



Which method of cultivation is best?

Thomas Walker discusses the pros and cons of the three main methods of growing cannabis: outdoor, greenhouse, and indoor cultivation.

Before committing funds to building your cannabis production facility, you need to decide which market (medicinal or recreational) you will be supplying.

As discussed in previous articles, the product requirements for these differ. Briefly, medicinal buyers seek efficacy and standardisation of the end product. They rarely want cannabis in its raw form; typically, they extract specific cannabinoids and create a tablet, patch, or tincture-based product. By contrast, recreational customers seek top-quality bud and concentrates that possess exceptional looks, density, smell and psychoactive effect.

The three main methods of producing cannabis are the following.

OUTDOOR CULTIVATION

Outdoor cultivation is by far the cheapest of the three. There is no need for expensive lighting; a heating, ventilation and air conditioning (HVAC) system; or a dehumidification system. Other benefits include:

- Terpene expression from outdoor cannabis is usually superior because the sun provides the full light spectrum, which cannot (at this stage, anyway) be emulated by artificial lighting.
 - The yield can be higher on a per-cycle basis, because plant height is not restricted, as it is indoors.
- Disadvantages:**
- Cannabis cultivated outdoors is at the mercy of pests, pathogens and climatic conditions.
 - No more than two cycles can be produced in a year.
 - Due to evaporation and seepage, the water requirements are much higher than with hydroponic production.
 - Outdoor cannabis is usually grown in soil. In this case, the rhizosphere needs to be developed to maximise the available bacteria and micro-organisms. This process can take between one and three years.

GREENHOUSE CULTIVATION

Hydroponic cultivation can be fully deployed in a greenhouse, resulting in higher yields, easier operation, and just 10% of the water used in outdoor cultivation. Other benefits of this type of cultivation include:

- Climate and pest pressures can be controlled to some extent, thereby increasing success rates and quality.
- Up to six production cycles per year are possible.

Disadvantages:

- The cost of production is higher than for outdoor cultivation, as electricity is needed to maintain the optimal environment.
- Capital costs are higher; it costs significantly more to design and set up a greenhouse than to grow the crop outdoors.
- Certifications for greenhouses are usually required if the product is being used to supply a medicinal market, and these can be prohibitively expensive.

INDOOR CULTIVATION

Cannabis grown hydroponically indoors usually produces the highest yield and the best quality of all three cultivation methods. This is because every variable, including nutrient uptake, environmental conditions, light intensity, carbon dioxide and supplementation, can be controlled. Other benefits of this type of cultivation method include:

Outdoor production is the cheapest method, and the per-cycle yield can be higher

- Indoor cultivation of cannabis is easier to certify, especially for the EU, as most of the production and subsequent processes can be tightly controlled.
- Water use and nutrient waste can be significantly reduced through precisely controlled fertigation.

Disadvantages:

- The capital expenditure involved in the construction of an indoor facility is at least five times that of a greenhouse.
 - The electrical requirements are significantly higher than for outdoor and greenhouse cultivation. All aspects of lighting, HVAC, dehumidification, and airflow require large amounts of electricity, which might not be available at the intended site.

It is important to remember that there is no clear winner when it comes to the three different methods of production. Instead, the market you are catering for and what the customer wants are ultimately more important.

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