CITRUS

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CITRUS CULTIVATION

Introduction:-

Botanical name - Citrus spp.

Family - Rutaceae

Area and production:-

- Citrus is native to a large area, which extends from Himalayan foot hills of north-east India to north central China.
- In India, in terms of area under cultivation, citrus is the third largest fruit crop after Banana and Mango.
- In India, citrus fruits are grown in 9.15 lakh ha. With total production of 79.22 lakh tonees annually, accounts for 13.6 and 10.4% of total area & production, respectiveely.
- In India major producing state are Maharashtra, Andhra Pradesh, Punjab, Madhya Pradesh, Gujarat, Karnataka, Rajasthan, Assam,Orissa, and Uttarakhand etc.

Important citrus spices:-

Crops	Botanical Name	Origin	Varieties
Mandarin	Citrus reticulata	China	Coorg, Khasi, Kinnow, Satsuma, Nagpur,
Sweet Orange	Citrus sinensis	China	Satgudi, Samouti, Hamlin, Mosambi
Lemon	Citrus limon	South-East Asia	Eureka, Villafranca
Lime	Citrus aurantifolium	India	Pramalini, Chakradhar, Sai sarbati, Jai devi
Grape fruit	Citrus paradisi		Star ruby, Triumph, Marsh seedless,

Important & uses:-

(i) Citrus is a good source of Vit. C

(ii) Prepared many value added products such as Juice, RTS, Nectar, Squash, cordial, preserve, pickle, chutney, marmalade.

Flowering and Fruiting:-

(i) The flowering in citrus take place mostly in spring.

(ii) In lime and lemon, flowering take place almost throughout the year.

(iii) Mostly in citrus flowering in Feb.-March.

(iv) The sweet lime tree two type of flowers staminate and hermaphrodite on the same tree.

(v) Inflorescence of citrus is solitary, and fruit type is hesperidium.

Climatic requirements:-

(i) Citrus trees are evergreen, grown in subtropical climates of the world.

(ii) Citrus fruits grow best between a temperature range of 13^0C to 37^0C, when temperatures below – 4^0C are harmful for the young plants.

(iii) Soil temperature around 25^0C seems to be optimum for root growth.

(iv) Frost is highly injurious.

(v) High humidity favors spread of many diseases.

Soil requirements:-

(i) Citrus plants are grown in sandy loam or alluvial soils.

(ii) Deep soils with pH range of 5.5 to 7.5 are ideal.

(iii) High calcium carbonate concentration in feeder root zone may adversely affect the growth.

Plant density:-

Crops	Spacing(m^2)	Planting Density
Mandarin	6 m x 6 m	277 / ha.
Sweet orange	6 m x 6 m	277 / ha.
Limes/lemons	5 m x 5 m	400 / ha.
Grape fruit/ Pummelo	6 m x 6 m	277/ ha.

Manures & Fertilizer:-

Year's/Plant	I	II	III	IV	V	VI
FYM(kg)	10	15	20	25	30	40
Nitrogen(g)	100	200	300	400	450	500
Phosphorus(g)	50	100	150	200	200	250
Potash(g)	25	50	75	200	200	250

Interculture/Intercropping:-

(i) Ploughing, spading of basins, weed control, etc., are important inter-culture operations for soil aeration and health.

(ii) 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.

(iii) Leguminous crops like soybean, gram, groundnut, cow peas, french bean, peas etc., may be grown in citrus orchards.

(iv) Intercropping is advisable during the initial three-four years after planting.

Training and Pruning:-

(i) In order to allow the growth of a strong trunk, initially shoots upto 40-50 cm from the ground level should be removed.

(ii) The centre of the plant should remain open.

(iii) Branches should be well distributed to all sides.

(iv) Cross twigs and water suckers are to be removed early.

(v) The bearing trees require little or no pruning.

(vi) All diseased, injured and drooping branches and dead wood are to be removed periodically.

Harvesting:-

(i) Normally the bearing starts from 4 year onwards. However, the commercial yield can be obtained from 6 year onwards.

(ii) Maturity of citrus fruits depends upon the climatic condition, scion-rootstock and management practices.

(iii) The period of maturity is shortest in lime (5-6 months), longest in mandarins and sweet oranges (9-10 months) which is further influenced by heat and moisture.

(iv) The maturity in sweet orange (Citrus sinensis) is indicated by the change of the skin colour from dark green to light yellow.

(v) The outer skin get shiny appearance and the oil glands are visible.

Yield:-

(i) A well maintained sweet orange orchard yields 600-800 fruits/plant/year from 8 year onwards,

(ii) Nagpur Mandarin of same age yields 800-1000 fruits/plant/year.

(iii) In case of lime, a seven year old lime plant yields 1000-1200 fruits/year.

Canker : (*Xanthomonas campestris* pv *citri)*

Symptoms:-

(i) Acid lime, lemon and grapefruit are affected.

(ii) Affects leaf, twig and fruits. In canker, leaves are not distorted.

(iii) Lesions are typically circular with yellow halo; appear on both sides of leaf.

(iv) On fruits, canker lesions reduce market value.

(v) Initial symptom on leaves

Management

(i) Streptomycin sulphate 500-1000 ppm; or Phytomycin 2500 ppm or Copper oxychloride 0.2% at fortnight intervals.

(ii) Control leaf miner when young flush is produced.

(iii) Prune badly infected twigs before the onset of monsoon

Tristeza or quick decline :- *Citrus tristeza virus* **(CTV)**

Symptoms:-

(i) Lime is susceptible both as seedling or buddling on any root stock.

(ii) Roots decay, twigs die back.

(iii) Tree stunted and dies yield very much reduced.

(iv) Use of infected bud wood and *Toxoptera citricida* (aphid) is the important vector.

(v) Fruits are small in size.

Management:-

(i) For sweet orange and mandarin, avoid susceptible root stocks.

(ii) For acid lime, use seedling preimmunised with mild strain of tristeza.

Greening : -***Liberobactor asiaticum*** (Phloem limited bacteria)

Symptoms:-

(i) This disease affects almost all citrus varieties irrespective of root stock.

(ii) Stunting of leaf, sparse foliation, twig die back, poor crop of predominantly greened, worthless fruits.

(iii) Sometimes only a portion of tree is affected. A diversity of foliar chlorosis.

(iv) Many twigs become upright and produce smaller leaves.

Greening symptom on leaf:-

(i) Low in juice and soluble solids, high in acid.

(ii) Infected budwood; psyllid vector-*Diaphorina citri*

Management:-

(i) Control psyllids with insecticides.

(ii) Use pathogen free bud wood for propagation.

(iii) 500 ppm tetracycline spray, requires fortnightly application.

Citrus aphids :-

Black aphid: *Toxoptera aurantii,*

Brown aphid: *Toxoptera citricida*

Symptoms of damage:-

(i) Feed on tender foliage and flowers.
(ii) Transmit tristeza virus disease.
(iii) Nymphs and adults suck the sap of leaves
(iv) Wilting and flower dropping
(v) Infested leaves - cup shaped and crinkled
(vi) Growth of the plants is hindered.

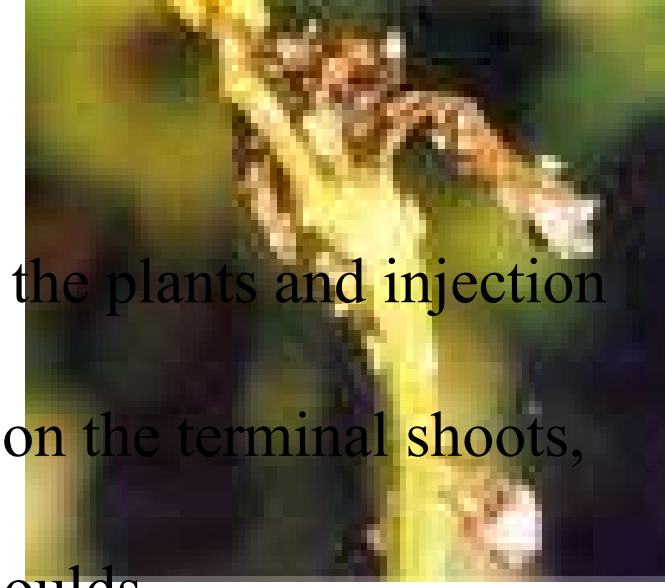
Management:-

(i) Use yellow sticky trap

(ii) Spray with methyl demeton (Metasystox) or dimethoate (Rogar) 2ml /lit

(iii) Use some concinellid beetles and syrphid flies

Citrus psyllid(Diaphorina citri):-



Symptoms of damage:-

(i) Both nymphs and adults suck sap from the plants and injection of toxic saliva.

(ii) Nymphs - are more destructive, crowd on the terminal shoots, buds and tender leaves

(iii) Excrete honeydew - growth of sooty moulds.

(iv) Affected plant parts dry and die away

(v) It is transmits the "Greening" virus

Management:-

(i) Collect and destroy the damaged plant parts.

(ii) Spraying with systemic insecticides at flush growth periods Spray malathion 0.05% or monocrotophos 0.036% or carbaryl 0.1% or methyl parathion 0.05%.

(iii) Encourage the activities natural enemies such as Syrphids and Chrysopids.

Citrus butterfly*(Papilio demolious, P. Polytes, P.helenus)*

Symptoms of damage:-

(i) Defoliation Larva feeding Caterpillars prefers on light green tender leaves

(ii) Feeding voraciously and leaving only the mid-ribs.

(iii) Severe infestation the entire tree gets defoliated.

Management:-

(i) Hand pick the larvae and destroy First instar

(ii) Spraying of 1.5ml monocrotophos (Nuvacron)

(iii) Field release of parasitoids *Trichogramme evanescens* and *Telenomus sp* on eggs

(iii) Brachymeria sp on larvae and *Pterolus sp*. on pupae.