flower size and cultivar.
- Keep 10 spikes/ bunch
- Recut stems under water to a uniform length.
- Store graded and bunched stems in clean, disinfected containers in commercial floral preservative.
- Keep stems upright position and wrapped in moisture proof materials.
- Store at 36–40°F and 85–90 per cent relative humidity.



Uses and health benefit of gladiolus:

The primary purpose of gladiolus is to produce cut flower which can be marketed in local market or these flowers can be grown for ornamental purpose. Cut flower is very good for beds, herbaceous border for making bouquets and does well in pots.

Some medicine health benefit of dried bulb which is ground into powder

are following :

- Gladiolus flower bulb powder may help in curing common cold
- It relieve from diarrhea
- Reduce pain during menstruation in women
- It may help in curing fungal infections
- It may help in relieving ulcers
- It may also help in alleviate constipation
- Cut flower used for decoration

Conclusion: Gladiolus is an important herbaceous plant that produce beautiful, attractive and glamorous flower that not only used as ornamental purpose but its product has several medicinal property. So from this above literature it is suggested to increase the focus of cultivation of this type flower crop that make our garden beautiful and create happiness in mind.