



Jain Tissue Culture
POMEGRANATE
With Jain Technology™

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 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.

The average yield pomegranate in India is 6.6 t/ha. Compared to the other countries; Spain (18.5 t/ha) USA (18.5 t/ha) and Turkey (11.3t/ha), the Indian yield is very low.



POMEGRANATE PRODUCTION IN INDIA		
STATE/UT'S	POMEGRANATE	
	Area x 000 ha	Production x 000 t
Andhra Pradesh	5.6	56.4
Chhatisgarh	0.1	0.4
Gujarat	4.4	45.6
Himachal Pradesh	1.3	0.5
Karnataka	13.2	138.5
Maharashtra	98.9	555.5
Nagaland	0.1	0.3
Orrisa	0.2	0.8
Rajasthan	0.8	4.8
Tamil Nadu	0.4	17.5
Total	125	820.3

Jain Tissue culture Pomegranate

- The conventional planting material of pomegranate is the air-layered saplings from existing mature trees. Production of this sapling brings with it all the diseases and other characteristics of the mother plant. In a way the disease transmission to the new generation of planting material is inevitable.
- Large number of mother plants is required to produce sufficient saplings; the maximum number of air layers per tree is 100-150.
- Added to these disadvantages is the very low survival rate of air layered saplings when planted in the field. This is mainly because of the manual handling of the process of air layering and removal of the layered saplings from the mother plant. Additionally, the poor selection of branches for air layering adds to the low survival after planting.
- Air layered saplings are not uniform in growth and fruiting characters. Similarly non-uniformity arises because of the large number of mother trees used for air layering.
- The turn over period (time duration from mature mother plant to the fruiting of air layered daughter plant) is very long in the conventional method of sapling production (36 months for the air layered sapling to come to fruition).
- These disadvantages cause loss of time, productivity and quality in Pomegranate production systems.
- Jain Irrigation introduced TC technology into Pomegranate to overcome these disadvantages.
- TC plants are produced from tissue taken from disease free elite mother plants grown in protected environment thus making the planting material (TC originated) totally disease germ free. The mother tissue is indexed for both bacterial and fungal organisms to ensure that the TC plants are not carrying any disease agents.
- TC production requires very few healthy mother plants to produce large number of saplings; for example, starter tissues from one mother plant can produce up to a million (10 lakh) TC plants.

- The field survival of these TC plants is very high (99%).
- TC planting material offers a uniform and faster growth rate compared to conventional air layered saplings.
- TC pomegranate will flower and fruit in 18 months after planting.
- TC plants produce more secondary and tertiary branches and develop a bigger canopy much faster giving rise to more shoot points for flowering.
- These trees flower early (18 months) and produce more fruits per tree per season.
- The fruits are bigger in size with attractive rind colour.



Better Yield. Greater Profits.

Climate

- It thrives best under hot dry summer and cold winter provided irrigation facilities are available.
- Rainfall above 500-750 mm is not suitable for fruiting of pomegranate.
- 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.

Soil

- Pomegranate is a very hardy crop and thrives well in shallow rocky soils.
- It grows well in a range of pH , 6-8; and can tolerate alkalinity and salinity
- However best results are obtained in deep, heavy loam and well drained soils.
- The incidence of diseases (bacterial and fungal) under low fertility conditions.
- It is sensitive to soil moisture fluctuation causing fruit cracking

Land preparation for TC pomegranate

- It is recommended to plant TC pomegranate saplings either on flat or raised beds.
- Pits are dug at recommended spacings; pits are of 1'x1'x1' for light loamy soils; 2'x2'x2' for medium soils; and 3'x3'x3' for rocky or stony soils.

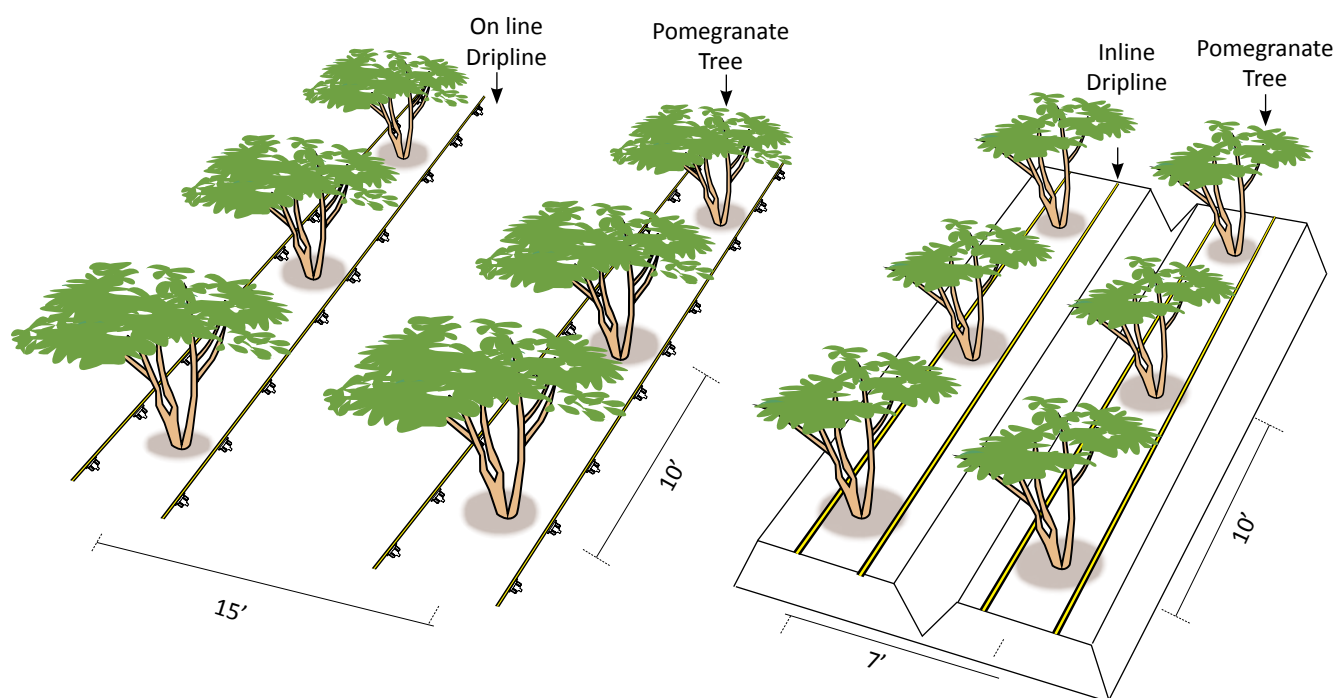
- Raised beds are compulsory for heavy soils; the width of the bed is 90 cm; the centre to centre distance of the beds will be 3 m. (DRAW two beds)
- The pits dug at the crest of the raised bed will be 1'x1'1'.

Plant spacing

- Spacing of TC pomegranate depends on soil type and climate. Normal spacing is 15' x 10' accommodating 299 trees/ac.
- In Precision farming, 12' x 12' (311 trees/ac), 10'x10' (449 trees/ac) and 7' (row-row) x 10' (plant-plant) (641 trees/ac) are recommended based on the soil type.
- 7'x10 spacing gives ultra high density with 641 trees per acre . The canopy of this UHDP population is maintained by pruning every year to eliminate plant to plant competition.



Drip Layout for Pomegranate Plantation



Conventional Spacing on flat land

Spacing : 15'x10'

Drip System : Online, 6x8 lph; on 2 laterals.

UHDP Spacing on raised bed.

Spacing : 7'x10'

Drip System : Inline, 4 lph at 50cm on 2 laterals.

Varieties

Among the varieties of Pomegranate currently available, Bhagava and Mrudula were selected for TC propagation based on a number of positive criteria ;

- Yield potential,
- Crop duration and time to maturity
- Disease tolerance
- Keeping quality of the fruit
- Market demand

Planting

- After the pits are made, sprinkle bleaching powder on to the floor and the surrounding wall of the pit (2-5 g/pit) and wet the inner surface by spraying water.
- Pits are to be filled at least a week before planting of the saplings. Pit filling is done by a 1:3 mixture of FYM and garden soil plus 250g SSP, 5g Phorate, 5g COC, and 1kg Neem cake.
- Hardened TC plants come in polybags transported by trucks. These plants should be unloaded and kept under shade for about 24-30 hours before planting. They should not be kept under dark or in an enclosure.
- Sprinkle water to keep the growing media in the polybags wet. Spray any fungicide (COC, for example) at 1 g/l rate on to the foliage.
- At planting cut the polybag vertically without damaging the root system and disturbing the surrounding medium.

- Keep the TC plant along with the growing medium carefully at the centre of the pit (by wading the filled up material to the sides of the pit) and press the soil mixture gently all around the base of the sapling.
- Irrigate with drip system.
- In disease hot spot areas, it is recommended to drench the newly filled soil mixture surrounding the sapling by a fungicide (COC) at 1 g/l concentration.
- Intercropping in TC Pomegranate orchard is not recommended for fear of negative competition.

Irrigation management

- Precision in irrigation is very critical for pomegranate; excess soil water would result in root water logging and subsequently increase in bacterial and fungal diseases.
- Drip irrigation is the best available method for precision farming of Pomegranate.

Drip system details

- For conventional tree spacings (15' x 10' or 12' x 12') Jain online drip system with 4 or 8 lph drippers based on soil texture is recommended. (see Figures). Six 4 lphdrippers 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') Jain inline system with two laterals with 4 lph emitters at 60 cm is recommended.

UHDP Pomegranate Plantation



Water requirement

Water requirement varies with the place and time (age of the tree). Table xx shows the WR per tree for conventional plant spacing (15' x 10') from year 1 to year 5.

Water Requirement of TC Pomegranate \$ for 15' x 10' tree spacing (l/tree/day), conventional populations

Period	year 1	year 2	year 3	year 4	year 5
October	2	7	21	28	35
November	2	7	21	28	35
December	2	7	21	28	35
January	3	10	30	40	45
February	3	10	30	40	50
March	3	10	30	40	50
April	4	13	40	50	60
May	4	13	40	50	60
June	3	7	21	40	50
July	2	6	18	25	30
August	2	6	18	25	30
September	2	6	18	25	30

\$ these figures are for Nashik. For other locations Jain agronomist will estimate WR and provide to the growers.

Water Requirement of TC Pomegranate \$ for 7' x 10' tree spacing (l/tree/day), UHDP

Period	year 1	year 2	year 3	year 4	year 5
October	2	3.3	9.8	13.1	16.4
November	2	3.3	9.8	13.1	16.4
December	2	3.3	9.8	13.1	16.4
January	1.4	4.7	14	18.7	21.1
February	1.4	4.7	14	18.7	23.4
March	1.4	4.7	14	18.7	23.4
April	1.9	6.1	18.7	23.4	28.1
May	1.9	6.1	18.7	23.4	28.1
June	1.4	3.3	9.8	18.7	23.4
July	0.9	2.8	8.4	11.7	14
August	0.9	2.8	8.4	11.7	14
September	0.9	2.8	8.4	11.7	14

\$ these figures are for Nashik. For other locations Jain agronomist will estimate WR and provide to the growers.



ONE STOP SHOP for Your

Jain Turbo Key Plus® Dripper



- Available discharge rates - 2, 4, 8, 14 lph at 1 kg/cm².
- For orchards and vineyards, greenhouses, nurseries, landscape etc.
- Recommended to use in problematic water condition where opening and cleaning of the emitter is needed.

Wide cross sectional area of flowpath makes the dripper clog resistant.

Ease in maintenance & inspection by dismantling emitter



Extended outlet facilitates connection of multi outlet connection for nurseries.



Cross shaped inlet filters prevents entrance of impurities.



Colour coded cap facilitates easy identity for flow rates.



Anti-Bug cap prevents entry of ants/bugs inside the dripper.

Jain Turbo Line Super®



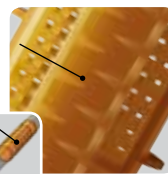
- Available discharge rates (at 1kg/cm²)
12mm - 2.2, 4 lph
16mm - 4, 8 lph
20mm - 2.2, 4, 8 lph
- Available in 12, 16 & 20 mm nominal diameter.
- Suitable for surface as well as subsurface installations.

Straight and wide labyrinth design makes the dripper truly clog resistant.

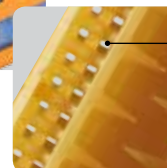
Computerized online checks for emitter spacing



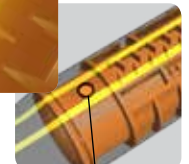
Hydrodynamic through bore design provides least obstruction to flow.



Hydrodynamically designed cascade tooth structure helps to create double flow regime for continuous flushing of dirt.



Precision inlet filters to prevent entry of physical impurities



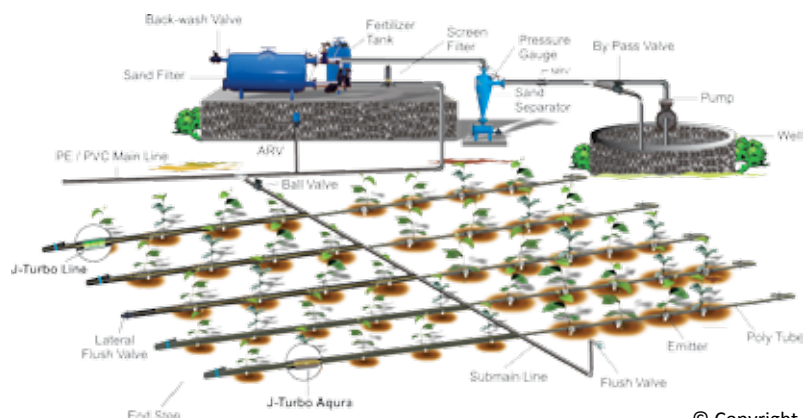
Laser Drilled Multiple Outlet Holes

Why Jain Drip Irrigation ?

Water is not the only need of the plant. To uptake this water efficiently, it requires proper air-water balance within the root zone. Drip irrigation, with its low application rate, prevents the saturation of water within the root zone and continuously maintains field capacity. This provides a favorable condition for the growth of the plant. Drip irrigation also helps to use fertilizer efficiently. With drip irrigation water can be provided at frequent intervals which helps maintain required soil moisture level within the vicinity of the plant roots. Jain is the pioneer of drip irrigation. Ours is the only company in the world, which fulfills your entire irrigation system requirement under one roof.

Characteristics of drip irrigation

1. Water is applied at a low rate to maintain optimum air-water balance within the root zone.
2. Water is applied over a long period of time.
3. Water is applied to the plant and not to the land.
4. Water is applied at frequent intervals.
5. Water is applied via a low pressure delivery system.



Micro Irrigation Needs

Jain Turbo Excel®



- Available discharge rates - 0.85, 1.2, 1.6, 2.1, 4 lph @ 1kg/cm².
- 12, 16, 20, 25 mm nominal diameter.
- Dripper Spacing 15, 20, 30, 40, 50, 60, 75, 90 cms.
- Suitable for surface as well as subsurface installations

Weir structure to prevent entry of sand particles in flow path



Computerized Continuous online quality checks for consistent performance

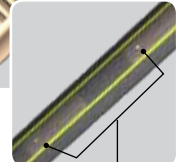
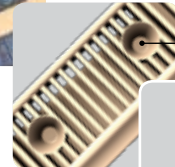
Innovative Cascade Labyrinth



Double flow regime which does continuous flushing of small particles.



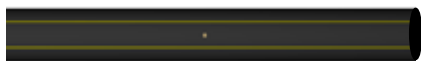
Unique 3-D inlet filter enable clog free operation.



Computerized online checks for emitter spacing



Jain Turbo Top™

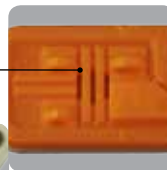


- Available discharge rates – 1.1 & 1.7 lph
- Anti Siphon feature (optional) prevents suction of sand and silt particles inside the dripper.
- Available in 16 & 20mm nominal diameter. 12 mm in Thin walled tubing.
- Suitable for surface as well as subsurface installations.

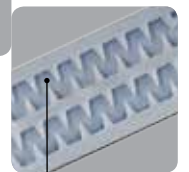
3-D inlet filter enables clog free operation



Weird outlet to prevent entry of roots



Injection moulded silicone diaphragm gives uniform performance



Long & wide Cascade flow path - Hydrodynamically designed cascade labyrinth helps to create double flow regime for continuous flushing of dirt



Largest Choice ! Customized Irrigation Solution for Pomegranate

Online Emitter



Jain Filtration Equipment



Jain Fertigation Equipment



Jain Jets & Spray heads



Jain PVC Pipes & Fittings



Automation Equipment



Benefits of Drip irrigation and Fertigation for Pomegranate

- Increases yield upto 50%
- Acts as a catalyst to achieve the highest potential yield of the crop.
- Improved quality, uniformity in fruit size.
- Reduces water used for irrigation up to 60%
- Saves Energy upto 50%.
- Increased fertilizer use efficiency through fertigation.
- Reduces NO₃-nitrogen leaching (thereby nitrate pollution) by 50% when fertigation is practised.
- Controls weed growth as water is applied only to the root zone.
- Drip - Fertigation provides a disease - free environment.
- Low humidity because of Drip Irrigation helps in maintaining crop hygiene.



Fertilizer requirement

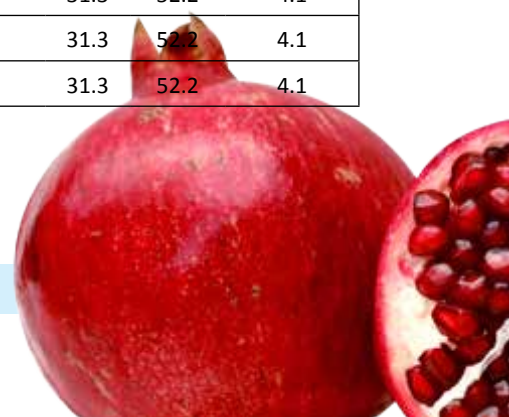
The fertilizer element requirement of TC pomegranate at different stages are given in table. Fertilizer requirement for TC Pomegranate

Age of tree (months)	FYM kg/tree	N g/tree	P g/tree	K g/tree
Jan-18	20	375	187.5	166.2
19-24	10	62.5	62.5	146.7
25-36	30	625	250	250
4	40	625	250	250
5	50	625	250	250

Fertigation

Fertigation thru the drip system give higher fertilizer use efficiency. The schedule of fertigation is given in table. Here the schedule is given for the first 18 months after planting coinciding with the first crop by TC Pomegranate.

Fertigation schedule for first 18 months (till first flowering)										
1-18 months (October-March)	Duration	N =375 g/tree	Urea g/tree	Schedule Urea g/ week/tree	P= 187.5 g/tree	Phosphoric Acid g/tree	Schedule Phosphoric acid (52% P) g/wk/ tree	K= 166.2 g/tree	White MOP g/tree	Schedule MOP g/ wk/tree
1-90 days	90 days	42	91.3	7.1	20.8	40	3.1	20.5	34.7	2.7
91- 180	90	42	91.3	7.1	20.8	40	3.1	20.5	34.7	2.7
181-270	90	83	180.4	14	42	80.8	6.3	31.3	52.2	4.1
271-365	90	83	180.4	14	42	80.8	6.3	31.3	52.2	4.1
366-456	90	62.5	136	10.6	31.3	60.2	4.7	31.3	52.2	4.1
457-546	90	62.5	136	10.6	31.3	60.2	4.7	31.3	52.2	4.1



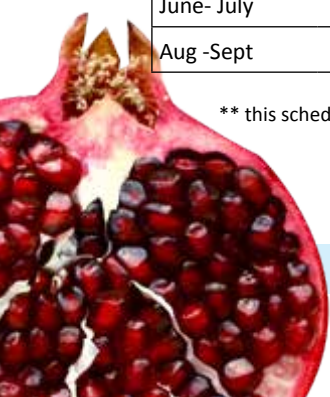
Fertigation schedule for 19-24 months (till first harvest) for VARIETY BHAGWA										
19-24 months (April- September)	Duration	N = 63 g/tree	Urea g/tree	Schedule Urea g/week/ tree	P= 62.5 g/tree	Phosphoric Acid g/tree	Schedule Phosphoric acid (52 % P) g/wk/tree	K= 146.3 g/tree	White MOP g/tree	Schedule MOP g/wk/tree
546-591 days	45	21	35	5.5	31.5	60.6	9.43	31	51.7	8.1
592-636	45	21	35	5.5	31	59.6	9.3	31.3	52.2	8.2
637-681	45	21	35	5.5	0	0	0	42	70	10.9
682-726	45	0	0	0	0	0	0	42	70	10.9

Fertigation schedule for 19-22 months (till first harvest) for VARIETY MRUDULA										
19-22 months (April- July)	Duration	N = 63 g/tree	Urea g/tree	Schedule Urea g/week/ tree	P= 62.5 g/tree	Phosphoric Acid g/tree	Schedule Phosphoric acid (52 % P) g/wk/tree	K= 146.3 g/tree	White MOP g/tree	Schedule MOP g/wk/tree
546-576 days	30	21	35	8.75	31.5	60.6	15.15	31	51.7	12.9
577-607	30	21	35	8.75	31	59.6	14.9	31.3	52.2	13.1
608-638	30	21	35	8.75	0	0	0	42	70	17.5
639-669	30	0	0	0	0	0	0	42	70	17.5

Fertigation schedule for 25-36 months (based on Bahar treatment)** BHAGWA										
25-36 month	Duration (days)	N = 625 g/tree	Urea g/tree	Schedule Urea g/week/ tree	P= 250 g/tree	Phosphoric Acid g/tree	Schedule Phosphoric acid (52 % P) g/wk/tree	K= 250 g/tree	White MOP g/tree	Schedule MOP g/wk/tree
Oct-Nov 15	45	187.5	407.6	63.7	100	192.3	30.0	25	41.7	6.5
Nov 16-Dec 31	45	STRESS PERIOD for inducing Flower								
Jan 1- Feb	58	187.5	407.6	49.1	75	144.2	17.4	50	83.3	10.0
March-May	90	187.5	407.6	31.8	75	144.2	11.3	75	125.0	9.8
June- July	90	62.5	135.9	10.6	0	0	0	75	125	9.8
Aug -Sept	60	0	0	0	0	0	0	25	41.7	5.2

Fertigation schedule for 25-36 months (based on Bahar treatment)** MRUDULA										
23-36 month	Duration (days)	N = 625 g/tree	Urea g/tree	Schedule Urea g/week/ tree	P= 250 g/tree	Phosphoric Acid g/tree	Schedule Phosphoric acid (52 % P) g/wk/tree	K= 250 g/tree	White MOP g/tree	Schedule MOP g/wk/tree
Aug-Sept	60 days	NO fertigation								
Oct-Nov 15	45	187.5	407.6	63.7	100	192.3	30.0	25	41.7	6.5
Nov 16-Dec 31	45	STRESS PERIOD for inducing Flower								
Jan 1- Feb	58	187.5	407.6	49.1	75	144.2	17.4	50	83.3	10.0
March-May	90	187.5	407.6	31.8	75	144.2	11.3	75	125.0	9.8
June- July	90	62.5	135.9	10.6	0	0	0	75	125	9.8
Aug -Sept	60	0	0	0	0	0	0	25	41.7	5.2

** this schedule is applicable to all further flushes.



Better Yield. Greater Profits.

 **Jain™**
Tissue-Culture

Secondary and Micro nutrients

For TC pomegranate micronutrient recommendation is based on soil test. However it is found that in Indian soils pomegranate requires, addition of :

1. Magnesium Sulphate (10-15 g/plant/month);
2. Copper sulphate (10 g/plant/month)
3. Zinc sulphate (10 g/plant/month).

These micronutrients also provide protection from bacterial blight.

Pruning and canopy control

Pruning in Pomegranate, especially in the high and ultrahigh density, is required to keep the canopy size maintained so that overlap and mutual shading will not occur.

- Pruning is essential for TC plants as their growth is more vigorous and in short time several branches and sub-branches develop to fill the canopy. Pruning induces formation of more fresh shoots, a requirement for increasing the flower density.
- Pruning reduces the length of shoot branches and compresses the canopy giving more strength to the branches. Strong branches do not require external support (props) to hold them. For TC plants, maintenance of multi trunk is strongly recommended. First pruning is done at 2-3 months after field establishment.
- Pruning should be done in TC Pomegranate in such way that at each pruned tip two fresh branches in the form of "Y" should initiate.
- Each branch should undergo pruning once it reaches 12-15" growth ; i.e. after 2-3 months' growth. Pruning should be done when the stem thickness reaches the size of a refill of a pen.
- About 25-50% inward branches should also be removed to allow sunlight penetration into the canopy. All branches directed towards the ground should be removed.

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. AmbRegulation 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. **AmbeBahar** : Flowering in Jan-feb; suspend irrigation in Nov-Dec for 45 days till leaves drop.
 2. **MrigBahar** : Flowering in Jun-Jul; suspend irrigation in Dec end-Aprilbeginning.eBahar – Flowering in Jan-feb; suspend irrigation in Nov-Dec for 45 days till leaves drop. October planted TC plants will begin flowering in late February matching to Mrigbahar.
 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 MrigBahar** treatments also leads Fertigation to be practiced during Jun (MrigBahar) and Jan (AmbeBahar)
- Stress management is critical to seasonalise flower induction by suspending irrigation.

DISEASES

Disease Name	Control
Bacterial leaf and nodal blight.	Select disease free planting material Spray Bordeaux mixture -1.00% Spray with Streptocycline (0.025%) in combination with Copper oxychloride (0.25%) or Carbendazim (0.15%) at 15 days interval for 5-6 times starting from leaf initiation stage. If possible, cut ends should be pasted with Bordeaux (10%) paste. Follow orchard sanitation measures strictly.
Anthracnose & Leaf spot and fruit spot	Spray the crop with Carbendazim (0.15%) or mancozeb (0.25%) or copper oxychloride (0.25%) before plucking fruits.
Fruit rot	Spray the crop with carbendazim (0.15%) or mancozeb (0.25%) or copper oxychloride (0.25%) before plucking fruits.
Internal break down of arils.	Harvest fruits at right time and avoid excess irrigation.

INSECT PESTS

Name	Control
Rhipiphorothrips	Remove pruned material from main field and burn, Rake the soil periodically, Keeping the basins clean also reduces damage due to thrips, Spraying Dimethoate 0.06% prior to flowering is important. If serious , a spray of methyl oxy-demeton 0.05% should be repeated after fruit set. The subsequent sprays for borer will limit thrips build up. In case of species other than R. cruentatus, Acephate 0.075 should be sprayed.
Pomegranate butterfly	Remove and destroy all the affected fruits (fruits with exit holes), Spray Decamethrin @ 0.0028% at the time when more than 50% of fruits have set. Repeat after two weeks with Carbaryl @ 0.2% or Fenvalerate @ 0.005% in non-rainy season Quinalphos @ 0.06% is also effective. The number of sprays depends on severity of infestation. Remove flowering weeds especially of compositae family.

Name	Control
Shoot hole borer	Early diagnosis with symptoms is a must. Hence, regular visit to orchards by growers is suggested. Signs of lateral branch yellowing to quick drying of full tree, should be immediately brought to notice of specialists and treatments be undertaken as recommended
Poimegranate aphid	Spray dimethoate 0.06%
Mealy bugs	Remove affected twigs and small branches. Spray monocrotophos (0.1%) or chlorpyrifos (0.02%) or dichlorvos (0.05%).

Harvest

Harvest time is decided by examining the fruit. The grower can decide to harvest by observing;

- Fruits are ready for harvest in 4-5 months in Mrudula and 6-7 months in Bhagwa
- Fruit gives a metallic sound when tapped.
- Opening of calyx partly or fully at the top of the fruit.
- Green rind surface turning to yellow in colour.

Yield

Both these varieties flower and fruit profusely. However it is recommended to do thinning of fruits as given below to maintain fruit size and quality and to sustain the health and vigour of the plant.

Management of fruit number/tree and yield per flush				
Variety	Flush no.	No of fruits/tree	Average fruit weight g/fruit	Total yield kg/tree
Mrudula	1	30-40	250	10-12
	2	60-70	250	15-17
	3	80-90	250	20-22
	4	100-110	250	25-27
	5	120-130	250	30-32
maintain the above fruit number by thinning				
Bhagwa	1	50-55	300	15-17
	2	65-70	300	20-22
	3	83-89	300	25-27
	4	100-105	300	30-32
	5	115-120	300	35-37
maintain the above fruit number by thinning				

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 gunny 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.





The Company

Jain Irrigation Systems Ltd. (JISL) derives its name from the pioneering work it did for the Micro Irrigation Industry in India. However, there is more to Jain Irrigation than Irrigation.

Jain Piping Division is the largest producer of Thermoplastic piping systems for all conceivable applications with pipes ranging from 3 mm to 1600 mm in diameter and in pressure ratings ranging from 1.00 kgf/cm² to 16 kgf/cm² and above. JISL has a production capacity of over 3,00,000 M.T. per annum or 5000 km/day

JISL is the only manufacturer to own DSIR approved R&D set-up with state-of-the-art facilities.

The pipes are manufactured confirming to IS, DIN, ISO, ASTM, TEC and other customized specifications.

The Piping Division includes PE, PVC Pipes and Fittings catering to the urban and rural infrastructure needs of the country apart from irrigation needs of the farmers.

Micro-Irrigation Division manufactures a full range of precision-irrigation products, provides services from soil survey, engineering design to agronomic support and nurtures a sprawling 2300 acre Hi-Tech Agri Institute. It undertakes turnkey projects for total agricultural development. The division's pool of over 800 agri scientists, technologists and technicians are well equipped to render consultancy for complete or partial project planning and implementation e.g. Watershed or Wasteland and/or Crop Selection and Rotation.

Tissue Culture Division grows Grand Naine Banana plantlets and has established vast primary and secondary hardening facilities and R&D labs.

Agricultural and Fruit processing wastes are converted into Organic Manure. Neem-based pesticides are also formulated. Both are critical inputs for Organic Farming.

Agro Processed Products Division processes tropical fruits into Purees, Concentrates & Juices. The Dehydration facility dehydrates Onions & Vegetables.

Plastic sheet division's globally marketed products help conserve forests by providing alternatives to wood in the home building market.

Solar Energy Heating, Lighting Equipments, Solar Pump and Bio-Energy sources are new additions.

In a nutshell, the Corporation is the only 'one-stop-shop' encompassing manufacturing and marketing of hi-tech agricultural inputs and piping services as well as processing of agri produce. No wonder, it has distinguished itself as a leader in the domestic as well as global markets.

The corporate product range improves productivity and adds value to the agri-sector. Conservation of scarce Natural resources, protection and improvement of the environment emerge as a blessed outcome.

The Corporation has 27 manufacturing plants and numerous offices across the globe.

The Corporation has pioneered and raised a new Micro Irrigation industry in India and thereby helped harbingers a Second Green Revolution.

The reward has been over millions of smiling farmers and scores of customers in 116 countries.

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