

PLANT PROTECTION

INTEGRATED DISEASE MANAGEMENT IN MANGO

Mango orchards are attacked by several diseases, leading to poor quality of fruits and low returns to the orchardists. The Central Institute for Subtropical Horticulture (CISH), Lucknow has developed a calendar of operations for integrated disease management.

January

- Protect plants from frost injury by irrigating the fields. Young plants should be protected by thatching the plants. Care should be taken that the east side of the thatch is kept open so that the sun light enters in the thatch at least for some time in the morning. To control mango malformation new flower buds or new growing panicles should be de-blossomed.

February

- Powdery mildew affected leaves and malformed panicles should be removed and burnt. Undertake first spray for control of powdery mildew with Wettable Sulphur @ 2 g/liter. Liquid soap is mixed with the solution so that the fungicide sticks well and makes it more effective. Generally 10–20 liters of solution is required for one plant, depending upon its age.

March

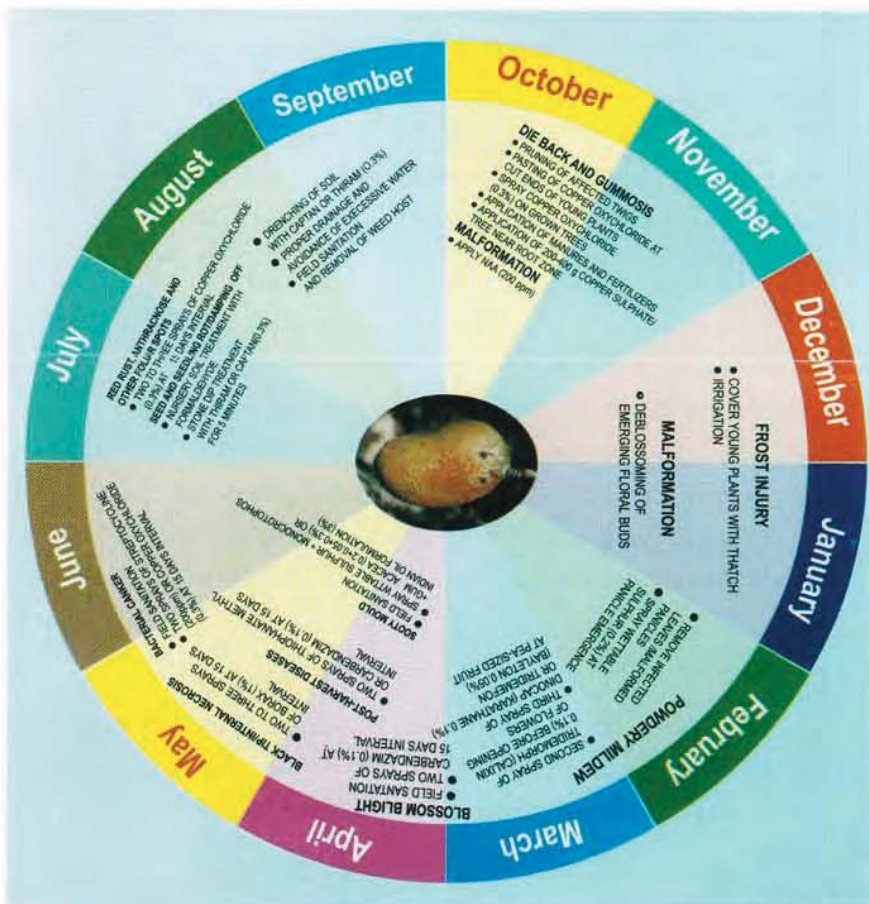
- Undertake second spray for the control of powdery mildew with Tridemorph (Calixin @ 0.1% i.e. 1 ml/liter). Care should be taken that the second spray is done before the opening of the flowers. In the third or fourth week of the month, Dinocap or Tridemefon (Karathane or Bayleton) @ 0.1% (1 ml or 1 g/liter) is sprayed. Third spray should be done when fruit set has already taken place. During this month, infestation of mango hopper also takes place. Joint control of powdery mildew and hopper can be taken.

April

- If blossom blight or anthracnose is visible on the panicles, Carbendazim (Bavistin) @ 0.1% (1 g/liter) should be sprayed. Side by side, affected leaves and twigs should also be removed and burnt, so that the inoculum load is kept under control.

May

- Two to three sprays of Borax @ 1% are desirable for control of Black tip or Internal necrosis during this period. As the Borax is not easily dissolved in ordinary cold water, it should first be dissolved in small quantity of warm water and then the volume should be increased to



the desired quantity. For the control of latent infections on fruit, 1–2 sprays of Thiophanate methyle or Carbendazim (Topsin M or Bavistin) @ 0.1% (1 g/liter) may be done, to protect mango fruits from post harvest diseases. For the control of sooty mould, spray of a mixture of Wettable Sulphur + Monocrotophos + Gum acacia (0.2, 0.05 and 0.3% respectively) may be done. Indian Oil formulation (Tree

spray oil) with 3% concentration is also effective for control of sooty mould. If there is chance of bacterial canker disease on fruit, Streptocycline 200 ppm should be sprayed. Field sanitation and pruning of infected twigs should also be done during this month.

June

- Second spray of Streptocycline 200 ppm may be done for the control of bacterial canker disease.

July

- Spray of Copper-oxchloride @ 0.3% (3 g/liter) may be done in the third or fourth week to control anthracnose and red rust. Sterilize the nursery soil by treating soil with Formaldehyde and then cover with polythene sheet. Later on, polythene sheet should be removed and soil opened so that the leftover Formaldehyde gets evaporated from the soil. The mango stones should also be treated with Thiram or Captan @ 0.3%.

August

- Undertake second and third sprays at 15–20 days interval with Copper oxchloride @ 0.3% to protect the crop from anthracnose and red rust. Field soil treatment with Captan @ 0.3% to control seedling rots be also carried out. Provide for appropriate drainage of water in the nursery to reduce the chance of infection by root rot fungi. Undertake weeding to remove the collateral hosts of the *Sclerotium* or *Rhizoctonia*.

September

- One spray of Copper-oxchloride can be repeated, if there is more incidence of anthracnose or red rust. Undertake field cleaning and ploughing to control collateral hosts of several pathogens.

October

- For the control of die-back, infected and dried branches should be pruned in such a way that these are removed 5 to 8 cm below the dried portion. After pruning, apply Copper-oxchloride paste to the cut ends in nursery plants, while in case of grown up plants, spray Copper-oxchloride @ 0.3%. This spray also takes care of phoma blight and gummosis. For control of gummosis, 200–400 g of Copper sulphate can be applied depending upon the age of the plants. During

this month, apply recommended quantity of fertilizers to develop plant vigor and to protect from different diseases. For the control of mango malformation, spray 200 ppm of Naphthalene acetic acid in the first week of October.

November

- Undertake second and third sprays of Copper-oxchloride @ 0.3% to control die back disease. This spray also takes care of phoma blight.

December

- Protect crop from frost injury as per the operations indicated for January. For the control of mango malformation, carry out de-blossoming of new flower buds.

All these operations may or may not be necessary to be adopted by every orchardist. These operations are need based and depend upon severity of disease in different mango growing areas.

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