

LEC.10 GRAPES – SOIL, CLIMATE, VARIETIES, NUTRIENT AND WATER MANAGEMENT, INTERCULTURAL OPERATIONS

Grapes : *Vitis vinifera* Vitaceae

Grape is a subtropical fruit but adapted to tropical conditions. It is a vine spreading on a support, native of Armenia, a district near the Caspian Sea in Russia. It was introduced into India by the invasions of Iran and Afghanistan. It is one of the most delicious refreshing and nourishing fruits. Fifty percent of the total production of fruits in the world is contributed by grapes. Cultivation of grapes is called Viticulture. There are about 10,000 varieties in the world.

Climate and soil requirement

It is a fruit of semi arid subtropical regions requiring warm dry summer and a cool rainy winter. During winter the grapes shed off their leaves and take rest. During spring they put forth new leaves and flowers. The fruits mature during summer when there is no rain. A long, warm to hot dry summer is needed for proper maturity and ripening. Grapes do not thrive in the region of humid summer as it causes fungal diseases. The distribution of rains is more important than the total amount of rainfall.

In North India heavy rains during July – September hence low production. The plant takes rest during winter since the winter is very severe and put forth new growth in summer. When the crop reaches ripening stage during June there is heavy rain resulting in poor production.

In Western India grapes do not take rest because of warm winter. Hence the grape put forth new growth twice a year. In Bombay – Deccan region and in Hyderabad the crop produced by the new flush in April maturing during rainy season (July – August) has lower market value due to less sugar content.

The climate in South India such as Bangalore in Karnataka, Dharmapuri and Madurai districts of Tamil Nadu is slightly humid and tropical. Here the maximum temperature goes up to 35°C and the minimum temperature does not fall below 12°C due to warm winter condition there is practically no rest period. Almost rainless period during November – June favours heavy as well as sweet crop. Here the vines are pruned twice. Early December pruning yields a sweet crop during April and summer pruning (May) yields a slightly sour crop during September. The

climatic conditions are favourable in parts of Tamil Nadu so that 5 crops are taken in 2 years by staggered pruning techniques.

Soil

Well – drained rich loamy soil with pH of 6.5-7.0. Soil depth should be almost 1 m.

Propagation

Propagated by hard wood cuttings prepared from matured canes (one year old shoot) of healthy, moderately vigorous, virus free vines. Cuttings of 25-30 cm length are prepared by making the lower cut just below a bud and upper cut slightly above the bud. Cuttings should be tied and stored in moist sand for a month for callusing. The callused cuttings start well in the nursery. While planting only one bud is left above the ground level and remaining portion buried in soil. At the end of winter the sprouted and rooted cuttings can be lifted and planted in the main yield. Grafting and budding is practiced with a particular root stock for specific requirement.

- a. Phylloxera resistant root stock
Vitis riparia, V. rupestris
- b. Nematode resistant root stock
Dogridge, Salt creek
- c. Saline tolerant : Solanis, 1616

Preparation of main field and planting

Trenches of 0.6 m width and 0.6 m depth are dug at a distance of 3 m apart for Muscat. Other varieties 1 m³ pits are dug. Well decomposed FYM or compost or green leaf manure has to be applied in the trenches or pit and then covered with soil. The rooted cuttings are planted during June – July.

Spacing: 3 x 2 m for Muscat
4 x 3 m for other Varieties

Irrigation

Immediately after planting 3rd day and once in a week. Irrigation withheld 15 days before pruning and also 15 days before harvest.

Manuring and fertilizer (kg per vine)

Variety	FYM			Green leaves			N			P			K		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Muscat	50	50	100	50	50	100	0.10	0.20	0.20	0.08	0.16	0.16	0.30	0.4	0.60
Thom -pron seedless	50	50	100	50	50	100	0.20	0.30	0.40	0.08	0.16	0.24	0.40	0.80	0.120

The manures should be applied twice after pruning. Apply half the dose of K immediately after pruning and the other half after 60 days of pruning. Foliary spray of 0.1% boric acid + 0.2 % ZnSO₄ + 1.0% urea twice before flowering and 10 days after first spray to overcome nutrient deficiency.

Special practices

Tipping of shoots and tying of clusters in the pandal after the fruit set. Remove tendrils. Nipping the growing shoots of axillary buds and terminal buds at 12 to 15 buds. Thinning the compact bunches by removing 20% of the berries at pea stage.

The clusters are dipped in a solution containing Brassinosteroid 0.5 ppm and GA₃ 25 ppm at 10-12 days after fruit set to maintain vigour, yield and quality parameters.