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Effect of Integrated Nutrient Management on Vegetative Growth and Yield of Turnip (*Brassica Rapa L.)* Cv. Pusasweti

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Abstract

A field experiment was conducted during the rabi season of 2018-2019 at Raja Balwant Singh College, Bichpuri, Agra (UP), India to find out the effect of FYM and vermicompost along with NPK on vegetative growth and yield of turnip cv. Pusasweti. The experiment was laid out in Randomized Block Design consisting 8 treatment combinations, i.e. T_1 (RDF 100:60:60 ha^{-1} N:P:K), T_2 (FYM 12.5 t ha^{-1}), T_3 (FYM 10 tha^{-1} + 50 % RDF), T_4 (FYM 10 tha^{-1} +100 % RDF), T_5 (FYM 10 tha^{-1} + vermicompost 5 tha^{-1}), T_6 (FYM 10 t ha^{-1} +vermicompost 7 tha^{-1}), T_7 (FYM 25 tha^{-1}), T_8(control) which was replicated thrice. On the basis of results on various aspects of the envisaged that T_4 (FYM 10 tha^{-1} + 100 % RDF) Followed by T_1, T_3 was significantly superior to improved the vegetative growth parametes and yield attributing characters of turnip in this investigation.

Keywords: FYM, Vermicompost, RDF of NPK, Turnip yield.

Introduction

The turnip (*Brassica rapa*L.) is a dalieious root vegetable crop one of the most important members of the family brassicaceae and turnip have many mineralsalts, protein, carbohydrate, little fat, vitamins etc. It has tremendous potential as a short duration high yielding fodder crop, The fodder is rich in readily available carbohydrates and crude protein. It is highly palatable succulent and easily digestible. The small tender turnip varieties are mostly grown as a feed for human, while larger varieties are cultivated for animal consumption (Shanmugavelu, 1999) turnip fooder is the cheapest source of supplying nutrient to animals and reducing the cost of milk production although turnip is mainly used as a vegetable crop for human consumption. In the form of salad and curry. Organic nutrition for vegetables is especially important as they provide quality foods, which are very important for health security to people since the vegetables are mostly consumed as fresh or partially cooked, they should be devoid of residual effect of chemical fertilizers (Raj and Geetakumari 2001). Integrated use of organic manures with optimum level of NPK fertilizers not only improves the nutrient status and soil health but also stabilizes the crop yield at higher level. Further the organic manure also amends the soil structure and correct the adverse soil condition and improve the soil productivity (Yadav and Vijayakumari, 2003).

Research Methods

The present experiment was carried out during rabi season of 2018-2019 at research farm of Horticulture, Raja Balawant Singh College, Bichpuri, Agra (U.P.) which is situated at an elevation (altitude) of 168m above mean sea level, 27.2^0 N latitude and 77.9^0 E longitude. The soil of experiment plot was sandy loam in texture and alkaline in reaction (pH 8.15). It had 0.36% organic carbon, 166.45 $kgha^{-1}$ available N, 30.00 $kgha^{-1}$ available P and 297.0 $kgha^{-1}$ available K. The investigation was laid out under Randomize Block Design having 8 treatment combinationsviz: T_1 (RDF 100:60:60 ha^{-1} NPK) T_2 (FYM 12.5 tha^{-1}) T_3 (FYM 10 t + 50% RDF) T_4 (FYM 10 tha^{-1} +100% RDF) T_5 (FYM 10 tha^{-1} + vermicompost5 tha^{-1}) T_6 (FYM 10 tha^{-1} + vermicompost 7 tha^{-1}) T_7 (FYM 25 tha^{-1}) T_8 (control) which were replicated three times. The seeds of turnip cv. Pusasweti were sown at 10 cm distance on the top of ridges prepared at 40 cm apart.Standard cultural practices were followed. The collected data regarding experimental observations were subjected for statistical analysis.

Results and Discussion

The data recorded for different traits was analysed statistically and the compiled data are presented in table 1 and 2.

A perusal of the data clearly implies that turnip responds well to nutrient supply. It is also indicated from the data there was a significant increment in the performance of each trait studied and for all the treatments over the absolute control. It is revealed from the data (Table-1) that at final stage of growth plant height (44.78 cm), number of leaves per plant(13.89), length of longest leaf (41.33 cm), width of longest leaf (11.83 cm), fresh weight of leaves (89.83 g) and dry metter content of leaves (10.65%) were obtained significantly higher with the application of T_4treatment (FYM 10 tha^{-1} +100% RDF) Followed by T_1 (RDF 100:60:60 ha^{-1} NPK) T_3 (FYM 10 tha^{-1} + 50% RDF) and T_6 (FYM 10 tha^{-1} + vermicopost 7 tha^{-1}) while the lowest values for these traits were recorded for absolute control (T_8).This may be attributed to proper utilization of supplied nutrients in balanced through inorganic fertilizers and organic manure in the form of FYM. The favourable effect of 100 percent RDF of NPK andFYM on plant growth and development might be due to the fact that the integrated use of organic and inorganic fertilizers is more effective through correction of primary and secondary nutrients Nitrogen has always been known to promote vegetative growth by increasing both the photosynthetic activity as well as the photosynthetic area.The photosynthetic activity is improved by increasing the concentration of chlorophyll in cell whereas the increase in photosynthetic area is brought about by increasing the plant height and number of leaves. The heigher plant height and more fresh weight associated with comparatively higher doses of fertilizer (both inorganic and organic) may be thus explained by the above fact these results are in close conformity with the findings of singh and singh (2007) in carrot,Badkhe, V.A and Moharkar (2010) in radish and Kirad et al (2010) in carrot.

The perusal of data on yield attributes of turnip was significantly influenced with different fertility level (Table-2). The maximum fresh weight of root (86.25g),diameter of root (16.93cm), dry matter content of root (7.08%) and yield of turnip roots (307.02q/ha^{-1})were recorded with T_4 (10 t FYM+100% RDF) followed by T_1 (RDF 100:60:60: ha^{-1} NPK), T_3 (FYM 10 t ha^{-1}+50% RDF)where as the lowest values for these characters were recorded with T_8 (absolute control). These result are in close conformity with the findings of Bieniaszewski (2012) in sugarbeet, Sentiyangla et al (2012) in radish,Kirad et al (2010) in carrot. This clearly signifies the importance of application of organic sources of nutrients along with the inorganic fertilizers at least in case of root crops.this result may be based on the fact that organic sources also improves the physico - chemical properties of soil along with supplying nutrients in smaller amounts for a longer duration.Another reason may be attributed to the fact that organic matter thus supplied in the form of FYM or Vermincompost improves the bulk density, porosity and makes the soil light and friable which favours enlargement or bulking of the under ground roots

Table no.1 Effect of Integrated Nutrient Management on of Turnip Growth on Horticultural Traits

Treatment	Plant hight (cm)	Number of leavesper plant	Length of longest leaf (cm)	Width of longest leaf (cm)	Fresh weight of leaves (g)	Drymettrcontect of leaves(%)
T_1	41.68	12.28	37.67	11.78	83.33	10.28
T_2	35.56	11.08	35.46	9.88	60.84	9.60
T_3	40.57	11.83	36.78	10.78	81.66	10.09
T_4	44.78	13.89	41.33	11.83	89.83	10.65
T_5	37.67	11.39	35.78	10.39	75.83	9.51
T_6	37.78	11.83	36.06	10.44	77.82	9.57
T_7	36.86	11.39	35.39	9.77	74.16	9.37
T_8	34.06	9.94	33.22	9.33	53.08	8.84
Sem+	1.02	0.37	0.84	0.62	3.52	0.30
CD at 5%	2.78	1.12	2.56	1.88	10.67	0.91

Table no.2 Effect of Integrated Nutrient Management on Horticulture Traits of Turnip

Treatment	Fresh weight of root(g)	Diameter of root (cm)	Dry mettercontant of root (%)	Yield q/ha
T_1	80.17	15.66	6.67	241.33
T_2	75.17	14.98	6.04	197.37
T_3	78.75	15.60	6.57	226.65
T_4	86.25	16.93	7.08	307.02
T_5	75.00	15.20	6.15	216.37
T_6	77.92	15.24	6.23	219.30
T_7	74.75	15.10	6.05	204.68
T_8	53.33	14.64	5.88	175.44
Sem+	1.95	0.41	0.14	4.81
CD at 5%	5.92	1.24	0.42	14.56

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