

Livelihood generation

through marigold cultivation round the year

Sanchita Ghosh*, R K Tiwari and Ranjan Kumar

Krishi Vigyan Kendra, Birauli, Samastipur, Dr Rajendra Prasad Central Agricultural University, Pusa, Bihar 848 113

Among the loose flower crops, marigold flowers are widely being used for floral decorations, floral arrangements, religious offerings etc. Marigold is reported to be native of Central and South America, especially Mexico. The genus Tagetes comprising about 33 species of which Tagetes erecta (African Marigold), Tagetes patula (French Marigold) and Tagetes minuta (Wild Marigold) are under commercial cultivation in India. Amongst these, T. erecta is commonly grown for their exquisite blooms and also natural dye (xanthophyll) extraction, while the later species is used for its essential oils. Apart from cut flower purpose, marigold is highly used for beautification as a pot plant and also used in landscaping as a bedding plant, in a herbaceous border, shrubberies to provide colour and fill the spaces. French marigold is most ideal for rockery, edging, hanging basket and window boxes.

Keywords: Flower-string, Marigold, Seedlings, Transplanting

MARIGOLD is a versatile crop due to which apart from beautification, it is also being used economically for extraction of carotenoid pigment which is mainly used in poultry industries to intensify yellow-orange colour of egg yolk and broiler skin. It also acts as a trap crop to control fruit borer in tomato and suppresses the nematode population. Marigold plant is also rich in therapeutic properties for which herbal doctors prescribe it for simple ailments. The juice extracted from leaves is used for getting relief from boils, carbuncles and earache. In Bihar, farmers are mostly cultivating marigold as most profitable ornamental plant. Bihar's agroclimatic condition is highly suitable for round year cultivation of marigold which is highly remunerative for small and marginal farmers.

Varieties

There are a large number of varieties of marigold are available for commercial cultivation. However, mostly local varieties are being

cultivated by the farmers which are generally low yielders. Premier institutions like, IARI, New Delhi; IIHR, Bangalore; and BCKVV, Mohanpur has lead to the release of several varieties of marigold for cultivation in Indian plains.

African marigold: Pusa Basanti

Gainda, Pusa Narangi Gainda, Pusa Arpita, Arka Agni, Arka Alankara, Arka Bangara, Siracole.

French marigold: Jafri, Red Brocade, Pusa Deep.

Soil and climate

The soil should be well drained,



Marigold field in full blooming condition



Fig. 1. Propagation and transplanting seedlings of marigold

Table 1. Sowing and transplanting time of marigold

Flowering season	Sowing time	Transplanting time
Late rains	Mid June	Mid July
Winter	Mid September	Mid October
Summer	January-February	February-March

well aerated, deep, fertile with good water holding capacity and neutral soil reaction (pH 6.5-7.5). Saline and acidic soils are not suitable for cultivation. An ideal soil for marigold cultivation is fertile sandy loam. African and French marigold both are hardy in nature. They can grow well throughout the year under tropical and subtropical conditions but requires mild climate for luxuriant growth and flowering.

Sowing time and season

Depending on environment, planting of marigold can be done round the year which is principally divided into three seasons i.e. rainy,

winter and summer and seeds are sown accordingly. Hence, flowers of marigold can be supplied to market round the year. The seasons of sowing and transplanting of seedling for obtaining flowers at different seasons of a year are given in Table 1.

Propagation

Marigold is commercially propagated by two methods i.e. by seed and cutting. The marigold seeds are black in colour and remain viable for about 1-2 years. Seeds should be sowed in pots filled with sand or raised nursery beds (Fig. 1). Nursery beds are prepared by digging area and well rotten FYM is incorporated

in the soil. Seeds should be treated with Captan (2.5 g/kg) before sowing of the seeds (Fig. 2). Seeds should be sown thinly (6-8 cm row to row) and 2cm deep and covered with sieved leaf mold. The nursery beds should be remained moist during entire period. The quantity of seed required depends upon the level of its purity and germination rate. Generally 200-300g seed/acre is required for raising the nursery in summer and rainy season, and 150-200g/acre for winter season. The seed germinate in 4-5 days after sowing and seedlings become ready for transplanting after 3-4 weeks of sowing.

Transplanting of seedlings

Marigold seedlings are transplanted when the plants are about 7-10 cm long with 3-4 true leaves (Fig. 2).

Thin and long seedlings are not desirable. Transplanting should be done in well prepared land and soil is pressed around root zone to avoid air pocket. After transplanting, a light irrigation or watering with rose-cane should be done.

Spacing

Plant density depends largely upon the growth habit, cultivar and the soil type. In general spacing should be 30 × 30 cm for French marigold and 40 × 40 cm for African marigold.

Manures and fertilizers

Marigold is a short duration crop, therefore it requires plenty of fertilizers for good yield. At the time of land preparation, 150-200 quintal FYM /ha has to be applied. In addition to FYM it is advisable to apply 200 kg/ha nitrogen and 60-80



Fig. 2. Seedling treatment before transplanting in main field



Fig. 3. Marigold plant as border crop in vegetable field

kg/ha each of phosphorous and potash for good flower yield. The full dose of phosphorous and potash should be given before transplanting while nitrogen is given in two split doses (30 and 60 days after transplanting).

Weeding, hoeing and irrigation

Weeds are major problem in marigold field especially during rainy season. Pre-emergence application of pendimethaline @ 1.0 kg a.i./ha followed by hand weeding at 30 and 60 DAP is proved to be effective in successful weed control at marigold field. Depending upon soil and season crop should be irrigated at 7-8 days interval. In lighter soil, more frequent irrigation is required than that in heavy soil. Moisture stress at any stage of crop growth can adversely affect the growth and development, therefore it is essential that soil should remain moist and heavy irrigation should be avoided.

Pinching

Pinching (removal of terminal portion) is done mechanically to promote laterals and increasing the number of flowers. Pinching is recommended after 34-40 days of transplanting when plants attain a height of 30-40 cm or before bud formation. Second pinching is also

done occasionally to avoid the glut or to catch markets.

Diseases and pests

Marigold is hardy crop, therefore relatively free from diseases and insect pests. However, occasionally diseases like Damping off, Leaf spot and blight, Collar and root rot, Flower bud rot are observed. In case of Damping off, infected seedlings are pulled, soil is sterilized with Formalin@ 2% or Captan 2 g/litre of water. For other diseases, spraying of Dithane M- 45 and Ridomil @ 2.5g/ lit of water and use of quality seeds is recommended. The insect pests mostly observed are Bud caterpillars (*Helicoverpa armigera*), Aphids (*Aphis gossypii*) and red spider mite. In all cases the infected parts need to be destroyed along with application of 2-3 sprays of Imidachloropid solution (0.25%) or Dicofol (30 ml/10 lit).

Harvesting and yield

Fully open flowers should be plucked at proper stage is important to keep the flowers fresh for a longer time for export purposes. Marigold flowers are plucked when they have attained the full size. Flowers should be plucked cultivars, cultural practices like planting time, spacing and fertilizers. The flower yield in African marigold ranges from 125-150 q/ha

whereas, it is 80-120 q/ha in French marigold.

Marigold cultivar Siracole blooms in farmer's field

Mr Rajendra Kumar Rai of Bahadura village, Samastipur district, Bihar has taken up cultivation of marigold cv. Siracole in 350 sq.m area (Fig. 3). He cultivates cv. Siracole round the year fetching remunerable price in the market. With good colour and attractive shape, it has great demand. "The flowers were strong and durable, that made transportation and marketing easy for us", said Mr Rajendra. Apart from selling loose flower in the market, he made value addition by preparing flower-string which also has good demand in the market. In a single picking he gets around 200 flower-strings and for making each string, about 30 flowers are used. His gross income is ₹ 10,000 from 350 sq.m area, expenditure ₹ 4,500 and therefore he gets a net income of ₹ 5,500 from 350 sq.m area in one cropping season. Then if the farmer grow one ha area of marigold cv. Siracole, he may get net income of ₹ 1,57,143 where the cost: benefit ratio is 1.81.

Corresponding author's email:
sanchitajolly28@gmail.com

Know Krishi Unnati Yojana

The *Krishi Unnati Yojana*, a central sector scheme, is envisaged as umbrella programme for focusing on food security, by merging schemes on Soil-health Card, Integrated Scheme on Agricultural Co-operation and Agricultural Marketing, National Mission on Agriculture Extension, Horticulture Development, Price Stabilization Fund, National Mission on Sustainable Agriculture and other programmes.