

Offshoot preparation in Date palm: Methods, maintenance and care

Date palm (*Phoenix dactylifera* L.) is one of the oldest cultivated fruit crops in the world and belongs to the family Arecaceae. It is believed to be originated in Mesopotamia (Current-day Iraq) during 4000 BC. From its origin, the cultivation has spread and has become a major crop in Arabian Peninsula, North Africa and the Middle Eastern countries. In India, date palm cultivation is believed to be 450-500 years old with the major cultivation concentrated in Kachchh district of Gujarat accounting for more than 85% of India's total area and cultivation. The crop is dioecious, monocotyledon plants and can grow in very hot and dry climate. It can relatively tolerate saline and alkaline soils. Being a dioecious crop, high heterozygosity is observed in its population and to maintain its quality characters, they are asexually propagated through offshoots. Since, one palm produces only 10-20 offshoots in initial duration of 10-15 years; mass production of the planting material becomes very difficult and thus needs special care.

THE commercial cultivation of date palm, *Phoenix dactylifera* L. is concentrated in the western border states of India where Kachchh district of Gujarat contributes the largest area and production but most of the cultivated area is still of seedling origin. The crop can be propagated through seeds, offshoots and tissue cultured plant. Being a dioecious and highly cross pollinated crop, great variability exist in colour, size, shape, taste of the fruits if propagated through seeds. Moreover, the seed never assure the true-to-type nature of mother palm and 50-60% turned to be male and it also leads to variability, hence not recommended for commercial plantation. Tissue culture plants are currently not very easily available in bulk in India; hence the best way to maintain and increase production of quality date palm is propagation through the offshoots.

Offshoots are auxiliary buds developed between leaf base and the trunk during the juvenile phase of the palm.

The number of offshoots developed per palm is dependent on the variety/clones which are limited to a short vegetative phase of the palms and in initial 10-15 years of age, the palm produces an average of 10-20 offshoots. The offshoot

development process is very slow, which retard the fast multiplication process. Currently, no tool or technique is available to increase as well as speed up the production of offshoot and also to reduce time gap. Furthermore, the survival rate of the offshoots is very low (20-30%) under field conditions, and there are chances of enhancement and spread of pests and diseases. The preparation and removal of offshoot is a skilled and laborious work, and needs proper care. The propagation of the offshoot can be divided into two parts, first is the preparation



Prepared offshoots in date palm

of the offshoots by allowing them to root and second is the removal of the offshoots and transplanting them into the field. Each of these events are discussed in the later section.

Preparation of date palm offshoots



1. Remove the soil around the offshoot



2. Remove the dead leaves around the offshoot



3. Peel the outer surface of the offshoot



4. Spray 2000 mg/L IBA on peeled part



5. Prepare mixture of sand with FYM or vermicompost (1:1 ratio)



6. Tie plastic bag around the offshoot and fill the media accordingly



7. Sew the bag



8. Arrange irrigation for the offshoots



9. After 4-6 months, roots emerge and are ready for transplanting

Selection of mother plants and offshoots

Mother plant should be healthy, high yielding with desirable qualities and bear good quality fruits. The same method can be followed for both male and female plants. Plants should be preferably disease or pest free. For proper development of the plant along with good harvest of offshoot, it is better to maintain average of 3-5 offshoots per plant.

Offshoots that emerges from the base of the plants are called as 'ground offshoot' and the offshoots emerging from the trunk are called as 'aerial offshoot'. Since the ground offshoots touch the soil, natural rooting from the ground is observed which allows higher success rate during propagation. For effective propagation of the offshoots, it is best to select 2-3 years old ground offshoots which weigh about 10-15 kg.

Preparation of offshoots

The offshoots are prepared by cleaning the base of the offshoots by removing the surrounding soil and

peeling the outer area using sickle. The exposed area is treated with IBA@2000 mg/L. The base of the offshoot is then covered with the plastic bag, long enough to cover the surface, they are tied and media is filled and tighten. For higher rooting, mixture of soil + FYM or soil + vermicompost (1:1 ratio) is beneficial. Offshoots are allowed to root for 4-6 months before planting in the field. If natural moisture is not available, make arrangements by using drip to regularly wet the surface. While removing the outer surface of offshoots, care should be taken that the cut should not be too deep to damage the offshoots and the mother palm. Media should be devoid of stones and moisture must be maintained in prepared offshoot for better root initiation.

Transplanting of offshoots

When the offshoots are rooted, they are ready to be detached from the main plant. Before removing, tie the leaves of the offshoot and clean the base of the offshoot by removing excess soil. Detach the offshoot using a chisel

Removal and transplanting of date palm offshoot



1. Offshoots are ready for transplanting



2. Tie the leaves of the offshoots



3. Remove the soil around the offshoot



4. Remove the offshoot from the mother plant using chisel and hammer



5. Dip the cut portion in IBA solution (2000 mg/L)



6. Smear the cut portion with fungicide



7. Plant the offshoot with maximum girth at the ground level



8. Cover the offshoot with dates leaves or gunny bags



9. Irrigate the planting



Newly planted offshoots of date palm

and a hammer. Dip the offshoot in IBA solution (2000 mg/L) for a minute. Smear the cut portion with systematic fungicide. Plant the offshoot in a 1 m × 1 m × 1 m pit and care must be taken that the maximum girth of the offshoot's bole remains at the ground level. Planting the offshoot too deep may result in entry of water at terminal portion resulting in death. Cover the offshoot with the dates leaves or gunny bags to reduce its transpiration and respiration loss as most of the offshoots are planted in the summer months. Irrigate after planting and keep the soil moist until the plants are set.

Care should be taken to keep the cut clean and it should not be deep enough that it damages the mother plant. The cut section of mother plant should be treated with systemic fungicide and covered with the soil to avoid pest/disease attack. One-third of the leaves of the offshoot are cut during transportation and planting to reduce the transpiration and respiration rate. Transplanting in the month of March-April is preferable and must not be done in winter as it increases the chances of mortality. Preferable distance of planting in date palm is 8 m × 8 m and 9 m × 9 m in a pit of 1 m × 1 m.

Post care after transplanting

Transplanted offshoots should not be disturbed to

prevent any root damage. It should be protected from extreme heat, cold and wind (by covering with date leaves or green net). Mild irrigation should be provided daily up to 5-6 weeks of transplanting. Spray of systemic fungicide on the new emerging leaves after one month of plantation reduces changes of spoilage of terminal leaves.

Success story

The most important impact of this technique was the selection of elite palm by the farmers and its further multiplication through offshoots which led the production of quality fruits in bulk. Before adopting this technique, there were hardly one or two orchards with same type of clones in large numbers, however the scenario has changed tremendously as now many orchard having elite clones with sufficient numbers are available. In Dhrub village of Kachchh, more than 95% farmers are propagating through offshoots.

For further interaction, please write to:

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SUSTAINABLE DEVELOPMENT GOALS RELATED TO FRUITS AND VEGETABLES



SDGs 2 3

Health benefits of fruit and vegetables
Harness the goodness

Fruit and vegetables have multiple health benefits. They strengthen the immune system, combat malnutrition and help prevent non-communicable diseases.



SDGs 2 3

Diversified diet and a healthy lifestyle
Live by it, a diverse diet

Adequate amounts of fruit and vegetables should be consumed daily as part of a diversified and healthy diet.



SDGs 2 3

Food loss and waste
Respect food from farm to table

Fruit and vegetables are worth more than their price. Maintaining their quality and assuring their safety across the supply chain, from production to consumption, reduces losses and waste and increases their availability for consumption.



SDGs 2 3

Innovate, cultivate, reduce food loss and waste
Innovate, cultivate, reduce food loss and waste

Innovation, improved technologies and infrastructure are critical to increase the



SDGs 2 8 12 13 14 15

Highlighting the role of family farmers
Growing prosperity

Cultivating fruit and vegetables contributes to a better quality of life for family farmers and their communities. It generates income, creates livelihoods, improves food security and nutrition, and enhances resilience through sustainably managed local resources and increased agrobiodiversity.



SDGs 1 2 3 4 5 8 11 12 15

Sustainable value chains
Foster sustainability

Sustainable and inclusive value chains can help increase production, and help to enhance the availability, safety, affordability and equitable access to fruit and vegetables to foster economic, social, and environmental sustainability.



SDGs 1 2 3 4 5 8 11 12 15

Source: Fruit and vegetables – your dietary essentials, FAO background paper, FAO, Rome















