LEC .26 AVOCADO - SOIL, CLIMATE, PLANTING, RACES, VARIETIES, FLOWERING BEHAVIOUR, NUTRIENT AND WATER MANAGEMENT, SPECIAL CULTURAL OPERATIONS, PHYSIOLOGICAL DISORDERS, PESTS AND DISEASES, MANAGEMENT PRACTICES

AVOCADO

Avocado, one of the most nutritive fruits, has orighinated in Central America. Avocado is now grown in most of the tropical and subtropical countries. The pulp of Avocado the so called butter fruit, has a buttery consistency and the fruit has very high fat content (26.4 g /100g). As the sugar content is low, it can be recommended as a high energy food for diabetics.

Climatic and soil requirements:

Avocado trees of the West Indian race perform well in humid tropical climate, but the other two races viz., Mexican and Guatemalan fail to flower or set fruit in the tropics. On the other hand, the West Indian race sets little or no fruit in subntropical climte. In between Mexican and Guatemalan races, the Mexican race alone survives in regions where minimum winter temperatures goes to – 0.5^{o}C to 3.5^{o}C. If proper race and cultivars are chosen, avocadoes can thrive and produce a good crop in climatic conditions ranging from true tropical to warmer parts of the temperate zone.

Though avocadoes can be grown successfully in varying soil conditions, they are extremely sensitive to poor drainage and saline conditions. They will be happy in soils with pH ranging from 5-7.

Mexican Race:

This group is characterized by small fruits weighing less than 250 g and ripening in 6-8 months after flowering. Oil content of the fruit is 30 per cent, the highest of all the three races.

Guatemalan Race:

Fruits are fairly large each weighing upto 600g and ripen in 9-12 months after flowering. Oil content ranges from 8 – 15%.

West Indian Race:

The fruits are medium sized and ripen in 9 months after flowering. The oil content of fruit is low, ranging from 3 – 10%.

CULTIVARS

Fuerte:

It is the most popular cultivar of avocado. It is a hybrid of the Mexican and Guatemalan races. Fruits are pyrifrom, each weighing between 225 and 450 g having 18 to 26 per cent oil. It is fairly resistant to cold, better suited to subtropics than tropical climate. It belongs to group-B.

Hass:

It originated as a seedling from the Guatemalan race. It matures much earlier than Fuerte. Fruits are medium sized, roundish and turn purple on ripening. This is also more suitable to subtropical climate. It belongs to group –A.

Pollock:

A West Indian race bears large fruit that weights upto 1 kg or more having an oil content of 3-5 per cent suited to be grown in a tropical climate.

Purple:

It belongs to the West Indian race. Fruits are pear-shaped, skin is deep crimson or maroon in colour. Suited to humid tropics.

Green:

This belongs to the Guatemalan race. Fruits are large, oval, with yellowish green skin. It is suited to subtropical climate.

TKD 1:

Developed at Horticultural Research Station, Thadiyankudisai of TNAU, Tamilnadu. The fruits are medium sized and round. Trees upright and semispreading hence suited for high density planting. Yield 264kg / tree. Fruits are sweet TSS8^{o} brix, fat 23.8%, protein 1.35%.

Propagation and planting:

Avocado is normally propagated by seeds. The viability period of avocado seed is very short (2-3 weeks), and can be improved by storing the seed in peat or sand at 5^{o}C. Removal of the seed coat before sowing helps to speed up the germination. The seed can also be split lengthwise into 4-6 parts, leaving a piece of embryo on each.

Avocado can also be propagated vegetatively by cutting and grafting. The Mexican race is relatively easy rooting whereas, the West Indian race is relatively easy rooting whereas, the West Indian race is quite difficult to root. The Guatemalan race is intermediate in rooting ability of cuttings. Cleft, whip and tongue and whip grafting are the most successful methods.

The normal planting distance for avocado is 6-12 M depending on the vigour of the cultivar.

Manurings:

Avocado requires heavy fertilization. Application of nitrogen is the most essential. Nitrogen deficiency causes restricted growth, with reduced, pale coloured leaves and smaller fruits. An average crop of avocado removes 40 kg N, 25kg P_2O_5, 60 kg K_2O, 11.2 kg Ca O and 9.2 kg MgO/ha from the soil. Therefore, to maintain the soil fertility for getting consistent yields, it becomes necessary to replenish these nutrients.

Problems in fruitset:

Avocado starts bearing at 5-6 years after planting and has a marked tendency to biennial bearing which is prevalent in a number of other fruit trees. But there is specific problem in fruitset as far as avocado concerned.

In avocado, the inflorescence is a compound panicle. The individual flowers are morphologically bisexual having fertile male and female organs. But they exhibit dichogamy viz., the male and female organs coming to maturity at different time thereby avoiding self-pollination of an individual flower. In dichogamy, they are protogynous viz., the female parts coming to maturity before male organs. The type of dichogamy in avocado is a complicated one unique to avocado-the diurnally synchronous dichogamy. The female parts of all flowers that open at a time in a particular tree will mature simultaneously and hence behave functionally as female flower. The male parts of same flowers will come to maturity when the flowers open

next time and hence all of them behave as male flowers during that period. By this the cross pollination between flowers of the same tree are also ruled out. The situation is further worsened by the fact that all the trees of a particular group will be exhibiting the same sex phase at a particular time and the opposite sex phase during the next opening of the same flower. So if the trees of single group are planting in mass, they will not set fruit and each group requires inter planting of trees of mother group, the two groups being compatible with one another.

Based on this unique flower behaviour, avocado cultivars can be divided into two groups A & B. In group A, first opening takes place in the morning, second opening during the afternoon of the following day. In group B, first they open in the afternoon then agin next morning. Therefore, every morning A-pistils can be fertilized by B-pollen, while during afternoon B-pistils are ready to receive A-POLLEN.

Honey bees are the chief pollinating agents.

Interculture and weed management:

Deep cultivation in avocado orchards should be avoided because of surface roots. Intercropping with legumes or shallow-rooted crops can be done in young orchards which can smoother weeds also.

Avocado trees are pruned sparingly mainly by heading back the central shoot in upright growing cultivars such as Pollock, to develop a spreading habit. Branches are thinned and shortened in spreading cultivars like Fuerte.

Plant protections:

Pests:

Mites, mealy bugs, scales are the important insect pests of avocado. Spraying of systemic insecticides will effectively check these pests.

Fruitspot:

It is caused by Colletotrichum gloeosprotioides. Infection results in shedding of young fruits. Ramaining fruits become deformed. This can be controlled by spraying of Indofil-M.45@2g/lit . Controlled atmospheric storage of fruits in 2% O_2 at 7.2^{o}C for 3-4 weeks will prevent the development of the fungus in storage.

Root rot:

Root of avocado is caused by Phytophthora cinnamomi. Soil drenching of Ridomil (1gai/10 lit) controls root rot.

Harvest and storage:

Fruits should be cut from the tree using hand clipper or a long pole equipped with a clipper and cloth catching bag. Average yield is about 100-500 fruits per tree.

Avocado fruit does not soften while on the tree, but does only after it is picked. The matured avocado fruit ripen in 6-12 days at 20^{o}C.