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Evaluation of Plant Growth, Yield and Yield Attributes of Biofield Energy Treated Mustard (*Brassica juncea*) and Chick Pea (*Cicer arietinum*) Seeds

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Abstract: The present study was carried out to evaluate the effect of Mr. Trivedi's biofield energy treatment on mustard (*Brassica juncea*) and chick pea (*Cicer arietinum*) for their growth, yield, and yield attributes. Both the samples were divided into two groups. One group was remained as untreated and coded as control, while the other group (both seed and plot) was subjected to Mr. Trivedi's biofield energy treatment and referred as the treated. The result showed the plant height of mustard and chick pea was increased by 13.2 and 97.41%, respectively in the treated samples as compared to the control. Additionally, primary branching of mustard and chick pea was improved by 7.4 and 19.84%, respectively in the treated sample as compared to the control. The control mustard and chick pea crops showed high rate of infection by pests and diseases, while treated crops were free from any infection of pests and disease. The yield attributing characters of mustard showed, lucidly higher numbers of siliquae on main shoot, siliquae/plant and siliquae length were observed in the treated seeds and plot as compared with the control. Moreover, similar results were observed in the yield attributing parameters of chick pea *viz.* pods/plant, grains/pod as well as test weight of 1000 grains. The seed and stover yield of mustard in treated plots were increased by 61.5% and 25.4%, respectively with respect to the control. However, grain/seed yield of mustard crop after biofield energy treatment was increased by 500% in terms of kg per meter square as compared to the control. Besides, grain/seed yield of chick pea crop after biofield energy treatment was increased by 500% in terms of kg per meter square. The harvest index of biofield treated mustard was increased by 21.83%, while it was slight increased in case of chick pea. In conclusion, the biofield energy treatment could be used on both the seeds and plots of mustard and chick pea as an alternative way to increase the production and yield.

Keywords: Mustard, Chick Pea, Biofield Energy Treatment, Growth, Yield, Yield Attribute

1. Introduction

Grain legumes being the major protein source in human and animal nutrition, play a major key role in crop rotations across the world. Among the various oilseed crops, mustard is one of the important because of its potential utilities in the growing biofuels industries [1]. It is widely used as a condiment and as edible oil. The pungency of mustard oil is due to the presence of allyl-isothiocyanate. The low pungency of mustard oil can be obtained after inactivating the myrosinase enzyme present in it and used as a filler

component in various processed meat products [2]. Glucosinolates are the major class of bioactive phytoconstituents mainly rich in mustard [3]. Mustard seed extract has the potential chemo-preventive and chemotherapeutic activities *in vitro* by scavenging the hydroxyl radicals; it also induces apoptosis of cancer cells [4]. It is also reported that the antioxidant activities of mustard seeds extract [1, 5]. Crop rotation along with other crops also improve the soil fertility, and reduces weeds, pest, and diseases [6]. Chick pea (*Cicer arietinum*) is the major legume in the vegetarian diet with high carbohydrate content. It is one of the drought resistant crops, and

considered as an important legume in the newly cultivated land. Chick pea is the third most widely grown grain legume after bean and soybean in the world. Due to its very high protein concentration (approximate 19.3-25.4%), its agronomical importance is demanding for human and animal diet as an alternative protein source. Utilization of nitrogen was reported with enhanced yield, and yield attributes in legume [7]. The National Center for Complementary and Integrative Health (NCCIH), allows the use of Complementary and Alternative Medicine (CAM) therapies such as biofield energy as an alternative in the healthcare field. About 36% of US citizens regularly use some form of CAM [8], in their daily activities. CAM embraces numerous energy-healing therapies; biofield therapy is one of the energy medicine used worldwide to improve the overall human health. Mr. Trivedi's unique biofield treatment (The Trivedi effect[®]) has been extensively contributed in scientific communities in the field of agricultural science [9-12] and chemical science [13].

Due to the necessity of mustard and chick pea as the food resource, and the improvement in overall productivity of these two plants, an effective control measure need to be established. Under these circumstances, the present work was undertaken to evaluate the effect of biofield energy treatment on mustard and chick pea in relation to growth, yield, and yield attributes.

2. Materials and Methods

The seeds and plots of both mustard and chick pea were selected for the study. Field experiments on mustard and chick pea were conducted at the Agricultural Research Farm of the Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, India during winter season. The experiments on both mustard and chick pea were performed un-replicated with gross plot size of 12.0 m x 6.0 m. One portion of both mustard and chick pea (seeds and plots) was considered as control; no biofield energy treatment was given. Besides, equally divided other portion (seeds and plots) was subjected to Mr. Trivedi's biofield energy treatment. Mustard crop was sprayed with insecticide (0.125% Rogor) against the aphid, while no plant protection was given to chick pea. Mustard and chick pea were received two and one irrigation, respectively.

Table 1. Growth, yield attributes and yield of control and biofield treated mustard.

Group	Plant height (cm)	Branches/plant		Siliquae/plant		Siliquae length (cm)	1000 seed wt. (g)	Seeds yield		Stover yield		Harvest index (%)
		Primary	Secondary	Main shoot	Total			kg/plot*	q/ha	kg/plot	q/ha	
Control	141.4	5.4	11.5	25.5	176.2	4.96	5.34	3.66	7.56	14.15	30.64	19.79
Treated	160.0	5.9	11.7	36.0	191.4	5.47	5.41	5.91	12.21	18.60	38.42	24.11

*Net plot size 11×4.4 = 48.4 m².

The effect of biofield energy treatment and its related data are presented in Table 1, which revealed marked difference in plant height of treated mustard at maturity as compared with

2.1. Biofield Energy Treatment Strategy

The above assigned both seeds and plots of both mustard and chick pea were subjected to Mr. Trivedi's biofield energy treatment under ambient conditions. Mr. Trivedi provided the treatment to the seeds through his inherent unique energy transmission process without touching the seeds or lands. Afterward, both the control and the treated samples were assessed for growth, yield, and yield attributes of both mustard and chick pea plant.

2.2. Growth, Yield, and Yield Attributes of Mustard

Biofield treated mustard seeds were allowed to germinate until ready to be transplanted according to the season. As a control, untreated mustard seeds were allowed to germinate in the same manner and transplanted alongside the treated plots in a randomized fashion. Overall, the plant height, primary and secondary branches, seed/grain yield, and harvest index of the control and treated mustard crops were calculated [14].

2.3. Growth, Yield, and Yield Attributes of Chick Pea

Both the control and biofield treated chick pea seeds were permitted to germinate until they ready to be transplanted to the particular season. After germination both plantlets were transplanted in the pre-defined plots separated with an imaginary barrier. The plant height, primary and secondary branches, seed/grain yield, and harvest index of the both control and treated chick pea crops were noted [14].

3. Results and Discussion

3.1. Growth, Yield, and Yield Attributes of Mustard

Allelopathy is the process of plant communication system through the direct or indirect, detrimental or advantageous effects of one plant to another. They communicate through the release of allelochemicals *i.e.* the secondary metabolites or waste products of plants into the environment through leaching, root exudation, volatilization and decomposition of plant residues. The mustard plant belongs to *Brassicaceae* family cited as allelopathic crop [15]. The growth, yield, and yield attributes of mustard seedling data of control and treated samples are shown in Table 1.

the control. Plants obtained from the biofield treated seeds and plot grew taller and were recorded 13.2% higher plant height than the control plants. Primary branching in treated

plots were improved by 7.4%, while slight increase was reported in secondary branches as compared with the control. Among the yield attributing characters, lucidly higher number of siliquae on main shoot, siliquae/plant and siliquae length were observed in treated seeds and plot as compared with the control. The seed and stover yield of mustard in treated plots were increased by 61.5% and 25.4%, respectively with respect to the control. However, grain/seed yield of mustard crop after biofield treatment was increased by 500% in terms of kg per meter square (Fig. 1). The harvest index of treated mustard was increased by 21.83% as compared to the control.

Use of fertilizers, pesticides, and nutrient management has been well reported as they play a key role in increasing and stabilizing the productivity of mustard [16]. The study results concluded, that the biofield energy treatment could be a new and safe approach in term of growth and yield of mustard crop.

Table 2. Growth, yield attributes and yield of control and biofield treated chick pea.

Group	Plant height (cm)	Branches /plant	Pods/ plant	Grains/ pod	1000 seed wt (g)	Grain yield		Straw yield		Harvest index (%)
						kg/plot	q/ha	kg/plot	q/ha	
Control	30.9	12.6	21.8	1.38	162.8	1.92	4.15	3.53	7.64	35.20
Treated	61.0	15.1	38.4	1.56	195.9	8.91	19.30	16.0	34.63	35.78

*Net plot size 11×4.2 = 46.2 m².

The results showed marked difference in growth characters of biofield treated chick pea as compared with the control. The linear growth as well as total number of branch/plant were recorded at harvest, and were found considerably higher in treated seeds and plot as compared with the control. The plants obtained from the treated seeds and plot were increase by 97.41% as compared the control plant. Branches per plants were also improved in biofield treated group by 19.84% as compared with the control. Similar results were noticed in yield attributing parameters viz. pods/plant, grains/pod as well as test weight of 1000 grains. Considerable infestation of wilt leading was observed which leads to plant mortality in untreated plots sown with normal seeds. Due to the better plant stand as well as growth and yield attributing characters, grain and straw yields of biofield energy treated plots increased by 365.1% and 353.3%, respectively. To improve the overall yield of chick pea, salinity mediated productivity have been reported with better growth [17]. The experimental results suggested biofield treated chick pea showed better yield as compared with the control. Moreover, grain/seed yield of chick pea crop after biofield energy treatment was also increased by 500% in terms of kg per meter square (Fig. 1). The harvest index was slightly increased in the case of treated chick pea as compared to the control.

The biofield treated crops had dark green colored leaves with a thick consistency being more in numbers, as compared with the control crops. The control mustard crop showed high rate of infection by pests and diseases, and leaves were reported with survival rate hardly by 40%, while biofield treated mustard was free from any kind of diseases or pests

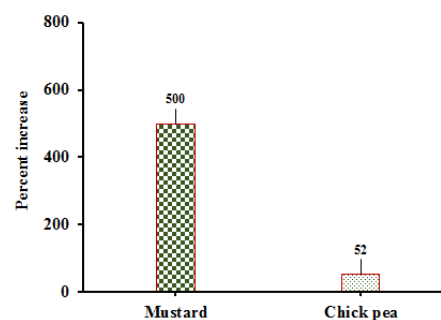


Figure 1. Effect of biofield energy treatment on percent increase in grain/seed yield of mustard and chick pea crops.

3.2. Effect on Growth, Yield, and Yield Attributes of Chick Pea

The results related with growth and yield attributes of chick pea before and after the biofield energy treatment are presented in Table 2.

attack, and leaves were quite thick, large, dark green in color, and more secondary and tertiary branches. Similarly, biofield treated chick pea showed high survival rate after germination, free from any kind of infections, the canopy of plant was better as compared with the control. Overall, the treated crops showed high yield as compared with the control. However, crops from all the treated seeds were found with a very thick population and free from the diseases and pests attack as compared with the respective control. In biofield treated seeds, there was no airborne infection observed which defies the laws of aerobiology.

The canopy of the biofield energy treated trees was more than the double as compared to the control; and had more secondary and tertiary branches. Leaf area was significantly more in the treated crop, which was well indicated with more grain/seed yields. Leaf area is directly related with the final productivity of the crop [18]. The longevity of the all crops in the treated plot was found to be increased, hence fruiting period has also been extended resulting in higher yield. Weed or unwanted plant growth was not seen in the treated plot, whereas in the control plot even after spraying weedicides (three-time) the weeds were continuously required to be removed approximately four times manually. It was reported that climatic change can influence the flowering time, and overall productivity of crops [19], biofield treated crops resulted in better flowering, which was directly related to overall productivity.

However, biofield treatment has been reported an improved overall plant health of *Withania somnifera* and *Amaranthus dubius*. Leaf, stem, flower, seed setting, and immunity parameters were reported with enhanced effect after biofield treatment. Concentrations of chlorophyll a,

chlorophyll b and total chlorophyll were consistently higher in treated plants along with genetic variability using RAPD DNA fingerprinting [12]. The impact of biofield treatment on the yield of ginseng, blueberry [10], and growth and yield of lettuce and tomato were reported [9]. Similar results were observed in our experiment with biofield treated mustard and chick pea. The results are well supported with the reported literature in terms of growth and yield of crops. Based on these results, it is expected that biofield energy treatment has the scope to be an alternative approach to improve the plant growth, yield, yield attributes, and development of crops.

4. Conclusions

Based on the study outcome, the biofield energy treated mustard and chick pea showed significant improvement of overall yield of the treated crops as compared to the control. The seed and stover yield of mustard in treated plots were increased by 61.5% and 25.4%, respectively as compared to the control. The percentage increase in yield was maximum in case of mustard (500%) in the biofield treated seed as compared to the control. Linear growth, plant height, branches, and grain/seed yield of mustard and chick pea were consistently increased in all the biofield treated crops, without any precautionary measures such as pesticides, fungicides, and organic additives. The harvest index of treated mustard was increased by 21.83%, whereas the harvest index was slightly increased in the treated chick pea as compared to the control. The chick pea plants obtained from the treated seeds and plot were increase by 97.41% as compared the control plant. Additionally, the growth and yield attributing characters, grain and straw yields of biofield energy treated chick pea were increased by 365.1% and 353.3%, respectively as compared to the control. Overall, Mr. Trivedi's biofield energy treatment resulted in improved yield in multiple kinds of crop, suggested the significant application of biofield treatment in agriculture sector instead of chemical measures to improve the overall productivity. In conclusion, the present investigation demonstrates that Mr. Trivedi's unique biofield treatment could be utilized as an alternate therapeutic approach concurrent with other existing approach to improve the productivity of mustard and chick pea in the field of agriculture in the near future.

Abbreviations

NCCIH: National Center for Complementary and Integrative Health; CAM: Complementary and Alternative Medicine.

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