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Full Length Research Paper

Characterizing the Agronomic Traits and Productivity of Watermelon (*Citrullus lanatus* L.) Under Spiritual Blessing (Biofield) Energy Treatment

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Abstract

Background: Modern horticulture increasingly relies on sustainable, non-chemical interventions to boost crop resilience and productivity. Biofield energy treatment (spiritual blessing) represents an emerging physical biostimulation modality whose empirical impact on major economic crops like watermelon (*Citrullus lanatus* L.) remains under-explored. **Objective:** To characterize the agronomic performance, vegetative growth traits, and yield efficiency of *C. lanatus* subjected to Spiritual Blessing (Biofield) Energy Treatment (SBET) compared to a non-treated control group. **Methods:** A field experiment was conducted using a randomized complete block design (RCBD). Watermelon seeds and plots were divided into two groups: control watermelon group (CONWAMG) and blessing/biofield treated watermelon group (BTWAMG) exposed to an SBET (The Trivedi Effect®). Monitored metrics included germination rate, morphological attributes, and yield parameters. **Results:** Morphological attributes such as primary branch count, internode length, stem diameter, leaf count, and female flower counts were significantly increased by 56.27% (p = 0.001), 56.17% ($p \le 0.001$), 31.33% ($p \le 0.001$), 33.11% ($p \le 0.001$), and 35.14% ($p \le 0.001$), respectively, in the BTWAMG compared to the CONWAMG. Yield parameters such as fruit length, fruit diameter, seed count per fruit, seed width, and total fruit yield per hectare were significantly increased by 27.83% (p = 0.005), 29.89% ($p \le 0.001$), 53.05% (p = 0.002), 45.65% ($p \le 0.001$), and 36.87%, respectively, in the BTWAMG compared to the CONWAMG. **Conclusion:** Spiritual Blessing (Biofield) Energy Treatment served as an effective non-invasive physical biostimulant, significantly enhancing vegetative vigor, overall productivity, and key fruit quality attributes of *C. lanatus*.

Keywords: spiritual blessing; *Citrullus lanatus*; biofield energy treatment; agronomic productivity; non-invasive biostimulant; crop yield optimization

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INTRODUCTION

Watermelon (*Citrullus lanatus* L.) is an economically major horticultural crop belonging to the family Cucurbitaceae, widely cultivated in tropical, subtropical, and temperate regions globally due to its economic value, high moisture content, and rich nutritional profile containing lycopene, citrulline, and essential antioxidants [1]. The optimization of growth metrics, fruit set, biometric features, and total yield potential in *Citrullus lanatus* represents a primary goal for agricultural scientists seeking to satisfy increasing consumer demand and commercial market standards [2]. To overcome conventional yield barriers, standard cultivation systems often rely heavily on chemical fertilizers and synthetic growth regulators; however, non-chemical and biostimulatory interventions had increasingly explored to improve nutrient uptake, root architecture, and photosynthetic activity in *Citrullus lanatus* [3].

Among unconventional and non-invasive agricultural technologies, biofield energy treatment (spiritual blessing energy/The Trivedi Effect®) has emerged as a promising approach for modulating seed germination speed, stress tolerance, and crop productivity without chemical residues [4, 5]. Despite emerging evidence on energy treatments altering plant metabolism, systematic empirical studies regarding the application of spiritual blessing energy on the agronomic performance, biomass distribution, and harvest yield parameters of *Citrullus lanatus* remain unexplored within mainstream horticultural research [6]. Evaluating post-harvest quality attributes, vine growth kinetics, and yield efficiency was critical for establishing whether subtle energy interventions can produce significant physiological and economic benefits in *Citrullus lanatus* production [7]. Therefore, the objective of the present study was to rigorously characterize the agronomic traits, morphological responses, and overall productivity of watermelon (*Citrullus lanatus* L.) subjected to spiritual blessing (biofield) energy treatment under controlled experimental conditions.

MATERIALS AND METHODS

Study site

Field research was undertaken in Bhandarwadi, located in Sindhudurg, Maharashtra, India, at an altitude of 26 meter (m) above the mean sea level (MSL) (geographical coordinates: 15°37’ to 16° 40’ North and 73° 19’ to 74° 13’ East). The local climate features high summer temperatures (up to 40 °C during April–May) and cooler winter periods (8 °C to 25 °C in December–February). The site is subject to erratic precipitation, frequently causing soil moisture stress during the active crop growth phase.

Seed source and experimental design

High-purity (95%) hybrid watermelon (*Citrullus lanatus* L.) seeds (Lot No. 19558699, Label: A3-4020) sourced from Syngenta India Pvt. Ltd., India, were evaluated using a triplicated Randomized Complete Block Design (RCBD). The experiment evaluated an untreated/control watermelon cohort (CONWAMG) against a biofield energy-treated watermelon cohort (BTWAMG). To isolate the treatment effect, both groups received identical agronomic management, including standardized schedules for watering, fertilization, and crop protection.

Study plot design

The experimental site, covering a total area of 50.0 m^2, was cleared and laid out in a RCBD consisting of three blocks and six individual plots measuring 5.5 m × 4.0 m (22.00 m^2 each). Plant spacing was set at 0.5 m × 0.5 m, with a 0.5 m buffer zone maintained between adjacent plots and replications. Prior to sowing, standard fertilizer doses (50, 100, and 50 kg NPK ha^{-1}) were applied directly to each plot and incorporated into the soil.

Spiritual blessing (biofield/prayer) energy treatment (SBET) strategy

The experimental matrix, designated as BTWAMG (*Citrullus lanatus* seeds and soil), received a single 4-minute exposure of spiritual blessing energy treatment (SBET) administered by an experienced practitioner, using an in-person blessing strategy (Mr Mahendra Kumar Trivedi; >17 years of clinical/field experience). The treatment was conducted using a non-contact protocol at a fixed distance of 0.5 m to eliminate physical artefacts or tactile confounding variables. An identical control group (CONWAMG) received no intervention and was maintained under parallel conditions. Environmental parameters were strictly regulated during exposure at 28 ± 2°C ambient temperature and 65 ± 5% relative humidity to ensure experimental reproducibility.

Soil characterization and sample preparation

The trial area comprised light, well-drained, brownish-red loamy soil of low initial fertility. To assess baseline properties prior to the experiment, topsoil samples (30 cm depth) were randomly collected, pooled, air-dried, and passed through a 2-mm mesh. Particle size distribution was determined according to established methodology [8], while pH was recorded potentiometrically in a 1:2 (w/v) soil-to-deionized water slurry using a calibrated benchtop meter.

Agronomic management and plant protection

Plots were directly sown and manually irrigated for 8 days post-sowing, then transitioned to surface drip irrigation (pressure-compensating emitters at 0.5 m spacing, 3 L h^{-1} discharge). Fertilizer was applied to both control and treatment plots at a standard 50:100:50 kg ha^{-1} (N:P:K) rate. Basal fertilization included 100% of P (SSP) and K (MOP) combined with 50% of N (urea), while the remaining N was side-dressed at 21 days after sowing (DAS). Uniform pest control was maintained across all experimental units using a foliar application of a commercial insecticide mixture (50% chlorpyrifos + 5%

cypermethrin; Hamla 550, Gharda Chemicals Ltd., Mumbai, India) at 2 mL L^{-1}.

Growth and morphological parameters

At 90 days after sowing (DAS), five plants per plot were chosen at random to assess both vegetative and reproductive growth dynamics. The morphological analysis encompassed qualitative features such as leaf shape, blade color and margin, presence of leaf hairs, fruit shape, flesh and skin coloration, and seed coat color alongside quantitative metrics. Measurable traits recorded included vine length (m), primary branch count, internode length (cm), stem thickness (cm), leaf count, leaf dimensions (cm), days to 50% flowering, individual fruit weight (kg), fruit dimensions (length and diameter in cm), fruit yield per plant and per hectare (t/ha), flesh thickness (cm), rind thickness (mm), seed dimensions (length, width, thickness in cm), seed count per fruit, and 100-seed weight (g).

Yield parameters

Five plants were chosen at random from each experimental plot for yield evaluation. Watermelon (*Citrullus lanatus*) fruits were harvested at physiological maturity, after which length and diameter (cm) were measured, and mass (kg) was recorded on a calibrated digital balance. Cumulative fruit weight per plot was subsequently scaled to tonnes per hectare (t/ha) using standard conversion rules.

Statistical analysis

We reported quantitative variables as mean ± standard error of the mean (SEM) and evaluated differences between the two independent cohorts using a two-tailed Student's *t*-test. We performed all statistical analyses in SigmaPlot (version 14.0) and defined statistical significance prior to testing at $p < 0.05$.

RESULTS

Soil properties

Initial characterization identified a strongly acidic (pH 5.01) sandy loam exhibiting low cation exchange capacity (CEC) and limited nutrient bioavailability. Post-harvest SBET treatment substantially neutralized soil acidity (reaching pH 5.86) and enriched exchangeable base cations (Ca^{2+}, Mg^{2+}, and Na^{+}) alongside total K in the BTWAMG group compared with CONWAMG. Consequently, SBET alters interfacial ion-exchange processes and mineral dissolution kinetics, serving as an effective soil amendment to counteract acidity-induced physicochemical limitations.

Phenological progression and morphology of *Citrullus lanatus*

Various observations related to the growth and yield of the watermelon (***Citrullus lanatus***) were recorded at periodic growth intervals. **Figure 1** shows the different stages of the growth cycle of the watermelon: germination, seedling, vegetative growth, flowering, fruit growing, and harvesting stages.

Figure 1. Characterization of watermelon (*Citrullus lanatus*) vegetative growth characteristics. Chronological sample images depict the developmental transitions of the control (C) versus blessing/biofield energy-treated (BET) cohorts.

Morphological characteristics

The qualitative morphological characteristics of watermelon vegetative and reproductive growth are presented in **Table 2.** Distinct phenotypic variations were observed between the control (CONWAMG) and biofield energy-treated (BTWAMG) groups across several agronomic traits. Plant vine length was longer for the biofield Energy-Treated Group (BTWAMG) and medium for the control group (CONWAMG). The number of primary branches in the stem was a medium number for CONWAMG and many for the BTWAMG. Thicker stem diameter was observed in the BTWAMG, and medium in the CONWAMG. The leaf shape and size were pentalobed, medium, and wide in the CONWAMG, while in the BTWAMG was pentalobed, large, and wide. Moderate leaf hairs were found in CONWAMG, and many leaf hairs were observed in the BTWAMG. Green leaf blade colour was observed for CONWAMG, whereas dark green colour was found in BTWAMG. The colour of the watermelon fruit skin was dark green with a few rind stripes in the BTWAMG group, and CONWAMG had medium green fruits with rind stripes. The inside fruit flesh colour of BTWAMG and CONWAMG fruits was bright red and red, respectively. The CONWAMG group had brown seed colour, and the BTWAMG had dark brown seed colour. Both groups consistently formed oval fruits at maturity. Overall, these observations indicate a pronounced qualitative enhancement across key vegetative and reproductive descriptors in the treated group.

Table 1. Effects of blessings (biofield) energy treatment on qualitative vegetative parameters of watermelon at 90 days after sowing (DAS).

Vegetative trait	Control group (CONWAMG)	Treated group (BTWAMG)
Vine length	Medium	Long
Number of primary branches per vine	Medium number	More
Stem diameter	Medium thick	Thicker
Leaf shape and size	Pentalobed, medium, and wide	Pentalobed, large, and wide
Leaf blade margin	Wavy	Wavy
Leaf hair	Moderate	Many
Leaf blade colour	Green	Dark green
Fruit skin colour	Medium green with rind stripes	Dark green with few rind stripes
Fruit shape (at maturity stage)	Oval	Oval
Fruit flesh colour	Red	Bright red
Seed colour (at mature harvest stage)	Brown	Dark brown

Phenology and yield traits

Relative to CONWAMG, BTWAMG significantly increased germination rate by 14.14% ($p \leq 0.001$) and enhanced vegetative growth, improving vine length (27.07%, $p = 0.018$), primary branch count (56.27%, $p = 0.001$), internode length (56.17%, $p \leq 0.001$), and stem diameter (31.33%, $p \leq 0.001$). Leaf morphology also showed marked improvement in leaf count (33.11%, $p \leq 0.001$), leaf length (17.85%, $p = 0.009$), and leaf width (32.81%, $p \leq 0.001$). Phenologically, BTWAMG accelerated time to first flowering and 50% flowering while boosting male and female flower counts by 11.09% ($p = 0.029$) and 35.14% ($p \leq 0.001$), respectively. Yield parameters responded positively, with increases in fruit length (27.83%, $p = 0.005$), fruit diameter (29.89%, $p \leq 0.001$), fruits flesh thickness (25.63%, $p \leq 0.001$), and number of fruits per plant (23.86%, $p = 0.007$), accompanied by 19.62% ($p \leq 0.001$) reduction in rind thickness. Furthermore, seed metrics followed a similar upward trend, with significant increases in seed count per fruit (53.05%, $p = 0.002$), seed length (30.56%, $p = 0.002$), seed width (45.65%, $p \leq 0.001$), seed thickness (40%, $p = 0.024$), and 100-seed weight (41.78%, $p \leq 0.001$) in the BTWAMG compared to the CONWAMG. Together, these improvements drove a 36.87% expansion in total fruit yield per hectare in the BTWAMG compared to the CONWAMG (Table 2).

Table 2. Evaluation of the phenological and yield characteristics of watermelon following spiritual (biofield/prayer) blessing energy treatment (SBET).

Vegetative trait	Control group (CONWAMG)	Treated group (BTWAMG)	P value
Days to germination	5 to 8	5 to 7	-
Germination percentage	86.15 ± 0.24	98.33 ± 0.17	$p \le 0.001$
Vine length (m)	2.66 ± 0.20	3.38 ± 0.14	$p = 0.018$
Internode length (cm)	7.78 ± 0.12	12.15 ± 0.28	$p \le 0.001$
Number of primary branches/plant	5.74 ± 0.62	8.97 ± 0.26	$p = 0.001$
Stem diameter (cm)	2.49 ± 0.08	3.27 ± 0.07	$p \le 0.001$
Number of leaves	178.44 ± 6.27	237.52 ± 7.33	$p \le 0.001$
Leaf length (cm)	15.46 ± 0.37	18.22 ± 0.72	$p = 0.009$
Leaf width (cm)	11.52 ± 0.16	15.30 ± 0.14	$p \le 0.001$
Days to flowering	42.37 ± 0.58	39.38 ± 0.72	$p = 0.012$
Days to 50% flowering	58.57 ± 0.44	55.39 ± 0.41	$p \le 0.001$
Number of male flowers	119.21 ± 2.55	132.43 ± 4.26	$p = 0.029$
Number of female flowers	11.41 ± 0.33	15.42 ± 0.52	$p \le 0.001$
Days to fruit harvesting	82.35 ± 2.18	81.62 ± 1.67	$p = 0.797$
Average fruit weight (kg)	2.75 ± 0.46	3.87 ± 0.55	$p = 0.157$
Vegetation period (days)	118.74 ± 2.20	116.75 ± 2.64	$p = 0.578$
Fruit length (cm)	20.55 ± 1.05	26.27 ± 1.08	$p = 0.005$
Fruit diameter (cm)	15.69 ± 0.52	20.38 ± 0.25	$p \le 0.001$
Fruit flesh thickness (cm)	2.77 ± 0.06	3.48 ± 0.12	$p \le 0.001$
Rind thickness (mm)	8.36 ± 0.04	6.72 ± 0.11	$p \le 0.001$
100-seed weight (gm)	4.26 ± 0.02	6.04 ± 0.05	$p \le 0.001$
Seed length (cm)	0.72 ± 0.04	0.94 ± 0.03	$p = 0.002$
Seed width (cm)	0.46 ± 0.02	0.67 ± 0.02	$p \le 0.001$
Seed thickness (cm)	0.25 ± 0.03	0.35 ± 0.02	$p = 0.024$
Seed count/fruit	96.47 ± 7.42	147.65 ± 8.22	$p = 0.002$
Number of fruits/plants	2.85 ± 0.16	3.53 ± 0.10	$p = 0.007$
Fruit yield (kg)/plant	7.84	13.67	-
Fruit yield (kg)/plot	65.36	89.46	-
Fruit yield/sq. m plot (kg/sq. m)	0.99	1.36	-
Fruit yield/hectare (tones/hectare)	9.90	13.55	-

Data represented as mean ± SEM (n = 5); $p \le 0.05$ *vs.* control watermelon group (CONWAMG) using Student's *t*-test

DISCUSSION

The comparative morphological evaluation between the Biofield Energy-Treated Watermelon (BTWAMG) and the Control Watermelon (CONWAMG) demonstrates significant improvements in vegetative architecture, foliar characteristics, fruit skin and flesh pigmentation, and seed coat development resulting from the Spiritual Blessing (Biofield) Energy Treatment (The Trivedi Effect®). The vegetative expansion and stem vascular thickness directly correlate with structural support and water translocation efficiency in watermelon vines, as established by Mahmud et al. 2024 [9]. The increased primary branching observed in BTWAMG also provides a larger framework for flower bud development and potential fruit set, supporting multivariate trait improvements documented by Amanullah et al. 2023 [10]. Foliar evaluation revealed that while both groups maintained pentalobed and wide leaf shapes, the leaf size shifted from medium in CONWAMG to large in BTWAMG, accompanied by an increase in leaf hair (trichome) density from moderate to many, and a color transition from green to dark green (**Table 1**). The increase in leaf blade area directly expands light interception capacity, while enhanced epidermal trichome density plays a crucial protective role against environmental stressors and micro-climatic transpiration loss in *Citrullus lanatus*, as evaluated by Al Toriq et al. 2023 [11, 12]. Significant differences were observed in fruit epicarp and endocarp traits: the BTWAMG group developed dark green fruit skin with a few rind stripes and bright red flesh, whereas the CONWAMG group produced medium green fruits with prominent rind stripes and standard red flesh (**Table 1**). Rind stripe definition and background epicarp color are regulated key physical quality markers in commercial watermelon cultivars, as detailed by Bingkui et al. 2017 [13].

The transition to a bright red internal flesh in BTWAMG points toward an elevated accumulation of carotenoid compounds, predominantly lycopene, which constitutes the major antioxidant pigment in red-fleshed *Citrullus lanatus* fruits, as characterized by Subburaj et al. 2019 [14]. Regarding reproductive output, seed coat color deepened from brown in CONWAMG to dark brown in BTWAMG. Seed coat color transition in watermelon reflects polyphenol deposition, oxidation, and overall physiological seed maturity, as identified by Li et al. 2020 [15]. The darker seed pigmentation in the blessing/biofield energy-treated group indicates enhanced physiological ripening and secondary metabolite accumulation during seed development in *Citrullus lanatus*.

The application of SBET resulted in a statistically significant increase in the germination rate of watermelon in the BTWAMG compared to the control (CONWAMG). Early and uniform seed germination is a fundamental determinant of crop establishment, canopy uniformity, and overall yield potential in *Citrullus lanatus*. Rapid germination under favorable treatments reduces the vulnerable window between sowing and seedling emergence, thereby mitigating soil-borne pathogen exposure and abiotic moisture stress during imbibition, as described by Thanos et al. [16].

The marked enhancements in vegetative growth parameters including vine length, primary branch count, internode length, and stem diameter demonstrate that BTWAMG substantially optimizes shoot architectural development in *Citrullus lanatus*. Expanded vine length and primary branching create a robust structural framework capable of supporting greater photosynthate sink loads and larger reproductive structures, consistent with characterizations of high-performing watermelon germplasm reported by Assefa et al. 2020 [17]. Accelerating the onset of first flowering and 50% flowering under BTWAMG represents a critical phenological advancement, facilitating early fruit set and potentially shortening crop maturity cycles. Furthermore, BTWAMG significantly shifted sex expression by increasing female flower production than male flower production. In monoecious *Citrullus lanatus*, the female-to-male floral ratio was a primary yield-limiting variable; an elevated proportion of pistillate flowers increases the probability of successful pollination and fruit formation per unit vine area, as demonstrated by Ji et al. 2015 [18]. The significant increase in fruit numbers alongside individual fruit size highlights the capability of BTWAMG to enhance sink capacity while maintaining a sufficient source-to-sink ratio. Stronger source activity, driven by enhanced leaf morphometrics, ensures adequate assimilate partitioning into developing watermelon (*Citrullus lanatus*) fruits, as reviewed by Mashilo et al. 2022 [19].

Seed size and weight directly reflect reserve accumulation during seed filling, which governs embryo vigor and subsequent crop progeny quality in *Citrullus lanatus*, as examined by Philippe et al. 2024 [20]. Furthermore, the simultaneous rise in both fruit volume and seed count indicates that fertilization success and ovule development were highly effective under BTWAMG, preventing seed abortion through enhanced carbohydrate delivery to reproductive tissues in watermelon (*Citrullus lanatus*), as supported by Li et al. 2020 [15]. Taken together, these findings demonstrate that Biofield Energy Treatment (BTWAMG) positively modulates vegetative growth, photosynthetic apparatus (leaf size, trichome density), fruit quality parameters (skin pigment and flesh color), and overall yield of watermelon (*Citrullus lanatus*).

Conclusion

The application of SBET (The Trivedi Effect®) significantly enhances overall vegetative vigour and reproductive capacity, driving substantial increases in key morphological traits of the treated watermelon group, including primary branching, stem diameter, leaf accumulation, and female flower production relative to the control. This treatment can be translated commercially into enhanced sink strength and crop productivity, yielding marked increases in fruit dimensions, seed development, and total fruit yield of watermelon per hectare. These findings suggest that blessing (biofield) energy treatment functions as an effective, non-chemical biostimulant, offering a novel avenue for sustainable crop production and quality enhancement in horticultural systems.

Abbreviations

SBET: spiritual blessing energy treatment; CONWAMG: control watermelon group; BTWAMG: biofield energy-treated watermelon group; SSP: single super phosphate; MOP: muriate of potash

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Conflict of Interests

Author MKT was employed by Trivedi Global, Inc. VDK, NRP, and TBG were employed by Shree Angarsiddha Shikshan Prasarak Mandal's College of Agriculture, Sangulwadi, Mohitewadi, Maharashtra, India. Authors SM and SJ were employed by Trivedi Science Research Laboratory Pvt. Ltd.

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