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Delta T Solutions
Engineering, Integrating, Innovating Systems



Proper heating, cooling and humidity are critical for healthy crops.

Control Your Growing Environment

Proper temperature and humidity are critical for a healthy cannabis crop.

There's no one-size-fits-all approach to growing cannabis, but properly controlling the growing environment is critical. Plants' needs vary based on the type of building they're grown in.

For example, cannabis grown indoors has different requirements from greenhouse-grown cannabis, says Shane Hutto, owner of consulting firm Horticultural Solutions. Having control of the growing environment will result in more consistently healthy crops, using either method.

"The number one thing to consider is light levels," Hutto says. "In a greenhouse, there can be as much as double the amount of light as to what is attainable with the best

artificial lighting." Indoor facilities will have a higher planting density but smaller plants with slower growth rates, he adds.

Next, growers must consider the crops' environment. Greenhouses are more difficult to control than indoor growing facilities. For example, the outside temperature and humidity have a much greater effect on a greenhouse operation compared to an indoor facility. And although there are plenty of technologies available to help manage greenhouse conditions, it requires more knowledge and attention to detail. "Mistakes in a greenhouse have more drastic consequences and occur faster than in indoor cultivation facilities," says Hutto.

Benefits of Delta T Solutions' Chilled Water Cooling System

- Controls relative humidity, providing both cooling and humidity control without dehumidifying to the extreme
- Cools the air to a temperature at or around dew point to avoid condensation of the air and excessive humidity
- Is regulated by environmental controls, giving growers precise control of the temperature of the plants and the humidity of the growing area
- System may be broken up into individual temperature zones for greater flexibility

HEAT, COOLING ARE CRITICAL

Carefully monitoring temperature in the greenhouse or indoor growing facility will result in the highest-quality crop. “Cannabis can be very sensitive to high temperatures in conjunction with high radiation levels, and on the other end, low temperatures can have a positive effect as long as temperatures do not drop below 60° F,” he explains. “However, the day to night temperature differential should be kept quite close, ideally no more than 10° F to keep growth rates optimal.”

DON'T OVERLOOK HUMIDITY

Humidity is incredibly important but often overlooked in cannabis growing operations, according to Hutto. “Humidity requirements are different for each plant’s developmental stage, but they truly control a large part of the plant growth and morphology,” he says. “Humidity control

is every bit as important as temperature control.”

Many growing operations use evaporative cooling to regulate humidity, but these systems use mists, sprays or wetted pads to lower air temperature, which can actually create too much humidity. Standard air conditioning, on the other hand, can dehumidify too much. Hutto works specifically with Delta T Solutions to design the best possible environments to give growers complete control over their facilities’ temperature and humidity.

HOW HYDRONIC COOLING CONTROLS HUMIDITY

Delta T Solutions’ hydronic cooling system is able to control relative humidity to provide the ideal growing environment. Hydronics uses water as the heat-transfer medium in heating and cooling. Chilled water cooling offers precise humidity

control for marijuana by pumping cold water from a chiller through fan coils specially designed for maximum sensible and minimum latent cooling. The fan coils are placed in accordance with the greenhouse layout and growing situation. For flexibility, the system may be broken up into individual temperature zones using circulator pumps and electrically operated mixing valves.

Like radiant heating, chilled water cooling is controlled and regulated by the environmental controls, giving the grower precise control of the temperature of the plants, the humidity of the growing area and other climate factors. Direct digital controls have the added benefit of energy and cost savings.

HARVEST AND POSTHARVEST

“Harvest and postharvest processing is one of the most crucial elements to high-quality cannabis, and the precise environmental control is needed all the way through drying and curing,” says Hutto. “Cannabis cultivation is a complicated, dynamic process, and small mistakes can have huge consequences...It is my goal to educate and build this industry to achieve a level of professionalism that is comparable to and respected by the large-scale agriculture and pharmaceutical industries.”

Delta T Solutions has designed and manufactured customized environmental control solutions for greenhouse growers using hydronic technology for 30 years. To learn more about cost-effective ground, bench and perimeter heating systems; chilled water cooling systems; high-efficiency boiler systems; and other systems that improve crop health, contact Delta T at 800-552-5058 or email Michael@deltatsolutions.com. For information on how Horticultural Solutions can help you design, plan and implement a new grow operation or improve an existing operation, contact Shane Hutto at shane@hort-solutions.com



Optimum Heating Efficiency

Delta T Solutions' LD EPDM heating systems can improve crop health and save as much as 30 percent on heating costs.

Plants thrive when they're heated from the soil level. With Delta T Solutions' DELTA-TUBE™ EPDM LD installed on the growing floor, growers can save significantly on heating bills while reaping the rewards of healthier, happier plants.

With forced air heating systems, much of the heat is lost in the air, never reaching the plants. Delta T Solutions' hydronic radiant heating systems use a closed loop system that loses very little heat while moving heated water to its destination.

The LD system is easy to install, easy to use and can easily grow along with your operation. Growers who use Delta T Solutions' floor heating systems have shown a 30 percent reduction in fuel usage, along with shorter production times and



improved crop quality. The LD system is ideal for starter houses.

ADVANTAGES OF LD RUBBER TUBE HEATING SYSTEMS

- Heat reaches plants directly at the soil level, promoting faster germination and improving plant health and vigor.
- Creates a quiet, moist environment that reduces disease and requires less watering.
- Soil is heated evenly for uniform crop growth.
- The system is compatible with any type of hot water heat source.

Contact Delta T Solutions for details on how one of our performance-engineered heating, cooling or irrigation systems will meet your needs. Call 800-552-5058 or email: info@deltatsolutions.com.



Delta T Solutions' LD EPDM heating systems lower energy bills while helping to produce healthier plants.

