

Cultivation techniques of Marigold

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BOTANICAL DESCRIPTION

Botanical name: *Tagetes patula* - French marigold

Tagetes erecta - African marigold

Family: Composite

Origin: Central and South America and Mexico

Chromosome Number:

African marigold $2n= 24$

French marigold $2n = 48$

***Tagetes erecta* (African marigold):**

- The African marigold plant is hardy, annual and grows about 90 cm tall, erect and branched.
- Leaves are pinnately divided and leaflets are lanceolate and serrated.
- Flowers are single to fully double with large globular heads.
- Flower colour varies from lemon yellow to yellow, golden yellow or orange.

***Tagetes patula* (French marigold):**

- The French marigold is a hardy annual, grows to about 30 cm tall, forming a bushy plant.
- Foliage is dark green with reddish stem.
- Leaves are pinnately divided and leaflets are linear, lanceolate and serrated.
- Flowers are small, either single or double borne on proportionately long peduncles.
- The flower colour varies from yellow to mahogany red.

USES

- The long stemmed flowers used for vase arrangements.

- It is highly suitable as bedding plant, in an herbaceous border, also as shrubbery in landscaping.
- French marigold is ideal for rockery, edging, hanging baskets and window boxes.
- Have medicinal properties to cure boils and carbuncles.
- Floral extract is used as a blood purifier and cure for bleeding piles.
- Good remedy for eye diseases and ulcers.
- Some species of *Tagetes* are used for essential oil extraction.
- Used for coloring the food stuffs, textile industries and pharmaceuticals.
- *Tagetes patula* contain essential oil which can readily be extracted by steam distillation.
- The oil has a pronounced odor and acts as a repellent to flies.

VARIETIES

- ***Tagetes erecta* (African marigold):**
 - Giant Double African Orange, Giant Double African Yellow, Crackerjack, Climax, Doubloon, Golden Age, Chrysanthemum Charm, Crown of Gold, Spun Gold.
- ***Tagetes patula* (French marigold):**
 - Red Brocade, Rusty Red, Butter Scotch, Valencia, Succana.
- ***Tagetes tenuifolia*:**
 - Golden Gem, Lulu, Pumila, Ursula.

CLIMATIC REQUIREMENT

- Marigold requires mild climate for luxuriant growth and profuse flowering.
- It ceases to grow at high temperature thereby flower quantity and quality is adversely affected.
- During severe winter including frost plants and flowers are killed and blackened.
- Sowing and planting is carried out during rainy season, winter and summer season.
- Hence, flowers of marigold can be had almost throughout the year.

SOIL REQUIREMENT

- Marigold can be successfully cultivated on a wide variety of soils.

- However, a soil that is deep fertile and sandy loam, friable having well water holding capacity, well drained and near to neutral in reaction
- pH of 7.0-7.5 is most desirable.

Time of Transplanting-

- Mid July, middle of September and middle of February are suitable time for transplanting.
- At the time of transplanting the seedlings should be of 7 to 10 cm height and bear 3-4 true leaves.

Transplanting should be done in well prepared land in the evening hours.

Transplanting of seedlings-

- Land should be ploughed 2 to 3 times to bring the soil to a fine tilth.
- One month old seedlings with 3-4 leaves are fit for transplanting.
- Watering of nursery bed one day prior to uprooting will lessen the damage to root system.
- Uprooting of seedlings and transplanting should be done in the evening hours for better establishment.

PROPAGATION

- Marigold is propagated by both methods i.e.,
 1. Seeds
 2. Cuttings.

BY SEEDS: Crop raised from seeds is taller than the vegetative propagated one and vigorous and heavy bloomer; thus, it is preferred over cuttings.

- For better seed germination, optimum temperature range between 18 to 30 oC is required.
- Seed rate of 1.5 kg is required for one-hectare area.
- Seeds of marigold can be sown in pots, seed boxes or on flat or raised nursery beds.

- Nursery beds of 3 x 1 m size are thoroughly prepared and mixed with 10 kg of well decomposed farmyard.

BY CUTTINGS

- This method is commonly followed for maintaining the purity of varieties.
- Normally, the presence of adventitious roots along the stem helps in the establishment of cuttings.
- About 10 cm long cuttings are made and treated with seradix No.1.
- The cuttings are planted in the sand to strike roots easily and plants thus raised are used for bedding and pot.

Selection of site-

- A sunny location is ideal for marigold cultivation.
- Under shade, it produces more vegetative growth and do not produce any flowers.
- Highest yields are obtained when planting is done during August - September.
- Rainfall during rainy season and high temperatures during summer will affect the flower quality.

SPACING

- Proper spacing between plants is required for better development of plant and higher flower yield. The following spacing is recommended for marigold.
- 1) African marigold: 40 X 30cm or 60 X30 cm.
- 2) French marigold: 20 X 20cm or 20 X15cm.

Manures and Fertilizers-

- Incorporate 50 tones of Farm Yard Manure/hectare during the last ploughing.
- Apply 400 kg N, 200 kg P₂O₅ and 80 kg K₂O per hectare.
- Half of nitrogen, entire dose of phosphorus and potash should be applied as basal dose, preferably one week after transplanting.
- Rest half of Nitrogen should be given two or three times during the vegetative growth period preferably applied one month after first application at fifteen days interval.

- Irrigate after each application of fertilizers.

Irrigation:

- At all stages of vegetative growth (55-60 days) and during flower production sufficient amount of moisture in soil is essential.
- Moisture stress at any stage affects normal growth and flowering.
- In lighter soils more frequent irrigations are required than in heavy soils.
- In sandy loam soil, weekly irrigation is necessary between Sep. to March while during summer months between April to June irrigation at 4-5 days intervals is required.

- **Insects Pest and their Management:**

Bud caterpillars (*Helicoverpa armigera* and *Phycita* sp.):

Control:

- Collection and destruction of infested buds and flowers can prevent the further spread of the disease. Sprays of Endosulfan 0.07% or Methyl Pathion 0.05%.

Aphids (*Aphis gossypii*):

Control: Spraying of Oxydemeton methyl 0.05% or Moncrotophos 0.05%.

Thrips-

Control: Two or three sprays of Oxydemeton methyl, Diemthoate 0.05%, at 10 days interval.

Hairy caterpillar (*Diacrisia oblique*):

Control: This caterpillar eats away foliage. This caterpillar can be controlled by Nuvan or Thiodan at 1 ml/l of water.

Diseases and their Management-

Damping off:

- Seeds should be treated with Captan @ 3 g or Carbendazim @ 2.5 g per kilogram of seeds before sowing.

Flower bud rot:

- To control this disease regular spraying of the crop with Dithane M- 45 @ 0.2% should be followed.

Powdery mildew (*Oidium sp. Leveillula taurica*):

- The disease can be controlled by spraying with Karathane (40 E C) @ 0.5% or dusting with sulphur powder at fortnightly intervals.

Harvesting:-

- Marigold flowers are plucked when they have attained full size.
- Plucking of flowers should be done in cool hours of the day.
- The field should be irrigated before plucking so that flowers keep well for a longer period after harvest.
- Plucked flowers are collected in polythene bags or bamboo baskets for carrying to markets.

Flower Yield-

- The yield of flowers in African and French marigold not only varies with cultivar but also cultural practices including planting, spacing and fertilization showed a marked variation in flower number from 6 to 8 millions and from 1.5 to 2.5 millions per hectare, in French and African marigold, respectively.
- The corresponding ranges of variation in the weight of flowers were 8 to 12 tones/ha in French marigold and 11 to 18 tones/ha in African marigold.

Seed Yield-

- Seeds should be collected only from winter crop.

African marigold:

- 120-150 Kg/acre

French marigold:

- 400-500 Kg/acre.