

Package of practices for flower crops in Odisha

Rose (open cultivation)

Soil : Soil should be loamy, fertile, well drained with good water holding capacity. The ideal pH of the soil for growing rose is 6.0 to 7.5.

Climate : Rose can be cultivated in Odisha. Good quality roses are produced during the winter season only. The number of flowers, stem length and number of petals decreases during summer season. The incidence of pest, particularly mite increases during summer season In Odisha.

Varieties : Mainu Parle, Papa Meilland and Via Mala are most preferred cultivar of rose in Odisha.

Planting time : Budded rose plants are planted during October-November.

Propagation methods : Rose is mostly propagated by budding.

Spacing : Roses are planted at a spacing of 60cm X 40cm. Ridge and furrows are prepared in the field and the budded plants are planted on ridges.

Manure and Fertilizer : Twenty tons well decomposed FYM, 3 tons bone meal is incorporated into one acre of land during field preparation. The recommended fertilizer dose for rose is 80:40:40 kg/acre NPK respectively. Half of Nitrogen, full Phosphorus and Potash are mixed with soil during field preparation. Other half of Nitrogen is applied 30 days after planting. Vermicompost (300g/m²), Azospirillum and PSB (2g/plant) are applied to rose plants for better results.

Pruning : Pruning in rose is mostly done during September-October to remove dead and diseased branches. Pruning is done with a sharp secateur and Bordeaux paste is applied to the cut ends immediately after pruning. Organic manures are applied immediately after pruning and chemical fertilizers are applied one week after pruning.

Weeding : Black polythene mulch is suitable for controlling weeds. UV stabilized black polythene (100µ thick) should be used as it last for 3 years.

Watering : Watering is done at regular intervals, depending on field condition.

Harvesting : The stems are harvested, with unfurling of first petal, early in the morning. Immediately after harvest, the cut stems are kept in a bucket containing clean water.

Pulsing and holding : Cut flowers of hybrid tea rose 'Mainu Parle' are pulsed with Aluminum sulphate (300ppm) for 6 hours for longer vase life. The holding solution containing 300ppm aluminum sulphate and 1.5% sucrose is the best holding solution for cut rose stems.

Pest and Disease :

The most common pests of rose in Odisha are thrips and mites which can be controlled by spraying Imidachloprid @0.5ml/lit.

The most common disease in rose is die back, which is controlled by taking preventive measures like, pruning with a clean secateur, cleaning the secateur with spirit at frequent intervals and applying Bordeaux paste on the cut end. The rose beds should be kept free from weeds.

Marigold

Soil : Soil should be fertile, friable, well drained with good water holding capacity. The pH of the soil should be 7 to 7.5.

Climate : The climate of Odisha is very much suitable for cultivation of marigold except hot summer months as high temperature reduces the size and number of flowers.

Varieties : Winter season : Bidhan marigold-1, Bidhan Marigold – 2, Arka Agni, Arka Bangara

Rainy season : Bidhan Marigold - 2

Summer season : Siracole

Propagation methods : The cultivars like, Bidhan marigold-1, Bidhan Marigold – 2, Arka Agni, Arka Bangara are mostly propagated by cuttings. The mother plants are always maintained in vegetative stage and are not allowed to bear flowers. The buds are pinched from the mother plant as soon as they appear. Terminal cuttings (4” long) are taken from the mother plants and planted in sand beds for rooting. These cutting are ready for planting after 15 days.

The cultivar Siracole is propagated by seeds.

Spacing : Rooted cuttings are planted at a spacing of 40cm (row to row) and 40cm (plant to plant). Ridge and furrows are prepared in the field and rooted cuttings are planted on ridges.

Manure and Fertilizer : Twenty tons well decomposed FYM is incorporated into one acre of land during field preparation. The recommended fertilizer dose for marigold is 80:80:80 kg/acre NPK respectively. Half of Nitrogen, full Phosphorus and Potash are mixed with soil during field preparation. Other half of Nitrogen is applied one month after transplanting.

Weeding : Black polythene mulch is suitable for controlling weeds in marigold.

Watering : Watering is done at regular intervals, depending on field condition.

Pinching : The terminal buds are pinched 40days after transplanting to encourage lateral shoots.

Harvesting : Fully opened flowers are plucked by hand early in the morning. The field is irrigated before plucking to enhance longevity of flowers. Regular plucking should be done to increase yield of flowers.

Pest and Disease :

The most common pest of marigold in Odisha is red spider mite. It can be controlled by spraying Sulfex @2g/lt.

The most common disease of marigold in Odisha is bud rot which can be controlled by spraying a mixture of Carbendazim and Mancozeb @1.5g/lt.

Tuberose

Soil : Soil should be sandy loam, fertile, well drained, well aerated with good water holding capacity. The ideal pH of the soil for tuberose is 6.5 to 7.5.

Climate : The climate of Odisha is very much suitable for cultivation of tuberose. More number of spikes are produced during rainy season. The number of spikes and size of florets are reduced with increase in temperature during summer months.

Varieties : Cultivars like Prajwal, Phule Rajni, Calcutta Double are suitable for cultivation in Odisha.

Planting time : In Odisha, tuberose bulbs are planted during April-May.

Propagation methods : Tuberose is propagated by bulbs (2-3cm diameter). Larger bulbs produce spikes earlier as compared to smaller bulbs. The bulbs are harvested and stored for 30 days in a shady and dry place with good ventilation, before planting. The bulbs are treated with copper fungicide for 30min, just before planting.

Spacing : Bulbs are planted at a spacing of 30cm X 30cm and at a depth of 5cm. Ridge and furrows are prepared in the field and bulbs are planted on ridges.

Manure and Fertilizer : Twenty tons well decomposed FYM is incorporated into one acre of land during field preparation. The recommended fertilizer dose for tuberose is 120:80:80 kg/acre NPK respectively. Half of Nitrogen, full Phosphorus and Potash are mixed with soil during field preparation. Other half of Nitrogen is applied 45 days after planting.

Weeding : Three to four times weeding are required during the growth of tuberose.

Watering : Watering is done at regular intervals, depending on field condition.

Harvesting : Cut Flower – The spikes are harvested when the lower most floret is fully open.

Loose Flower – Fully open florets are harvested early in the morning.

Pest and Disease :

The most common pest of tuberose in Odisha is mealy bug. It can be controlled by spraying Thiomethazyme @ 0.5ml/lt.

Chrysanthemum

Soil : Chrysanthemum prefers a soil pH ranging from 6.5 to 7.0. Soil should be rich in organic matter, friable, well drained with good water holding capacity.

Climate : Chrysanthemum can be grown in the climate of Odisha during winter season only.

Varieties : Flirt, Yellow Gold, Bidhan Jayanti, Bidhan Madhuri, Arka Chandrika, White Reagan.

Propagation methods : Chrysanthemum is mostly propagated by terminal cuttings. Root suckers arise from the base of the plant after flowering. These root suckers are allowed to grow and terminal cuttings are collected from these suckers in the following rainy season. Terminal cuttings (3-4" long) are taken from these suckers and planted in sand beds for rooting. These cutting are ready for planting after 21 days.

Planting time : The rooted cuttings are planted in poly bags in the month of July-August and kept inside poly houses to encourage vegetative growth. These plants in poly bags are planted in the main field after the rain ceases. This results in more vegetative growth and more flower production.

Spacing : Plants in poly bags are planted at a spacing of 40cm (row to row) and 30cm (plant to plant). Ridge and furrows are prepared in the field and rooted cuttings are planted on ridges.

Manure and Fertilizer : Twenty tons well decomposed FYM is incorporated into one acre of land during field preparation. The recommended fertilizer dose for chrysanthemum is 120:80:80 kg/acre NPK respectively. Half of Nitrogen, full Phosphorus and Potash are mixed with soil during field preparation. Other half of Nitrogen is applied one month after transplanting.

Weeding : Black polythene mulch(50µ) is suitable for controlling weeds in chrysanthemum.

Watering : Watering is done at regular intervals, depending on field condition.

Pinching : Chrysanthemum requires two pinching. The terminal buds are pinched 30days after transplanting and second pinching is done 21 days after 1st pinching to encourage lateral shoots.

Harvesting : Fully opened flowers are plucked by hand late in the morning, after dew dries up.

Pest and Disease :

The most common pest of chrysanthemum is aphid. It can be controlled by spraying Malathion @1ml/lit.

The most common disease of chrysanthemum in Odisha is black leaf spot which can be controlled by spraying Carbendazim @2g/lit.

***Dendrobium* hybrids**

Climate - *Dendrobium* hybrids can be grown successfully in the coastal districts of Odisha.

Protected structure – *Dendrobiums* hybrids are mostly grown in shade net houses. They prefer black shade net (50% shade). The sides of the shade net house should be kept open for adequate ventilation.

Media – A mixture of coconut fiber and charcoal (2:1) is the best for growing *Dendrobiums*. In the absence of charcoal only coconut fiber can be used for cultivating orchids.

Bench – *Dendrobiums* are mostly kept 2.5ft above the ground level as they need good aeration for their growth and flowering. This is done by keeping them on benches or raised structures made up of concrete posts and shade net. Shade nets are preferred to benches as excess moisture drains out instantly.

Variety: Emma White, Sonia-17, Pompadour, Sapphire.

Propagation : *Dendrobiums* are mostly propagated by division or by keikis. To start a commercial plantation of orchid, it is advisable to go for tissue culture raised plants from an authentic source.

Nutrition : Water soluble fertilizer (19:19:19 NPK) @ 0.2% is applied to the plants twice a week. Micronutrient @0.1% is applied once in two months. Vermiwash (3%) is sprayed on plants to get healthy plants and better spikes.

Post harvest handling

The spikes of *Dendrobiums* are pulsed in a solution containing aluminum sulphate (100 ppm) for better vase life. The holding solution containing 300 ppm aluminum sulphate and 5% sucrose is considered as the best holding solution for *Dendrobiums*. The keeping quality of *Dendrobium* hybrids were maximum when the spikes were wrapped with polythene and kept in packing boxes with KMnO_4 during transit.