



# MEDICAL CANNABIS

## TOP-TO-BOTTOM TURNKEY PROJECTS

**NaanDanJain** offers a wide range of solutions for the growing and cultivation of **medical cannabis**, from **top-to-bottom turnkey projects** to specific problem solving. We take pride in the **high standard of solutions** we can provide for this industry.

**NAANDANJAIN**  
A **JAIN IRRIGATION** COMPANY

## INTRODUCTION

Cannabis has long been a part of our culture. Throughout history, it has been extensively used for hemp fiber, for hemp oils, for medicinal purposes, and as a recreational drug. Due to its narcotic qualities, cannabis was made illegal in most parts of the world.

Over the last few years, however, many industries have begun to acknowledge the tremendous benefits of this extraordinary plant. As a result, more and more countries are now legalizing the use and production of cannabis for medicinal purposes.

The market, industry and manufacturing of cannabis have become fields to be reckoned with. In the field of healthcare, researchers in Israel have had many breakthroughs.

Medical cannabis is now being used to alleviate symptoms of chemotherapy, such as nausea and vomiting, to improve appetite, to treat chronic pain and muscle spasms, and much more.

This brochure provides a general outline of how high-grade medicinal cannabis is produced.

Cannabis is a seasonal dioecious plant. Its life span is only one season—it blossoms, bears seeds and dies. The female plants are the ones that are cultivated, and their flowers are the parts that are used for recreational and medicinal cannabis. The crop goes through several distinct stages before fully-grown female plants are produced in late bloom. Each of these stages is critical and must be monitored carefully and precisely. There are several ways of doing so.



## PLANT TISSUE (MOTHERS)

Most of the propagation and manufacturing of young plants has traditionally been done using 'cuttings'. When propagating with cuttings or any other form of cloning, the genetic identity of the original plant is preserved. Therefore, the genotype of the mother plants or their source, needs to be carefully chosen. Growing the mother plants, from which the cuttings are produced, is the first and crucial stage. Mother plants are grown in relatively large containers or growing bags, and are kept under specific conditions. Temperature, moisture, nutrition and even day length are carefully monitored. These mother plants are provided with the optimal conditions to stay juvenile and vigorous and

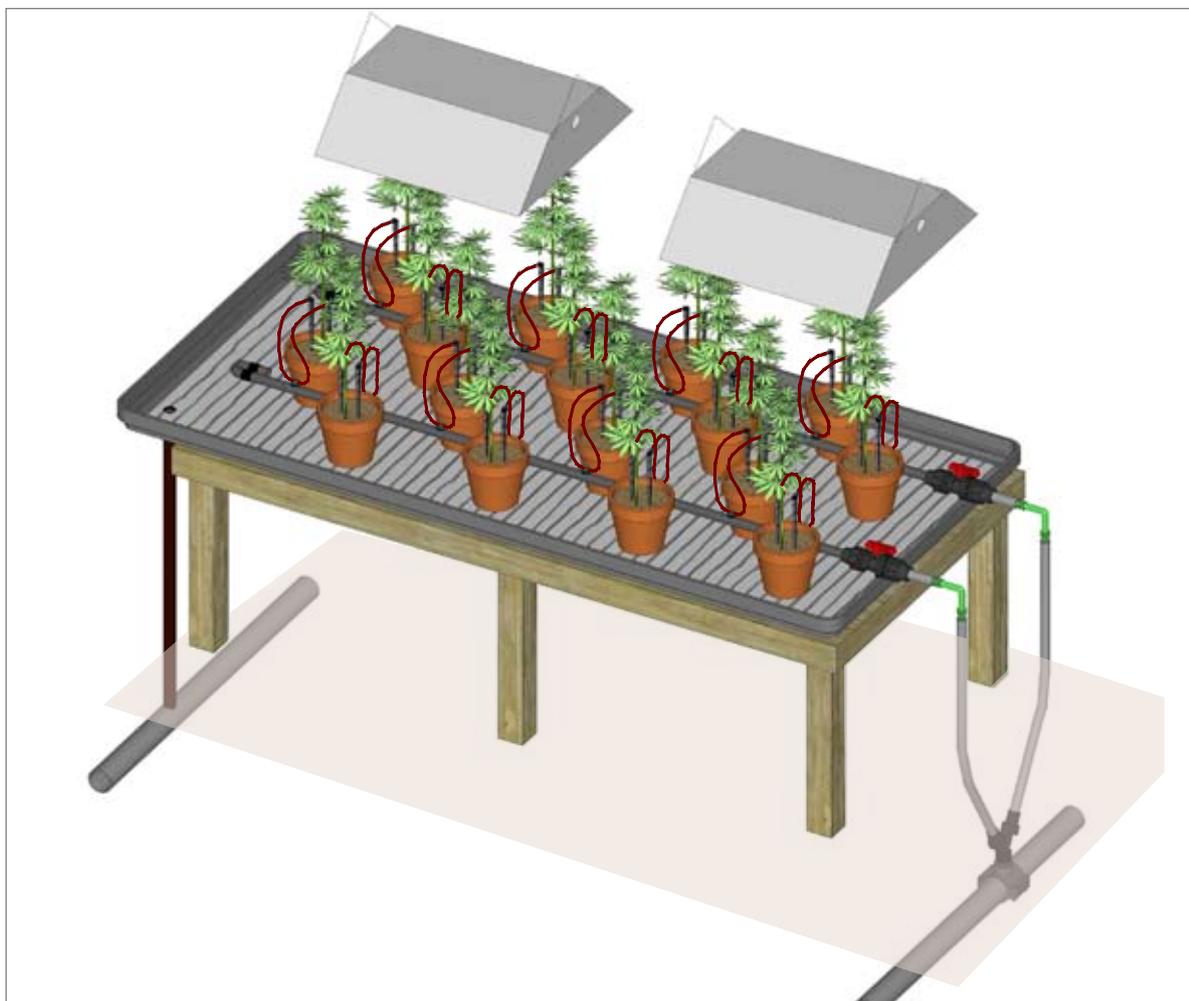
to never go into bloom. Long days and a specific fertilizer regime are maintained.

There have been innovations in the field of propagation. Tissue culture is a very efficient way of producing new and identical plants. Even seed companies are now producing genetically engineered varieties that go into bloom independently of day length.

Regardless of the method of propagation, the source needs to be well-maintained and looked after. When it comes to irrigation, we recommend using 2 ClickTif HD with 2 outlet connectors each, all together providing 4 labyrinth stakes for each mother plant.



ClickTif HD CNL



## VEGETATIVE STAGE

The vegetative stage is characterized by a long day (18 hours of light a day) and a vigorous growth rate. Ideally, this stage should last no longer than one month. There is more than one way of achieving that. If smaller pots (or growing bags) are used at this stage, it's possible to cultivate a larger number of plants per meter.

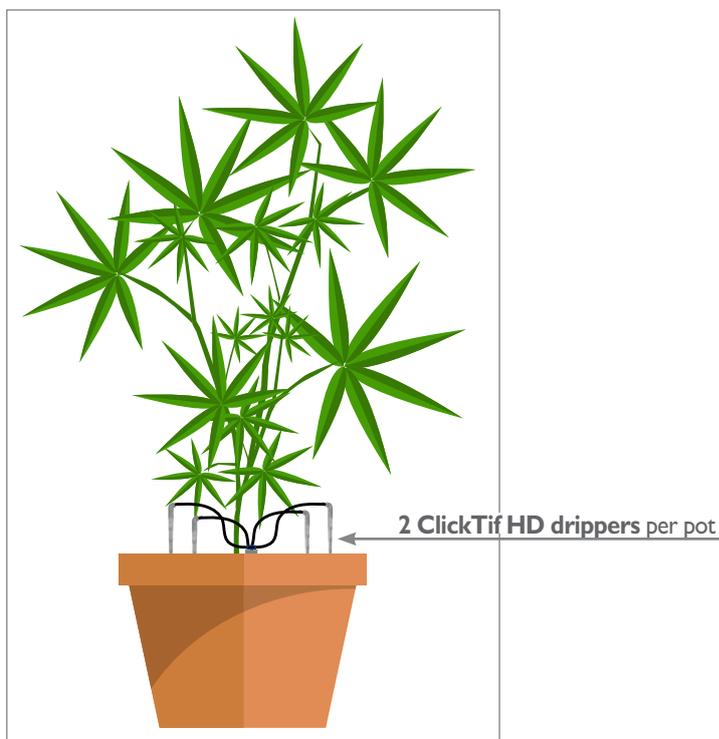
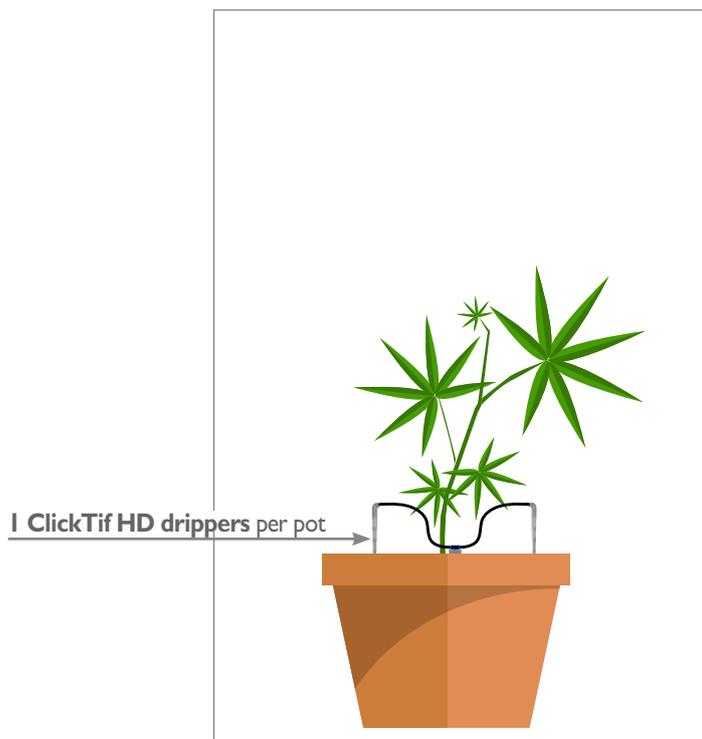
It can be advantageous to separate the vegetative stage from the reproductive stage. In this case, the vegetative plants are kept in a designated growing chamber and are only moved to the blooming chamber when they reach the desired size. Both stages require specific growing conditions.

If you choose to grow the young plants in their final pots and location—namely, in the same place where the next stages of the cycle will take place—the use of a drip system is recommended. In this case, the same drip system is used for the rest of the growing period, up until harvest.

### OUR RECOMMENDATION:

When using smaller pots, use **one ClickTif HD dripper with two outlets per pot.**

When using bigger pots, use **two ClickTif HD drippers with two different outlets per pot.** Using two different drippers ensures constant water supply for the plant, even if one of the drippers malfunctions.



As in any high precision cultivation, the cannabis plant requires specific environmental conditions. In the vegetative stage, as in any growing stage, the growing chamber itself is equipped with climate control systems that regulate all the factors required for optimal growth.

These include wet pads and/or foggers to reduce temperature, screens to darken the chamber, and specific lighting to simulate either shorter days or longer days. NaanDanJain provides all of the above and more, tailor-made for any environmental conditions.

**WET PAD**



**LIGHTING**



## BLOOMING

The blooming stage is the final and longest stage. During this stage, the grower needs to be most precise and attentive. The transition from the vegetative stage to the blooming stage is induced by a short day (12 hours of light). From this point on, until the end of the growth cycle, short 12-hour days are maintained. Both artificial darkening and a specific fertilization regime are implemented. These two are essential to ensure that the crop successfully reaches its full potential. For this reason, in addition to the customized irrigation system, we also provide a very strict and sophisticated monitoring and control system. All growth factors need to be optimized and carefully adjusted to meet the specific needs of the crop, with an instant response time. These factors include: temperature, relative humidity, day length, irrigation and nutrition.



Ideally, the blooming stage takes no more than two months (60 days, depending on the variety). After this, the plants are harvested and go through post-harvest treatment. NaanDanJain has an in-house monitoring and control system, Gavish, which is one of the most advanced and sophisticated control systems in the world today. Only a Gavish unit can oversee, monitor, control, report on and log all of the parameters or factors mentioned above. The Gavish system also provides a specific mixture of fertilizers and is able to simultaneously deliver multiple kinds and ratios of fertilizers to each growing unit. Every sensor installed in the greenhouse can be read and logged by the system. At any given time, the grower is informed of the EC and pH of the irrigation solution and the drain water. All of the parameters are continuously monitored and an alert is sent if they do not reach optimal levels. In short, a system like Gavish is essential for this kind of cultivation. Reaching the required standard in this field is impossible without it.



## LIGHTING

As mentioned before, each physiological stage of the Cannabis requires a specific light setting. NaanDanJain characterises, supply, consults and offers a full package when it comes to lighting. We provide solutions for all photoperiodic lighting, photosynthetic lighting, custom made for any intensity and spectrum required by the grower. As a full project or as a specific solution.

## NAANDANJAIN NUTRI-CARE FERTIGATION MACHINES

Gavish produces fertigation machines made of PVC, assembled on an aluminum frame. There are three types: In-line, Bypass and Mixer machines. All three machines ensure correct proportions between the amount of water and fertilizer required for the crop. The irrigation controllers ensure accuracy and set points defined by the user.



## NAANDANJAIN NUTRI-CARE MIXER MACHINE

Water flow: 10 to 75 m<sup>3</sup>/h  
Polyethylene mixing tank  
Stainless steel booster pump  
3 to 5 Venturi Pumps  
Fertilizer flow: 160-350 l/h  
Fertilizer visual flow meters for each injector  
Fertilizer counters for each injector, optional



**All growth factors need to be optimized and monitored:**



The cannabis-growing process is very complex and requires a lot of knowledge. When dealing with the production of a clinical end product, no shortcuts can be taken and the highest quality must be maintained.



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DISCLAIMER: NaanDanJain is a worldwide provider of irrigation and related agricultural products and services. The information provided herein is a general, non-specific, compilation of commonly available knowhow and practices regarding the agricultural cultivation of medicinal cannabis, with an emphasis on the irrigational aspects. This brochure cannot and does not provide specific growing consultation for any specific plot, nursery or farm, therefore NaanDanJain will not be responsible for any outcome of any sort of venture concerning the growing and/or manufacturing of medical cannabis and/or any other cannabis cultivation for that matter, nor for any loss of crop and/or loss of profit related with any such cultivation, nor for any illegal activity related therewith.

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