leading off

Controversy—Reality—Opportunity

As more and more legislative bodies legalize the growth and sales of both medicinal and recreational marijuana/cannabis/weed/pot—the controversy continues to grow. Regardless of this controversy, the growing of this product, distribution, sales, use and tax collection are all realities which none of us can deny.

This brings in the opportunity portion: HVACR! The growing of marijuana has become a very sophisticated process which involves producing max yields that are of top quality while keeping the energy usage to a minimum.

To begin with, on average, a grow facility's energy consumption may vary from 70-170 kWh/sq ft, where, on average, a hospital uses approximately 30 kWh/sq ft. In order to reduce the energy usage of a grow facility, maximum production is imperative and can only be accomplished by precise control of the environment—HVACR.

Proper indoor temperatures of 68°F-75°F (20°C-22°C) with a relative humidity range of 50%-60% are only part of the equation. It is important to know when to control the temperature and the percent of RH since the sensible and latent loads shift between day and night operation, as well as day-to-day during the entire growing process. In some cases, the shift in the latent load between full vegetation from light vegetation by a factor of 5:1 may occur, while the sensible loads during the night cycle may be reduced near zero. This is due to the watering methods and techniques, quantity of water required as the plant develops, transpiration, lighting control and growth rate changes from seedling to harvest.

The facilities itself must be built to achieve near clean room conditions using UV/O_3 devices, HEPA filtration, air exchange requirements and room pressurization to reduce the risk of outside contaminants such as pollen, bacteria, molds, insects and even people from "infesting" the plants.

Oscillating fans with a controlled air speed between 100 fpm-150 fpm are used to ensure the temperature and moisture levels are evenly distributed as well as helping to prevent the plants from drying out, which, in turn, affects watering requirements, growth rate, product yield and quality.

A CO_2 enriched environment with limits between 1,000 ppm-1,500 ppm is used to improve crop yields by as much as 40%—similar to what vegetable greenhouses use.

Carbon filters installed to reduce the exhaust odors emitted by the plants so that people in neighborhood are not offended!

Eventually, in my opinion, ASHRAE will need to produce a design guide for these grow facilities that may help maximize yields, but, more importantly, control energy usage of these energy hungry facilities, which, in turn, will assist in keeping market costs down, and tax collections up. LEED certified grow facilities?

Who ever thought that all this expertise was required for something that grows wild in some parts of the country and that eventually goes up in smoke! Resources used—just Google "Cannabis."

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