



## Comparisons of Different Types of Organic Manures Integrated in Diverse Ratios with Inorganic N-Fertilizer in Terms of Maize Yield and Productivity.

**Mussaddiq Khan Khalil**

Department of Soil and Environmental Sciences, The University of Agriculture Peshawar, Pakistan

### Abstract

In modern agriculture, the integration of organic and inorganic fertilizers has been proved as the best technique to maximize the nutrient availability to crops for longer period of time and to minimize the essential nutrients loss from rhizosphere soil. However, most of the researchers and farmers are uninformed of that which is the best fertilizer integration ratio and what type of organic manure should be used for obtaining good fertile soil and economical crop yield. In response of the above question the present research experiment was carried out in Kharif season 2018 at Cereal Crop Research Institute (CCRI), Nowshera, KPK, Pakistan to investigate the performance of maize crop in response to different types of organic manures integrated with inorganic nitrogen fertilizer in distinct ratios based on % nitrogen (N). Total 9 treatments were used in the experiment such as T1 (Control=100% N from Urea), T2 (50% N from SSB+50% N from Urea), T3 (50% N from SCB+50% N from Urea), T4 (50% N from PL+50% N from Urea), T5 (50% N from FYM+50% N from Urea), T6 (25% N from SSB+75% N from Urea), T7 (25% N from SCB+75% N from Urea), T8 (25% N from PL+75% N from Urea) and T9 (25% N from FYM+75% N from Urea). The outcomes of the experiment revealed that all the treatments have significantly affected the kernel yield, plant height, 100 kernel weight, and ear length while the number of kernel rows was non-significant. Treatments having 1:1 combination (T2, T3, T4, T5) have far better results as compared to 3:1 ratio combination (T6, T7, T8, T9) and 1:0 ratio combinations (T1). Among 1:1 treatment the overall performance of treatment T2 (50% N from Soyabean Straw Biochar (SSB)+50% N from urea) was

best of all increasing the kernel yield, plant height, 100 kernel weight, ear length and kernel rows per cob up to 54.5%, 15.2%, 16%, 17.7% and 8.1% respectively more than any other treatment. Hence the integration of Soya Bean Straw Biochar with urea in 1:1 based on % N is advised.

### Keywords

Maize; Soyabean straw biochar; Sugarcane bagasse; Poultry litter; Farmyard manure; Urea; Kernel yield.

### Introduction

Maize botanically called as *Zea mays* L. is the 3rd most growing cereal crop in Pakistan after wheat and rice [1]. It is a nutritional source of food for humans, feed for animals and raw material for deficiency [3]. Various other factors that will affect the nitrogen availability are temperature, moisture content, pH of the soil and amount of clay minerals in the soil. Nitrogen is the most essential nutrient required for plant growth and is usually absorbed by plants in form of nitrate [4] and it constitutes about 1.7%-5.8% of dry weight of many plants. It is also the important component of many nucleic acids, organic acids, and many proteinaceous compounds, apart from this its plays a vital role in synthesis of chlorophyll, photosynthesis process and carbon dioxide (CO<sub>2</sub>) assimilation.



Nitrogen also has synergistic relationships with other nutrients like phosphorous, potassium and calcium and deficiency of nitrogen in soil will result the plants to suffer from other nutrients deficiency [6]. The major loss of nitrogen in Pakistani soils occurs through leaching due to its mobile nature in soils. Integration of organic and inorganic is the best possible way to reduce nitrogen loss through leaching and to increase its availability to crops for longer period of time [7]. The present study was planned to investigate the comparison between various types of organic manures for obtaining best performance of maize crop in terms of yield and productivity and to evaluate what is the best integration ratio between organic manures with inorganic nitrogen fertilizers for economical maize yield and various other yield attributes of maize crop in agro- climatic conditions of Nowshera, KPK, Pakistan.

#### References

- 1 Agriculture statistics of Pakistan (2014) Ministry of National Food Security and Research (MNFSR), Islamabad, Pakistan.
- 2 Mengel K, Kirkby EA (2001) Principles of Plant Nutrition 5<sup>th</sup> edition, Kluwer Academic Publishers, London.
- 3 NFDC (2001) Balanced fertilization through phosphate promotion. Project terminal report NFDC, Islamabad, Pakistan.
- 4 Tisdale SL, Nelson WL (1990) Soil fertilizer and effect of Magnesium on the yield and chemical of crops. Michigan Agricultural Experimental Statistics. Bull Press, Mechigan, American, pp: 29-31.

**E-mail:** [mussaddiqses@gmail.com](mailto:mussaddiqses@gmail.com)