

Importance of Irrigation in Pomegranate

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Pomegranates are one of the world's oldest fruits. They are thought to have originated in Iran, Afghanistan, and parts of southwest Pakistan as early as 2500 BCE. Mesopotamian sources say that pomegranates were part of the diet of humans 5,000 years ago. Pomegranates were introduced to other parts of Asia, Africa, and Europe, including Spanish America in the late 16th century and California by Spanish settlers in 1769.



Fig 1. Pomegranate Fruit

The fruit and leaves are used to treat inflammation, cardiovascular disease, and gastrointestinal issues. The seeds are a good source of potassium, vitamin A, C, and E, as well as various antioxidants, calcium, and iron. The word "garnet" and "grenade" come from the word "pomegranate". This is because a shrapnel-scattering grenade imitates the seed-scattering explosion of a smashed pomegranate.

Pomegranate (*Punica Granatum*) is commercially planted in Maharashtra, Andhra Pradesh, Karnataka, Tamil Nadu, Gujarat and Madhya Pradesh. This fruit crop can tolerate soil salinity and saline irrigation water and does well even in shallow stony soils. It can also tolerate drought. Pomegranate makes an excellent choice under arid and semiarid condition. The plant is hardy and bushy

growing to a height of 2 to 4 m and is deciduous in cool climates. It can grow from sea level to 1850 m altitude.

Table No. 1 Production of Pomegranate in India

Pomegranate Production in India		
State	Area (ha)	Production (t)
Andhra Pradesh	5600	56400
Chhattisgarh	100	400
Gujarat	4400	45600
Himachal Pradesh	1300	500
Karnataka	13200	138500
Maharashtra	98900	555500
Nagaland	100	300
Orrisa	200	800
Rajasthan	800	4800
Tamil Nadu	400	17500
Total	125000	820300

Irrigation in Pomegranate Crop

Irrigation and fertilizers are the most important inputs which directly affect the plant growth, development, yield and quality of produce. Application of irrigation water and fertilizers through drip are the most effective ways of supplying water and nutrients to the plant roots. Farmers generally irrigate the pomegranate through surface method of irrigation, which needs more water to irrigate the crop and huge quantity of water losses occur through leaching and evaporation. Similarly, farmers are using solid fertilizers for fruit crop production but these are not totally water soluble and hence are less available to plants and some of the fertilizers contain salts of sodium and chloride which not only affect the quality and quantity of crop production but they are also harmful to the soil. The drip irrigation method is an appropriate answer, particularly for horticultural and cash crops as it permits the irrigator to limit the watering as per water requirement of plants and optimum application of fertilizers through drip irrigation system.

Advantages of Drip Irrigation in Pomegranate Crop

- **Water Efficiency:** Drip irrigation delivers water directly to the root zone of the pomegranate plants, minimizing evaporation and runoff. This targeted approach reduces water wastage and ensures optimal water use efficiency, crucial in areas where water resources are limited or expensive.
- **Improved Nutrient Management:** Along with water, drip systems can also deliver fertilizers and nutrients directly to the root zone, ensuring that the plants receive the necessary nutrients for healthy growth. This precision in nutrient delivery helps in better crop yield and quality.
- **Reduced Weed Growth:** Drip irrigation only waters the area around the plant roots, reducing moisture in the inter-row spaces where weeds tend to grow. This can significantly lower weed pressure, leading to reduced competition for water, nutrients, and sunlight, ultimately benefiting pomegranate growth and yield.
- **Minimized Disease Spread:** By avoiding overhead watering, drip irrigation helps keep the foliage dry, reducing the spread of foliar diseases that thrive in moist conditions. This can contribute to better overall plant health and reduced need for chemical treatments.

Irrigation Management

In arid and semi-arid regions pomegranate is grown with limited irrigation facilities. It requires regular irrigation to get optimal yield and fruit quality. In commercial production, irrigation should be scheduled as per the requirement of crop growth stage. The most sensitive phase of a plant growth cycle occurs during pollination, fruit set and development. Further water deficits, at fruit maturity and ripening

stages results in fruit cracking and such fruits become unsuitable for the fresh market. The water requirement of plants depends on age, season, location and management practices.

Drip irrigation has great potential due to high water use efficiency and increased yield. Besides water saving (60%), yield can be increased up to 30-35% by drip irrigation. Drip irrigation system with 2-4 adjustable drippers per plant should be installed depending upon age of the tree. For one- to three-year-old plants, 2 drippers/plant may be enough to provide required irrigation to the plant whereas from fourth year onwards 4 drippers/plant found better. Even fertilizers and chemicals can be applied through drip irrigation. In general, for non-bearing trees, about 5-25 litres/plant/day and 20-65 litres/plant/day for bearing trees are needed. For conventional tree spacings (15' x 10' or 12' x 12') online drip system with 4 or 8 lph drippers based on soil texture is better. Six 4 lph drippers per tree is the best lay out for trees above 3 years of age. Two lateral lines one on either side of the tree is found to wet the tree basin uniformly. For high density (10' x 10') and ultra-high density (7' x 10') inline system with two laterals with 4 lph emitters at 60 cm is recommended and it is best.

References

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