

Discover a whole new world of
cannabis cultivation

Case Study

AGRO MECHANIX / SLAB MECHANIX

LOCATION_ Tacoma, Seattle, Washington

CROPS_ Medical Cannabis

TECHNOLOGY_ Ursa Helios Series, Ursa Optilux



*photos from Agro Mechanix's grow experiment

BACKGROUND

Agro Mechanix is one of many professional, state regulated production cultivation facilities supplying the state of Washington with recreational cannabis. Agro Mechanix has been known to produce high quality, top shelf cannabis, and also produces concentrates via Slab Mechanix.

In Washington, Initiative 502, created a licensed and regulated system of cannabis production and distribution similar to liquor controls. Since almost all producers grow indoors, there is a high amount of power consumption associated with lighting and HVAC during production. This has prompted the state to push for more efficient ways of producing cannabis. One solution is to use LED lighting, which can provide power savings of up to 70% including the amount of heat generated that would require cooling.

"Purpose Built Fixtures"





CHALLENGES

In the early stages of LED technology, LED fixture manufacturers lacking top-tier experience released a surge of low quality products. Because of this, LEDs in the grow market have received a poor reputation due to ineffective integration of the technology.

The main problem with the cannabis industry is that it requires a light fixture that will produce less heat and more effective light, while maintaining or reducing the wattage used. Current market solutions are driven by high pressure sodium (HPS) and metal halide lamps, which have been proven to produce quality cannabis under the right factors.

Agro Mechanix set up a growing room in 4 x 4 plots inside a racking system that allows fixtures to be hung about two feet from the canopy. Currently, 1000W HPS lamps are being used along with entire environmental control using HVAC, CO2 burners and humidity control. The problem with this setup is that it produces a very high amount of heat resulting in unnecessary power loss. By retrofitting with LEDs to produce higher light output, additional yield amounts would increase revenue dramatically.

"Designed by growers"

BENEFITS

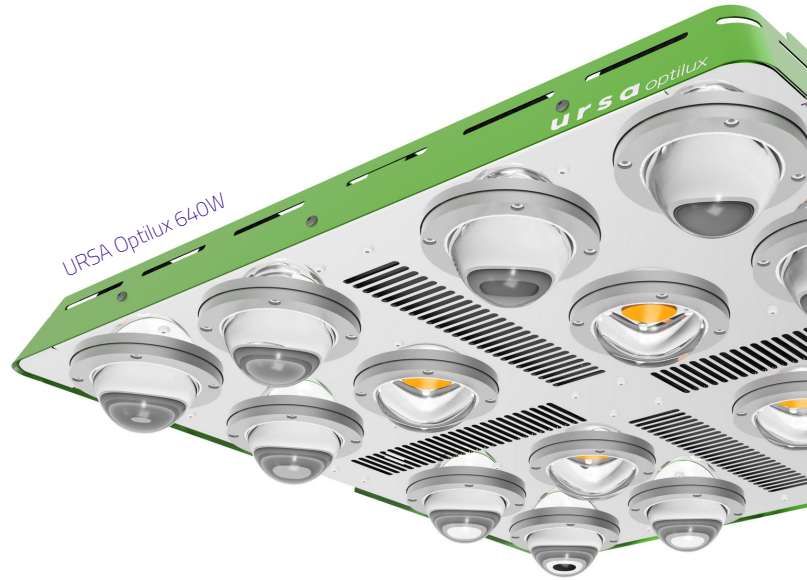
By testing the LEDs under the same exact growing conditions as in the HPS setup, a direct comparison can be made between the two lighting options.

In the first of three tests, three Helios 320W lamps were used in place of one 1000W HPS lamp. This test featured the URSA 4080 full spectrum. The results showed better performing yields and higher potency numbers than the 1000W HPS lamp, while using 9% less power.

BENEFITS CONT'D

In the second test, the Helios 600W and Helios 1200W under the URSA 4080 spectrum both outperformed a single 1000W HPS lamp. The Helios 1200W performed exceptionally well, and the cannabis plant reached an incredible height due to single sourced light penetration. This type of light is best used for greenhouses and medium to high ceilings.

In the third test, the URSA Optilux 640W under the URSA 4080 spectrum was compared against a 1000W HPS lamp. The Optilux performed incredibly well, exceeding all the other models. It's the newest flagship fixture from URSA, and produces a stunning 1600 PPFD (photosynthetic photon flux density) in the center coverage and an industry leading 400 PPFD on the edges of the 4 x 4 coverage. The cannabis plants under the URSA Optilux achieved 11% increased yields and 3% increased potency, while using only 65% of the power of a 1000W HPS lamp.



Single Source Light Penetration

Single source lighting provides deep canopy penetration. When light reaches the plant, some amount passes through the leaves and continues downward until all the light is absorbed by the plant. If light does not provide adequate penetration, the bottom parts of the plant or canopy will perform poorly.

Flip Chip Opto's advanced 3-Pad LED patented technology has given them the ability to create single-source chip-on-board LED engines. This technology, overcomes the 500W limitation of other single source LED engines, and when engineered to provide horticultural applications, 3-Pad LED technology gives URSA an advantage no other LED fixture manufacturer has.

URSA 4080 Spectrum

Under the URSA 4080 spectrum, professional growers have noticed exceptional leaf to node strength. This means that the connection between the leaves and stem is more durable, showing increases in tensile strength and exaggerated swollen node connections. There is also a significant decrease in node to node stretching, implying that vertical stacking is magnified. Penetration of the URSA fixture's single source penetration allows light to reach further into the canopy, reducing the appearance of yellow leaves on the lower parts of the plant when compared to HPS lamp hence more yield grown in the same vertical spaces.

Under flowering, buds are shown to be denser and have increased sugar production, measured through lab testing after drying and curing. This increase can be noticed through the increase of THC crystal production, which appeared to be correlated through various batch testing.

CONCLUSION

In the cannabis growing market, change from high pressure sodium lamps to LEDs has been hindered by uncertainty of the light's performance and high investment risk. However, through live and direct replacement testing, it has been found that URSA can potentially reduce power usage by 65% while increasing cannabis yields by 11% and cannabis potency by 3% under the same environmental factors.

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