GUIDE
TO THE
PRODUCTION OF
GRAPE VINE
EXTENSION GUIDE No 127
GUIDE TO THE PRODUCTION OF GRAPEVINE

INTRODUCTION:

The grapevine was introduced in Nigeria by Haj Pilgrims from the Middle East and Christian Missionaries from Europe. Hitherto, the growing of grapevine was confined to a few stands around the backyards and some vegetable gardens with little or no success due to lack of know-how of its cultivation. Successful cultivation of grape, requires high capital investment and intensive maintenance. A well managed vineyard will produce good yield and consequently give enviable profits. Ripe fruits are eaten fresh as desserts and fruit juice, raisins and wine are also made from it.

CLIMATE AND SOIL:

Grape is basically grown in the temperate and sub-tropical regions. The vines shed leaves, the rest in winter, put forth new shoots in spring and mature in summer. In the tropics, however, the vine is evergreen and yields poorly unless special techniques of pruning are employed. Humid tropical conditions are ideal for pests and diseases and therefore unsuitable for grape cultivation. Rains during flowering and ripening result in poor fruit set and berry splitting, respectively. The grapevine can withstand temperature up to 35 degrees centigrade during the dry season provided they are profusely irrigated. Grapes can be grown on a variety of soils with free drainage. The root systems of the grapevine do not go beyond one meter depth therefore silty and loam soil are ideal. Acidic soils need fortification with calcium.
VARIETY
Anab-e-shahi
Black Hambury
Thompson Seedless
Muscat of Alexandria

USES
Table and Desserts
Juice Grapes
Raisins and Desserts
Wine

PROPAGATION:

For large scale cultivation, grape is propagated by cuttings. Seed propagation in grape is resorted to in breeding work mainly. Grafting and budding on rootstock to obtain resistance to phylloxera pest or nematodes, or to increase the vigour of weak-growing varieties is also practiced in grape cultivation. If, however, the need for propagation through seeds or rootstock has not arisen, cuttings, should preferably be used.

Mature wood for the previous season's growth is to be selected at grape pruning. Each cutting should be at least 8 mm thick (about pencil thickness). Make the basal cut just below a bud. However, mallet cuttings (cuttings that bear a small portion, or heel, of the previous years growth) root more easily. The cutting should also be at least three buds long (Fig. 1). Protect the cuttings from drying out by putting them in moist sacks or in wet soil, sand or saw dust. Plant before any root or shoot growth occur in the cuttings.

Fig. 1 - a, Mallet cutting; b and c, good ones cuttings; d, thinner than optimum; e, thicker than optimum.
The cuttings could be planted in nursery soils well-prepared, well-fertilized and free of weeds. Polythene bags or pots are, however, commonly used to raise seedlings for transplanting. Prepared soil mixture, two parts top soil and one part sand in the ratio 2:1. To every kerosine tin full of this soil mixture, add a hand-ful of single super-phosphate fertilizer. The polythene bags are then filled with the soil mixture and watered. Plant one cutting per bag with one or two buds above soil surface and firm the soil around them. The cuttings should be watered as often as necessary until good sprouts and sufficient roots are established for transplanting.

**PREPARATION OF LAND AND PLANTING:**

Grapevines are planted in pits, however, it is preferable to plough and harrow the land at the beginning of the rainy season. The vines are planted at equal distances in the square system with the following spacing:-

<table>
<thead>
<tr>
<th>Variety</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anab-e-shahi</td>
<td>5m x 5m</td>
</tr>
<tr>
<td>Thompson Seedless</td>
<td>2.5m x 2.5m</td>
</tr>
<tr>
<td>Black Hambury</td>
<td>3.5m x 3.5m</td>
</tr>
<tr>
<td>Blue Grapes</td>
<td>3.5m x 3.5m</td>
</tr>
</tbody>
</table>

Rectangular pits of size 72cm deep by 50cm width are dug at specified distances. At digging, the top half soil should be put on one side and the other half of the dug soil on the opposite. To the top half of the soil, an equal amount of well decomposed organic matter, preferably animal manure, should be added and mixed. Then to this is added 5kg of single superphosphate and mixed thoroughly.

Vigorous and healthy rooted cuttings of the age of 6 to 12 months are to be planted. The rooted cuttings should be planted any time from
the month of January to June. Place the plant deep in the centre of the pit with half of the plant exposed. The soil is rammed and compacted with foot and watered profusely.

**STAKING:**

Support the vine with any stick of two meters height. Paint the stick with tar or old engine oil to prevent termite attack. It takes about one month for transplanted young plant to establish. As the vine grow, only one single shoot should be allowed to come. The shoot should be tied to the stick at every half meter distance with a strip of polythene film of 1cm width. All side branches that appear from time to time should be nipped, allowing one main shoot to climb up to 2m height.

**TRAINING AND PRUNING:**

In order to understand better the discussion that follows, definition of the following important terms are given (also see Fig. 2).

1. **Trunk or main stem** – This is one single stem raised up to 2m height.

2. **Arms or secondary stems** – These are two horizontal arms (right and left of the vine along the bower) branching at 2m height.

3. **Tertiary** – Shoots produced up to 1m initially and at one time, allowed to extend only up to 2m length. A vine will have 20 tertiaries with 10 each side.

4. **Cane** – Shoots which are of pencil thick and attain brown colour (change from green to brown colour as they ripen). This cane ripening occurs 100 days from pruning the vine.
5. **Spur**—A cane that has been cut back to one bud to produce next year fruiting cane.

![Diagram of Grapevine Plant Parts](image)

**Fig. 2** Diagramatic Presentation of Grapevine Plant Parts

---

**A. TRAINING:**

The vine is trained to assume many shapes and forms. Usually these forms are in relation to the different types of support and determines the disposition of trunk, arms and canes. Many modification of grapevine training have been adopted the world over. In Nigeria, the **overhead horizontal bower system** (Abour system) appears most suitable for high yield.

**OVERHEAD HORIZONTAL BOWER:**

The vines are climbers, hence they are supported on overhead horizontal bower made of galvanized pipes or ‘Azara’ posts. Where wooden posts
are used, they should be treated with soligunum or tar or old engine oil to prevent termite attack or early decay. These structures can be erected one month of planting. One hectare, needs 450 galvanized pipes or ‘Azara’ posts of 3m length, and 2,470 sticks (50 cm length) to be placed horizontally and tied firmly to the vertical post. Thin wire (4 mm gauge) could be used, tied to the vertical post at 50 cm distance to form a horizontal square frame to support the bearing vine.

Training of grapevine is an important operation in grape production. When vines are allowed to grow haphazardly into long shoots without branches, only a few branches will be produced when pruned. Initially, the main stem is allowed 2m height vertical. At 2m height, it is pinched. Due to pinching, two branches will develop (Fig. 3)
These two shoots form the two horizontal arms at right angles. The two branches are tied horizontally to the bower at 2m height and should not be allowed to grow beyond 2m at any time. These will produce the tertiaries which are again pinched when they attain 1m length to encourage side branches to come out at every 20 to 30 cm distance. The shoot coming out from the tertiaries are cut at 1 m length and on ripening these become fruit bearing branches, called canes. These branches, become brown and are pencil thick when ripened.

**B. PRUNING:**

Pruning is another important operation performed when a vine attains one year age. It is performed twice a year, one in September, for securing fruits, and again in March, after harvest of the fruits. In March, all canes are cut back to produce the spur. Tendrils are removed once in three days. Tendrils are hair-like structures and coil-like springs found opposite each leaf.

After pruning, all leaves are buried into the soil. The vine will remain leafless for three weeks. The vines are manured as stated below, three to five days before pruning.

In September, after the rains, pruning is done. The canes or ripened shoot alone are pruned or cut back leaving three to twelve buds depending on the variety grown.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Buds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anab-e-shahi</td>
<td>5–7</td>
</tr>
<tr>
<td>Thompson seedless</td>
<td>10–12</td>
</tr>
<tr>
<td>Blue grapes and other short spur varieties</td>
<td>3–5</td>
</tr>
</tbody>
</table>

Any mistake in cutting or pruning means loss of crop. Bury all leaves and other green shoots that were removed in the vine-yard as this too is good manure.
MANURING:

The grapevine is voracious feeder and need large quantities of manures and fertilizers. The initial requirement of manure and fertilizer have been described above at planting. After the initial dose (of fertilizer and manure), compound fertilizer (15:15:15) at the rate of 50 gm per plant should be given as broadcast one meter distance round the vine at fortnightly interval, beginning at one month up to five months after planting, Rake gently with hoe every week. As the vine grow, apply manure 100 kg/plant all over 2m distance round the plant and hoe the manure as to penetrate 5cm depth of soil. The application of manure (100 kg/plant) should be done once during each pruning, that is twice a year and each time with 5kg of single superphosphate. It should be followed with the application of compound fertilizer (15:15:15) at 2.5 kg/plant in six doses at fortnightly interval. Muriate of potash at 2 kg/plant should be applied one year after transplanting and during September pruning only. The suggested fertilizer/manure rates described in this section is essentially for variety Anab-e-shahi, but other varieties with shorter spacing and less vigorous growth than it, only half of these rates should be given per grapevine plant.

IRRIGATION:

Usually, young vines need watering on alternate days at 75 litres and old vines at 350 litres at every three-day interval. Water should be applied in a basin of two meters diameter around each plant. No irrigation is required during the wet season except if there is a break in rainfall for over two weeks.

WEEDING:

Special attention should be given to keep the vineyard free from weeds by occasional shallow
cultivation. Most of the grapevine feeding roots are in the top 60 – 80 cm layer, therefore, the depth of the cultivation should be minimum. Young grapevines are very sensitive to herbicides. No herbicide should be used for the first 3 – 4 years.

PESTS AND DISEASES:

Fruits in grapevine are produced during the dry season and therefore not many disease problems are experienced. However, some of the important diseases and pests of grapevine include the following:

1. Powdery mildew: This shows up in the form of white growth on berries and upper leaf surface. Young leaves become curled and older ones, browny. Flowers become black and affected berries remain small and cracked.
   Control: Sulphur (either as dust, 30 gm in 18 litres - 4 gallons of water or as wettable, 30 gm in 9 litres - 2 gallons of water) should be sprayed at weekly intervals until berries attain peanut size.

2. Downy mildew: This disease affects twigs, buds, flowers and fruits. White growth appear on the lower surface of the leaves which later turn to brown.
   Control: Prune badly affected parts and destroy them.

3. Anthracnose (Bird's eye disease). Dark brown oval spots appear on leaves, twigs and fruits. This disease is serious during the rainy season.
   Control: Prune badly affected parts and also destroy them. Difolitan or Dithane M 45 at 0.1 per cent solution in water
could be sprayed at weekly intervals under serious infection of leaf spot and downy mildew diseases.

4. Termites: These feed on the roots and stems. When the attack is heavy, the vine gets killed.

Control: Young seedling at transplanting are protected against termites by applying dieldrex or aldrex T or gamalin at the rate of one table spoon in a litre of water in the basin. Repeat the application every four to six weeks until the vine established firmly.

5. Birds: They destroy fruits just as they ripen.

Control: Cover the developing berries that have attained the size of peas with cloth bags. In commercial vineyards, plastic netting or chicken mesh wire can be used to protect the crop. Bird scarers may be employed during the day.

HARVESTING:

The fruits do not ripen or improve much after harvest, hence they should be plucked only when fully ripe. You should expect grape bunches to ripen 125 to 150 days after manuring. Ripeness in grapes is judged by a combination of indications like the waxy bloom of the fruits, characteristic colour development, slight thickening of juice, easy detachment of berries, browning of cluster stems, freedom of seeds from pulp and sweetness of berries.

YIELD:

Grapes start bearing fruits from second year of planting and the yield increases gradually with age. If the vine gives a heavy crop one year, the succee-
Yield will be less due to exhaustion. Yield varies from 10–25 t/ha depending upon the variety, method of training and pruning, irrigation and manuring. Under tropical conditions, vine may continue to produce fruits for 25 years with good management. Severe heading or pruning to ground level can revive an old grapevine.