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Evaluation of Bio Dynamic Compost and Bio Dynamic Compost Wash on Growth and Yield of Rice

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The present investigation, was conducted in the *Kharif* of 2021–2022 at the Student's Instructional Farm at the A.N.D. University of Agriculture & Technology, Kumarganj, Ayodhya (U.P.). The experiment was laid out in Randomized Block Design, replicated thrice, having 8 treatments i.e. T1 (Absolute Control), T2 (Bio dynamic compost 1q/ha + 50 % RDF), T3 (Bio dynamic compost 2 q/ha + 50 % RDF), T4 (T2 + Root dipping with Bio dynamic compost wash 10 ml/ lit of water), T5 (T3 + Root dipping with Bio dynamic wash 10 ml/lit of water), T6 (T2 + foliar application of Bio dynamic compost wash of 10 ml/10 lit of water), T7 (T3 +foliar application of Bio dynamic compost wash of

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10 ml/ lit of water), T8 (100 % RDF. Result revealed that the highest growth attributes viz., Plant height (cm), maximum dry matter accumulation, highest number of tiller (m-2), Panicle length (cm), number of grain per panicle and test weight (gm), maximum grain yield (q ha-1), highest straw yield, maximum biological yield (q ha-1) and maximum harvest index (q ha-1) was recorded significantly over rest of the treatments in T7 (T3 +foliar application of Bio dynamic compost wash of 10 ml/ lit of water) while it recorded lowest in in T1 (absolute control) during the investigation.

Keywords: Bio dynamic compost; bio dynamic wash; growth attribute; yield attribute.

1. INTRODUCTION

Rice (*Oryza sativa* L.) is one in all the most important food crops, grown in south Asia. Rice is the most popular staple meal consumed by more than half of the world's population, especially in Asia and Africa. As a result, it is a key source of food for around 35% of the world's population and one of the principal crops in developing nations.

After maize and sugarcane, it is the agricultural product with the third-highest global production (https://www.fao.org/faostat/en/#data/QCL). The rice plant is capable of growing to a height of 1-1.8 m (3-6 feet), depending on the soil's kind and fertility. Its long, narrow leaves are 2-2.5 cm (3-4 in) broad and range in length from 50 to 100 cm (20 to 40 in). The small wind-pollinated blossoms are carried by a branching, arching, to pendulous inflorescence that is 30–50 cm (12–20 in) in length. The most extensively produced grain in the world, paddy is a staple meal for more than 60% of humanity. Over the last 15 years, the global paddy output has expanded gradually but slowly, from 400 million tonnes to 477 million tonnes. The world's first crop to be intentionally grown is said to have been paddy. Asia, which leads the sector, produces over 90% of the world's paddy crop. It is the second most widely grown cereal in the world after maize. India is the world's second-largest producer of rice. According to the Directorate of Economics and Statistics (2021) the production of rice in 2020-21 was 122.27 million tons with productivity of 2713 kg ha^{-1} under 43.82 mha area in India. In Uttar Pradesh, production was 15.66 million tons and productivity was 2759 kg ha^{-1} under 19.93 mha area in 2020-21.

According to Ponnamperuma et al. [1] rice straw is most suited for this use because it typically contains 0.9% N, 0.2% P, 0.2% S, 2.5% K, 0.6% Ca, 7.0% Si, and 40% C. There are many different production techniques utilised to create organo-mineral fertilizers from organic and mineral wastes. Numerous studies have shown that chemical, thermochemical, and biological methods can all be used to produce products with adequate fertilizing capabilities. The nature of the employed feedstock and the intended market have a major role in the selection of an appropriate procedure. This section thoroughly examines the most significant chemical and biological techniques used in the OMF generation process by valorising organic/mineral waste and low-grade phosphate. Biodynamic farming is a method of production that actively cooperates with the elements of nature that support wellness. It served as the catalyst for the nonchemical farming movement. In a nutshell, "biodynamic" agriculture is a group of "biological dynamic" farming practices. Numerous well-known organic agriculture practices that improve soil health are referred to as "biologically" in this sentence.

"Dynamic" farming methods try to change the biological and metaphysical qualities of the farm (like increasing vital life energy) or to make the farm more in sync with the seasons (like sowing seeds at certain moon phases). The initial biodynamic formulations were identified by numbers (500–508). The fermentation process for the BD 500 preparation, sometimes referred to as horn manure, takes place in a cow horn that has been buried in dirt for six months in the autumn and winter. The quartz powder-based BD 501 preparation (horn-silica) is packaged in a cow horn and submerged in soil for six months in the spring and summer. The fact that biodynamic preparations 502–507 are used to create the compost makes it special. In many nations, biodynamic farming is carried out on a commercial scale, and it is becoming more well-known for its contributions to community supported agriculture, organic farming, food quality, and qualitative tests for soils and composts. From a real-world perspective, biodynamic farming has been shown to be effective and produce wholesome, high-quality foods [2]. Therefore**,** present investigation was emphasized to know the effect of biodynamic compost and bio dynamic wash on growth and yield parameters of rice.

2. MATERIALS AND METHODS

2.1 Experimental Site and Climatic Conditions

The experiments were conducted at the Student's Instructional Farm of the Acharya Narendra Deva University of Agriculture and Technology in Kumarganj, Ayodhya, which is located in the subtropical Indo Gangetic Plains climate zone at 26.470 N latitude, 82.120 E longitude, and an elevation of 113 metres above mean sea level.

2.2 Cultural Operations

2.2.1 Preparation of field

The experimental area was ploughed with tractor just after harvest of winter crop and ploughed again in the 3rd week of July. The experiment was then set up according to the experimental design after the field had been flattened and puddled with cage wheels.

2.2.2 Application of fertilizers

The test crop was 894 ertilized according to treatment using the N: P_2O_5: K_2O (150:60:40 kg ha^{-1}) recommended fertilizer dose (RDF) for the Ayodhya region. Before transplanting, potassium, phosphorus, and nitrogen were all administered topically at the recommended doses. At the active tillering and panicle initiation stages, the remaining two thirds of nitrogen were applied in two equal portions.

2.3 Growth Parameter

For the record of growth and yield parameter following methodology were used:

2.3.1 Plant height (cm)

The height of the plants was measured from the base of the plant to the tip of the uppermost fully opened leaf at harvest and at 30, 60, and 90 days following transplantation from five randomly chosen/tagged hills. Height was measured from the point when the panicle first emerged to its tip.

2.3.2 Number of tillers (m^{-2})

At 30, 60, 90, and at harvest from each plot, tillers were counted from 5 tagged hills to determine the average number of tillers hill. Attributes and yields of the crop. During experiments, the following observations on yield and yield studies were made.

2.3.3 Effective tillers (m^{-2})

At 30, 60, and 90 DAT, as well as at harvest, crop plants from each plot were cut with a sickle at ground level in three different places along the sample lines. The plants were then allowed to dry in an oven at 70^0 C until a steady weight was attained. The weight of the dry substance was then determined using an electronic scale and given as dry weight in gram $hills^{-1}$.

2.3.4 Length of panicle (cm)

Ten randomly selected panicles from tagged plants were measured from the neck node to the tip of the topmost spikelet, and the average length was recorded.

2.3.5 Numbers of grain $panicle^{-1}$

After the crop had reached full maturity, it was measured by randomly planting 0.25 m^2 quadrate at two different positions within each net plot. The quantity of panicles that entered the quadrate was counted, and the average number of panicles m^{-2} was recorded.

2.3.6 Flag leaf area (cm^2)

Grid paper: Place the flag leaf on a sheet of graph paper or any paper with a grid pattern. Trace the outline of the leaf on the paper and count the number of grid squares that the leaf covers. Multiply this count by the known area represented by each grid square to calculate the total leaf area.

2.3.7 Test weight (g)

Grain samples were taken from the threshed and cleaned produce of each net plot and 1000grains were counted and weighed.

2.3.8 Grain yield (q ha^{-1})

The net plot's harvested produce was sun-dried and threshed to determine the grain yield in kg $plot^{-1}$.Straw yield (q ha^{-1}).

The straw yield was worked out by subtracting the grain yield from total biologicalyield and finally it was computed to q ha^{-1}.

2.3.9 Harvest index (%)

Harvest index of each experimental plot is calculated with the help of following formulae:

Harvest index= (Grain yield / Biological yield)

3. RESULTS AND DISCUSSION

3.1 Effect of Bio Dynamic Compost and Bio Dynamic Compost wash on Plant height (cm)

The maximum plant height 36.25 cm, 80.20 cm, 109.5 cm and 112 cm respectively, at 30 DAS, 60 DAT, 90 DAT and at harvesting stage were recorded with the application of T_7 (T_3 + foliar application of Bio Dynamic compost wash of 10 ml 10 lit^{-1} of water) and statistically at par with T_5:-(T_3 + Root dipping with Bio dynamic compost wash 10 ml lit^{-1} of water) while, minimum plant height was observed under the non-treatment plot (Control) T_1. It was observed that plant height of rice can be increased sustainably with the application of Bio dynamic compost, root dipping with Bio dynamic compost wash and foliar application of Bio dynamic wash at different growth stages of crop. In contrast, 100 % RDF also gave significantly higher growth compared to control plot. Similar observations also reported by Mahmud [3].

3.2 Dry matter Accumulation

The maximum dry matter accumulation m^{-2} 227.5, 460.25, 797.5 and 1401.70 m-2 respectively, at 30 DAS, 60 DAT, 90 DAT and at harvesting stage were recorded with the application of T_7 (T_3 + foliar application of Bio dynamic compost wash wash of 10 ml lit^{-1} of water) and statistically at par with T_5 (T_3 + Root dipping with Biodynamic compost wash 10 ml lit^{-1} of water) while minimum dry matter accumulation m^{-2} was observed under the non-treatment plot (Control) T_1.The reason for the increase in total dry matter production could be that HA has promotive effect on photosynthesis by increasing soluble protein content (Khristeva and Luk" Yanenka, 1962). Similar results was obtained by Ravindra Prasad et al. [4], Tiwana et al. [5] studying on rice-wheat sequence with or without green manure to rice have also reported favourable effect of green manuring on dry matter accumulation by rice at all stages of crop growth. Khan et al. [6] reported application of lime with FYM before planting showed beneficial effect during initial growth stages and dry matter production through stimulated mineralization of nitrogen from FYM and soil.

3.3 Effect on Yield and Yield Attributes

Data pertaining to grain yield (q ha^{-1}), straw yield (q ha^{-1}), biological yield (q ha^{-1}) and harvesting index (%) as influenced by various treatments Table 4 & Fig. 3. Among the various treatments application of T_7 (T_3 +foliar application of Bio dynamic compost wash of 10 ml lit^{-1} of water) significantly influenced the maximum grain yield (57.92 q ha^{-1}),straw yield (82.25 q ha^{-1}),biological yield (140.17 q ha^{-1}) and harvest index (41.31%), and these were statistically at par with T_5:-(T_3 + Root dipping with Bio dynamic compost wash 10 ml lit^{-1} of water) while minimum grain yield, straw yield, biological yield and harvesting index was observed under the non-treatment plot (Control) T_1.

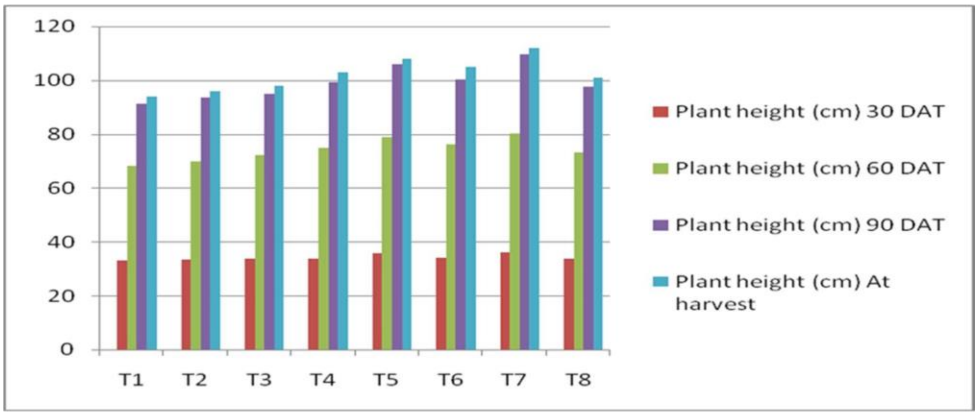

Fig. 1. Effect of bio dynamic compost and bio dynamic compost wash on plant heightat different days after sowing

Table 1. Details of treatment used in experiment

Treatment No.	Treatment details
T1	Absolute Control
T2	Bio Dynamic Compost 1q/ha+50%RDF
T3	Bio Dynamic compost 1.5 q/ha+50%RDF
T4	T2+Root dipping with Bio Dynamic compost wash 10 ml/ lit of water
T5	T3 + Root dipping with Bio Dynamic compost wash 10 ml/lit of water
T6	T2+foliar application of Bio Dynamic compost wash of 10 ml/ lit of water
T7	T3 +foliar application of Bio Dynamic compost wash of 10 ml/ lit of water
T8	100%RDF

Table 2. Effect of bio dynamic compost and bio dynamic compostwash on plant height (cm)

S.No.	Treatment combination	Plant height(cm)			
		30 DAT	60 DAT	90 DAT	At harvest
T1	Control	33.20	68.20	91.20	94.00
T2	Bio dynamic compost1q ha^{-1} +50 % RDF	33.50	69.80	93.50	96.00
T3	Bio dynamic compost1.5 q ha^{-1} + 50 % RDF	33.70	72.10	95.00	98.00
T4	T2 + Root dipping withBio dynamic compost wash 10 ml lit^{-1} of water	33.90	75.00	99.40	103.00
T5	T3 + Root dipping withBiodynamic wash 10 ml lit^{-1} of water	35.80	79.00	106.10	108.00
T6	T2 + foliar application of Bio dynamic compost wash of 10 mllit^{-1} of water	34.10	76.20	100.40	105.00
T7	T3 + foliar application of Bio dynamic compost wash of 10 mllit^{-1} of water	36.20	80.20	109.50	112.00
T8	100 % RDF	33.80	73.1	97.50	101.10
SEm±		0.473	1.01	1.353	1.399
C.D.		1.447	3.12	4.144	4.284

Table 3. Effect of bio dynamic compost and bio dynamic compost on dry matter accumulation m^{-2} of rice crop

S. No.	Treatment combination	Dry matter accumulation m^{-2}			
		30 DAT	60 DAT	90 DAT	At harvest
T1	Control	188.10	424.11	715.30	908.30
T2	Bio dynamic compost1q ha^{-1} +50 % RDF	194.10	412.70	726.30	1144.20
T3	Bio dynamic compost2 q ha^{-1} +50 % RDF	198.10	431.10	734.10	1184.70
T4	T2 + Root dipping with Bio dynamic compost wash 10 mllit^{-1} of water	205.40	435.10	752.20	1293.80
T5	T3 + Root dippingwith Biodynamicwash 10 ml lit^{-1} of water	218.10	455.20	780.10	1379.70
T6	T2 + foliar applicationof Biodynamic compost wash of 10ml lit^{-1} ofwater	211.10	470.50	761.20	1340.70
T7	T3 + foliar applicationof Bio dynamic compost wash of 10ml lit^{-1} of water	227.50	460.20	797.50	1401.70
T8	100 % RDF	201.20	480.50	742.10	1233.10
SEm±		2.80	6.17	10.34	17.06
C.D.		8.59	18.91	31.68	52.24

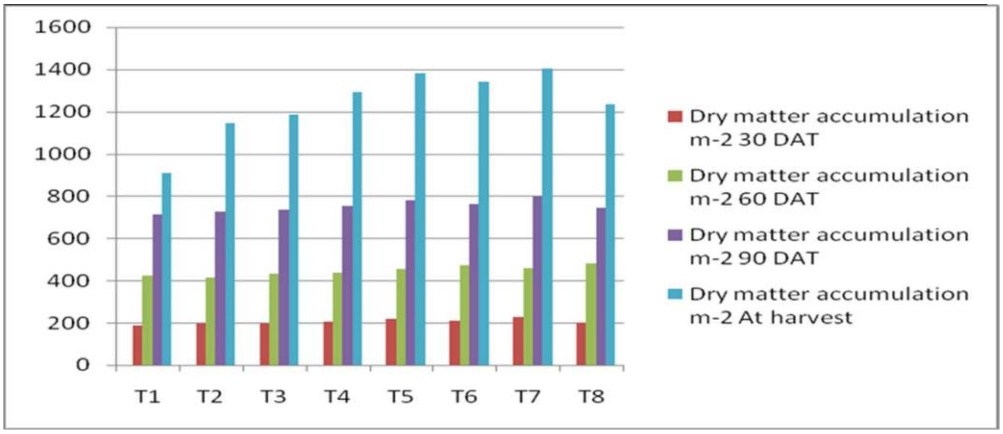

Fig. 2. Effect of bio dynamic compost and bio dynamic compost dry wash on matter accumulation at different days after sowing

The above finding showed that the optimum dose of nitrogen, phosphorus, potassium and Bio dynamic compost and their interaction increased the vegetative growth significantly, which helped to increase the grain and straw yield, biological yield and ultimately harvest index of rice. The higher yields with T_7:-(T_3+foliar application of Bio dynamic compost wash of 10 ml lit^{-1} of water) were mainly owing to adequate supply of major nutrients to plants, which in turn contributes to better growth and yield attributes, thus leading to higher yields. Our findings are in close conformity with Kumar et al. [7] who had also reported similar to present results.

3.4 Effect of Different Treatments on Number of Grains Panicle^{-1}

It is obvious from Table 4 that the number of grains panicle^{-1} in rice was firmly affected by various treatment combinations. The maximum number of grains panicle^{-1} (150.5) was recorded with treatment T_7:-(T_3 + foliar application of Bio dynamic compost wash of 10 ml lit^{-1} of water) which was significantly superior over the treatment T_1(control), and T_5:-(T_3 + Root dipping with Bio dynamic wash 10 ml lit^{-1} of water) which was statistically at par to each other in their performance. However, minimum number of grains panicle^{-1} (114.25) was recorded in T_1 (control) treatment. Similar to present finding Muhammad Usman et al. [8] also reported that increased number of grains per panicle in rice might be due to better utilization phosphorus in organic manures, phosphorus as a part of DNA played a crucial role in the building of genetic parts of plants.

3.5 Effect of Different Treatments on Panicle Length (cm)

The data presented in Table 5 & Fig. 4 revealed that the panicle length vigorously affected by various treatment combinations. The maximum panicle length (25.20 cm) was recorded with treatment T_7:-(T_3 + foliar application of Bio dynamic compost wash of 10 ml lit^{-1} of water) which was significantly superior over the treatment T_1 (control), and statistically at par with T_5:- (T_3 + Root dipping with Bio dynamic wash 10 ml lit^{-1} of water). The minimum panicle length (20.78 cm) was recorded in T_1 (control) treatment. HA improved soil nutrient status by increasing organic matter (9%), total N (30%), available P (166%) and available K (52%). Similar observation was also recorded by Reddy et al. [9] as well as Dixit and Gupta [10]. Murali and Setty [11] observed that the increased yield and yield attributing character are mainly due to better source and sink relationship such as increased dry matter production and its translocation from source to sink.

3.6 Effect of Different Treatments on Test Weight (g)

Test weight of rice generally varied from 22.00 to 26.00 g. There is no significant difference found between treatments. However, highest test weight was observed in T_7:-(T_3 + foliar application of Bio dynamic compost wash of 10 ml lit^{-1} of water) (26.09 g) and lowest is observed in control T_1 (22.24 g).

The results are in close conformity with the findings of Mondal et al. [12].

Table 4. Effect of bio dynamic compost and bio dynamic compost wash on grain yield (qha^{-1}). straw yield (q ha^{-1}), biological yield (q ha^{-1}), harvest index (%) of rice crop

S. No.	Treatment combinations	Grain yield (qha^{-1})	Straw Yield (q ha^{-1})	Biological yield(q ha^{-1})	Harvest Index(%)
T1	Control	36.30	54.50	90.80	39.90
T2	Bio dynamic compost1q ha^{-1} + 50 % RDF	47.10	67.30	114.40	41.10
T3	Bio dynamic compost 2q ha^{-1} + 50 % RDF	48.60	69.80	118.40	41.00
T4	T2 + Root dipping with Bio dynamic compostwash 10 ml lit^{-1} of water	53.20	76.10	129.30	41.10
T5	T3 + Root dipping with Bio dynamic wash 10 ml lit^{-1} of water	56.20	81.70	137.90	40.70
T6	T2 + foliar application of Bio dynamic compost wash of 10 ml lit^{-1} of water	54.80	79.10	134.00	40.90
T7	T3 + foliar application of Bio dynamic compost wash of 10 ml lit^{-1} of water	57.90	82.20	140.10	41.30
T8	100 % RDF	51.11	72.20	123.30	41.40
SEm±		0.70	1.00	1.70	0.57
C.D at 5 %		2.14	3.07	5.22	N/S

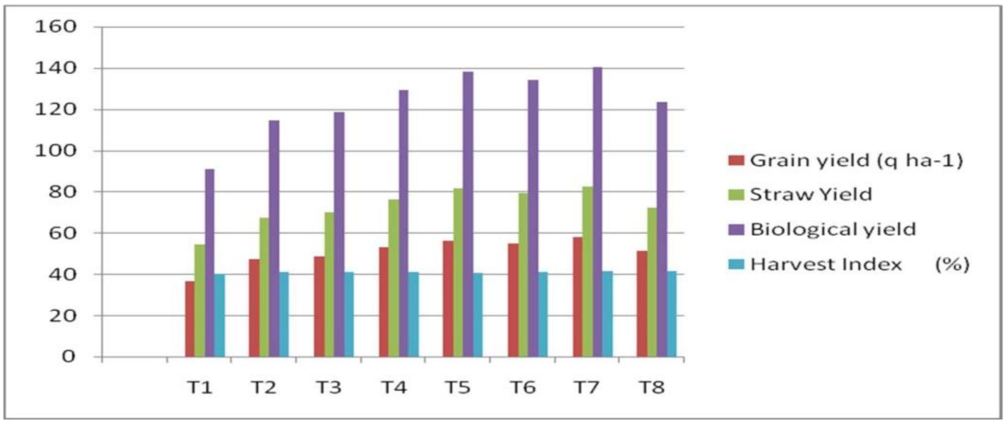

Fig. 3. Effect of bio dynamic compost and bio dynamic compost washon grain yield (qha^{-1}) straw yield (q ha^{-1}), biological yield (q ha^{-1}), harvest index (%) of rice crop

3.7 Number of Tillers (m^{-2})

The number of tillers increased at different stage of crop growth different methods of applying Bio dynamic compost and Bio dynamic compost wash. The maximum number of tillers m^{-2} at harvesting stage were recorded with the application of T7:- (T3 + foliar application of Bio dynamic compost wash of 10 ml lit^{-1} of water) which is statistically at par with T5:- (T3 + Root dipping with Bio dynamic wash 10 ml lit^{-1} of water) while minimum number of tillers m^{-2} was observed under the non-treatment plot (Control)T1.Tillering is an important trait for grain production and is thereby an important aspect in rice yield. The results are in conformity with the findings of Singh and Jain [13], and Godhwale et al. [14].

Table 5. Effect of bio dynamic compost and bio dynamic compost wash on panicle length (cm), number of grains panicle^{-1}, Test weight (g) and number of tillers (m^{-2})

S. No.	Treatment combination	Yield attribute			No of tiller(m^{-2})
		Panicle length(cm)	No. of grain panicle^{-1}	Test weight(gram)	At Harvest
T1	Control	20.70	114.20	22.20	308.90
T2	Bio dynamic compost1q ha^{-1} + 50 % RDF	21.90	114.60	22.60	317.90
T3	Bio dynamic compost1.5 q ha^{-1} + 50 %RDF	22.80	138.50	22.80	329.00
T4	T2 + Root dippingwithBio dynamic compost wash 10 ml lit^{-1} ofwater	24.00	143.10	23.50	348.00
T5	T3 + Root dipping with Bio dynamic wash 10 ml lit^{-1} of water	25.00	145.50	25.10	365.00
T6	T2 + foliar application ofBio dynamic compostwash of 10 ml lit^{-1}of water	24.10	143.50	23.70	352.00
T7	T3 + foliar application ofBio dynamic compostwash of 10 ml lit^{-1}of water	25.20	150.00	26.00	366.90
T8	100 % RDF	23.40	141.20	23.28	336.90
SEm±		0.32	1.89	0.32	4.71
C.D.at 5%		0.99	5.80	0.99	14.42

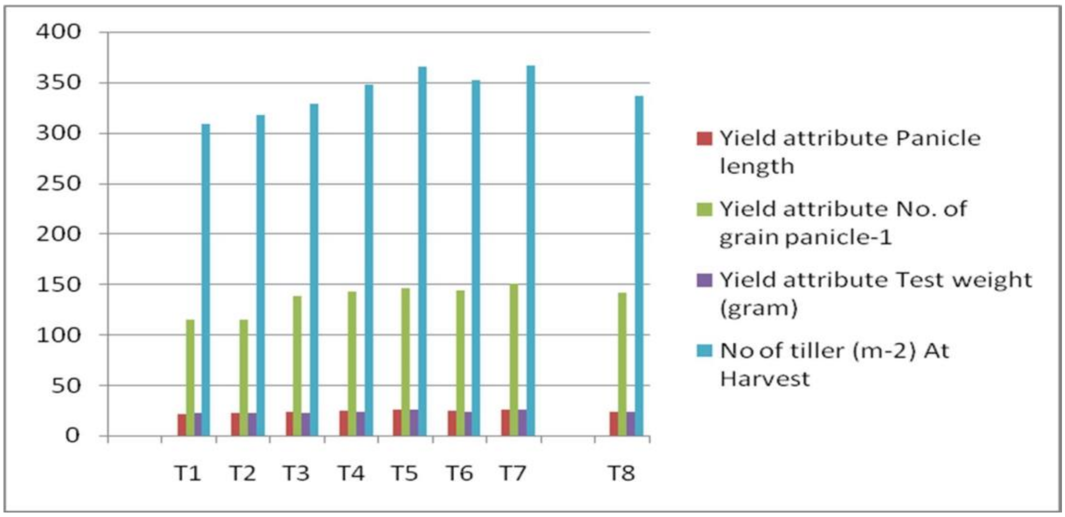

Fig. 4. Effect of bio dynamic compost and bio dynamic compost wash on paniclelength(cm), number of grains panicle^{-1}, test weight (g), and number of tillers (m^{-2})

3.8 Effect of Bio Dynamic Compost and Bio Dynamic Compost wash on plant population

It is obvious Table 6 that the plant population in rice was firmly affected by various treatment combinations. The maximum plant population at initial stage (52) and at final stage(50) was recorded with treatment T7 (T3 + foliar application of Bio dynamic compost wash of 10ml lit^{-1} of water) which was significantly superior over the treatment T1(control) and statistically at par with T5:-(T3 + Root dipping with Bio dynamic wash 10 ml lit^{-1} of water).The minimum plant population at initial stage (45) and at final stage(42) was recorded in T1 (control) treatment due to the biotic and abiotic stress final plant population decrease.

3.9 Effect of bio Dynamic Compost and Bio Dynamic Compost Wash on Flag Leaf Area(cm^2)

The data on progressive Flag leaf area at the successive stages of crop growth as greatly influenced by various Bio dynamic compost application practices. The presented in Table 7 depicted that, at 30 Panicle initiation, at 50% flowering, 100% flowering and at harvesting stage clearly indicates that bio-decomposed treatment influenced significantly over all treatment.The maximum Flag leaf area (38.50 cm^2), (43.98cm^2) and (44.52cm^2) respectively, at 30 Panicle initiation, at 50% flowering, 100% flowering stage were recorded with the application of T7(T3 + foliar application of Bio dynamic compost wash of 10 ml lit^{-1} of water) This treatment was statistically comparable to T5 (T3 + Root dipping with Bio dynamic wash 10 ml lit^{-1} of water) while minimum Flag leaf area was observed under the non-treatment plot (Control) T1. The primary factor of photosynthetic rate is leaf area. Higher dry matter production results from larger leaf area expansion because it improves light absorption [15]. The stimulation of chloroplast growth, particularly in terms of size, by HA therapy may have contributed to the increase in leaf area and, number of grana mm'2 as reported by Forton et al. [16].

Table 6. Effect of bio dynamic compost and bio dynamic compost wash onplant population in rice

S.No.	Treatment combination	Initial plant population (m^{-2})	Final plant population
T1	Control	46	42
T2	Bio dynamic compost 1q ha^{-1} +50 % RDF	48	44
T3	Bio dynamic compost 1.5 q ha^{-1} + 50 % RDF	47	45
T4	T2 + Root dipping with Biodynamic compost wash 10 ml lit^{-1} of water	48	46
T5	T3 + Root dipping with Biodynamic wash 10 ml lit^{-1} of water	51	48
T6	T2 + foliar application of Biodynamic compost wash of 10 ml lit^{-1} of water	49	46
T7	T3 + foliar application of Biodynamic compost wash of 10 ml lit^{-1} ofwater	52	50
T8	100 % RDF	47	46
SEm±		0.66	0.63
C.D.		2.04	1.939

Table 7. Effect of bio dynamic compost and bio dynamic compost wash on flag leafarea (cm^2)

S.No.	Treatment combination	Flag leaf area(cm^2)		
		Panicle initiation	At 50% Flowering	At 100% Flowering
T1	Control	33.48	40.85	40.25
T2	Bio dynamic compost 1q ha^{-1} + 50 % RDF	35.37	40.90	42.10
T3	Bio dynamic compost 1.5 q ha^{-1} + 50 %RDF	35.55	41.20	41.90
T4	T2 + Root dipping with Bio dynamiccompost wash 10 ml lit^{-1} of water	36.40	42.15	42.60
T5	T3 + Root dipping with Bio dynamic wash10 ml lit^{-1} of water	38.10	43.10	43.25
T6	T2 + foliar application of Bio dynamiccompost wash of 10 ml lit^{-1} of water	35.78	42.10	42.11
T7	T3 + foliar application of Bio dynamic washof 10 ml lit^{-1} of water	38.50	43.98	44.52
T8	100 % RDF	35.79	41.8	42.65
SEm±		0.50	0.581	0.589
C.D.		1.532	1.78	1.803

4. CONCLUSION

On the basis of the current experiment , it can be concluded that the application of Bio dynamic compost 1.5q ha^{-1} + 50% RDF + foliar application of Bio dynamic compost wash of 10 ml lit^{-1} of water may be advised to acquire the high values of growth and yield characteristics in rice crop.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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