b. Irrigate the vineyard @ 1380 L/ha/day during no rainfall period.

c. As a part of IPM for mealy bug infestation, carry out following practices during this period:
   i. To remove leaf over population of mealy bugs swab the plants with Disholclos 2 ml + Neem Oil 5 ml + Fish oil 2ml/l.
   ii. Remove the bark and apply gum banding to avoid ant as well as crawler movement.
   iii. Make 3" to 4" wide ring of insecticide using Malathion or Chlorpyriphos @ 25 kg/ha.

iv. Spray sulphur fungicide @ 2 g/litre water for the control of powdery mildew during cane maturity.

v. Spray Carbendazim @ 1 g/litre water for the control of anthracnose and also remove the excess new shoot growth.

**WATER MANAGEMENT**

The irrigation water requirements stated under various stages are subject to variation depending upon PAN, evaporation reading and local site conditions.

<table>
<thead>
<tr>
<th>Days after pruning</th>
<th>Growth Stage</th>
<th>Quantity of water (l/ha) per mm of evaporation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-40</td>
<td>Shoot growth</td>
<td>450</td>
</tr>
<tr>
<td>41-60</td>
<td>Fruit bud differentiation</td>
<td>140</td>
</tr>
<tr>
<td>61-120</td>
<td>Fruit bud development &amp; maturity initiation</td>
<td>140</td>
</tr>
<tr>
<td>121-185</td>
<td>Cane maturity &amp; storage</td>
<td>140</td>
</tr>
</tbody>
</table>

* These stages normally coincide with the pre-monsoon rains and/or onset of monsoon season when pruned during the 2nd fortnight of the April month. Some local adjustments will be necessary for increasing or decreasing the irrigation rates keeping in view the rainfall and irrigation water quality.

**FERTILIZATION SCHEDULE**

<table>
<thead>
<tr>
<th>Growth Period</th>
<th>N (Quantity per hectare)</th>
<th>P2O5 (Quantity per hectare)</th>
<th>K2O (Quantity per hectare)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rest period</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harvest - 20D</td>
<td>26.6 (10)</td>
<td>35.6 (10)</td>
<td>26.6 (10)</td>
</tr>
<tr>
<td>1-30 DAP</td>
<td>86.6 (30)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>31-60 DAP</td>
<td>213.1 (30)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>61-120 DAP</td>
<td>80 (30)</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

* The figures in parenthesis indicate percent distribution of annual dose for newly planted unpruned in bearing. The annual dose is 266.8 N, 325.2 P2O5 and 296.8 K2O kg/ha/yr for carcaseness/trach cotton type soil.

1. Apply well decomposed FYM 25 ton per ha.
2. About 70 kg/ha of Magnesium sulphate should be applied in 3-4 equal splits.
3. Apply 20 kg Ferrous sulphate, 10 kg Zinc sulphate and 5 kg/ha of Manganese Sulphate along with FYM or through cow dung slurry.

**Note:** Over a period of time, the nutrients tend to accumulate in soil. Hence after few years of fertilizer application, soil and pebble analysis should be carried out before deciding fertilizer doses.

**Folder No. 4**

December 2003

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I. PRE-PRUNING PRACTICES
a. Rest period of about 25-30 days is necessary for vine to recover from the exhaustion out of the previous crop.
b. Immediate flush of root development starts after harvest, which should be supported by application of 10% of total annual fertilizer requirement.
c. Irrigation is continued till pruning @ 4000 Ltr per acre per day (at avg. evaporation of 7.14 mm).
d. Apply Farmyard manure (FYM) @ 10.75 cu & Single super phosphate 500 kg per acre, ten days before pruning.

II. PRUNING AND SHOOT GROWTH
1) Pruning
a. Prune the vines by leaving 1-2 buds of previous year canes on cordon. The vineyard resemble like a framework of cordon with 10 buds standing in the field.
b. Dead wood (if any) should be removed and cordon renovation carried out if necessary.
c. Put the pruned material in the pit that can be used in the next season as compost. If the material is infected, destroy the pruned material by burning.
d. Apply Hydrogen cyanamide @ 1.5% (20mL/L) in case of grafted vines and at 1.0% concentration (20mL/L) in case of own-rooted vines to enhance sprouting of buds. Add colour to the solution as an indicator of uniform pasting.
e. Spray Bordeaux mixture 1% (Copper Sulphate 1.0 kg + Lime 0.6 to 0.8 kg in 100 Ltr water) within 48 hours of pruning.
f. Apply Urea @ 80 kg + Magnesium Sulphate 8 kg per acre after pruning.
g. Start irrigation @ 12,650 Ltr. per acre per day (at average evaporation of 7.53 mm).

2) Bud Sprouting
a. Buds start sprouting within 8 days (Own-rooted vines) or 15 days (Grafted vines) after pruning.

Time required for sprouting depends on previous production phase stress, rest period and soil conditions i.e. aeration, moisture status and salinity.
b. Infestation of Flea beetle is predominant during this period due to hot and dry climate. Spray Carbaryl @ 2 g/l or Imidacloprid @ 0.4 ml/l or Lambda Cyhalothrin @ 0.5 ml/l.

3) Five Leaf Stage (7 days after sprouting)
   a. After sprouting, shoots grow very fast and attain 5-leaf stage in 7 days.
   b. Spray CCC @ 500 ppm at 5-leaf stage to control the vigour.

4) Nine Leaf Stage (10-12 days after sprouting)
   a. Pinch the shoot tip along with two leaves to maintain seven eye-buds on main shoot to initiate sub-cane.
   b. Apply DAP (18:46:0) @ 180 kg/acre.
   c. Continue irrigation @ 12,650 Ltr/acre/day (at avg. evaporation of 7.53 mm).

5) Sub-cane Growth (30-50 days after sprouting)
   a. At 7-10 leaf stage of sub-cane or 12-leaf stage of straight-cane, spray CCC @ 500-750 ppm to check the further growth.
   b. Apply Sulphate of Potash @ 87 kg/ac at 30-35 days after sprouting and Magnesium Sulphate 8 kg/ac after 8-10 days of application of SOP.

III. CANE MATURITY
1) Fruit Bud Development (51-80 days after sprouting)
   a. After formation of inflorescence primordia, the development takes place inside the dormant bud.
   b. Apply Sulphate of Potash @ 87 kg/ac after 60 days from sprouting for bunch fixation and magnesium sulphate 1.2 kg/ac at 90 days.
   c. Irrigate the vineyard @ 1,620 Ltr/acre/day (at avg. evaporation of 3.25 mm). In case rain exceeds 4-5 mm/day, no irrigation is required.

2) Storage of Food in Vines (61-110 days after sprouting)
   a. Do not allow young shoots to grow and maintain the leaves in healthy condition.

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Notes:
- Fig. 1a: Pruning
- Fig. 1b: Sprouting
- Fig. 2a: 5th leaf stage
- Fig. 2b: 9th leaf stage
- Fig. 3a: 5th leaf stage
- Fig. 3b: Spraying
- Fig. 4a: Sub-cane growth
- Fig. 4b: Straight-cane growth