

Cultivation Practices and Production Technology of Marigold Crop

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Introduction:

Flowers are considered as a symbol of love, beauty and a gift of nature. Flowers are used by us to provoke the feelings of love and happiness. Marigold is native to South and Central America especially Mexico and belong to the family Composite. The genus *Tagetes* commonly cultivated species are *Tagetes erecta* (African Marigold), *Tagetes patula* (French Marigold) and *Tagetes minuta*. Amongst these *Tagetes erecta* and *Tagetes patula* are more commonly grown for their ornamental values while the later for its high content of essential oil. Marigold are long upright and quick growing habit. The height of plants ranges from 30 to 90 cm. The flowers of these varieties are deep orange, light orange, golden yellow, bright yellow and lemon yellow in color. The size of flower may vary from 4 to 6cm (diameter). Marigold is good source of carotenoid pigment for poultry feed to intensify yellow color of egg yolks. Marigold also finds industrial application like preparation of natural dyes and essential oils. It is used as mosquito and nematode repellents. The marigold plants are highly useful for suppressing the population of nematodes in the field also. The uses of marigold are many fold, often referred to as, "Versatile crop with golden harvest". Marigolds produce thiopenes, which are toxic to nematodes and used as trap crop in tomato, brinjal, tobacco etc. In India, major flower growing states are West Bengal, Tamil Nadu, Karnataka, Uttar Pradesh etc. About 309-thousand-hectare area under floriculture with production estimated to 1653 thousand MT of loose flower and 593 thousand MT of cut flower. Among these flowers, marigold is the leading loose flower of India. In India, the total area under marigold

cultivation is 47.68 thousand hectares with production of 501.87 thousand MT (**Anomous, 2017**).

Climate:

Marigold requires mild climate for luxuriant growth and flower production. The optimum temperature range for its growth is 20 -30°C. Marigold plant survive best in dry and hot condition but very hot climate give adverse effect on flower yield.

Soil:

Marigold can be grown in a varied type of soils except water logged conditions. But it can be grown best on well drained sandy lome fertile soil. Marigold no need more acidic and alkaline soils with pH 7.0 to 7.5 are suitable for higher production of flower.

Land preparation:

Ploughing the field 2 to 3 times by the desi plough or tractor with rotavator bring field to fine tilth. During the last ploughing of the field Farm Yard Manure @ 50 ton/hectare or well decomposed cow dung in soil or compost mix in the field.

Sowing time:

Marigold easily grown three times in a year- **Rainy seasons** (seed sown in middle of Jun and transplanting seeding during middle of July month), **Winter seasons** (seed sown in middle August and seeding successful transplanting in middle of September month) and **Summer seasons** (sowing of seed first week of January and then transfer seedling first week of February) hence flowers of marigold can be grown throughout the year.

Seed rate and transplanting:

For raising seedling, required 1.5 kg seeds/ha. Raising seedling standard size of nursery bed is 3×1 meter. 8 to 10 bed are required for raised seedling for one-hectare transplanting. Seed can be sown by broadcast or line method in nursery. Treat the seeds with *Azospirillum* before sowing. Before sowing of seed DDT and BHC broadcasted outer side of bed to protect from the ants. Seedlings are transplanted after 28 to 32 days when seedling attained 3 to 5 true type leaf. Propagation by cutting commonly followed for maintain the purity of varieties.

Variety: Some specific variety are given below-

(1) African Marigold: Climax, Cracker jack, Golden Age, Crown of Gold, Chrysanthemum Charm, Star Gold, Pusa Narangi Genda, Pusa Basanti Genda, Guinea Gold, Apricot, Sun Giants, Primrose, Fiesta, Golden Yellow, Shaggy, Glitters, Mammoth Mum, Happiness, Spun Gold and Cupid.

(2) French Marigold: Butter Scotch, Valencia, Rusty Red, Flame, Spry, Star of India,

Spacing:

Spacing should be maintaining in African marigold is 40×30 cm and French marigold 20× 20 cm or 20 ×15cm.

Manure and Fertilizer:

Incorporate 40 to 50 tonnes of FYM /hectare during the last ploughing of field. Marigold is one of the commercial flower but research work has not been determining the describe dose of nutrient for growth and flowering. For heights yield of flower N: P: K @100:100:100 kg/ha required at the time of preparation of land and remain 100kg Nitrogen/ha should be applied one month after transplanting of seedling.

Weeding and Hoeing:

Weed problem in marigold found especially in rainy season. In, India weeding is done manually. Total 3 to 4 times weeding are required during entire growth period marigold. Chemical weed control is also recommended.

Irrigation:

Irrigation should be given 7 to 8 days' interval for obtain higher yield of marigold. In summer season frequent irrigation 4 to 5 days' interval required. Water stagnation should be avoided otherwise many diseases are occurred easily and destroyed the entire plant.

Pinching in Marigold:

Removal of apical portion of shoot is known as pinching. Pinching is a form of pruning that encourages branching of the plant. Pinching forcing the plant to grow more new stems from

the leaf nodes below the pinch. First time pinching done at 40 days after transplanting enhances flower yield. Due to pinching maximum yield are obtaining easily.

Yield:

Flower yield are depending upon the season of planting and cultural practice adopted by former. In rainy season fresh flower yield are 200 to 250 quintal/hectare, in winter season 150 to 175 quintal/hectare and 100 to 120 q/ha yield obtain in summer season.

Diseases management:

Generally marigold crop is free from diseases and insects' pest. Occasionally some diseases and insect pests observed are given below.

(1) Damping off: Caused by the fungus (*Rhizoctonia solani*) and major symptoms are brown necrotic spots on young seedlings.

Control:

- ❖ Drenching with copper oxychloride @3g/l or brassicol (0.3%).
- ❖ Proper drainage should be provided in the nursery beds.

(2) Powdery Mildew: Caused by the fungus *Oidium* sp. and *Leveillula taurica*. Major symptoms are appearing as grey or white powder and in severe condition leaves turn yellow and fall prematurely.

Control:

- ❖ Dusting Kerathane (40 E.C) @ 0.5% or sulphar powder on the plant surface for immediate control.

(3) Alternaria leaf spots and Blight: Caused by *Alternaria*, *Cercospora* and *Septoria*. Small brown spot near the lower leaves.

Control:

- ❖ Spraying Dithane M-45 2 0.2%.

(4) Collar rot: Caused by *pythium* sp. and *phytophthora* sp. fungus. Major symptoms of this disease are black lesions on main stem of the plant, rotting at the collar region and destroyed the entire plant.

Control:

- ❖ Carbendazim @ 1g/l diminishes the occurrence of collar rot disease.

(5) **Fusarium Wilt:** Wilting in marigold caused by the fungus (*Fusarium oxysporum*) and wilting of entire plant.

Control:

- ❖ Crop rotation is the best way to control wilting in marigold.
- ❖ Carbendazim (0.2%) is effective for wilting.

(6) **Cucumber mosaic:** This is the Viral disease and caused mottling of leaves and busy appearances of plant.

Control: Use of Dimethoate at 2 ml/l.

Pest management:

(1) **Red spider mite (Tetranychus sp.):** This pest sucks the sap of the plant and then plant are injured badly.

Control: Spraying of Kelthane (2 ml/l).

(2) **Aphid:** Attack of aphid on the marigold plant the major symptoms are black or brown spot on the plant appear.

Control: Spraying of malathion at 2 ml/l.

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