

Individual LED Fixture Production Evaluation

BIOS *Icarus*[™]

Grower: Senior Cultivation Project Manager, American Cannabis Company, Inc.



American Cannabis Company (ACC) has created a team with deep industry knowledge and expertise in establishing and servicing the regulated Cannabis markets globally, providing the best in industry solutions that continue to support their position as a leader in the evolving Cannabis industry. ACC provides state-of-the-art commercial cultivation solutions to their clients, and performs regular commercial product evaluations for the rapidly developing Cannabis production space. Because there are very few industrial grade LED fixtures available that are designed for commercial crop production, ACC's senior cultivation project manager performed a side-by-side cultivation test comparing a number of different LED grow light products.

"There are a lot of retail/hobbyist grade LED grow lights on the market today that do not come close to replacing the incumbent HID standard. It's difficult to find the ones that are designed to meet the demands of commercial Cannabis production." Says ACC's senior cultivation project manager, "When we met the guys from BIOS and talked to them about our commercial production needs to support our clients, we knew we found a product worthy of consideration. But, we had to test it first."

The test compared 5 different LED grow light products, including the Industrial grade Icarus LED fixture designed by BIOS. Using a single plant of four different strains grown under identical environmental conditions, ACC set out to see how they compare. "The sturdy, solid state design of the Icarus fixture was the first thing that impressed us. It had superior light uniformity across the plant canopy. It was no surprise that the BIOS Icarus fixture significantly beat out all the others in this test, and with some strains 40% more yield compared to the next best performing LED fixture. We saw great all around flower density and consistent uniform bud size throughout the plants. Based on the impressive results we got, we are confident that under more optimal environmental and horticultural conditions, we could have yielded 2 lbs per fixture."

Testing Parameters

Strain Data: Four cloned strains of the following were used in the test. Katsu Kush, a typically lower yielding strain with very high quality, Chunky D, a typically moderate yielding strain with high quality, Island Sweet Skunk (ISS), a typically high yielding good quality strain, and Super Silver Sour Diesel Haze (SSSDH), a typically high yielding strain with good quality. Katsu Kush and Chunky D plants were grown in flowering mode for 63 days, and ISS and SSSDH were allowed 70 days to flower. Because all four strains shared the same individual LED fixture, an average of 66.5 days flowering time was used to calculate power consumption for the combined harvest yield.

Energy Consumption (lighting system): Katsu Kush and Chunky D; 63 days x 12 hr/day x 660 watts = 499.0 kWh. ISS and SSSDH; 70 days x 12 hr/day x 660 watts = 554.4 kWh. Average power consumption for the combined strain test was 66.5 days x 12 hr/day x 660 watts = 526.7 kWh.

Plant Containers: The plants were grown in 6.6 gallon AutoPots. AutoPots are self-feeding, gravity fed, wicking grow systems. They were filled with SoHum Living Soil.

Grow Space: 25 square feet (5' x 5')

Environment: Day: 78-82 degrees F, 45-50% humidity. Night: 67-69 degrees F, 50-55% humidity, ambient CO₂.

Nutrition: SoHum Living Soil and Compost Tea.

Results

Table 1: Dry flower weight of each plant of strains “Katsu Kush, Chunky D, ISS*, and SSSDH**” harvested at either 63 days (Katsu Kush and Chunky D) or 70 days (ISS and SSSDH) with a flowering photoperiod of 12 hr light/12 hr dark.

| Strain | Total Dry Flower Weight (g) | Total Dry Flower Weight (oz) |
|--------------|-----------------------------|------------------------------|
| Katsu Kush | 123 | 4.4 |
| Chunky D | 138 | 4.9 |
| ISS | 190 | 6.8 |
| SSSDH | 180 | 6.4 |
| Total | 631 | 22.26 |

*ISS=Island Sweet Skunk, and SSSDH = Super Silver Sour Diesel Haze



Left: Canopy development at 28 days into the flowering cycle.



Right: Katsu Kush strain flowers at 42 days into the flowering cycle. Outstanding coloration and flower/trichome development.

Table 2: Yield analysis of all four strains combined at the tested 25 ft² (5' x 5') canopy area.

| Total Dry Flower Weight (g) | Electrical Consumption (kWh) | Yield (g/kWh) | Yield (g/ft ²) | Electrical Cost (\$)* | Yield Value (\$) ** |
|-----------------------------|------------------------------|---------------|----------------------------|-----------------------|---------------------|
| 631 | 526.7 | 1.20 | 25.2 | \$70.58 | \$6,310 |

*Electricity rate of \$0.134/kWh used in this calculation.

**Retail value of \$10/g used in this calculation.

Table 3: Yield analysis of all four strains tested extrapolated (calculated) for a monoculture of four plants per strain at 25 ft².

| Strain @ 4 plants | Total Dry Flower Weight (g) | Total Dry Flower Weight (oz) | Total Dry Flower Weight (lb) | Yield Value (\$) ** |
|-------------------|-----------------------------|------------------------------|------------------------------|---------------------|
| Katsu Kush | 492 | 17.6 | 1.1 | \$4,920 |
| Chunky D | 552 | 19.7 | 1.2 | \$5,520 |
| ISS | 760 | 27.1 | 1.7 | \$7,600 |
| SSSDH | 720 | 25.7 | 1.6 | \$7,200 |

**Retail value of \$10/g used in this calculation.

Table 4: Power consumption of all four strains tested extrapolated (calculated) for a monoculture of four plants per strain at 25 ft².

| Strain @ 4 plants | Total Dry Flower Weight (g) | Electrical Consumption (kWh) | Yield (g/kWh) | Yield (g/ft ²) | Electrical Cost (\$)* |
|-------------------|-----------------------------|------------------------------|---------------|----------------------------|-----------------------|
| Katsu Kush | 492 | 499.0 | 0.99 | 19.7 | \$66.87 |
| Chunky D | 552 | 499.0 | 1.10 | 22.1 | \$66.87 |
| ISS | 760 | 554.4 | 1.37 | 30.4 | \$74.29 |
| SSSDH | 720 | 554.4 | 1.30 | 28.8 | \$74.29 |

*Electricity rate of \$0.134/kWh used in this calculation.

Ready to learn more about optimizing your commercial crop production lighting solution today?

Contact us at: info@bioslighting.com

