

Table 3: Stage and concentration of growth regulator used for increase in rachis length and berry size.

Sl. No.	Phenological stage	Growth th regulator used	Conc. (ppm)	Purpose
1.	Parrot green colour	GA ₃	10	Elongation
2.	3-4 days after 1st spray	GA ₃	15	Rachin elongation
3.	3-4 days after 2nd spray	GA ₃	20	Rachis elongation
4.	3-4 mm berry size	GA ₃ + CPPU	40+2	Berry development
5.	6-7 mm berry size	GA ₃ + CPPU	30+1	Berry development

4. Berry thinning :

In a bunch approximately 600 to 700 berries are found. Retention of all these berries leads to heavy competition among the berries for fertilizers, water, light, etc. Such type of bunch will have reduced berry size that may not fit in the standards of the importing market. Hence, berry thinning should be given priority to achieve proper bunch size. Generally, to achieve a bunch weight of 450-500 g having 18 mm diameter and 3.5-4.5 g berry weight, 100-120 berries are enough. Removal of excess berries at 4-6 mm berry size can help in proper utilization of food material.

5. Girdling :

Girdling is one of the major important horticultural practices followed for increase in berry size in grape. Removal of 2 mm skin thickness on trunk just at 4-6 mm berry size helps in achieving 1.0 to 1.5 mm extra berry size. The vine girdled after the required berry stage does give good effect.

6. Protection of bunches :

To harvest maximum proportion of exportable quality grapes from per unit area, bunches should be protected from direct sunlight. This is possible in Flat Roof Gable system where the angle is more (130-135 degree) that protect the bunches from

direct sunlight. Under the situation of reduced canopy, protection of bunches by covering them with paper bags or shade nets are used.



Fig. 4: Use of shade nets in vineyard

Folder No. 09

Compiled & Edited by :

Dr. R. G. Somkuwar

Dr. S. D. Ramteke

Published by :

Dr. P. G. Adsule

Director,

National Research Centre for Grapes,

P. B. No. 3, Manjri Farm Post, Solapur Road,

Pune- 412 307

For more details contact:

The Director, NRC for Grapes, Pune

March 2007

Printed at :

Western Sales Corporation

Sadashiv Peth, Pune - 411 030

Price : Rs. 10/-

Bunch development through canopy management & growth regulators



भाकृअनुप
ICAR

NATIONAL RESEARCH CENTRE
FOR GRAPES
(Indian Council of Agricultural Research)
Manjri Farm Post, Solapur Road,
Pune- 412 307

Shoot thinning:

The bud starts sprouting 7-8 days in own root and 10-12 days in grafted vines after the forward pruning. Before pruning bud testing is an important operation in grapes. Hence, 20-25 matured canes in an acre area should be selected randomly one week before the actual pruning. Bud testing under microscope should be completed within 48 hours of the cane removal for proper visibility of the bunch in the bud

Grape is pruned twice in a year in the peninsular region of the country. After back pruning, cultural operations followed during April to September period mainly decide the type of bunch available in the bud on the cane. After October pruning, the development of a bunch depends on the canopy management practices along with the use of growth regulators.

Since the swabbing of Hydrogen Cyanamide is done on 3-4 buds on a cane, shoot thinning should be done on priority immediately after the bunch is visible. This will help in reducing the losses of storage.



Fig. 1: Stage of shoot thinning

Leaf area requirement:

Leaves are major source of food material required for a developing bunch. Availability of leaves on each shoot having bunch helps in supplying the food material to the berries. For the development of average size bunch, 16-17 leaves (2600-2800 cm²) per shoot are enough. The leaves less or more than the requirement can disturb the source: sink relationship leading to reduced berry size

Bunch thinning:

Once the shoot starts growing, the bunch appears at 3rd leaf stage. There will be approximately 80-100 bunches on vine spaced at 10'X6' distance. Retention of all bunches will hamper the quality of exportable produce. Hence, bunch thinning is done during the pre bloom stage. This will increase the sink capacity and a balance between shoot growth and bunches will be maintained.

Retention of shoots and bunches based on the cane diameter and the spacing allotted to each vine is given in the table below.

Table 1: Retention of shoots and bunches

Cane dia (mm)	No of bearing shoots	No of non bearing shoots	No of bunches to be retained
6	One	Nil	One
6 - 8	One	One	One
8 - 10	Two	One	Two
> 10	Three	Two	Three

Use of Chemical for uniform bud break:

Hydrogen Cyanamide plays an important role in achieving the uniformity in bud break. The bud break is said to be uniform if the gap between application and sprouting is narrow. Increase in the gap may lead to delay in the cultural practices. Uniformity of bud break is important in view of the uniformity in the phenological stages. The application based on weather condition and plant type is given below.

Table 2: Application of Hydrogen Cyanamide (50% a.i.) based on temperature.

Parameters	Own rooted vines (ml/l)	Grafted vines (ml/l)
Temp. 25-35 (°C)	30	40
Cane dia. 6-8	30	40
Cane dia. 8-10	35	40
Humidity > 85%	30	40

(Note: The above doses are to be applied once only)

Use of growth regulators :

In addition to the other cultural practices, growth regulator plays an important role in bunch development. In grape cultivation, growth regulator has become the backbone of the export. Irrespective of the type of market selected for sending the produce, growth regulator needs to be given top priority. The use of growth regulators varies with the growth stages. The growth stages and the growth regulators used in grape berry development are given as below.

1. Increasing the distance between rachis :

After sprouting, bunch appears at 3-leaf stage in white seedless grapes. To achieve the loose bunch, increased distance between two rachis is important. This can also help in reducing the cost on berry thinning after set. Application of GA₃ at parrot green colour of flower panicle (pre bloom stage) increases the distance between rachis by cell elongation. During the second phase of GA₃ application as dip, the rachis length can be increased.



Fig.3: Parrot green colour stage of panicle

2. Increase in berry size :

Once the berry setting is completed, the bunch development becomes the priority. To achieve the maximum berry size fulfilling the export quality standard, bunches are generally dipped in GA₃ along with 6-BA or CPPU. The details of growth regulators used are given below.