Biological Forum – An International Journal **13(3a): 793-796(2021)**

ISSN No. (Print): 0975-1130
ISSN No. (Online): 2249-3239

Response of Late Sown Wheat (*Triticum aestivum* L.) to Organic and Liquid Manures on Growth and Yield

Marupaka Praneeth[1*], Rajesh Singh[2] and Ekta Singh[3]

[1]M.Sc. Researh, Scholar, Department of Agronomy, NAI, SHUATS, Prayagraj, (Uttar Pradesh), India.
[2]Assistant Professor, Department of Agronomy, NAI, SHUATS, Prayagraj, (Uttar Pradesh), India.
[3]Ph.D. Research Scholar, Department of Agronomy, NAI, SHUATS, Prayagraj, (Uttar Pradesh), India.

(Corresponding author: Marupaka Praneeth)*
(Received 19 July 2021, Accepted 30 September, 2021)
(Published by Research Trend, Website: www.researchtrend.net)

ABSTRACT: During the *Rabi* season of 2020-2021a field experiment was executed at crop research farm, SHUATS, Prayagraj to examine approximately the "Response of late sown wheat (*Triticum aestivum* L.) to organic and liquid manures on growth and yield". The experiment become set out in randomized block design with the aid of using 3 Poultry manure levels, *i.e*. PM1 - (PM-2t/ha), PM2 – (PM-2.5t/ha) and PM3 – (PM-3t/ha) and Liquid manures (Panchagavya 3% and Vermiwash 3%) which was replicated three thrice. Results revealed that Poultry Manure 3.0 t/ha + Panchagavya 3% + Vermiwash 3 % recorded significantly higher in plant height (73.95 cm), number of tillers per hill (6.60), plant dry weight (20.01 g/plant), grain yield (3.24 t/ha), straw yield (4.41 t/ha) and harvest index (42.13 %). Therefore, I concluded that Poultry Manure 3.0 t/ha + Panchagavya 3% + Vermiwash 3 % were produced more grains (3.24 t/ha) and economic effective (1.41).

Keywords: Wheat, Poultry manure, Vermiwash, Panchagava and Yield.

INTRODUCTION

Wheat (*Triticum aestivum* L.) is the world's outstanding crop that excels all other cereals each in area and production, referred to as king of cereals. It's grown at some point of the temperate, tropical and sub-tropical location within side the world.

It constitutes the staple food in at the very least 43 nations. The most essential wheat-developing countries are the USA, China, India, Canada, Argentina, Australia, and some of European countries. The maximum area under wheat is China followed by India, Russian federation, and therefore the USA. India is within the second position in world wheat cultivation. India covers 295.76 lakhs of hectares area, 99.70 million tones production (12.32%), yield 3371(kg/ha). three largest producing states of India, U.P. 31.88, Punjab 17.85, Madhya Pradesh 15.91 during 2017-18 years, (Directorate of economics & Statistics, DAC&FW 2017-18).

India is that the international's second biggest producer of Rice, Wheat, and different cereals. The huge demand for cereals in the world's marketplace is making an incredible surroundings for the export of Indian cereal product. In 2008, India had obligatory a ban at the export of rice and wheat, etc. to satisfy home desires. Now, seeing the huge demand inside the world's marketplace and consequently the country's surplus production, the Country has lifted the ban, but most effective a restrained amount of trade goods export is allowed. The allowed marginal quantity of exports cereals could not built any crucial effect both on home expenses or the garage conditions, (APEDA 2018).

Organic farming can also be a system of production that favors maximum use of natural materials, crop residues, animal excrement, legumes, on and off-farm natural wastes, growth- regulators, biopesticide, etc. and discourages the usage of synthetically created agro-inputs for preserving soil health, productiveness, and pest control beneath the situations of sustainable organic resources and healthful environment. The usage of manures has been observed to be promising in arresting the decline in productiveness through correction of deficiencies of secondary and micro nutrients and its beneficial impact on the physical and biological residences of soil (Kumar *et al*., 2007).

Poultry manure can be a realistic deliver of nutrients for crops. It is also referred as fowl manure, is a splendid soil modification that has nutrients for developing crops and additionally improves soil quality as soon as implemented wisely, due to the fact its excessive organic matter blended with to be had nutrients for plant growth. That include a higher amount of nitrogen and phosphorus in comparison to different large organic manures. The common nutrient content material is 3.03 % N; 2.63 % P_2O_5 and 1.4 % K_2O. Poultry manure is

relatively a less expensive supply of every macro and micronutrients and will increases the soil nitrogen, soil porosity, and improves soil microbe activity. As poultry waste incorporates a excessive awareness of nutrients that the addition of a tiny low amount of poultry manure in an integrated nutrient management system would possibly meet the storage of FYM to a few extent (Ghosh *et al*., 2004). Poultry manure accomplished speedy mineralization.

Panchagavya, a natural product is potential supply of nutrients to play the role of promoting growth and provide immunity in the plant system. Panchagavya contains cow- primarily based 5 product *viz.* cow dung, cow urine, cow milk, curd, and ghee. Bio-chemical properties of panchagavya observed that it possesses maximize the most nutrients like NPK and micronutrients necessary for plant and growth hormones like IAA and GA needed for crop growth further because the predominance of fermentative microorganisms *viz.,* yeast, azotobacter, phospo-bacteria, and lactobacillus.

Application of vermiwash at two spray effect to increase in plant height, the number of tillers, dry weight, and yield attributes (Dekhane *et al*., 2016). The role of foliar application or seed soaking of panchagavya in the production of the various plantation crop plants have been properly documented in Bharat (Selvaraj, 2003).

MATERIALS AND METHODS

The experiment was executed during the *Rabi* season 2020-2021, on the Crop Research Farm, Department of Agronomy, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology and Sciences (SHUATS), Prayagraj (U.P.) That is located at 25°30′42″N latitude, 81°60′56″E longitude and 98 m altitude above the mean sea level. during the *Rabi* season 2020-2021 on sandy loam soil, having nearly almost impartial in soil reaction (pH 7.7), organic- carbon (0.44), available nitrogen (171.48 kg/ha K), available phosphorus (27 kg/ha) and available potassium (291.2 kg/ha). The climate of the region is semi-arid subtropical. Treatments comprised of T_1– Poultry Manure 2.0 t/ha + Panchagavya 3%, T_2 – Poultry Manure 2.0 t/ha + Vermiwash 3%, T_3 – Poultry Manure 2.0 t/ha + Panchagavya 3% + Vermiwash 3%, T_4 – Poultry Manure 2.5 t/ha + Panchagavya 3%, T_5 - Poultry Manure 2.5 t/ha + Vermiwash 3%, T_6 – Poultry Manure 2.5 t/ha + Panchagavya 3% + Vermiwash 3%, T_7 – Poultry Manure 3.0 t/ha + Panchagavya 3%, T_8– Poultry Manure 3.0 t/ha + Vermiwash 3% and T_9 – Poultry Manure 3.0 t/ha + Panchagavya 3% + Vermiwash 3%. These have been replicated thrice in Randomized Block Design.

A. Chemical analysis of soil

Composite soil-samples are collected earlier the layout of the experiment to decide the preliminary soil properties. The soil sample's area unit become gathered from 0-15 cm depth and had been dried below the shade, powdered with wood pestle and mortar, surpassed through 2-millimeter sieves, and had been analyzed for organic carbon with the aid of using fast volumetric analysis methodology by Nelson and Sommers, (1975). Obtainable nitrogen become envisioned with the aid of using alkaline permanganate technique by Subbiah and Asija (1956), available phosphorus using Olsen's method as mentioned by Jackson, (1973), available metal was decided with the aid of using the flame photometer regular ammonium acetate solution and estimating with using flame photometer (ELICO-Model) as mentioned by Jackson, (1973) and obtainable $ZnSO_4$ was estimated by Atomic Absorption spectro-photometer technique as published by Lindsay and Norvell (1978).

B. Statistical analysis

The recorded information that had different characteristics were subjected to statistical evaluation with the aid of using adopting Fisher the approach of analysis of variance (ANOVA) as described by Gomez and Gomez (2010). Critical difference (CD) values had been calculated the 'F' test become discovered significantly at 5% level.

RESULTS AND DISCUSSION

Plant height (cm). At harvest observed that significantly maximum Plant height (73.95 cm) was observed in Poultry manure 3.0 t/ha + Panchagavya 3% FS + Vermiwash 3% FS. However, treatment combination with Poultry Manure 3.0 t/ha + Panchagavya 3% FS with plant height (73.44 cm) were statistically on par with Poultry Manure 3.0 t/ha + Panchagavya 3% FS + Vermiwash 3% FS. With the addition of poultry manure the plant height was increased. This can be because to the fact that utility of manure caused the provison of the nutrients important for the good growth of the plant. These results are in line with that carried out from Abbas *et al*., (2012); Rasul *et al*., (2015).

Number of tillers per hill. At harvest, observed that a significantly maximum number of tillers per hill (6.6) was recorded in Poultry-Manure 3.0 t/ha + Panchagavya 3% FS +Vermiwash 3% FS. However, treatment combination with Poultry Manure 3.0 t/ha + Panchagavya 3% FS with tillers (6.40) were statistically on par with Poultry Manure 2.5 t/ha + Panchagavya 3% FS + Vermiwash 3% FS. Data revealed that the positive effect on the number of tillers per hill was significantly increased through organic manures Poultry (Dekhane *et al.,* 2017). Foliar application of panchagavya and fish amino acid accrued a maximum number of tillers per hill (Divyansh and Abraham, 2018).

Table 1: Response of Late Sown Wheat (*Triticum aestivum* L.) to Organic Manure and Liquid Manure on growth attributes.

Sr.No.	Treatments	Plant height At harvest	No. of tillers At harvest	Dry weight At harvest
1.	Poultry Manure 2.0t/ha + Panchagavya 3%	70.76	5.7	17.98
2.	Poultry Manure 2.0t/ha + Vermiwash 3%	67.33	5.23	17.47
3.	Poultry Manure 2.0 t/ha + Panchagavya 3% + Vermiwash 3%	71.2	5.76	18.86
4.	Poultry Manure 2.5t/ha + Panchagavya 3%	71.64	5.96	19.26
5.	Poultry Manure 2.5t/ha + Vermiwash 3%	67.78	5.3	17.55
6.	Poultry Manure 2.5 t/ha + Panchagavya 3% + Vermiwash 3%	72.41	6	19.50
7.	Poultry Manure 3.0t/ha + Panchagavya3%	73.44	6.40	19.94
8.	Poultry Manure 3.0t/ha + Vermiwash3%	69.22	5.43	17.74
9.	Poultry Manure 3.0t/ha + Panchagavya 3% + Vermiwash 3%	73.95	6.6	20.01
	Ftest	S	S	S
	SEm (±)	0.51	0.07	0.43
	C.D (P = 0.05)	1.52	0.22	1.28

Dry weight (g/plant): At harvest data showed that a significantly and higher in (20.21 g/plant respectively) Poultry Manure 2.5 t/ha + Panchagavya 3% FS + Vermiwash 3% FS. However, treatment combination with Poultry Manure 3.0 t/ha + Panchagavya 3% FS and Poultry Manure 2.5 t/ha + Panchagavya 3% + Vermiwash 3% and Poultry Manure 2.5 t/ha + Panchagavya 3% and Poultry Manure 2.0 t/ha + Panchagavya 3% + Vermiwash 3% (19.94, 19.50, 19.26 and 18.86 g/plant respectively) were statistically on par with Poultry Manure 2.5 t/ha + Panchagavya 3% FS + Vermiwash 3% FS. Result indicated that available of essential micronutrients, less incidence of pest attack and favored to increase the dry weight of plant. Similar results were found (Suhane *et al*., 2008). Organic manures make easily available of nutrients to the crop plants without any losses (leaching, runoff), nutrient uptake will increase, ultimately dry matter accumulation significantly increases (Singh *et al*., 2018; Mubarak and Singh 2011).

Yield

Grain yield (t/ha)

The data revealed that a significantly higher economic yield (3.24 t/ha) in Poultry Manure 2.5 t/ha + Panchagavya 3% FS + Vermiwash 3% FS. However, treatment combination with, However, treatment combination with Poultry Manure 2.5 t/ha + Panchagavya 3% FS showing (3.07 t/ha) were statistically on par with Poultry Manure 2.5 t/ha + Panchagavya 3% FS + Vermiwash 3% FS.

Strawyield (t/ha). The data revealed that the significantly higher straw yield (4.41 t/ha) in Poultry Manure 2.5 t/ha + Panchagavya 3% FS + Vermiwash 3% FS. However, treatment combination with However, treatment combination with Poultry Manure 2.5 t/ha + Panchagavya 3% FS showing (4.27 t/ha) were statistically at par with Poultry Manure 2.5 t/ha + Panchagavya 3% FS + Vermiwash 3% FS. Under organic production, Organic reassets of nutrients are the first class option to maintain the health of soil, provide the same possibility for all living existence to live and use from their beneficial activities, like nitrogen fixation, phosphorus solubilization, use of animal waste, and manure. FYM 25% +VC 75% + Panchagavya at 2% + Vermiwash at 5% spray, found better result in yield attributes i.e. grain, straw and harvest index.Similar result found (Tamim and Hunshal 2010); (Pagar, 2016 b).

Table 2: Response of Late Sown Wheat (*Triticum aestivum* L.) to Organic Manure and Liquid Manure on Yield.

Sr. No.	Treatment	Grain yield	Straw yield	Harvest index
1.	Poultry Manure 2.0t/ha + Panchagavya 3%	2.47	3.67	40.24
2.	Poultry Manure 2.0t/ha + Vermiwash 3%	2.1	3.3	38.87
3.	Poultry Manure 2.0 t/ha + Panchagavya 3% + Vermiwash 3%	2.59	3.79	40.61
4.	Poultry Manure 2.5t/ha + Panchagavya 3%	2.78	3.98	41.12
5.	Poultry Manure 2.5t/ha+Vermiwash3%	2.28	3.48	39.57
6.	Poultry Manure 2.5 t/ha + Panchagavya 3% + Vermiwash 3%	2.89	4.09	41.40
7.	Poultry Manure 3.0t/ha + Panchagavya 3%	3.07	4.27	41.81
8.	Poultry Manure 3.0t/ha + Vermiwash 3%	2.42	3.62	40.05
9.	Poultry Manure 3.0t/ha+ Panchagavya 3% +Vermiwash 3%	3.24	4.41	42.13
	Ftest	S	S	S
	SEm (±)	0.06	0.04	0.14
	C.D (P=0.05)	0.18	0.14	0.44

Harvest index (%): The data showed that the significantly higher harvest index (42.13%) in Poultry Manure 2.5 t/ha + Panchagavya 3% FS + Vermiwash 3% FS. However, treatment combination with However, treatment combination with Poultry Manure 2.5 t/ha + Panchagavya 3% FS showing (41.81 %) were statistically at par with Poultry Manure 2.5 t/ha + Panchagavya 3% FS + Vermiwash 3% FS.

CONCLUSION

On the basis of one season experimentation treatment with Poultry Manure 3.0 t/ha + Panchagavya 3% + Vermiwash 3 %.was found more productive (3.24 t/ha).

Acknowledgement. The authors are grateful to the Department of Agronomy, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj – 211007, Uttar Pradesh, India for offering us important facilities to adopt the studies.
Conflict of Interest: None.

REFERENCES

Abbas, G., Khattak, J. Z. K., Mir, A., Ishaque, M., Hussain, M., Wahedi, H. M., Ahmed, M. S., & Ullah, A. (2012). Effect of organic manures with recommended dose of NPK on the performance of wheat (*Triticum aestivum* L.). *Journal of Animal. & Plant Science, 22*(3): 683-687.

Anonymous (2017-18). Directorate of Economics &Statistics, DAC&FW eands.dacnet.nic.in.

APEDA (2018). Agricultural and Processed Food Products Export Development Authority.

Dekhane, S. S., Mangave, B. D., Patel, D. J., & Dumbre, R. B. (2016). Effect of organic products on plant growth and yield of Wheat. *International Journal of Horticulture, Agriculture and Food Science, 1*(4).

Dekhane, S. S., Mangave, B. D., Dumbre, R. B., & Patel, D. J. (2017). Response of nutrient management practices through organic substances on rice var. GR-11 in North Konkan Coastal zone of Maharashtra. *International Journal of Environment, Agriculture and Biotechnology*, *2*(6): 3007-3009.

Divyansh, V., & Abraham, T. (2018). The evaluation of system of planting with different foliar application of liquid formulation under organic rice production. *International Journal of Current Microbiology Applied Sciences, 7*(8): 3278-3283.

Ghosh, B. N., Prakash, V., & Singh, R. D. (2004). Micronutrient status in soybean (*Glycine max* L.) wheat (*Triticum aestivum* L.) cropping system in Kumaon region of Uttaranchal. *Indian J. Agric. Sci., 71*(2): 149-152.

Gomez, K. A., & Gomez, A. A. (2010). Statistical procedures for agricultural research 2nd edition. *New York*, 680p.

Jackson, M. L. (1973). Soil chemical analysis. *Prentice Hall of India Pvt. Ltd. New Delhi.*

Kumar, A., Tripathi, H. P., & Yadav, D. S. (2007). Correcting nutrient for sustainable crop production. *Indian Journal of Fertilizers.*

Lindsay, W. L., & Norvell, W. A. (1978). Development of a DTPA soil test for zinc, iron, manganese, and copper. *Soil Science Society of America Journal, 42*: 421-428.

Mubarak, T., & Singh, K. N. (2011). Nutrient management and productivity of wheat (*Triticum aestivum* L.)-based cropping system in temperate zone. *Indian Journal of Agronomy, 56*(3): 176-181.

Nelson, D. W., & Sommers, L. E. (1975). A rapid and accurate procedure for estimation of organic carbon in soil. *Proceedings of Indian Academy of Science, 64*; 1815-1826.

Pagar, R. D., Jangilwad, D. B.,& Chaudhary, M. K. (2016 b). Effect of Panchagavya on Growth and Yield of Wheat (*Triticum aestivum* L.). *Advances in Life Sciences, 5*(3).

Rasul, G. A. M., Ahmed, S. T., & Ahmed, M. Q. (2015). Influence of different organic fertilizers on growth and yield of wheat. *Am-Euras. J. Agric. & Environ. Sci*., *15*(6), 1123- 1126.

Selvaraj, N. (2003). Report of work done on organic farming at horticulture research station, Tamil Nadu Agriculture University, Ooty, India. pp-2-5.

Singh, A. K., Gupta, P. K., Benjamin, J. C., Masih, H., Singla, A., Kumar, S. O. & Ramteke, P. W. (2018). Study of vermicompost and vermiwash produced from cow manure and rice bran waste on the physiological growth of *Abelmoschus esculentus* L. *Int. J. Curr. Microbiol. App. Sci., 7*(8): 1447-1464.

Subbiah, B., & Vand Asija, G. L. (1956). A rapid procedure for estimation of available nitrogen in soils. *Current Science*, *25*: 259-260.

Suhane, R. K., Sinha, R. K., & Singh, P. K. (2008). Vermicompost, cattle dung compost and chemical fertilizers: Impact on yield of wheat crops. *Communication of Rajendra Agriculture University, Pusa,* Bihar, India.

Tamim, F., & Hunshal, C. S. (2010). Effect of Organic Manures on Yield and Economics of Late Sown Wheat (*Triticum aestivum* L.). *International Journal of Research and Review*, *6*(1): 168-171.

How to cite this article: Praneeth, M., Singh, R. and Singh, E. (2021). Response of Late Sown Wheat (*Triticum aestivum* L.) to Organic and Liquid Manures on Growth and Yield. *Biological Forum – An International Journal*, *13*(3a): 793-796.