



Fig. 6: Training of sprouted shoot

Management of grafted vines:

a) Recut:

The vines grafted during August-September are allowed to grow by following all the cultural operations. Due to the variation in the grafting material (stock and scion), if there is no uniform growth of all the grafted vines at a time, then recut is recommended when the minimum temperature starts rising above 15° C. This is generally done during the second week of February in Nasik and Pune region while in last week of January in Solapur and first week of February in Sangli regions. The grafted vines are cut above the joint leaving 2-3 buds on it.



Fig. 7. Recut of the grafted vines

b) Framework development:

Both the buds retained on the scion sprout after grafting. However, due to the apical dominance the first bud grows faster than the later. Chances of occurrences of disease infection at the first bud are more than the later and therefore the shoot from the second bud is preferred for training. There is a practice of taking two shoots at a time for training. In such cases, two shoots should be selected only when the growth of both shoots is uniform for the appropriate development of framework of the canopy.



Fig. 8: Selection of shoot for training

c) Development of cordons:

The development of cordons depends on the time given to the vine after grafting and also the cultural practices followed. The length of the cordon depends on the spacing allotted to each vine in a row. Generally "stop and go" method is followed for cordon development. In this system, the newly grown shoot is pinched back at 6 to 7 leaf when it is grown up to 9 leaves. The apical growth on the shoot is again turned to the direction of the cordon and allowed to grow. Likewise, the shoot is pinched 2-3 times so that the cordon develops properly and the shoot also matures in a given time.

The schedule of fertilizers to be followed from the time of recut till cane development is given in Table 3.

Table 3: Fertilizer requirement from re-cut to the cane maturity.

Sl. No.	Growth Stage	Fertilizer (Kg/ac/day)
1.	Up to top pinching (Pinching up to first wire)	19:19:19 @ 0.5 Kg + Ammonium nitrate @ 0.5 Kg
2.	Up to pinching for secondary arm	19:19:19 @ 0.5 Kg + 0:0:51 @ 0.5 Kg
3.	Up to half development of cordon	0:52:34 @ 0.5 Kg + 19:19:19 @ 0.5 Kg
4.	Up to complete development of cordon	0:52:34 @ 0.5 Kg + 13:0:45 @ 0.5 Kg
5.	Up to last sub cane pinching	0:0:51 @ 0.5 Kg + 0:52:34 @ 0.5 Kg
6.	From sub cane pinching to one month	0:0:51 @ 1.0 Kg

d) Development of canes on cordon:

During the first year limited canes are developed on the vine, as the vine is young.



Fig. 9: Development of canes on cordon

Cane maturity:

The fruit bud formation takes in a bud during shoot development. The differentiated bud needs to be taken care by following all the cultural practices during the period of fruit bud differentiation. In the initial stage, the pink colour of the shoot changes into milky green and subsequently brown in colour. The change of milky green to brown colour is an indication of cane maturity.

Folder No. 6

Contribution and Compilation by
Dr. R. G. Somkuwar
Senior Scientist (Horticulture)

Edited & Published by:

Dr. P. G. Adsule
Director,
National Research Centre for Grapes,
P. B. No. 3, Manjri Farm Post, Solapur Road,
Pune- 412 307
August, 2006

Price: Rs. 10/- (Rupees Ten Only)

For more details contact:
The Director, NRC for Grapes,
Pune - 412 307

Printed at - Western Sales Corporation,
Sadashiv Peth, Pune - 411 030

INITIAL CARE AND MAINTENANCE OF GRAFTED VINE UPTO CANE DEVELOPMENT



माकअनुप
ICAR

NATIONAL RESEARCH CENTRE
FOR GRAPES
(Indian Council of Agricultural Research)

Manjri Farm Post, Solapur Road,
Pune- 412 307

E-mail: nrcgrape.mah@nic.in
Website: <http://nrcgrapes.mah.nic.in>

Introduction:

Grape is one of the major commercially important fruit crop grown in the country. Maharashtra is leading in area and production followed by Karnataka, Andhra Pradesh, Tamil Nadu, and some parts of North India. As grape is a perennial fruit, once planted in the field will remain up to more than 15 years. Hence, an appropriate planning in selecting the land, varieties and training system to be used will go long way in achieving the success in grape production. In view of this background, the information on establishment of grape vineyards and the practices to be followed at each growth stage is given in this folder.

Site/Land:

Land preparation and trench opening should be started during the month of December to January. While selecting soil of specific site ensure the following.

1. The selected site should be away from river or water body like lake/tank to avoid high relative humidity.
2. It should be away from road, highway to reduce menace of mites and dust and heavy metal accumulation on the bunches.
3. The slope should be to the extent of 3%
4. At least a meter soil depth
5. Soil should be free from sub surface hardpan or rocks.
6. Soil should be non saline or saline which can be tolerated by rootstock
7. Soil to be free from water stagnation even in rainy season and have provision of drainage.



Fig. 1: Trench opening in the field

When to use rootstock?

The rootstock can be used under the following conditions.

1. In saline and sodic soils
2. In drought regions
3. In soils having problem of nematodes, Phylloxera etc.
4. In vineyards where yield is low and produce is poor



Fig. 2: Own rooted vine (left) & grafted vine (right)

Land preparation:

Land should be prepared by removing the trees and bushes, leveling and removal of weeds. Layout and spacing should be decided based on the soil type. In the heavy soils, the spacing of 10 feet X 6 feet between row and plants is enough while in light soil, it can be 9' X 5'.

Ripping is done in rocky and semi rocky soil to loosen the upper soil strata for easy penetration of water and thereby in-situ conservation of rainwater. This will also help the roots to go deeper in search of water and nutrient. This operation has become essential in light and rocky soils where grape cultivation is being taken.

Planting of rootstock:

The planting of rooted cuttings of the rootstock should be done from February to March in a year. During this period, the minimum temperature starts rising above 15°C and at this stage the plant comes out of the resting phase. The planting carried out during this period will help in development of the root system in the field and also get the desired thickness of shoot for grafting during September.

Planting:

While planting the rooted cuttings in the main field, the pit of 1' X 1' X 1' size is opened at the places identified in each row. FYM, sand and Chloropyriphos powder and soil is then mixed in the pit for easy root spread and control of termites in the soil during hot summer.



Fig. 3: Planting of rootstock in the main field

Care of rootstocks till grafting:

The rootstock plants in the field should be irrigated every day in the light soil whereas alternate day irrigation is enough in the heavy soil. The schedule of fertilizers to be followed from the planting of rootstock to the time of grafting is given in Table 1.

Table 1: The schedule of fertilizers applied to the young rootstock plants as soil application

Days after grafting	Fertilizers (per acre)
30	30 kg urea + 10 kg DAP
60	30 kg urea
90	25 kg urea + 40 kg SOP
120	20 kg SOP

Training the shoots:

After 50 days of planting, weak and thin shoots are to be removed leaving 2-3 strong and healthy shoots. To avoid any chance of failure of grafting, generally two shoots are grafted on one rootstock.



Fig. 4: Shoot ready for grafting

Period of grafting

The rooted cuttings planted during February to March should attain the graftable size of about 8 mm thickness with good food reserves by September. The success in grafting, however, depends on the grafter's skill and the prevailing weather condition during the period when the grafting is done. The grafting performed during August - September when hot and humid condition prevailed may give the success even up to cent percent.

Grafting:

Grafting is carried out on matured shoots of rootstock planted in the field. This system is more popular among the growers as it has following advantages.

1. The rootstock can be planted in the field as per the availability of plant material from the nursery.
2. Rootstock establishes faster in the field and can attain the graftable size in 4 to 5 months.
3. The roots develop much faster in the ground as it receives more rooting media.
4. The graft success rate is higher.
5. It avoids the transplanting shock as in the case of grafted plants.



Fig. 5: Grafting performed on rootstock

Training the sprouted shoot:

The newly sprouted shoot is trained to bamboo stick with the help of sutali. This helps in growing the plant straight to the bamboo and problem of sunburn on the trunk can be avoided in the near future. The grafted vines are to be maintained till the fresh recut is given during February by following all cultural practices in the field. The fertilizers schedule followed from grafting to recut is given in Table 2.

Table 2: Schedule of fertilizer followed from grafting to recut.

Days after grafting	Nutrient/fertilizers	Through drip (per acre per day)
0-15	--	--
16-30	Urea	0.5 Kg
31-45	19:19:19	1.0 Kg
46-60	Urea	0.5 Kg
61-75	19:19:19	1.0 Kg
76-90	Urea	1.0 Kg
91-105	19:19:19	1.0 Kg
106-120	Urea	1.0 Kg
121-150	13:0:45	1.0 Kg
151-180	0:0:51	1.0 Kg