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"EFFECT OF NON LEGUMINOUS WEED MANURES ON MORPHOLOGICAL GROWTH OF GREEN LEAFY FODDER MAIZE"

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ABSTRACT :

In India, almost all farmers use green corn as feed for livestock, there is a need to create different types of organic food using different weeds everywhere to increase growth of green leafy fodder maize.

The experimental design was a randomized block design [RBD] with ten treatments and three replications. The weeds selected were Achyranthes and Parthenium. The vegetation was fresh, lushly, dark green and in healthy condition .The aerial part was just cut into pieces with the traditional iron cutter but weed vegetation was collected at 10 - 20 % flowering stage (uprooted) from the roadsides and field Campus early in the morning, chopped, mixed and directly dumped in the soil 13889 kg/ha in randomly selected green manure plots. Under naturally dried plant manure was also incorporated in the randomize selected respective plots after analysis each weed plant before using as nutritive Biofertilizers. After 30 days, the well fermented compost material was uniformly mixed an amorphous dark brown compost was available and then it was applied to the plots with size 3 x 3 meters in a random block design having three replicates along with the control.


Field Photo of crop: Zea mays L.

On the basis of result obtained, it can be concluded that all the results were significant over control i.e. Parthenium compost manure, Achyranthes compost manure, Parthenium green manure and Achyranthes green manure.

KEYWORDS : *Weeds, Treatments, Green, Dry & Compost Manure, and Fodder Maize.*


Achyranthes aspera L.


Parthenium hysterophorus L.

INTRODUCTION:

"The longer I live the greater is my respect for manure in all its forms."

- Elizabeth von Arnim.

Weeds are available in large amount only in the monsoon season. They may not be available always in the vicinity of the crop field; mainly weeds grow on roadsides, fallow land, around railway tracks, vacant grounds in graveyards or around cremation place etc. The dry matter percentage ranges from 10 to 15%. That means 85 to 90% is the only moisture content.

In monsoon to transfer this much of bulk from one place to other or to the working site is practically impossible. This has become a limiting factor or a hazard to use weeds as manure. Wherever they are produced in large quantity they may not be required or used there but there is a yawning gap between the sight of production and its utility in the field. To overcome this problem attempts had been made that whether it can be used through compost formation or by drying it. This drying method will reduce the bulk up to 85 to 90 % and compost preparation up to 43 to 50%.Thus making the transport comparatively easier or cheaper. For this we have to bear the nutrient loss in the raw material especially during the formation of compost, maximum protein nitrogen is consumed by the microorganisms and reducing its manurial value. After harvesting the vegetation, if it is dried under Sun in open space again there is every possibility of the loss of nutrients from the vegetation (Bharati Jadhav and R. N. Joshi Ph.D. thesis, 1979).

Green manures provide soil cover and thereby control erosion. Tanzanian farmers have used sunhemp *(Crotolaria ochroleuca*) to increase their maize yield from 12.5 to 45 bags ha-1. (Lupatu and Kilimwiko, 1991)

The relatively higher N_2O emissions in the green manure treatment as compared to synthetic fertilizer treatment could be attributed partially to the incorporation of the green manure leaves which promoted high levels of nitrate and available carbon in the soil enhancing denitrification (Janzen and Schaalje 1992).

Channappagoudar B. B., *et al*., (2007) Observed that weed composts were prepared at preflowering and postflowering stage while *Portulaca oleracea* at preflowering stage. These composts were compared with farm yard manure (FYM), vermin compost and poultry manure in combination with recommended dose of fertilizer (RDF). Before application to the filed these composts were analyzed for major nutrients composition.

MATERIALS AND METHODS:

Experimental Design: The experimental design was a randomized block design [RBD] with ten treatments and three replications.

RANDOMISED BLOCK DESIGN

NALA [EAST]

1} P.&A.GM.	2} PK	3} A.GM.	4} NPK	5} A.DM.
6} P.GM.	7} A.Co.	8} P.Co.	9} CON.	10} P.DM.
11} A.Co.	12} CON.	13} P.GM.	14} P.&A.GM.	15} A.DM.
16} A.GM.	17} P.Co.	18} PK	19} NPK	20} P.DM.
21} P.GM.	22} PK	23} P.&A.GM.	24} P.Co.	25} A.GM.
26} A.DM.	27} A.Co.	28} CON.	29} NPK	30} P.DM.

POLY HOUSE

GAJRAJ GRASS

ASHOKA TREE

Treatments, Composting Process and Plot Size: The weeds selected were *Achyranthes* and *Parthenium* .The vegetation was fresh, lushly, dark green and in healthy condition .The aerial part was just cut into pieces with the traditional iron cutter but weed vegetation was collected at 10 - 20 % flowering stage (uprooted) from the roadsides and field Campus early in the morning, chopped, mixed and directly dumped in the soil 13889 kg/ha in randomly selected green manure plots.

Pits having size 75x105x90 cm along with cattle shed waste i.e. pieces of Sorghum straw, cow dung slurry and soil one above the other. The weed layer was about 15cm., it was closed by the dung-mud mixture and irrigated. For the weed materials, the combination was 13889 kg/ha vegetation for *Achyranthes* as well as Parthenium along with 65 kg of waste + 25 kg of cow dung and 90 kg of cleaned soil for compost manure. After 30 days, the well fermented compost material was uniformly mixed. an amorphous dark brown compost was available and then it was applied to the plots with size 3 x 3 meters in a random block design having three replicates along with the control.

Under naturally dried plant manure was also incorporated in the randomize selected respective plots after analysis each weed plant before using as nutritive Biofertilizers. The maize seeds sowing of the variety 'African Tall' produced by National Seed Corporation Ltd., Beej Bhavan, Pusa Complex, New Delhi were sown at the rate of 75 kg/ha on 27 September with row to row distance 22.5 cm to keep the population uniform, in all the plots along with the control.

Duplicate samples from each weed manure dried in oven at 105°C till it gives constant weight for the determination of the Dry matter percentage of the green manure, dry plant manure and compost manure. The dried samples were converted into fine powder in the laboratory and it was used for further analysis.

Application of mineral fertilizers: For the baby plants squirrels were creating problems. They first cut the seedlings and consume the germinating seed. To overcome this difficulty additional seeds were sown along with the border of the experimental field. In order to ensure uniform population density per row and the plant to plant spacing within the row, extra seedlings were thinned after emergence and transplanted in the gaps from the border line plants.

After 20 days of sowing weeding was done and the first dose of nitrogen was given through urea and the crop was irrigated, after 72 days of sowing second dose of nitrogen and phosphorus (120:80 kg/ha.) was given through urea and super phosphate and the crop was irrigated.

Plant Sampling: After 104 days i.e. on 09, January the crop was harvested early in the morning and the fresh yield of the aerial part of the crop was noted and calculated as kg/ha. 3kg sample of fresh vegetation was pulped (Davys and Pirie, 1969). From it 100gm of pulp was dried in oven at 90°C till it gives constant weight for the determination of dry matter (DM). Dried sample was converted in to fine powder and used for further laboratory analysis. Yield of fresh green fodder and dry matter (kg/ha) was calculated considering the yield of green fodder per plot and its dry matter content.

ANALYSES : Growth Analyses - The morph-physiological traits of the crop were noted at 102 DAS as plant height, diameter, number of leaves per plant, total weight, 4th upper leaf area per plant was determined by gravimetric method [Shahane and Mungikar, 1984; Mungikar, 1986].

Chemical Analyses - The chemical analyses were done by adopting standard analytical methods. Estimation of the total leaf chlorophyll, leaf chlorophyll 'a' and 'b' was done at the age of 103 days after the first and second dose were estimated following Yoshida *et al.*,[1976], using 80 % acetone as a solvent for extraction of pigments. The dried samples were taken for analyses.

Statistical Analyses - All the results were statistically analyzed by the analysis of method of variance [ANOVA] test and treatments means were compared using the least significant difference [CD,P_0.05] which allowed determination of significance between different applications [Mungikar, 1997]. The reducing sugars

were calculated was calculated on the basis of the standard graph prepared by using variable concentration of the standard solution.

Sr. No.	Field Activities	Date	Period [DAS]
01	Weed Collection: *Achyranthes, Parthenium*	01 AUG.	00 DAS
02	Preparation of Dry Manure	15 AUG.	15 DAS
03	Preparation of Compost Manure	30 AUG.	30 DAS
04	Treatments given to R. B. D. plots	01 SEP.	32 DAS
05	Sowing of Crop Maize.	27 SEP.	58 DAS
06	Basal Dose of PK	27 SEP.	**[00 DAS]**
07	Growth Analyses of Crop - I	07 JAN.	102 DAS
08	Chlorophyll Analyses of Crop - I	08 JAN.	103 DAS
09	Harvesting of Crop	09 JAN.	104 DAS
10	Chemical Analyses	24 JAN.	119 DAS

Table : I : ANALYSES OF NON LEGUMINOUS WEEDS BEFORE SOWING OF MAIZE CROP.

Treatments	Kg./ha.			%					C/N Ra.
	F.wt.	D.M.	N.	P.	K.	A.	C.	N.	
1] P.&A.GM	13889	2160	27	0.10	0.13	10.6	6.15	1.25	4.92
2] A.GM.	13889	2319	54	0.10	0.15	9.35	5.42	2.33	2.33
3] A.DM.	13889	2185	35	0.08	0.14	10.1	5.86	1.58	3.70
4] P.GM.	13889	2042	44	0.09	0.12	9.1	5.28	2.17	2.44
5] A.CO.	13889	8500	64	0.09	0.14	32	18.56	0.75	24.76
6] P.CO.	13889	7708	55	0.08	0.10	27.5	15.95	0.72	22.26
7] P.DM.	13889	1889	41	0.08	0.11	9.5	5.51	1.42	3.89

Fig. 1. TO Fig. 4 :- GROWTH ANALYSIS OF MAIZE PLANT

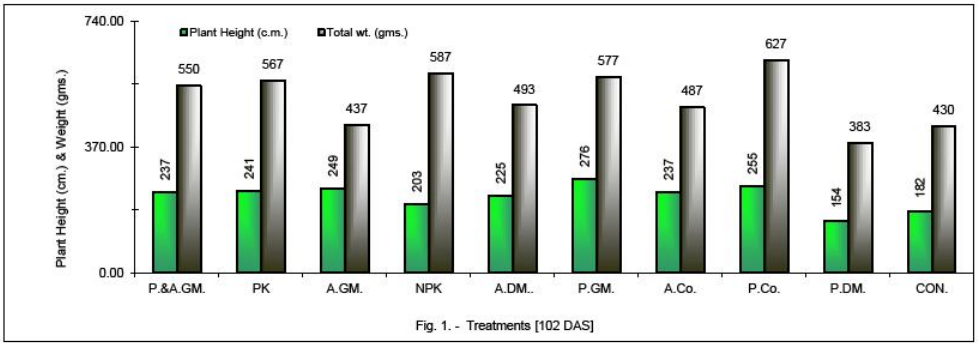

Fig. 1. - Treatments [102 DAS]

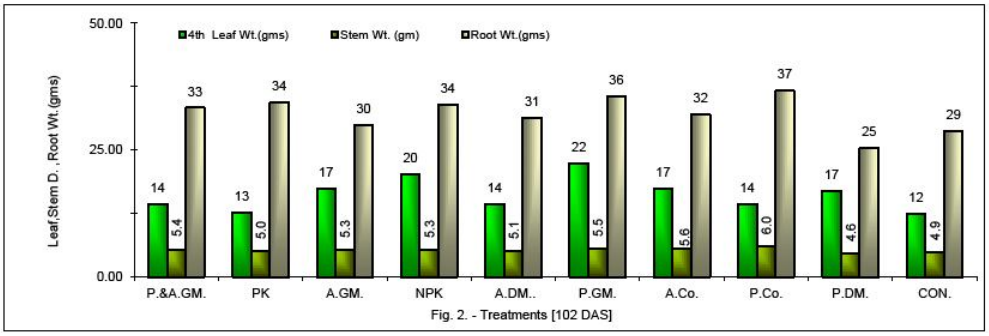

Fig. 2. - Treatments [102 DAS]

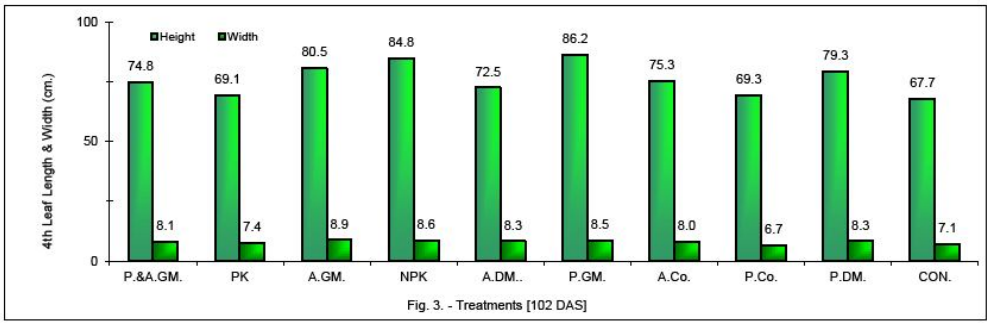

Fig. 3. - Treatments [102 DAS]

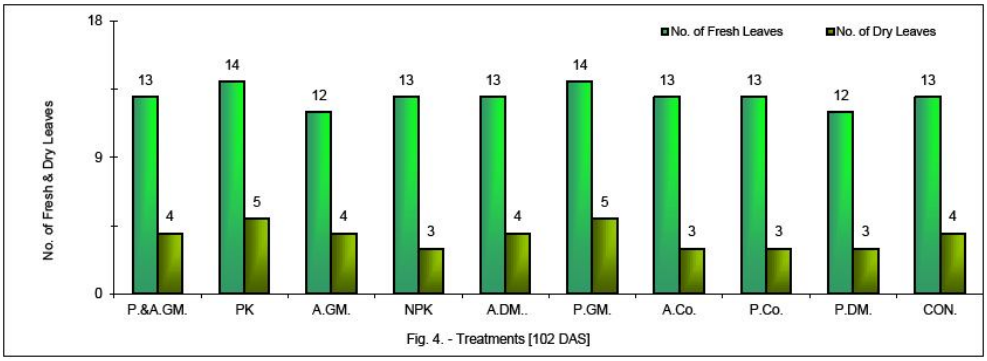

Fig. 4. - Treatments [102 DAS]

RESULTS AND DISCUSSION:

Analyses of Weeds [Table I]**:-** shows the analyses of non leguminous weeds before sowing of maize crop used as green manure, compost and dry manure as percentage of Phosphorous, potassium, Ash, carbon, Nitrogen and C/N Ratio. fresh weight, dry matter, Nitrogen and Crude Protein used as kg/ha.

Analyses of Growth [Fig.1 to 4]**:-** shows the growth analysis of maize plant done after 102 DAS of plant height and total plant weight showing in Fig.1, plant fourth leaf weight of Leaf, Stem, Root in gms shows in Fig.2, plant fourth leaf length, width (cm.) showing by Fig.3, number of fresh and dry leaves in cm shows in Fig.4, compared with control plant from each plot.

The total plant weight and their height when statistically analyzed were found to be statistically significant over control. The plant height greater in the plots was PGM i.e. 275.67cm followed in order by P.CO. 254.67cm, AGM i.e. 248.67cm, PK i.e. 241.33cm. However, lower height was found in PDM i.e. 154 cm followed in order by control i.e. 182.33 cm. Whereas total weight was highest in the plots P.CO i.e. 626.67gm followed in order by NPK i.e. 586.67gm, PGM i.e. 576.67gm and PK i.e. 566.67gm. Lastly total weight shows lowest result in the plots PDM i.e. 383.33gm then control i.e. 430.00gm.

CONCLUSION:

On the basis of result obtained, it can be concluded that all the results were significant over control i.e. *Parthenium* compost manure, *Achyranthes* compost manure, *Parthenium* green manure and *Achyranthes* green manure.

All the results reported in tables and graphs are the means of three replicates in which very impressive effect shows of non leguminous weed as Parthenium green and compost manures treatment on morphological growth of green leafy fodder maize.

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