

# Grapes

## Manuring & Fertilization

### At Pre-Bearing Age

In India grapevines are pruned one year after planting. For developing adequate canopy, fast and profuse vegetative growth is encouraged. Thus by giving 100g urea together with 200g of super phosphate at monthly intervals to each vine develops adequate branches in pre-bearing period.

### At Bearing Age

The efficiency of applied nutrients increases by placing them in the active feeder root zone. In grape vines fertilizers are placed around the vine at 10-15 cm depth in a shallow circular ring of 60-75 cm radius. Ring method is adopted to provide split doses of fertilizers to vines planted at wider spacing. Band method is adopted in case of vines spaced at a closer spacing within a row and widely spaced between the rows. A shallow trench is opened 45-60 cm away from the vine on either side of the row and fertilizers are placed along the length and covered with soil.

In drip irrigated vineyards 10-15cm deep pit is excavated under the dripper. The number of pits depends on the number of dripper placed around the vine. Fertilizer is applied in the pit and covered by soil.

Nutrient requirement in case of grapevines differs from variety, soil characteristics and cultural practices. Relative nutrient requirement of grapes at different stages of growth is given below:

Days After Back Pruning	N	P	K	Mg
0-30	High	Medium	Nil	Nil
32-60	Low	High	Low	Medium
61-90	Nil	Medium	High	Medium
91-120	Nil	Nil	Low	Nil
Days After Forward Pruning				
0-40	High	Low	Low	Low
41-70	Medium	Medium	Medium	Low
71-110	Low	Low	High	Medium
111-140	Nil	Nil	Medium	Nil

(Source : NRC Grapes)

To determine the nutrient needs of the grapevine it has been found that leaf analysis is better as compared to soil analysis. It is also useful in finding out the association of nutrients with some disorders. Normally petiole nutrient contents are analysed 45 days after back pruning. A critical level of petiole nutrient contents during bloom time has been worked out. The nutrient contents of the petiole below the critical level indicate the need for fertilization. If case of low nutrient level full dose of fertilizer is given, if adequate or normal 75% and if higher then 50% of the recommended dose is applied.

## Recommended doses nutrients at different levels in the petioles :

	Low	Adequate	High	Excess
Petiole content (%)	<0.87	>0.87-1.54	1.54-2.66	>2.66
<b>Dose of N (Kg/ha)</b>				
Red Sandy	300	225	150	-
Black clay	666	500	333	-
Petiole content (%)	<0.19	0.19-0.32	0.32-0.95	>0.95
<b>Dose of P (Kg/ha)</b>				
Red Sandy	500	375	250	-
Black clay	888	666	444	-
Petiole content (%)	<0.60	0.60-2.24	-	>2.73
<b>Dose of K (Kg/ha)</b>				
Red Sandy	1000	750	500	-
Black clay	666	500	333	-
Petiole content (%)	<0.33	0.33-0.50	0.50-0.70	>0.70
<b>Dose of MgSO<sub>4</sub> (kg/ha)</b>				
Red Sandy	180	135	90	-
Black clay	180	135	90	-

(Source : Pre-harvest Manual For Production Of Table Grapes For Exports- APEDA, New Delhi)

## Nutritional Deficiency :

### Magnesium

This deficiency is mostly observed in Bangalore and Kolar in Karnataka. Symptoms appear as pronounced pattern of whitish yellow colour between the veins with the areas adjacent to the larger veins remaining green. In advanced stages the margins of the leaves become brown.

**Control :** Soil application of Magnesium Sulphate (250 kg/ha) at the pruning time is recommended.

### Iron

This deficiency is observed in Nasik and Pune districts in Maharashtra. Symptoms appear as yellowing of younger leaves with small veins remaining green.

**Control :** Soil application of Fe-EDDHA or foliar application of Ferrous Sulphate (250g/100 litre water) + citric acid (50g)+ liquid detergent (125 ml) is recommended.

### Zinc

This deficiency is mostly observed in Nasik and Ahmednagar districts in Maharashtra.

Symptoms appear as stunted lateral shoots with small leaves (little leaf). The small veins remain green with interveinal tissues remaining green-pale yellow.

Clusters show poor set and shot berries with smallest one remaining green.

**Control :** Soil application of Zinc Sulphate (250 kg/ha) or foliar spray of Zinc Sulphate (200g /100 litre water) + 50 ml liquid detergent is recommended.

## **Boron**

This deficiency is mostly observed in Chikaballapur in Kolar and Bangalore in Karnataka. Symptoms appear as death of shoot tips and leaves near the shoot tips with chlorotic areas between the veins. Necrosis of the old yellow tissues takes place. Uneven, compressed shot and immature berries

**Control** : Soil application of Borax or Boric Acid (10 kg/ha) or foliar spray of borax/boric acid (1g/litre) 4 times before flowering is recommended.

## **Calcium**

This deficiency is mostly observed on Thompson Seedless variety in Pune district of Maharashtra. Calcium deficiency leads to grape bunch necrosis.

**Control** : Foliar spray of Calcium Acetate /Calcium Chloride /Calcium Nitrate (2 g/litre water) + liquid detergent (50 ml) is recommended.

## **Excess of Sodium and Chloride Salts**

This is mostly observed in Sangli district of Maharashtra.

Excess of Sodium and Chloride salts leads to the development of typical salt burn symptoms. These symptoms start from the margins of the leaves and progresses inwards.

**Control** : Use of rootstock e.g. Salt Creek, Dogridge, 1613 or St. George depending on extent of salinity is recommended.

## **Potassium**

This deficiency symptom is mostly observed in Maharashtra. Symptoms appear as fading of green colour from the leaf margins and areas adjacent to the main veins. In severe cases wilting and subsequent drying of rachis and attached berries is observed.

**Control** : Application of Potash based on the petiole analysis done at full bloom stage is recommended