EvaluationofBioDynamicCompostandBioDynamicCompostwashongrowthand yieldofrice

Abstract

The present investigation, was conducted in the *Kharif* of 2021–2022 at the Student'sInstructional Farm at the A.N.D. University of Agriculture & Technology, Kumarganj, Ayodhya (U.P.). Theexperiment was laid out in Randomized Block Design, replicated thrice, having 8 treatments i.e. T_1 (AbsoluteControl), T_2(Bio dynamic compost 1q/ha + 50 % RDF),T_3(Bio dynamic compost 2 q/ha + 50 % RDF),T_4(T_2+ Root dipping with Bio dynamic compost wash 10 ml/ lit of water), T_5(T_3+ Root dipping with Biodynamic wash 10 ml/lit of water), T_6 (T_2 + foliar application of Bio dynamic compost wash of 10 ml/10 lit ofwater), T_7 (T_3 +foliar application of Bio dynamic compost wash of 10 ml/ lit of water), T_8 (100 % RDF. Resultrevealed that the highest growth attributes viz., Plant height (cm), maximum dry matter accumulation, highestnumber of tiller (m^{-2}), Panicle length (cm), number of grain per panicle and test weight (gm),maximum grainyield(q ha^{-1}),highest straw yield, maximumbiological yield (q ha^{-1})and maximumharvest index (q ha^{-1})was recorded significantly over rest of the treatments in T_7(T_3+foliar application of Bio dynamic compostwashof10ml/litofwater)whileitrecordedlowestininT$_1$(absolutecontrol)duringtheinvestigation.

Keywords: Biodynamiccompost,Biodynamicwash,Growthattribute,Yieldattribute

1.0Introduction:

Rice(*Oryzasativa*L.)isoneinallthemostimportantfoodcrops,growninsouthAsia.Riceisthemostpopularstaplemealconsumedbymorethanhalfoftheworld'spopulation,especially in Asia and Africa. As a result, it is a key source of food for around 35% of theworld'spopulationandoneoftheprincipalcropsindevelopingnations.

After maize and sugarcane, it is the agricultural product with the third-highest globalproduction**(https://www.fao.org/faostat/en/#data/QCL).**Thericeplantiscapableofgrowing 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).Thesmallwind-pollinatedblossomsarecarriedbyabranching,arching,topendulousinflorescencethatis30–50cm(12–20in)inlength.Themostextensivelyproducedgraininthe world, paddy is a staple meal for more than 60% of humanity. Over the last 15 years, theglobal paddy output has expanded gradually but slowly, from 400 million tonnes to 477 milliontonnes.The world's first crop to be intentionally grown is said to have been paddy. Asia, whichleads the sector, produces over 90% of the world's paddy crop. It is the second most widelygrown 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 in2020-21 was 122.27 million tons with productivity of 2713 kg ha^{-1}under 43.82 mha area inIndia. In Uttar Pradesh, production was 15.66 million tons and productivity was 2759 kg ha^{-1}under19.93mhaareain2020-21.

Accordingto**Ponnamperuma*etal.*(1982)**,ricestrawismostsuitedforthisuse 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.Therearemanydifferentproduction techniques utilisedtocreateorgano-mineralfertilisersfromorganicandmineralwastes.Numerousstudieshaveshownthatchemical,thermochemical, and biological methods can all be used to produce products with adequatefertilising capabilities. The nature of the employed feedstock and the intended market have amajor role in the selection of an appropriate procedure. This section thoroughly examines themost significant chemical and biological techniques used in the OMF generation process byvalorisingorganic/mineralwasteandlow-gradephosphate.Biodynamicfarmingisamethodof production that actively cooperates with the elements of nature that support wellness. Itserved as the catalyst for the nonchemical farming movement. In a nutshell, "biodynamic"agricultureisagroupof"biologicaldynamic"farmingpractises.Numerouswell-knownorganic agriculture practises that improve soil health are referred to as "biologically" in thissentence.

"Dynamic" farming methods try to change the biological and metaphysical qualities ofthefarm(likeincreasingvitallifeenergy)ortomakethefarmmoreinsyncwiththeseasons (like sowing seeds at certain moon phases). The initial biodynamic formulations were identifiedbynumbers(500–508).ThefermentationprocessfortheBD500preparation,sometimesreferred to as horn manure, takes place in a cow horn that has been buried in dirt for six monthsintheautumnandwinter.Thequartzpowder-basedBD501preparation(horn-silica)ispackagedin a cow horn and submerged in soil forsix months in the spring and summer.Thefact that biodynamic preparations 502–507 are used to create the compost makes it special. Inmany nations,biodynamicfarming is carried out on a commercial scale, and it isbecomingmore well-known for its contributions to community supported agriculture, organic farming,foodquality,andqualitativetestsforsoilsandcomposts.Fromareal-worldperspective,biodynamic farming has been shownto be effective and produce wholesome,high-qualityfoods **(Steve Diver, 1999).** Therefore**,** present investigation was emphasized to know the effectofbiodynamiccompostandbiodynamicwashongrowthandyieldparametersofrice.

2.0 MaterialsandMethods:

2.1 Experimentalsiteandclimaticconditions:

TheexperimentswereconductedattheStudent'sInstructionalFarmoftheAcharyaNarendra Deva University ofAgriculture and Technologyin Kumarganj, Ayodhya,whichis located in the subtropical Indo Gangetic Plains climate zone at 26.470 N latitude, 82.120Elongitude,andanelevationof113metresabovemeansealevel.

2.2 Culturaloperations:

2.2.1 Preparationoffield:

The experimental area was ploughed with tractor justafterharvestofwintercropandploughedagaininthe 3rd week of July. The experiment was then set up according to theexperimentaldesignafterthefieldhadbeenflattenedandpuddledwithcagewheels.

2.2.2 Applicationoffertilizers

The test crop was fertilised 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 theactivetilleringandpanicleinitiationstages,theremainingtwothirdsofnitrogenwereappliedintwoequalportions.

2.3 Growth parameter: For the record of growth and yield parameter following methodologywereused:

2.3.1 Plantheight(cm)

Theheightoftheplantswasmeasuredfromthebaseoftheplanttothetipoftheuppermost fully opened leaf at harvest and at 30, 60, and 90 days following transplantation from fiverandomly chosen/taggedhills.Heightwas measured from the point when the panicle firstemergedtoitstip.

2.3.2 Numberoftillers(m^{-2}):

At30, 60,90, and at harvest from each plot, tillers were counted from 5 taggedhills todeterminetheaveragenumberoftillershill.Attributesandyieldsofthecrop.

Duringexperiments,thefollowingobservationsonyieldandyieldstudiesweremade.

2.3.3 Effectivetillers(m^{-2}):

At30,60,and90DAT,aswellasatharvest,cropplantsfromeachplotwerecutwithasickleat groundlevel inthreedifferent places along the sample lines.Theplants were then allowedto dry in an oven at 70 ^{0} C until a steady weight was attained. The weight of the dry substancewasthendeterminedusinganelectronicscaleandgivenasdryweightingramhills^{-1}.

2.3.4 Lengthofpanicle(cm):

Tenrandomlyselectedpaniclesfromtaggedplantsweremeasuredfromthenecknodetothetipofthetop mostspikelet,andtheaveragelengthwasrecorded.

2.3.5 Numbersofgrainpanicle^{-1}:

Afterthecrophadreachedfullmaturity,itwasmeasured byrandomlyplanting 0.25m^2quadrateat twodifferent positions within each netplot. The quantity ofpanicles that enteredthequadratewascounted,andtheaveragenumberofpaniclesm^{-2}wasrecorded.

2.3.6 Flagleafarea(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 theleaf covers. Multiply this count by the known area represented by each grid square tocalculatethetotalleafarea.

2.3.7 Testweight(g):

Grainsamplesweretakenfromthethreshedandcleanedproduceofeachnetplotand1000grainswerecounted andweighed.

2.3.8 Grainyield(qha^{-1})

Thenetplot'sharvestedproducewassun-driedandthreshedtodeterminethegrainyieldinkgplot^{-1}.Strawyield(q ha^{-1}).

Thestrawyieldwasworkedoutbysubtractingthegrainyieldfromtotalbiological yieldandfinallyitwascomputedtoqha^{-1}.

2.3.9 Harvestindex(%)

Harvestindexofeachexperimentalplotiscalculatedwiththehelpoffollowingformulae:

$$\text{Harvestindex} = \frac{\text{Grainyield}}{\text{Biologicalyield}}$$

Table-1: Detailsoftreatmentusedinexperiment

TreatmentNo.	Treatmentdetails
T_1	AbsoluteControl
T_2	BioDynamicCompost1q/ha+50%RDF
T_3	BioDynamiccompost1.5q/ha+50%RDF
T_4	T_2+RootdippingwithBioDynamiccompostwash10ml/litofwater
T_5	T_3+RootdippingwithBioDynamiccompostwash10ml/litofwater
T_6	T_2+foliarapplicationofBioDynamiccompostwashof10ml/litofwater
T_7	T_3+foliarapplicationofBioDynamiccompostwashof10ml/litofwater
T_8	100%RDF

3.0 ResultsandDiscussion:

3.1 Effect ofBio DynamicCompost andBio DynamicCompostwashon 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 + foliarapplication ofBio Dynamic compostwash of10 ml 10 lit^{-1}ofwater) and statistically atparwith 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 observedthat plant height of rice can be increased sustainably with the application of Bio dynamiccompost, root dipping with Bio dynamic compost wash and foliar application of Bio dynamicwash at different growth stages of crop. In contrast, 100 % RDF also gave significantly highergrowthcomparedtocontrolplot.Similarobservationsalsoreportedby**Mahmud(2016).**

Table-2: EffectofBioDynamicCompostandBioDynamicCompostwashonPlantheight(cm)

S.No.	Treatmentcombination	Plant height (cm)			
		30 DAT	60 DAT	90 DAT	At harvest
T_1	Control	33.20	68.20	91.20	94.00
T_2	Biodynamiccompost1qha^{-1}+ 50%RDF	33.50	69.80	93.50	96.00
T_3	Biodynamiccompost 1.5qha^{-1}+50%RDF	33.70	72.10	95.00	98.00
T_4	T_2 + Root dipping withBiodynamiccompostwash10 mllit^{-1}ofwater	33.90	75.00	99.40	103.00
T_5	T_3+RootdippingwithBiodynamicwash10 mllit^{-1}ofwater	35.80	79.00	106.10	108.00
T_6	T_2 + foliar application of Biodynamiccompostwashof10 mllit^{-1}of water	34.10	76.20	100.40	105.00
T_7	T_3 + foliar application of Biodynamiccompostwashof10 mllit^{-1}of water	36.20	80.20	109.50	112.00
T_8	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

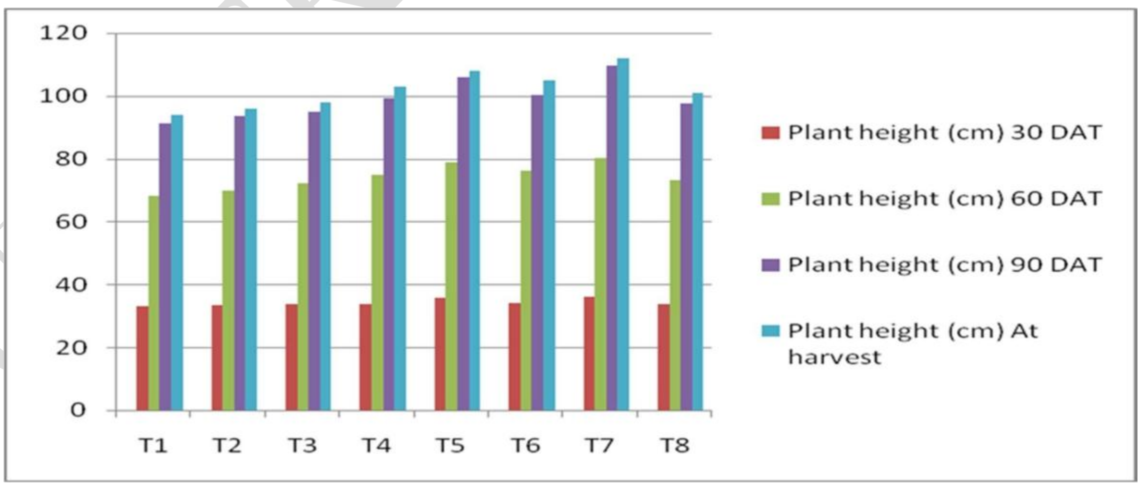

Fig-1: EffectofBioDynamicCompostand BioDynamicCompostwashonPlantheightatdifferent daysaftersowing

3.2 Drymatteraccumulation:

Themaximumdry matter accumulation m^{-2}227.5, 460.25,797.5 and 1401.70m-2 respectively, at 30 DAS, 60 DAT, 90 DAT and at harvesting stage were recordedwith the application of T_7 (T_3 + foliar application of Bio dynamic compost wash wash of10 ml lit^{-1} of water) and statistically at par with T_5 (T_3 + Root dipping with Biodynamiccompost wash 10 ml $lit^{-1}$of water) while minimum dry matter accumulation m^{-2}wasobservedunder the non-treatmentplot(Control) T_1.The reason for the increasein totaldry matterproduction couldbethatHA has promotiveeffect onphotosynthesisbyincreasingsolubleproteincontent(**KhristevaandLuk‟Yanenka,1962**). Similarresults was obtained by **Ravindra Prasad *et al*., (1989)** &**Tiwana *et al*.(1999)** studyingonrice-wheatsequencewithorwithoutgreenmanuretoricehavealsoreportedfavourable effect of green manuring on dry matter accumulation by rice at all stages ofcrop growth. **Khan *et al*., (1986)** reported application of lime with FYM before plantingshowed beneficial effect during initial growth stages and dry matter production throughstimulated mineralizationofnitrogenfromFYMandsoil.

Table-3: Effect of Bio Dynamic Compost and Bio Dynamic Compost on Dry matteraccumulationm^{-2} ofricecrop

S. No.	Treatmentcombination	Drymatteraccumulationm^{-2}			
		30 DAT	60 DAT	90 DAT	Atharvest
T_1	Control	188.10	424.11	715.30	908.30
T_2	Biodynamiccompost1qha^{-1}+50%RDF	194.10	412.70	726.30	1144.20
T_3	Biodynamiccompost2qha^{-1}+50%RDF	198.10	431.10	734.10	1184.70
T_4	T_2+RootdippingwithBiodynamiccompostwash10mllit^{-1}ofwater	205.40	435.10	752.20	1293.80
T_5	T_3+RootdippingwithBiodynamicwash10mllit^{-1}ofwater	218.10	455.20	780.10	1379.70
T_6	T_2+foliarapplicationofBiodynamic compostwashof10mllit^{-1}ofwater	211.10	470.50	761.20	1340.70

T_7	T_3+foliarapplicationofBiodynamiccompostwashof10mllit^{-1}ofwater	227.50	460.20	797.50	1401.70
T_8	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

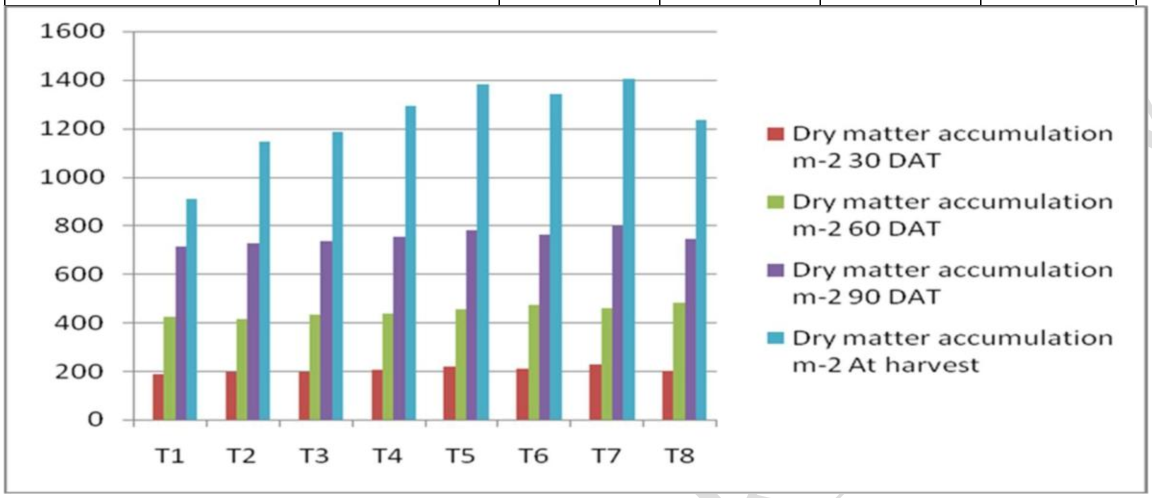

Fig-2: EffectofBioDynamicCompostandBioDynamicCompostdrywashonmatteraccumulationatdifferentdaysaftersowing

3.3 Effectonyieldandyieldattributes:

Data pertaining to grain yield (q ha^{-1}), straw yield (q ha^{-1}), biological yield (qha^{-1}) and harvesting index (%) as influenced by various treatments (Table-4 & Fig-3).Among the various treatmentsapplication of T_7 (T_3 +foliar application of Bio dynamiccompost 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 harvestindex (41.31%), and thesewerestatistically at parwith T_5:-(T_3+ Root dipping withBio dynamic compost wash 10 ml lit^{-1}ofwater) while minimum grain yield, strawyield, biological yield and harvesting index was observed under the non-treatment plot(Control)T_1.

Theabovefindingshowedthattheoptimumdoseofnitrogen,phosphorus,potassium and Bio dynamic compost and their interaction increased the vegetativegrowth significantly, which helped to increase the grain and straw yield, biologicalyieldandultimatelyharvestindexofrice.ThehigheryieldswithT$_7$:-(T_3+foliarapplication ofBio dynamic compost wash of10 ml lit^{-1}ofwater) were mainly owingto adequate supply of major nutrients to plants, which in turn contributes to bettergrowthandyieldattributes,thusleadingtohigheryields.Ourfindingsareinclose conformitywith**Kumar*etal.*,(2022)**whohadalsoreportedsimilartopresentresults.**Table-4:**Effect ofBioDynamicCompostandBioDynamicCompostwashonGrainyield(qha^{-1}).Strawyield(qha^{-1}),Biologicalyield(qha^{-1}),Harvestindex(%) ofricecrop.

S.No.	**Treatmentcombinations**	**Grain yield (qha^{-1})**	**Straw Yield(qha^{-1})**	**Biological yield (qha^{-1})**	**Harvest Index (%)**
T_1	Control	36.30	54.50	90.80	39.90
T_2	Bio dynamic compost1qha^{-1}+50%RDF	47.10	67.30	114.40	41.10
T_3	Biodynamiccompost2qha^{-1}+50%RDF	48.60	69.80	118.40	41.00
T_4	T_2+RootdippingwithBio dynamic compostwash10mllit^{-1}of water	53.20	76.10	129.30	41.10
T_5	T_3+RootdippingwithBiodynamicwash10 mllit^{-1}ofwater	56.20	81.70	137.90	40.70
T_6	T_2 + foliar applicationof Bio dynamiccompostwash of10ml lit^{-1}ofwater	54.80	79.10	134.00	40.90
T_7	T_3 + foliar applicationof Bio dynamiccompostwash of10ml lit^{-1}ofwater	57.90	82.20	140.10	41.30
T_8	100%RDF	51.11	72.20	123.30	41.40
SEm±		0.70	1.00	1.70	0.57
C.Dat5%		2.14	3.07	5.22	N/S

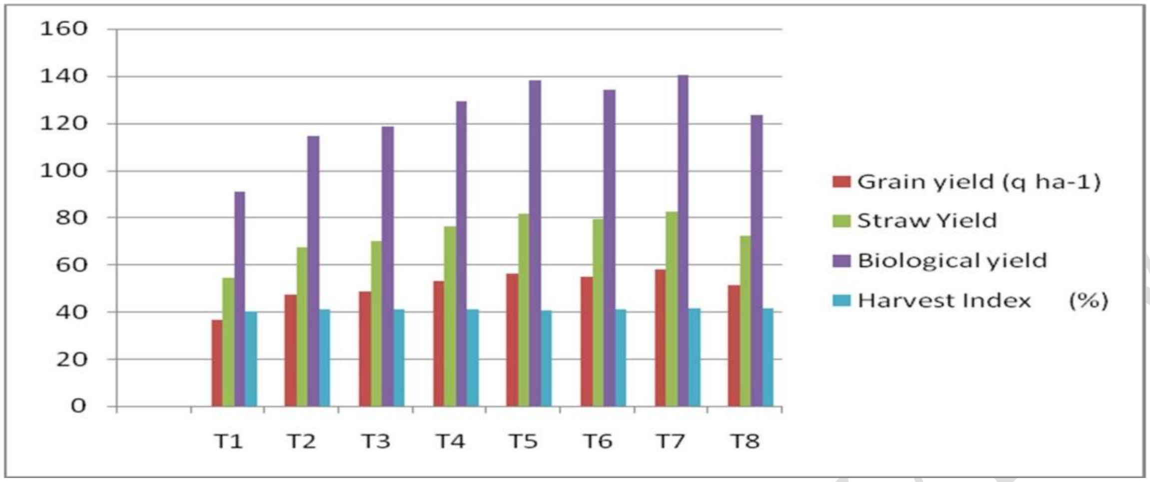

Fig-3:EffectofBioDynamicCompostandBioDynamicCompostwashon Grain yield(qha^{-1}) Straw yield (q ha^{-1}), Biological yield (q ha^{-1}), Harvestindex(%) ofricecrop.

3.4 Effectofdifferenttreatmentsonnumberofgrainspanicle^{-1}:

It is obvious from (Table-4) that the number of grains panicle^{-1}in rice was firmly affected byvarioustreatmentcombinations.Themaximumnumberofgrainspanicle^{-1}(150.5)wasrecordedwithtreatmentT$_7$:-(T$_3$+foliarapplicationofBiodynamiccompostwashof10mllit^{-1} of water) which was significantly superior over the treatment T$_1$(control), and T$_5$:-(T$_3$ + Rootdipping with Bio dynamic wash 10 ml lit^{-1} of water) which was statistically at par to each otherin their performance. However, minimum number of grains panicle^{-1}(114.25) was recorded inT$_1$(control) treatment.Similar topresent finding **Muhammad Usman *et al.* (2003)**alsoreported that increased number of grains per panicle in rice might be due to better utilizationphosphorus in organic manures, phosphorus as a part of DNA played a crucial role in thebuildingofgeneticpartsofplants.

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 varioustreatment combinations.Themaximumpaniclelength(25.20cm)wasrecordedwithtreatmentT$_7$:-(T$_3$+foliarapplication of Bio dynamic compost wash of 10 ml lit^{-1}of water) which was significantlysuperior over the treatment T$_1$ (control),andstatistically at par with T$_5$:- (T$_3$+ Root dippingwithBiodynamicwash10mllit^{-1}ofwater).Theminimumpaniclelength(20.78cm)was recorded in T_1(control) treatment. HA improved soilnutrient status by increasing organicmatter (9%),totalN (30%),available P(166%) and availableK (52%). Similar observationwas also recorded by **Reddy *et al.* (2005)** as well as **Dixit and Gupta (2000). Murali andSetty,(2001**)observedthattheincreasedyieldandyieldattributingcharacteraremainlyduetobetter sourceandsinkrelationshipsuchasincreaseddrymatterproductionanditstranslocationfromsourcetos ink.

3.6 Effect of different treatments on Test weight (g): Test weight of rice generally variedfrom 22.00 to 26.00 g. There is no significant difference found between treatments. However,highesttestweightwasobservedinT$_7$:-(T$_3$+foliarapplicationofBiodynamiccompostwashof10mllit^{-1}ofwater)(26.09g)andlowestisobservedincontrolT$_1$(22.24g). Theresultsareincloseconformitywiththefindingsof**Mondal*etal*.(2016).**

3.7 Numberoftillers(m^{-2}):

The number of tillers increased at different stage of crop growth different methods of applyingBio dynamic compost and Bio dynamic compost wash. The maximum number of tillers m^{-2} atharvesting stage were recorded with the application of T$_7$:- (T$_3$+ foliar application of Biodynamic compost wash of 10 ml lit^{-1} of water) which is statistically at par with T$_5$:- (T$_3$ + Rootdipping with Bio dynamic wash 10 ml lit^{-1} of water) while minimum number of tillers m^{-2} wasobservedunderthenon-treatmentplot(Control)T$_1$.Tilleringisanimportanttraitforgrainproduction and is thereby an important aspect in rice yield. The results are in conformity withthefindingsof**SinghandJain(1999),**and**Godhwale*etal.*(2006).**

Table-5: EffectofBioDynamicCompostandBioDynamicCompostwashonpanicle length (cm), number of grains panicle^{-1}, Test weight (g) and number of tillers(m^{-2})

S.No.	Treatmentcombination	Yieldattribute			Noof tiller (m^{-2})
		Panicle length (cm)	No.ofgrainpanicle^{-1}	Test weight (gram)	AtHarvest
T_1	Control	20.70	114.20	22.20	308.90
T_2	Biodynamiccompost1 q ha^{-1}+50%RDF	21.90	114.60	22.60	317.90
T_3	Biodynamiccompost1.5qha^{-1}+50% RDF	22.80	138.50	22.80	329.00

T_4	T_2 + Root dippingwithBio dynamiccompost wash 10mllit^{-1}of water	24.00	143.10	23.50	348.00
T_5	T_3 + Root dippingwith Bio dynamicwash10ml lit^{-1}ofwater	25.00	145.50	25.10	365.00
T_6	T_2+ foliarapplicationofBiodynamiccompost washof10mllit^{-1}of water	24.10	143.50	23.70	352.00
T_7	T_3+ foliarapplicationofBiodynamiccompost washof10mllit^{-1} ofwater	25.20	150.00	26.00	366.90
T_8	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

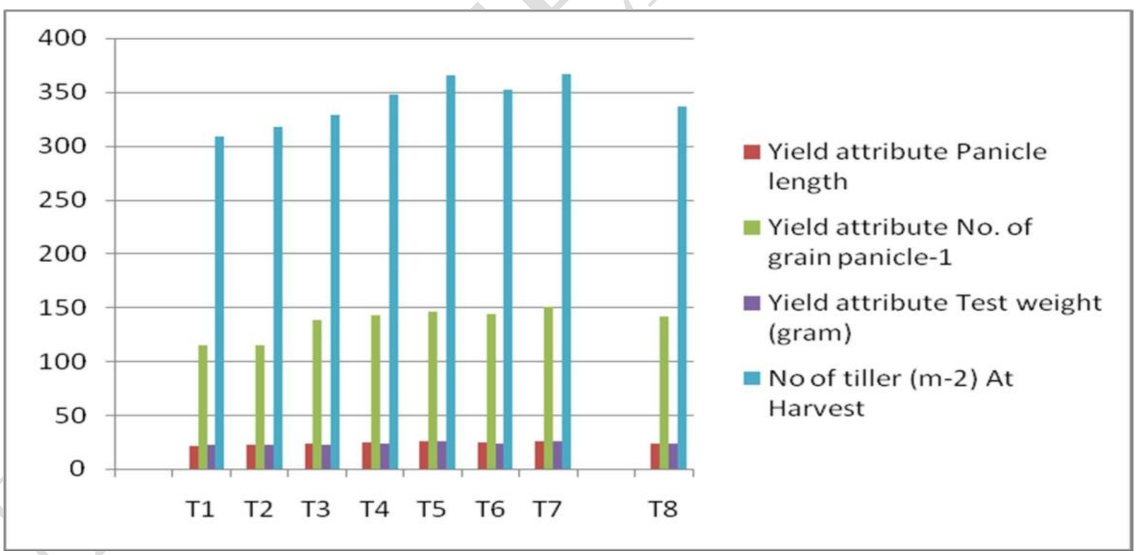

Fig-4: EffectofBioDynamicCompostandBioDynamicCompostwashonpaniclelength(cm),numberofgrainspanicle^{-1},Testweight(g),andnumberoftillers(m^{-2}).

3.8 EffectofBioDynamic Compostand BioDynamicCompostwashonplantpopulation

It is obvious (table-6 & fig-5) that the plant population in rice was firmly affected by varioustreatmentcombinations.Themaximumplantpopulationatinitialstage(52)andatfinalstage(50) was recorded with treatment T_7 (T_3 + foliar application of Bio dynamic compost wash of 10ml lit^{-1} of water) which was significantly superior over the treatment T_1(control) and statistically at parwith T_5:-(T_3+ Root dipping with Bio dynamic wash 10 ml lit^{-1} of water).The minimum plantpopulation at initial stage (45) and at final stage(42) was recorded in T_1 (control) treatment due tothebioticandabioticstressfinalplant populationdecrease.

Table- 6: Effect of Bio Dynamic Compost and Bio Dynamic Compost wash onplantpopulationinrice

S.No.	Treatmentcombination	Initialplantpopulation (m^{-2})	Finalplant population
T_1	Control	46	42
T_2	Biodynamiccompost1qha^{-1}+50% RDF	48	44
T_3	Biodynamiccompost1.5qha^{-1} + 50% RDF	47	45
T_4	T_2+RootdippingwithBiodynamic compost wash 10 ml lit^{-1} ofwater	48	46
T_5	T_3 + Root dipping with Biodynamic wash10mllit^{-1}ofwater	51	48
T_6	T_2+foliarapplicationofBiodynamic compostwashof10 ml$lit^{-1}$of water	49	46
T_7	T_3+foliarapplicationofBiodynamic compostwashof10mllit^{-1}ofwater	52	50
T_8	100%RDF	47	46
SEm±		0.66	0.63
C.D.		2.04	1.939

3.9 Effect of Bio Dynamic Compost and Bio Dynamic Compost wash on Flag leaf area(cm^2)

ThedataonprogressiveFlagleafareaatthesuccessivestagesofcropgrowthasgreatlyinfluencedby various Bio dynamic compost application practices. The presented in (Tables-7) depicted that,at30Panicleinitiation,at50%flowering,100%floweringandatharvestingstageclearlyindicatesth atbio-decomposedtreatmentinfluencedsignificantlyoveralltreatment.ThemaximumFlagleafarea(38.50c m^2),(43.98cm^2)and(44.52cm^2)respectively,at30Panicleinitiation,at50%flowering, 100% flowering stage were recorded with the application of T_7(T_3 + foliar applicationof Bio dynamic compost wash of 10 ml lit^{-1} of water) This treatment was statistically comparableto T_5 (T_3 + Root dipping with Bio dynamic wash 10 ml lit^{-1} of water) while minimum Flag leafareawasobservedunderthenon-treatmentplot(Control)T_1.Theprimaryfactorofphotosyntheticrate is leaf area. Higher dry matter production results from larger leaf area expansion because itimproves light absorption **(Shibles and Weber, 1966).** The stimulation of chloroplast growth,particularly in terms of size, by HA therapy may have contributed to the increase in leaf area and,numberofgranamm'2as reportedby **Forton*et al.*(1985).**

Table-7: EffectofBioDynamicCompostandBioDynamicCompostwashonFlagleafarea (cm^2).

S.No.	Treatmentcombination	Flagleaf area(cm^2)		
		Paniclei nitiation	At50% Flowering	At100% Flowering
T_1	Control	33.48	40.85	40.25
T_2	Biodynamiccompost1qha^{-1}+50% RDF	35.37	40.90	42.10
T_3	Biodynamiccompost 1.5qha^{-1}+50%RDF	35.55	41.20	41.90
T_4	T_2+RootdippingwithBiodynamiccompostwash10mllit^{-1}ofwater	36.40	42.15	42.60
T_5	T_3 + Root dipping with Bio dynamic wash10mllit^{-1}ofwater	38.10	43.10	43.25
T_6	T_2+foliarapplicationofBiodynamiccompostwashof 10mllit^{-1}of water	35.78	42.10	42.11
T_7	T_3+foliarapplication ofBiodynamicwashof10mllit^{-1}ofwater	38.50	43.98	44.52
T_8	100%RDF	35.79	41.8	42.65
SEm±		0.50	0.581	0.589
C.D.		1.532	1.78	1.803

4.0Conclusion

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

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