

SHORT COMMUNICATION

Effect of Inorganic, Organic and Bio Fertilizer on Growth of Hybrid *Moringa oleifera* (PKM 1)

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Abstract: A pot experiment was carried out on hybrid drumstick PKM 1 added with inorganic and organic fertilisers. Seeds of hybrid Drumstick PKM1 were sown in the plastic pots in glass house condition. Single inorganic fertilizer, phosphate solubiliser and bio organic fertilizer as well as in different combinations were applied to the pots. Data revealed that plant height, fresh and dry biomass, moisture content were affected significantly with the application of organic, inorganic and biofertilisers individually and in combination. Inoculation of phosphate solubilizing fungi (indigenous strain) exhibited growth and biomass of Drumstick plants individually and in combination with SSP (inorganic fertiliser) and Multiplex Annapurna (Commercial biofertiliser).

Key words: Moringa • Drumstick • Phosphate solubiliser • SSP • Urea

INTRODUCTION

Hybrid drumstick PKM 1 is high yielding edible variety and have high demand due to its medicinal value [1]. All parts of the tree are used in treatment of ascites, rheumatism, venomous bites and cardiac and circulatory stimulants [2, 3]. In southern India this variety is being used for alley cropping in agro forestry. In the present study, an attempt was made to observe the performance of this variety under different treatment of inorganic, organic and biofertiliser and phosphate solubilisers alone and /or in combination.

Pot experiments was carried out in 9'' plastic pots having sandy loam soil. Individual pot soil was treated with (T1) Urea (50 mg./ pot), (T2) superphosphate (5 mg./ pot), (T3) Potash (5 mg./ pot), (T4) Shymala-a combination of N,P,K (5 mg./ pot), (T5) Multiplex Annapurna (5 g./ pot), (T6) Garden Samrat (5 g./ pot), (T7) Nirmal Bio-power (5 g. / pot), (T8) broth culture of fungi F1 (5ml. /pot). (T9) Fungi (F1), super phosphate (5ml + 5mg. per pot). (T10) Fungi (F1), super phosphate, Multiplex Annapurna (5ml.+5mg.+5g./pot), (T11) with Fungi (F1), Multiplex Annapurna (5 ml.+5g./pot) along with uninoculated and untreated control. The Garden samarat, Nirmal Bio powder, Annapurna are

the commercial biofertilisers and were bought from local market. The Plants were watered daily and final observation on various growth parameters were recorded on 60 days old plants.

Results obtained on growth parameters exhibited good performance of *Moringa oleifera* PKM 1 grown in different treatments (Table 1). Highest leaflets numbers and shoot height were obtained in plants treated with urea (5g/pot) and fungi + SSP (5ml, 5g/pot). However, urea alone increased the root:shoot ratio whereas fungal inoculation with SSP resultant into better % solid. Other commercial biofertiliser like shyamala helped in better root development in host plants. The dry biomass were highest in plants treated with fungi, SSP and annapurna. Overall performance of phosphate solubilising fungi F1 along with SSP treatment showed promising effects on growth and biomass generation of these plants. Though, phosphate solubilizing properties of any microbe depends upon the soil properties, fertilizer type and intake, our small experiment indicated the potential of fungi F1 in improving growth and development of host plants [4]. Further experimentations on standardization of inoculum density, soil factors and fertilizer applications are required to reach any conclusion [1].

Table 1: Growth performance of hybrid drumstick PKM 1 grow in different treatments

	No. of Leaves lets	No. of leaves	Shoot heitht (cm)	Root length (cm)	Root: shoot ratio	Dry wt.	% moisture	% moisture density	% solid
C	105.571±20.280	9.571	33.557±5.479	7.214±1.532	4.651	3.572± 0.38	32.040±0.794	47.157±1.719	67.958±0.794
T1	134.333±25.263	9.500	45.500±9.962	7.516±2.646	5.674	4.203±0.38	32.231±0.749	48.095±12.564	67.767±5.749
T2	118.375±23.427	9.875	42.650±9.348	8.537±2.902	5.329	3.724±3.72	31.215±2.204	45.457±4.659	68.783±2.204
T3	88.800±30.044	8.000	32.660±8.636	9.740±2.159	3.353	3.702±0.10	29.876±0.605	42.611±1.233	70.122±0.605
T4	110.142±20.876	8.857	40.658±6.027	10.514±2.208	3.867	3.768±0.14	29.063±0.543	40.975±1.080	70.935±0.543
T5	101.500±29.789	9.125	40.262±7.943	8.962±3.504	4.492	3.851± 0.23	29.784±0.635	42.425±1.289	70.214±0.635
T6	112.000±31.802	9.375	40.525±6.922	9.200±2.569	4.404	4.296±0.59	29.153±2.233	41.220±4.452	70.845±2.233
T7	100.625±24.106	8.500	37.575±10.56	8.125±0.996	4.624	3.874±0.47	30.656±2.429	44.297±5.055	69.343±2.429
T8	99.571±13.525	8.142	41.428±8.538	8.283±2.738	5.001	3.737±0.12	31.095±1.974	45.188±4.160	68.907±1.980
T9	129.571±28.958	8.000	48.814±4.942	9.342±1.447	5.225	4.066±0.01	9.039 ±0.141	9.556±0.409	90.378±0.681
T10	119.571±26.726	9.428	44.014±7.629	9.128±2.661	4.821	4.931±0.88	22.237±1.417	28.465±2.128	74.082±6.621
T11	92.142±18.951	8.857	37.014±6.568	8.987±1.730	4.118	3.678±0.14	26.083±1.414	31.928±2.121	72.916±2.828

Abbreviations

± standard deviation of three replications

C=no treatments T1=Urea (50mg/pot) T2=SSP (5mg/pot) T3=Potash (5mg/pot) T4=Shymala (5mg/pot)
 T5=Multiplex Anapurna (5g/pot) T6=Garden samrat (5g/pot) T7=Nirmal Biopowder (5g/pot) T8=Fungi F1 (5ml/pot)
 T9=Fungi+ SSP (5ml, 5 g/pot) T10=Fungi+SSP+Annapurna (5ml+5g=5g/pot) T11=Fungi+ Multiplex Annapurna (5ml+5g/pot)

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