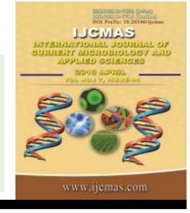
Int.J.Curr.Microbiol.App.Sci (2018) *7*(4): 3454-3457

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 7 Number 04 (2018)**
Journal homepage: http://www.ijcmas.com



Original Research Article https://doi.org/10.20546/ijcmas.2018.704.390

Effect of Vermicompost and Moisture Conservation Practices on Yield and Economics of Sesame (*Sesamum indicum* L.)

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Keywords

Sesame, Vermicompost, Mulch, Economics and Yield

Article Info

Accepted:
28 March 2018
Available Online:
10 April 2018

A B S T R A C T

A field experiment was conducted at Agronomy farm, S.K.N. College of Agriculture, Jobner (Rajasthan) during *kharif*¸ 2016 on loamy sand soil. The experiment comprising of four levels of vermicompost (Control,1.5, 3.0 and 4.5 t/ha) and four moisture conservation practices (control, dust mulch, straw mulch and plastic mulch), thereby making 16 treatment combinations was laid out in randomized block design and replicated thrice. Results indicated that every increase in level of vermicompost from control to @ 3.0 t/ha fetched significantly higher yield *viz.*, seed (834 kg/ha), stalk (2073 kg/ha) and biological yields (2907 kg/ha) over preceding levels, application of @ 4.5 t/ha provided the gross returns (Rs. 82082/ha) and net returns (Rs. 43964/ha) over @ 3.0 t/ha, @ 1.5 t/ha and control. Application of straw mulch the significantly higher yield *viz.*, seed (810 kg/ha), stalk (2022 kg/ha) and biological yields (2832 kg/ha), gross returns (Rs. 72900/ha) and net returns (Rs. 45979/ha) over plastic mulch, dust mulch and control.

Introduction

India is one of the four major players in the global oilseeds/vegetable oils scenario, being one of the important oilseed grower, producer, importer, and exporter (De and Sinha, 2011). Sesame is the key edible oilseed crop in India and cultivated on 15.98 lakh hectares with production of 8.20 lakh tonnes (Anonymous, 2014-15a). This crop is having high quality of oil and meal and also sows wide adaptability for varied agro-climatic conditions. Due to soil and climatic adversities in rainfed ecosystems, the crop suffers from several biotic and abiotic stresses, particularly moisture stress and multi-nutrients deficiency, resulting in poor and unpredictable crop yields. Vermicompost is a prime source of macro and micro nutrients in chelated form and fulfills the balanced nutrient requirement of crops for longer period. Besides this, it also helps in maintaining soil fertility and precious eco-friendly environment of the soil. Organic mulch has been found to increase the nutrient content of soil following decomposition and mineralization, hence, can increase the vegetative growth of plants, which ultimately results in high yield (Singh *et al.*, 2007;

Ahamefule and Peter, 2014). Attributable to the reduction in soil temperature and improved moisture holding capacity of the soil (Lal, 1974). Looking to the above facts, an experiment entitled "Effect of vermicompost and moisture conservation practices on growth parameters, yield attributes and yield of sesame'' was under taken.

Materials and Methods

The experiment was conducted at Agronomy Farm, S.K.N. College of Agriculture, Jobner. Jobner is situated 45 km west of Jaipur at 26^{0}05' N- latitude and 75^{0}28' E longitudes and at an altitude of 427 metres above mean sea level in Jaipur district of Rajasthan. The region falls in Agro-climatic zone III-a (Semi-arid Eastern Plain). The soil of the experimental field was loamy sand in texture with low in organic carbon (0.18%), low in available nitrogen (132.4 kg/ha), medium in available phosphorus (18.25 kg/ha) and potassium (144.26 kg/ha) and slightly alkaline in reaction with pH 8.2.

Results and Discussion

Effect of vermicompost

A perusal of data (Table 1 and 2) further indicated that application of vermicompost from control to @ 3.0 t/ha fetched significantly higher yield *viz.,* seed (834 kg/ha), stalk (2073 kg/ha) and biological yields (2907 kg/ha) over preceding levels, application of @ 4.5 t/ha provided the gross returns (Rs. 82082/ha) and net returns (Rs. 43964/ha) over @ 3.0 t/ha, @ 1.5 t/ha and control. The significant increase in seed yield under the influence of vermicompost was largely a function of improved growth and consequently increase in different yield attributes as mentioned above. Further, vermicompost increased the efficiency of added chemical fertilizer in soil and increased rate of humification. Humic acid present in vermicompost enhance the availability of both native and added micronutrients in soil and thus plant growth, yield attributes and ultimately yield increased. These results are in close conformity with those of Raghawendra and Kedar (2008) in chickpea, Sherin and Ahuja (2009) and Ramawtar *et al.,* (2013) in Clusterbean, Meena *et al.,* (2014) in cowpea. The net returns decrease with the each increasing dose of vermicompost, because of the fact the cost involved in each addition of higher dose of vermicompost increase the cost of cultivation whereas the addition in term of returns was low. Similar results were also reported by Kadam *et al.,* (2014) in blackgram.

Effect of moisture conservation practices

A perusal of data (Table 1 and 2) further indicated that Application of straw mulch the significantly higher yield *viz.,* seed (810 kg/ha), stalk (2022 kg/ha) and biological yields (2832 kg/ha), gross returns (Rs. 72900/ha) and net returns (Rs. 45979/ha) over plastic mulch, dust mulch and control. The significant increase in seed yield under the influence of mulching was largely a function of improved growth and consequent increase in different yield attributes as mentioned above. The beneficial effect of organic mulch on seed yield might be due to favourable soil moisture regime and its better utilization in production of large number of seeds possibly by reducing floral abortion, maintenance of a steady flux of assimilates during grain filling, reducing the rate of leaf senescence and maintenance of photosynthetic activity of surviving leaves and enhanced remobilization of pre anthesis assimilates to seed during seed filling. Extended period of moisture availability and lower weed incidence due to organic mulch resulted in a higher dry matter accumulation and thereby, higher stover and biological yield.

Table.1 Effect of vermicompost and moisture conservation practices on seed, stalk and biological yield and harvest index of sesame

Treatments	Seed yield (kg/ha)	Stalk yield (kg/ha)	Biological yield (kg/ha)	Harvest Index (%)
Vermicompost (t/ha)				
Control	557	1514	2071	26.9
1.5	712	1784	2496	28.5
3.0	834	2073	2907	28.7
4.5	912	2264	3176	28.7
SEm$\pm$	28	66	94	0.7
CD (P = 0.05)	81	192	271	NS
Moisture conservation practices				
Control	655	1697	2352	27.8
Dust mulch	760	1916	2676	28.3
Straw mulch	810	2022	2832	28.5
Plastic mulch	790	2000	2790	28.2
SEm$\pm$	28	66	94	0.7
CD (P = 0.05)	81	192	271	NS
CV (%)	13	12	12	9.11

Table.2 Effect of vermicompost and moisture conservation practices on gross return and net returns

Treatments	Gross return (Rs./ha)	Net returns (Rs./ha)
Vermicompost (t/ha)		
Control	50130	34014
1.5	64080	40464
3.0	75060	43944
4.5	82080	43964
SEm$\pm$	1986	1161
CD (P = 0.05)	5736	3353
Moisture conservation practices		
Control	58950	33529
Dust mulch	68400	40699
Straw mulch	72900	45979
Plastic mulch	71100	42179
SEm$\pm$	1986	1161
CD (P = 0.05)	5736	3353
CV (%)	10	10

Similar findings were reported by Verma (2002) in pearlmillet, Sekhon *et al.*, (2005) in soybean and Yadav (2005) in mustard, Chhetri *et al.*, (2015) in blackgram.

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How to cite this article:

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