Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

J P P Journal of Pharmacognosy and Phytochemistry

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(4): 2491-2493
Received: 10-05-2019
Accepted: 12-06-2019

Darade GA
M.Sc. Scholar, Department of Agronomy, College of Agriculture, Badnapur, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra, India

Elumle Priyanka
M.Sc. Scholar, Department of Agronomy, College of Agriculture, Badnapur, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra, India

Thombre SV
M.Sc. Scholar, PDKV, Akola, Maharashtra, India

Correspondence
Darade GA
M.Sc. Scholar, Department of Agronomy, College of Agriculture, Badnapur, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra, India

Effect of foliar nutrition on economics of blackgram (*Vigna mungo* (L). Hepper)

Darade GA, Elumle Priyanka and Thombre SV

Abstract
Present investigation entitled Effect of foliar nutrition on growth and yield of blackgram [*Vigna mungo* (L). Hepper]. was carried out at at Agriculture Research Station, Badnapur. situated at 19^0 52˙00'' North latitude and 75^0 44˙00'' East longitudes at 498 m altitude above mean sea level on clayey soil with low in nitrogen and phosphorus and high in potassium.
Gross monetary returns, net monetary returns and B:C ratio were significantly higher in treatment RDF+ Neem coated urea 2 percent + Salicylic acid (75 ppm) sprays at flower initiation and next better RDF+ Salicylic acid (75 ppm) spray at flower initiation and 7 days after 1st spray and RDF+19:19:19 (NPK) 2 percent spray at flower initiation. On the other hand, in all cases the lower response was found from only RDF treatments.

Keywords: B:C ratio, black gram, foliar nutrition, gross monetary returns, salicylic acid, yield

Introduction
Black gram [*Vigna mungo* (L). Hepper] is one of the most important pulse crop grown throughout the India. Black gram is excellent source of protein as well as carbohydrates. Black gram [*Vigna mungo* (L). Hepper] belong to the family "Leguminosae" and sub-family "Papilionaceae" having chromosomes number 2n=24. It also known as "Mash bean and urdbean". Most of the scientist believes that the India is a primary center of origin and Central Asia is considered as a secondary center of origin of black gram. Black gram is probably native of India as is seen from the Vedic literature; there is a mention of Urd bean in Vedic texts such as Kautilya's "Arthasasthra" and "Charaksamhita" (Singh *et al*., 2010) [3].
Black gram is third important crop of India which is cultivated over a wide range of agro-climatic zones of the country. It is mainly a day neutral warm season crop commonly grown in semi-arid to sub-humid low land tropics and sub-tropics. In India, black gram traditionally grown in *Kharif* season, but in south it also grown as *rabi* crop. It is grown in area at which received annual rainfall is 800 mm. It is a hardy and drought resistant plant.
Black gram producing major states in India are Madhya Pradesh, Rajasthan, Uttar Pradesh, Andhra Pradesh, Tamilnadu and Maharashtra (Anonymous, 2017-18). It occupies about 50.31 Lakh ha area in the country producing 32.84 Lakh tones. The total area under the crop has increased progressively from 1.98 million ha in 1964 - 1965 to 3.10 million ha in 2016- 2017. Similarly, the production has increased from 0.64 million tone to 1.74 million tone (Anonymous, 2017a). The area under Maharashtra state is 4.84 lakh ha with the production of 1.77 lakh tones and productivity is 385 Kg ha-1. (Anonymous, 2017-18).
Throughout the India, black gram is used for different purpose. The major portion is utilized in making dal, soup, curries, sweet, snacks, idli and dosa. The food values of black gram in its high and easily digestible protein. Its seed contain approximately 25-28 percent protein, 1-1.5 percent oil, 3.5-4.5 percent fiber, 4.5-5.5 percent ash and 62-65 percent carbohydrates on dry weight basis (Anonymous, 2017c). Black gram protein content is more than twice that of cereals reported by Thesiya *et al*. 2013 [5].

Material and Methods
The present field experiment was conducted during *kharif* season of 2018-19 at the Experimental Farm of Agronomy at Agriculture Research Station, Badnapur, Jalna (Maharashtra), Vasantrao Naik Marathawada Krishi Vidyapeeth Parbhani. The initial soil sample analysis the experimental plot was clayey in texture, low in available nitrogen (180.36 kg ha^{-1}), moderate in available phosphorus (14.36 kg ha^{-1}), high in available potassium (460.59 kg $ha^{-1)}$. The soil was slightly alkaline in reaction (7.96 pH). The experiment was laid out in Randomized Block Design with three replications. The treatments were (T_1) RDF (25:50:00 NPK kg/ha), (T_2) RDF+ Neem coated urea 2 percent spray at flo-wer initiation, (T_3) RDF+ TNAU Pulse

Wonder @ 5 kg/ha spray at flower initiation, **(**T_4) - RDF+ Salicylic acid (75 ppm) spray at flower initiation and 7 days after 1st spray, (T_5) - RDF+19:19:19 (NPK) 2 percent spray at flower initiation**, (**T_6) - RDF+ Neem coated urea 2 percent + Salicylic acid (75 ppm) sprays at flower initiation**, (**T_7) - RDF+ Boron @ 0.25 ppm spray at flower initiation, **(**T_8) - RDF+ Nitrobenzene @ 500 ppm spray at flower initiation and **(**T_9) - RDF+NAA (50 ppm) spray at flower initiation.Sowing was done by dibbling by using seed rate 12 kg ha^{-1}. The gross and net plot size was 5.10 x 4.50 m and 4.50 x 4.30 m respectively. The total rainfall received during growth period of Black gram was 381 mm with 17 rainy days. The recommended dose of fertilizer was 25:50:00 kg NPK ha^{-1} applied as per treatments through DAP. Other cultural practices were done as per treatments. Statistical analysis of the data was carried out by using standard analysis of variance (Panse and Sukhatme 1967) [2].

Result and Discussion

Effect of different nutrition on Economics of black gram cultivation

The results regarding Gross monetary returns, net monetary returns and B:C ratio of black gram were presented in table 1. Significantly maximum Gross monetary returns (45341), net monetary returns (27816) and B:C ratio (2.43) were recorded due to application of RDF + Neem coated urea 2 percent + Salicylic acid (75 ppm) sprays at flower initiation.

Gross Monetary Returns (Rs ha^{-1})

The gross monetary returns were significantly influenced due to various treatments. The maximum gross monetary returns was obtained in treatment (T_6) RDF+ Foliar spray of 2 percent Urea+ salicylic acid 75 ppm (Rs 45341 ha^{-1}). The next higher gross monetary returns obtained in treatment T_4 (RDF + Salicylic acid (75ppm) Spray at flower initiation and 7 days after 1st spray) (Rs 43101 ha^{-1}) which were at par with T_3 and T_5 (Rs 38099 and 42299 ha^{-1}respectively). However lowest gross monetary returns were obtained in T_1 (RDF 25:50:00 NPK kg ha^{-1}) (Rs 30016 ha^{-1}) and in T_8 (RDF + Nitrobenzene @ 500 ppm spray) (Rs 30635 ha^{-1}).

The gross monetary and net monetary returns were highest with (T_6) RDF + foliar spray of Urea @ 2 percent and salicylic acid @ 75 ppm followed by application of (T_4) RDF + Salicylic acid (75ppm) Spray at flower initiation and 7 days after 1st spray. Lowest gross monetary and net monetary returns was recorded in (T_1) RDF (25:50:00 NPK kg ha^{-1}) treatment. Similar result was obtained by Mudalagiriyappa *et al*. (2016) [1].

Net monetary returns (Rs ha^{-1})

The net monetary returns were significantly influenced due to various treatments. The maximum net monetary returns was obtained in treatment RDF+ Foliar spray of 2 percent Urea+ salicylic acid 75 ppm (T_6) (Rs 27816 ha^{-1}). The next higher net monetary returns obtained in treatment T_4 (RDF + Salicylic acid (75ppm) Spray at flower initiation and 7 days after 1st spray) (Rs 25591 ha^{-1}) which were at par with treatment T_3 and T_5 (Rs 20579 and 24779 ha^{-1}). However lowest net monetary returns were obtained in T_1 (RDF 25:50:00 NPK kg ha^{-1}) (Rs 12516 ha^{-1}) and in T_8 (RDF + Nitrobenzene @ 500 ppm spray) (Rs 12972 ha^{-1}). These results are in conformity with the results of Mudalagiriyappa *et al*. (2016) [1].

Benefit: Cost ratio

Highest B:C ratio of 2.43 was found with treatments RDF+ Foliar spray of 2 percent Urea+ salicylic acid 75 ppm (T_6). The next best B:C ratio (2.27) and (2.10) were recorded in treatment (T_5) RDF + 19:19:19 (NPK) 2 percent (at flowering and T_4 (RDF + Salicylic acid (75ppm) Spray at flower initiation and 7 days after 1st spray, which were at par with T_2 and T_3 (1.99 respectively).However lower B:C ratio found in T_9 (RDF + NAA 50 ppm spray) (1.45) and in T_8 (RDF+Nitrobenzene @ 500 ppm spray) (1.67).

The data presented in table 1. showed that benefit cost ratio affected significantly due to control treatment. Treatment (T_6) RDF + foliar spray of Urea @ 2 percent and salicylic acid @ 75 ppm recorded highest benefit cost ratio (2.43) followed by treatment T_5 (2.27), T_4 (2.10), T_3 (1.99), and T_2 (1.99) and having same benefit cost ratio, as compared to other treatments. However lowest benefit cost ratio (1.45) was recorded in treatment T_9. As a result of not provide essential nutrient which reduced the black gram yield significantly. Similar results were obtained by Shashikumar *et al.* (2013) and Harithvardhini J. *et al.* (2016) [4].

Table1: Economics of black gram cultivation as influenced by various treatments.

Treatment	Gross Monetary Return (Rs Ha^{-1})	Net Monetary Return (Rs Ha^{-1})	Benefit Cost ratio
T_1- RDF(25:50:00 NPK kg/ha).	30016	12516	1.70
T_2- RDF + Neem coated urea (2%) spray.	36186	18671	1.99
T_3- RDF + TNAU Pulse Wonder @ 5 kg/ha spray.	38099	20579	1.99
T_4-RDF + Salicylic acid (75ppm) Spray at flower initiation and 7 days after 1st spray.	43101	25591	2.10
T_5 - RDF + 19:19:19 (NPK) 2%.	42299	24779	2.27
T_6 - RDF + Neem coated urea 2% + SA (75 ppm) sprays.	45341	27816	2.43
T_7 - RDF + Boron @ 0.25 ppm spray.	31509	13929	1.73
T_8- RDF + Nitrobenzene @ 500 ppm spray.	30632	12972	1.67
T_9- RDF + NAA (50 ppm) spray.	30651	13125	1.45
SE ± m	2781.67	2781.67	-
C.D. at 5%	8373.63	8373.63	-
General Mean	36426	18886.56	1.93

References

1. Mudalagiriyappa SM, Ali BK, Ramachandrappa Nagaraju, Shankaralingappa BC. Effect of foliar application of water soluble fertilizers on growth, yield and economics of chickpea (*Cicer arietinum* L.). Leg. Res. 2016; 39(4):610-613
2. Panse VG, Sukhatme PV. Statistical Methods for Agricultural Workers (1st edn.), ICAR, New Delhi, 1967.
3. Singh C, Singh P, Singh R. Modern Techniques of Raising field crops. Second edition. 2010, 256.
4. Shashikumar R, Basavarajappa SR, Salakinkop, Manjunatha Hebbar, Basavarajappa MP, Patil HY. Influence of foliar nutrition on performance of blackgram (*Vigna mungo* L.), nutrient uptake and economics under dry land ecosystems. Leg. Res. 2013; 36(5):422-428.
5. Thesiya MN, Chovatia PK, Kikani VL. Effect of potassium and sulphur on growth and yield of black gram [*Vigna mungo* (L.) hepper] under rainfed condition. Leg. Res. 2013; 36(3):255-258.