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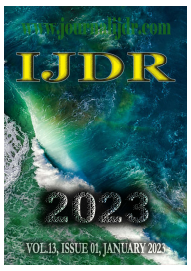

RESEARCH ARTICLE OPEN ACCESS

EFFECT OF DIFFERENT ORGANIC LIQUID FORMULATIONS ON GROWTH AND YIELD OF SOYBEAN

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ABSTRACT

The present investigation entitled effect of different organic liquid formulations on growth and yield of Soybeanwas carried out during the *rabi* season 2021 on the field of ASPEE, Agricultural Research and Development Foundation, Tansa Farm, At- Nare, Taluka- Wada, Dist- Palghar, Maharashtra, India. The experiment was laid out in Randomized Block Design (RBD). The five treatments of different organic liquid formulation (Jeevamrut @ 10%, Panchgavya @ 10%, Vermiwash @ 10%, Cowdung wash@ 10% and Cow urin@ 10%) along with control were replicated four times. The plant height (cm) and number of branches per plant at harvest were found maximum with the application of panchgavya @ 10%. The highest number of pods/ plant, no. of seeds per pod, test weight (gm), seed yield and straw yield (kg/ha) were found with the application of panchgavya @ 10% in soybean. While, the lowest plant height (cm), number of branches per plant, no. of pods per plant, number of seeds/ plant, test weight (gm), seed yield and straw yield (kg/ha) was found in the control treatment. The data clearly indicated that the yield obtained with treatment T2 (Panchgavya @ 10%) was significantly higher than all other treatments, and also for growth parameters.

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INTRODUCTION

Oilseeds play a pivotal role in the Indian agricultural economy and edible oils dominate the food basket. The demand for edible oils and oilcake meals is growing rapidly in the country fuelled with the fast growth in consumer's income, increasing population and urbanization. The country, one of the major consumers of oilseeds and their products, accounts for approximately 10.2 per cent of global consumption of edible oils as well as oilcake meals. Further, per capita consumption of edible oils has also been increasing. This increase in demand for oilseeds and their products has been accompanied by increases in their domestic production. Soybean (Glycine max) is one of the most important and fastest growing oil-bearing crops in the world. During 1980-2013, the world's soybean area grew at an annual rate of 2.65 per cent and production by about 4 percent, higher than the growth in area and production of most other food crops. Soybean accounts for 37.4 percent of the global area under oilseeds, and contributes to 28 percent of vegetable oil production. Soybean, rich in protein and edible oil, has now been recognized all over the world as a potential supplementary source of edible oil and nutritious food.The organic farming is an ecofriendly and best way to attain sustainability in agriculture. The present investigation was therefore, undertaken to find the effect of different organic inputs on growth; yield attributes and yield in soybean.

MATERIALS AND METHODS

Afield experiment was conducted at ASPEE, Agricultural Research and Development Foundation Farm, Village- Nare, Taluka- Wada, District, Palghar in the *rabi* season during 2021 in Randomized Block Design (RBD) with four replications (r=4) (Panse and Sukhatme, 1967). The experimental site was located at 19.650 N latitudes and 73.130 E longitudes with an average annual rainfall of 3600 mm. The five treatments of different organic liquid formulation (Jeevamrut @ 10%, Panchgavya @ 10%, Vermiwash @ 10%, Cowdung wash@ 10% and Cow urin@ 10%) along with controlwere replicated fourtimes. Treatments were applied twice by spraying over a standing crop. The first spray was applied at 30 days after sowing, while the second spray was applied 45 days after sowing in field. The positive effects of panchgavya on soybean on growth and production, manifested when it was specifically supplied during the reproductive growth stage rather than vegetative and ripening stages, which exerted a feed-forward effect on photosynthesis coupled with an increased in both stomatalconductances.

RESULTS AND DISCUSSION

Effect of organic formulations on growth of soybean

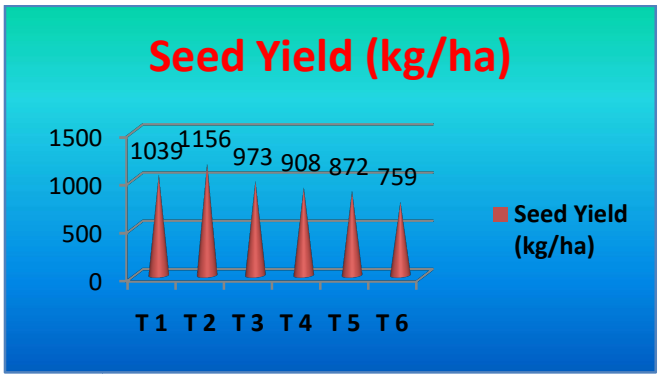
Plant height: The data of plant height of soybean at various growth stages as influenced by different organic formulations are presented in Table 1.

Plant height showed significant differences due to the effect of different treatments of organic formulation at various growth stages. Significantly maximum height (37.52 cm) was found with treatment T2 (Panchgavya @ 10%) over rest of the treatments. However, minimum plant height (26.74 cm) was noticed in control treatment. Similar results have been reported by Palve*et al.* (2011).

No. of branches per plant: The result on number of branches per plant as influenced by the application of organic formulation in soybean is presented in Table 1. There was a continuous increases branch of soybean with advancing growth stages. The results also indicated that the application of organic formulation *i.e.* Panchgavya @ 10%significantly influenced number of branches (7.75) in soybean over all other treatments. Similar results have been reported by Tharmaraj *et al.,* (2011).

Significantly highest soybean seed yield was obtained with treatment T2 receiving Panchagavya@ 10% (1156 kg/ha) and lowest was found in T6 treatment (759 kg/ha).The better nutrient availability and nutrient uptake increased the growth and yield of crop. These results are in compliance with the finding of Gore and Sreenivasa (2011) and Patil and Udmale (2016).

Straw yield: The data on straw yield of soybean are presented in Table 1. The straw yield was highest (2087 kg/ha) with the treatment T2 (Panchagavya @ 10%). The lowest straw yield was (1367 kg/ha) was recorded in treatment T6 (Control). These results are in combination with the finding of Sahay*et al* (2016) and Patil and Udmale (2016).



Graph 1.

Table 1. Effect of different organic liquid formulations on growth and yield of Soybean

Treatment	Plant height (cm)	No. of branches per plant	No. of pods per plant	No. of seeds per pod	Test weight (g)	Seed Yield (kg/ha)	Straw Yield (kg/ha)
T 1	35.45	7.3	20.95	3.45	11.87	1039	1874.4
T 2	37.52	7.75	24.6	3.85	12.29	1156	2087.5
T 3	34.43	7.1	16	3.2	11.3	973	1758.3
T 4	32.97	6.8	15.45	2.95	10.8	908	1640.1
T 5	30.09	6.1	14.6	2.7	10.34	872	1572.9
T 6	26.74	5.3	11.7	2.4	8.2	759	1367.8
S.Em.±	1.01	0.34	1.34	0.07	0.1	20.01	41.82
CD	3.01	1.02	4.05	0.2	0.31	60.28	126.03

No. of pods and no. of seed per plant: The data on number of pods per plant and no. of seeds per plant at harvest as influenced by different treatment of organic formulations are presented in Table 1. Nodulation in soybean was significantly influenced by application of various organic formulations along with RDF. The data narrated in Table 1 shows that the number ofsignificantly higher value of number of pods and no. of seed per plant (24.6 and 3.85) was recorded in Panchagavya@ 10%(T2) treatment while lowest number of pods and no. of seed per plant (11.7 and 2.4)was recorded in T6 treatment. Similar finding have reported by Sanjutha*et al*(2008) and Patil and Udmale (2016).

Effect of organic formulations on yield of soybean

Test weight (g): The result on test weight as influenced by the application of organic formulation at various growth stages of soybean are presented in Table 1. There was continuous increasing of test weight in soybean with advancing growth stages.Significantly higher value of test weight (12.29 g) was recorded in treatment T2 (Panchagavya@ 10%). while lowest test weight (8.2 g) was recorded in control T6 treatment. Similar finding have reported by Devi *et al.,* (2013).

Seed yield: The data on seed yield of soybean (kg/ha) as influenced by different treatments are synthesized in Table 1. There was significant increase in the seed yield of soybean due to application of organic formulations along with recommended dose of fertilizer.

CONCLUSION

A comparative study of different organic liquid formulation was done in Soybean with variety (JS-9560) to obtain the higher returns under north konkan coastal zone of Maharashtra. From the data it is very clear that treatment T2 i.e. application of Panchgavya @ 10% recorded higher soybean yield with variety JS-9560.

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