

October 20, 2019

*Industrial Hemp: Engaging an “Unintentional Selection Process” in Order to Improve the Chemistry of Whole Plant Hemp Extractions and Patient Outcomes*

Human cultivation of *Cannabis sativa* dates back over 8,000 years, using the plant for both industrial, agricultural and clinical purposes. Unfortunately, over the past 30 to 40 years, the plant was hybridized to produce the highest level of THC. Now, because of the legality of Industrial Hemp derived CBD, the plant has been pigeon-holed into the production of CBD only varieties. Without reservation, and just from a clinical perspective, Cannabis, whether Hemp or Marijuana, offers exponentially more benefits than just these two molecules. To add to the dilemma, the current patient outcome data suggests that naturally diverse (chemically), whole plant cannabis preparations demonstrate no issues regarding safety, toxicology and provide much better patient outcomes than single or isolated cannabinoid preparations. Growing cannabis plants for single cannabinoid profiles (CBD or THC) creates a plant that has lost its full clinical capacity as a profound, endogenous anti-inflammatory. In fact, single molecule cannabis plants may be converted to PRO-inflammatory agents or agonists because of the non-natural, genetic removal of a complete chemical portfolio including phytocannabinoids, terpenes, fats, waxes, flavonoids and more; all related to Mechoulam’s “Entourage Effect”.

Royal Queen Seeds explains: “Whole plant—or full spectrum—products contain all the beneficial components found in the cannabis plant. Research shows that naturally complex whole plant extracts are likely more effective than single isolated cannabinoids because they leverage the entourage effect and minimize the bell-shaped curve response.

The universe of cannabis derivatives and concentrates keeps expanding, and cannabis science is expanding its knowledge as well. Over the last decades, research has consistently displayed the therapeutic potential of cannabinoids. Along the way, researchers stumbled upon an intriguing realization that a complex extract of cannabis compounds appears more medicinally effective than a single cannabinoid in isolation. This is where the “whole plant” concept begins.

Fruits and veggies contain a multitude of biochemical compounds in addition to the vitamins and minerals we need to stay healthy. Simply said, the reason it is much better to consume these vitamins via fruit, as opposed to a capsule, for example, is because all these natural elements work together to enhance their individual effects—after all, Mother Nature prepared this nutrient-rich package for a reason! When we need some extra vitamins, there’s nothing wrong with taking supplements, just like there’s nothing wrong with pure THC or CBD. However, it appears that whole plant extracts, whether in the form of fruit juice or CBD oil, are generally more effective.

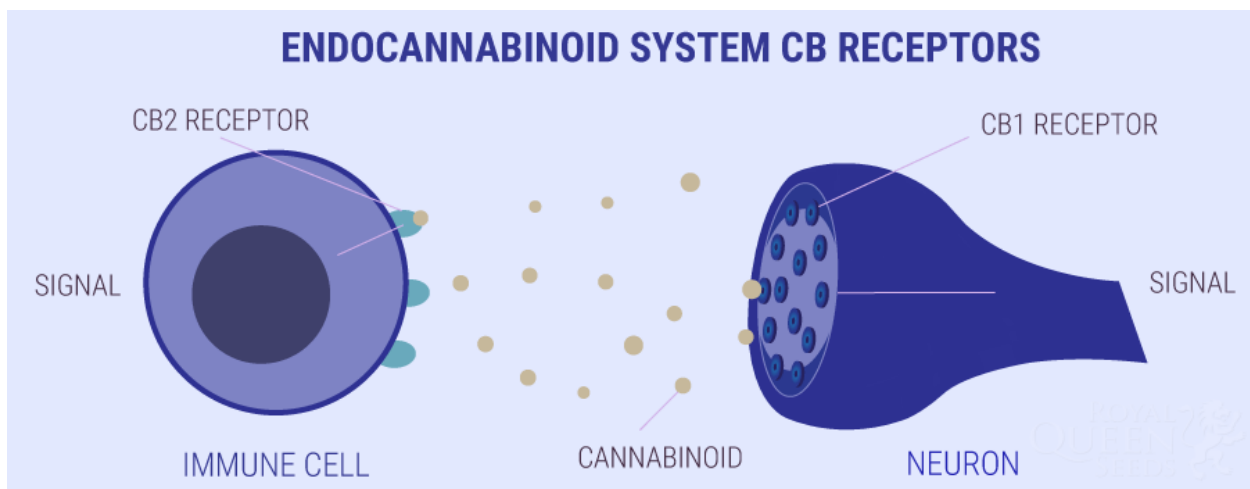
## THE COMPLEXITY OF CANNABIS COMPOUNDS

The cannabis plant contains over 400 chemical compounds including THC, CBD, CBN, and other cannabinoids. Moreover, terpenes, not cannabinoids, are the volatile substances that give flavor to the flower and provide us with some beneficial properties that enhance the medicinal effect of cannabinoids. Plus, flavonoids, fatty acids, proteins, enzymes, and sugars are all present in whole plant matter, eventually playing a role in further enhancing the plant's medical efficacy.

The research mentioned below, together with other studies and anecdotal accounts, is today challenging the misconception that botanical extracts are less effective and harder to dose than single-molecule cannabinoids, usually produced by Big Pharma. It's all because of the "entourage effect" and the "bell-shaped curve" effect.

## THE ENTOURAGE EFFECT

"Entourage effect" (<https://www.royalqueenseeds.com/blog--entourage-effect-how-cannabinoids-and-terpenes-work-together-n233>) is a term frequently used to describe the medicinal result of a combination of cannabinoids, terpenes, and other minor cannabis compounds inside the body. A famous study by Ethan Russo, MD, PhD (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3165946/#b245>) on the medical synergies among various cannabis components ushered in a new era of research on cannabis as a beneficial yet intricate phytocomplex. This and other studies also found that CBD contained in a full spectrum (<https://www.royalqueenseeds.com/blog-full-spectrum-cbd-vs-isolate-whats-the-difference-n1131>) extract is able to antagonize THC, limiting its binding affinity to CB1 receptors in the brain, thus lessening its intoxicating effects while still providing relief from pain and inflammation.



As a result of these findings, researchers started experimenting with different THC:CBD ratios, and with combinations of other cannabinoids. Furthermore, scientists began to realize the pharmacological properties of terpenes and the significant role they play in the entourage effect. In fact, researchers are now striving to address the specific role of terpenes (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6308289/>) in cannabis preparations. Different cannabis chemotypes have distinct terpene profiles that generate a diverse range of whole plant extracts, resulting in slightly different effects on the body and mind.

CBD-rich extracts containing a variety of plant compounds also seem to present a better therapeutic profile than single-molecule CBD in patients with refractory epilepsy. A significant instance of the potential superiority of whole plant extracts comes from a meta-analysis of studies from 2013 to 2017. The review sought to explore the therapeutic benefits of CBD for epilepsy patients. More than 70% of patients treated with full spectrum CBD extracts reported improvements, compared to just 36% of patients who received pure, single-molecule CBD.

The cannabis community was immediately excited by these results, and breeders were among the most receptive, quickly developing new strains with unique cannabinoid and terpene profiles. Because of this, new generations of cannabis genetics often have a richer phytocomplex than their “old-school” grandparents, and they can easily satisfy the needs of both recreational and medical users with today’s manifold forms and consumption methods.

(<https://www.royalqueenseeds.com/blog-are-whole-plant-extracts-more-effective-than-single-cannabinoids-n1194/>)”.

Even more specifically, Pamplona, et al, *Potential Clinical Benefits of CBD-Rich Cannabis Extracts Over Purified CBD in Treatment-Resistant Epilepsy: Observational Data Meta-analysis*, *Frontiers in Neurology*, September 12, 2018: Abstract: “This meta-analysis paper describes the analysis of observational clinical studies on the treatment of refractory epilepsy with cannabidiol (CBD)-based products. Beyond attempting to establish the safety and efficacy of such products, we also investigated if there is enough evidence to assume any difference in efficacy between CBD-rich extracts compared to purified CBD products. The systematic search took place in February/2017 and updated in December/2017 using the keywords “epilepsy” or “Dravet” or “Lennox-Gastaut” or “CDKL5” combined with “Cannabis,” “cannabinoid,” “cannabidiol,” or “CBD” resulting in 199 papers. The qualitative assessment resulted in 11 valid references, with an average impact factor of 8.1 (ranging from 1.4 to 47.8). The categorical data of a total of 670 patients were analyzed by Fischer test. The average daily dose ranged between 1 and 50 mg/kg, with treatment length from 3 to 12 months (mean 6.2 months). Two thirds of patients reported improvement in the frequency of seizures (399/622, 64%). There were more reports of improvement from patients treated with CBD-rich extracts (318/447, 71%) than patients

treated with purified CBD (81/175, 46%), with statistical significance ( $p < 0.0001$ ). Nevertheless, when the standard clinical threshold of a “50% reduction or more in the frequency of seizures” was applied, only 39% of the individuals were considered “responders,” and there was no difference ( $p = 0.52$ ) between treatments with CBD-rich extracts (122/330, 37%) and purified CBD (94/223, 42%). Patients treated with CBD-rich extracts reported lower average dose (6.0 mg/kg/day) than those using purified CBD (25.3 mg/kg/day). The reports of mild (158/216, 76% vs. 148/447, 33%,  $p < 0.001$ ) and severe (41/155, 26% vs. 23/328, 7%,  $p < 0.0001$ ) adverse effects were more frequent in products containing purified CBD than in CBD-rich extracts. **CBD-rich extracts seem to present a better therapeutic profile than purified CBD, at least in this population of patients with refractory epilepsy. The roots of this difference are likely due to synergistic effects of CBD with other phytocompounds (aka Entourage effect), but this remains to be confirmed in controlled clinical studies.**

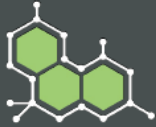
<https://www.frontiersin.org/articles/10.3389/fneur.2018.00759/full>”.

Once again, recent Cannabis genetic exploration has been focused on the production of single molecules while the emerging data suggests the need for the complete opposite! Thus, since 2015, Apothio has been intentionally planting a broad variety of Industrial Hemp P1, non-GMO, non-feminized seeds. In 2018, Apothio began planting its “all natural” proprietary Industrial Hemp seeds by the millions so the plants can express their full genetic AND epigenetic capacities from germination to harvest. Large scale, high volume genetic production is key for a timely discovery. Thus, through this “accelerated genetic pool”

<file:///C:/Users/Dr.%20Trent%20Jones/Desktop/Genetics/Fast%20Forwarding%20Genetic%20Gain%202018.pdf>) Apothio is trusting nature to quickly recover and further diversify the molecular complexity of the Industrial Hemp plant; thereby, improving the clinical outcomes of the consumers of Apothio’s Industrial Hemp extractions and formulations. For example, the Noah variety is Apothio’s first Industrial Hemp variety, validated in 2014. The original Noah variety’s chromatograph (see below) demonstrates an outcome of 9.1% CBDA, 0.32% THCA, and 0.46% in “microcannabinoids” (CBN, CBGA and CBCA). Apothio’s original Noah produced 95.4% CBDA and THCA, while only producing 4.6% of total cannabinoid production was in microcannabinoids. After 5 years of Apothio’s “Unintentional Selection Process”, those numbers have shifted significantly. On average, 76.7% of the total cannabinoid production is CBDA and THCA, while Apothio’s current Industrial Hemp microcannabinoid (CBN, CBC, CBG, THCV, CBDV, etc.) production has exploded to 23.3% of the plants’ total cannabinoid production. This is very rare today and strongly supports Apothio’s choice to “trust nature” in her ability to re-diversify Cannabis’ genetic pool.

As a closing note, Apothio would NOT be able to engage the “Unintentional Selection Process” without participating as a “*California Industrial Hemp Research Institution*”. Apothio has complied with this program and to date has not sold any Industrial Hemp byproducts. As a

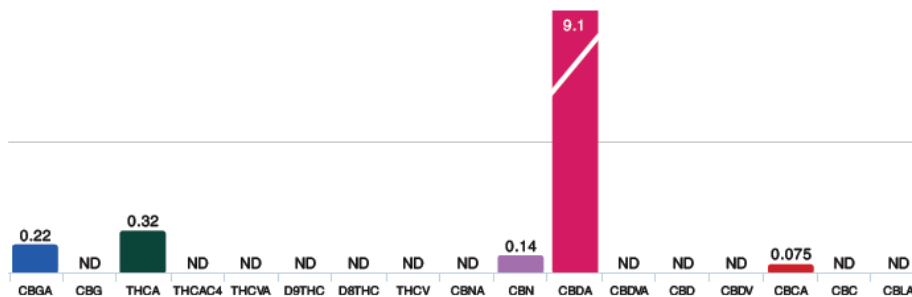
“Research Institution”, Apothio is able to grow these plants, and when we discover that a plant has exceeded acceptable THC levels, we destroy only that plant, and not the entire field. This rule allows us to research one plant at a time; thus, improving the overall outcomes for those well beyond Apothio.



## NA 1 East End G13 3

Customer: Just Us Aquaphionics	Test Site: SHL Oakland	Instrument: LCMSMS
Test: Terpenoid/Cannabinoid Profile	Type: Flower	Customer's ID: -
Submitted: -	Tested: 10/20/2014	Reported: 10/20/2014
		Sample Mass: 573.9 mg

### Cannabinoids as Percent of Total Sample Mass



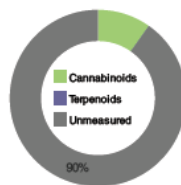
### Terpenoids as Percent of Total Sample Mass

No terpenoids to report

### Sample Overview



NA 1 East End G13 3

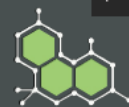


### Sample Details

Mycotoxin	NOT REQUESTED
Pesticide	NOT REQUESTED

For more information about this report, including how to calculate your own approximate post-decarboxylate THC and CBD values, please visit [www.steehillab.com/FAQ](http://www.steehillab.com/FAQ).

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## Original Noah Variety Terpenes (listed in the Right Column)

Summary Terpene Profile and Percentage of Leading Terpenes By Leading Varieties:						
		Noah Tableside (Veg) - USDA Hemp			NOAH Flower - USDA Hemp	
	CBD %	THC %	CBC %	CBD %	THC %	CBC %
	2.16%	0.03%		6.51%	0.29%	
	CBD:THC Ratio			CBD:THC Ratio		
	72 to 1			22.45 to 1		
Terpene:	Terpene (ppm)	Terpene mg/g	% of Total Terps	Terpene (ppm)	Terpene mg/g	% of Total Terps
Alpha-Pinene	551.69	0.2	26.6%	1749.0	3.8	32.8%
Camphene	0	0	0.0%	0.0	0.0	0.0%
Beta-Myrcene	112.2	0	5.4%	1382.06	3.0	25.9%
Carene	123.34	0	6.0%	668.49	1.5	12.6%
Beta-Pinene	0	0	0.0%	0.0	0.0	0.0%
Limonene	43.2	0	2.1%	94.94	0.2	1.8%
Eucalyptol	147.62	0.1	7.1%	15.73	0.1	0.3%
Terpinolene	5.99	0	0.3%	74.74	0.2	1.4%
Linalool	1.12	0	0.1%	112.61	0.2	2.1%
p-Cymene	9.95	0	0.5%	5.88	0.0	0.1%
Geraniol	0	0	0.0%	5.38	0.0	0.1%
Beta-Caryophyllene	580.11	0.2	28.0%	694.48	1.5	13.0%
Humulene	212.99	0.1	10.3%	345.15	0.8	6.5%
Nerolidol	5.06	0	0.2%	70.34	0.2	1.3%
Caryophyllene Oxide	155.7	0	7.5%	3.02	0.0	0.1%
Bisabolol	122.54	0	5.9%	104.31	0.2	2.0%
Phytol (lab n/a)	0	0	0.0%	0.0	0.0	0.0%
Sub-Total	2071.51	0.6	100.0%	5,326.13	11.7	100.0%

[illegible]

**Pharmacological actions of non-psychotropic cannabinoids** (with the indication of the proposed mechanisms of action)  
Abbreviations: D9-THC, D9-tetrahydrocannabinol; D8-THC, D8-tetrahydrocannabinol; CBN, cannabinol; CBD, cannabidiol; D9-THCV, D9-tetrahydrocannabivarin; CBC, cannabichromene; CBG, cannabigerol; D9-THCA, D9-tetrahydrocannabinolic acid; CBDA, cannabidiolic acid; TRPV1, transient receptor potential vanilloid type 1; PPAR $\gamma$ , peroxisome proliferator-activated receptor  $\gamma$ ; ROS, reactive oxygen species; 5-HT1A, 5-hydroxytryptamine receptor subtype 1A; FAAH, fatty acid amide hydrolase. (+), direct or indirect activation;  $\uparrow$ , increase;  $\downarrow$ , decrease.



## Current Apothio Industrial Hemp Varieties Grown in Bakersfield, CA, 2019

October 6, 2019

Apothio – Bakersfield 2019 Hemp Farms Potency, Heavy Metals, Pesticide and Herbicide Testing

3<sup>rd</sup> Party Testing: BelCosta Labs, Long Beach, CA

October 4 – 6, 2019

Summary Results of the Following Tests:

1. Average CBDA Content: 7.95% ,
2. Average THCA Content: 0.35% ( $0.35 \times 0.87\% = 0.30\%$  THC Maximum Content),
3. Average Flower Cycle: Week 6 -7 of 8 Weeks of Flowering,
4. Average Total “Microcannabinoid” (CBDV, THCV, CBN, CBC, CBG) Content in the Fields: 23.3%
5. Heavy Metal Testing: PASSED, and
6. Herbicides and Pesticides: PASSED.

Summarily, for the past 5 ½ years, as a “California Industrial Hemp Research Institution”, Apothio has grown hemp plants in

the most natural settings possible; i.e., natural seeds, males and females growing together, etc. Our goal is to allow the plants to fully express its genetics AND epigenetics, giving us the broadest array of whole plant extracted, natural plant medicines. Where else are we seeing plants deliver over 23% of its cannabinoid profile via the micros? Just as importantly, this “genetic freedom” also gives the plants the ability to express themselves by way of hurd, fiber, root, seed, and of course, chemical production.

Enjoy the review and we look forward to your thoughts and suggestions.

Trent 



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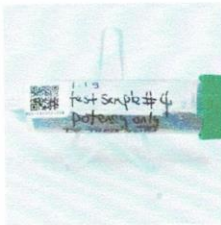
# CERTIFICATE OF ANALYSIS

\* FOR QUALITY ASSURANCE PURPOSES. NOT A CALIFORNIA COMPLIANCE CERTIFICATE.

PRODUCED: OCT 04, 2019

VANDEBURG ROAD 223 (INDUSTRIAL HEMP) // CLIENT: APOTHIO

BATCH RESULT: **PASSED AS CALIFORNIA INDUSTRIAL HEMP**



MATRIX: INDUSTRIAL HEMP  
SAMPLE ID: BCL-191002-004  
COLLECTED ON: OCT 02, 2019  
RECEIVED ON: OCT 02, 2019  
SAMPLE SIZE: 2 GRAMS

TOTAL THC	0.24 %
TOTAL CBD	5.23 %
TOTAL CANNABINOIDS	7.19 %



CANNABINOIDS



RESULTS CERTIFIED BY: RON BROOKS, M.S.  
SCIENTIFIC DIRECTOR, BELCOSTA LABS  
OCT 04, 2019

<https://lims.tagleaf.com/coa/py1gcBCLbK>

- Plant harvested in week 6 of 8 weeks of flower.
- 24% of the cannabinoids are the micros (cbe, cbg, etc.)

Trent Jones, DC  
765-327-1016 w/questions.

BCL-03: CANNABINOID POTENCY BY HPLC-UV  
OCT 04, 2019



ANALYTE	LABELED AMOUNT	DETECTED	DETECTED	LOD	LOQ	PASS/FAIL
CBC		< LOQ	< LOQ	0.025 mg/g	0.1 mg/g	N/A
CBCA		0.26377 %	2.6377 mg/g	0.025 mg/g	0.1 mg/g	N/A
CBD		0.12206 %	1.2206 mg/g	0.025 mg/g	0.1 mg/g	N/A
CBDA		5.82313 %	58.2313 mg/g	0.025 mg/g	0.1 mg/g	N/A
CBDV		ND	ND	0.025 mg/g	0.1 mg/g	N/A
CBDVA		0.30142 %	3.0142 mg/g	0.025 mg/g	0.1 mg/g	N/A
CBG		0.02847 %	0.2847 mg/g	0.025 mg/g	0.1 mg/g	N/A
CBGA		0.35475 %	3.5475 mg/g	0.025 mg/g	0.1 mg/g	N/A
CBN		ND	ND	0.025 mg/g	0.1 mg/g	N/A
Δ <sup>8</sup> -THC		ND	ND	0.025 mg/g	0.1 mg/g	N/A
Δ <sup>9</sup> -THC		0.01559 %	0.1559 mg/g	0.025 mg/g	0.1 mg/g	N/A
THCA		0.25529 %	2.5529 mg/g	0.025 mg/g	0.1 mg/g	N/A
THCV		ND	ND	0.025 mg/g	0.1 mg/g	N/A
THCVA		0.02073 %	0.2073 mg/g	0.025 mg/g	0.1 mg/g	N/A
TOTAL THC (TOTAL THC = (THCA X 0.877) + THC)		0.23948 %	2.3948 mg/g			N/A
TOTAL CBD (TOTAL CBD = (CBDA X 0.877) + CBD)		5.22895 %	52.2895 mg/g			N/A

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<https://lims.tagleaf.com/coa/py1gcBCLbK>

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PRODUCED: OCT 04, 2019

NA-OG LAMONT (INDUSTRIAL HEMP) // CLIENT: APOTHIO

BATCH RESULT: **FAILED AS CALIFORNIA INDUSTRIAL HEMP**



MATRIX: INDUSTRIAL HEMP  
SAMPLE ID: BCL-191002-001  
COLLECTED ON: OCT 02, 2019  
RECEIVED ON: OCT 02, 2019  
SAMPLE SIZE: 5 GRAMS

TOTAL THC	0.38 %
TOTAL CBD	8.74 %
TOTAL CANNABINOIDS	11.13 %



CANNABINOIDS



Please Trent with  
any questions 765-327-1016.

RESULTS CERTIFIED BY: RON BROOKS, M.S.  
SCIENTIFIC DIRECTOR, BELCOSTA LABS  
OCT 04, 2019

*Ron Brooks*

<https://lims.tagleaf.com/coa/FhAwB6wkO9>

- this sample was harvested in week 7 of 8 weeks of flower
- All flower is heavily seeded
- the CBD content will exceed 9.5%, while the content is expected to reduce to 0.30% or less.
- \* - the micro (CBN, CBC, THCV, etc) cannabinoid content is 18% of total cannabinoid content.

BCL-03: CANNABINOID POTENCY BY HPLC-UV  
OCT 04, 2019



ANALYTE	LABELED AMOUNT	DETECTED	DETECTED	LOD	LOQ	PASS/FAIL
CBC		0.06614 %	0.6614 mg/g	0.025 mg/g	0.1 mg/g	N/A
CBCA		0.35426 %	3.5426 mg/g	0.025 mg/g	0.1 mg/g	N/A
CBD		1.30159 %	13.0159 mg/g	0.025 mg/g	0.1 mg/g	N/A
CBDA		8.4766 %	84.766 mg/g	0.025 mg/g	0.1 mg/g	N/A
CBDV		ND	ND	0.025 mg/g	0.1 mg/g	N/A
CBDVA		0.10963 %	1.0963 mg/g	0.025 mg/g	0.1 mg/g	N/A
CBG		0.06299 %	0.6299 mg/g	0.025 mg/g	0.1 mg/g	N/A
CBGA		0.30789 %	3.0789 mg/g	0.025 mg/g	0.1 mg/g	N/A
CBN		0.01211 %	0.1211 mg/g	0.025 mg/g	0.1 mg/g	N/A
Δ <sup>8</sup> -THC		ND	ND	0.025 mg/g	0.1 mg/g	N/A
Δ <sup>9</sup> -THC		0.12375 %	1.2375 mg/g	0.025 mg/g	0.1 mg/g	N/A
THCA		0.29253 %	2.9253 mg/g	0.025 mg/g	0.1 mg/g	N/A
THCV		ND	ND	0.025 mg/g	0.1 mg/g	N/A
THCVA		0.02166 %	0.2166 mg/g	0.025 mg/g	0.1 mg/g	N/A
TOTAL THC (TOTAL THC = (THCA X 0.877) + THC)		0.3803 %	3.803 mg/g			N/A
TOTAL CBD (TOTAL CBD = (CBDA X 0.877) + CBD)		8.73557 %	87.3557 mg/g			N/A

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[https://lims.tagleaf.com/coa\\_/FhAwB6wkO9](https://lims.tagleaf.com/coa_/FhAwB6wkO9)

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# CERTIFICATE OF ANALYSIS

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PRODUCED: OCT 06, 2019

"CLEO" VANDBURG CUDA (INDUSTRIAL HEMP) // CLIENT: APOTHIO

BATCH RESULT: **FAILED AS CALIFORNIA INDUSTRIAL HEMP**



MATRIX: INDUSTRIAL HEMP  
SAMPLE ID: BCL-191002-005  
COLLECTED ON: OCT 02, 2019  
RECEIVED ON: OCT 02, 2019  
SAMPLE SIZE: 2 GRAMS

TOTAL THC	0.53 %
TOTAL CBD	11.55 %
TOTAL CANNABINOIDS	16.19 %



CANNABINOIDS



RESULTS CERTIFIED BY: RON BROOKS, M.S.  
SCIENTIFIC DIRECTOR, BELCOSTA LABS  
OCT 06, 2019



[https://lims.tagleaf.com/coa\\_/USwd6GbgUt](https://lims.tagleaf.com/coa_/USwd6GbgUt)

- WEEK 7 of 8 weeks of flower.
- Fully sealed.
- 25% of total cannabinoids are the micro cannabinoids (CBN, ~~CBD~~, THCV, CBDV, etc.)
- Demonstrates the need for "research status" to develop the full array of cannabinoids.

BCL-03: CANNABINOID POTENCY BY HPLC-UV  
OCT 06, 2019



ANALYTE	LABELED AMOUNT	DETECTED	DETECTED	LOD	LOQ	PASS/FAIL
CBC		ND	ND	0.025 mg/g	0.1 mg/g	N/A
CBCA		0.61911 %	6.1911 mg/g	0.025 mg/g	0.1 mg/g	N/A
CBD		0.30339 %	3.0339 mg/g	0.025 mg/g	0.1 mg/g	N/A
CBDA		12.82866 %	128.2866 mg/g	0.025 mg/g	0.1 mg/g	N/A
CBDV		ND	ND	0.025 mg/g	0.1 mg/g	N/A
CBDVA		1.22815 %	12.2815 mg/g	0.025 mg/g	0.1 mg/g	N/A
CBG		0.05399 %	0.5399 mg/g	0.025 mg/g	0.1 mg/g	N/A
CBGA		0.47951 %	4.7951 mg/g	0.025 mg/g	0.1 mg/g	N/A
CBN		ND	ND	0.025 mg/g	0.1 mg/g	N/A
Δ <sup>8</sup> -THC		ND	ND	0.025 mg/g	0.1 mg/g	N/A
Δ <sup>9</sup> -THC		0.03379 %	0.3379 mg/g	0.025 mg/g	0.1 mg/g	N/A
THCA		0.56995 %	5.6995 mg/g	0.025 mg/g	0.1 mg/g	N/A
THCV		ND	ND	0.025 mg/g	0.1 mg/g	N/A
THCVA		0.07299 %	0.7299 mg/g	0.025 mg/g	0.1 mg/g	N/A
TOTAL THC (TOTAL THC = (THCA X 0.877) + THC)		0.53364 %	5.3364 mg/g			N/A
TOTAL CBD (TOTAL CBD = (CBDA X 0.877) + CBD)		11.55412 %	115.5412 mg/g			N/A

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PRODUCED: OCT 05, 2019

VANBURG FARM #2 (INDUSTRIAL HEMP) // CLIENT: APOTHIO

BATCH RESULT: PASSED AS CALIFORNIA INDUSTRIAL HEMP



MATRIX: INDUSTRIAL HEMP  
SAMPLE ID: BCL-191002-002  
COLLECTED ON: OCT 02, 2019  
RECEIVED ON: OCT 02, 2019  
SAMPLE SIZE: 5 GRAMS

TOTAL THC 0.25 %

TOTAL CBD 6.26 %

TOTAL CANNABINOIDS 8.84 %



PESTICIDES



CANNABINOIDS



RESULTS CERTIFIED BY: RON BROOKS, M.S.

SCIENTIFIC DIRECTOR, BELCOSTA LABS

OCT 05, 2019

[https://lims.tagleaf.com/coa/\\_zpU6J7A16a](https://lims.tagleaf.com/coa/_zpU6J7A16a)

APOTHIO HEMP (WEEK 7 OF 8 IN FLOWER)  
- COA < 26.3% MICROS (CON, THC, ETC)  
- COA < 0.3% THC  
- HERBICIDE / PESTICIDE: PASSED

Trent Jones, CEO  
CEO, APOTHIO  
765-327-1016 (cell)

BCL-03: CANNABINOID POTENCY BY HPLC-UV  
OCT 04, 2019



ANALYTE	LABELED AMOUNT	DETECTED	DETECTED	LOD	LOQ	PASS/FAIL
CBC		0.04613 %	0.4613 mg/g	0.025 mg/g	0.1 mg/g	N/A
CBCA		0.21504 %	2.1504 mg/g	0.025 mg/g	0.1 mg/g	N/A
CBD		1.21481 %	12.1481 mg/g	0.025 mg/g	0.1 mg/g	N/A
CBDA		5.74878 %	57.4878 mg/g	0.025 mg/g	0.1 mg/g	N/A
CBDV		0.15767 %	1.5767 mg/g	0.025 mg/g	0.1 mg/g	N/A
CBDVA		0.83991 %	8.3991 mg/g	0.025 mg/g	0.1 mg/g	N/A
CBG		0.05416 %	0.5416 mg/g	0.025 mg/g	0.1 mg/g	N/A
CBGA		0.20694 %	2.0694 mg/g	0.025 mg/g	0.1 mg/g	N/A
CBN		0.02272 %	0.2272 mg/g	0.025 mg/g	0.1 mg/g	N/A
Δ <sup>8</sup> -THC		0.02966 %	0.2966 mg/g	0.025 mg/g	0.1 mg/g	N/A
Δ <sup>9</sup> -THC		0.12672 %	1.2672 mg/g	0.025 mg/g	0.1 mg/g	N/A
THCA		0.14584 %	1.4584 mg/g	0.025 mg/g	0.1 mg/g	N/A
THCV		ND	ND	0.025 mg/g	0.1 mg/g	N/A
THCVA		0.03366 %	0.3366 mg/g	0.025 mg/g	0.1 mg/g	N/A
TOTAL THC (TOTAL THC = (THCA X 0.877) + THC)		0.25462 %	2.5462 mg/g			N/A
TOTAL CBD (TOTAL CBD = (CBDA X 0.877) + CBD)		6.25649 %	62.5649 mg/g			N/A



BCL-13: PESTICIDE TESTING BY GC/MS  
OCT 05, 2019

ANALYTE	ACTION LIMIT	DETECTED	LOD	LOQ	PASS/FAIL	ANALYTE	ACTION LIMIT	DETECTED	LOD	LOQ	PASS/FAIL
CAPTAN		ND	0.03 µg/g	0.05 µg/g	N/A	CHLORPYRIFOS		ND	0.03 µg/g	0.05 µg/g	N/A
CYFLUTHRIN		ND	0.03 µg/g	0.05 µg/g	N/A	CYPERMETHRIN		ND	0.03 µg/g	0.05 µg/g	N/A
DICHLORVOS		ND	0.03 µg/g	0.05 µg/g	N/A	METHYL PARATHION		ND	0.03 µg/g	0.05 µg/g	N/A
CHLORFENAPYR		ND	0.03 µg/g	0.05 µg/g	N/A	PENTACHLORONI- TROBENZENE		ND	0.03 µg/g	0.05 µg/g	N/A

BCL-05: RESIDUAL PESTICIDE ANALYSIS BY LC-MS/MS ESI  
OCT 05, 2019

ANALYTE	ACTION LIMIT	DETECTED	LOD	LOQ	PASS/FAIL	ANALYTE	ACTION LIMIT	DETECTED	LOD	LOQ	PASS/FAIL
NALED		ND	0.03 µg/g	0.05 µg/g	N/A	METHIOCARB		ND	0.03 µg/g	0.05 µg/g	N/A
OXAMYL		ND	0.03 µg/g	0.05 µg/g	N/A	SPINETORAM	3 µg/g	ND	0.03 µg/g	0.05 µg/g	N/A
PHOSMET		ND	0.03 µg/g	0.05 µg/g	N/A	ACEQUINOCYL		ND	0.03 µg/g	0.05 µg/g	N/A
ACEPHATE		ND	0.03 µg/g	0.05 µg/g	N/A	ACETAMIPRID		ND	0.03 µg/g	0.05 µg/g	N/A
ALDICARB		ND	0.03 µg/g	0.05 µg/g	N/A	ETHOPROPHOS		ND	0.03 µg/g	0.05 µg/g	N/A
BOSCALID		ND	0.03 µg/g	0.05 µg/g	N/A	FLUDIOXONIL		ND	0.03 µg/g	0.05 µg/g	N/A
CARBARYL		ND	0.03 µg/g	0.05 µg/g	N/A	HEXYTHIAZOX		ND	0.03 µg/g	0.05 µg/g	N/A
DIAZINON		ND	0.03 µg/g	0.05 µg/g	N/A	PRALLETHRIN		ND	0.03 µg/g	0.05 µg/g	N/A
FIPRONIL		ND	0.03 µg/g	0.05 µg/g	N/A	SPIROXAMINE		ND	0.03 µg/g	0.05 µg/g	N/A
IMAZALIL		ND	0.03 µg/g	0.05 µg/g	N/A	THIACLOPRID		ND	0.03 µg/g	0.05 µg/g	N/A



METHOMYL	ND	0.03 µg/g	0.05 µg/g	N/A	AZOXYSTROBIN	ND	0.03 µg/g	0.05 µg/g	N/A
PROPOXUR	ND	0.03 µg/g	0.05 µg/g	N/A	CLOFENTEZINE	ND	0.03 µg/g	0.05 µg/g	N/A
COUMAPHOS	ND	0.03 µg/g	0.05 µg/g	N/A	IMIDACLOPRID	0.0415 µg/g	0.03 µg/g	0.05 µg/g	N/A
ETOXAZOLE	ND	0.03 µg/g	0.05 µg/g	N/A	MYCLOBUTANIL	ND	0.03 µg/g	0.05 µg/g	N/A
METALAXYL	ND	0.03 µg/g	0.05 µg/g	N/A	SPIROMESIFEN	ND	0.03 µg/g	0.05 µg/g	N/A
PYRIDABEN	ND	0.03 µg/g	0.05 µg/g	N/A	TEBUCONAZOLE	ND	0.03 µg/g	0.05 µg/g	N/A
BIFENAZATE	ND	0.03 µg/g	0.05 µg/g	N/A	THIAMETHOXAM	ND	0.03 µg/g	0.05 µg/g	N/A
BIFENTHRIN	ND	0.03 µg/g	0.05 µg/g	N/A	FENPYROXIMATE	ND	0.03 µg/g	0.05 µg/g	N/A
CARBOFURAN	ND	0.03 µg/g	0.05 µg/g	N/A	PACLOBUTRAZOL	ND	0.03 µg/g	0.05 µg/g	N/A
DAMINOZIDE	ND	0.03 µg/g	0.05 µg/g	N/A	PROPICONAZOLE	ND	0.03 µg/g	0.05 µg/g	N/A
DIMETHOATE	ND	0.03 µg/g	0.05 µg/g	N/A	SPIROTETRAMAT	ND	0.03 µg/g	0.05 µg/g	N/A
ETOFENPROX	ND	0.03 µg/g	0.05 µg/g	N/A	KRESOXIM- METHYL	ND	0.03 µg/g	0.05 µg/g	N/A
FENHEXAMID	ND	0.03 µg/g	0.05 µg/g	N/A	TRIFLOXYSTROB- IN	ND	0.03 µg/g	0.05 µg/g	N/A
FENOXYCARB	ND	0.03 µg/g	0.05 µg/g	N/A	PIPERONYLBUTO- XIDE	ND	0.03 µg/g	0.05 µg/g	N/A
FLONICAMID	ND	0.03 µg/g	0.05 µg/g	N/A	CHLORANTRANIL- IPROLE	ND	0.03 µg/g	0.05 µg/g	N/A

\* FOR QUALITY ASSURANCE PURPOSES. NOT A CALIFORNIA COMPLIANCE CERTIFICATE.





BELCOSTA LABS // 1131 E. SOUTH STREET LONG BEACH CA 90805 // PH: (562) 676-4206  
CA LICENSE #: C8-0000008-LIC

# CERTIFICATE OF ANALYSIS

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PRODUCED: OCT 05, 2019

CAUZZA FEMALE FLWN #3 (INDUSTRIAL HEMP) // CLIENT: APOTHIO

BATCH RESULT: **PASSED AS CALIFORNIA INDUSTRIAL HEMP**



MATRIX: INDUSTRIAL HEMP  
SAMPLE ID: BCL-191002-003  
COLLECTED ON: OCT 02, 2019  
RECEIVED ON: OCT 02, 2019  
SAMPLE SIZE: 3 GRAMS



RESULTS CERTIFIED BY: RON BROOKS, M.S.  
SCIENTIFIC DIRECTOR, BELCOSTA LABS  
OCT 05, 2019

<https://lims.tagleaf.com/coa/4MGX6rsEou>

APOTHIO HEMP  
HERBICIDES & PESTICIDES : PASSED

BCL-13: PESTICIDE TESTING BY GC/MS  
OCT 05, 2019

ANALYTE	ACTION LIMIT	DETECTED	LOD	LOQ	PASS/FAIL	ANALYTE	ACTION LIMIT	DETECTED	LOD	LOQ	PASS/FAIL
CAPTAN		ND	0.03 µg/g	0.05 µg/g	N/A	CHLORPYRIFOS		ND	0.03 µg/g	0.05 µg/g	N/A
CYFLUTHRIN		ND	0.03 µg/g	0.05 µg/g	N/A	CYPERMETHRIN		ND	0.03 µg/g	0.05 µg/g	N/A
DICHLORVOS		ND	0.03 µg/g	0.05 µg/g	N/A	METHYL PARATHION		ND	0.03 µg/g	0.05 µg/g	N/A
CHLORFENAPYR		ND	0.03 µg/g	0.05 µg/g	N/A	PENTACHLORONI- TROBENZENE		ND	0.03 µg/g	0.05 µg/g	N/A

BCL-05: RESIDUAL PESTICIDE ANALYSIS BY LC-MS/MS ESI  
OCT 05, 2019

ANALYTE	ACTION LIMIT	DETECTED	LOD	LOQ	PASS/FAIL	ANALYTE	ACTION LIMIT	DETECTED	LOD	LOQ	PASS/FAIL
NALED		ND	0.03 µg/g	0.05 µg/g	N/A	METHIOCARB		ND	0.03 µg/g	0.05 µg/g	N/A
OXAMYL		ND	0.03 µg/g	0.05 µg/g	N/A	SPINETORAM	3 µg/g	ND	0.03 µg/g	0.05 µg/g	N/A
PHOSMET		ND	0.03 µg/g	0.05 µg/g	N/A	ACEQUINOCYL		ND	0.03 µg/g	0.05 µg/g	N/A
ACEPHATE		ND	0.03 µg/g	0.05 µg/g	N/A	ACETAMIPRID		ND	0.03 µg/g	0.05 µg/g	N/A
ALDICARB		ND	0.03 µg/g	0.05 µg/g	N/A	ETHOPROPHOS		ND	0.03 µg/g	0.05 µg/g	N/A
BOSCALID		ND	0.03 µg/g	0.05 µg/g	N/A	FLUDIOXONIL		ND	0.03 µg/g	0.05 µg/g	N/A
CARBARYL		ND	0.03 µg/g	0.05 µg/g	N/A	HEXYTHIAZOX		ND	0.03 µg/g	0.05 µg/g	N/A
DIAZINON		ND	0.03 µg/g	0.05 µg/g	N/A	PRALLETHRIN		ND	0.03 µg/g	0.05 µg/g	N/A
FIPRONIL		ND	0.03 µg/g	0.05 µg/g	N/A	SPIROXAMINE		ND	0.03 µg/g	0.05 µg/g	N/A
IMAZALIL		ND	0.03 µg/g	0.05 µg/g	N/A	THIACLOPRID		ND	0.03 µg/g	0.05 µg/g	N/A



METHOMYL	ND	0.03 µg/g	0.05 µg/g	N/A	AZOXYSTROBIN	ND	0.03 µg/g	0.05 µg/g	N/A
PROPOXUR	ND	0.03 µg/g	0.05 µg/g	N/A	CLOFENTEZINE	ND	0.03 µg/g	0.05 µg/g	N/A
COUMAPHOS	ND	0.03 µg/g	0.05 µg/g	N/A	IMIDACLOPRID	0.0214 µg/g	0.03 µg/g	0.05 µg/g	N/A
ETOXAZOLE	ND	0.03 µg/g	0.05 µg/g	N/A	MYCLOBUTANIL	ND	0.03 µg/g	0.05 µg/g	N/A
METALAXYL	ND	0.03 µg/g	0.05 µg/g	N/A	SPIROMESIFEN	ND	0.03 µg/g	0.05 µg/g	N/A
PYRIDABEN	ND	0.03 µg/g	0.05 µg/g	N/A	TEBUCONAZOLE	ND	0.03 µg/g	0.05 µg/g	N/A
BIFENAZATE	ND	0.03 µg/g	0.05 µg/g	N/A	THIAMETHOXAM	ND	0.03 µg/g	0.05 µg/g	N/A
BIFENTHRIN	ND	0.03 µg/g	0.05 µg/g	N/A	FENPYROXIMATE	ND	0.03 µg/g	0.05 µg/g	N/A
CARBOFURAN	ND	0.03 µg/g	0.05 µg/g	N/A	PACLOBUTRAZOL	ND	0.03 µg/g	0.05 µg/g	N/A
DAMINOZIDE	ND	0.03 µg/g	0.05 µg/g	N/A	PROPICONAZOLE	ND	0.03 µg/g	0.05 µg/g	N/A
DIMETHOATE	ND	0.03 µg/g	0.05 µg/g	N/A	SPIROTETRAMAT	ND	0.03 µg/g	0.05 µg/g	N/A
ETOXENPROX	ND	0.03 µg/g	0.05 µg/g	N/A	KRESOXIM- METHYL	ND	0.03 µg/g	0.05 µg/g	N/A
FENHEXAMID	ND	0.03 µg/g	0.05 µg/g	N/A	TRIFLOXYSTROB- IN	ND	0.03 µg/g	0.05 µg/g	N/A
FENOXYCARB	ND	0.03 µg/g	0.05 µg/g	N/A	PIPERONYLBUTO- XIDE	ND	0.03 µg/g	0.05 µg/g	N/A
FLONICAMID	ND	0.03 µg/g	0.05 µg/g	N/A	CHLORANTRANIL- IPROLE	ND	0.03 µg/g	0.05 µg/g	N/A

\* FOR QUALITY ASSURANCE PURPOSES. NOT A CALIFORNIA COMPLIANCE CERTIFICATE.



# CERTIFICATE OF ANALYSIS

\* FOR QUALITY ASSURANCE PURPOSES. NOT A CALIFORNIA COMPLIANCE CERTIFICATE.

PRODUCED: OCT 05, 2019

1.2G NA-OG BAKERSFIELD (INDUSTRIAL HEMP) // CLIENT: APOTHIO

BATCH RESULT: PASSED AS CALIFORNIA INDUSTRIAL HEMP



MATRIX: INDUSTRIAL HEMP  
SAMPLE ID: BCL-191002-006  
COLLECTED ON: OCT 02, 2019  
RECEIVED ON: OCT 02, 2019  
SAMPLE SIZE: 2 GRAMS







BELCOSTA LABS // 1131 E. SOUTH STREET LONG BEACH CA 90805 // PH: (562) 676-4206

CA LICENSE #: C8-0000008-LIC

# CERTIFICATE OF ANALYSIS

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PRODUCED: OCT 05, 2019

1.2G NA-OG BAKERSFIELD (INDUSTRIAL HEMP) // CLIENT: APOTHIO

BATCH RESULT: **PASSED AS CALIFORNIA INDUSTRIAL HEMP**



MATRIX: INDUSTRIAL HEMP  
SAMPLE ID: BCL-191002-006  
COLLECTED ON: OCT 02, 2019  
RECEIVED ON: OCT 02, 2019  
SAMPLE SIZE: 2 GRAMS



HEAVY METALS



RESULTS CERTIFIED BY: RON BROOKS, M.S.

SCIENTIFIC DIRECTOR, BELCOSTA LABS

OCT 05, 2019

[https://lims.tagleaf.com/coa/\\_9vkaenHenr](https://lims.tagleaf.com/coa/_9vkaenHenr)

APOTHIO HEMP  
- HEAVY METALS : PASSED

BCL-10: HEAVY METAL TESTING BY ICP-MS  
OCT 05, 2019

ANALYTE	ACTION LIMIT	DETECTED	LOD	LOQ	PASS/FAIL
LEAD	0.5 µg/g	0.277 µg/g	0.006 µg/g	0.019 µg/g	N/A
ARSENIC	1.5 µg/g	0.151 µg/g	0.004 µg/g	0.011 µg/g	N/A
CADMIUM	0.5 µg/g	0.07 µg/g	0.004 µg/g	0.011 µg/g	N/A
MERCURY	3 µg/g	0.023 µg/g	0.004 µg/g	0.013 µg/g	N/A

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