



## **Bimonthly Pomegranate Advisory for Bearing Orchards (April- May 2022)**

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### **I. Bahar: Mrig (May-Jun Crop regulation)**

**CURRENT STAGE OF THE ORCHARD:** Late stage of rest period or stress period or crop regulation at May end)

#### **A. Horticultural Practices:**

- Crop (orchard) is under **stress period**, only if early mrig bahar has to be taken, then defoliation should be done using Ethephon 39 % SL followed by light pruning at the end of the May month (10 -15 cm from top or refill thickness and partially removing thorns).
- Fallen leaves and debris in the orchard may be removed/ buried in soil at fertilizer application.

#### **B. Nutrient Management:**

- Those who are regulating crop in May end only should apply following manures and bio-fertilizer after pruning, at the time of first irrigation or release of stress.
- Apply 25-30 kg Farm Yard Manure (FYM) or 15-20 kg FYM + 2 kg vermicompost + 2 kg neem-cake per plant or 7.5 kg well decomposed poultry manures + 2 kg neem-cake per plant.
- Apply bio-formulation of *Azospirillum* sp., *Aspergillus niger*, *Trichoderma viride* and *Penicillium pinophilum* after incubating separately with well decomposed farmyard manure for 15 days maintaining 60-70% moisture content in the mixture and alternate day stirring under shade. In about 15 days, these helpful bacteria/fungi grow nicely in the compost.
- Before application, mix Arbuscular Mycorrhizal Fungi, AMF (*Glomus intraradices* syn. *Rhizophagus irregularis*) in the bioformulation mixture and use this @ 10-20 g per plant. Give light irrigation immediately after manure application.

**Note: Apply bio formulations 20-30 days after application of chemical fertilizers.**

#### **C. Insect Pest Management:**

- Regular monitoring/observation should be done for stem borer, shot hole borer, termites, which are major pests during dry stress periods.
- Stem pasting: Make the paste by mixing the Red soil 4 kg + Chloropyriphos 20% EC 20 ml **OR** Emamectin benzoate 5% SG 20 g + Copper oxychloride 25 g in 10 liters of water and paste on a stem up 2-2.5 ft. from the bottom.

#### **D. Disease Management:**

- Sprays of freshly prepared 1% Bordeaux mixture should be taken at 15 days'

interval alternatively Copper oxychloride 50% WP (2.5-3.0 g/L) or Copper hydroxide 53.8% (2.0-2.5 g/L) along with spreader sticker @ 0.3 to 0.5 ml/L. This will take care of bacterial blight and fungal spots during rest/stress period.

- Wilt/borer affected plants, if any, should be removed carefully and burnt. The wilt treatments given below should be taken if not taken in previous months.

## II. Bahar: Hasta (Sep-Oct Crop regulation)

**CURRENT STAGE OF THE ORCHARD:** About to harvest and rest period after harvest

### A. Horticultural Practices:

- If very late hasta bahar has been taken, then fruit bagging with butter paper bags open at the bottom is recommended or protective crop cover covering the entire row at the top and 1.5-3 ft from top to sides is recommended to avoid sun burn /scald on fruits. The width depends on the height and canopy of the plants and the side where sun is after 12 noon/sunset side should be covered 60% as that receives more sunlight by afternoon. This also protects fruits from abiotic fruit cracking to some extent.
- Bearing branches having optimum crop load may be staked and tied for support.
- After harvest of hasta bahar fruits, medium to deep pruning (removal of criss cross, diseased, broken and overcrowded branches) and basal dose application of nutrition is recommended.

### B. Nutrient Management:

#### (i) Crop stage is around 1 month to harvest:

- Fertigate urea @ 41.44 - 69.56 kg/ha/application; N:P:K::00:52:34 Mono-Potassium Phosphate @ 22.20 kg/ha/application, and N:P<sub>2</sub>O<sub>5</sub>:K<sub>2</sub>O::00:00:50 Potassium Sulphate @ 22.20 kg/ha/application. Give 4 applications at 7 days interval through irrigation.
- Three foliar application of 0:52:34 @ 5 - 6 g/L and two foliar application of Manganese sulphate @ 6 g/L at 10 days interval.

#### (ii) Rest period:

- Immediately after harvest of fruits, Apply 15 - 20 kg FYM **OR** 10 - 15 kg FYM + 2 kg vermi-compost + 2 kg neem-cake per plant.
- Apply 225 - 280 g N (490 - 610 g Urea), 63 g P<sub>2</sub>O<sub>5</sub> (395 g SSP), 200 g K<sub>2</sub>O (335 g MOP), 488 g Ca (2.80 kg gypsum) and 80 g Mg (800 g MgSO<sub>4</sub>) per plant depending on the age of the plant (lower dose of N for 5<sup>th</sup> year plants and higher dose for 6<sup>th</sup> and above years old plants) followed by light irrigation.
- Apply bio-formulation of *Azospirillum* sp., *Aspergillus niger*, *Trichoderma viridae* and *Penicillium pinophilum* @ 10-20 g/plant after incubating separately with well decomposed farmyard manure for 15 days maintaining 60% moisture content in the mixture and periodical stirring under shed.
- Also apply Arbuscular Mycorrhizal Fungi, AMF (*Glomas* sp.) @ 10-15 g per plant. Give light irrigation immediately after manures and bio-fertilizers application.
- **Note: Apply bio-formulations 20-30 days after application of chemical fertilizers.**

### C. Insect Pest Management:

- Regular monitoring/observation should be done for stem borer, shot hole borer, termites, mites, leaf eating caterpillars and sucking pests (Mealy bugs, scale insects etc.). Depending on insect pest observed, take 2 - 3 sprays at 15 to 20 days' interval with any of the insecticides mentioned below:
- If low foliar insect pest infestation is observed, spray only Azadirachtin/Neem oil @ 3 ml/L water. If harvesting of crops is due in 1 month avoid any insecticide spray, if any emergency, consult an expert before taking any spray.

#### Rest Period:

(a) **Foliar Pests:** In rest period, if any foliar pest infestation observed is high, take spray with any of these insecticides Lambda cyhalothrin 5% EC @ 0.5-0.75 ml/L **OR** Indoxacarb 14.5% SC @ 0.75 ml/L **OR** Cyantraniliprole @ 0.75 ml/L **OR** Thiamethoxam 25% WG @ 0.5 g/L water.

(b) **If shot hole /stem borer infestation is observed in the orchard:** Follow the advisory

- डाळिंबावरील खोड किडा (भुंगेरा) व्यवस्थापन  
(<https://nrcpomegranate.icar.gov.in/files/Advisory/108.pdf>)
- Advisory for pomegranate shot hole borer management :  
(<https://nrcpomegranate.icar.gov.in/files/Advisory/107.pdf>)

(c) **Mealy bugs/scale insect:**

- In Early infestation: Spray Azadirachtin/Neem oil 1% (10000 ppm) @ 3 ml/L + Pongamia oil @ 3 ml/L water.
- If the infestation is at the late stage, spray Thiamethoxam 12.6% + Lambda-cyhalothrin 9.5% ZC @ 0.75 ml/L water.



a. Mites on leaves



b. Scales on Pomegranate fruit

#### (d) Mite infestation:

- If mite infestation is observed at an early stage, take the spray with Azadirachtin/Neem oil 1% (10000 ppm) @ 3 ml/L water.
- If the infestation is at a late stage, take the spray with Fenazaquin 10% EC @ 1.5 ml/L or Fenpyroximate 5 % EC @ 0.4 ml/L or Phosalone 35% EC @ 2 ml/L water.

#### D. Disease Management:

(i) **Harvesting of crop due in 1 month:** Avoid any sprays, if emergency, take 1 spray of Copper fungicide or Sulphur 80%WP @ 2.5 g/L.

#### (ii) In rest period:

- **Wilt and Nematode affected plots** should take wilt treatment soon after harvest. Details given at the end of the advisory.
- **Take following sprays** during rest period at 10-15 days' interval depending on climate and individual crop problems - 1% Bordeaux mixture **OR** Copper oxychloride 50% WP @ 3 g/L **OR** Copper hydroxide 53.8% WP @ 2 g/L altered with 2-Bromo-2-nitropropane-1,3-diol (95%) @ 0.5 g/L. Still if any fungal disease observed, one spray can be taken using fungicide mentioned in Adhoc list of agrochemicals (<https://nrcpomegranate.icar.gov.in/files/Advisory/91.pdf>).

### III. Bahar: Ambia (Jan-Feb Crop regulation)

**CURRENT STAGE OF THE ORCHARD:** Flowering, fruit set and fruit enlargement

#### A. Horticultural Practices:

- Shoot pinching if too much vegetative growth is there.
- Staking and support to the bearing trees and branches.
- When the fruit is lemon size or about 100 g fruit bagging or protective crop cover over the entire row is recommended to avoid sun scald.





**Sun scald**



**Internal Breakdown**



**Fruit bagging**



**Protective crop cover**

## **B. Nutrient Management:**

### **(i) Flowering:**

- Foliar application of Naphthyl Acetic Acid (NAA) 4.5% @ 22.5 ml per 100 lit water for good flower induction.
- Foliar application of micronutrient mixture @ 1.0 - 1.5 kg/ha.
- Fertigate  $N:P_2O_5:K_2O::00:52:34$  Mono-Potassium Phosphate @ 11 kg/ha/application and  $N:P_2O_5:K_2O::00:00:50$  Potassium Sulphate @ 11 kg/ha/application. Give 4 applications at 7 days interval through irrigation.
- Apply Gypsum @ 1.14 kg/plant and  $MgSO_4$  @ 300 g/plant followed by thorough mixing with the soil and watering.

### **(ii) Fruit setting and Enlargement**

- Fertigate  $N:P:K::00:52:34$  Mono-Potassium Phosphate @ 11 kg/ha/application and  $N:P_2O_5:K_2O::00:00:50$  Potassium Sulphate @ 11 kg/ha/application. Give 4 applications through irrigation.
- Fertigate urea @ 13.70 - 23.13 kg/ha/application. Give 8 applications at 7 days interval through irrigation.
- Foliar application of micronutrient mixture @ 1-2 kg/ha.
- Two foliar application of Gibberellic acid @ 50 ppm at 15 days interval.
- Apply Gypsum @ 640 g /plant and  $MgSO_4$  @ 400 g/plant followed by thorough mixing with the soil and watering.
- Remove weeds from plant basin.

## C. Insect Pest Management:

### (i) Fruit borer (egg stage):

- If low infestation is observed, single spray may be taken and if higher infestation is observed take two sprays (1<sup>st</sup> single and 2<sup>nd</sup> combination) with Azadirachtin/Neem oil 1% (10000 ppm) @ 3 ml/L or Pongamia oil @ 3 ml/L or combination of both the above @ 3 + 3 ml/L water at 7-10 days' interval.
- Remove all the damaged fruits with holes and dispose them by burying in pit and take a spray with any one of the insecticide Cyantraniliprole 10.26% OD @ 0.75 ml/L **OR** Chlorantraniliprole 18.5% SC @ 0.75 ml/L **OR** Tolfeprad 15% EC @ 0.75ml/L **OR** Flonicamid 50% WG @ 0.75-1.0 ml/L water.

### (ii) Mealybugs/scale insect:

- Early infestation: Spray Azadirachtin/Neem oil 1% (10000 ppm) @ 3 ml/L + Pongamia oil @ 3 ml/L water.
- If the infestation is at the late stage, spray Thiamethoxam 12.6% + Lambda-cyhalothrin 9.5% ZC @ 0.75 ml/L water.

### (iii) Mite infestation:

- If mite infestation is observed at an early stage, take the spray with Azadirachtin/Neem oil 1% (10000 ppm) @ 3 ml/L water.
- If the infestation is at a late stage, take the spray with Fenazaquin 10% EC @ 1.5 ml/L **OR** Fenpyroximate 5 % EC @ 0.4 ml/L **OR** Phosalone 35 % EC @ 2 ml/L water.

## D. Disease Management:

### (i) Spray during crop season (Take sprays at 10-14 days interval)

- Take 4 sprays of Salicylic acid (SA) @ 0.3 g/L and Micronutrient mixture @ 2 g/L each at 1-month interval from pre-flowering.
- Bordeaux mixture 0.5% **OR** Copper oxychloride 50 % WP (2.5-3.0 g/L) **OR** Copper hydroxide 53.8% (2.0-2.5g/ L along with spreader sticker @ 0.3 to 0.5 ml/L, altered with 2-bromo, 2-nitro propane-1, 3-diol 95% (Bronopol) @ 0.5 g/L at 10 days interval.
- If orchard has bacterial blight history take spray of Streptomycin sulphate 90% + Tetracycline hydrochloride 10% (Streptocycline) @ 0.5 g/L once a month and at 7-10 days' interval from Bronopol. Avoid too many sprays, if rain is there; take an additional spray of Streptocycline + Copper based fungicide.
- Depending on fungal problems present in the orchard, Copper based formulations may be replaced with appropriate fungicides.

**Some promising fungicides for Pomegranate Fungal Scab, Spots and Rots are:**

<b>Some promising fungicides for pomegranate fungal scab, spots and rots</b>	
<ol style="list-style-type: none"> <li>1. Mandipropamid 23.4% SC @ 1 ml/L.</li> <li>2. Metiram 55% + Pyraclostrobin 5% EC @ 3 g/L.</li> <li>3. Propiconazole 25% EC @ 1 ml/L + Azoxystrobin @ 1 ml/L.</li> <li>4. Azaoxystrobin 20% + Difenconazole 12.5% SC @ 2 ml/L.</li> <li>5. Chlorothalonil 50% + Metalaxyl M 3.75% @ 2 ml/L.</li> <li>6. Bordeaux mixture @ 0.5%.</li> <li>7. Chlorothalonil 75% WP @ 2 g/L.</li> </ol>	<ol style="list-style-type: none"> <li>8. Propiconazole 25% EC @ 1 ml/L.</li> <li>9. Copper Oxychloride 45% + Kasugamycin 5% @ 2.5 g/L.</li> <li>10. Zineb 68% + Hexaconazole 4% WP @ 2.5 g/L.</li> <li>11. Tricyclazole 18% + Mancozeb 62% WP @ 2.5 g/L.</li> <li>12. Fluopyram 17.7% + Tebuconazole 17.7% w/w SC @ 1 ml/L.</li> <li>13. Tebuconazole 50% + Trifloxystrobin 25% w/w WG (75WG) @ 0.5g/L.</li> </ol>
<p><b>PLEASE NOTE:</b></p> <ul style="list-style-type: none"> <li>● Remove rot infected fruits and destroy before each spray; do not dump or throw anywhere.</li> <li>● Avoid spray if rain is expected on the spray day; Spraying after a few hours of rain is better and very important to prevent diseases.</li> <li>● Spray pH should be checked and adjusted from 6.5-7 pH.</li> <li>● Best results are obtained with 2-3 sprays starting during flowering and fruit setting stage at 15 days interval with any of the above. This will avoid several sprays at later stages.</li> <li>● Always use spreader sticker with sprays except Bordeaux mixture.</li> <li>● Need based sprays be used later.</li> <li>● No pesticide should be used more than 2-3 times in a season except copper fungicides.</li> <li>● Sprays can be taken in rotation as per pre-harvest interval for residue free production (<a href="https://nrcpomegranate.icar.gov.in/files/Advisory/91.pdf">https://nrcpomegranate.icar.gov.in/files/Advisory/91.pdf</a>).</li> </ul>	

## Fungal Wilt Management

**DRENCHING FOR HEALTHY PLANTS SURROUNDING WILT AFFECTED PLANTS OR WHERE WILT JUST STARTED:** Prefer drenching soon after harvest in rest period, or initial stage of crop regulation. One day before drenching, irrigate the soil properly; next day drench with only one of the methods (I or II or III) given below. Do not irrigate 2-3 days after drenching for best results.

- ❖ **Method I:** (1<sup>st</sup> drenching Propiconazole 25% EC @ 2 ml/L + Chlorpyrifos 20% EC @ 2 ml/L **OR** Thiamethoxam 25% WG @ 1-1.5 g/L (5 to 10 litre solution per plant depending on age of the plant). After 30 days of first application, 2<sup>nd</sup> drenching with *Aspergillus niger* AN 27 (New Packs have AN27 with IRAG07) fungus @ 5 g/plant with 2 Kg FYM/plant. 3<sup>rd</sup> application after 30 days of 2<sup>nd</sup> application - AMF fungus (Arbuscular Mycorrhizal Fungi - *Rhizophagus irregularis* @ 25 g/plant with 2 Kg FYM/plant).

**OR**

- ❖ **Method II:** Propiconazole 25% EC @ 2 ml/L + Chlorpyrifos 20% EC @ 2 ml/L (10 Litre solution per plant and 3 drenching's at 20 days' interval).

**OR**

- ❖ **Method III:** 1<sup>st</sup> and 3<sup>rd</sup> drenching Fosetyl Al 80% WP @ 6 g/plant (10 L solution per plant) while 2<sup>nd</sup> and 4<sup>th</sup> drenching with Tebuconazole 25.9 % w/w EC @ 3 ml/plant (10 L solution per plant). Drench at 20 days' interval.

### **TREATMENT FOR WILT (PARTIAL OR COMPLETE) AFFECTED PLANTS:**

Remove the affected plants and destroy/dispose of carefully without spreading the sick soil on uprooted plants to healthy plants. Irrigate the soil and cover with transparent linear low-density polyethylene (LLDPE) 50-100 microns thick plastic for 6 weeks in hot months when no rains are there. Later new plants with recommended bio-formulation can be planted.

**NOTE:** The wilt pathogen survives for several years in affected soil or plant parts, hence proper disposal of wilted plants and soil treatment is important steps. **For complete details, method of drenching please see Wilt advisory on NRCP website**

## Nematode Infestation

The different bio formulation used in Method I as mentioned in fungal wilt management are also effective against root knot nematode. Alternatively promising bioformulations like *Paecilomyces* or *Trichoderma* for nematode management may be added. In addition intercrops like African marigold, Dhaincha, Sunhemp should be preferred as intercrops during rest period while many vegetable, tuber and pulse crops increase nematode infestation hence should not be grown in the orchard as inter-culture crops.

**During rest period/ or just before bahar initiation:** any one of the following methods should be used if the nematode infestation is very high:

1. Apply Fluensulfone 2% GR @ 10 g/dripper (Maximum dose of Fluensulfone should not exceed 40 g/plant) make a small pit of 5-10 cm deep below each dripper add 10 grams granular nematicide and cover it with soil, give light irrigation at crop initiation.



2. Alternatively, drenching can be done with fluopyrum 34.48% SC @ 2 ml/plant. Plants should be sufficiently irrigated day before drenching. Mix 2 ml of the nematicide in two litre of water and pour 500 ml per dripper (4 drippers/plant) or 1000 ml per dripper (2 drippers/plant).

#### IMPORTANT LINKS ON ICAR-NRCP WEBSITE

- **Nutrient Management Schedule 2019** in English  
(<http://nrcpomegranate.icar.gov.in/files/Advisory/41.pdf>)
- डाळिंबावरील खोड किडा (भुंगेरा) व्यवस्थापन  
(<https://nrcpomegranate.icar.gov.in/files/Advisory/108.pdf>)
- **Advisory for pomegranate shot hole borer management**  
(<https://nrcpomegranate.icar.gov.in/files/Advisory/107.pdf>)
- **Nutrient Management Schedule 2019** in Marathi  
(<http://nrcpomegranate.icar.gov.in/files/Advisory/36.pdf>)
- **IDIPM Schedule:-** <http://nrcpomegranate.icar.gov.in/files/Advisory/12.pdf>
- **Adhoc List of Chemicals For Pomegranate 2020**  
(<https://nrcpomegranate.icar.gov.in/files/Advisory/91.pdf>)
- **List of Trade Names of Agrochemicals 2020**  
(<https://nrcpomegranate.icar.gov.in/files/Advisory/90.pdf>)
- **Wilt advisory in Marathi** (<https://nrcpomegranate.icar.gov.in/files/Advisory/76.pdf>)
- **Wilt advisory in English** (<https://nrcpomegranate.icar.gov.in/files/Advisory/86.pdf>)