



Influence of foliar application for maximizing the yield of blackgram

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Abstract

A field experiment was carried at Department of Agronomy, Annamalai University during kharif season of 2019 to study the influence of foliar application for maximizing the yield of blackgram. The experiment was laid out in Randomized block design with three replications and eight treatments of foliar sprays *viz.*, Control, Panchagavya @ 2 %, Vermiwash @ 5 %, Fish aminoacid @ 0.5 %, Egg extract @ 0.5 %, Seaweed extract @ 5 %, TNAU pulsewonder @ 1 % @ pre flowering stage and Humic and Fulvic acid @ 2 %. At 30 and 45 DAS, foliar sprays were administered. The results showed that foliar spraying of different nutrients changed the yield and characteristics of blackgram considerably. Vermiwash @ 5 % had the highest values among the different foliar treatments, which were comparable to panchagavya, followed by TNAU pulse wonder 1 % At pre flowering stage. The treatment had the highest grain yield (975 kg ha⁻¹), haulm yield (1530 kg ha⁻¹), harvest index (39%), number of pods plant⁻¹ (16.70), and number of seeds pod⁻¹ (5.64) among all foliar spray treatments, with the lowest value at control.

Keywords: maximizing, blackgram, kharif season

Introduction

Blackgram is a key pulse crop that is widely grown in India's state. Every year, the output of blackgram decreases for a variety of reasons. Farmers are especially interested in blackgram in rice fallow settings where no basal fertilisers are used. It is one of the reasons for a decrease in the crop's potential yield, as well as a decrease in productivity. Furthermore, nutrient deficiencies in the soil tend to reduce production, therefore a soil nutrient plays an important part in meeting the crop's requirement for growth. The majority of plants absorbed more nutrients through their leaves, and this absorption occurred quickly. As a result, when foliar application of nutrients is compared to soil application of nutrients, it is assumed that foliar application of nutrients results in higher growth and production characteristics. Along with frequent plant protection, foliar fertiliser treatment would be very helpful in crop growth, especially for short-term crops like blackgram. Since the nutrients are given by foliar technique, they enter through the stomata, where they are quickly utilised by the plant cells for growth. Furthermore, foliar spray has the added benefit of maximising nutrient usage, reducing nutrient losses through leaching, and regulating nutrient intake by plants (Manonmani and Srimathi, 2009). Foliar application lowers the cost of cultivation by reducing the amount of fertiliser used, hence minimising crop loss and increasing crop production efficiency.

Materials and Methods

The field experiment was done to study the effect of foliar application of nutrients on productivity blackgram was conducted during the seasons of kharif 2019 at Experimental field, Department of Agronomy, Annamalai university. The soil of the experimental field was having soil pH – 7.4, available N -224 kg ha⁻¹, available P₂O₅ 13.89 kg ha⁻¹ and available K₂O - 287 kg ha⁻¹. Eight treatments comprising of foliar application of panchagavya (2%), vermiwash (5%), fish aminoacid (0.5%), egg extract (0.5%), seaweed extract (5%), TNAU pulse wonder (1%), humic and fulvic acid (2%), and control were laid out in a randomised block design with three replications. The variety VBN - 6 was sown with spacing of 30 cm X 10 cm. The recommended nutrient levels of 12.5 kg N and 25 Kg P₂O₅ per ha were applied to all the plots. Panchagavya, fish aminoacid and egg extract were prepared as per the standard procedure. Foliar spray was carried out at flower initiation. The data on yield and its attributes were statistically analysed and interpreted.

Results and Discussion

The administration of nutrients by foliar approach considerably boosted growth metrics such as greatest grain yield, haulm yield, harvest index, number of pods plant⁻¹, and number of seeds pod⁻¹ in the current study. The foliar application of vermiwash resulted in significantly higher grain yield (975 kg ha⁻¹), haulm yield (1530 kg ha⁻¹), harvest index (39%), number of pods plant⁻¹ (16.70), and number of seeds pod⁻¹ (5.64) (Table 1), and was comparable to the foliar application of panchagavya 2%, which was followed by the foliar application of TNAU pulse wonder 1% @ pre flowering stage. Similar results were discovered in the French dwarf bean by (Mondal *et al.*, 2011).

The foliar application of vermiwash resulted in a higher yield and its qualities, which is an extra benefit in the crop's development. This could lead to an increase in the number of pods and their growth, as well as more efficient photosynthate and photosynthetic activity transfer from source to sink relationships. This could be due to foliar spraying more nutrients into the foliage during the vegetative and flowering stages of the crop's growth. These findings are consistent with those of Samadhiya *et al.* (2014) and Nath and Singh (2015). (2016). The foliar treatment increases grain yield, which can be ascribed to a reduction in flower droppings and a rise in pod setting. The above findings are in line with the observations of (Jarecki *et al.*, 2005) and (Gutierrezmiceli *et al.*, 2008) and (Tejada *et al.*, 2008) and (Verma. 2017). The enhanced nutrient intake was mostly owing to nutrient absorption without loss during foliar application and higher activity of root nodules, which would have fixed atmospheric nitrogen into the soil, resulting in a higher nutritional status in the soil. These findings were comparable to those of Alvarez and Grigera's research (2005). The use of vermiwash increased the intake of N, P, and K, yielding significant benefits. These findings were found to be in agreement with Azizi *et al.*, 2005.

Conclusion

Based on the results of this study, foliar applications of vermiwash 5%, panchakavya 2%, and TNAU pulse wonder 1% was recommended for irrigated blackgram to get a profitably higher yield. Higher yields may create more income for farmers, allowing them to maintain their livelihood.

Table 1: Effect of foliar application grain yield, haulm yield, harvest index, number of pods plant⁻¹ and number of seeds pod⁻¹

Treatments	Grain yield (kg ha ⁻¹)	Haulm yield (kg ha ⁻¹)	Harvest Index	Number of pods plant ⁻¹	Number of seeds pod ⁻¹
T ₁ – Control.	509	1112	31	10.24	4.25
T ₂ – Foliar application of Panchagavya spray 2% @ 30 and 45 DAS.	944	1511	38	16.47	5.51
T ₃ – Foliar application of Vermiwash spray 5% @ 30 and 45 DAS.	975	1530	39	16.70	5.64
T ₄ – Foliar application of Fish Aminoacid 0.5% @ 30 and 45 DAS.	731	1227	36	13.66	4.76
T ₅ – Foliar application of Egg Extract 0.5% @ 30 and 45 DAS.	696	1202	35	13.01	4.72
T ₆ – Foliar application of Seaweed Extract 5% @ 30 and 45 DAS.	773	1275	37	14.17	4.80
T ₇ – Foliar application of TNAU Pulse Wonder 2.5% @ 30 and 45 DAS.	885	1429	38	15.49	5.19
T ₈ – Foliar application of Humic and Fulvic acid 2% @ 30 and 45 DAS.	844	1368	37	15.13	5.14
S.Ed	26.83	36.45	0.004	0.35	0.13
CD (p=0.05)	57.42	78.01	0.01	0.76	0.27

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