

Banana

IMPORTANT FACTS ABOUT THE BANANA

- Banana is an herbaceous plant of the genus *Musa*.
- The fruit is an important staple food throughout the world and is commercially grown in more than 100 countries.
- Banana production is divided into two main categories: banana, sweet fruit that is eaten raw, and plantain, which is used for cooking and processing.
- More than 10 million hectares are cultivated worldwide with total production of 115 millions ton.
- The largest producer of bananas is India, followed by Brazil and China.
- Although banana is grown in a large variety of climates, optimal climatic conditions for banana cultivation are temperatures averaging 27°C with 60% humidity and winds not stronger than 4 m/ sec.
- Banana thrives in fertile, well-drained soils with high waterholding capacity.
- The optimal pH is between 5 and 7. Because banana is sensitive to salinity, the EC should not exceed 1.0 ds/ m.
- Banana has a shallow root system no deeper than 80 cm, with 60% of the effective root zone in the top 30 cm.

PLANT NUTRITION

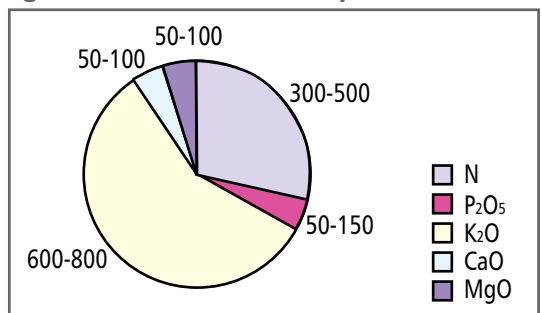
Banana is a heavy consumer of fertilizer, especially potassium and nitrogen. Constant and balanced nutrition results in optimal plant growth and yield and prevents nutrient loss due to leaching. In this way, growers benefit economically and prevent the pollution of underground water, which is harmful to the environment.

FERTIGATION

Fertilizer application via the irrigation system is considered the most effective method of fertilization. A good irrigation system facilitates accurate fertilizer application - precise timing and quantities - without additional manual labor costs.

The system can also be used in rainy periods. This technique, known as technical irrigation, allows growers to time their fertilizer application according to precipitation and to avoid nutrient loss due to leaching.

Average fertilizer application rates in kg/ ha for a 50 - 80 MT/ ha yield



* Microelements such as Fe, Zn, Mn and B should also be applied according to local planting conditions.

IRRIGATION

Due to its large leaf area and vigorous growth, the banana is a heavy consumer of water. Water deficits badly affect crop growth and yields:

1. During the early vegetative period, an adequate water supply is essential in determining the potential for growth and fruiting.
2. During the vegetative and flowering period, water deficits limit leaf growth, which in turn influences the number of flowers and fruits produced.
3. During yield formation, water deficits can cause late flowering, which affects fruit size and quality. A reduced leaf area influences the rate of fruit filling and small fruit are older than they appear at harvest time.

The banana is grown in a wide range of climatic conditions with varying precipitation and evapotranspiration rates. In some areas, rainfall fulfils all the crop requirements, while in others irrigation is needed. However, even areas with high annual rainfall require irrigation when these rains are not well- distributed. Because more and more growers are realizing that water deficit results in decreased yield, they are installing irrigation systems to ensure a constant supply of water and fertilizers.

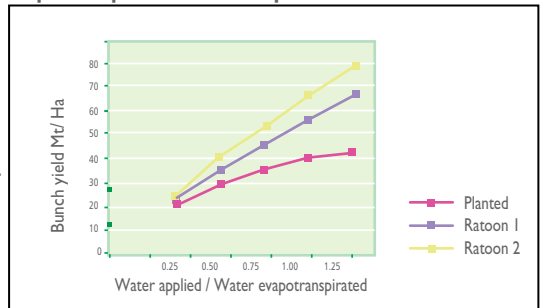
To calculate the water quantity needed for irrigation, the following data is required: the relevant crop factor, local precipitation rates and evaporation rates. Irrigation requirements can be calculated as follows:

$$\text{Daily amount of irrigation required, mm} = \text{daily evaporation, mm} \times \text{crop factor}$$

Delay irrigation according to rain precipitation amount.

Depending on climatic conditions and crop variety, the banana plant consumes 1,200–2,500 mm/ year. Irrigation quantities and intervals depend on local climate, soil type and the type of irrigation system in use. During hot- dry periods, daily irrigation may be required to maintain soil moisture in the upper soil layer. If daily irrigation requirements are extremely high, it is recommended to divide irrigation to two applications.

Yield response to irrigation based on pan evaporation and crop factor



Banana crop factor vs. growing month, in tropical conditions



ORGANIC PLANTATIONS

It is recommended to irrigate organic plantations with low angle sprinklers or micro sprinklers because they are ideal for the incorporation of organic fertilizers such as compost and animal manure, and they ensure minimal wetting of foliage, thus reducing the risk of fungal diseases.

NAANDAN JAIN SOLUTIONS

Because growers face varying conditions and challenges, NaanDan Jain offers a wide range of irrigation and fertigation solutions. Our experienced team will help you find the ultimate irrigation solution to fit all your needs.

UNDER-TREE SPRINKLERS

This commonly used method of irrigation is highly cost-effective. It is based on wide spacing and high water energy to overcome obstacles caused by foliage.

5024

Low-volume impact sprinkler with low trajectory angle

- 9°, 12°, 14° water trajectory angle with nozzle replacement only
- High water distribution uniformity with spacing up to 12 m
- Flow rates ranging from 350– 930 l/ h
- Spacial anti-vandalism base available on request



Tropical 5024
Anti vandalism 3/4" model



Silva 6024

Low-volume impact sprinkler with low trajectory angle

- Heavy duty sprinkler for extreme conditions
- High water distribution uniformity with spacing up to 14 m
- 9°, 12°, 14° water trajectory angle
- Flow rates ranging from 480–955 l/ h
- Special square nozzle available for higher distribution uniformity



Super 10 LA, Super Mamkad & Mamkad 16

Low angle ball driven sprinklers

- Closed sprinkler with protected mechanism for high resistance in extreme conditions
- 10°, 14° water trajectory angle
- High water distribution uniformity with spacing up to 8 m (Mamkad 16), 10 m (Super Mamkad) and 12 m (Super 10).
- Different nozzles for flow rates ranging from

Sprinkler model	Flow rate (l/h)
Super 10	360 - 850 l/h
Super Mamkad	335 - 900 l/h
Mamkad 16	180 - 225 l/h

- Regulated version with built-in flow regulator

Super 10 LA

14°

10°



Super Mamkad



Anti Robo-
Anti vandalizm
protection
box

Mamkad 16



Insect-resistant,
pop-up
pop-down
nozzle

Opal

Reliability in operation, no wear & tear

- Optimum water distribution with 9° and 15° trajectories, with spacing up to 8.0 m
- Snail protection with unique swivel
- Low water trajectory, 40-120 cm above nozzle level
- Flow range: 70-360 l/h

Opal



MICRO SPRINKLERS

Micro sprinklers are essential for certain tree spacing and plot design such as double row plantations. Micro sprinklers are also highly recommended for organic plantations. NaanDan Jain micro sprinklers also provide the advantage of insect-proof swivels and high clogging resistance.

2002 AquaSmart

Flow-regulated micro sprinkler

- Uniform irrigation in all topographic conditions
- Wetted diameters up to 7.5 m
- Flow rates ranging from 20–95 l/h
- Insect-proof pop-up swivel
- Sturdy and solid structure

2005 AquaMaster

Long-range micro sprinkler

- Large droplets
- Wetted diameters up to 12 m
- Flow rates ranging from 120–300 l/h
- Insect-proof pop-up swivel

2002
AquaSmart

2005
AquaMaster



DRIP IRRIGATION:

NaanDan Jain offers a broad range of innovative dripline solutions; the result of intense R&D conducted by our engineers and agronomists. Drip irrigation is highly recommended in water shortage conditions.

- Unique Cascade labyrinth ensures high resistance to clogging due to its self-cleaning effect
- Driplines available in different diameters 16, 17, 20, 22 mm
- Different wall thicknesses ranging from 0.65 mm–1.2 mm
- Discharge rates vary from 2–4 l/ h
- Pressure-compensating driplines available for uniform distribution and hilly terrain
- Dropper spacing determined on request to suit banana spacing

AmnonDrip PC & PC AS

Innovative, pressure-compensating dripline with special anti-siphon and non-drainage models, based on the Cascade labyrinth.

16, 20 mm



1.1, 1.6 ,2.2 ,3.8 l/h

Naan PC

Heavy duty, pressure-compensating dripline for maximum accuracy in variable topography and long laterals.

16, 20 mm



1.6, 2.2, 3.5/3.8 l/h

TifDrip

Heavy duty clog-resistant, cost-effective dripline.

16 mm



4.0 l/h

TopDrip

Pressure-compensating (PC) and anti-siphon (PC AS), thin to medium-walled dripline for maximum irrigation uniformity (EU–95%) at minimum cost.

16, 22 mm

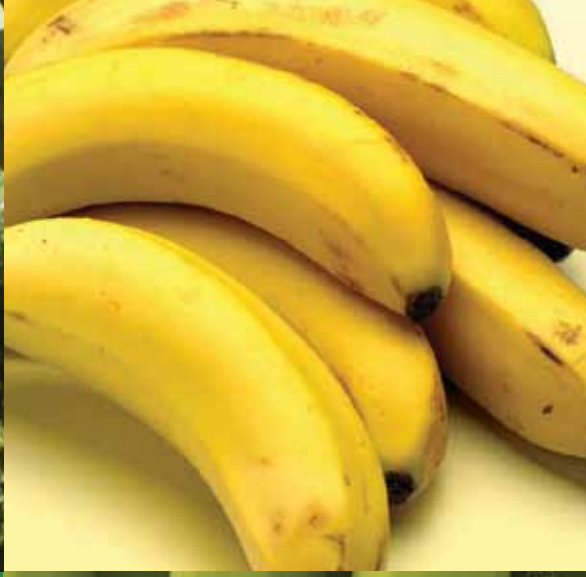


1.0, 1.6 l/h

SYSTEM COMPARISON TABLE

	Under- tree sprinklers	Micro sprinklers	Drip systems	Furrows	Overhead sprinklers
Water distribution	good	very good	good	poor	good
Water use efficiency	good	very good	excellent	poor	poor
Fertilizer use efficiency	good	very good	very good	poor	good
Cooling and climate control	good	good	poor	poor	very good
Maintenance	low	medium	medium	low	low
Canopy wetting	medium	low	none	none	high
Filtration and water quality demands	low	medium	high	none	low
Primary investment	medium	high	high	low	medium





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NaanDan Jain is committed to finding the ideal solution for your banana plantation, tailored to your local climatic conditions, soil and water properties and budget.

Contact our office or your local dealer for further information.

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All specifications are subject to change without notice.

All information should be used only as a guideline. For specific recommendations contact your local agronomist.

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