REVIEW OF RESEARCH

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

Prakash N. Gholap

HEAD, Dept. of Botany, Kalikadevi Arts, Comm. & Sci., College, Shirur (Ka.),Tal. Shirur (Ka.), Dist. Beed (M.S.)

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ABSTRACT:

In India, almost all farmers use green corn as feed for domestic herbivores, there is a need to create different types of organic food using different weeds everywhere to increase more green leafy maize fodder productivity at a low cost.

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. 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).

The Non leguminous weeds selected were Achyranthes and Parthenium then its Green Manure, Dry manure in randomize selected respective plots, after analysis each weed plant before using as nutritive Biofertilizers. After the well fermented compost Manure was uniformly mixed 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.

All the results reported in tables and graphs are the means of three replicates and calculations had been done on dry matter basis. If handled carefully the other treatments may also give significant results in the future and a clue for the cheaper agricultural production.

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

INTRODUCTION:

Production in an ecosystem is the production of organic matter as a result of photosynthetic activity of green plants is of paramount importance to the ecosystem functioning, survival and welfare of entire human race is dependent on this process. The production studies are thus of great significance in any ecological investigation. The primary production studies also offer a convenient tool to study the impact of an environment perturbation in ecosystem. These studies are also of great help to planners for whom this data is at the base of national policies.

The reduction in C:N ratio was the result of decrease in carbon content which was utilized as the energy source for the soil microflora and consequently converted into the N content. Similar results were reported by Nagarajan *et al*. (1985), Rajendran (1991) and Thilagavathi (1992). Osei and Buckles, (1993) obtained maize yields with mucuna similar to those obtained with recommended levels of fertiliser of 130 kg N ha-1.

Dry matter accumulation is as a result of nutrient uptake. It is one of the measures of plant growth (Noggle and Fritz, 1983). However, (Harley and smith., 1983) reported that P uptake still depends on the soil phosphorus content.

Maize yields with complementary inorganic + organic fertilizers and with sole inorganic fertilizer treatment were compared because nutrients were readily released from the inorganic fertilizer. Utilization information is not generally available for composts formed from different waste streams, such as municipal solid waste (MSW), source separated MSW (SSMSW), wastewater biosolids -wood waste (WB), and fish waste (FW) (Brinton and Seekins, 1994). Mucuna has been successfully used to control *Imperata cylindrica* in Benin (Bunch, 1995).

He also reported that the green manure require no capital outlay. A mucuna relay cover crop improved the performance of a subsequent maize crop by 40% on the acid ultisols in Southern Nigeria, (Ile *et al*., 1996). Vissoh *et al.,* (1997) recorded a maize yield increase of 98% after mucuna short fallow without chemical fertilizer and 179% yield increase with mucuna when supplemented with 51 kg N ha-1, 46 kg P ha-1 and 28 kg K ha-1.

The preparation of dry powder or leaf manure will minimize the, transport problem at a large extent by reducing the bulk. In this investigation attempts had been made by comparing the fresh vegetation as green manure, dried leaf manure or whole plant as manure comparing with compost prepared by the same quantity of vegetation and their effect on the maize crop cultivated on it with random block design and three replicates each.

MATERIALS AND METHODS:

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

Treatments, Composting Process and Plot Size: The weeds selected were *Achyranthes* and *Parthenium* along with Green, Dry and compost manure was incorporated in the randomize selected respective plots after analysis each weed plant before using as nutritive Biofertilizers applied to the plots with size 3 x 3 meters in a random block design having three replicates along with the control.

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.

Achyranthes aspera L.

1. Field Photo of crop: Zea mays L.

Parthenium hysterophorus L.

2. Field Photo of crop: Zea mays L.

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.

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

ANALYSES :

Ash values were obtained by heating the moisture-free samples in a muffle furnace at 600°C for 2 hours, Carbon (C) was then calculated by multiplying A value with 0.58 as factor and Calcium (Ca) content was analyzed by titrating the sample solution against 0.01 N KMnO4 solution using methyl red as indicator [AOAC, 1995]. Nitrogen (N) was measured by micro-Kjeldahl's method after digesting the sample with Conc. H2SO4 according to Bailey [1967] and crude protein (CP) was expressed N x 6.25 equation as specified by AOAC, [1995]. Total Reducing Sugar (RS) was determined by reacting the sample with phosphomolybdic acid at 420 nm using Folin-Wu-tubes and Phosphorus (P) was analyzed by reacting the sample with ammonium molybdate solution at 660 nm [Oser, 1979] and Potassium (K) content was determined on a flame photometer [model Mediflame-127] as suggested by [Jackson, 1973].

Statistical Analyses - All the results were statistically analysed 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.

RESULTS AND DISCUSSION:

Analyses of Maize plant [Fig.1.]:- shows the effect of non legume weed manures on the maize fresh yield kg/ha, analysis total plant at 24 January, DM yield kg/ha, nitrogen and crude protein kg/ha, after 104 days when the crop was harvested on 09.January The highest average yield of fresh vegetation in the treatments *Parthenium* green manure i.e. 58852 kg/ha, followed in order by *Achyranthes* compost manure as well as *Parthenium* compost manure i.e. 56185 kg/ha, *Parthenium* & *Achyranthes* green manure i.e. 54667 kg/ha, PK i.e. 53296 kg/ha, *Achyranthes* green manure i.e. 52111 kg/ha, NPK i.e. 50185 kg/ha. and lowest average yield of fresh vegitation was shows in the treatments control i.e. 38889 kg/ha followed in order by *Achyranthes* dry manure i.e. 44444 kg/ha, *Parthenium* dry manure i.e. 46370 kg/ha.

The dry matter yield kg/ha was highest in the treatments *Parthenium* green manure i.e. 11967 kg/ha followed in order by *Achyranthes* green manure i.e. 11291 kg/ha, *Parthenium* and *Achyranthes* green manure i.e. 11116 kg/ha. The dry matter yield kg/ha was lowest in the treatments control i.e. 8685 kg/ha followed in order by *Parlhenium* dry manure i.e. 8779, *Achyranthes* dry manure i.e. 8889 kg/ha.

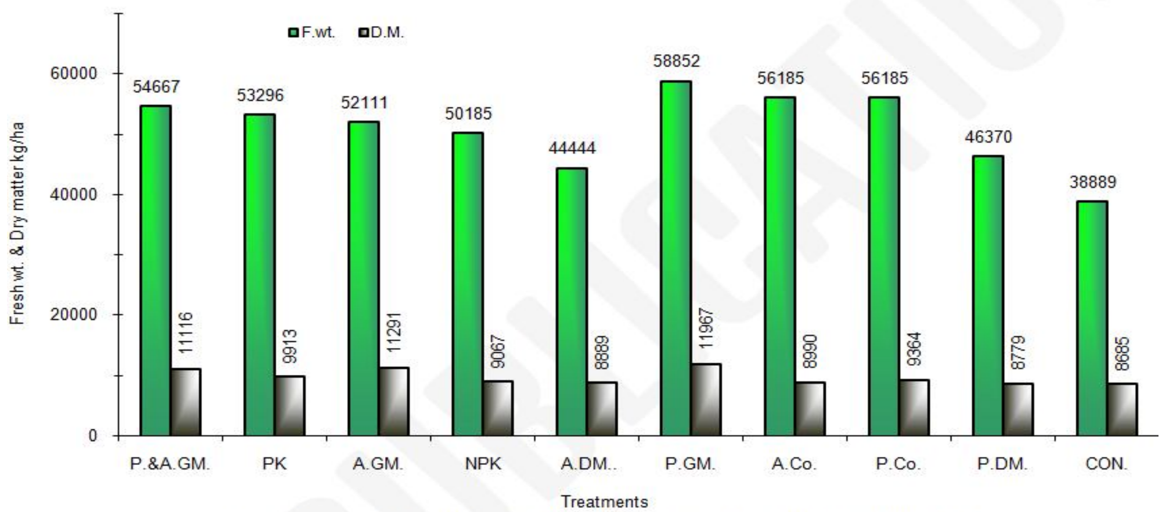

Fig. 1. - Fresh wt. S.E.= 3411, C.D.= 7163 and Dry matter S.E.= 1274, C.D.= 2676 [kg/ha]

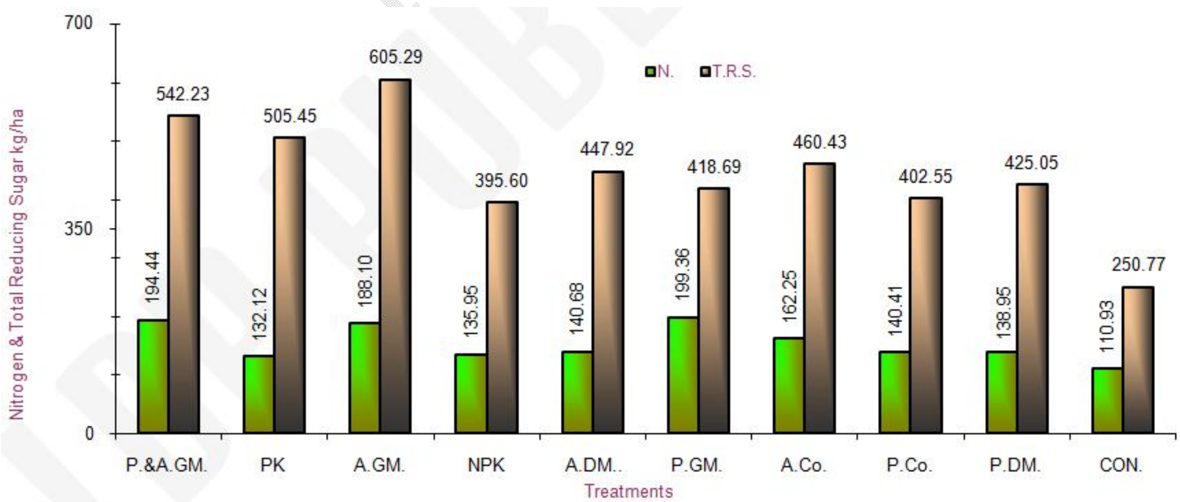

Fig. 2 - Nitrogen S.E.= 23.1, C.D.= 49.6 and Total Reducing Sugar S.E.= 60.3, C.D.= 126.6 [kg/ha].

Table :- EFFECT OF NON LEGUMINOUS WEEDS AS BIOFERTILIZERS ON MAIZE CROP ANALYSES OF TOTAL PLANT.

Treatments	F.wt./plot	%									C/N Ra.
		D.M.	C.P.	R.S.	Ca.	P.	K.	A.	C.	N.	
1} P.&A.GM.	49	20.3	10.93	4.88	0.15	0.10	0.10	10.23	5.94	1.75	3.39
2} PK	48	18.6	8.33	5.10	0.16	0.10	0.12	10.20	5.92	1.33	4.44
3} A.GM.	47	21.7	10.41	5.36	0.18	0.11	0.11	10.23	5.94	1.67	3.56
4} NPK	45	18.1	9.37	4.36	0.15	0.09	0.12	9.27	5.37	1.50	3.58
5} A.DM..	40	20.0	9.89	5.04	0.15	0.09	0.11	9.73	5.65	1.58	3.57
6} P.GM.	53	20.3	10.41	3.50	0.14	0.09	0.09	10.00	5.80	1.67	3.48
7} A.Co.	51	16.0	11.28	5.12	0.15	0.11	0.12	10.23	5.94	1.80	3.29
8} P.Co.	51	16.7	9.37	4.30	0.14	0.10	0.12	9.82	5.69	1.50	3.80
9} P.DM.	42	18.9	9.89	4.84	0.15	0.09	0.10	9.75	5.66	1.58	3.57
10} CON.	35	22.3	7.98	2.89	0.09	0.07	0.08	6.90	4.00	1.28	3.13
S.E. =	2.89	2.34	0.60	0.17	0.007	0.005	0.006	0.32	0.19	0.10	0.25
C.D. =	6.08	4.90	1.25	0.35	0.015	0.010	0.013	0.67	0.39	0.20	0.53

Analyses of Maize plant [Fig.2.]:- shows the Nitrogen kg/ha was highest in the amended plots was accounted for soil *Parthenium* green manure i.e.199 kg/ha followed in order by treated soil with *Parthenium* and *Achyranthes* green manure i.e.194 kg/ha, *Achyranthes* green manure i.e. 188 kg/ha and the lowest amended plots was accounted Nitrogen kg/ha was Control i.e. 111 kg/ha followed in order by treated soil with PK i.e. 132 kg/ha, NPK treatments i.e. 136 kg/ha, *Parthenium* dry manure i.e. 139 kg/ha,

The total reducing sugar kg/ha was higher in amended plots *Achyranthes* green manure i.e 605kg/ha followed in order by *Parthenium* and *Achyranthes* green manure i.e. 542 kg/ha, PK i.e. 505 kg/ha. Control given lower total reducing sugar kg/ha i.e 251 kg/ha followed in order by NPK i.e. 396 kg/ha, *Parthenium* compost manure i.e. 403 kg/ha.

Analyses of Maize plant [Table]:- shows the Phosphorous percentage was highest in the treatments *Achyranthes* compost then followed in order by *Achyranthes* green manure and lowest Phosphorous percentage was found in the treatments Control followed in order by *Achyranthes* dry manure then on *Parthenium* green manure treatments.

The Potassium percentage was highest in the treatments *Achyranthes* compost manure and PKand followed in order by NPK. the lowest Potassium percentage was found in the plot Control followed in order by *Parthenium* green manure, *Parthenium* and *Achyranthes* green manure treatments. The Calcium percentage was highest in the plots *Achyranthes* green manure followed in order by *Parthenium* and *Achyranthes* green manures, *Achyranthes* compost manure, PK then *Parthenium* compost manure amended plots.

The C/N Ratio observed highest in the treatment PK then in *Parthenium* compost manure amended plots and lowest C/N Ratio was found in the treatnent Control followed in order by *Achyranthes* Compost manure, *Parthenium* and *Achyranthes* green manure, *Parthenium* green manure, *Achyranthes* green manure.

CONCLUSION:

On the basis of result obtained, it can be concluded that all the results were statistically 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 and calculations had been done on dry matter basis. The treatments may give significant results in the effect of non leguminous weed manures on green leafy fodder maize productivity as well as for the cheaper agricultural production.

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Prakash N. Gholap
HEAD, Dept. of Botany, Kalikadevi Arts, Comm. & Sci., College, Shirur (Ka.), Tal. Shirur (Ka.), Dist. Beed (M.S.)