Indoor Cannabis Cultivation Standards

Introduction

These standards address the best practices for cultivating cannabis in an indoor facility. Indoor cannabis cultivation offers the grower complete control over the cultivation environment. Unlike open-field or greenhouse-grown cannabis, the indoor grow environment is not subject to fluctuations in temperature, humidity, or sunlight. As a result, indoor-grown cannabis is typically high quality, with a very low presence of plant pathogens.

Indoor cannabis cultivation is the preferred method for producers interested in global export opportunities, since the controlled environment ensures compliance with strict GMP guidelines.

Definitions

“Indoor cannabis cultivation” is the production of plants in a completely enclosed facility.

“Standard Operating Procedures” are a set of step-by-step instructions for realizing cultivation activities.

“Inventory management system” is a process by which a company tracks its cannabis product throughout the entire cultivation production chain, from seed to sale.

“Starter genetics” are the seeds, seedlings, unrooted cuttings, or mature plants that a company acquires to launch their cultivation program.

“Propagation” is the act of multiplying plants through seed production, vegetative cuttings, or tissue culture.

“Stock plants”, or mother plants, are plants that are cultivated to produce vegetative shoots that can be cut and rooted to produce new plants.

“Tissue culture”, or micropropagation, is the growth of plant tissues or cells in an artificial medium separate from the stock plant.

“Integrated Pest Management (IPM)” is a broad-based approach that integrates cultural, physical, biological, and chemical practices for the economic control of plant pests.

Standards

A. Licensing Requirements

A cannabis producer must have various permissions to legally cultivate cannabis. The aggregate of these permissions results in a cultivation license.

Although the state is responsible for licensing cannabis businesses, the cultivation takes place within municipalities. Municipalities have the responsibility of managing land-use designations and zoning, and sometimes cannabis facilities are only permitted in agricultural zones.

Indoor cannabis producers should not begin cultivation activities until they have received all state and municipal permissions to commence operations.

B. Physical Cultivation Structure

The Indoor cultivation facility must be a completely enclosed growing environment with no unfiltered air exchange with the outdoors. The structure must have adequate electrical infrastructure to support the cultivation equipment, as well as adequate water supply.
The structure should not be located close to schools, day cares, churches, or residential areas.

The facility must have an energy management plan for monthly gas and electric usage estimates. The facility should describe the energy source (local utility, on-site generator, or renewable energy). The facility should estimate the water requirements in a water management plan and describe the water source.

The irrigation plan must measure and report the volume of the water supply and runoff and not exceed 20% runoff of the irrigation water. Cultivators should filter and use wastewater to the best of their ability.

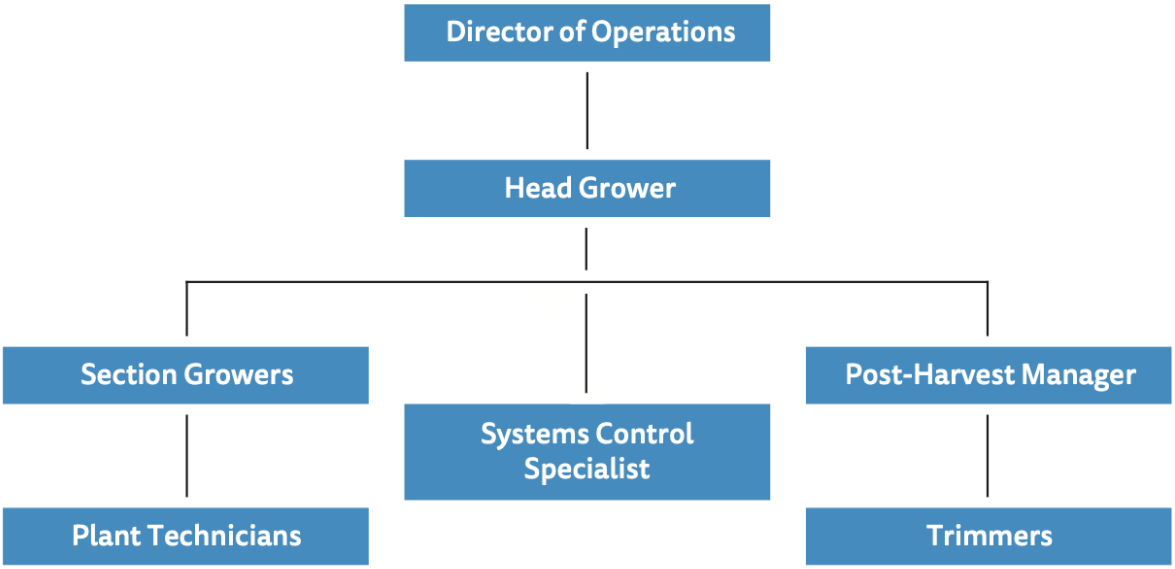
The facility should also adhere to high efficiency standards. The grow light minimum efficiency standard should not exceed 36 watts LPD (Lighting Power Densities) per square foot of active or growing canopy area. High efficiency ductless split HVAC units are required for facilities less than 6,000 square feet of canopy. Larger operations require efficient variable refrigerant flow (VRF) HVAC units that perform more than on and off functions.

C. SOPs and Their Management

Standard Operating Procedures (SOPs) are the foundation of a company's cultivation program. They are the company's cultivation protocols. Companies must have strict internal rules for how an SOP is approved, how it's changed, and who has the authority to make these changes. SOPs should be reviewed annually to guarantee their relevance and update them with new procedures.

D. Organization and Personnel

A cultivation site must have a clear chain of command to ensure smooth operation. A cultivation company's organizational chart should resemble the following:



The *director of operations* is responsible for coordinating all departments within a commercial cultivation facility.

The *head grower* is responsible for managing the cultivation department of an indoor grow facility.

The *section grower* manages cultivation activities for a specific area of the grow facility. Indoor operations typically divide sections by grow room.

Plant technicians support the head grower and section growers by handling day-to-day plant maintenance and facility cleaning.

The *post-harvest manager* is responsible for the finished crop once it's removed from the cultivation area.

Trimmers remove excess leaf from the harvested cannabis flower and help guarantee that the end product is visually appealing and free of insects, seeds, or mold.

The *systems control specialist* supports the head grower and section growers by allowing them to focus on growing, not technical troubleshooting. This individual installs, maintains, and troubleshoots everything related to technology in the cultivation facility, such as climate control equipment and inventory tracking systems.

E. Workflow

Indoor cannabis producers must ensure that their facility is designed to prevent external contamination from employees and visitors. Producers must limit the flow of employees, equipment, and plants from areas of high risk to areas of low risk. Areas of high risk are rooms where there is a known pathogen present. Workflow should be planned to minimize movement of employees between grow rooms, as well as prevent the entrance of visitors into the grow rooms.

Visitors must wear hazmat or Tyvek suits, hair nets, and shoe covers to enter a facility. The touching of plants should be highly discouraged.

F. Cleanliness and Sanitation

Each cultivation space must be thoroughly sanitized prior to moving any new plants into a growing area. Growers must use sanitization products that are proven to kill viruses, bacteria, and algae.

Chlorine bleach is an effective grow room cleaner, as well as these specialty products:

- Hydrogen dioxide
- Hydrogen peroxide + peroxyacetic acid
- Quaternary ammonium compounds

G. Inventory Management System

Operators must implement an inventory management system to track plant inventory and the movement of plants throughout the production cycle. Inventory tracking is a fundamental component of compliance, since regulators want to account for every gram of cannabis that is produced and sold by a cultivation business. Inventory tracking does not begin with the finished product, it begins much earlier with the planting of the seed or rooted cutting. Growers must track the movement of plants with the use of RFID tags or barcodes printed on plastic wristbands attached to each plant. Plant identifiers should not be paper labels or tape attached to pots, as water can wash off paper IDs and labeled pots can get mixed up during the transplanting process.

H. Starter Genetics

Operators must acquire pathogen-free starter genetics in compliance with state and applicable regulations governing this activity. If regulations require that new cultivation operations must start from seed, then launching a cultivation site through the acquisition of live plants is prohibited.

Operators must also pay close attention to where they source their starter genetics. If sourcing plants from caregivers, seed banks, or the illicit market is prohibited in your state, new cultivators can only source their starter genetics from existing licensed cultivators that have permission to sell seeds or plants.

If there are dates governing the acquisition of starter genetics, operators can only acquire genetics within that window of time. Any cannabis produced from starter genetics acquired outside of that window will be non-compliant and ineligible for sale.

I. Propagation

Producers must begin each crop from: 1) seed; 2) vegetatively propagated cuttings; or 3) mature plants.

a) Stock Plants.

Growers that maintain stock plants and produce cuttings from these plants must ensure that their stock plants are pathogen-free and that they refresh these stock plants with new plant material at least once every year.

b) Outsourcing requirements.

Growers that outsource the propagation of their plants to tissue culture labs must require certification from the propagator that the plants the producer is receiving are disease-free.

J. Plant Growth

a) Flowering Stage-Hands-Off.

Producers must take a hands-off approach to cultivation during the majority of the flowering plant stage. Excessive manipulation of the plant, or the application of pest control products while the plant is in full flower, can result in a contaminated final product. Most of the physical manipulation of the plant, as well as the application of pest control products, should be applied in the vegetative growth stage prior to the onset of flowers.

b) Dehumidification/Airflow.

Producers must ensure that the indoor environment is conducive to healthy plant growth. Producers must implement dehumidification units and adequate airflow to prevent the formation of mold on their cannabis flowers, and producers must tightly control temperature variations that can aggravate the onset of plant diseases.

K. Insect and Disease Control

Producers cannot use any chemicals or substances prohibited by the respective state. Producers must implement an integrated pest management (IPM) program to prevent and mitigate the damage associated with plant pathogens, including regulating use of pesticides outside of the facility. This program must be implemented preventatively, and all pest control products used must be registered for use on cannabis. These products include beneficial insects, chemical pest control products, true organic pest control products, and bio stimulants.

The certificate of analysis (COA) of an indoor cultivation facility's final product should not contain any detectable traces of pest control products.

L. Storage of Cannabis

Producers must store cannabis flower in a method that does not promote mold growth or deteriorate the active pharmaceutical ingredients (APIs), preferably in rooms with UV air handling systems. Cannabis must be stored in a secure area with a temperature range 55-65 degrees F and a RH of 45-55%. Bulk cannabis must be stored inside plastic, metal, or glass containers with a lid, or inside vacuum-sealed bags.

M. Waste Management

Producers must know and describe the waste stream from the cultivation, including the types and amount of waste that the facility will be generate and any waste reduction or recycling plans.