International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(5): 2822-2824

Received: 04-07-2019
Accepted: 08-08-2019

Padekar VD
Department of Horticulture, College of Agriculture, Latur, V.N.M.K.V, Parbhani, Maharashtra, India

Solanke AA
Department of Horticulture, College of Agriculture, Latur, V.N.M.K.V, Parbhani, Maharashtra, India

Ghatul ID
Department of Horticulture, College of Agriculture, Latur, V.N.M.K.V, Parbhani, Maharashtra, India

Kadam AS
Department of Horticulture, College of Agriculture, Latur, V.N.M.K.V, Parbhani, Maharashtra, India

Bidave SR
Department of Horticulture, College of Agriculture, Latur, V.N.M.K.V, Parbhani, Maharashtra, India

Corresponding Author:
Padekar VD
Department of Horticulture, College of Agriculture, Latur, V.N.M.K.V, Parbhani, Maharashtra, India

Effect of organic manures on economics of pomegranate (*Punica granatum* L.)

Padekar VD, Solanke AA, Ghatul ID, Kadam AS and Bidave SR

Abstract
The present investigation entitled "Effect of organic manures on economics of pomegranate *(Punica granatum* L.)" was conducted at Krishi Vigyan Kendra, Manjra, Latur, on a well established pomegranate orchard of eight years age, spaced at 4.5 X3 m during 10 Dec to 5 Aug 2018 for ambe bahar crop of 2017-2018. An experiment was laid out in a Randomized Block Design with 13 treatments. The economics of pomegranate as influenced by different organic manures showed that the lowest cost of cultivation (Rs.108290ha^{-1}) in the treatment of R.D.F.i.e.625:250:250gNPK/tree (T_{13}).The maximum gross returns (Rs.696800ha^{-1}) and net monetary returns(Rs.525995ha^{-1})were obtained in the treatment of Poultry manure @ 30kg/tree (T_{12}). The maximum B:C ratio (4.82) was recorded in Poultry manure @ 25kg/tree (T_{11}).

Keywords: Organic manures on economics *Punica granatum* L.

Introduction
Pomegranate (*Punica granatum* L.) is an important fruit crop of the Tropical and Subtropical regions belonging to the family Punicaceae and genus *Punica.* The pomegranate is a neat rounded shrub or small tree that can grow more typically to 12 to 16 feet in height. It is usually deciduous, but in certain areas the leaves will persist on the tree. The trunk is covered by a red-brown bark which later becomes gray. The branches are stiff, angular and often spiny. There is a strong tendency to suckers from the base. Pomegranates are also long lived. The vigor of a pomegranate tree declines after about 15 years. Leaves are glossy, narrow and lance-shaped. The flowers may be solitary or grouped in twos and threes at the ends of the branches. The pomegranate is self-pollinated as well as cross-pollinated by insects. Cross-pollination increases the fruit set (Kumari *et al*. 2012) [4]. Pomegranate is commercially grown for its delicious, refreshing with sweet- acidic taste. Pomegranate is also processed to make product like fruit juice, concentrate and beverage, wine, syrup and jelly. The 'Anardana' is also prepared from pomegranate (Singh and Singh, 2004). The edible part of pomegranate fruit is the juicy outgrowth of the seed, called aril. The parts of the fruit are a good source of Vitamin C (16 mg/100 g.), Minerals (0.7%), Calcium (10 mg/100 g.), Phosphorus (70 mg/100g.), Iron (0.3 mg / 100 g.) and also contains considerable amount of acids, fats and carbohydrates (Bhowmik, *et al*., 2013) [3]. The fruit mainly used for dessert purpose but its juice have good medicinal properties to be useful for patients suffering from leprosy, diarrhea, dysentery and hemorrhages. The juice of wild pomegranate contains citric acid and sodium citrate for pharmaceutical purposes (Shastri and Pawar 2014) [5]. Recently, it has been reported that extract of fruits has anti-cancer properties (Sudhakar, *et al*. 2015) [6].

Pomegranate is native of Iran and is extensively cultivated in Mediterranean countries like Spain, Morocco, Egypt, Afghanistan and Baluchistan. It is also grown to some extant in Burma, China, Japan, USA (California) and India. The total area under cultivation of Pomegranate in India is 197 (000 ha) and production is around 2300 (000MT) according to N.H.B (2017) [1]. The pomegranate is grown to a limited extent in selected locations in many states in India. Maharashtra is leading producer of pomegranate followed by Karnataka, Andhra Pradesh. The Maharashtra state, alone occupies an area of 128.65 thousand ha. followed by Karnataka (23.23 thousand ha.), Gujarat (14.77 thousand ha.) and Andhra Pradesh (5.38 thousand ha.). Even Maharashtra is having largest area under pomegranate cultivation; production and productivity are 1197.71 thousand metric tonnes and 9.31metric tonnes per ha, respectively (Anon 2016). In Maharashtra pomegranate is commercially cultivated in Solapur, Sangli, Nasik, Amhednagar and Pune. Cultivation of pomegranate in rural area is one of the

fastest growing segments within agricultural sector in India today (Aher and Rahane, 2016) [2]. In India mainly cultivated varieties like Ganesh, Mridula, Bhagwa, Dholka, Jyoti, Muscat, Jodhpur Red, Ruby Red, etc. grown in different agro-climatic conditions (Venkatesha and Yogish, 2016) [7].

Organic farming is becoming increasingly popular, with a rapidly growing global demand for organic products. It offers considerable benefits over conventional farming systems particularly with respect to sustainable yield, better quality and health hazard free produce. Fruits, often eaten raw, are more vulnerable to contamination with chemicals due to the latter's residual toxicity as compared to cereals and pulses. Thus, organic production of fruits is gaining popularity over that of other crop groups.

The production of pomegranate through organic means may help in improving the fruit quality. The farmers of the region are also interested to generate the experimental information about the meeting the nutrient needs of pomegranate trees for organic production of pomegranate fruits. From the view point of sustainable agriculture, management of horticultural practices is one of the main ways to produce healthy crop. The role of organic manures has been well established in many fruits crops; while such studies are very meager in pomegranate. Keeping in view, of the above limitation the present investigation is planned to study the effect of different sources of organic manures *viz* FYM, Goat manure, vermicompost, poultry manure, Neem cake and Press mud on growth, yield and quality of pomegranate.

Material and Methods

The present investigation "Effect of organic manures on economics of pomegranate (*Punica granatum* L.)" was carried out at Krishi Vigyan Kendra, Manjra, Latur during *Ambe bahar* of 2017-2018 Geographically, Krishi Vigyan Kendra, Manjra, Latur is situated between $18^{0}24'$ North Latitude and $76^{0}36'$ East longitude has an elevation of 633.85 meter above Mean Sea Level. The climatic condition of Latur represents semi arid tropical climate characterized by a hot summer and general dryness throughout the year except during South-West monsoon. The experiment was carried out during January 2018 to Aug 2018. The Bhagwa pomegranate trees grown on vertisol at 4.5 X 3 meter spacing of 8 year age having uniform growth and vigour were subjected to bahar treatment by withholding irrigation from 18 November to January 18, 2018, The various operations like land preparation, removal and disposal of diseased fruits of previous bahar was done. The pruning of dead and diseased branches was also done. A total 13 treatments replicated twice and two trees per treatment were executed in a Randomized Block Design: FYM @ 75kg/tree (T_1), FYM @ 100kg/tree (T_2), Goatmanure @ 15kg/tree (T_3), Goatmanure @ 20kg/tree (T_4), Pressmud @ 25kg/tree (T_5), Pressmud @ 30kg/tree (T_6), Vermicompost @ 20kg/tree (T_7), Vermicompost @ 30kg/tree (T_8), Neemcake @ 5kg/tree (T_9), Neemcake @ 7.5kg/tree (T_{10}), Poultrymanure @ 25kg/tree (T_{11}), Poultrymanure @ 30kg/tree (T_{12}), R.D.F 625:250:250g NPK/tree (T_{13}).

Result and Discussion

The data regarding the economics of pomegranate cultivation influenced due to application of organic manure was computed and presented in Table 1.

The data revealed that, among different treatments under study the lowest (Rs 1,08,290. ha^{-1}) cost of cultivation was required for the treatment of application of RDF i.e.625g N, 250g P_2O_5, 250g K_2O/tree (T_{13}). The highest cost of cultivation (Rs. 2,30,005 ha^{-1}) was required for the treatment of application of FYM @ 100kg/tree (T_2).The lowest cost in the treatment of application of RDF i.e. 625g N, 250g p_2O_5, 250g K_2O/tree (T_{13}) might be attributed to less quantity of fertilizers needed for the supply of recommended dose of inorganic fertilizers to meet the nutrient needs. While, the highest cost in treatment of application of FYM@100kg/tree (T_2) might be attributed to huge quantity of FYM needed for the application of the treatment and may be due to its increased price due to less availability. The highest gross monetary returns (Rs. 6,96,800 ha^{-1}) were obtained with the treatment of application of Poultry manure @ 30kg/tree (T_{12}). While, lowest gross monetary returns (Rs3,36,000 ha^{-1}) were obtained in the treatment of application of Vermicompost @ 20kg/tree (T_7). The maximum (Rs 6,96,800 ha^{-1}) gross returns in the treatment of application of Poultry manure @ 30kg/tree (T_{12}) may be due to production of high yield. However, the lowest gross returns (Rs 3,36,000 ha^{-1}) was obtained from the treatment Vermicompost @ 20kg/tree (T_7) might be attributed to lowest yield of fruits produced by this treatment.

Table 1: Economics of pomegranate cultivation as influenced due to application of different organic manures

Tr.no	Treatments	Cost of cultivation (Rs/ha)	Gross monetary returns (Rs/ha)	Net monetary returns (Rs/ha)	B.C ratio
T_1	FYM-75kg/tree	193005	428800	235795	2.22
T_2	FYM-100kg/tree	230005	462000	231995	2.00
T_3	Goat manure-15kg/tree	126405	384400	257995	3.04
T_4	Goat manure-20kg/tree	141205	415600	274395	2.94
T_5	Press mud-25kg/tree	119005	471200	352195	3.95
T_6	Press mud-30kg/tree	126405	529200	402795	4.18
T_7	Vermicompost-20kg/tree	170805	336000	165195	1.96
T_8	Vermicompost-30kg/tree	215205	386400	171195	1.79
T_9	Neem cake-5 kg/tree	130105	595200	465095	4.57
T_{10}	Neem cake-7.5kg/tree	154155	658000	503845	4.26
T_{11}	poultry manure-25kg/tree	137505	664000	507995	4.82
T_{12}	Poultry manure- 30kg/tree	148605	696800	525995	4.68
T_{13}	R.D.F.(625g N, 250g p_2O_5, 250g K_2O/tree)	108290	468000	359710	4.32

The highest net monetary returns (Rs 525995ha^{-1}) were obtained with the application of Poultry manure @ 30kg/tree (T_{12}). However, the lowest net monetary returns (Rs. 1,65,195 ha^{-1}) were recorded with the application of Vermicompost @ 20kg/tree (T_7). This could be attributed to production of high yield of fruits in the treatment of application of poultry manure with comparatively moderate cost of cultivation while, lowest yield in treatment of application Vermicompost @ 30kg/tree (T_8) and comparatively higher cost of cultivation

of this treatment results in getting minimum net monetary returns in this treatment.

The maximum B: C ratio (4.82) was recorded in the treatment of application of poultry manure @ 25kg/tree (T_{11}). While the lowest B.C ratio (1.79) was recorded due to application of Vermicompost @ 30kg/tree (T_8).

The highest B.C ratio (4.82) as obtained in the present investigation due to application of poultry manure @ 25kg/tree and at par results are observed with the application of poultry manure @ 30kg/tree could be due to higher yield obtained in this treatment with moderate cost of cultivation required for this treatment resulting in getting maximum net returns/ha and ultimately leading in obtaining high B:C ratio in these treatments. The next best results were obtained with the application of Neem cake @ 5 kg/tree and 7.5 kg/tree (T_9, T_{10}). Followed by application of press mud@ 30kg/tree (T_6). These finding as in accordance with the findings of yadav *et al*. (2013) [8] in guava. They reported that, the application of poultry manure @ 20kg/tree in guava produced maximum net returns and recorded highest B:C ratio, which supports the results of present investigation. The minimum values of B:C ratio were observed in the treatments of application of vermicompost could be due low yield of marketable fruits and comparatively high cost of production of these treatments.

References

1. NHB. Horticultural Statistic at a glance. www.agricrop.nic.in. 142,191 and 245, 2017.
2. Aher Yogesh L, Rahane Sanjeevani. A Review of Pomegranate Cultivation. Int. Res. J of Eng. and Tech, 2016, 03(04).
3. Bhowmik Debjit, Gopinath Harish, Kumar Pragati B, Duraivel, Aravind G, Sampath Kumar KP. Medicinal Uses of Punica granatum and Its Health Benefits. J of Pharmacognosy and Phytochemistry. 2013; 1(5):2278-4136.
4. Kumari Archana, Dora Jyotsna, Kumar Anil, Bhowmik Kumar Ashok. Pomegranate (*Punica granatum*) Overview. Int. J of Pharmaceutical and Chem Sci. 2012; 1(4):2277-500.
5. Shastri Aarti, Pawar Sneha. Antioxidant Property Analysis of Pomegranate Peels In Ayurvedic Formulations. Int. J of Adv.Res. 2014; 2(9):890-894.
6. Sudhakar Swathi, Venugopal Dhivya, Vignesh D, Karthikeyan S. Antioxidant and Anticancer Activity of the Pomegranate and Their Role in Cancer Prevention and Therapy. Int. J of Life Sci. Research. 2015; (3):77-84.
7. Venkatesha H, Yogish SN. High yielding varieties of pomegranate. Int. J of App Res. 2016; 2(2):73-75.
8. Yadav Ram Ishwar, Singh Ram Kumar, Pravesh Kumar, Singh Anil Kumar. Effect of nutrient management through organic sources on the productivity of guava (*Psidium guajava* L.). Hort flora research spectrum. 2013; 1(2):158-161.