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Response of Sesame to Foliar Application of N, P and K

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ABSTRACT

Afield experiment was conducted during 2010 and 2012 at Agricultural Research Station, Yelamanchili, to determine the response of sesame to foliar application of N, P and K. Among the foliar treatments spraying with Multi–K(13:0:45) yielded significantly higher (522 Kg/ha).However recommended dose of fertilizer recorded higher yield than all the other treatments. During kharif the BC ratio was higher (2.65) with recommended dose of fertilizers as the gross returns and net returns were higher. Both the foliar treatments Urea and MOP recorded with BC ratio of 1.53 as the cost of treatments was low. However multi- k and polyfeed (19:19:19) recorded low BC ratio as the cost of treatments was high. During rabi the BC ratio was 2.87 higher with recommended dose of fertilizers as the gross returns and net returns were higher. Both the foliar treatments urea and MOP recorded with BC ratio of 2.56 and 2.77 as the cost of treatments was low. However multi- k and polyfeed recorded low BC ratio as the cost of treatments was high.

Key words : Foliar, Response of sesame.

Sesame seed production could be raised by 50 per cent by way of proper fertilization (Palaniappan et al., 1999). Seed yield increased with an increased rate of N and K application (Mondal et al., 1992). Split application of N and K as 50 per cent as basal and 50 per cent as top dressing on 20 DAS significantly increased growth, yield characters and yield of sesame.The application of 50 per cent of N and K as basal + 50 per cent through one per cent foliar spray on 40 DAS and the remaining as a top dressing on 20 and 30 DAS through soil on equal splits recorded significant increase in all yield contributing attributes, yield and also gave higher gross and net returns as well as return per rupee invested (Kalaiselvan *et al*., 2002). In recent AICRP trials at Amreli and Jabalpur, foliar application of urea or DAP @ 2% twice at flowering and capsule formation stages significantly out-yielded soil application of RDF(Okpara et al., 2009).

Response of sesame to foliar nutrition is noticed at various locations of the country. Two to three irrigations to sesame are recommended at flowering, capsule formation and capsule filling stages. Split application of nitrogen coinciding first irrigation is also suggested for higher yields. However, the farmers seldom apply nutrients either basal or split. Since the crop is an exhaustive one, it's response to foliar application need to be evaluated.

MATERIAL AND METHODS

The field experiment was conducted during kharif and rabi seasons of 2010,2011 and 2012 at Agricultural Research Station, Yelamanchili, under Rainfed during Kharif and under well irrigated condition during Rabi. Initial soil analysis revealed that the soil is sandy loam with PH-7.0, EC (dsm^{-1}) – 0.22, OC% - 0.52, Available N -241 Kg/ha, Available K2O – 392Kg/ha. The experiment was laid out in Randomised Block Design with four replications and six treatments. The variety was YLM- 17 with 90 days duration. The plot size was 10x6 meters with a spacing of 30x15 cms. Blanket application of FYM @ 10t/ha was applied at the time of second ploughing. Recommended dose of fertilizer 40:20:20 NPK kg/ha was given to the crop with half N, entire P and K during the last ploughing. Remaining half N was top dressed at the time of first hoeing. The treatments are T1- N alone (Urea 2 % foliar spray), T2- K alone (MOP 2 % foliar spray),T3- 19:19:19 (2 % foliar spray),T4-13:0:45 foliar (2 % foliar spray),T5- Recommended N-P-K dose as basal and T6- Control. Foliar application should be done twice at flowering and capsule formation stages. All the agronomic practices were

Table1. Yield attributes and economics as influenced by foliar application of nutrients in Sesame during kharif. Pooled data of three years.

Treatments	Plant Heiht (cm)	No. of branches	No. of capsules	Seed yield (Kg/ha)	Cost @ 35 Per Kg Gross return (Rs)	Treatment cost + cost of cultivation	Net returns (Rs)	BC ratio
T1- N alone (Urea @ 2%)	130	3.6	60.7	246	8610.00	5613.00	2997.00	1.53
T2- K alone (MOP @ 2%)	130	4.0	63.8	251	8785.00	5737.00	3049.00	1.53
T3- Polyfeed 19:19:19 (@ 2%)	128	4.0	65.4	250	8750.00	8700.00	50.00	1.00
T4- Multi-k (13:0:45) (@ 2%)	136	4.3	73.8	261	9135.00	7740.00	1395.00	1.18
T5- Recommended fertilizer as basal	137	4.3	82.9	311	10885.00	6787.00	4098.00	2.65
T6-Control	127	3.4	48.9	203	7105.00	5500.00	1605.00	1.29
CV %	7.46	14.65	15.73	5.86				
CD(P=0.05%)	NS	NS	15.627	22.38				

Table 2. Yield and economics attributes as influenced by foliar application of nutrients in Sesame during Rabi Pooled data of three years.

Treatments	Plant Heiht (cm)	No. of branches	No. of capsules	Seed yield (Kg/ha)	Cost @ 35 Per Kg Gross return (Rs)	Net returns (Rs)	BC ratio
T1- N alone (Urea @ 2%)	85.0	3.3	80.4	411	14385	8772	2.56
T2- K alone (MOP @ 2%)	88.0	3.7	86.0	455	15925	10188	2.77
T3- Polyfeed 19:19:19 (@ 2%)	86.0	3.5	85.2	500	17500	8800	2.01
T4-Multi-k (13:0:45) (@ 2%)	95.2	3.8	89.5	522	18270	10530	2.36
T5- Recommended fertilizer as basal	96.0	4.1	95.0	557	19495	12708	2.87
T6-Control	81.0	2.8	76.2	316	11060	5560	2.01
CV %	2.88	2.63	2.88	3.39			
CD (P=0.05%)	3.836	0.14	2.73	23.51			

followed and the crop was kept free from pests and diseases. Observations on Yield and Yield attributing characters were recorded at harvest. The results of the experimentation showed same trend on all the three years, hence the pooled data was presented.

RESULTS AND DISCUSSION

Pooled results of the kharif experiment revealed that recommended basal dose of fertilizer application yielded more than the other treatments. Kharif yields recorded were low at this Research station as the crop experienced heavy rain fall during the crop season, which affected the seed setting. The difference between foliar treatments were atpar, however Multi –K (261 kg/ha) recorded highest yield. The other parameters like Plant height, number of branches was also statistically non significant. The number of capsules per plant was significant with recommended basal and Multi –K were at par. The performance of the crop was good during Rabi. During Rabi out of the foliar treatments Multi – K yielded significantly higher (522 Kg/ ha).As the additional fertilizer is giving with foliar spray mainly during rabi Multi –K play major role in with standing the crop to water stress condition and thereby giving more yields. However recommended dose of fertilizer recorded higher yield (577 Kg/ha) than all the other treatments.

The economics during kharif was the BC ratio 2.65 was higher with recommended dose of fertilizers as the gross returns and net returns were higher. Both the foliar treatments Urea and MOP recorded with BC ratio of 1.53 as the cost of treatments was low. These findings are in tune with the findings of Tiwari et al., 2000. However multi-k and polyfeed recorded low BC ratio as the cost of treatments was high. The economics during rabi was the BC ratio 2.87 was higher with recommended dose of fertilizers as the gross returns and net returns were higher. Both the foliar treatments urea and MOP recorded with BC ratio of 2.56 and 2.77 as the cost of treatments was low. Similar results was adopted by Haruna et al., 2010. However multi- k and polyfeed recorded low BC ratio as the cost of treatments was high.

It is inferred that, both the seasons during Kharif and Rabi recommended dose of fertilizers recorded significantly higher yields and BC ratio. Most of the times sesamum crop was grown with limited number or no irrigations where basal application or top dressings was not possible at that time Foliar sprays are more useful to increase the yields with low input cost. Foliar spray twice with Urea and MOP was more economical with high BC ratio.

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