GREENHOUSE GROW WITH BRe³ WAND

STANDARD OPERATING PROCEDURE

Sterling Pacific
Cannabis Quality/Yield Test
Vegetative Growth to Harvest Cycles
ID# SP-10042

Prepared for:

BioRadiance Grow Science

June 18, 2018

Revision Change Record			
Revision	Date	Responsible Person	Revision Notes
1.0	6/12/18	Christian David	Initial
2.0	6/26/18	Christian David	Additions/Revisions to Contents & Sections 1.2, 1.3, 10.0, 12.0, 13.0, 13.1
3.0	7/3/18	Christian David	Revisions in Section 10 & Section 12.1.1
4.0	11/15/18	Christian David	Logo change PDW→BRG and Wand name change PDe → BRe
5.0	11/22/18	Christian David	Amended Section 12 data point reporting
6.0	11/26/18	Christian David	Final Test Results Summary

Approvals

Trey Maxwell Product Development Sterling-Pacific	Christian David Sales & Marketing Sterling-Pacific	Steven Cady COO Pathogen Death Wand	James Millichap-Merrick President Vitabeam

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1.0 SCOPE AND APPLICABILITY

Cannabis flowers are the main source of Δ-9-tetrahydrocannabinol (THC) used as both a medicinal and recreational drug. To produce standardized product, especially with regards to the medicinal platform, it is necessary to control proper environmental factors to inhibit disease pressure as well as produce the most efficacious and bountiful product to maximize quality and yield. For these reasons indoor cultivation or greenhouse operations of cannabis plants are rapidly increasing as more and more states legalize the plant so perfecting the process has become the *Holy Grail*. One of the most important growing factors of cannabis is light and its spectrum which has to be optimized to affect the growth, health and cannabinoid concentration. Replication of the sun is the ultimate goal and the wavelength irradiation that the BRe³ Wand projects is the object of the study that shall be executed in a Greenhouse environment. This test trial using the BRe³ Wand vs control shall validate that using the BRe³ Wand not only increases the growth and yield, but acts as a biopest deterrent while systemically mechanically strengthening the plant's health and vitality. The cannabinoid concentration shall be validated by a 3rd party Cannabis Test Lab that specializes in this specific measurement.

1.1 SUMMARY OF METHOD

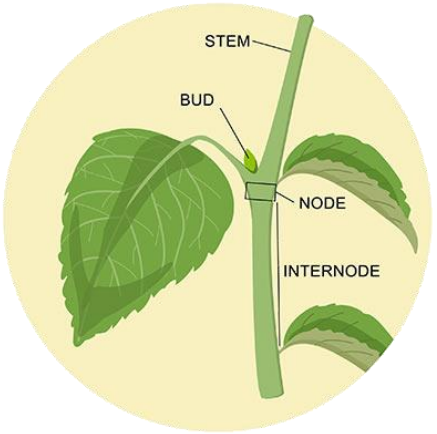
- Cloned plants of a THC strain named Crème Brûlée. Crème Brûlée is an Indica dominant hybrid of platinum OG Kush and Girl Scout Cookie.
- The cuttings are transplanted into 4in x 4in square pots
- The cloned plants will grow inside a clone tray/dome kit that is 22in x 11in x 8in. The clone propagation kit was equipped with a T5 light.
- When clones are rooted and ready (2-3 weeks), 6 clones will be selected visually for uniformity, root quantity and overall health
- The selected clones will then be transplanted into the soil and grown in Greenhouse temperature range of 65 to 85 degrees Fahrenheit and a humidity of 75%-45%
- A T5 High Output Fluorescent Light will be used as a supplemental grow lighting during the vegetative stage
- The BRe³ Wand will be used in accordance with the time periods set by the protocol for each plants growth stage as outlined in the *Procedure Implementation*
- Vascular Definition, Internodal Spacing, Canopy Density, Stalk Circumference, # of Flowering Heads, Overall Flower Yield and Cannabinoid Concentration % levels are the principal parameters tested.

1.2 DEFINITIONS

The following definitions apply to this SOP with direct correlation to the test parameters:

- pH Range = the allowable range for soil is 6.4 to 6.8. The allowable range for hydroponics is 5.8 to 6.1.
- Biowater = dechlorinated water mixed with Sterling Pacific biologicals/inoculants only
- Feed= the dechlorinated water mixed with the NPK (Mr. B's Nutrients)
- Vascular Stem = the main structure of the plant by which it provides support to leaves/flower and also acts as the main transportation system for all fluids (nutrients/water/sugars) from the roots to the leaves. The larger & more stout the vascular system of the stem in turn enables the plant to grow larger as well as support larger more robust buds.
- Canopy = the canopy is defined as the area and depth that a plant's leaves take up.. The larger the canopy the more bud development, also looking for uniformity in canopy size which shows strong health.

- Nodes = The stem of a plant is made up of nodes. The nodes connect the leaves of the plant to the stems. Nodes are the joints that connect new stem offshoots. They branch off from the main stalk and eventually create small branches and new budding sites.
- Internodes= The spaces between the plant's nodes. Too much distance between Internodes is not a good thing and may point to a weaker plant. If the internodal distance is too long, branches and stems become weaker meaning that buds will not be properly supported during flowering, with the risk that the branches will snap.
- Stacking = As the plants prepare to flower, leaf production slows and internode distance shortens, so the nodes where flowers emerge from are said to "stack up", ultimately becoming the dense masses known as colas.
- Yield = the quantity of bud that is actually produced after the harvest of specified batch lot of each particular strain.



1.3 TEST PROTOCOL

- The T5 fluorescent grow light will only be used during vegetative state and for a set period of time (6 hours)
  - When using clones in a greenhouse environment you still have to use some supplemental light during vegetative cycle
- Test Trial will consist of six (6) plants total: Four (4) plants under a BRe³ Wand and two (2) plants as control
- BRe³ Wand during Vegetative cycle follows an 18 hours on, 6 hours off protocol
- Flowering will be induced by the natural sun to 12/12 hours (light/dark). During this phase the BRe³ Wand will follow same protocol.
- Harvest will commence after approximately18-20 weeks of both Veg and Bloom cycles
- Test Results of BRe³ Wand vs. Control will be determined by a comparison of the following parameters:
  - Canopy Density
  - Color
  - Internodal Distance
  - Vascular Definition- both main stalk & 8 inches up the main stalk
  - Flower Yield by weight using a calibrated Brecknell Precision Lab Scale
  - Cannabinoid Concentrations - CBD & THC Potency
- Only the Cannabinoid Concentrations will require 3rd party validation from a reputable High Performance Liquid Chromatography (HPLC) test laboratory.

2.0 CHECKLISTS

The daily operational procedures for ensuring a successful test trial validation study in a Greenhouse environment is as follows:

- ☑ 8am- Check Greenhouse temperature and humidity and open side flaps to allow proper air flow.
- ☑ Check overall look of the Greenhouse, check plants for any pests, disease pressure, broken branches or anything that looks or smells awry.
- ☑ Check soil hydration with hydrometer.
- ☑ During Veg stage (only) check T5 light and power supply- grow light will run as a supplemental till 11am each morning up until flower cycle begins.
- ☑ Check BRe³ Wand and power supply- ensure green LED on BRe³ Wand is lit.
- ☑ 5pm- Check Greenhouse and plants again for issues, corrective action or suspicious charateristics
- ☑ Water plants if needed per application requirements, such as feed / biowater / water
- ☑ 5-7pm- Close flaps on Greenhouse
- ☑ Repeat steps again following morning

3.0 SAFETY & SECURITY

The Greenhouse will be surrounded on all 4 sides with a 5 foot high fence with a locking gate to prevent any potential unforeseen tampering or disruption of the product during the validation test trial. The fence shall also act as a deterrent to unwelcome animals both domesticated and wild. All individuals handling/feeding the plants shall wear nitrile gloves and eye protection at all times.

4.0 INTERFERENCES (Greenhouse Operation)

1. Greenhouse Temperature- Without good ventilation, any greenhouse can become too warm, even in relatively cool weather. More plants die from excess heat within a greenhouse rather than from the cold.

2. Proper Ventilation- Without proper ventilation, greenhouses and their plants become prone to a myriad of problems. The heat and humidity from poor ventilation will cause plants to become sick and fall victim to opportunistic bugs, fungus and molds. Correct ventilation serves 3 major purposes:

- Helps to regulate temperature
- Helps ensure plants get plenty of fresh air that they can use to photosynthesize
- Helps prevent pest infestation

5.0 PEST, MOLD & DISEASE PRESSURE

6.0 APPARATUS AND MATERIALS

6.1.1 Equipment:

- (1) ShelterLogic GrowIT Greenhouse-in-a-Box with Easy-Flow roll-up side vents = 10 x 20 x 8 FT.
- (1) Water Permeable Weed Cloth = 4 rolls of 20 FT.
- (3) GeoPot Geoplanter Raised Fabric Gardening Beds = 4 x 8 x 12 FT- 240 gallons
- (3) 24inch Hurricane Box Fans
- (1) 14inch Vortex Inline Fan
- (1) 50 FT Garden Hose
- (1) In-line hose carbon filter
- (1) Soil Hydrometer
- (1) Digital Thermometer
- (1) Portable pH Meter
- Trellis Net
- 3/4inch gravel (1inch bottom layer)
- Power supply = 30 amp 110v extension cord
- (1) T5 High Output Fluorescent Light Fixture- 120 watt
- (4) BRe³ Wand
- (1) 20 amp Outdoor Water Resistant light timer- 24 hour cycle
- Digital Caliper
- (2) 4ft Yardsticks
- Salter Brecknell Precision Lab Balance Scale- Model # MBS-6000




6.1.2 RAW MATERIALS:

- Soil- Heritage Organics Perfect Potting Soil with Perlite added = 2.5 yards
- Sterling-Pacific Enrich Bio Grow-Bags- individual 4gram bags of humic acid and mycorrhizal fungi
- Mr. B's Green Trees Natural Based Line Growth 7-4-4
- Mr. B's Green Trees Natural Based Line Bloom 2-8-6
- Sterling-Pacific Liquid Biostimulants- YieldMaker (inoculants), BioExtract (worm casting tea), BioActivator (biostimulant), Northern Icelandic Sea Kelp (micro/macro nutrient)
- Dechlorinated Water
- Neem Oil- foliar spray for pest control
- Silica- foliar spray for pest control

7.0 PROCEDURE IMPLEMENTATION

- Organic soil medium with two plants per bed- total 6 plants and 3 soil beds
- Clones planted in beds when they are rooted and approx. 10"tall
- Each Clone gets planted with Sterling Pacific Enrich Bio Grow-bags = 5 bags per plant
- Each plant gets tagged with a # to delineate it for testing purposes
- All water used is dechlorinated through in-line hose carbon filter
- Sterling Pacific Yield Maker and BioActivator liquids mixed together and applied to the plants:
    - 16oz of YieldMaker + 16oz of BioActivator mixed into 30 gallons of water
    - Apply 3 times per week- 5 gallons of water per plant
    - Apply for total of 4 weeks
- Sterling Pacific BioExtract + Icelandic Sea Kelp liquids + Molasses mixed together and applied to the plants:
    - 60 oz. of BioExtact + 30 oz. of Sea Kelp + 20 oz. of Molasses mixed into 30 gallons of water
    - Apply 2 to 3 times per week- 5 gallons per plant
    - Apply for total of 6 weeks
- Top dressed every three to four days with Mr B's organic nutrients-
    - Mr B's 7-4-4 nutrient = Four applications of veg once a week (4 weeks): nutrient feed/biowater/biowater/water
    - One more week of plain water
    - Then switch to Mr. B's 2-8-6 Bloom nutrient- feed biowater, feed biowater, water for seven weeks
    - Then water and molasses until they are done = 9-10 weeks in flower
- T5 HO Fluorescent Light Fixture hung in middle of Greenhouse fastened with ratchet hangars at 4 feet above plants/plant beds
- T5 light is only run during vegetative cycle for 6 hours from 5:00am to 11:00am for 8 weeks
- BRe³ wand set at 18" over four plants each covering a max at full growth of 16 square feet of canopy
- The wands are fastened using plastic housing aluminum clip ratchet hangers and nylon rope provided by manufacturer
- All lighting is plugged into a 6-plug extension cord
- During the Vegetative Cycle the wands are run for 18hrs on / 6hrs off
- Veg Cycle = 8 weeks
- Spray Neem Oil twice during Veg stage- at week 3 and at week 5 (2.0 oz per gallon- 1 gallon applied over 2 days)
- During the Flowering Cycle the wands are run at 12 hours on and 12 off
- Flowering Cycle could 8-9 weeks or 9-10 weeks as it varies.
- The BRe³ Wand and the T5 Light are controlled by a 24hour timer
- Transition into flower should be held off with the coverage of the PDe3 lights at that hour duration
- BRe³ wands will continue through transition into flower and throughout the rest of the maturation of the plants

7.1 PREPARATION OF MEDIUM

- Weed cloth allows for proper drainage so there is no standing water or weeds sprouting up/getting in the way
- Gravel layered 1inch on bottom
- 6 wheelbarrows of soil dumped into each bed
- Soaked with dechlorinated water

7.2 METHOD CALIBRATION FOR EQUIPMENT

BRe3 Wand Set-up and Continued Application

- Using a tape measure, each BRe³ Wand is set at 18 inches above each plant.
- Using a bubble level each BRe³ wand is checked to ensure each light is hanging perfectly level horizontally so the spectrum coverage is uniformed and accurate
- Power Supply is routinely checked to ensure zero failure
- A 24 hour timer is used to set the exact times the BRe³ Wand and T5 Grow Light (when applicable) is on or off depending on the grow cycle protocol

8.0 DATA ACQUISITION

Reports done in MS Excel Spreadsheet detailing the growth or yield characteristics that are executed BI-WEEKLY throughout the trial. Each data set must be dated and recorded in appropriate level of measurement for each test category.

9.0 RECORDS MANAGEMENT

Good Manufacturing Practice and Requirement of premises, plant and equipment for cannabis growth, quality and yield test for using BRe³ Wand vs Control in both indoor and Greenhouse Environment. To achieve the objectives for the test process and appropriate methodology, systems and procedures shall be documented and maintained for inspection and reference; and the manufacturing premises shall be used exclusively for production of cannabis and no other manufacturing activity shall be undertaken therein.

10.0 RESULTS PREP AND PROCEDURE

During course of grow cycle, key characteristics you should expect are that plants should look strong, heathly, vibrant and uniformed in height. The canopy should be dense and stacked. The stalks should be robust and the vascular system shall show no signs of stress. Distance between internodes is also indicative of the health of plant. Growth should be vigorous and green is consistent throughout the plant. Test perimeters for each quantitative property used to compare BRe³ vs Control shall be checked and recorded using different measuring instruments or simply by visual image.

- Canopy = The density of the canopy and how the plant is stacking shall be visually recorded through the Veg Cycle
- Internodal Distance = Measure Internodal Distance (lower average internodal spacing is desirable)
- Stem Circumference (Part 1)= Beginning in Week 4, check main stalk diameter with digital slide caliper- record measurement using outside caliper in inches
- Stem Circumference (Part 2)= Beginning in Week 4through Week 8 of Veg check diameter 8 inches above main stalk to determine if the thickness of the base is consistent up the plant, using digital caliper in inches
- Bud Weight = Biomass dry weight of the total # of buds that have flowered, harvested and dried/cured (7-10 days) *Bud weight will be measured in grams but will not be done weekly, only once after harvest/cure/drying process.

10.1 RESULT METHODOLOGY

Results of the test regarding plants under the BRe³ Wand could represent an improving, similar and a lower alternative to the control plant. The flower yield obtained will be weighed separately and compared and the production of the highest concentration of cannabinoids shall be determined by independent 3rd party test lab to determine if either has improved, similar or lower than the other.

11.0 TROUBLESHOOTING

- Plants Start drooping right after watering = overwatering or not enough drainage/soil compaction
- Plants stop drooping right after getting water = underwatering, plants need more water.
- The top leaves are "tacoing" or flipping up at the edges = Light and or heat burn. Plants may need more fresh air blowing over top of canopy- open roof vents and doors and turn on box fans.
- During Veg stage or early flowering the lower leaves turn yellow & soft with possible brown splotches then dry out and drop off = plants need higher levels of properly formulated nutrients.
- Leaf tips brown or burnt = nutrient burn, which means your plants are getting too much nutrients in general.
- Leafs are dark green with tips turned sharply down = too much nitrogen, must reduce nitrogen levels.
- High temperature inside greenhouse- open roof vents, roll-up sides and doors on both ends will help to keep the temperature more even and will allow some of this heat to naturally escape.

12.0 REPORTING CHARTS

Bi-weekly to monthly data as well as data at the end of each cycle, vegetative and flower, shall be recorded in the following charts.

12.1.1 STALK DIMENSION DATA DURING VEG CYCLE

Stalk dimension comparison during vegetative cycle from base of stalk to 8 inches up the stalk for both Wand and Control plants using a caliper to include the following information:

- Images of overhead canopy and side image of full plant
- Images of base of stalk and 8inches up the stalk
- Stalk circumference in inches at base and again at 8inches up the stalk for 1A, 2A, 4A, 5B, 6B
- Calculate % growth difference in circumference from base of stalk to 8inches up
- Compare both base and 8inches up vs previous week of same plant

MEASUREMENTS TAKEN (insert date)								% Change vs Previous Week	
GROUP #	WAND OR CONTROL PLANT	SIDE ANGLE IMAGE	CANOPY IMAGE	STALK IMAGE (BASE)	STALK BASE CIRCUMFERENCE (inches)	8-INCHES UP THE STALK (inches)	% Growth Difference of stalk from base to 8in up	% Increase Base	% Increase 8-inches Up

12.1.2 FINAL STALK DIMENSION SUMMARY: VEG CYCLE

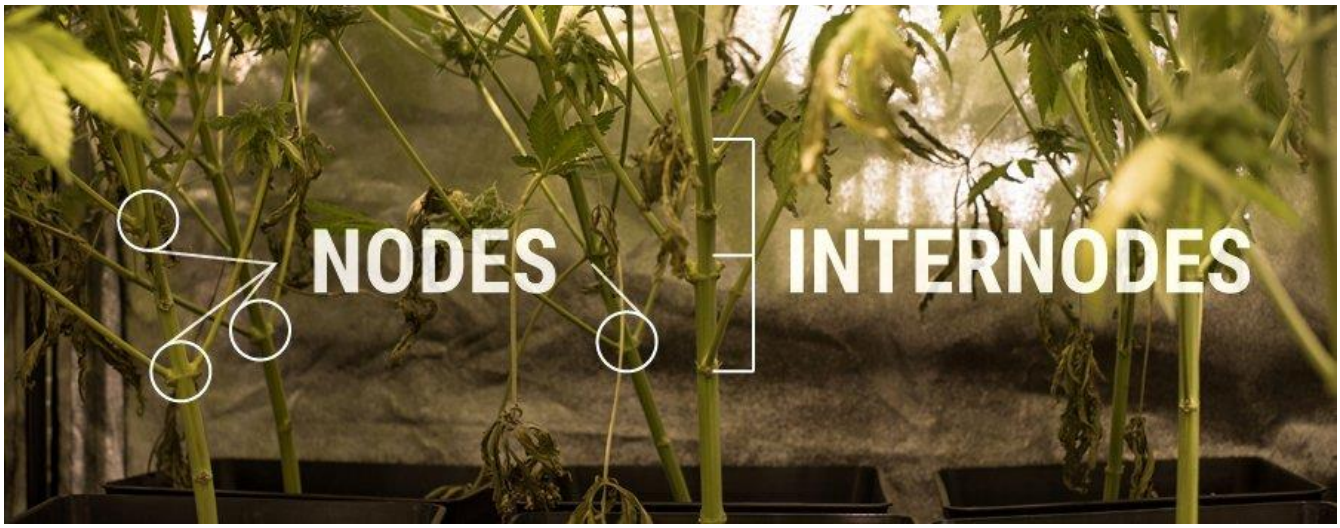
Compilation of stalk circumference data from Week 4 (when 1st measurement taken) to Week 11 (before harvest)
Data to include the following:

- All Wand plants stalk base circumference from Week 4 to Week 11
- All Control Plants stalk base circumference from Week 4 to Week 11
- % Growth week over week for stalk base circumference
- All Wand plants stalk circumference 8inches up the stalk from the base from Week 4 to Week 11
- All Control plants stalk circumference 8inches up the stalk from the base from Week 4 to Week 11
- % Growth week over week for 8inches up the base circumference

12.1.3 INTERNODAL LATERAL DISTANCE & BRANCH UNIFORMITY REPORT

Internodal spacing distance will be checked and data inputted in WEEK 7 for total number of branches that have developed at 12 inches up the stalk as well as internodal distance in inches for both Wand and Control plants: Usually, after week 6 of vegetative growth, cannabis plants will begin to display pre-flowers. So Week 7 is chosen since by that time the plant has established its branch system and secondary shoots as it prepares for the Flower Cycle.

- The number of branches at 12 inches up from the base of the stalk for both Wand & Control
- Distance of the internodes in inches for Wand and Control



*Nodes are the intersection or joint between branches and the main stem or between a branch and new secondary shoots. While an internode is simply the gap between nodes.

12.1.4 POST HARVEST CENTRAL STALK COMPARISON- CROSS SECTION OF MAIN STEM FROM ROOT BULB

Split 2 stalks in half- one from Wand and one from Control and compare the following data points:

- Thickness of bark
- Dimensions of Vascular bundle
- Grain and fiber uniformity

*Also include the Base of the Stalk measurement comparison and images out of the soil using a caliper in inches

12.1.5 POST-HARVEST YIELD COMPARISON

Compare buds taken from Wand plant and Control plant and measure the following data points:

- Bud density between Wand and Control
- Total yield weight between Wand and Control

12.1.6 POTENCY, FOREIGN MATERIALS & MICROBIAL 3RD PARTY TEST RESULTS

SC Labs test results will report the following test results:

- Potency- THC and Cannabinoid levels
- Foreign Materials- Powdery Mildew
- Microbial- identify and detect Yeast & Molds, E.coli, Coliforms and Enterobacteriaceae such as Salmonella and Shigella which have all been shown to be potential contaminants of cannabis

13.0 TEST STUDY SUMMARY OF GOALS

The purpose of this study was to demonstrate that when nutrient, energy, and environmental inputs are controlled ,the BRe³ LED light will produce healthier, more robust plants than with plants without the proprietary LED wavelengths. The Wand has three unique benefits; Stimulating Photosynthesis balanced with Cellular Respiration, Cell Repair and Pathogen Destruction. The Wand delivers positive BRe³ energy, absorbed by the plants chloroplasts and chlorophyll. This positive BRe³ energy stimulates photosynthesis, cellular respiration and the production of Adenosine Triphosphate (ATP). ATP is vital for plants to assimilate CO_2 and water to make Glucose and Oxygen. Stimulating these essential plant processes means better growth, and a visibly healthier plant.

The **4 Main Goals** of this experiment will be based on the following factors:

1. ROBUST, HEALTHIER & STRONGER PLANTS- We expect the Wand plants to have more vitality with bigger and stronger root systems, stalk base and branching.

2. INTERNODAL SPACING- Another main factor that is used as indicators of plant health and quality in this experiment will be internodal distance. The Wands should produce plants with a lower internodal distance versus the Control plants. Closer internode distance or spacing is a sign that a plant is not wasting large amounts of energy on vertical growth alone. In fruiting plants, more vertical growth is far from ideal and is often referred to in the pejorative sense as "stretching". Stretching occurs when a plant is not receiving the complete spectrum required for photosynthesis (specifically, there is not an adequate ratio of red to far-red light, nor is there an adequate amount of blue light) or when the ambient temperature is too high and is undesirable for a number of reasons (Rajapakse & Kelly, 1992; Appelgren, 1991; Frimanslund & Grimstad, 1993). Stretching generally predicates a reduced fruit yield, results in weak stems that need to be supported, and greatly reduces light penetration to the lower portion of the plant.

3. ZERO PATHOGEN OR DISEASE PRESSURE - The BRe3 Wand creates a healthier plant which strengthens its natural defense system against infestations and the BRe³ energy is toxic to pathogens, blocking their important life processes, so they cannot grow or live. This should enable the Wand plants to be disease free throughout the grow cycles.

4. LARGER YIELD- The BRe3 Wand stimulates photosynthesis, cellular respiration and the production of Adenosine Triphosphate (ATP)- so the Wand plants should be more robust and healthier which should produce denser buds and a larger overall yield versus Control. As well we will test to see if there is an increase in THC and Cannabinoid levels via 3rd party validation testing.

13.1 TEST STUDY FINAL CONCLUSION

The results of this study have proven based on the data charted, measured and visually represented the following key conclusions on the effectiveness of the Bre3 Wand (Experiment) versus Control in the following areas:

HEALTHIER, MORE ROBUST PLANTS: An early data set we discovered was the stalk circumference at the base of the plant was notably uniformed and more consistent in diameter from base to 8inches up the stalk on the Wands, whereby the Control plants from base to 8inches up where notably skinnier and less uniformed. On average base to 8inches up on the Wand plants only changed about 30% in diameter while the control plants at times exceeeded 50% in diameter difference from base to 8inches up. The conclusion here is that the Wands provided more nutrient uptake- the nutrient highway was much bigger allowing for the stalk to grow stronger and more robust from base upwards while the Control plants became more narrow and restricted the flow of water and nutrients creating a weaker stalk from base upwards. The Wands had a much easier path of nutrient flow because they were stronger and healthier due to the BRe3 energy. These findings were validated once we split open the stalks which revealed that the vascular bundles which are the main transport system in vascular plants. The Wand plant had a significantly larger diameter of vascular bundles (almost 60% larger) and 50% thicker bark which shows improved plant growth; faster production of new tissue and more area devoted to active nutrient uptake. Please note that without a true reliable microscopic measurement of the vascular bundles we are only reporting these results based on initial representation using a 100mm macro lens on a high resolution professional camera.

INTERNODAL SPACING- When compared to the Control the Wands had more uniform internodal spacing which indicates a more potent and reliable light source. Also the Wands had more consistent and increased branching.

YIELD- BRe3 Wand plants produced larger denser buds and a 23.5% increase in overall flowering.

POTENCY & DISEASE PRESSURE- Awaiting results from SC Labs, but the Control Plants suffered a Powdery Mildew outbreak during the flower cycle which was immediately treated with The Amazing Dr.Zymes Eliminator non-toxic and OMRI listed insecticide and fungicide. The Wand plants remained free of powdery mildew.

FINAL CONCLUSION- Based on the above data it can be reasonable concluded that the BRE3 Wands produce more robust and healthier plants and it can also be concluded that the BRe3 light causes more uniformity in plant growth, increase yield free of disease when compared to plants grown without the supplemental BRe3 light source.

BRe³ Wand
Greenhouse Test Trial: #SP-10042
Newport Beach, CA

VEGETATIVE GROW CYCLE
STALK DIMENSION COMPARISON
WEEK 4 THRU WEEK 11

	WAND- STALK BASE		CONTROL- STALK BASE	
	1A	4A	5B	6B
WEEK 4	0.99	0.96	0.92	1.00
WEEK 5	1.19	1.12	1.01	1.16
WEEK 7	1.28	1.32	1.21	1.36
WEEK 9	1.45	1.53	1.38	1.58
WEEK 11	1.83	1.88	1.54	1.90
WK 4 to Wk 11 Growth	46%	49%	40%	47%

% GROWTH WEEK/WEEK			
1A	4A	5B	6B
20.20%	16.67%	9.78%	16.00%
7.56%	17.86%	19.80%	17.24%
13.28%	15.91%	14.05%	16.18%
26.21%	22.88%	11.59%	20.25%

	WAND- 8 INCHES UP FROM BASE		CONTROL- 8 INCHES UP FROM BASE	
	1A	4A	5B	6B
WEEK 4	0.78	0.63	0.47	0.46
WEEK 5	0.84	0.74	0.58	0.57
WEEK 7	0.86	0.82	0.68	0.67
WEEK 9	0.99	0.92	0.80	0.74
WEEK 11	1.20	1.03	0.89	0.82
WK 4 to Wk 11 Growth	35%	39%	47%	44%

% GROWTH WEEK/WEEK			
1A	4A	5B	6B
7.69%	17.46%	23.40%	23.91%
2.38%	10.81%	17.24%	17.54%
15.12%	12.20%	17.65%	10.45%
21.21%	11.96%	11.25%	10.81%

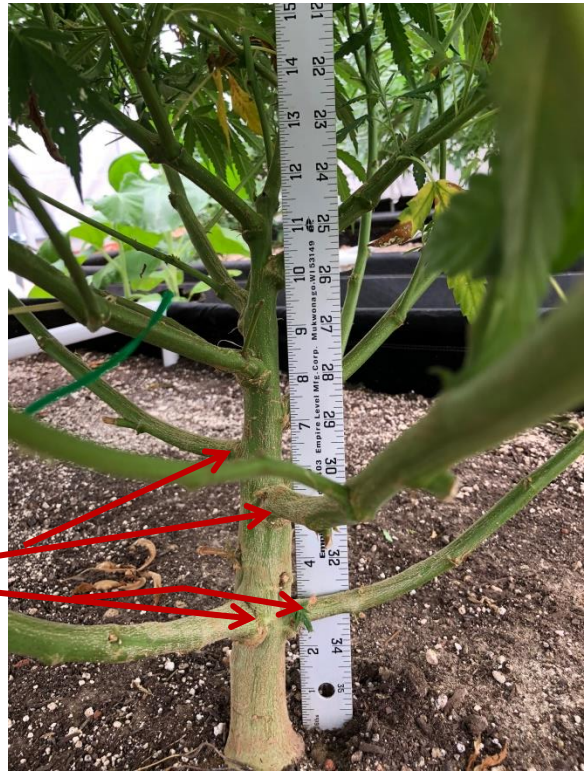
	% DIFFERENCE IN GROWTH FROM BASE TO 8 INCHES UP WEEK TO WEEK			
	1A	4A	5B	6B
WEEK 4	21.21%	34.38%	48.91%	54.00%
WEEK 5	29.41%	33.93%	42.57%	50.86%
WEEK 7	32.81%	37.88%	43.80%	50.74%
WEEK 9	31.72%	39.87%	42.03%	53.16%
WEEK 11	34.43%	45.21%	42.21%	56.84%
Average % Difference	29.92%	38.25%	43.91%	53.12%

WEEK 7 COMPELLING DATA SET COMPARISON: INTERNODAL LATERAL DISTANCE & BRANCH UNIFORMITY

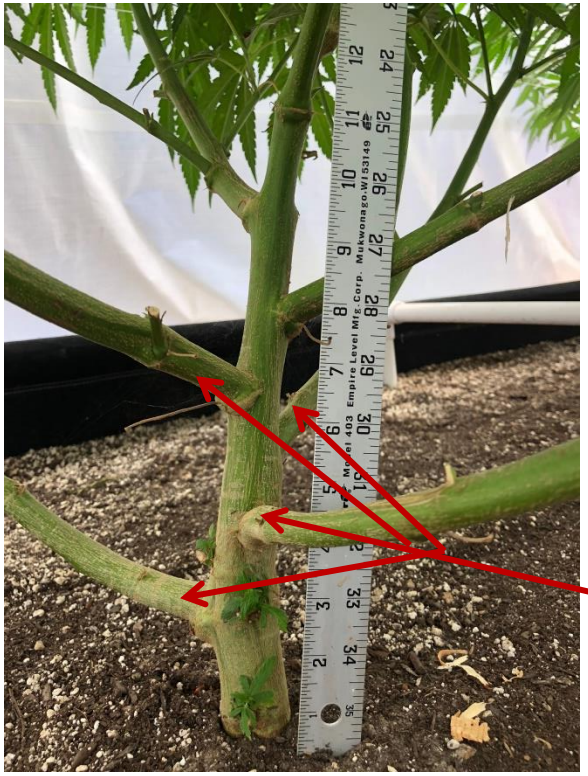
INTERNODES:
The number of Branches at 12 inches up from the base of the stalk is significantly more on the PDe³ Wand Plants than found on the Control Plants. The nodes split almost evenly on Wand vs. Control, which are more spread out and do not branch uniformly. This is why you see more branches (8-10) on the Wand Plants vs Control (7). Plus the lateral distance b/w the nodes on the Wand Plants are very consistent while Control is sporadic and farther apart.
★These findings are consistent with all the Wand Plants (1A, 2A, 4A) and both Control Plants (5B, 6B).

DISTANCE BETWEEN NODES RANGE
2.0 - 2.5 INCHES

NODES SPLIT EVENLY & BRANCH OFF UNIFORMLY = INCREASE BRANCHES TO FLOWER



PLANT 1A- WAND



PLANT 5B- CONTROL

DISTANCE BETWEEN NODES RANGE
1.0 - 3.0 INCHES

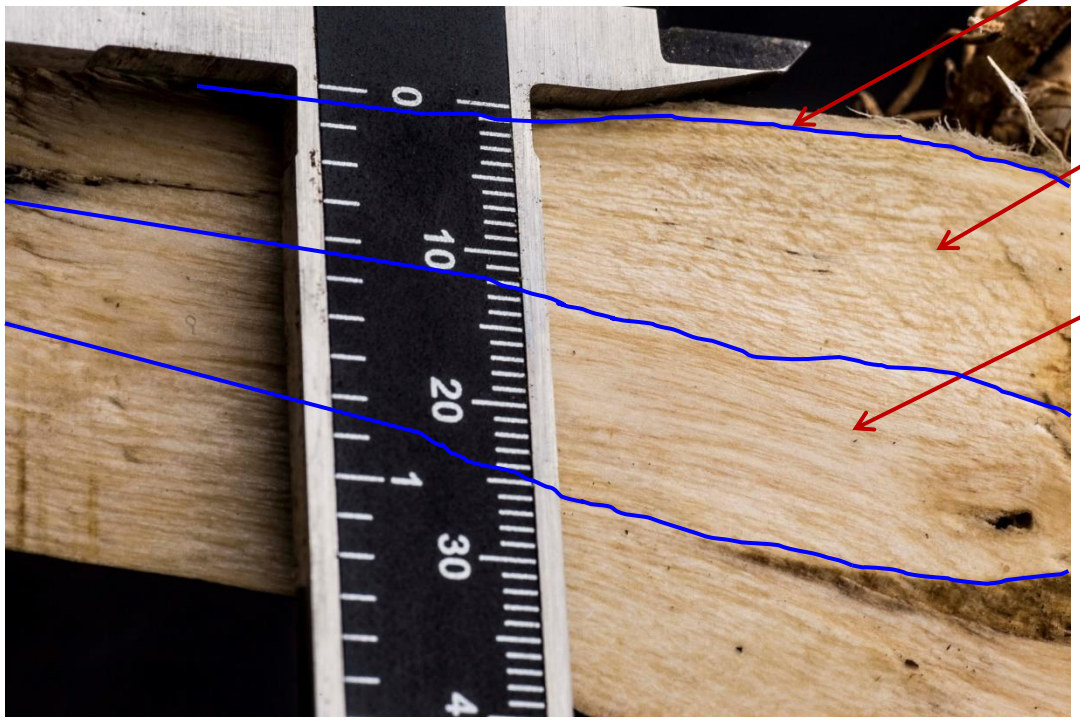
NODES DO NOT SPLIT OFF EVENLY & ARE SPORADIC = FAR LESS BRANCHES TO FLOWER

POST HARVEST CENTRAL STALK COMPARISON- CROSS SECTION OF MAIN STEM FROM ROOT BULB
WAND (4A) V. CONTROL (6B)

*Equipment used: Zeiss Contax 100mm Macro Lens focused at 3inches from each stalk

BRe³ Wand Results:

- Bark = 2mm
- Vascular = 12mm

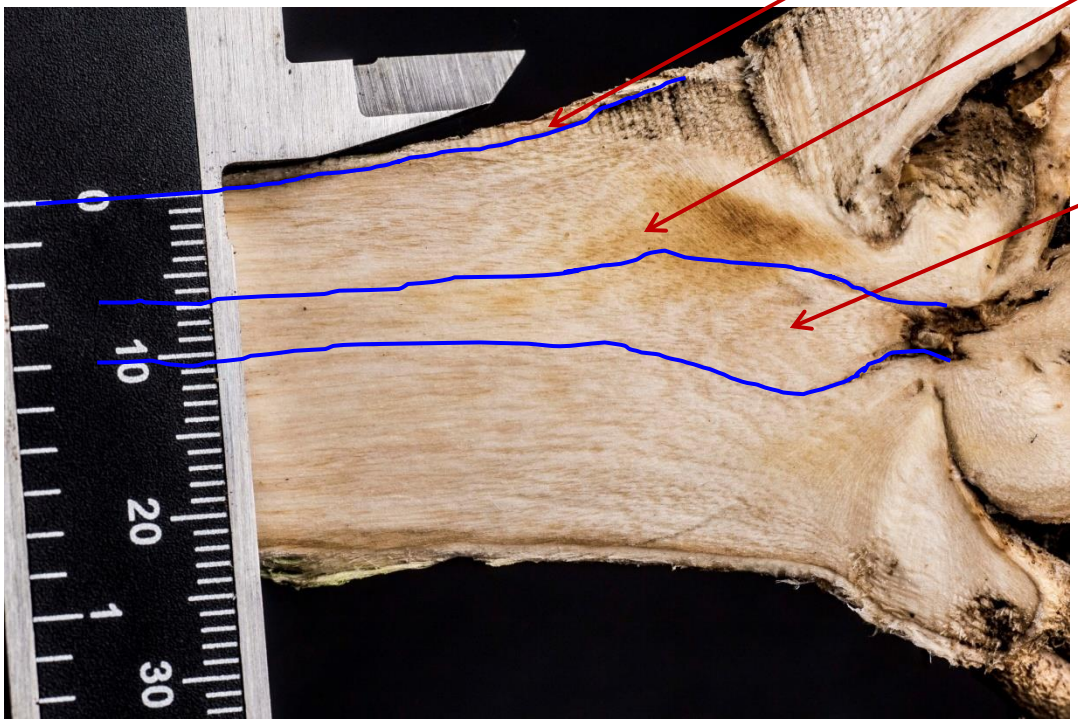


SUMMARY: Significantly larger diameter of vascular bundles and thicker bark shows improved plant growth; faster production of new tissue, more area devoted to active nutrient uptake

POST HARVEST CENTRAL STALK COMPARISON- CROSS SECTION OF MAIN STEM FROM ROOT BULB

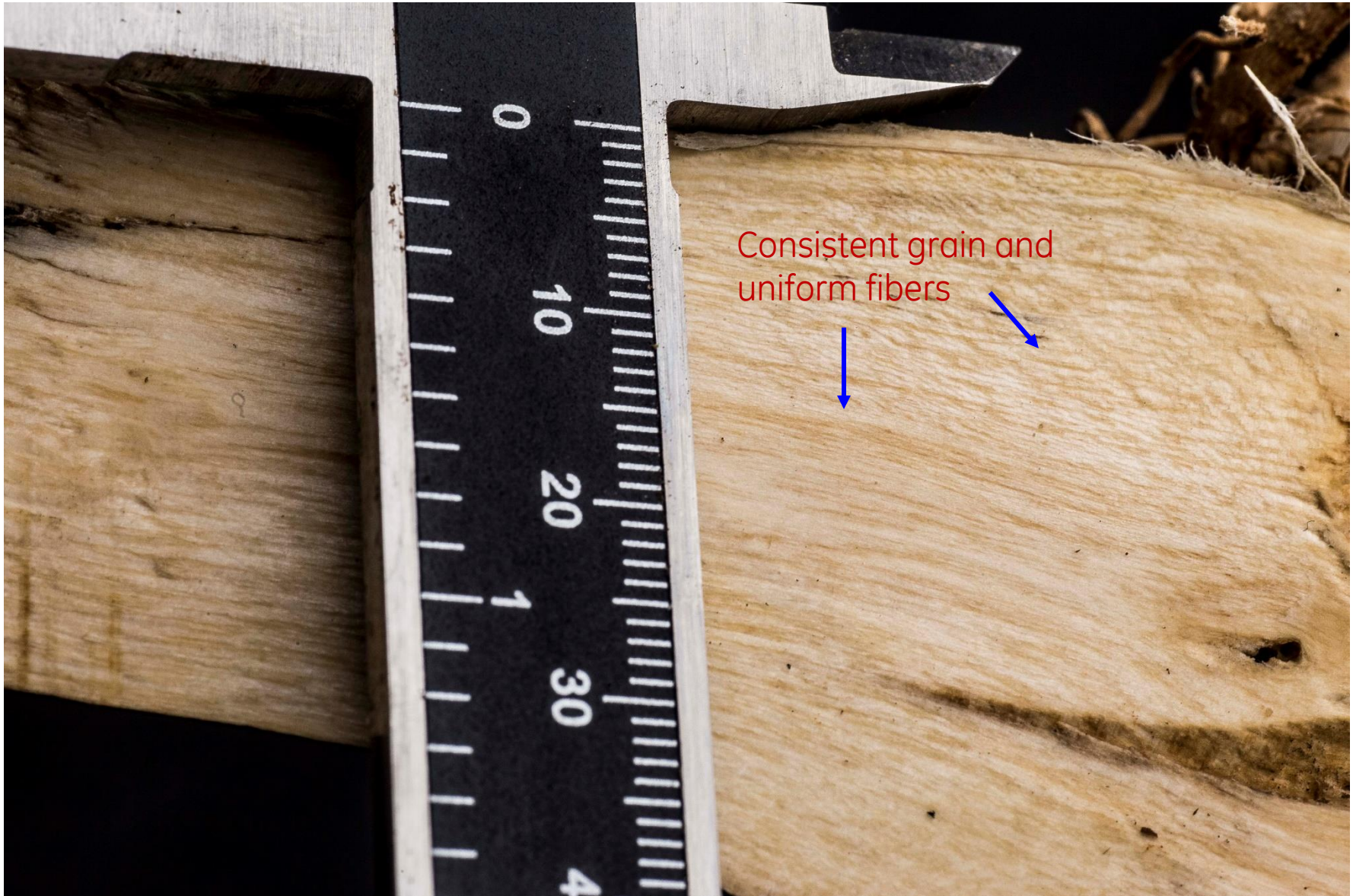
6B Control Results:

- Bark = 1mm
- Vascular System = 5mm



SUMMARY: Significantly smaller diameter of vascular bundles and thinner bark shows reduced plant growth; less area devoted to active nutrient uptake, slower tissue production

WAND



CONTROL

POST HARVEST STALK COMPARISON- WAND (4A) V CONTROL (6B)

Base of the Stalk: gauge Comparison

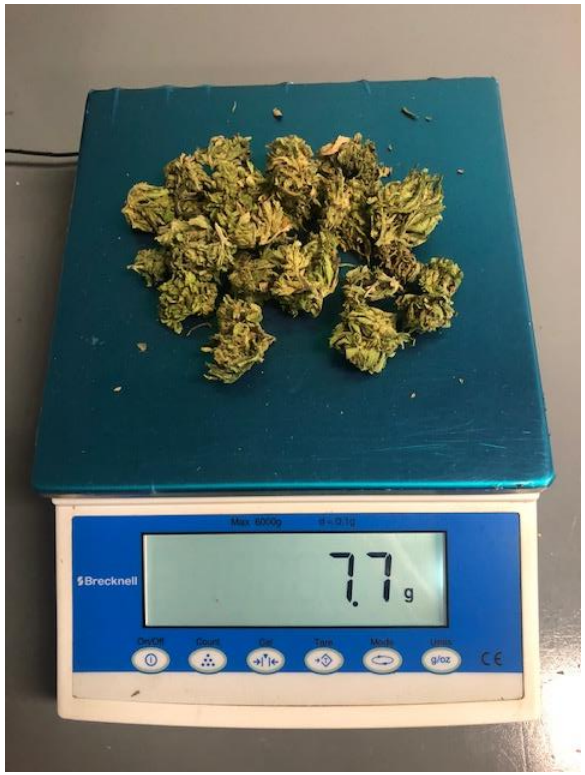
WAND

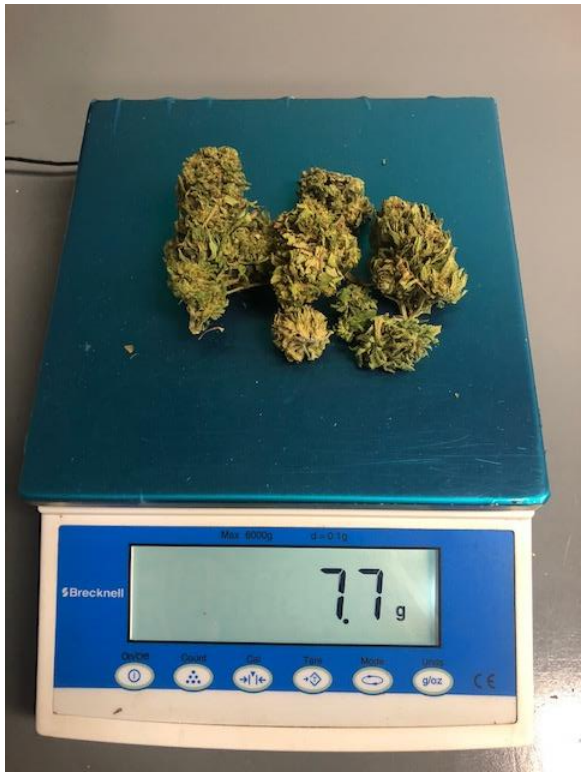
CONTROL

POST HARVEST YIELD COMPARISON: CONTROL (6B) V. WAND (4A)
Summary: Wand's larger denser buds compared to Control

6B Soil Bed
"Control"

4A Soil Bed
"Wand"





POST HARVEST YIELD COMPARISON: CONTROL (6B) V. WAND (4A)
Summary: Wand saw a 23.5% increase in total yield

6B Soil Bed
"Control"

4A Soil Bed
"Wand"