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Organic crop production: An analysis of impact of shivyogmodality of agriculture on growth and yield of crops

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Abstract

A systematic research with scientific framework is essential to establish the authenticity of ancient knowledge given by the Sages of Indian tradition. The present study aims to generate scientific basis for authentication of shivyog modality of agriculture based on principle of sound energy and positive consciousness on growth and yield in different crops. The experiment was carried out in both fields as well as in pot condition with green gram (var. Pratap) and black gram (var. KU- 301). The study reveals that there is positive impact of Shivyog modality of agriculture on growth and yield parameters in green gram and black gram. The treatment combination of Shivyog Krishi and organic inputs in both field and pot experiments were observed higher yield and its attributes as compared to normal organic cultivation and recommended inorganic cultivation, indicating impacts of positive thinking and cosmic celestial sounds of Shivyog modality of agriculture on the crops. The study indicated shivyog modality of agriculture in combination with organic manure can be successfully employed for yield optimization in organic condition.

Keywords: organic cultivation, Shivyogkrishi, *mahamrityunjaybeej mantra*, Green gram, black gram, yield, seed quality

Introduction

Worldwide, there is evidence of increased shift towards the use of organic product. Organic Agriculture is a production system based on an agro-ecosystem management approach that utilizes both traditional and scientific knowledge (Dittrich 2010) [6]. Organic agriculture is one of the most dynamic and rapidly-growing sectors of the global food industry. Furthermore, organic farming is one of several approaches to sustainable agriculture (FAO 1999) [7], because of its commercial viability, and it may provide solutions to the current problems in conventional agriculture (Scialabba 2000 [15], Wheller 2008) [17]. Organic agriculture is frequently promoted as an exit strategy from poverty for small-scale marginal producers in developing countries (Wheller 2008) [17]. Concepts of Vedic agricultural practices can aid to organic movement towards production of agrochemical free food production. Based on sound concept and practice, *Ayurvedic* System of Medicine is well documented and includes every aspect of health and disease. But there is dearth of fundamental and applied researches on ancient *Vedic* agriculture. Various spiritual Masters initiated Vedic agriculture but there is dearth of scientific studies. Dr. Avdhoot Shivanand, the founder of the global community *Shiv Yog International Forum* provided cost-effective solution for agricultural farmers by introducing the ancient knowledge of *ShivYog* cosmic science (<http://shivयोगindia.com/agriculture/>) [10]. *Shiv YogKrishi* involves the tapping and harnessing Cosmic Energy to treat the farm soil, seeds, crops etc. with zero input cost and no chemicals. The modality works on the principle of changing cell property by changing its vibration frequency. The process is catalyzed by making the use of *Mahamrityunjay Beej Mantra* as amplifiers in the process. Various reports are available on positive effect of this mantra on human health and agricultural crops (<http://cureispossible.org>) [9]. Many scientific studies identified the positive effect of Vedic chanting on healthy body, mind and soul which is more in synchrony with law of nature (Chivukulacetal. 2014) [3]. In the Vedic knowledge sound is the first subtle manifestation in creation. It is also purest form of manifestation of energy and consciousness. (Saraswati 1997) [13]. Sounds exist in the form of vibration '*spandana*' (Saraswati 2010) [14]. Mantra has also vibration but with *Shakti* and *Chaitanya* (Sivananda 1986) [16].

A systematic research with scientific framework is essential to establish the authenticity of ancient knowledge given by the Sages of Indian tradition. Keeping this in view present study is proposed with following broad objectives to study the effect of *ShivyogKrishi* on crop

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phenology and yield. The study also aims to assess the quality of seeds produced by ShiyogKrishi.

Methodology

Experimental area

The experimental materials were sown in the Instructional-cum Research Farm of Assam Agricultural University Jorhat, Assam, which is located between 26°44' N latitude and 94°10' E longitude. Two sets of experiments were conducted; one is at field condition and another in pot conditions.

Field trial

Assam Agricultural University started few exploratory trials on *ShiviyogKrishi* from 2015 on green gram and black gram. These studies show yield and seed quality improvement. These studies give us a basis to start an observational trial during 2016. To study the detail scientific background of this ancient Vedic knowledge an experiment is proposed with the observed experiences with green gram; variety Pratapand black gram; variety KU 301 with the following treatment

T₁ = Shiviyogkrishi (no fertilizer only chanting)

T₂=Organic cultivation+ chanting

T₃ = Cultivation with recommended fertilizer (Inorganic, no chanting)

T₄ = Absolute control (Cultivation without fertilizer+ No Chanting)

Sowing of seeds

The crops were grown in the field condition in summer season. Sowing was done on 20th March 2017. Direct sowing method was followed for each crop. The experiment was conducted in the Instructional Cum Research farm of Assam Agricultural University, Jorhat, in two different plots to give isolation of chanting to treatment 3 and 4.

Shiviyogkrishi methodology

Soil and seed healing:

Every morning a person trained in *ShivYogtap* the Cosmic Energy and uses the vibrations to treat the land prepared for cultivation for twenty-one days. In *Shiv Yog* protocol the celestial sounds of *Mahamrityunjaya Mantra Beej Mantra* (*Aum, Hroum, Jum, Saa*) preferably with the audio aid to further strengthen the efficacy of the treatment. Simultaneously seeds are also treated through *Shiv Yog* Cosmic Energy with audio aid for the same period. After sowing, the land along with the seeds (or the crops) is treated together for a period of 30 minutes every day throughout the growth period of the crops.

Cultural practices

Three weeding was done one each at early vegetative stage, at flowering and at pod formation. Life saving irrigations was given at sowing, flowering and at the time of pod filling in all the treatments.

Pot experiment

Preparation of pots and treatments

Based on the results of above observational trial an experiment was conducted in *Kharif* season (29th August 2017) with green gram; variety Pratapand black gram; variety KU 301. The experiment was conducted in earthen pots of 10 Kg capacity, taking top soil from barren land where no crop was grown to eliminate any residual effects of organic and inorganic fertilizer. The following treatments were given to each crop

T₁=Shiviyogkrishi (no fertilizer)

T₂=ShiviyogKrishi+FYM (Farm Yard Manure)

T₃ =ShiviyogKrishi +Vermicompost

T₄=Cultivation with recommended fertilizer (IO)

T₅ =Cultivation with FYM (Control)

T₆ =Cultivation with vermicompost (Control)

T₇=Absolute control (Cultivation without fertilizer+ No Chanting)

Application of manures and fertilizers

For the treatments 2, 3, 5 and 6, FYM and vermicompost are applied @5t/ha as recommended in the package of practice for organic cultivation. For treatment 4; inorganic fertilizers were applied at the rate of urea 32kg/ha, SSP 220kg/ha and MOP 25kg/ha.

To apply in the pots of 10 kg capacity, the amounts of manures and fertilizers were calculated using the following standard method.

1 ha furrow slice of 15 cm depth contains = 2240000kg soil

Seed quality evaluation

Quality of the seeds produced by *shiviyogkrishi* was evaluated with harvested seeds from Green gram field experiments of first year after a storage period of 9 months. An inorganic check of the same variety was also collected from ICR Farm of Assam Agricultural University. Laboratory germination test was conducted following guideline given by, International Seed Testing Association (ISTA) with four replication. Observations on Germination %, root length, shoot length, seedling dry weight, Seed Vigour Index I (SVI I) and Seed Vigour Index II (SVI II) was calculated as per ISTA guideline (1995) [11].

Statistical analysis

The experiments were laid out in Randomized Block design (RBD) with 5 replications. The data recorded for each parameter were subjected to analysis of variance (ANOVA), following the method suggested by Gomez and Gomez (1984) [8]. The significance and non-significance of the given variance were determined by calculating the respective values of F and by comparing the calculated F values with corresponding tabulated F value of 5% level of probability and significantly different treatment means were compared by the method of Least Significance Difference (LSD).

Results

Field experiment

Effect treatments on field emergence (%) and plant growth

The mean data on effects of seed treatments on different growth parameters of green gram and black gram with their C.D. values at 5 per cent level of probability are presented in table 1. According to analysis of variance, significant difference on field emergence percentage due to the treatment was observed. Growth related attributes such as field emergence (%), plant height (cm), no. of branches per plant and root Length (cm) were recorded where treatment T₁ (78.20) showed higher field emergence percent followed by T₂, T₃ and T₄ in green gram. In case of black gram also treatment T₁ (73.60) showed higher field emergence. The highest plant height found in treatment T₂ (51.00) which is followed by T₁, T₃ and T₄ in green gram. In case of, black gram highest plant height found in T₁ (73.60) followed by T₃, T₂ and T₄. Numbers of branches per plant were recorded higher in treatment T₂ in both black gram and green gram

i.e. 7.60 and 9.80 respectively. Highest root Length also found higher in treatment T₁ (20.40) which is followed by T₂, T₃,

and T₄ and T₃, T₂, and T₄ in black gram and green gram respectively (Fig1)

Table 1: Effect Treatments on Field emergence (%) and plant growth (Field experiment)

Green gram				Black Gram				
Field Emergence (%)	Plant height (cm)	No. of branches/plant	Root Length (cm)	Field Emergence (%)	Plant height (cm)	No. of branches/plant	Root Length (cm)	
T ₁	78.20	50.20	8.20	20.40	73.60	31.40	7.00	20.40
T ₂	74.20	51.00	9.80	16.80	67.40	27.00	7.60	16.40
T ₃	72.80	47.20	7.60	13.00	69.40	28.40	6.40	18.40
T ₄	67.00	40.80	6.80	12.60	67.00	24.00	5.40	12.80
SED	0.51	1.14	1.39	1.06	0.48	0.96	0.74	0.75
SEM (±)	0.72	0.81	0.98	0.75	0.34	0.68	0.52	0.53
CD at(5%)	1.58	2.49	3.02	2.30	1.04	2.09	1.61	1.64

Table 2: Effect of treatments on yield and yield attributes (Field experiment)

Green gram							
No. of cluster/plant	No. of pod/cluster	No. of pod/ plant	No. of seeds/pod	1000 seed weight (gm)	Yield per plot (kg)	Total Yield (q/ha)	
T ₁	14.60	2.40	36.80	10.00	34.70	2.00	13.45
T ₂	15.00	2.60	44.80	10.40	34.77	2.31	13.58
T ₃	13.20	2.40	36.00	9.20	33.82	1.99	11.58
T ₄	12.40	2.20	33.60	9.20	31.63	1.89	5.08
SED	1.18	0.24	3.99	0.32	0.18	0.07	0.20
SEM (±)	0.78	0.35	2.82	0.23	0.13	0.05	0.14
CD at 5 %	2.40	0.75	8.70	0.70	0.39	0.16	0.43
Black Gram							
No. of cluster/plant	No. of pod/cluster	No. of pod/ plant	No. of seeds/pod	1000 seed weight (gm)	Yield per plot (kg)	Total Yield (q/ha)	
T ₁	9.80	2.20	22.60	5.80	44.65	4.50	12.50
T ₂	9.80	2.20	22.60	6.00	44.68	5.95	12.58
T ₃	8.20	2.00	21.60	5.40	44.59	3.94	10.30
T ₄	6.80	2.00	13.60	5.40	44.58	3.58	6.06
SED	0.83	0.21	3.18	0.44	0.21	0.05	0.24
SEM (±)	0.59	0.15	2.25	0.31	0.15	0.04	0.17
CD at 5 %	1.82	0.45	6.93	0.97	0.47	0.11	0.52

Table 3: Effect Treatments plant growth parameters (Pot experiment)

Black gram			Green gram			
Plant height (cm)	Root Length (cm)	No. of branches/plant	Plant height (cm)	Root Length (cm)	No. of branches/plant	
T ₁	25.02	17.04	3.60	33.36	17.04	2.60
T ₂	19.74	12.30	5.00	31.32	11.26	2.80
T ₃	25.22	11.44	4.60	24.54	10.60	2.60
T ₄	17.46	11.26	3.40	22.38	10.30	2.00
T ₅	17.24	10.86	3.00	19.80	8.00	2.00
T ₆	15.26	7.84	3.20	20.40	8.14	2.40
T ₇	15.10	5.84	2.60	19.00	7.84	1.60
SED	1.03	1.77	0.38	1.22	1.63	0.46
SEM (±)	0.73	1.25	0.27	0.86	1.13	0.33
CD (5%)	2.13	3.66	0.78	2.51	3.30	0.95

Table 4: Effect of treatments on yield and yield attributes (Pot experiment)

Black gram						
No. of cluster/plant	No. of pod/cluster	No. of pod/ plant	No. of seeds/pod	Yield /plant (kg)	1000 seed weight (gm)	
T ₁	2.60	1.36	4.20	6.00	0.91	48.90
T ₂	6.00	2.16	13.60	4.80	4.39	53.90
T ₃	5.00	2.86	12.60	5.80	3.39	48.00
T ₄	4.00	1.84	5.30	6.00	1.56	46.50
T ₅	2.60	1.30	3.00	5.40	0.64	47.00
T ₆	1.80	1.40	1.80	4.20	0.47	45.60
T ₇	2.00	1.93	2.60	3.60	0.33	37.00
SED	0.44	0.30	1.01	0.43	0.06	0.18
SEM (±)	0.31	0.21	0.72	0.31	0.04	0.13
CD at 5 %	0.91	0.63	2.09	0.94	0.13	0.38
Green gram						
No. of cluster/plant	No. of pod/cluster	No. of pod/plant	No. of seeds/pod	Yield /plant (kg)	1000 seed weight (gm)	
T ₁	2.00	2.86	4.40	10.60	0.91	32.40
T ₂	3.00	1.56	5.80	9.40	1.46	35.10
T ₃	1.60	2.16	6.20	9.00	2.10	34.50

T ₄	2.20	1.90	2.60	5.80	0.31	32.00
T ₅	2.00	2.50	1.90	6.40	0.36	27.30
T ₆	1.80	1.80	3.00	6.60	0.66	30.00
T ₇	1.00	1.00	1.60	5.60	0.51	23.00
SED	0.68	0.43	0.66	0.67	0.05	0.17
SEM (±)	0.48	0.31	0.47	0.47	0.04	0.12
CD at 5 %	1.39	0.90	1.37	1.46	0.11	0.34

Table 5: Seed quality parameters of ShiviyogKrishi and Inorganic production

Treatments	Germination %	Root Length(Cm)	Shoot Length(Cm)	Seedling Dry Weight (Gm)	SV I	SV II
Cosmic healing	94.5	8.1025	6.8075	0.226675	1271.16	19.3707
Inorganic seed	74.5	2.5925	1.1925	0.163275	217.3945	9.447625
SE	4.833	1.325	1.544	0.0198	74.697	1.544
CD (at 0.05%)	16.726	4.5861	5.3452	0.0686	258.490	5.3429
CV	13.497	49.555	77.233	20.337	20.073	28.261

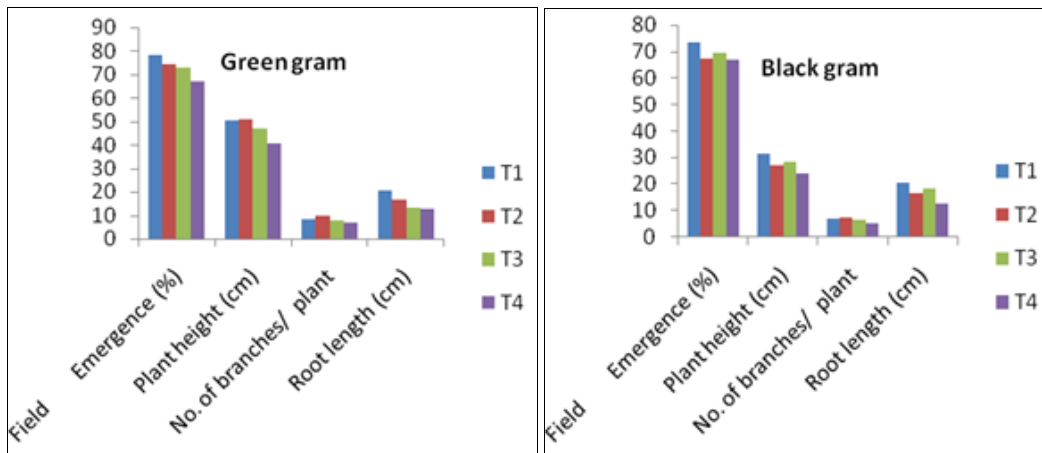


Fig 1: Effect Treatments plant growth parameters in field condition

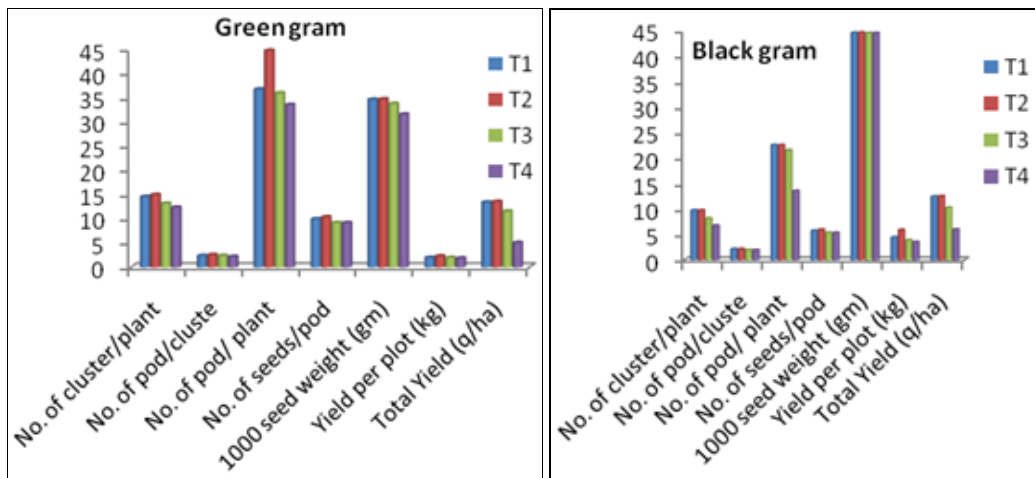
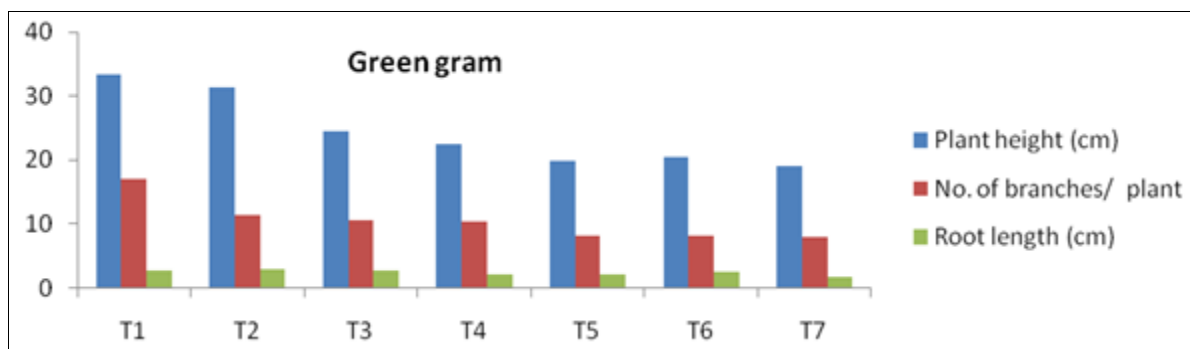


Fig 2: Effect of treatments on yield and yield attributes in field condition



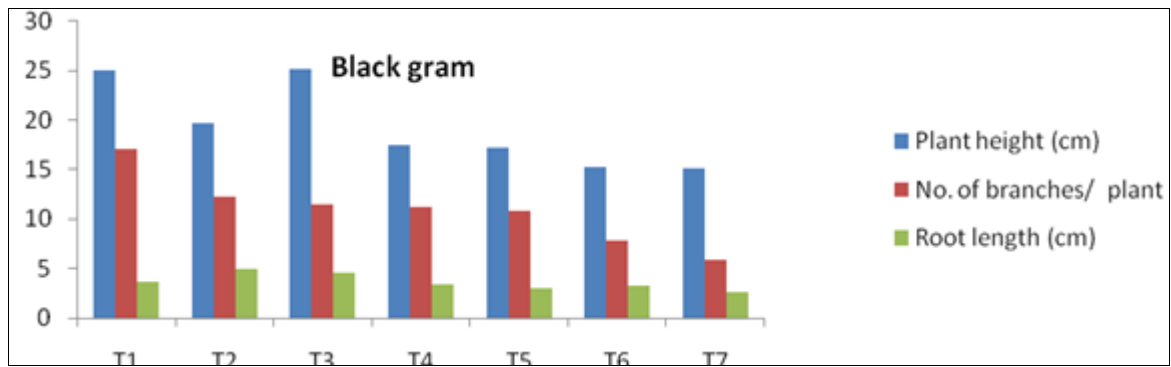


Fig 3: Effect Treatments plant growth parameters in pot condition

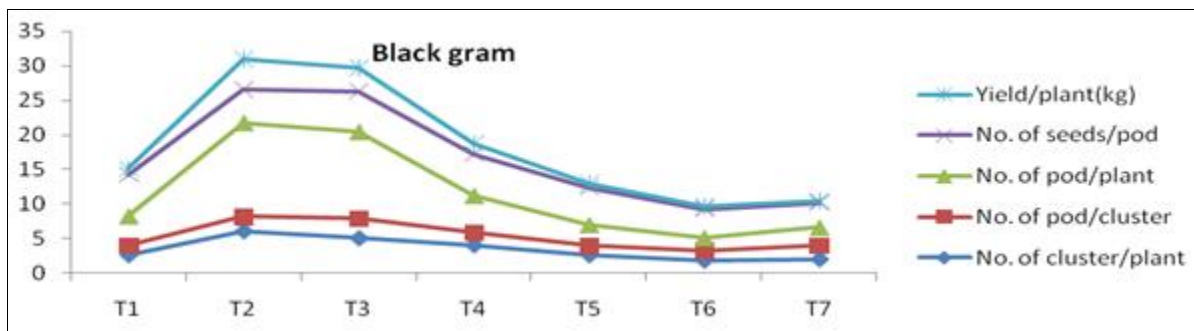
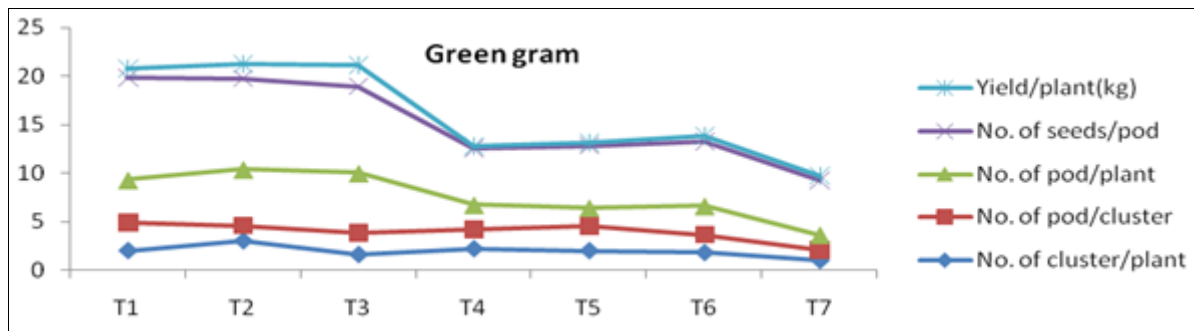


Fig 4: Effect of treatments on yield and yield attributes in pot condition

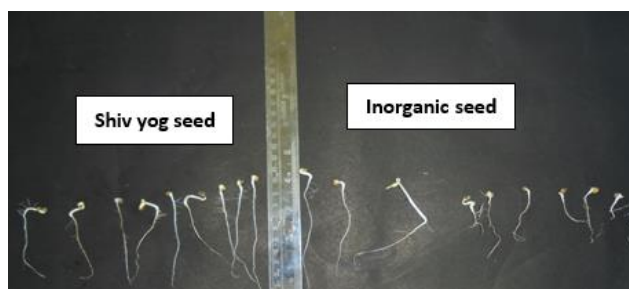


Fig 5: 7 days old Germinated Seedlings after storage (laboratory test)

Effect of treatments on yield and yield attributes

Yield related attributes such as number of cluster per plant, number of pod per cluster, number of pod per plant, number of seeds per pod, 1000 seed weight (gm), per plot yield (kg) and total yield (q/ha) are presented in table 2., showed significant variation for different treatments. Highest number of cluster per plant was recorded in treatment T₂ in both black gram and green gram i.e. 9.80 and 15.00, respectively. Lowest was found in T₄ (6.80 gm and 12.40gm respectively). In case of green gram higher number of pod per cluster were found in treatment T₂ (2.60gm). In case of black gram treatment T₁ (2.20gm) is at par with treatment T₂ followed by T₃ and T₄. Number of pod per plant was found higher in treatment T₂ (44.80gm) followed by T₁, T₃ and T₄ in green gram. T₁ (22.60gm) showed higher number of pod per plant in black

gram is at par with T₂ followed by T₃ and T₄. Treatment T₂ showed the highest number of cluster per plant, number of pod per cluster, number of pod per plant, number of seeds per pod in both black gram and green gram which was followed by T₁, T₃ and T₄. 1000 seed weight (gm) was recorded the highest in T₂ followed by T₁, T₃ and T₄. The highest yield /plot was recorded in treatment T₂ (13.58 gm and 12.58gm respectively) in both green gram and black gram followed by T₁, T₃ and the lowest was recorded in T₄ (Fig2).

Pot Experiments

Effect Treatments plant growth parameters

Observations on growth and its attributes such as plant height (cm), no. of branches per plant and root length (cm) were recorded in each plant of the treatment and average was

calculated. The mean data on effects of seed treatments on different growth parameters of green gram and black gram with their C.D. values at 5 per cent level of probability are presented in table 3. T₁ (25.02 cm and 33.36 cm respectively) showed higher plant height followed by T₂, T₃, T₄, T₅, T₆, and T₇ in black gram and green gram. In case of black gram and green gram treatment T₁ (17.04cm) showed higher root length followed by T₂, T₃, T₄, T₅, T₆, and T₇. In both the crops highest number of branches per plant found in T₂ (5.00 and 2.80 respectively) which is followed by T₃, T₂ and T₄, T₅, T₆, and T₇. Numbers of branches per plant in green gram T₁ (2.60) is at par with T₃ followed by T₄, T₅, T₆, and T₇ (Fig3).

Effect of treatments on yield and yield attributes

Yield related attributes such as number of cluster per plant, number of pod per cluster, number of pod per plant, number of seeds per pod, 1000 seed weight (gm) and total yield (q/ha) with their C.D. values at 5 per cent level of probability are presented in table 4, Fig. The highest number of cluster per plant was recorded in treatment T₂ (6.00 and 3.00 respectively) in both black gram and green gram. In case of black gram treatment T₂ followed by T₃, T₄ and T₁ is at par with T₅. Lowest number of cluster per plant was recorded in T₆ (1.80). In case of green gram the lowest number of cluster per plant was found in T₇ (1.00). In case of black gram higher number of pod per cluster were found in treatment T₃ (2.86) and lowest was in T₅ (1.30) whereas in green gram it was highest in T₁ (2.86) and the lowest was recorded in T₇ (1.00). Number of pod per plant was recorded highest in treatment T₂ (13.60) followed others in black gram. And in case of green gram higher number of pod per cluster showed by T₃ (6.20) and was lowest in T₇ (1.60). The highest numbers of seeds per pod was produced by treatment T₁ (6.00) which is at par with T₄ in black gram followed by treatment T₃, T₅, T₂, T₆ while the least numbers of seeds per pod was observed in T₇ (3.60). In case of green gram the highest numbers of seeds per pod was recorded in T₁ (10.60) followed by T₂, T₃, T₅, T₆, T₄ and T₇. The highest seed yield per plant (kg) T₂ (4.39kg) followed by treatment T₃, T₄, and lowest Seed yield per plant (kg) was in treatment T₇ (0.33) in black gram. In case of green gram higher seed yield was in T₂ (1.46kg) and lowest was in T₄ (0.31kg). Highest 1000 seed weight (gm) was observed in treatment T₂ (53.90) followed by treatment T₁, T₁, T₅, T₄, T₆ and T₇ in black gram. In case of green gram the highest seed weight was recorded in T₂ (35.10) and lowest was in T₇ (27.00) (Fig4).

Effect of shivoyogkrishi on seed quality

In the present study laboratory germination percentage is significantly higher in seeds produced by *ShivoyogKrishi* (94.5%) than in inorganic seeds (74.5%) indicating higher number of living seeds after one year storage in ambient storage condition (Table 5, Fig5). Minimum certification standard for green gram seed is 75% with a validity of 9 months. The present study revealed that *shivoyogkrishi* seeds have higher viability than the normal inorganically produced seeds. All the seed vigour indicators viz root length, shoot length, seedling dry weight and SVI I and SVI II (table5) found to be significantly higher in *ShivoyogKrishi* seeds as compared to inorganically produced seeds.

Discussion

Before the advent of 20th century, science did not acknowledge the vitality of trees and plants. Then, on May 10, 1901, Acharya Jagadish Chandra Bose proved that plants

are like any other life form (Chaudhuri and Chattopadhyay, 2009)^[2]. Bose proved that plants have a definite life cycle, a reproductive system and are aware of their surroundings. The demonstration took place in the Royal Society in London, England. After that many scientists proved the effect of environment and sound on growth and development of plant. The present study reveals that there is positive impact of chanting of *mahamritunjay mantra* on all the growth and yield parameters of both green gram and black gram. The treatment combination of *ShivoyogKrishi* and organic inputs in both field and pot experiments were observed higher yield and its attributes as compared to normal organic cultivation or without any chanting, indicating impacts of positive thinking and cosmic celestial sounds of *Mahamritunjay mantra* on the crops. Devi *et al* (2004)^[5] reported that the Vedic mantras have beneficial effects on human beings and plants. Jungyun *et al* (2016)^[12] reported that chanting of *mahamrtyunjaya mantra* had positive effects on emergence, radical length, fresh weight and dry weight of emerged seeds. They reported that chanting of the *mantra* accelerated the rate of growth of fenugreek seeds. Our result is in accordance to it. All the growth characters significantly varied and *mahmritunjay mantra* with different organic matters were found better than that without chanting treatments. This was observed irrespective of field and pot experiments for all the growth related traits. The potential attributes of seed vigor as a fundamental physiological seed characteristic and its association with field stand establishment and crop productivity has been worldwide recognized from the 1960s onward. The present study reveals higher potential of seeds produced in combination with chanting of *Mahamritunjay mantra* seeds as compared to normal inorganically produced seeds. Creath & Schwartz (2004)^[4] reported that that sound vibrations (music and noise) as well as bio- fields (bio-electro-magnetic and healing intention) both directly affect living biologic systems, and that a seed germination bioassay has the sensitivity to enable detection of effects caused by various applied energetic conditions. There are reports on different types of rhythm when exposed to the seeds give different effect towards the rate of germination. Anilizawatima and Lidawani (2014)^[1] reported, based on the findings from their study, that, plants are definitely influenced by the sound in term of rhythms. However, different plant species required different rhythm for their best growth.

Conclusion

The present study indicated that organic cultivation has added advantages of application of *Maha Mritunjaybeej Mantra*. The physiology behind high seed viability and vigour needs to be analyzed to identify the reason behind high potential of seeds produced with chanting of Mantra. To validate the study, further investigations on identification of the genes that are up or down regulated due to effect of chanting and in turn caused yield and other differences in crops produced by Shivoyog Krishi with rhythmic sounds of Vedic Mantras. The study indicates that *shivoyog agriculture with Maha Mritunjay Beej Mantra* can, not only boost up the productivity of organic cultivation but also give economic relief to the marginal farmers as the input cost is almost negligible.

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