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Effect of FYM and Vermicompost on the Vegetative Growth, Yield and Quality of Sugar Beet (*Beta vulgaris* L.) Cv. Detroit Dark Red

Roshan Kushwah, Brijesh Kumar, Dalveer Singh, Manvendra Singh Solanki, Deepak Karan
Department of Horticulture, R.B.S. College, Bichpuri, Agra, U.P. (India)

ABSTRACT
The field investigation was conducted during the year 2016-2017 at Raja Balwant singh College, Bichpuri, Agra, U.P. to find out the response of organic and inorganic fertilizer viz. FYM and Vermicompost along with NPK on vegetative growth, yield and quality of sugar beet cv. Detroit Dark Red. The experiment was laid out in Randomized Block Design (RBD) consisting 8 treatment combinations i.e. T_1 (80% RDF + FYM) T_2 (80% RDF + FYM + Vermicompost) T_3(60% RDF + FYM) T_4(60% RDF + FYM + Vermicompost) T_5(50% RDF + FYM) T_6 (50% RDF + FYM + Vermicompost) T_7(RDF 80:100:80 NPK) and T_8(control) which was replicated thrice. On the basis of results on various aspects of the study envisaged that T_2 (80% RDF + FYM +Vermicompost) was found significantly superior to improved the growth, yield and quality of sugar beet.
***KEYWORDS**: FYM, Vermicompost, Nitrogen, Phosphorus, Potassium, Sugar beet, root yield.*

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INTRODUCTION

Sugar-beet or Beet root (*Beta vulgaris* L.) is a popular root vegetable grown in kitchen gardens as well as market gardens. The sugar beet is cultivated through- out the India. It is mostly cultivated in U.P., Punjab, Rajasthan, Haryana and Tamil Nadu mainly for its fleshy enlarged roots. In world Europe, France, Germany, U.S.A., Iran, Pakistan etc. countries are cultivated beet root. The beet root is a member of chenopodeaceae family and the chromosome no. 2n =18 which is biennial and cross pollinated crop. The most popular potherb or green has or had perhaps as wide spread publicity as any other vegetable. It is mainly grown for its tender, succulent leaves but the tender seed –stalk is also cooked in some parts of the country [3,4].

Keeping these facts in mind the present experiment was conducted at R.B.S.College, Agricultural Research farm, Bichpuri, Agra in rabi season during year 2016-2017 to assess the effect of FYM and vermicompost on the vegetative growth and quality yield of sugar beet.

METERIAL AND METHODS

The experiment was conducted at research form of Department of Horticulture, Raja Balwant Singh College, Bichpuri, Agra during 2016-2017. The research farm is situated at latitude of $27^{0}2$ N and longitude of $77^{0}9$ E at an elevation of 163.4m above sea level. The Agra tract has a tropical and subtropical climate with hot dry summer and sever winter. Under normal climate condition the area receives about 670 mm. annual rain fall, around

80% of which occurs from July to September. The mean annual maximum and minimum atmospheric temperature are 46^0 and $1\text{-}2^0$ respectively.

The soil of experimental plot was genetic alluvial with calcareous layer at the depth of about 1.5-2.0 meter. It was sandy loam. Fertile, well drained and slightly alkaline in reaction having 7.9pH. The Soil sample were collected from 30 cm. depth just before layout and after analysis. If was found that field was sufficient in potash content but low in available nitrogen and organic carbon and medium in available phosphorus content.

The investigation was laid out under Randomized Block Design having 8 treatment combinations. T_1 (80% RDF + FYM) T_2(80% RDF + FYM + Vermicompost) T_3(60% RDF + FYM) T_4(60% RDF + FYM + Vermicompost) T_5(50% RDF + FYM) T_6 (50% RDF + FYM + Vermicompost) T_7(RDF 80:100:80 NPK) and T_8(control) which were replicated thrice. The seeds of radish cv. Purple top white were sown on the top of ridge on 2.11.2016. The spacing from ridge to ridge was kept 40 cm. and seed to seed 10 cm. Two seeds were sown at each hill at a depth of about 2 cm. depth only bold and apparently healthy seeds were used. Finally maintain the proper plant population by removing the week and unhealthy plant and maintained gapped place.

RESULTS AND DISCUSSION

The pooled data regarding vegetative growth, yield and quality of sugar beet were presented in Table-1 and Table-2. It is evident from Table-1 that different treatment combinations showed significant effect on different vegetative observations except fresh weight of leaves per plant (gm) in sugar beet. The significantly maximum number of green leaves (10.67) was counted with T2 (80% RDF + FYM + Vermicompost) followed by T4,T6 and T7 which were found at par to each other. The maximum length of longest leaves (21.40 cm.),width of longest leaves(9.87cm.) and fresh weight of leaves (9.67cm.) were measured with T2(80% RDF + FYM+Vermicompost) treatment followed by T4 (60%RDF + FYM +Vermicompost) which was found at par. Maximum Significantly minimum number of leaves (6.34) length of longest leaf (16.50 cm), width of longest leaf (6.67cm) and fresh weight of leaves per plant (5.06 gm) were recorded with T8 (control). These findings are in the close proximity to the results reported by Waclawowicz *et.al.* [4], Lamani *et. al.* [2], Kumar *et. al.*[6].

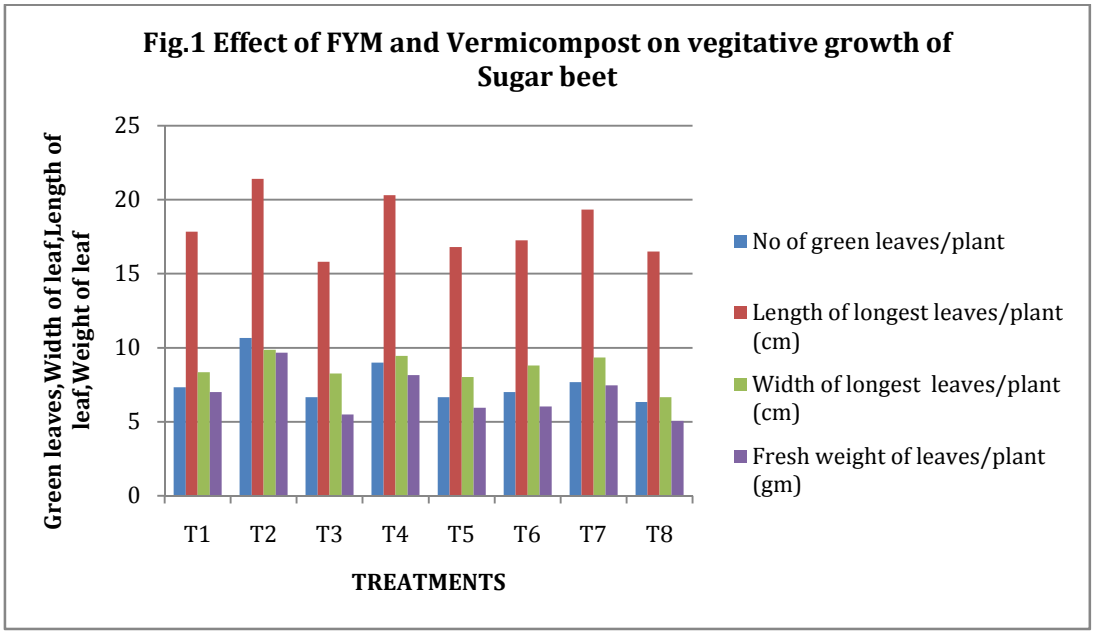
The examination of data presented in Table-2 revealed that all the treatment have significant effect on fresh weight of root, yield of root, dry matter in root and dry matter content in leaves as compared to control. The non significant response was found in the length of sugar beet where maximum length of root (7.34cm) was measured in T2 (80% RDF + FYM+Vermicompost) and minimum (3.86 cm) was found in control (T8).

Table No. 1- Effect of FYM and Vermicompost on vegetative growth of Sugar beet.

Treatment	No. of green leaves per plant	Length of largest leaves per plant (cm)	Width of largest leaves per plant(cm)	Fresh weight of leaves per plant (gm)
T_1	7.34	17.84	8.34	7.00
T_2	10.67	21.40	9.87	9.67
T_3	6.67	15.80	8.26	5.50
T_4	9.00	20.30	9.46	8.16
T_5	6.67	16.83	8.03	5.94
T_6	7.00	17.26	8.80	6.04
T_7	7.67	19.33	9.34	7.46
T_8	6.34	16.50	6.67	5.06
CD at 5% level of probability	**2.06**	**2.090**	**1.44**	**1.166**

The maximum (394.94 q/ha) root yield was observed from T2 (80% RDF + FYM+ Vermicompost) followed by T4, T6 and T7 which were found at par to each other. The maximum fresh weight of root per plant (343gm), dry matter content of root (5.92%) and leaves (11.96%) were recorded with T2 treatment (80%RDF+FYM+Vermicompost) followed by T4 (60%RDF + FYM + Vermicompost) which was statistically at par to each other. The significantly minimum fresh weight of root (166.66 gm), length of root (3.86 cm), yield of

roots (147.56 q/ha), dry matter content in root (3.63%) and leaves (10.43%) were observed in T8 (control). It may be due to balance application of NPK and organic and inorganic fertilizer which makes the availability of almost all the major nutrients in available form and improve the physio-chemical properties of soil. The findings are in consonance with the earlier results of Eman *et. al.* [1] and Shani *et. al.*[7].



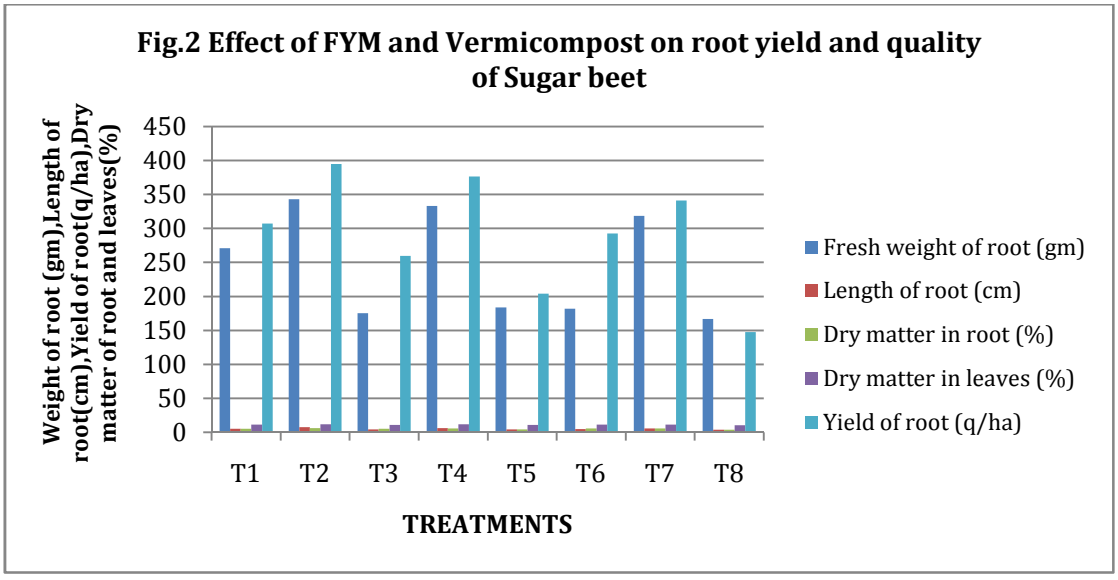


Table No. 2- Effect of FYM and Vermicompost on root yield and quality of Sugar beet

Treatment	Fresh weight of root (gm)	Length of root (cm)	Dry matter content in root (%)	Dry matter content in leaves (%)	Yield of roots (q/ha)
T_1	271.00	5.16	5.286	11.33	307.26
T_2	343.00	7.34	5.92	11.96	394.94
T_3	175.33	4.23	5.09	10.83	259.53
T_4	333.33	6.20	5.80	11.96	376.70
T_5	183.66	4.10	4.46	10.70	203.96
T_6	181.66	4.83	5.43	11.26	292.46
T_7	318.33	5.73	5.50	11.46	341.10
T_8	166.66	3.86	3.63	10.43	147.56
CD at 5%	**42.28**	**1.400**	**0.6747**	**0.944**	**21.48**

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