

## Yield response of pepper (*Capsicum Frutescence*) to source of P-Application in Anyigba, Kogi state, Nigeria

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**Key words:** Organic fertilizer, NPK fertilizer, Plant height, Number of leaves, Stem girth, Fruit yield

### Abstract:

The study evaluates effect of P - source (as NPK 15:15:15 or cow dung manure) on the growth and yield of pepper (*Capsicum frutescence*) in Anyigba (latitude 7o151N and 7o291N and longitude 7o111E and 7o321E with altitude of 420m above sea level). The treatment components were a control: 60 kg and 120 P/ha (applied as cow dung) as well as 60 kg and 120 kg P/ha (applied as NPK 15:15:15) in addition to 60 kg and 120 kg P/ha as equal split between NPK 15:15:15 and cow dung in a Randomized Complete Block Design (RCBD) with three replications. Data on growth and yield components were taken at 2, 4, 6, and 8 weeks after transplanting (WAT). Generally nutrient source did not differ significantly relative to plant height, leaf number and stem girth. Nutrient addition however indicate better significant performance when compared with the control. Regarding crop yield application of 120 kg P /ha in split equal doze of NPK 15:15:15 + Cow dung gave the best yield result.

### Introduction:

The use of both organic and inorganic manures have been reported to enhance soil productivity, increase the soil organic carbon content, soil micro-organism, improve soil and enhance crop yield [1, 2]. The superiority and richness of combination of organic manures and mineral fertilizers over single manure applications have been confirmed in other studies [3, 4, 5, 6, 7 and 8].

### Materials and Methods:

The study evaluates effect of P - source (N.P.K. 15:15:15 or cow dung) on the growth and yield of pepper (*Capsicum frutescence*) in Anyigba (latitude 7o151N and 7o291N and longitude 7o111E and 7o321E with altitude of 420 m above sea level). The treatment components were a control: 60 kg and 120 P/ha (applied as cow dung); 60 kg and 120 kg P/ha (applied as NPK 15:15:15) in addition to 60 kg and 120 kg P/ha as equal split between NPK 15:15:15 and cow dung in a Randomized Complete Block Design (RCBD) with three replications. Data on growth and yield components were taken at 2, 4, 6, and 8 weeks after transplanting (WAT). The data collected were subjected to Analysis of Variance (ANOVA) for

a Randomized Complete Block Design (RCBD). Significantly different means were separated using the Least Significant Difference (LSD) test at 50% level of probability.

### Results:

Chemical and physical properties of the soil used for the experiment are presented in Table 1. Soil is sandy loam and low in plant nutrients. The laboratory analysis of the cow dung manure for N, P, and K contents is also presented on Table 1, indicating percentage N, P and K.

**Table 1: Physical and chemical properties of experimental soil and cow dung**

Soil Properties/Nutrient	Value	Cow dung
	0 - 15 cm	
Total Nitrogen (%)	-	1.5
Total Phosphorus (%)	-	1.86
Total Potassium (%)	-	1.02
Total Nitrogen (g/kg)	0.02	
Available P (mg/kg)	11.25	
K (C mol/kg)	2.31	
Organic Carbon (g/kg)	0.34	
% Organic Matter	1.52	
pH in KCl	4.56	
pH (H <sub>2</sub> O)	5.1	
Silt (%)	6.56	
Clay (%)	14.64	
Sand (%)	78.8	
Textural class	Sandy loam	

While generally nutrient source did not differ significantly relative to plant height, leaf number and stem girth, nutrient addition indicate better significant performance when compared with the control plots (Table 2). Regarding crop yield, application of 120kg P/ha in split application of NPK 15:15:15 + Cow Dung gave the best yield response (Table 3), while the least yield responses were observed in the control plot.

**Conclusion:**

Regarding crop yield, application of 120kg P/ha in split application of NPK 15:15:15 + Cow Dung gave the best result thus recommended for the experimental area.

**Table 2: Effect of nutrient application on plant height, leaves and stem girth**

Nutrient	Plant Height (cm) VAT				Number of Leaves VAT				Stem Girth (cm) VAT			
	2	4	6	8	2	4	6	8	2	4	6	8
Control	13.1	15.17	20.89	31.77	7	11	40	66	0.51	0.77	1.38	1.54
<b>Organic nutrient</b>												
60kg P/ha (Cow Dung)	15.22	20.07	26.9	37.75	8.33	14.67	60.67	94.33	0.63	0.82	1.57	1.83
120kg P/ha (Cow Dung)	14.63	19.08	27.28	36.33	9.67	14.67	56.33	89	0.62	0.8	1.56	1.79
<b>Mineral Nutrient</b>												
60kg P/ha (NPK 15:15:15)	12.78	17.05	22.6	32.67	8.67	13.33	51.33	78.67	0.54	0.78	1.48	1.64
120kg P/ha (NPK 15:15:15)	14.27	18.98	25.05	35.29	8.67	15.67	59.67	90	0.58	0.81	1.5	1.78
<b>Organic nutrient+ Mineral Nutrient</b>												
60kg P/ha (Cow Dung + NPK 15:15:15)	12.93	16.83	24.98	34.94	8	12	52.67	87	0.55	0.81	1.45	1.66
120kg P/ha (Cow Dung + NPK 15:15:15)	16	21.57	28.09	38.44	10.33	16.67	69	100.33	0.63	0.83	1.56	1.84
<b>LSD</b>	4.032	5.545	6.106	7.031	2.761	5.043	22.984	26.072	0.122 <sup>NS</sup>	0.122 <sup>NS</sup>	0.150	0.561*

WAT=Weeks after transplanting, LSD=Least Significant Difference, NS= Not Significant; \* Significant

**Table 3: Effect of nutrient application on fresh yield**

Nutrient	Fresh yield / plant (g)
Control	101.85
<b>Organic nutrient</b>	
60kg P/ha (Cow Dung)	144.4
120kg P/ha (Cow Dung)	144.1
<b>Mineral Nutrient</b>	
60kg P/ha (NPK 15:15:15)	114
120kg P/ha (NPK 15:15:15)	140.67
<b>Organic nutrient+ Mineral Nutrient</b>	
60kg P/ha (Cow Dung + NPK 15:15:15)	137.18
120kg/ha (Cow Dung + NPK 15:15:15)	177.18
<b>LSD</b>	45.644*

LSD=Least Significant Difference, \*= Significant

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