Int.J.Curr.Microbiol.App.Sci (2019) *8*(7): 2627-2632

International Journal of Current Microbiology and Applied Sciences
***ISSN: 2319-7706* Volume 8 Number 07 (2019)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2019.807.323

Effect of Different Organic Manures with Combination of Inorganic Fertilizers on Transplanted Gobhi Sarson (*Brassica napus* L.)

A. Malemnganba Meitei and Anurag Bajpay*

School of Agricultural Sciences & Technology, RIMT University, Mandi Gobindgarh-147301, Punjab, India

**Corresponding author*

Keywords

Transplanted *Gobhisarson*, Organic manures, Inorganic fertilizers, Poultry manure, Nitrogen and yield attributes

Article Info

Accepted:
20 June 2019
Available Online:
10 July 2019

A B S T R A C T

To evaluate the effect of organic manureswith or without combination of inorganic fertilizers on transplanted Gobhi Sarson (*Brassica napus* L.) on various growth and yield attributing traits of transplanted Gobhisarson. The experiment was conducted under Randomized Block Design with 8 treatments and three replication, during the rabi season (2018– 2019) at Agricultural Research Farm, RIMT University, Punjab. The effect of eight treatments *viz.*, (T_1) 20 tha^{-1} Farm yard manure, (T_2) 10 ton ha^{-1} Farm yard manure + ½ Nitrogen, (T_3) 10 tha^{-1} Poultry manure, (T_4) 5 tha^{-1} Poultry manure + ½ Nitrogen, (T_5) 5 tha^{-1} Farm yard manure + 5 tha^{-1} Poultry manure, (T_6) 5 ton ha^{-1} Vermicompost, (T_7) 40:12 (Recommended Dose of Fertilizer) and (T_8) Control were studied on various growth and yield attributing parameters. The findings have revealed that upon various treatments combination, application of 5 tha^{-1} Poultry manure + ½ Nitrogen, produced significantly higher growth attributes *viz.*, survival % (89.81), plant height (147.0 cm), number of branches plant^{-1} (8.3) and maximum yield *viz.*, number of siliqua plant^{-1} (303.0), silliqua length (8.56 cm), number of seeds siliqua^{-1} (27.3), test weight (2.77 g), grain yield (2329.0 Kgha^{-1}), straw yield (8592.2 Kgha^{-1}) and consequently, harvest index (23.6 %). The combined effect of poultry manure and nitrogen were also produced quality green leafy vegetable because *gobhisarson* is also widely used as green leafy vegetable in Punjab state.

Introduction

Gobhi sarson (*Brassica napus* L.) belongs to the family Brassicaceae, is an annual herb. The centre of origin for *Brassica napus* is Mediterranean Europe (OECD 2012; Rakow 2004). Its plant height is up to 1.5 m. Leaves are alternately arranged and hairless, which is widely used as green leafy vegetable in India specially Punjab state. Sepals are 4 having yellow colour with 1.5 mm broad 6 mm long and flowering at February- March (OECD 2012). In 1974, the first agronomically viable low-erucic acid / low glucosinolate variety was released in Canada and in 1978, the term "canola," derived from "Canadian oil," was adopted to identify these varieties (Canola Council of Canada, 2011; Daun, 1993). Canada, China and India are largest mustard producing countries in the world with 12 % of

world's total production. Organic manures, including animal manures such as poultry manure, sheep manure etc, residues of field crops, green manures and composts were traditionally and preferentially used in developing countries until 1960's before the inorganic chemical fertilizers began to gain popularity, they can produce safe and nutritive food as well as increased the soil health (Ramesh *et al.,* 2005). By recycling the bio-waste resources in the form of compost can be a way of means to meet the demands of organic manures and it could also help to clean the environmental pollution (Kumar, 2005). Because of these unbalanced used of chemical fertilizers and pesticides decreases the soil fertility and causes health problems to the consumers (Follet *et al.,* 1981, Mandal, 2009). Sustainable farming looks for making the best use of natural resources without damaging the environment and indigenous agricultural knowledge is a vital part of the process of making agriculture sustainable (Ramprasad *et al.,* 2009). The integrated use of organic fertilizers and inorganic fertilizers maintains harmful free ecological conditions on long-term basis and helps in achieving the economical need for the farmer's (Kumar *et al.,* 2007). It also helps to restore the deficiency of nutrients along with N, P and K as well as sustain soil fertility and crop productivity. The integrated nutrient management approvingly affects the environment of soils. Integrated nutrient supply with combination used of organic sources of nutrients and fertilizers presume greater significance (Roy, 1992). The application of poultry manure stimulation the soil microbial growth and activity, subsequent mineralization of plant nutrients, and increased soil fertility and quality and also considered as a good management practice in any agricultural production system (Arancon *et al.,* 2006). The commercial organic farming as practiced today is still at an initial stage. According to survey of International Federation of Organic Agriculture Movement (IFOAM) and Shifting Oekologic and Landban (SOEL), India has 41,000 ha land under organ1ic management, which is only 0.03% of total agricultural land (Anonymous, 2004).

Materials and Methods

The present field experiment entitled "Effect of different organic manures with combination of inorganic fertilizers on transplanted Gobhi sarson (*Brassica napus* L.)" was carried out at Agriculture Research Farm, School of Agricultural Sciences and Technology, RIMT University, Mandi Gobindgarh (Punjab). The experiment conducted during November - April, 2018-19, under randomized block design (RBD) with 8 treatments (T_1: 20 t/ha Farm yard manure, T_2:10 t/ha FYM + ½ N, T_3:10 tha^{-1} PM, T_4: 5 t/ha PM + ½ N, T_5: 5 t/ha FYM + 5 t/ha PM, T_6: 5 t/ha VC, $T_7$40:12 RDF and T_8: control) and three replications. Seeds of Gobhi sarson were sown in nursery beds (40 m^2) for rising seedling. After 35 days, seedling was transplanted in the prepared experimental field with 45 cm row to row and 15 cmplant to plant distance, in plots (1.65 × 2.00 m^2). Growth and yield parameters were observed viz., per cent survival before harvesting, height of plants (cm), number of branches $plant^{-1}$, number of siliqua $plant^{-1}$, silique length (cm), number of seed $silique^{-1}$, test weight, grain yield ($kgha^{-1}$), straw yield ($kgha^{-1}$) and harvest index (%).

Statistical analysis

The data was analysis through the statistical software OPSTAT, 1998 (Sheoran *et al.,* 1998). One way ANOVA was applied for data analysis from Randomized Block Design according to the method given by Panse and Sukhatme (1985). The calculated 'F' value is compared with table F values at 5% level of significance for field data. If the calculated 'F'

value is greater than the table value the difference is said to be significant and critical difference is calculated for further comparison.

Results and Discussion

The significant variations were observed among the treatments for growth and yield attributing parameters. Maximum survival % before harvesting (89.8 %), plant height (147.0 cm), number of branches plant^{-1} (8.3) was recorded in the T_4 (5 tha^{-1} Poultry manure + ½ Nitrogen) followed by T_2 (10 tha^{-1} Farm Yard Manure + ½ Nitrogen) whereas minimum number of silique plant^{-1}was recorded in T_8 (control) 183.0 followed by T_3 (10 tha^{-1} Poultry manure) 218.3. Maximum length of silique (8.56 cm) was recorded in T_4 which was at par with T_2 (8.56 cm) followed by T_7 (8.47 cm). Minimum number of seed silique^{-1} (22.9) was recorded in T_8 followed by T_3 (24.3). Maximum test weight (2.77 g) was recorded in T_4 followed by T_2 (2.66 g). Maximum grain yield (2329.0 kgha^{-1}) was recorded in T_4 followed by T_2 (2245.5 kgha^{-1}). Maximum straw yield (8592.2 kgha^{-1}) was recorded in T_4 followed by T_2 (8592.2 kgha^{-1}) whereas minimum harvest index (19.6 %) was recorded in T_5 followed by T_1 (19.5 %) (Table 1 and 2).

Poultry manure contains 13 essential nutrients which are used by plants for its better growth and development. Poultry manure is rich source of N, P_2O_5, K_2O, S, Ca, Mg, Mn, Cu, Zn, Cl, B, Fe, and Mo, Barker (1990). Nowadays used of poultry manure is taking prime position among organic manures for organic production of agronomical and horticultural crops, it is also widely used in conducting research trials of agriculture field. Ogboghodo *et al.*, (2004) reported that the application of poultry manure in crude oil polluted soil increased survival percentage growth and yield of *Zea mays*. Lim (2016) reported that the combination of poultry manure + Nitrogen increase plant height of mustard which was significantly higher than the other treatments combinations.

Table.1 Effect of organic manure on growth parameters of transplanted Gobhi sarson

Treatments	Survival %	Plant height	Number of branches
T_1: (20 t/ha Farm yard manure)	85.2	143.7	7.0
T_2: (10 t/ha Farm Yard Manure + ½ Nitrogen)	89.8	144.3	7.3
T_3: (10 tha^{-1} poultry manure)	72.2	137.0	5.3
T_4: (5 t/ha Poultry manure + ½ Nitrogen)	89.8	147.0	8.3
T_5: (5 t/ha Farm yard manure + 5 t/ha Poultry manure)	78.7	142.0	6.0
T_6: (5 t/ha Vermicompost)	78.7	140.3	5.7
T_7: (40:12 (Recommended dose of fertilizer)	86.1	143.7	7.0
T_8: (control)	62.0	128.3	5.0
C.D (P=0.05)	2.7	8.6	1.8
C.V	1.9	3.4	16

Table.2 Effect of organic manure on growth parameters of transplanted Gobhi sarson

Treatments	Number of siliqua plant^{-1}	silique length (cm)	Number of seed silique^{-1}	test weight	grain yield (kgha^{-1})	straw yield (kgha^{-1})	Harvest index (%)
T_1	291.7	8.53	26.4	2.52	1651.2	6802.7	19.6
T_2	296.7	8.56	27.2	2.66	2245.5	8592.2	23.4
T_3	218.3	8.46	24.3	2.39	1601.4	4771.5	20.7
T_4	303.0	8.56	27.3	2.77	2329.0	8592.2	23.6
T_5	268.7	8.51	26.3	2.45	1614.2	5736.0	19.5
T_6	229.0	8.47	24.8	2.42	1608.4	5320.9	20.2
T_7	292.7	8.55	26.8	2.54	1861.9	6826.2	21.4
T_8	183.0	7.35	22.9	2.38	951.1	2719.3	21.2
C.D(P=0.05)	21.3	N/S	4.08	N/S	88.0	80.7	2.4
C.V	4.6	6.62	8.34	6.27	2.5	0.7	6.2

Similar findings were observed by Reddy and Singh (2018) observed that providing 80 kg N to mustard by supplying 50 kg N through urea and 30 kg N through poultry manure gave the higher yield attributes *viz.*, number of siliqua plant^{-1}, number of seed siliqua^{-1}, test weight, seed yield, stalk yield and harvest index.

Ewulo *et al.*, (2016) Observed and reported that the effects of urea and PM (50 kg Urea + 8 tha^{-1} PM) significantly increase number of branches in tomato plants. Similar finding were observed by Adekiya and Agbede (2010) that NPK fertilizer + poultry manure mostly enhanced the growth parameters such as palnt height, number of leaves and leaf area. These finding highly corroborated with the findings of Choudhary *et al.*, (2011) they reported that integration of 50 % Recommended dose of nitrogen through inorganic fertilizer + 50 % nitrogen and other nutrients through poultry manure increased higher growth and yield attributes in fenugreek (*Trigonella foenumgraecum*) which pod length, seed pod^{-1}, pod plant^{-1}, and test weight. Similar finding were also observed by Khiriya *et al.*, (2003) the application of nitrogen through various source and their integration with organic manure enhanced growth and yield of fenugreek.

It can be concluded that the Treatment T_4 (5 t /ha Poultry Manure + ½ N) was recorded significantly higher growth performance, which is desirable parameter for production of transplanted Gobhi sarson for green leafy vegetable, and yield attributes (Seed production) of transplanted Gobhi sarson followed by T_2 (10 t/ha Farm Yard Manure + ½ N). These findings are based on one-season experiment.

References

Adekiya, A.O. and Agbede, T.M. (2010). Growth and yield of tomato (*Lycopersicon esculentum* Mill) as influenced by poultry manure and NPK fertilizer. *Journal of Food and Agriculture.* 21 (1): 10-20.

Anonymous, (2004) Industry Focus-organic farming, *Agriculture Today*. 35-26.

Arancon NQ, Edwards CA, Bierman P (2006). Influences of vermicomposts on field strawberries: Part 2. Effects on soil microbiological and chemical properties. Bioresour. Technol. 97: 831-840.

Barker, J. (1990). Unpublished manure nutrient data. Department of Biological

and Agricultural Engineering, North Carolina State University, Raleigh, NC.

Canola Council of Canada (2011). Canola grower's manual. Available: *http://www.canolacouncil.org/crop-production/canola-grower's-manual-contents/[2013]*.

Choudhary B.R, Gupta A.K, Parihar C.M, Jat S.L and Singh D.K (2011). Effect of integrated nutrient management on fenugreek (*Trigonella foenumgraecum*) and its residual effect on fodder pearlmillet (*Pennisetum glaucum*). *Indian Journal of Agronomy*.56:189-195.

Daun, J. K. (1993). Oilseeds production, Grains & Oilseeds Handling, Marketing and Processing, 4 edition *Canadian International Grains Institute* (*CIGI*), Winnipeg, 2: 831-882.

Ewulo, B.S. Eleduma, A.F. and Sanni, K.O. (2016). Effect of Urea and poultry manure on growth and yield attributes of Tomato (*Lycopersicon esculentum* Mill) and soil chemical composition. *International Journal of Innovative Research and Advanced Studies*.3: 5-9.

Follet, R., R. Donahue and Murphy, L. (1981). Soil and Soil Amendments. *Prentice hall:* Inc., New Jersey.

Khiriya, K.D., Singh, B.P. and Taneja, K.D. (2003). Effect of farm yard manure and phosphorus levels on yield, quality and nutrient uptake by fenugreek (*Trigonellafoenumg-raecum* L.). Forage Research 28: 210-214.

Kumar, A., (2005). "Verms and Vermitechnology", A.P.H Publishing Corporation, New Delhi.5, 71.

Kumar, A., Tripathi, H.P. and Yadav, D.S. (2007). Correcting nutrient for sustainable crop production. *Indian Journal of Fertilizer*, 2: 37- 44.

Lim A.H. (2016). Effect of poultry manure on the growth and yield of leaf mustard (*Brassica juncea*) and lettuce (*Latuca sativa*) grown on bris soil. *Journal of Tropical Agriculture and Food Science*. 44 (1): 29 - 37.

Mandal, S. (2009). Pesticide peril in vegetables', *The Telegraph, March 09*, Calcutta, India

OECD. (2012) Organisation for Economic Co-operation and Development, Consensus document on the biology of the brassica crops (*Brassica spp*.). *Series on Harmonisation of Regulatory oversight of Biotechnology*. Paris, 54: 142.

Ogboghodo, I.A., Erebor, E.B., Osemwota, I.O. and Isitekhale H.H. (2004). The effect of application of poultry manure to crude oil polluted soil on maize (*Zea mays*) Growth and soil properties. *Environmental Monitoring and Assessment*, 96(1-3): 153-161.

Panse, V. G. and Sukhatme, B. V. (1985). Statistical Method for Agricultural Workers, 2nd Ed., Indian Council of Agricultural Research, New Delhi.

Rakow, G. (2004). Species Origin and Economic importance of Brassica. Springer-Verlag Berlin Heidelberg.

Ramesh, P., Singh, M., and Rao, S.A. (2005). "Organic Farming: Its Relevance to the Indian Contex. *Curr. Sci.,* 88 (4):561-568.

Ramprasad, V., Srikanthamurthy, H.S., Ningappa, Shivakumar, Nagaraju, B., Ningaraju, Shashidhara, Doddappa, Vijay, A.R., Shivanna, M., Obanna, N., Pandu A.C., Rama, S, Sundhya, M., Veena P and Suma S (2009). A Handbook on Sustainable Agricultural Practices, Fist edition, Green Foundation, Bangalore.

Reedy, G.N.K., and Singh, R. (2018). Effect of integrated nitrogen management on the growth and yield of mustard (*Brassica juncea* L.). *Journal of Pharmacognosy and Pphytochemistry*. 7(3): 617-619.

Roy, R.N. (1992). Integrated Plant Nutrition System. An overview. In: Fertilizers, Organic Manure, Recyclable Wastes and Bio-Fertilizers, Tandon, H.L.S. (Ed.). Fertilizer Development and Consultation Organization, New Delhi.

Sheoran O.P., Tonk D.S., Kaushik L.S., Hasija R.C. and Pannu R.S. (1998). Statistical Software Package for Agricultural Research Workers. Recent Advances in information theory, Statistics and Computer Applications, Department of Mathematics Statistics, CCS HAU, Hisar; 139-143.

How to cite this article:

Malemnganba Meitei, A. and Anurag Bajpay. 2019. Effect of Different Organic Manures with Combination of Inorganic Fertilizers on Transplanted *Gobhi Sarson* (*Brassica napus* L.). *Int.J.Curr.Microbiol.App.Sci.* 8(07): 2627-2632. doi: https://doi.org/10.20546/ijcmas.2019.807.323