



Irrigation Solution  
**POMEGRANATE**  
With Jain Technology™



**JAIN**®

**Jain Irrigation Systems Ltd.**

*Small Ideas. Big Revolutions.®*

Pomegranate, *Punica granatum* is commercially planted in Maharashtra, AP, Karnataka, TN, 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 semi-arid 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.

#### Soil

- Pomegranate is very hardy crop and thrives well in shallow rocky soils.
- It can tolerate alkalinity and salinity.
- However best results are obtained in deep, heavy loam and well drained soils.
- It is sensitive to soil moisture fluctuation causing fruit cracking.

#### Climate

- It thrives best under hot dry summer and cold winter provided irrigation facilities are available.
- Humidity lowers the quality and proliferate diseases.
- It is fairly tolerant to low temperatures.
- However for proper fruit development, a temperature of 35-38° C is necessary.

#### Varieties

- **Ganesh**, soft seeds and pink flesh
- **Muskat red**, hard seed and reddish flesh
- **Jyothi**, soft seed and yellowish red flesh

- **Paper shell**, soft seed and reddish pink flesh
- **Jodhapur red**, hard seed, light pink flesh
- **Dholka**, soft seeds pinkish white flesh
- **Mridula**

#### Propagation

- Raised by cuttings or air or ground layering.
- 15-20 cm long hardwood cuttings taken from 1-2 years old plant, should be treated with Keradix 'B' rooting hormone or given a quick dip in 500 ppm IBA before planting.
- Plants will be ready in 55-66 days.
- Rainy season is the best time for rooting.

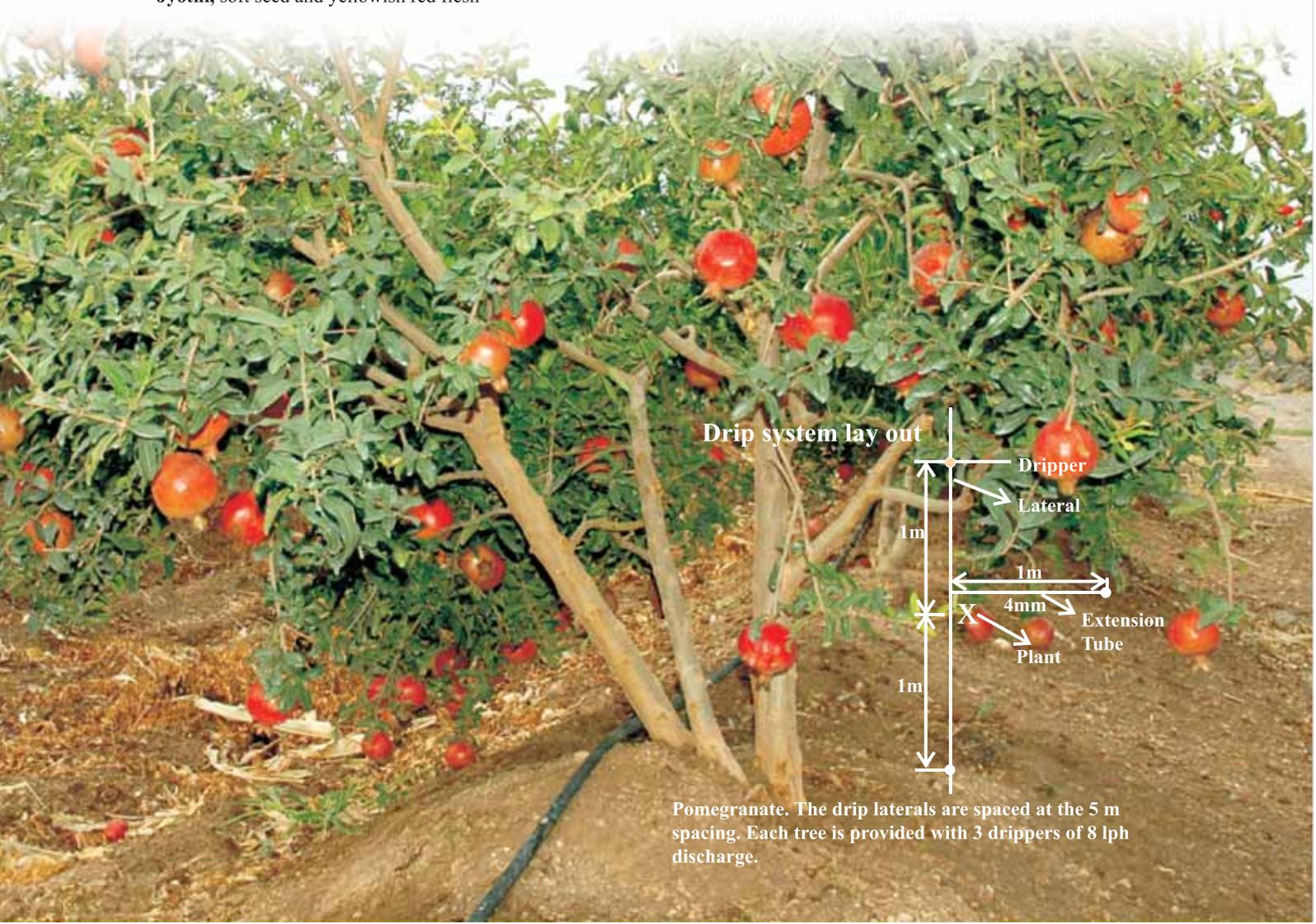
#### Planting

- Planting should be done during monsoon season.
- Different spacings are recommended based on soil richness; 5 x 2 m (400 plants/ac), 5 x 5 m (160 plants/ ac) or 5 x 4 m (200 plants/ac).
- Spacing of 5 m x 2 m, high density planting gives maximum return.
- Pits of 1 x 1 x 1m are dug at 5 m spacing in square system.
- Fill the pits with 20 kg FYM.
- Irrigation must be done immediately after planting.

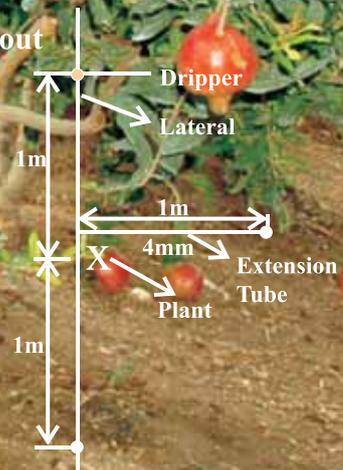
#### Irrigation

In post monsoon period copious and regular irrigation is essential for better development of fruits and to avoid fruit cracking.

A drip irrigation of 50-60 l per day per tree is essential at peak growth.



#### Drip system lay out



Pomegranate. The drip laterals are spaced at the 5 m spacing. Each tree is provided with 3 drippers of 8 lph discharge.

## Water requirement for Pomegranate

mature trees at 5m x 5m.

Month	Water requirement	
	Mm/day	Lt/plant/day
June	2.39-3.99	59.75-99.75
July	1.97-3.32	49.25-83.00
August	1.91-3.47	47.75-86.75
September	2.28-3.66	57.00-91.50
October	2.15-3.54	53.75-88.50
November	2.1-3.22	52.50-80.50
December	1.8-3.09	45.00-77.25
January	2.03-3.22	50.75-80.50
February	2.48-3.74	62.00-93.50
March	2.99-4.35	74.75-108.75
April	3.28-4.80	82.00-120.00
May	3.34-5.12	83.50-128.00

Stop irrigation if it rains more than 20 mm. Similarly irrigation is suspended for induction of flowering and fruiting.

### Fertigation

The recommended fertilizer doses for Pomegranate are given below. Estimation of fertilizer requirement based on soil analysis will be more accurate.

#### 1st year tree

All of SSP per tree is applied directly to the soil in two equal splits, in January and June, respectively. Apply in the form of a ring 40 cm away from trunk and 10 cm below the soil surface. Cover with top soil.

SSP can also be mixed with FYM/ Compost and applied together.

Fertilizers	Quantity	Fertigation rate	Duration
Urea	100g/tree	50g/tree/week	Jan 1 <sup>st</sup> wk-Jan 2 <sup>nd</sup> wk
	100g/tree	"	June 1 <sup>st</sup> wk-June 2 <sup>nd</sup> wk
MOP	50g/tree	25g/tree/week	Jan 1 <sup>st</sup> wk-Jan 2 <sup>nd</sup> wk
	50g/tree	25g/tree/week	Jun 1 <sup>st</sup> wk-June 2 <sup>nd</sup> wk

#### 4th year tree

All SSP to be applied in two splits, January and June (200 g /tree each), as soil application. Apply the SSP in rings around the tree 1m away from the trunk. Place the fertilizer at a depth of 10-15 cm below the soil surface and cover with top soil.

Fertilizer	Quantity	Fertigation rate	Duration
Urea	400g/tree	100g/tree/week	Jan 1 <sup>st</sup> wk-Jan 4 <sup>th</sup> wk
	400g/tree	100g/tree/week	June 1 <sup>st</sup> wk-June 4 <sup>th</sup> wk
MOP	200g/tree	50g/tree/week	Jan 1 <sup>st</sup> wk-Jan 4 <sup>th</sup> wk
	200g/tree	50g/tree/week	June 1 <sup>st</sup> wk-June 4 <sup>th</sup> wk

SSP can also be mixed with the FYM/Compost and apply as per the above schedule.

### Benefits of Drip irrigation for Pomegranate

- Increases leaf yield upto 50%.
- Reduces water used for irrigation up to 60%.
- Increased fertilizer uptake by plants when fertigation is practiced increased fertilizer use efficiency through fertigation.
- Consequently a reduction of up to 30% of applied fertilizer

from the recommended dose is possible.

- Reduces NO<sub>3</sub>-nitrogen leaching (thereby nitrate pollution) by 50% when fertigation is practised.
- Controls weed growth as water is applied only to the root zone.
- Allows for intercropping during the early years.

### Pruning

Pomegranate is trained as bush. The plant should be allowed to retain 4 main stems from the ground level. Extra suckers should be removed continuously. The main stem should be topped at a height of about 70 cm to reduce branching. The tree is given a balanced shape during the initial 2-3 years by the proper selection of secondary and tertiary branches. Downward growing branches and crossing branches should be removed.

After the tree is trained, much pruning is not required as the fruits are borne on one year old branches. However water sprouts and dry branches should be removed. After 10 years, old main stems should be removed by cutting back to make it more productive.

### Regulation of Flowers (Bahar treatments)

Pomegranate flowers in three distinct phases with maximum intensity in the rainy season.

These are traditionally indicated as Bahar treatments

1. **Ambe Bahar** - Flowering in Jan-Feb; suspend irrigation in Nov-Dec for 45 days till leaves drop.
2. **Mrig Bahar** - Flowering in Jun-Jul; suspend irrigation in Dec end-April beginning.
3. **Hasta Bahar** - Actually this season is not suitable as fruit sucking moths finish of the fruits. It is however practiced in some parts of Maharashtra. Suspend irrigation during Aug-Sept and flowering happens in Oct.
4. **Ambe and Mrig Bahar** treatments also leads Fertigation to be practiced during Jun (Mrig Bahar) and Jan (Ambe Bahar).

### Harvest

5-6 months after flowering when fruits change in skin color and gives a metallic sound when tapped. Yields 100-150 fruits/annum. High density planting 1000 plants/ha (5 X 2m) is profitable.

### Post harvest

Fruits can cured in shade for about a week so that the skin becomes hard and fruit can stand transportation. When stored at 0c to 4.5c with 80-85% R.H. can be safe for 7 months.

### Intercropping

Since pomegranate plants take 3-4 years to come into good bearing low growing vegetables, pulses or green manure crops can be taken up as intercrops.

Provide additional drip line for the intercrop.



## Insect and disease pests of Pomegranate

### IPM for Pomegranate

Cultural: eg. Crop rotation to avoid insect build up.

Mechanical eg. Cultivation to remove weeds.

Biological eg. Release of parasitic wasps for Anar butterfly control

Chemical eg. Herbicides, insecticides, fungicides (given below)

### Diseases of Pomegranate

#### Fruit spot (*Cercospora spp.*)

Brown to black spots on the fruit

Spray Dithane M-45 or Captan 500g in Gloeosporoides 200 liter water at fruit spp. formation. Repeat the spray 3-4 times at 15 day interval.

#### Fruit rot (*Phomopsis spp.*)

Occurs in Rainy young fruits drop Yellow black spots on fruit season Spray Dithane M-45 or Captan as above.

#### Fruit Cracking

young fruits crack due to Boron deficiency as one reason and drought.

maintain soil moisture Early harvest Spray Calcium Hydroxide on leaves and fruits after fruit set.

### Insect pests of Pomegranate

#### Anar Butterfly (*Infested fruits*)

Virachola isocrates rot, Fruit drop

Larve bores fruits, Spray carbaryl 3ml/l at every 15 days.

Special care should be taken if it rains during the fruiting period.

#### Bark eating (*Caterpillar*)

dies later Bores bark Tree

Clean the Bore hole Swab with cotton Inderbela soaked in Kerosene or tetraonis petrol or Carbon disulphide.

### Dos

- Ensure good drainage in the field.
- Adopt drip for irrigation.
- Prepare pits and fill it with the mixture as recommended.
- Compulsorily apply organic manure as per recommendation
- Select high yielding, disease and pest tolerant variety suitable for each location.
- Practice drip irrigation from the beginning of the orchard.
- Irrigate with drip strictly following the schedule given by the engineer.
- Compulsorily weed/ intercultivate, timely operation helps in crop growth.
- Follow fertigation schedule as given by the engineer.
- Apply micronutrient as and when needed.
- Follow disease and pest control measures timely and effectively.
- Apply sprays in the evening or early morning only.

### Don'ts

- Don't over irrigate the crop at anytime.
- For fertigation don't mix solid fertilizers and dissolve them together. Prepare individual solutions and mix them for application.
- Don't use the fertigation unit for bulky organic manure and fertilizers that are not soluble in water.
- Don't add solid fertilizer from the bag directly to the fertilizer tank. Prepare solution separately and pour the solution to the fertilizer tank. Prepare solution only in plastic buckets. Don't use metal container.
- Don't stir the solution with naked unprotected hand. Use wooden spoon or stick.
- Don't heat the fertilizer solution to increase solubility.
- Do not spray pesticide under hot sun.

*Crop yields depend on climate, soil and management and therefore can't be guaranteed by the company.*

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