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# IMPACT OF LIMING AND GREEN MANURING ON PRODUCTIVITY OF PADDY AND BRINJAL CROPS IN ACIDIC SOIL

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## ABSTRACT

Acidic soil cover quite larger area in the Korba district of chhattisgarh which is an important rice producing region of the chhattisgarh. As a result of this low pH ranges (4.5-5.5) and low fertility of these soils, rice yields are low to low. To increase rice production and to maximize the net profit, improvement of acidic soil by liming should be done. Liming increased grain yield by 5.16 % as compared to no application and Similarly green manuring give also impact on the productivity of crops are studied. Application of Green manuring Sunhemp var.Kanpur 12 increased grain yield by 30.53 %, also No. of effective tillers and grain per panicle as compared to without application. Both Liming and green manuring separately impact on productivity of crop on soil.

**KEYWORDS:** Acidic Soil, Agroclimatic zone, FLDs, Green manuring and OFT

## INTRODUCTION

Lime application may improve yield and influence nutrient level in the anaerobic rice cropping system in the acidic soil. Several reports suggest that lime application in the acidic soil is beneficial for soil health and improves the crop yields (Lal and Mathur, 1989; Prasad, 1992; Dixit and Sharma, 1993). The beneficial effect of liming on irrigated rice yields is also reported by Mamaril *et al.*(1991). Similarlily green manuring exerts multiple beneficial impact on the soil. Green manures supply nitrogen to the soil and consequently make it available to the plants, leguminous green manure convert unavailable nitrogen of the atmosphere into available ammonium of the soil. The over dry weight of leguminous plant contain on an average 2.5 to 3.0 % nitrogen.

## BACKGROUND INFORMATION DISTRICT KORBA

**Table 1**

| Agro-Climatic Zone | Chhattisgarh Plains |
|---|---|
| No. of tehsils | 05 |
| No. of blocks | 05 |
| No. of villages | 797 |
| No. of electrified village | 630 |
| No. of farmers / Farm families | 1,16,260 |
| Literacy rate (%) | 64.58% for male , 40.56 %for female |
| Average size of land holding | 5 Acre (2 ha) |
| Population (lakh) | 10.12 |
| Percent tribal population to total population (%) | 52% |

**Table 2**

| | |
|---|---|
| Geographical area (,000 ha) | 714.54 |
| Net sown area (,000 ha) | 146.641 |
| Gross sown area (,000 ha) | 182.667 |
| Area under forest (,000 ha) | 467.667 |
| Percent forest area to geographical area (%) | 65.45 % |
| Kharif sown area (,000 ha) | 146.641 |
| Rabi sown area (,000 ha) | 36.36 |
| Summer crop area (,000 ha) | Nil |
| Total area under horticultural crop (,000 ha) | 30.12 |
| Cropping intensity (%) | 125 % |
| Irrigation (%) | 13.9 % |
| Average rainfall (mm) | 1360 mm |

## TECHNOLOGY DISCRIPTION

- Technology under nutrient management was conducted on liming under OFT "Assessment of lime application in brinjal crop for growth and development" during Rabi year 2012 to increase the production of vegetable. Lime application @ 5q/acre should be applied in the farmers' field. It should be applied at the time of field preparation.
- The technology under soil fertility management was conducted under FLD on "green manuring "during Kharif year 2011 to improve soil health and to improve physical properties of the soil. Green manure Sunhemp var. Kanpur 12 shall be tested against farmers practice. Sunhemp should be grown in field 25-30 days before planting of main crop.

## METHODOLOGY ADOPTED IN DISSEMINATION

- The experiment was conducted at village Jurali under OFT programme during Rabi year 2012 to observe the impact of liming on yield of brinjal crop under acidic condition were pH ranges from (4.5-5.5). Two treatment were selected T1 (No application of lime) and T2 (lime @ 5q/acre) for this experiment.

The experiment was conducted at village Pulalikala under FLD programme during Kharif year 2011 and aimed was to increase crop productivity by the application of Green manuring. Two treatment were selected T1 (No application of green manuring) and T2 (Sunhemp var. Kanpur 12) to analyze the impact of green manuring on productivity of paddy crop under rainfed condition. Farmers involve in these research are in appendix- I.

**Replication/ Area Covered**

| 1. Liming | 2. Green manuring |
|---|---|
| Area(ha) = 1.600 | Area (ha) =4.800 |
| Replication = 04 | Replication = 12 |

## RESULT AND DISCUSSION

Under OFT & FLD result were found in adopted village Jurali and Pulalikala Block Pondi uproda and Pali in District Korba (C.G.).

**Table 3**

| Treatments | Avg. Yield (q/ha) | No. of fruit /plant | Wt. of per fruit (gm) |
|---|---|---|---|
| T1 ( No application of lime) | 193.75 | 19.25 | 77.50 |
| T2 ( lime @ 5q/acre) | 203.75 | 23.25 | 83.75 |

**Table 4**

| Treatments | Avg. Yield (q/ha) | No. of effective tillers | Grain per panicle |
|---|---|---|---|
| T1 ( No application of green manuring) | 29.21 | 6.67 | 200.25 |
| T2 ( Sunhemp var. Kanpur 12) | 38.13 | 8.75 | 227.42 |

Application of lime in 2012 increased grain yield, No. of fruit /plant and Wt. of per fruit (gm) (Table 2a) compared to the no lime, liming slightly increased grain yield by 5.16 % , No. of fruit /plant by 20.77% and Wt. of per fruit (gm) 7.41%. Similar results were also reported on soybean production by Prasad (1992).

Application of Green manuring Sunhemp var.Kanpur 12 increased grain yield, No. of effective tillers and Grain per panicle (Table 1a) compared to the without green manuring. Green manuring increased grain yield by 30.53 %, No. of effective tillers by 31.18% and Grain per panicle 13.56%. Similar result were also founded on wheat by Baddurudin *et.al* (1990)

## CONCLUSION

- From the above result and discussion, lime application 5q/acre in acidic soil with pH ranges (4.5-5.5) had no clear effect on the yield of brinjal in rabi season. Liming attributed to the general decrease acidity and improve the microbial activities into soil. Application of CaCO3 at the time of field preparation in the soil use as a liming material, increased availability of Ca and released (OH) ions which responsible to increased the pH of soil.
- From the above result and discussion, green manuring had positive effect on yield of paddy crop in Kharif season under rainfed condition. Sunhemp used as green manuring crop for manuring, before one month of planting of main crop (Paddy). It increased yield of crop with supply of nitrogen and maintain the fertility of soil.

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**Appendix-I**

- Under OFT 04 farmers were selected from adopted village Jurali Block Pondi uproda in District Korba (C.G.).

**Table 5**

| S.No. | Farmers/ Fathers Name | Category | Area(ha) |
|---|---|---|---|
| 1 | Chhatram/Mangal Ram | OBC | 0.400 |
| 2 | Jaipal/Sawan Das | OBC | 0.400 |
| 3 | Satlal/Gambhir | OBC | 0.400 |
| 4 | Ganeshram/Ram Pyare | OBC | 0.400 |

- Under FLD 12 Farmers were selected from adopted village Pulalikala Block Pali in District Korba (C.G.)

**Table 6**

| S.No. | Farmers/ Fathers Name | Category | Area(ha) |
|---|---|---|---|
| 1 | Gulab sing /Manhar | ST | 0.400 |
| 2 | Sant ram / Sukul sing | ST | 0.400 |
| 3 | Shiv sing / Ajor sing | ST | 0.400 |
| 4 | Madhuram/ Manohar | ST | 0.400 |
| 5 | fool sing /Samar sing | ST | 0.400 |
| 6 | Suresh sing /Fool sing | ST | 0.400 |
| 7 | Sukul sing /Anjor sing | ST | 0.400 |
| 8 | Girpal sing /Sukul sing | ST | 0.400 |
| 9 | Omprash /J.P. Dixena | OBC | 0.400 |
| 10 | J.P.Dixena | OBC | 0.400 |
| 11 | RamGopal | ST | 0.400 |
| 12 | Suresh sahu | ST | 0.400 |