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Study of various Components of Manures in Plant Growth

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ABSTRACT
The waste matter from animals that is put on the ground in order to make plants grow better Manure is the decomposed form of dead plants and animals, which is applied to the soil to increase production. It is a natural form of fertilizer and is cost-effective. The human and animal excreta is also used as manure. The livestock manure is rich in nitrogen, phosphorus, and potassium. Manure is organic matter that is used as organic fertilizer in agriculture. Most manure consists of animal feces; other sources include compost and green manure. Manures contribute to the fertility of soil by adding organic matter and nutrients, such as nitrogen, that are utilized by bacteria, fungi and other organisms in the soil. Higher organisms then feed on the fungi and bacteria in a chain of life that comprises the soil food web. This Research article is to Study of various components of manures in plant growth.
Keywords: *Manure, Plant growth, habitation, chemical composition, agriculture*

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I. INTRODUCTION

Manure is highly rich in organic matter and humus and thus improves the soil fertility. These are better in the long run and does not cause any pollution. It is a valuable and renewable resource. Manuring-Manure can be obtained from various sources. The different sources of manure are -Cattle dung, urine, and slurry from biogas plants, Wastes from human habitation such as human urine, night soil, sludge, sewage, domestic waste, Droppings of goat and sheep waste from the slaughterhouses such as bones, meat, horn and hoof meal, fish waste by-products of agricultural industries, Crop waste Weeds, water hyacinth.

Types of Manure

Manure can be grouped as farmyard manure, green manure and compost manure. Following are the different types of manure used by the farmers:

Green Manure :-

Green manure increases the percentage of organic matter in the soil. The roots of such manures go deep into the soil. These help in the suppression of weeds and the prevention of soil erosion. In agriculture, green manure is created by leaving uprooted or sown crop parts to wither on a field so that they serve as a mulch and soil amendment. The plants used for green manure are often cover crops grown primarily for this purpose. Typically, they are ploughed under and incorporated into the soil while green or shortly after flowering. Green manure is commonly associated with organic farming and can play an important role in sustainable annual cropping systems.

Farmyard Manure:-

Farmyard manure improves the soil structure and is used as a natural fertilizer in farming. It increases the soil capacity to hold more water and nutrients. It also increases the microbial activity of the soil to improve its mineral supply and also the plant nutrients. Farmyard manure is one of the oldest manure used by the farmers in growing different crops because of its easy availability and presence of all the nutrients required by the plants.

Compost Manure:-

It improves the soil structure and water and nutrient holding capacity of the soil. Thus, it increases the nutrient value and thereby improves the health of the plants. Compost is a mixture of organic residues (manure, animal carcasses, straw, etc.) that have been piled, mixed and moistened to undergo thermophilic (high heat 113 to 160 degrees Fahrenheit) decomposition

II. MATERIALS AND METHODS

Preparation of Organic Manures:- Organic manures are composed of dead plant and animal remains and contain plant nutrients. They are applied to the soil to increase crop production. Farmyard manures from cow or buffalo dung, compost made from plants, leaves and kitchen waste, and leguminous crops used as green manures are some examples of organic manures.

Most farmers in the hills of Nepal use compost and other forms of organic manures as supplements to mineral fertilizers. However, compost prepared by traditional methods is not well-decomposed and has a poor nutrient content. Well-decomposed compost will reduce weeds and insects. Also, there are serious insect and weed problems when undecomposed compost is used. (The average nitrogen content of the compost prepared by farmers is 0.5%. Using improved methods can increase the nitrogen content of the compost to 1.5%.)

Preparation of Organic Manure at Home

Organic manures are natural products used by farmers to provide food for the crop plants. Organic manures are beneficial in the cultivation of crops. They increase the organic matter in the soil which in turn releases the plant food in available from the use of crops. Organic manures enable a soil to hold more water and also help to improve the drainage in clay soils. They even provide organic acids that help to dissolve soil nutrients and make them available for plants. Organic manure is being increasingly popular for organic farming.

Method to prepare organic manure

It is very simple to prepare organic manure at home by converting daily dustbins into rich, organic manure and grown flowers, vegetables or plant with it. So let us start with the most popular method of preparing organic manure at home-

III. RESULTS AND DISCUSSION

Table 1: *Effect of poultry manure levels on growth, yield and yield components of maize.*

Treatment	**Plant Height (cm)**	**No. of Cobs per plant**	**No. of rows per cob**	**No. of grains Per row**	**1000 grain wt.(g)**	**Grain**	**Biological Yield(t ha^{-1})**	**HI (%)**
T1=Control	171d	1.00	8.0 c	18.0 c	172 d	1.79 d	13.4 d	13.6 d
T2=4 t $^{ha-1}$PM	201c	1.00	10.0bc	21.3b	178d	1.78d	15.6cd	15.1bc
T3=6t ha^{-1}PM	209bc	1.00	10.5bc	23.0b	200c	2.31d	17.9cd	16.5bc
T4=8tha^{-1}	213	1.00	12.2b	27.4a	204c	2.91c	20.3ab	17.8bc
T5=10 t ha^{-1}	218	1.00	12.4b	28.3a	240b	3.61b	21.2a	19.5ab
T6=12 t ha^{-1}	232	1.11	16.2a	29.0a	252a	4.14b	22.2a	23.1a
LSD (95%)	15.5	NS	3.26	3.19	52	5.10a	3.15	4.76
EMS	80.3	-	3.16	3.21	8.70	0.572	2.99	6.90

PM= Poultry manure , NS= Non Significant , EMS= Error mean square

Data presented in table 1 show that plant height was significantly affected by different levels of poultry manure (PM). The comparison of treatments' means reveals that maximum plant height (230 cm) was recorded from plots where 12 t ha-1 Poultry Manure was applied (T6) followed by T5 (10 t ha-1) which was statistically at par with T6. Application of 4, 6 and 8 t ha-1 Poultry Manure did not differ significantly from each other with respect to plant height of maize while control (no Poultry Manure) gave minimum plant height.

The increase in plant height with P M was mainly due to the reason of more availability of nutrients by P M throughout the growing season. These results are in accordance with the findings of Mitchell and Tu and Warren et al. The results presented in table revealed that number of cobs per plant was not significantly affected by the application PM. This may be attributed to the reason that cob bearing potential of a variety controlled by its genetic make up rather than the agronomic practices. Non-significant effects of NP application on number of cobs per plant have also been reported by Maqsood et al.

Number of grain rows per cob is an important yield determining factor in maize. It affects the number of grains per cob and cob weight. The data recorded (table 1) reveal that different levels of PM had significant effect on number of grain rows per cob. Significantly maximum number of rows per cob (16.0) was recorded in treatment T6 where 12 t ha-1 PM was applied, and was followed by T5 and T4 each of which produced 12 rows per cob. The lowest number of rows per cob (8.0) was recorded in case of T1 (control) where no PM was applied. It was statistically at par with T2 and T3 treatments.

The comparison of treatments' means reveal that maximum number of grains per row (29.1) was recorded from plot fertilized with 12 t ha-1 PM (T6) which was statistically equal to that of T5 (10 t ha-1 PM) and T4 (8 t ha-1 PM) followed by T3 (6 t ha-1 PM) which was at par with that of T2 (4 t ha-1 PM). The minimum number of grains per row (18.1) was recorded from plot where no manure was applied (T1). The increase in number of grains per row may be attributed to the availability of more nitrogen and other nutrients from PM required for plant development up to cob formation.

Data presented in table 1 show that 1000-grain weight was affected significantly by different levels of poultry manure. Maximum 1000- grain weight (254 g) was recorded from plots where PM was applied @ 12 t ha-1 (T6) followed by T5 (241g). The minimum 1000-grain weight (173 g) was noted in control (T1) which was however, statistically at par with that of T2 treatment (179 g). These results are in accordance with the findings of Ma et al. and Garg and Bahla. The increase in 1000- grain weight with increased level of PM could be due to balanced supply of food nutrients from poultry manure throughout development of plant.

Biological yield was significantly affected by different levels of poultry manure. A perusal of table 1 shows that maximum biological yield (22.2 t ha-1) was obtained in T6 where 12 t ha-1 PM was applied which was statistically equal to that of T5 (10 t ha-1 PM) and T4 (8 t ha-1 PM) treatments giving biological yields of 21.2 t ha-1 and 20.3 t ha-1, respectively. The lowest biological yield in T1 (13.4 t ha-1) was recorded from plot where no PM was applied (control) which was statistically at par with that of T2 treatment. These results are in line with those of Deksissa et al. (2008).

Grain yield is a function of interaction among various yield components that were affected differentially by the growing conditions and crop management practices. It is clear from the table 1 that grain yield was significantly affected by the application of different levels of PM. All the means of data presented clearly show that significantly highest grain yield (5.11 t ha-1) was recorded from T6 where 12 t ha-1 poultry manure was applied, followed by T5 (10 t ha-1 PM) which was statistically equal to that T4 (8 t ha-1 PM), the grain yield produced by these plots were 4.16 t ha-1 and 3.60 t ha-1,respectively. Similarly statistically same grain yield was recorded in case of plots of T2 (6 t ha-1 poultry manure) and T1 (control) treatment. These results are in accordance with the findings of Boateng et al that poultry manure significantly increased the grain yield.

IV. CONCLUSION

There are several benefits of organic manure in improving soil quality and soil health and the quality soil is the most important and primary input of plant growth. By intensive agriculture the organic matter status of soil declined day by day. So, to improve the fertility status of soil, use of organic manure instead of inorganic chemical fertilizer is a common practice and this concept originated along with the crop production . Until mid of nineteenth century the organic manures were the only source of nutrient required by the crop plants. Even today its application is supposed to be of prime importance despite of tremendous advances made in the field of agriculture. Organic manure improve soil quality by modifying soil physical property, increase biological activity i.e, micro-organism activity, helps in decomposition of organic matter etc. Organic manure helps plants to quick uptake of nutrients from soil, increase nutrient availability in soil, reduces soil pollution, minimize soil erosion and degradation, improve nutritional security and reduce many problems related to crop production. Lastly, we can say that application of organic manure and practice of organic farming has a desirable effect on sustainable food production.

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