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NATURAL FARMING IN MANGO

Mango is known as the king of fruits. In sanskrit, it is known as Amram, Rasalum, Sahakarfalam, etc. In Malayalam, it is known as manga, based on this the Portuguese gave the name mango. From The Himalayas in the North to Kanyakumari in the South, no village is found without mango tree. Thus, mango has connected the diversity of India. Mango is cultivated in Uttar Pradesh, Bihar, Andhra Pradesh, West Bengal, Tamil Nadu, Odisha, etc. The production of mango is highest in Uttar Pradesh.

Varieties

In India, about 1000 mango varieties are cultivated and among these, same important varieties are Dashehari, Langra, Himsagar, Malda, Gopal Bhog, Krishna, Chausa, Alphanso, Suvarnarekha, Baneshan, Neelum, Kesar, Fazli, Jardalu, Gulab, Totapuri, etc.

The following technique helps manage mango orchards efficiency with good yields. Dig 3 ft. wide and 2 ft. deep trench. Mulch this trench with dry leaves. At the beginning of the monsoon, spray 200 to 400 litres jeevamrit one to two times a month on mulch. Due to rain, jeevamrit will reach to the bottom of the soil and with the combination of mulch, moisture and jeevamrit, earthworms will work faster. The plant will get nutrients due to composting. The decomposition of mulch will form humus. By adopting these practices, the tree will give fruits every year and the number of fruits and quality will also improve.

On both sides of the trench grow cowpea and pigeon pea. These crops fixes atmospheric nitrogen in the soil, which provides necessary nitrogen to the roots for humus formation during summer and winter, apply jeevamrit in trenches during evening. Spray jeevamrit 10 liters with 100 liters of water once in a month to get good results.

The trench harvests rainwater and mulching reduces evaporation of water. You can get good production without chemical fertilizers, biofertilizers, compost, FYM, irrigation and pesticides by adopting this method. Aonla, guava, pomegranate, castor, papaya, drumstick, banana, curry leaves, custard apple, chilli, turmeric, cowpea, tulsi, fenugreek, mint, marigold and cucurbits crops are the companion crops of mango.

Distance

In traditional orchards for planting seedling of mango trees, spacing is kept as 33 x 33 ft which will accommodate 40 plants per acre. However, at present high density mango cultivation of dwarf trees with narrow spacing is followed because spaced plants become tall, so harvesting fruits is complex. Due to the scarcity of skilled labour, even mature fruits are difficult to harvest and they reach the ripening stage and fall. In high density planting distance is kept 10 x 10 ft, accommodating 435 trees per acre. The fruit bearing starts 3 year after planting, but it is advisable to start harvesting after 5 years leading to the reduction of the yield. Pruning the touching branches after one month of harvesting is advisable to increase yield with better quality. In high density planting trees remain dwarf, which facilitate easy harvesting of fruits and spraying of jeevamrit.

Propagation

To raise the rootstock of mango, select fruits from desi mango varieties that have a wide-spread canopy, strong branches, sour, fruit and grow naturally without irrigation. Fresh mango stones have higher vigour, but with the time vigour decreases, so the stone should be removed from the fruit at the time of sowing. After treatment with beejamrit, sow 3 to 4 stones at 33 x 33 ft distance in the circular pit as per below diagram. After sowing stone, cover it with a mixture of 4 parts soil 3 parts ghan-jeevamrit and slightly press with hand followed by application of water. Spray jeevamrit and mulch it with dry grass. Mango is an evergreen tree that survives and gives yield without irrigation, however, grafts purchased from the nursery have broken taproot and sub root due to which it cannot survive for a long time against the storm, drought and scarcity of water. So, instead of purchasing graft from a nursery, prepare graft in situ. The stone sown in June, germinates within 20 to 40 days. One year after the germination, roots go deep more than 150 cm and 90 to 120 cm parallel to the surface. After 12 to 15 months sowing of stone, 15 to 16 leaves will emerge and provide food materials to the grafts. August-September months are the ideal for softwood grafting; scion should be attached on the top portion of rootstock.

When the spacing is kept 10 x 10 ft between four mango plants, plant one drumstick plant, and between two mango and two drumstick plants, sow pigeon pea and bajra. Between two rows of plants, dig a trench of 2.5 ft wide and 1.5 ft deep opposite the slope. In the alternate trench, add water + jeevamrit and on the edge of the trench, grow chilli, ginger, cowpea, and cucurbitaceous crops. Apply jeevamrit mixed with water once or twice a month along with spraying. The alternate row which is not irrigated should be filled with mulching materials. They do not compete with each other, but act as a companion to each other. No plant grabs the food of another plant. It is wrong to say that a tree planted nearby steals or divides the food of other. The real situation is quite different from this. In nature, exploitation is not there but there is a companionship.

During the plantation of mango, we have to follow the laws of nature. If mango is planted alone without any companion crops, then yield will suffer during natural calamities. But if we grow companion crops, *viz.*, aonla, pomegranate, drumstick, etc., as an intercrop, then at the time of natural disasters, even though one crop fails the yield of others will not be affected. We will get production because all the crops have different fruiting times. Inter crops help each other and provide mulching material. Mango pest predators live and survive on intercrops. Intercrop also provides income throughout the year.

Mother plant should have the following characters

1. Higher yield
2. Sweet fruit
3. Better quality and colour
4. Disease and pest free

Select straight branches for scions having 10 to 15 cm length and 8 to 10 buds. For the plantation, select double mother plant (scion) in comparison to actual trees to be plant. Scion should be prepared 8-10 days before grafting by removing leaves. Before separation of bud stick, spray jeevamrit twice in the first week. Then spray jeevamrit (10 liter /100 liters water) in a week. Grafting needs to be done on 14 to 15-month old rootstock by removing the top 6 to 8 cm portion. Insert a sharp knife in the middle part of the rootstock and make a 5 to 6 cm deep cut. Make a 'V' shape on the lower portion of the scion and insert it in the rootstock as shown in the picture. Keep in mind that the thickness of rootstock and scion should be the same. Tie this portion with a plastic tap. After 10 to 15 days, new leaves will emerge on scion. Remove leaves from the rootstock every 15 days; when graft becomes uniform and leaves become dark green, remove the grafting tap and spray jeevamrit once or twice a month. To protect the graft from cold to heat, from Oct.-Nov. and May-June grow pigeon pea, bajra, etc. as a mix crop or companion crop. In situ softwood grafting is the best method in which the main root goes deep. After planting the stone, we shall do the grafting of mother plant (scion) up to three years. This method is simple, easy and cheap.

Scion from outside

When you want to select any special mango variety from outside the farm, select the mother plant

and remove leaves from the scion branch. After 8-10 days, cut scion from the mother plants. One third portion of the scion should be dipped in jeevamrit, then wrapped in a wet cloth, and bring it to the grafting site. If the temperature is high, then 3 to 4 time spraying of water shall be done. If it is grafted within 24 hours after cutting from mother plant, you can get 70-80% success; after 72 hours, the success rate reduces up to 50%. Because of mulching after grafting, weeds don't grow in surrounding area, and if any weed growth occurs, then cut it and mix it in a form of mulch. To protect from wind, tie the plant with support. After grafting, up to 4 years, remove the flowers and fruits so that the plant becomes strong. To pick fruits of the initial stage is unnatural that make the plant weak, and lifespan of the plant also decreases. From 5 to 10 years, take limited fruits, and then after ten years, pick all the fruits.

Flowering

The fruit should be picked with petiole after full blooming. As rain start in June, 2 to 3 new branches will emerge at the terminal portion. These new branches will mature from September to October, and flowering will start in January to February. In Mango, there are three types of flowers.

1. Male
2. Female
3. Hermaphrodite

The male flower matures first, so it is unable to fertilize the female flower. Wind pollination also does not occur. The possibilities of fruit setting are more if honeybees and house fly work as a pollinator, so to attract bees, grow flower crops in mango orchards. Honey bee pollinated fruits are of the best quality and healthy.

Maturity Indices of Mango Fruits

1. **Slight shoulder colour development** - light yellowish tinge appears on fruit shoulders
2. **Tapka method** - natural dropping of one or two ripe fruits indicates maturity
3. **Skin colour change** - shifts from dark green to olive green
4. **Days from fruit set** - maturity assessed by counting days from fruit set to harvest. It takes generally 110 to 130 days from fruit set to fruit harvesting
5. **Specific gravity** - fruits attain 1.01 to 1.02
6. **Flesh firmness** - slight softening of pulp indicates ripening stage
7. **Lenticel appearance** - become more prominent and waxy bloom starts disappearing
8. **Total Soluble Solids (TSS)** - reaches 11-15° Brix, showing proper sweetness
9. **Limitations** - methods like shoulder colour change and tapka are less reliable as they are not representative of whole-tree maturity, leading to uneven ripening.

Rejuvenation of old orchard

Generally, mango lives about 250 years, but due to lack of knowledge of natural farming, it lives only for 50 years and subsequently yield is reduced. Farmers should adopt the following steps to make the old mango orchard productive again.

Mango tree bearing small fruit, sour fruit and unproductive trees should be cut with the sharp cutter at 8-10 ft from ground level. At the time of cutting, care should be taken that root system should not be damaged. At the time of cutting, the primary branches should be kept safe. Apply neem paste on cut branches.

Preparation of neem paste

Take 30 liters water + 20 kg desi cow dung + 20 liters cow urine + 20 kg powder of dry neem leaves, mix all the ingredients, and keep it in the shade for 48 hours. Stir it with a stick 3 to 4 times day. Apply this neem paste on the trunk of the tree in May and October months. Application of neem paste will prevent different diseases. After 20 to 25 days of harvesting, a new shoot will emerge and get ready as a mother plant for grafting after 45 days. On the cut branches, keep only 8-10 shoots, and remove others. When the shoot achieves 10 to 15 cm length, at that time grafting of the scion of selected variety should be done.