

Scientific cultivation of Citrus Production (Citrus spp.)

Lav kumar¹, Alok Kumar², Agnivesh yadav³, Bhanu Pratap⁴

¹Research Scholar, Department of Vegetable Science

²Research Scholar, Department of Fruit Science

³Research Scholar, Department of Vegetable Science

⁴Associate professor, Department of Fruit Science

^{1,2,3}Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya (U.P)

⁴Banda University of Agriculture and Technology, (BUAT) Banda, (U.P)

CITRUS

(Tangerine/loose skinned of jaket)

Botanical Name - *Citrus spp.*

Family - Rutaceae

Sub family - Aurantoideae

Chromosome No. - $2n=2X= 18$

Origin - Tropical and Subtropical South East Asia

Pollination - Entomophilous (Honey bee)

Inflorance - Cymose or solitary

Bearing habit - Axillary on current season

Growth curve - Double sigmond growth curve

Propogation - T Budding

Type of Fruit - Hesperidium

Edbile part - Juice placental hairs

Acid present in citrus fruit - Citric acid



Introduction

Citrus is native to a large area, which extends from Himalayan foot hills of northeast India to north-central China, the Philippines in east and Burma, Thailand, Indonesia and New Caledonia in Southeast. In India, in terms of area under cultivation, citrus is the third largest fruit crop after Banana and Mango. Citrus cultivation in India is plagued with various problems due to limiting growing

conditions, limiting water resources and high incidence of pests and diseases warranting great care from planting till the plants come to bearing in order to sustain a productive life of a minimum of 15-20 years. There is growing interest/awareness among the citrus growers for adoption of latest technologies for commercial cultivation of citrus. The National Research Centre (NRC) for Citrus (ICAR), Nagpur.



Citrus fruits

| | Global Scenario | National Scenario |
|--------------|-----------------|-------------------|
| Mandarin | 13% | 44% |
| Lime & lemon | 10% | 28% |
| Sweet orange | 71% | 18% |
| Others | 6% | 10% |

Technical Requirements of Citrus Cultivation

Climate and temperature

Citrus fruits in India are cultivated under varied agro-ecological conditions right from arid and

semiarid areas of southwest region to humid tropical climate of northeast India. Citrus trees are evergreen, grown in truly subtropical climates of the world although in tropical regions of the world they tend to produce cyclic growth flushes and hence regulating cropping in tropical areas for forcing them into concentrated bloom needs judicious management of water deficit stress according to soil type and growing season.

Citrus plants are grown in a wide range of soils ranging from sandy loam or alluvial soils of north India to clay loam or deep clay loam or lateritic/acidic soils in the Deccan plateau and north-eastern hills. grown in a pH range of **4.0 to 9.0**.

Planting Material

Availability of quality planting material is of utmost importance in citrus cultivation. Citrus plants are very sensitive to various biotic and abiotic stresses. Therefore, selection of an ideal rootstock is a continuing challenge for the citrus industry of India. Currently used rootstocks viz. rough lemon and Rangpur lime have gone through a lot of variation over the last five decades. Therefore, ideal selections developed from the conventional rootstocks by National Research Centre for Citrus (NRCC), Nagpur polythene bags also as they become ready for plantation in the main field after attaining the height of about 30-40 cm after one year.

Land preparation

Land needs to be thoroughly ploughed and levelled. In hilly areas, planting is done on terraces against the slopes and on such lands, high density planting is possible as more aerial space is available than in flat lands. Since citrus trees are highly sensitive to water logging and water stagnation during rainy season providing drainage channels of 3-4 feet depth along the slopes around the orchard is essential.

Planting

The best season of planting is June to August. Pits of the size of 1m x 1m x 1m may be dug for planting seedlings. 15-20 kg of FYM and 500 g of super phosphate is applied per pit while planting. With good irrigation system, planting can be done in other months also.

Vatieties

1 - Coorg

- 2- Khasi
- 3 - Nagpur
- 4- Satsuma (seedless)
- 5 - Emperor and Fuetrelles
- 6- Sutwa
- 7- Laadu

Hybrid

- 1 - Kinnow

Table: Year wise requirement of various nutrients (g/plant/year)

| Nutrients | I Yr | II Yr | III Yr | IV Yr | V Yr | VI Yr onwards |
|-------------------|------|-------|--------|-------|------|---------------|
| Nitrogen | 100 | 200 | 300 | 400 | 450 | 500 |
| Phosphorus | 50 | 100 | 150 | 200 | 200 | 250 |
| Potash | 25 | 50 | 75 | 200 | 200 | 250 |
| ZNSO ₄ | 25 | 25 | 50 | 50 | 100 | 150 |
| FeSO ₄ | 25 | 25 | 50 | 50 | 100 | 150 |
| MnSO ₄ | 25 | 25 | 50 | 50 | 100 | 150 |

Interculture

Ploughing, spading of basins, weed control, etc., are important inter-culture operations for soil aeration and health. Chemical control of weeds with pre-emergence weedicides like diuron (3 Kg/ha), simazine (4 Kg/ha), glyphosate 4 l/ha, paraquat (2 l/ha), etc. may also be adopted. Intercrops Leguminous crops like soybean, gram, groundnut, cow peas, french bean, peas etc., may be grown in citrus orchards.

Pests and Diseases Management

Pests

Important insect-pests of citrus are citrus black fly and whitefly, citrus psylla, Citrus thrips, leaf miner, scale insects, bark eating caterpillar/trunk borer, fruit fly, fruit sucking moth, mites, etc. Other

pests attacking citrus particularly mandarin orange, especially in humid climate are mealy bug,

Citrus thrips:

Foliar spray either with dimethoate 1.5 ml or monocrotophos 1 ml/litre of water at bud burst stage and berry size fruits.

Trunk borer:

Swabbing of tunnel either with dichlorvos (0.1%) or carbaryl (1%) or monocrotophos (0.02%) kills the grub effectively.

Bark eating caterpillar:

Plugging of larval tunnels with cotton wad soaked either in dichlorvos (0.1%) or carbaryl (1%) or monocrotophos (0.01%) effectively checks the pest.

Diseases

Powdery mildew:

Pruning of dead twigs followed by foliar spray of wettable sulphur @ 2 g/litre, copper oxychloride @ 3 g/litre of water in April and October.

Anthraxnose:

Pruning of dead twigs followed by two foliar sprays of carbendazim @ 1 g/litre or copper oxychloride - 3 g/litre at fortnightly interval.

Harvesting

There are two main crops in mandarins and sweet oranges. One is called as *Ambiabahar* (mango flowering) the flowering of which occurs in the month of January (at the time of flowering of mango hence the name *Ambia*) the fruits of which are available in the months of October-December. The other crop is *Mrigbahar* (Monsoon bloom) the flowering of which occurs in the month of June-July and the fruits are harvested during February-April. Mandarins and sweet oranges normally take 240-280 days to arrive at maturity. Mature fruits at colour break stage are picked up in 2 - 3 intervals of 10-15 days. Limes and lemons take 150-160 days for maturity. There may be 2 or 3 crops in a year in limes and lemons.

Yield

Mandarin:

Commences from the 5th year with about 50 fruits per tree and stabilizes in the 8th year. Average production is about 700-800 fruits per tree after stabilization.

Sweet Orange:

Commences from 5th year with 40-50 fruits per tree & stabilizes around the 8th year. Average production is about 500-600 fruits per tree after stabilization.

Lime/Lemon:

Commences from the 3rd year with 50-60 fruits per tree & stabilizes in the 8th year. Average production is about 1000-1500 fruits per tree after stabilization. Economic life of plantation: 15 to 25 years.

Post-harvest management

For imparting uniform yellow-orange colour to the fruit's application of ethephon @ 250 ppm along with 1 % calcium acetate as foliar spray at maturity stage is recommended. Sweet oranges and mandarins may be treated with ethylene gas for de-greening and development of colour. A temperature of 6-7°C, 5-10 ppm of ethylene and 90-95% RH in a de-greening chamber can set a change in colour in about 48 hours. The cold storage conditions for long term storage for different citrus fruits are available. Pre-cooling of citrus is done by forced air system.