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## RESEARCH ARTICLE

# RICE YIELD WITH INHERENT SOIL CHARACTERISTICS AND MANAGEMENT PRACTICES IN A RICE GROWING FIELD OF LOWER ASSAM

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### ABSTRACT

Most of the rice growing field of Boko block was found as saturated soil during Kharif season and Ground water table goes below (>2.5m) the surface soil during the entire period of Rabi season. All the selected farmers has grown winter rice (cv-Ranjit) satisfactorily as rainfed crop. Only a few numbers of farmers has applied Urea fertilizers @25kg/ha. Dried FYM@4-5t/ha was applied by all farmers in their rice field before the final land preparation of soil. P<sup>H</sup> of the rice soil was mostly acidic. Except, K-other nutrients were found as low to medium range. Grain yield variations were recorded from 48.0-53.0q/ha. Highest net returns of rs.1,19,328.00 per hactre was received by a selected farmers of village-18.

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## INTRODUCTION

The proper utilization of soil resources for sustainable agriculture is possible after knowing the inherent characteristics of the soils by use of soil resources inventory and their proper management with the application of organic as well as inorganic fertilizers in such type of poor soils. 50%N substitutes through FYM was found to be superior over Azolla and Rice straw decomposition in the rice based cropping system. Phosphorus, in soil occurs in in-organic and organic forms and their management practices performed by each farmer in their crop field. K-status in Assam soil is more or less found to be the optimum. Keeping this points in view the present study was under taken in the Boko block of Assam in a rice growing field during 2020-21.

## MATERIALS AND METHODS

The study area of rice based cropping system under the Boko block of Kamrup(R) district of Assam, located at 25°97'N and 91°24'E longitude at an elevation of 66m above the mean sea level. The topography of the soil area is more or less flat and uneven, with gentle slope.

The soil of Boko block is more or less Incepti- soil of Brahmaputra basin with P<sup>H</sup>-4.5-5.5, Available N is medium range, Available K is medium to high and P-status is low to medium. The climate of the Boko block is sub-tropical humid climate with a mean annual rainfall of 2165mm and Av maximum and minimum temperature varies from 39°C and 23°C during July-August and 34°C and 18°C in December-January in each calendar year. Most of the soil of Boko block was found saturated in Kharif season. Ground water table goes below (>2.5m) the surface soil during the entire period of Rabi season. Air dried and processed soil sample (<2mm size) were analysed for different Physico-Chemical properties like mechanical composition (Jackson,1956) Organic matter, p<sup>H</sup>, Available N, Available P<sub>2</sub>O<sub>5</sub>, Available K<sub>2</sub>O, following standard procedures (Jackson, 1973). Different textural classes were determined by using Soil Taxonomy Criteria (Soil Survey Staff, 1994). Almost all the selected farmers prepare their land for nursery bed of rice crop during May and transplanted 25-30 days old rice seedlings in the first week of June in each calendar year. All the farmers selected the most promising rice variety (cv-Ranjit) to grow in their field as winter rice. They use to transplant the rice seedlings haphazardly in a puddled field and broadcasted urea fertilizers@15kg/ha at flowering time. Irrigation facilities were found within normal.

But most of the farmers from Boko block depend on natural rain. Soil samples were collected from selected area in 30cm depth. Rice crop (cv-Ranjit) starts yellowing due to its maturity from first week of October onwards and harvest within first fourth-night of October. Grain yield and Straw yields were recorded from the 100m<sup>2</sup> area in each farmer's field. Physico-Chemical properties of Soil were analysed after the harvest of rice crop and shown the data in Table-1. All yield data were converted in to quintal per hectare for studying the variations of yield due to the effect of inherent Soil characteristics and management practices.

## RESULTS AND DISCUSSION

The grain yield, straw yield, harvest index and net returns were presented in Table-2. Variation on yield was recorded in Boko block due to the inherent soil characteristics as well as management practices. Lowest grain and straw yield were recorded by the farmer no-V<sub>9</sub> (Table-2) followed by V<sub>7</sub>, V<sub>8</sub> and V<sub>16</sub>. Similarly, highest grain and straw yield were observed by the farmer no-V<sub>18</sub>, followed by V<sub>17</sub>, V<sub>13</sub>, and V<sub>11</sub> (Table-2).

Highest harvest index of 83.35% was recorded by the farmer no-V<sub>12</sub> and Lowest being recorded by the farmer no-V<sub>5</sub> (73.64%). Highest net returns were recorded by the farmer no-V<sub>18</sub> (rs.1,19,328.12/ha) followed by V<sub>13</sub>(rs.1,16,266.00/ha), V<sub>3</sub> (rs.1,15,959.00/ha), V<sub>11</sub>(rs.1,15,938.00/ha), V<sub>4</sub>(rs.1,15,631.25/ha). Thus, it is observed that variability of soil properties over the distance, moisture status and depth is of great significance for getting information of soil properties in a given area of study.

Accordingly, the yield, harvest index as well as net returns (rs./ha) get varies from block to block and district wise yield variations also observed ; which is found because of diverse climatic effect and soil inherent properties. Clay content varies from 18.70% to 38.80%; similarly silt content varies from 18.76% to 35.20% (Table-1). Available N, Available P<sub>2</sub>O<sub>5</sub> & K<sub>2</sub>O varies from 415 to 438kg/ha, 19.89 to 27.23kg/ha and 143 to 248kg/ha; respectively (Table-1). These are the inherent characters of the selected sites of Boko block presented in the Table-1 indicates that yield variations of winter rice was mostly due to the management practices as well as inherent characters of original soil of the selected sites.

**Table-1: Physico-Chemical properties in selected villages under Boko block of Assam**

Sl.no.	Notations	p <sup>H</sup>	Sand%	Silt%	Clay%	Av.N(kg/ha)	Av.P <sub>2</sub> O <sub>5</sub> kg/ha	Av.K <sub>2</sub> O kg/ha
1	V <sub>1</sub>	4.63	26.30	35.20	28.50	446.06	23.43	240.80
2	V <sub>2</sub>	5.07	27.00	33.00	26.00	432.92	24.66	251.50
3	V <sub>3</sub>	4.69	34.00	28.00	38.00	436.30	23.80	249.90
4	V <sub>4</sub>	4.92	36.40	24.00	38.80	415.72	23.54	242.80
5	V <sub>5</sub>	4.72	31.30	32.23	36.40	440.64	24.21	240.50
6	V <sub>6</sub>	4.76	38.00	27.00	35.00	425.24	24.09	146.00
7	V <sub>7</sub>	4.61	42.70	19.00	38.30	415.78	23.67	234.56
8	V <sub>8</sub>	5.50	41.67	20.10	37.9	416.84	27.23	231.50
9	V <sub>9</sub>	4.90	47.10	21.00	35.00	409.80	19.89	149.24
10	V <sub>10</sub>	4.88	43.00	22.17	33.90	432.00	23.46	246.00
11	V <sub>11</sub>	5.29	44.00	18.76	37.56	434.27	25.60	235.00
12	V <sub>12</sub>	5.33	30.78	24.56	36.89	427.00	24.50	247.90
13	V <sub>13</sub>	4.78	35.87	23.50	18.70	415.60	24.95	143.89
14	V <sub>14</sub>	5.02	44.06	34.15	19.75	435.00	24.15	245.85
15	V <sub>15</sub>	5.06	41.25	28.90	32.00	406.00	22.91	238.90
16	V <sub>16</sub>	4.28	39.00	25.13	32.50	435.00	25.12	149.00
17	V <sub>17</sub>	4.82	41.45	31.80	21.50	431.00	23.56	237.00
18	V <sub>18</sub>	5.05	35.87	28.85	33.45	438.00	23.50	248.00
19	V <sub>19</sub>	4.92	38.09	28.15	33.50	434.06	23.90	245.05
20	V <sub>20</sub>	4.65	39.05	27.85	32.05	413.50	24.55	235.85

**Table 2. Yield characters and Net returns(Rs/ha) of Rice (cv-Ranjit) at Boko block of Assam**

Sl.No.	Notations	Grain yield (q/ha)	Straw yield (q/ha)	Harvest Index (%)	Net returns (Rs/ha)
1	V <sub>1</sub>	51.50	63.00	81.74	1,15,500.00
2	V <sub>2</sub>	51.71	66.55	77.35	1,16,865.00
3	V <sub>3</sub>	51.00	68.60	77.25	1,15,959.38
4	V <sub>4</sub>	52.00	63.43	83.30	1,15,631.25
5	V <sub>5</sub>	50.65	68.78	73.64	1,10,797.00
6	V <sub>6</sub>	52.00	62.40	83.33	1,13,750.00
7	V <sub>7</sub>	49.60	59.52	83.33	1,08,500.00
8	V <sub>8</sub>	48.50	64.20	75.54	1,06,094.00
9	V <sub>9</sub>	48.60	58.60	82.93	1,06,313.00
10	V <sub>10</sub>	51.60	64.92	79.48	1,12,875.00
11	V <sub>11</sub>	53.00	68.60	77.25	1,15,938.00
12	V <sub>12</sub>	52.84	63.40	83.35	1,15,588.00
13	V <sub>13</sub>	53.15	63.78	83.33	1,16,266.00
14	V <sub>14</sub>	52.85	68.42	77.24	1,15,609.00
15	V <sub>15</sub>	50.89	66.87	76.10	1,11,322.00
16	V <sub>16</sub>	49.95	59.94	83.30	1,09,265.60
17	V <sub>17</sub>	53.20	68.60	77.25	1,15,938.00
18	V <sub>18</sub>	54.55	66.45	82.09	1,19,328.12
19	V <sub>19</sub>	51.08	68.30	74.78	1,11,737.50
20	V <sub>20</sub>	52.00	68.40	76.02	1,13,750.00

## CONCLUSION

Due to the effect of environmental pollution, Organic nitrogen supplements unlike fertilizer nitrogen, do not suffer any loss in the field. Therefore, it is better to apply Organic fertilizers to get higher yield of rice and also to improve the inherent fertility status of soil. Ideal soil condition may be created through the combination of Organic manure and Nitrogenous fertilizers in the crop field in future.

## REFERENCES

- Jackson, M.L. 1956. Soil chemical Analysis-Advance Course. Univ. Winconsin, Madison,pp-27-95.
- Jackson, M.I. 1973. Soil Chemical Analysis. Prentice Hall of India. Pvt. Ltd. New Delhi,pp-498-99.
- Soil Survey Staff 1994. Keys to Soil Taxonomy.6<sup>th</sup> ed. SMSS. Tech. Monogr. 6. Blackberg, Virginia, USA.

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