Annual Activities of the Year 2021-2022
SRDI, Divisional Office, Rajshahi.

1.Progress of Nirdeshika Updating

District	Field Survey		Map finalization		Draft Report Preparation		Final Report Preparation	
	Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement
Divisional Office, Rajshahi-								
Rajshahi	-	-	-	-	-	-	-	-
Chapai	-	-	-	-	Mohonpur	Completed	Tanore,Gurudaspur	Completed
Pabna	Charghat	Completed	Chouhali	Completed	Chouhali	Completed	Chouhali	Completed
Bogura	Ful chori	Completed	Fulchori	Going on	Sariakandi	Completed	Sariakandi, Panch bibi	Completed
Naogaon	Potnitola	Completed	Potnitola	Completed	Natore Sadar	Completed	Natore Sadar	Completed
Sirajganj	Fotikchai	Completed	Baraigram	Completed	shazadpur	Completed	shazadpur	Completed
	Motlob Uttar	Completed	Belkuchi	Completed				

2.Information on Upazila Surveyed during 2021-2022

2(a) Name of Upazila & District:

Upazila	District
Chatmohor	Pabna
Fulchori	Gaibandha
Potnitala	Naogaon
Shazadpur	Sirajganj

2(b) Major findings: **Patnitala Upazilla**
i) Total area- 37927ha
ii)Total sample colleted- 172
iii)Physiography & AEZ code- Barind Tract ((25) & Tista flood plain (2)
iv)Major land type- High Land
v)Major soil group- Amnura

2(b) Major findings: **Chatmohor Upazilla**
i) Total area-30699 ha
ii)Total sample colleted-156
iii)Physiography & AEZ code-High Ganges River Floodplain (11) and Tista Floodplain
iv)Major land type- Medium Low land
v)Major soil group- Sands of Jamuna

2(b) Major findings: Fulchori Upazilla
i) Total area-30,654
ii)Total sample colleted-114
iii)Physiography & AEZ code- Tista floodplain(3), Jamuna floodplain(4)
iv)Major land type-high land, medium highland, medium lowland, lowland
v)Major soil group-Jamun,Gongachora, kaunia,Loshkora,Chilmari, Jamunar poli mati, Jamunar bele mati

2(b) Major findings: **Gomostapur Uoazilla**
i) Total area-31812 ha

ii)Total sample colleted-191
iii)Physiography & AEZ code-Barind Tract: High barind(26),High ganges (11),TistaFlood plain(3)
iv)Major land type-High land and medium High Land
v)Major soil group- Atahar , Amnura,Nachole,Sara,Gopalpur and Jaonia.

(b) Major findings: **Shazadpur Upazilla**
i) Total area-32,462 ha
ii)Total sample colleted-125
iii)Physiography & AEZ code-Karotoya Bangali Floodplain (4) , Mixed Karotoya- Bangali and Jamuna Floodplain (4 and 7),Active and young jamuna Flood plain(7) and Old Ganges Floodplain(11)
iv)Major land type- High Land,Medium High Land ,Medium Low land and Low Land
v) Major soil group-Sonatola,Silmondi,Ghatail,Savar bazaar,Kazla, Matia, Maldoho,Daspara and Sands and Silt of Jamuna .

2(c) Changes in Land Type: (Data should be provided both in MS Word & Excell sheet) **Patnitola Upazilla (Naogaon)**

Land type	Previous (19930Year)		Present (2021 Year)		% increase/ decrease	Possible reasons
	Area (ha)	%	Area (ha)	%		
Highland	31953	84.25	30997	81.7	-2.99	
Medium Highland	905	2.39	1105	2.91	22.09	
Medium Lowland	203	0.54	239	0.63	17.73	
Lowland	36	0.09				
Miscellaneous	4830	12.73	5586	14.7	15.65	
Total	37927	100.00	37927	100		

2(d) Changes in LandUse:(Data should be provided both in MS Word &Excell sheet)

Land Use	Land type	Previous (1993 year)		Present (2021 year)		% increase/ decrease	Possible reasons
		Area (ha)	%	Area (ha)	%		
Fruit Garden (Litchi, Guava			0	5265	13.8		
Rabi Crops(Potato/Mustard/Pulse crops - Rabi (Hybrid) T aman .		1913	5.04	8505	22.4	344.58	
Rabi vegetables,jute,Mango-T.Aman		0	0	1090	2.87		
Rabi(Rabi/wheat/Pulse crops) - Aus T.Aman		2451	6.46		0		
Rabi vegetabes- Maize - Fallow		0	0	70	0.18		
Rabi vegetabes-Maize/potato Fallow-T aman		0	0	13015	34.31		
Rabi Fallow T aman		6762	17.82		0		
Rabi Crops (Potato/Mustard/wheat/Pulse Crops-Fallow-T Aman		5252	13.84		0		
Fallow - Fallow -T.Aman		13603	35.86		0		
Rabi- Fallow-Fallow		880	2.32		0		
Fallow-Fallow T aman		0	0	4415	11.64		
Other Cropping Patterns		7066	18.63	5567	14.67	-21.21	
Total		37927	100	37927	100		

2(e) Changes in Settlement area increament: (Data should be provided both in MS Word &Excell sheet)

Settlement Area	1993 (year)		2021.(year)		% increase/ decrease	Possible Reasons
	Area (ha)	%	Area (ha)	%		
Settlement	3160		5073 (Approximate)		60.53	

Chatmohor Upazilla (Pabna):

2(c) Changes in Land Type: (Data should be provided both in MS Word &Excell sheet)

Land type	(Year)		…….. (Year)		% increase/ decrease	Possible reasons
	Area (ha)	%	Area (ha)	%		
Highland	4531	14.8	5466	17.8	3.0	
Medium Highland	6431	21.0	7893	25.7	4.7	
Medium Lowland	10161	33.0	6443	21.0	-12.0	
Lowland	3752	12.2	3868	12.6	0.4	
Very lowland	1232	4.0	779	2.5	-1.5	
Miscellaneous	4592	15.0	6250	20.4	5.4	
Total	30699	100	30699	100	0	

2(d) Changes in Land Use: (Data should be provided both in MS Word &Excell sheet)

Land Use	…… (year)		……..(year)		% increase/ decrease	Possible Reasons
	Area (ha)	%	Area (ha)	%		
wheat-jute-T aman	1422	4.6	0	0	-4.6	
Wheat-T aman	899	2.9	0	0	-2.9	
Wheat-T aman	537	1.7	0	0	-1.7	
Rabi-T.Aus- T aman	252	0.8	0	0	-0.8	
Grass pea-Rabi	1976	6.4	0	0	-6.4	
Mixed Mustard-Lentil-Rabi	4926	16	0	0	-16	
Whear-Sesame-T.aman	34	0.1	0	0	-0.1	
wheat-T.Aus-T aman	554	1.8	0	0	-1.8	
wheat-T.Aus-T aman	1257	4.1	0	0	-4.1	
Wheat/Mustard/Potato-Rabi-T.Aman	0	0	552	1.8	1.8	
Onion/Garlic-T.Aus-T.Aaman	503	1.6	2701	8.8	7.2	
Mustard-Rabi/T.Aus-T.aman	251	0.8	1105	3.6	2.8	
Grasspea-T.Aus-T.Aman	0	0	2486	8.1	8.1	
	50	0.2	61	0.2	0	
Garlic/onin/jute/sesame-Taman	0	0	2280	7.4	7.4	
Rabi-Fallow-T aman	2148	7.0	2149	7.0	0	
Garlic-Jute-B Aman	76	0.2	1289	4.2	4	
Mustard-Rabi-Fallow	2390	7.8	2395	7.8	0	
Mxed Mustard and grass pea-Rabi	2783	9.2	2456	8.0	-1.2	
Rabi-Fallow	2693	8.8	1259	4.1	-4.7	
Mustard-Rabi-B.Aman	200	0.7	829	2.7	2	
Grass pea/Sesame-B.Aus-Fallow	215	0.7	215	0.7	0	
Rabi Crops(Bean/Mustard/Lentil/Grass pea	1709	5.6	1719	5.6	0	
Miscellaneous (Other crops)	1232	4.0	2517	8.2	4.2	
Kithen Garden(Vitimati)			436	1.4	1.4	
Miscellaneous (Home stead, River. Pond,Waterbody and Others))	4592	15.0	6250	20.4	5.4	
Total	**30699**	**100**	**30699**	**100.0**		

2(e) Changes in Settlement area increament: (Data should be provided both in MS Word &Excell sheet)

Settlement Area	(year)		……...(year)		% increase/ decrease	Possible Reasons
	Area (ha)	%	Area (ha)	%		
বসতবাটি	3709	12.08	4352	14.18	2.1	
Total						

Gomostapur Upazilla:

2.Comparison of land type between 1999 & 2019 of GomostapurUpazilla:

Land type	Gomostapur Upazila			
	Previous Survey (1999)		Present Survey (2019)	
	Area (ha)	%	Area (ha)	%
High land	17,991	56.6	15,855	49.9
Medium High Land	3,563	11.2	3,151	9.9
Medium Low Land	1,694	5.3	2,215	7.0
Low Land	3,131	9.8	2,894	9.0
Very Low Land	1,455	4.6	1,530	4.8
Miscellaneous Land	3,978	12.5	6,167	19.4
Total	31,812	100	31,812	100.0

3.Changes in Nutrients status of Amnura soil series:

Nutrients	1999	2019
OM	1.12	1.5
PH	5.3	5.97
N	0.08	0.09
P	13.04	25.33
K	0.28	0.16
Ca	6.68	4.86
Mg	2.0	1.27
S	35.24	31.08
B	0.57	0.43
Zn	1.41	1.12

Mn	28.39	13.64

Sahazadpur Upazilla:

2.Comparison of land type between 1994 & 2020 of Shahazadpur Upazilla:

Land type	Shahazadpur Upazila			
	Previous Survey (1994)		Present Survey (2020)	
	Area (ha)	%	Area (ha)	%
High land	1296	4	1257	4
Medium High Land	9100	28	7854	24
Medium Low Land	6736	21	7080	22
Low Land	5442	17	5846	18
Very Low Land	904	3	866	3
Miscellaneous Land	8984	27	9559	29
Total	32,462	100	32,462	100.0

3.Changes in Nutrients status of Sonatola soil series:

Nutrients	1994	2020
OM	1.44	1.76
PH	5.5	5.9
N	Amonium N 29	0.10
P(bray)	7	25.54 P(bray)
P (Olsen)	-	15.45
K	0.05	0.16
Ca	6.4	7.14
Mg	1.71	2.61
S	13	36.83
B	0.47	0.4
Zn	1.5	1.15
Mn	25.5	34.42

3. Union Sahayika Preparation

Name of Office	Name of Upazila	No. of Union Sahayika Prepared	Remarks
Rajshahi	-	-	-
Chapainawabganj	Gomostapur and Shapahar	Alinagor union, Bangabari union, Boalia union, Chodala union, Gomostapur union, Radhanagor union, Parbortipurunion, Rahhonpur union and RahhonpurPourosava.) and patari	completed
Pabna	Sathia	5 Union Sahayika (Dhulaura Nagdemra, Vulbaria, Gourigram,Nandanpur)	Published
Bogura	Panchbibi	5 Union Sahayika (Kushumba,atapur,Mohammadpur,Dhoronji and Balighata)	completed
Naogaon	Naogaon Sadar and Badalgachi	5 Union Sahayika (Bokhtiarpur,Tilakpur and pouroshava of Naogaon Sadar under Mathurapur and Paharpur of Badalgachi Upazilla)	completed
Sirajganj	Kazipur	5 Union Sahayika Gandhail,Sonamukhi,Maizbari,Chalitadanga and nishcintapur	completed

4. Mobile Soil Testing Services (MSTL)

Name of the Upazila and number of soil samples analyzed through MSTL under Farmer's Service Program during Rabi 2021 & Kharif 2022 season.

Sl. No	Upazila	District	No. of Soil Samples Analyzed	Upazila	District	No. of Soil Samples Analyzed
Rabi 2022				Kharif 2021		
	Ullapara	Sirajganj	50	Sirajganj sadar	Sirajganj	50
	Ishwardi	Pabna	50	Sujanagar	Pabna	50
	Puthia	Rajshahi	50	Tanore	Rajshahi	50
	Bagatipara	Natore	50	Baraigram	Natore	50
	Gabtoli	Bogura	50	Kahalu	Bogura	50
	Nachole	Chapai	50	Chapai sadar	Chapai	56
	Badalgachi	Naogaon	50	Patnitola	Naogaon	50
		Total	350		Total	356
Special MSTL Program under "Matir Dactar" activities						

Sl. No	Upazila	District	No. of Soil Samples Analyzed	Upazila	District	No. of Soil Samples Analyzed
1.	Bogura Sadar (Fapore union)	Bogura	11	Fertilizer Recommendation card has been distributed among the respective farmers.		

5.Yield Data of STB Field Trial

Sl. No.	Name of Upazila	District	Crop & Variety	Average yield (t/ha)		
				Farmer's field	FRC based plot	Yield increase
1.	Godagari	Rajshahi	Potato Asteric	38.73	39.91	3.04
			Wheat BARI GOM 33	2.7	3.3	22.22
2.	Bogura Sadar,Kahalu	Bogra	Potato Red dalia	35.06	40.63	15.88
			T. Aman BRRI dhan-100	4.45	4.6	15
3	Sadar, Atgharia	Pabna	Wheat BARI GOM 30	3.0	3.53	17.66
			Wheat BARI GOM 30	3.3	4.30	30.30
4	Chapainawabganj Sador	Chapainawabganj	Boro -29	25	29	16

6. Distribution of Fertilizer Recommendation Card

Name of Office	District	Upazila	Type of service		No. of card distributed	Remarks
			Nirdeshika based recommendation	Online/offline/ test based recommendation		
Rajshahi					700	
Chapainawabganj			51	649	700	
Bogura	Bogura		100	600	700	
Sirajganj	Sirajganj	-	100	600	700	
Pabna	Pabna	-	40	400	440	

7. Training Programme

7(a)Training Received

Name of Office	Title of the programme	Duration	Host organization	Participant	
				Designation	Number

Rajshahi	In house training E-nothi	1 Day 1 Day	SRDI,Divisional office ,Rajshahi SRDI HQ	All officer and staff PSO	 1
Chapainawabganj	In house training E-nothi	1 Day 1 Day	SRDI,Divisional office ,Rajshahi SRDI HQ	All officer and staff PSO	 1
Bogura	In house training	1 Day	SRDI,Divisional office ,Rajshahi	All officer and staff	07
Pabna	Survey 123 APP	1 Day	SRDI HQ	SO	2
Naogaon	-	-	-	-	-
Sirajganj	In house training	1 Day	SRDI,Divisional office ,Rajshahi.	All officer and staff	3
	Survey 123 APP	1 Day	SRDI HQ	SO	1
	ICT,web portal	1 Day	DC Office,Pabna	SO	1

7(b)Training Imparted

Name of Office	Title of the programme	Duration	Host organization	Participant	
				Type	Number
SRDI,Rajshahi	Method of Soil Sample Collection, use of Balance fertilizers and Fertilizer Management	01	SRDI,Rajshahi	Farmers	200
	Use of Upazilla Nirdeshika	05	SRDI,Rajshahi	SAAO	50
	Method of Soil Sample Collection.	1	SRDI,Rajshahi	Farmer	50
SRDI, Bogura	Tranning on balanced fertilizer utilization, soil sample collection.	01	SRDI, Bogura	Farmer,innovator	145
	Data entry in software by survey 123 app	01	SRDI,Bogura	SAAO.	30
SRDI,Chapai	Acid Soil Management and Sustainable crop production	03	SRDI,Chapai	SAAO	30
	Tranning on balanced fertilizer utilization, soil sample collection.	01		Farmers	150
SRDI, pabna	Method of Soil Sample Collection, use of Balance fertilizers and Fertilizer Management	01	SRDI, pabna	Farmers	50*2+50=150
	Use of Upaziila Nirdeshika	5	SRDI, pabna	SAAO	50
SRDI,Naogaon	Soil sample collection & adulterated fertilizer identification	1 day	SRDI Naogaon	Farmers	50*2= 100
	Using of Survey 123 Apps	1 day	SRDI Naogaon	SSAO	30
SRDI,Sirajganj	Soil sample collection & adulterated fertilizer	1 day	SRDI Sirajganj	Farmers	50*2= 100

	identification				
	Using of Survey 123 Apps	1 day	SRDI Sirajganj	SSAO	30

8. Advisory Services to Beneficiaries

Name of Office	District	Upazila	Agency	Service Provided
SRDI Rajshahi				
SRDI Chapai				
SRDI pabna	Pabna	Ishwardi	ishwardi Army Farma	Soil sample collection and fertilizer recommendation provided
		Ishwardi	Farm of pepe badsha	Soil sample collection and fertilizer recommendation provided
SRDI Naogaon	-	-	-	-
SRDI Sirajganj	Rajshahi	Godagari	RU	Assist MS students in collecting soil samples from different soil series.
	Sirajganj	Sirajganj Sadar	DAE, Researchers	Information supplied to one Ph.D. & one MS student regarding Soil & Land type.
	Sirajganj	Sirajganj Sadar,Kazipur	Farmers	Assistance Provided to collect soil samples from farmers field.

9. Distribution of saplings and/seedlings:

Name of Office	District	Upazila	Number		Total	Remarks
SRDI Rajshai			Fruits	Vegetables		
SRDI Pabna	Pabna	sadar	200	300	500	
		Atghoriya	200	300	500	
SRDI Naogaon	Naogaon	Naogaon Sadar	-	-	800	
SRDI chapai	Chapai		200	-	200	
SRDI Bogra	-	-	-	-	-	-
SRDI sirajganj	Sirajganj	Sirajganj Sadar	-	-	200	

11. Research Experiment (if any):

RESEARCH TITLE:

ORGANIC MATTER AND VARIOUS DOSES OF LIMING EFFECTS ON SOIL PROPERTIES, GROWTH TRAITS AND YIELD OF WHEAT GROWN IN AMNURA SOIL SERIES OF HIGH BARIND TRACT

Dr.M.N. Islam*

ABSTRACT

A field experiment was conducted from 2020-2021 to evaluate the effects of liming and organic matter on soil properties, soil health, growth traits and yield of wheat grown in Amnura soil series of High Barind Tract. In High Barind Tract (AEZ-26), **Amnura** soil series of GomastapurUpazila under Chapainawabganj district. There were five treatments of liming material applied from dolomite (CaCO3.MgCO3) and also 4 kg decimel^{-1} Organic Matter (OM) i.e.Vermicompost incorporated in soil in each treatments plot. Yield and yield components data of crop was recorded during growth stage and harvesting time. The post-harvest soils were analyzed for pH, OM, N, available P, K, S, Zn, B, Ca and Mg. The application of different doses of lime along with OM to soil progressively increased 0.8-2.0 units of soil pH and increased availability of nutrients i.e. P, Ca, Mg & others in soils. The grain yields of crops Wheat (BARI Gom-33) was positively correlated with soil pH, available P contents of post-harvest soils. Plant height (cm), effective tiller number hill^{-1}, spike length plant^{-1}, grains spike^{-1}, 1000-grains weight (g), grain yields (t ha^{-1}) were significantly affected by liming. The treatment T_3 (2.0 t lime ha^{-1}) produced grain yield of 5.6 ton ha^{-1} which was statistically higher to those in T_1, T_2, T_4, T_5 & T_6 treatments. Total uptake of P, K, S were increased due to application of lime along with OM which was mainly associated with increased wheat yields. The findings demonstrated that OM and liming are not only essential for wheat cultivation but also beneficial for microbial alive in soil in the Amnura soil series of Gomastapur Upazila under Chapainawabganj district. The application of 2.0 t lime ha^{-1} appears to be optimum for desired soil pH for wheat (pH 6.5-7.0), increased availability of nutrients and eventually increased of wheat yield for sustainable crop production.

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INTRODUCTION

Soil organic matter (OM) is a key factor in maintaining long-term soil fertility since it is the reservoir of metabolic energy, which drives soil biological processes involved in nutrient availability. A good soil should have at least 2.5% organic matter, but in Bangladesh most of the soils have less than 1.5%, and some soils contain even less than 1% organic matter (FRG, BARC, 2012).Organic nutrient sources improve physical, chemical and biological properties of soil. Organic matter (OM) improves the soil structure through aggregation, which favourably influences tillage preoperative crusting, water infiltration, moisture retention, aeration, temperature and root penetration (Mandal*et al.*, 2003, De Datta and Hundal, 1984). Organic matter supplies plant nutrients, increases water holding capacity of soil, reduce residual negative effect of fertilizers and pesticides (Padre *et al.*, 2007 and Tinglu*et al.*, 2007). It makes the crops more tolerant to diseases, insects and also prevents soil erosion (Dreyfus*et. al.*, 1985; Evans and Rotar, 1986). It increases the capacity of the soil to buffer changes in pH, increases the cation retention capacity, reduces phosphate fixation. Organic matter is the energy source for soil microorganisms, which are the primary agents that enhance the decomposition and release of minerals in soil system.

OM also creates a positive soil environment from which plants can uptake nutrients from applied chemical fertilizers. Organic matter increases uptake of applied chemical fertilizers by the plants; thereby increases crop productivity and reduces toxic flow of active chemical fertilizers to the environment.

Soil environment is very important for plant growth and soil pH is the most important indicator of soil environment. Soil pH indicates whether the media for plant growth is favorable or not. Soil pH indicates whether the soil acidic, alkaline or neutral. Acid soils are a major agricultural constraint for crop production due to its adverse effect on soil fertility and productivity. In Bangladesh, soil acidification problem is becoming more acute than the previous time due to the removal of base material from top soil.

In acid soil, low phosphorus (P) and iron (Fe) toxicity are considered as two major yield limiting factors on crop production of Barind soils of Bangladesh. Soils in the study area of Bangladesh are becoming acidic (strongly acidic) day by day. As soil pH indicates the soil environment as well as soil quality which regulate the availability of plant nutrients and crop yield and also crop quality.

Most of the soils of Bangladesh are low to medium acid in reaction, due to the predominance of high rainfall areas and leaching. There are mainly three groups of acid soils found in Bangladesh, such as: acid basin clay, acid sulphate soil and brown hill soil (Alam, 2006).The soils of northwest part of Bangladesh are light textured, low in organic matter and strongly acidic to moderately acidic in nature, pH ranges from 4.5 to 6.5. The status of available P, Ca and Mg of these soils are low. Aluminum toxicity is responsible for poor yields in acid soils.Liming on acid soil increases the pH level, decrease Fe, Al and Mn toxicity, increase the availability of N, P, Ca and Mg and microbial activities. In acid soils, application of lime significantly increased water soluble nitrogen and fixed ammonium. Therefore, a study was undertaken in a highly acidic soil of Gomastapur Upazila under Chapainawabganj district, to demonstrate the changes of soil properties due to liming along with OM in wheat field and to evaluate the effects of lime and OM on yield and yield contributing traits of wheat.

Major Objectives

i. **T**o determine the appropriate lime rate at different pH level & crops
ii. To study the effect of liming on soil nutrient availability
iii. To evaluate the effect of lime on crop yield and yield contributing characters at different lime rate

Material and Methods

The experiment was conducted at farmer's field of GomastapurUpazila under Chapainawabganj District from November 2020 to March 2021. The experimental field is located at 24°50′54.0″ latitudeand E- 88°26'35.6"longitude at a height of 22 m above the mean sea level. It belongs to the Agro Ecological Zone 26 (High Barind Tract). The soil was clay loam having pH 5.4, Organic matter 1.34%, total N 0.08%, available P 6.3 μg g^{-1}, K 0.12 meq 100 g $soil^{-1}$, available Ca 6.7 meq 100 g $soil^{-1}$, Mg 2.37 meq 100 g $soil^{-1}$, S 4.09 μg g^{-1} ,B 0.55 μg g^{-1}, Zn 0.39 μg g^{-1} and Mn 8.2 μg g^{-1}. The test crop was wheat *Triticumaestivum cv.* BARI Gom-33 for the study. Certified seeds were collected from the Bangladesh Wheat and Maize Research Centre, Nashipur, Dinajpur. There were six different doses of lime application along with 4 kg $decimel^{-1}$ Organic Matter (OM) i.e.Vermicompost incorporated in soil in each treatment plot in wheat experiments field as follows T_1 (Control); T_2 (1.0 t ha^{-1} lime); T_3 (2.0 t ha^{-1} lime); T_4 (3.0 t ha^{-1} lime); T_5 (4.0 t ha^{-1} lime). The liming material had 20% Ca and 10% Mg. The liming material was applied to the soil on 21 November 2019 and mixed well with soil by repeated ploughing by power tiller and country plough. Final land was prepared on 29 November, 2020.

The experiment was laid out in a Randomized Complete Block Design with three replications. There were altogether 18(6×3) unit plots (5m ×4 m). Inter-block and Inter-plot spacing were 1m and 0.7m, respectively. Fertilization was as N @ 1240 g $decimel^{-1}$ from urea, P @ 425 g $decimel^{-1}$ from TSP, K @ 615 g $decimel^{-1}$ from MoP, S @ 455 g $decimel^{-1}$ from gypsum, Zn @ 15 g $decimel^{-1}$ from zinc sulphate (heptahydrate) and B @ 8g $decimel^{-1}$ from boric acid. Three irrigations were applied, the first irrigation after 18 days of sowing, second irrigation after 55 days of sowing at crown root initiation stage and the third after 75 days of sowing at heading stage. Weeding and pest control program were done when necessary. The crop was harvested at maturity after about three months of sowing (March 28, 2021). Ten plants from each plot were sampled randomly recording for yield parameters. Then plot- wise weights of grain and straw were recorded.

Analysis of soil samples:

Soil samples were collected randomly from 10 different spots of the field from a depth of 0-15cm. After harvest of wheat, the soil samples from each plot were collected at a depth of 0-15 cm. The initial soil samples were analyzed as per standard methods for soil texture, pH, organic matter, total N and available P, K, S, Ca, Mg, Zn, B and Mn contents. The post-harvest soils were also analyzed for soil pH, available P,K, S, Ca ,Mg, Zn, B and Mn contents.

The data were analyzed statistically by F-test to examine whether the treatment effects were significant or not. The mean comparisons of the treatments were evaluated by LSD (Least significant Difference Test) if the treatments were significant. The analysis of variance (ANOVA) for different parameters was done by computer using "Statistix-10" software program.

Results and Discussion

OM and liming effects on changes of Soil properties of post-harvest soils:

The changes in pH, P, Ca and Mg content in soil markedly varied after the harvest of wheat. The pH values, P, Ca and Mg availability of the post-harvest soils in different treatments of wheat increased steadily with increasing rates of lime application (Table 1). The pH of the initial soil was 5.4 which increased to 6.2, 7.0, 7.0, 7.3, 7.3 and 7.4 T1, T_2, T_3, T_4, T_5 andT_6 respectively. The increased in soil pH was due to available of Ca and Mg in soils. The initial value of available phosphorus in the soil was 6.3µg g^{-1} soiland the post-harvest soils had the values 24.63, 36.20, 92.06, 26.63, 57.70 and 25.73 µg g^{-1} soils in T_1, T_2, T_3, T_4, T_5 and T_6 respectively. Lime application increased the soil pH which helped the release of fixed P from the oxides and hydroxides of Fe and Al thus increased the P availability in soils. The available Ca of the initial soil was 6.7 meq100 g $soil^{-1}$ which increased to 7.99, 7.85, 8.29, 8.58, 3.20 and 3.20 meq100 g $soil^{-1}$ in T_1, T_2, T_3, T_4, T_5 and T_6 respectively. The liming material used as dolomite (CaCO3.MgCO3), which on dissolution released a large amount of Ca& Mg and thus the available of Ca increased in post-harvest soils. The available Mg of the initial soil was 2.37 meq 100g $soil^{-1}$ which decreased to 2.79, 3.55, 3.62, 3.44, 3.71 and 3.73 meq100 g soil-1 in T_1, T_2, T_3, T_4, T_5 and T_6 respectively.

Table 1: Interaction effects of OM and liming on soil properties of post-harvest soils of Wheat field

Treatments	pH	Organic Matter (%)	TN (%)	K (meq $100g^{-1}$soil)	Ca (meq $100g^{-1}$soil)	Mg (meq $100g^{-1}$soil)	P (µg g^{-1}soil)	S (µg g^{-1}soil)	Zn (µg g^{-1}soil)	B (µg g $soil^{-1)}$	Mn (µg g $soil^{-1)}$
Initial soil Values	5.4	1.34	0.08	0.12	6.7	2.37	6.3	4.09	0.39	0.55	8.2
Analytical Values after 2nd Year Experiment											
T_1: Control + OM	6.0-6.2	1.51 ^{ab}	0.09^{a}	0.12^{a}	7.99^{a}	2.79^{c}	24.63^{d}	5.0^{c}	0.23^{a}	1.10^{b}	17.1^{a}
T_2: 1.0 t ha^{-1} + OM	6.6-7.0	1.60 ^{a}	0.09^{a}	0.12^{a}	7.85^{a}	3.55^{a}	36.20^{c}	10.33^{b}	0.21^{a}	1.20^{b}	18.2^{a}
T_3 : 2.0 t ha^{-1}+ OM	6.5-7.0	1.39 ^{bc}	0.09^{a}	0.17^{a}	8.29^{a}	3.62^{a}	92.06^{a}	14.94^{a}	0.33^{a}	1.50^{a}	20.7^{a}
T_4: 3.0 t ha^{-1} + OM	6.9-7.3	1.50 ^{ab}	0.09^{a}	0.11^{a}	8.58^{a}	3.44^{a}	26.63^{d}	10.06^{a}	0.41^{a}	1.06^{b}	18.3^{a}
T_5 : 4.0 t ha^{-1} + OM	6.8-7.3	1.36 ^{c}	0.09^{a}	0.08^{a}	3.20^{a}	3.71^{a}	57.70^{b}	5.80^{a}	0.30^{a}	1.16^{b}	17.5^{a}
T_6 : 5.0 t ha^{-1} + OM	6.7-7.4	1.59^{a}	0.09^{a}	0.07^{a}	3.20^{a}	3.73^{a}	25.73^{d}	6.47^{c}	0.30^{a}	1.23^{ab}	17.5^{a}
F-test		*	NS	*	NS	NS	*	*	NS	NS	NS
$LSD_{0.05}$		0.127	0.017	0.028	1.437	0.348	6.237	2.263	0.409	0.296	6.198
CV (%)		4.70	10.93	11.45	9.45	5.52	7.82	14.19	13.71	13.46	17.91

OM= Organic Matter, equally incorporated in soil in every treatment plot

*= Significant at 0.05% level of probability

The Figures having common letter in a column are not significantly different by F-test at 5%level.

LSD= Least Significant Difference, CV= Co-efficient of Variation

OM and liming effects on changes of growth and yield components of wheat

Table 2: Interaction effects of OM and lime on growth and yield components of wheat

Treatments	Plant Height (cm)	Tillers $hill^{-1}$ (no.)	Spike Length (cm)	Grains $Spike^{-1}$	1000-grains weight (g)	Grain yield (t ha^{-1})
T_1: Control + OM	81.10 ^{a}	12.60 ^{a}	13.23 ^{b}	26.67 ^{b}	23.34 ^{a}	4.3 ^{c}

T_2: 1.0 t ha^{-1} + OM	83.73 ^{a}	13.00 ^{a}	14.50 ^{ab}	37.67 ^{a}	33.34 ^{a}	5.3 ^{b}
T_3 : 2.0 t ha^{-1}+ OM	85.33 ^{a}	11.47 ^{a}	15.13 ^{a}	35.00 ^{ab}	32.00 ^{a}	5.6 ^{a}
T_4: 3.0 t ha^{-1} + OM	84.67 ^{a}	12.06 ^{a}	15.03 ^{a}	34.00 ^{ab}	23.34 ^{a}	5.5 ^{ab}
T_5 : 4.0 t ha^{-1} + OM	84.00 ^{a}	12.53 ^{a}	13.23 ^{b}	34.00 ^{ab}	26.66 ^{b}	5.4 ^{ab}
T_6 : 5.0 t ha^{-1} + OM	81.70 ^{a}	12.53 ^{a}	13.13 ^{b}	34.33 ^{ab}	30.00 ^{a}	4.5 ^{c}
F-test	*	*	*	*	*	*
LSD value	353.35	3.312	1.753	9.203	11.247	0.483
CV	149.30	14.72	6.86	15.05	21.99	4.44

OM= Organic Matter, equally incorporated in soil in every treatment plot
*= Significant at 0.05% level of probability
The Figures having common letter in a column are not significantly different by F-test at 5%level.
LSD= Least Significant Difference, CV= Co-efficient of Variation

Yield Components:
The application of different doses of lime significantly increased the plant height, the effective number of tillers $hill^{-1}$, spike length $plant^{-1}$, the number grain $spike^{-1}$, 1000 grain weights (g) and Grain yield (t ha^{-1}) are presented in Table 2.

Plant height of wheat progressively increased with increase in lime doses. The plant height ranged from 81.10 cm in T_1 (control) treatment to 85.33 cm in T_3 treatment. The tallest plant recorded in T_3 was significantly comparable to those obtained in T_4 treatments. All the treatments of T_1, T_2, T_5 and T_6 differed statistically from each other in plant height.

The **Tillers** $hill^{-1}$ by different treatments varied from 11.47 to 13.00. The highest number of tillers was obtained in the treatment T_2, which was significantly comparable to those obtained in T_1 treatment.

Spike length of wheat ranged from 13.13 to 15.13 cm, the tallest spike was found in T_3. The treatmentT_3 and T_4 treatment which values are same and statistically similar. The treatments of T_1 differed statistically from each other in Spike length.

The number of **grains $spike^{-1}$** of wheat ranged from 23.34 to 33.34. The highest number of grains was found in T_2 treatment which was significantly comparable to those obtained in all treatments. The treatment T_2 recorded higher number of grains $spike^{-1}$ over T_1 treatment and statistically superior to T_1 treatment.

The **1000- grains weight** of wheat ranged from 23.34 to 33.34g. The highest 1000 grains weight was found in T_2 which was significantly comparable to those obtained in all treatments. The treatments of T_2 recorded highest1000- grain weight and T_3, T_4 and T_5 statistically similar.

Grain yield of wheat (var. BARI Gom33) was significantly responded due to application of different doses of lime along with OM (Table 2). The highest grain yield was found in T_3 (5.6 t ha^{-1}) while the lowest in T_1 (4.3 t ha^{-1}) treatment. All the treatments of T_1, T_2, T_4 T_5 and T_6

differed statistically from each other in grain yields of wheat. Application of lime combined with OM increased grain yield of wheat to a considerable extent but application of lime at the doses of 2.0 t ha^{-1} was enough for desired yield of wheat.

Conclusion:

It may be concluded that OM and lime application in High Barind Tract (AEZ-26) in the Amnura soil series increased desired soil pH level (pH 6.5) along with soil health which in term of increased yield of components and yield of wheat. It is supplementary that the amount of lime **2.0 t ha^{-1} along with OM**may be optimum for wheat cultivation in the Amnura soil series in AEZ 26. It may be varied dueto different pH range & OM contents in soil. However, it was the only oneyear research findings, further research may be carried out for the recommended doses on the effect of lime on different crops of different soil series for conserving soil health and sustainable crop production.

Achievement/success of Divisional Office Rajshahi:

1: Special programme Matir Doctor initiated by Bogura Regional Office in going on Success fully.

2. Mr. kamal Uddin .,Office Assiatant,Divisional Office Rajshahi and Mr. Abu Taleb, Field man Regional Office Chapainawabganj achieved NIS award in the FY 2021-2022.

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	5.MD.ANOARUL ISLAM	Cleaner	01737416616	5.MD.ANOARUL ISLAM
	6.MD. ROMJAN ALI	Security Guard	01712237803	6.MD. ROMJAN ALI
	7.MD.ZAHANGIR ALOM	Security Guard/ Daily basis labourer	01796173302	7.MD.ZAHANGIR ALOM
	8.MD.LOTIF PRAMANIK	Daily basis labourer	01744434808	8.MD.LOTIF PRAMANIK
	9.MD.MANIK PRAMANIK	Daily basis labourer		9.MD.MANIK PRAMANIK

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i)Abstract
ii) Introduction
iii) Objectives
iv) Materials & Methods
v) Result & Discussion
vi) Conclusion

12. Salinity Monitoring:(if any): N/A

12(a) Soil Data:(Data should be provided both in MS Word &Excell sheet)

Year	Monthwise EC Value											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

12(b) Soil Data:(Data should be provided both in MS Word &Excell sheet)

Year	Monthwise EC Value											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec