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Effect of different organic manures on growth and economics of late sown wheat (*Triticum aestivum* L.)

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Abstract
The field experiment was conducted during *Rabi* 2019 at SMOF (SHIATS Model Organic Farm). Department of Agronomy, SHUATS, Prayagraj (UP). The experiment was laid out in Randomized Block Design with nine treatments replicated thrice. The treatment with 50% Sheep manure at basal and 50% Poultry manure at top dressing at 30 DAS recorded significantly higher in Plant height (75.66 cm), Number of tillers (6.70), Plant dry weight (11.00 g/plot). Recorded statistically on par with basal application of 50% FYM and 50 top dressing of Poultry manure at 30 DAS compared to other treatments. The treatment application with 50% FYM at basal and 50% of Poultry manure at top dressing at 30 DAS recorded significantly higher in gross return (Rs. 84385.0/ha), net return (Rs.59396.0/ha), and B:C ratio (1.67) with Sheep manure 50% at basal application and 50% Poultry manure at top dressing at 30 DAS.

Keywords: Organic, manures, Farm yard manure, Vermicompost, Poultry manure

Introduction
Wheat (Triticum aestivum L.) is one of the important leading cereal crops. Which ranks first both in acreage and production (758.3 million tonnes) among the grain crops of the world (FAO, 2019) [5] about one third of the world population lives on wheat grains for their subsistence (FAO, 2017) [6]. Wheat grain is rich in food value containing 12% protein, 1.72% fat, 69.60% carbohydrate and 27.20% minerals (BARI, 2016) [3]. Delayed sowing of wheat in India is very common due to the wide spread intensive cropping system. Some of the crucial factors for choosing late sown wheat verities are higher yields, greater tolerance to adverse conditions and shorter maturity (Kumar *et al*., 2013). Further, heavy application of inorganic fertilizer left residues in grain fruits and vegetables and caused human and animal health. The use of inorganic fertilizer alone also reduces the fertilizer use efficiency by crop through creation of problems such as volatilization, leaching and denitrification of nitrogen. To overcome the problem of nutrient deficiency and helping the nature rather than destroying it. Organic sources of nutrients are the best option maintain the health of soil, plant and animal and provide the equal opportunity for all living existence to live and use from their beneficial activities, like nitrogen fixation, phosphorus solubilization, recycling of animal waste etc. Hence, the present study was undertaken.

Material and Methods
The experiment was carried out during Rabi season of 2019 at the SMOF (SHIATS Model Organic Farm), Department of Agronomy, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj, Uttar Pradesh. The SMOF is situated at 25º24‘41.27” N latitude, 81°50‘56” E longitude (Google, 2018) and 98 m altitude above the mean sea level. SMOF was developed under the National Project on Organic Farming (NPOF) by Department of Agronomy with Prof. (Dr). Thomas Abraham, Professor (Agronomy) as its P.I. The two hectares area has been certified by Lacon Quality Certification (Pvt.) Ltd. [Accreditation Number, NPOP/NAB/006 Ministry of Commerce, and Govt. of India] till 2019. The field was in its 11th year of certification during the duration of the current trial. All the facilities required for crop cultivation are available.

The soil of the experimental field is sandy loam in texture, nearly neutral in soil reaction (pH 7.5), Organic carbon (0.58%). The treatment comprised of FYM (50%) basal+ VC (50%) basal, FYM (50%) basal+ PM (50%) basal, Sheep manure (50%) basal+ VC (50%) basal, Sheep manure (50%) basal + PM (50%) basal, FYM (50%) basal+ VC (50%) top dressing at 30 DAS, FYM (50%) basal+ PM (50%) top dressing at 30 DAS, Sheep manure (50%) basal+ VC (50%) top dressing at 30 DAS, Sheep manure (50%) basal+ PM (50%) top dressing at 30 DAS, Control plot Seeds were placed in 20 cm spacing.

Results and Discussion

Plant height (cm)

At harvest, significantly maximum plant height (75.65 cm) was observed with application of Sheep manure (50%) basal + PM (50%) top dressing at 30 DAS. However, treatment with application of FYM (50%) basal + PM (50%) top dressing at 30 DAS (73.79 cm), Sheep manure (50%) basal + VC (50%) top dressing at 30 DAS (70.25 cm) and control plot (70.85 cm) were statistically on par with Sheep manure (50%) basal + PM (50%) top dressing at 30 DAS compared to other treatments. With the application of poultry manure the plant height was increased. This may be due to the fact that application of Poultry manure led to the availability of the nutrients necessary for the good growth of the plant. These results are consistent with that achie ved from Abbas *et al*., 2012 and Rasul *et al*., 2015 [1, 11]. Chandrashekara *et al*. (2000) [4] reported that application of poultry manure at 10 t/ha with recommended rates of fertilizers produced taller plants (187.5 cm) as compared to control.

Number of tillers

At harvest recorded that application of Sheep manure (50%) basal + PM (50%) top dressing at 30 DAS (6.70) was significantly superior over rest of all the treatments except with application of FYM (50%) basal + PM (50%) top dressing at 30 DAS (6.61) and Sheep manure (50%) basal + PM (50%) basal (6.04) as compared to other treatments. Organic sources offer more balanced nutrition to the plants, especially micro nutrients which may also positively affect the number of tiller in plants (Miller, 2007). Similar findings were also reported by Kumar (2015). Application of poultry manure increased plant growth because more nutrients were made readily available and easily absorbable by receiving plants leading to faster growth and development and ultimately to more tillers/plant, Enujeke (2013) [7]. Our findings are supported by Ibrahim *et al*., (2008) [8]. Agboola and Aiyelari (2000) [2] indicated that sheep or goat manures have physical and chemical properties that facilitate aggregation with mineral particles especially clay, and in turn modifies soil structure and influences soil water regime thereby encouraging rapid growth.

Plant dry weight (g)

At harvest follows the same trend in which significantly maximum plant dry weight (9.77) was recorded with application of Sheep manure (50%) basal + PM (50%) top dressing at 30 DAS. However treatments with application of FYM (50%) basal + PM (50%) top dressing at 30 DAS (11 g/plant) was statistically at par with Sheep manure (50%) basal+ PM (50%) top dressing at 30 DAS. The total dry matter production depends upon photosynthetic ability of a plant which in turn depends on the dry matter accumulation in leaves, since organic manures particularly poultry manure contains appreciable quantities of magnesium apart from other nutrients, which might have helped in synthesis of chlorophyll in leaves leading to higher photosynthesis and dry matter production by plant (Nehra *et al*., 2001) [10]. This result is in conformity with the findings of Yerriswamy *et al*. (1994) [13].

Table 1: Effect of different organic manures on growth attributes of late sown wheat

	Treatment	Plant height (cm)	Tillers/plant (No.)	Plant dry weight (g/plant)
1.	FYM (50%) basal+ VC (50%) basal	63.40	5.20	7.94
2.	FYM (50%) basal+ PM (50%) basal	66.80	5.23	7.96
3.	Sheep manure (50%) basal+ VC (50%) basal	64.70	4.92	7.87
4.	Sheep manure (50%) basal+ PM (50%) basal	65.86	5.55	8.28
5.	FYM (50%) basal+ VC (50%) top dressing at 30DAS	67.86	4.93	7.97
6.	FYM (50%) basal+ PM (50%) top dressing at 30DAS	71.23	6.02	9.08
7.	Sheep manure (50%) basal+ VC (50%) top dressing at 30 DAS	67.03	4.33	7.95
8.	Sheep manure (50%) basal+ PM (50%) top dressing at 30 DAS	74.33	6.28	9.77
9.	Control	66.46	4.69	7.66
SEm (±)		1.87	0.21	0.28
CD (p=0.05)		5.57	0.65	0.85

Economics cost of cultivation, gross return, net return and B:C ratio

The cost of cultivation of wheat crop recorded numerically higher (₹54570/ha) value for the treatment of application of FYM (50%) basal + VC (50%) top dressing at 30 DAS and numerically minimum cost of cultivation was recorded with application of Sheep manure (50%) basal + PM (50%) basal and Sheep manure (50%) basal + PM (50%) top dressing at 30 DAS. Numerically higher gross return (₹94966.0/ha) was obtained with application of Sheep manure (50%) basal + PM (50%) top dressing at 30 DAS, which was significantly superior over rest of the treatments except Sheep manure (50%) basal + VC (50%) basal, Sheep manure (50%) basal + PM (50%) basal and FYM (50%) basal + PM (50%) top dressing at 30 DAS. Numerically higher net return (₹59396.0/ha) was obtained with application of Sheep manure (50%) basal + PM (50%) top dressing at 30 DAS, which was significantly superior over rest of the treatments except Sheep manure (50%) basal + PM (50%) basal and FYM (50%) basal + PM (50%) top dressing at 30 DAS. Higher benefit cost ratio (1.67) was obtained with application of Sheep manure (50%) basal+ PM (50%) top dressing at 30 DAS, which was significantly superior over rest of the treatments except Sheep manure (50%) basal + PM (50%) basal and FYM (50%) basal + PM (50%) top dressing at 30 DAS. Due to the variation in rate of organic manures, as well as significant contribution of

different organic manures, with application Sheep manure (50%) basal + PM (50%) top dressing at 30 DAS which was increased the grain and straw yield respectively over all other treatments and recorded higher gross return, net returns and benefit cost ratio.

Table 2: Effect of different organic manures on Economics of late sown wheat

	Treatment	Cost of cultivation	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C ratio
1.	FYM (50%) basal+ VC (50%) basal	54070	79170.3	25100.3	0.46
2.	FYM (50%) basal+ PM (50%) basal	36070	79907.3	48837.3	1.22
3.	Sheep manure (50%) basal+ VC (50%) basal	53570	90273.3	36703.3	0.69
4.	Sheep manure (50%) basal+ PM (50%) basal	35570	90239.2	54669.3	1.54
5.	FYM (50%) basal+ VC (50%) top dressing at 30DAS	54570	79490.7	24920.7	0.46
6.	FYM (50%) basal+ PM (50%) top dressing at 30DAS	36570	93748.7	57178.7	1.56
7.	Sheep manure (50%) basal+ VC (50%) top dressing at 30 DAS	54070	84385.0	30315.0	0.56
8.	Sheep manure (50%) basal+ PM (50%) top dressing at 30 DAS	35570	94966.0	59396.0	1.67
9.	Control	36570	75429.7	38859.7	1.06

Conclusion

On the basis of one season experimentation application of Sheep manure (50%) basal + Poultry manure (50%) top dressing at 30 DAS was found more productive (28.27 q/ha) as well as economic (Rs 59396.00/ha). The conclusions drawn are based on one season data only which requires further confirmation for recommendation.

References

1. Abbas G, Khattak JZK, Mir A, Ishaque M, Hussain M, Wahedi HM, *et al*. Effect of organic manures with recommended dose of NPK on the performance of wheat (Triticum aestivum L.). J. Anim. & Plant Sci 2012;22(3):683-687.
2. Agboola AA, Ailyelari EA. Land degradation and soil fertility decline in Africa. Proceedings of African experts meetings on Fertilizers. Ouagadougou Burkina Faso 2000;7(31):35-53.
3. BARI (Bangladesh Agricultural Research Institute). Annual report for (2005). Bangladesh Agril. Res. Inst., Joydebpur, Gazipur, Bangladesh 2016, 22-23.
4. Chandrashekara CP, Harlapur SI, Muralikrishna S, Girijesh GK. Response ofmaize (ZeamaysL.) to organi c manures with inorganic fertilizers. Karnataka J Agric. Sci 2000;13(3):144-146.
5. FAO. Production Year Book. Food and Agricultural Organization, Rome 2019;67:88-90.
6. FAO. Production Year Book. Food and Agricultural Organization. Rome 2017;68:115.
7. Enujeke EC. Effects of poultry manure on growth and yield of improved maize in Asaba area of delta state, Nigeria. J Agri. Vet. Sci 2013;4:24-30.
8. Ibrahim M, Hassan A, Iqbal M, Valeem EE. Response of Wheat Growth and Yield to Various Levels of Compost and Organic Manure. Pak. J Bot 2008;40(5):2135-2141.
9. Kumar M, Singh RP, Rana NS. Effect of organic and inorganic sources of nutrition on productivity of rice (Oryzasativa). Indian J Agron 2003;48(3):175-177.
10. Nehra AS, Hooda IS, Singh KP. Effect of integrated nutrient management on growth and yield of wheat (Triticum aestivum). Indian J Agron 2001;46(1):112-117.
11. Rasul GAM, Ahmed ST, Ahmed MQ. Influence of different organic fertilizers on growth and yield of wheat. Am-Euras. J Agric. & Environ. Sci 2015;15(6):1123-1126.
12. Tamim F, Hunshal CS. Effect of Organic Manures on Yield and Economics of Late Sown Wheat (Triticum aestivum L) International Journal of Research and Review 2010;6(1):168-171.
13. Yerriswamy RM, Vasuki N, Satyanaryana T. Alleviation of iron chlorosis of maize on calcarious vertisol. J Ind. Soc. Soil Sci 1994;42(1):156-159.