



15% Yield Improvement with L2 vs. 1000W SE HPS

Abstract

The purpose of this case study was to compare the difference between cannabis plant characteristics grown using the Nate Controls L2 Grow Light vs. a major brand single-ended 1000W HPS grow light. Plants grown using L2 for the flowering phase had a **15% increase in dry, trim weight** and a **9% increase in cannabinoid concentration** compared to those produced using HPS.

Methods

This case study shows the results between cannabis plants grown with two different light sources for the flowering phase. The first test group was grown under single-ended High-Pressure Sodium (HPS) grow lights from a major manufacturer while the second test group was produced under the L2 grow lights. The plants received light from T5 fluorescent fixtures for all stages of growth other than the flowering phase. The plants received no natural light.

	HPS	L2
Fixture Type	single-ended HPS	LED
Power (watts)	1000	1000

Table 1: Light Source for Flowering Phase

This was a side-by-side study keeping all grow conditions the same except for the light source used during the flowering phase. All plants were grown indoors in the same room and were exposed to the same air temperature, humidity, CO₂ level, feeding and watering schedule, and nutrient mix.

The Bruce Banner strain was used for this case study. It is a hybrid strain with a relatively dense flower structure and a moderate to high concentration of THC.

A total of 12 plants were grown with an even split of plants between test groups. Three grow light fixtures were used for each test group for a total of 6 fixtures. Each light covered a 16 ft² area with two plants per light fixture. The breakdown of plants and fixtures is shown in the table below.

	HPS	L2	Total
Number of Plants	6	6	12
Number of Light Fixtures	3	3	6
Square Feet per Light	16	16	
Plants per Light	2	2	

Table 2: Plant and Light Fixture Count Breakdown



The plants, which were all grown from clones, went through a 14-day propagation phase, a 70-day vegetation phase, and a 60-day flowering phase. The plants were then harvested and dried. The table below shows the specifics of the grow schedule that was used.

			Light Source	
Phase	Number of Days	% of Plant Life	Control Group	Experimental Group
Propagation	14	10%	T5	T5
Vegetation	70	49%		
Flower	60	42%	HPS	L2
Total	144	100%		

Table 3: Growing Schedule

Results

Yield by Weight

The resulting average weight per plant for the two test groups after dry and trim is shown in the table below. The weight of the plants grown under the L2 lights was **15% higher** than the plants grown under the HPS lights providing a **significant yield improvement**.

HPS	L2	Difference	% Increase
0.73	0.84	0.15	15%

Table 4: Dry Weight (pounds per plant)

THC Content

The results of cannabinoid chemical testing appear in the table below. A sample was taken from three plants in each of the two test groups for a total of six samples. Testing was conducted by CB1 Analytics, an analytical testing laboratory based in Denver, Colorado. The average THC content of the plants grown under the L2 lights was **8.8% higher**, which was a **significant improvement**, compared to the plants grown under the HPS lights.



	HPS			L2			Average % Increase
Sample Number	1	2	3	1	2	3	
Cannabidiol (CBD) (mg/g)	9.8	7.7	10.2	10.8	8.6	9.1	2.9%
Cannabinol (CBN) (mg/g)	2.3	1.8	3.3	3.3	4.1	5.2	70.3%
Tetrahydrocannabinol (D9THC) (mg/g)	6.8	2.1	5.6	8.3	7.7	6.2	53.1%
Tetrahydrocannabinolic Acid (THCa) (mg/g)	207.7	200.3	208.9	229.1	210.8	221.7	7.2%
Total (mg/g)	226.6	211.9	228	251.5	231.2	242.2	8.8%
Average (mg/g)		222.2			241.6		

Table 5: THC Content in mg/g

Plant Characteristics

The characteristics of the plants grown under the Nate L2 lights displayed enhanced vibrancy, plumpness, and visually appealing features when compared with those produced under the HPS lights. During the last 21 days of the flowering cycle, there was a notable difference in color between the two groups: the plants exposed to HPS light were a yellow-green color while the plants exposed to the L2 were a deep green color. The resulting plant characteristics appear in the table below.

Characteristic	HPS	L2
Color	Light yellow-green	Deep green
Height	Taller	Shorter
Structure	Leaner	Bushier
Nodular Spacing	Farther	Closer

Table 6: Plant Characteristics Summary



Figure 1: Flowers grown under a Nate Controls L2 fixture showing a high density of trichome resins compared to those produced under a 1000W SE HPS.

Conclusion

The Nate Controls L2 grow light significantly outperformed the major brand single-ended 1000W HPS light. The dry weight of the plants was 15% higher, and a 9% higher THC potency was exhibited resulting in a significant profit increase for this grower. Moreover, the potential yield increase could be considerably higher when the L2 is used for both the veg and flower cycles rather than just the flowering phase as it was for this study.

Dry Weight Increase	15%
THC Potency Increase	9%
Additional Profit per Year per Light	\$1,520

Table 7: Nate Controls L2 Grow Light Performance vs. 1000W HPS

The HPS grow lights produced 1.461 pounds per light per harvest (0.731 pounds/plant x 2 plants/light = 1.462 pounds/light/harvest). This grower gets 4.62 harvests per year (365 days/year / (72 day grow period + 7-day transition) = 4.62 harvests/year). The wholesale price for premium indoor cannabis in Colorado is \$1,500 /pound. Therefore, this grower generated \$1520 of additional profit per light per year (1.462 pounds/light/harvest x 4.62 harvests/year x 15% increase x \$1,500/pound = \$1520 additional profit/year/light).