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Short Communication

Influence of sulphur and micronutrients on quality and yield performance of sunflower

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Sunflower (*Helianthus anmuus)* is one of the important oil seed crops. The productivity of sunflower in the country as well as compared to the world productivity. Imbalance nutrition one of the most important causes of low yield and inferior quality of sunflower seed. Insufficient supply of macro and micronutrients seems to be one of the major causes for poor seeds in sunflower. Besides the growing deficiencies of primary and secondary nutrients, micronutrients such as B, Zn and Fe calls for immediate attention towards their application along with the fertilizer for achieving higher productivity.

A field experiment was conducted during 2003 at Kulathur village, Sankarapuram taluk with sunflower crop cv. Cargill to study the influence of sulphur and micronutrients on quality and yield performance of sunflower. The soil was sandy clay loan texture with pH 7.19, EC 0.64 d Sm^{-1} and organic carbon 5.3 g kg^{-1}. The available N, P_2O_5 and K_2O contents were 232, 19, 338 kg ha^{-1} respectively and available S amounts to 8.1 mg kg^{-1}. The treatments include application of different micronutrients as foliar spray on 45 and 60 DAS with and without sulphur. T_1 – control, T_2 – 0.25% $ZnCl_2$, T_3 – 0.25% $ZnCl_2$ + S, T_4 – 0.50 % $ZnCl_2$, T_5 – 0.50% $ZnCl_3$+S, T_6-0.25% $FeCl_3$ + S, T_7 – 0.25% $FeCl_3$ + S, T_8 – 0.50% $FeCl_3$, T_9 – 0.50% $FeCl_3$+S, T_{10}-0.25% MnO, T_{11}-0.25%MnO+S, T_{12}-0.50% MnO, T_{13} – 0.50%MnO+S, T_{14}-0.25% B, T_{15}-0.25% B+S, T_{16}-0.50% B, T_{17}-0.50%B+S. The treatment were replicated thrice in randomized block design. All the plots were applied with recommended dose of fertilizers @ 40:20:20 NPK ha^{-1}.

Among the various treatments tried, foliar application of 0.25% B on 45 and 60 DAS in combination with S @ 45Kg ha^{-1} (T_{15}) recorded the maximum head diameter of 22.27 and 25.12 cm at 60 DAS and harvest stage respectively. The treatments next in order was foliar application of 0.50% B on 45 and 60 DAS + S (T_{17}). The foliar application of 0.25% B on 45 and 60 DAS in combination with S @ 45 kg ha^{-1} (T_{15}) recorded the highest hundred seed weight of 4.198g. This was followed by foliar application of 0.50% B on 45 and 60 DAS + S (T_{17}). It might be attributed to favourable effect of S nutrient on carbohydrate metabolisms which might have led to increased translocation of photosynthates resulting in the formation of bold seeds, Khan *et al,* 1990 and Gangadhar *et al* 1992. The maximum seed yield of 2412.4 kg ha^{-1} was recorded as against 1457.8 kg ha^{-1} in control and stalk yield of 3977.2 kg ha^{-1} as against 2619 kg ha^{-1} in control was recorded with foliar application of 0.25% on 45 and 60 DAS in combination with S 45 kg ha^{-1} (T_{15}). The above result is in accordance with the findings of Aswasthi *et al* (2000).

The foliar application of 0.25% B on 45 and 60 DAS in combination with S@ 45 kg ha^{-1} (T_{15}) recorded the maximum protein content of 19.03% as against 15.89 in control. The treatment next in order was foliar application of 0.50% B on 45 and 60 DAS + S (T_{17}). The foliar application of 0.25% B on 45 and 60 DAS in combination with S @ 45 kg ha^{-1} (T_{15}) also increased the oil content from 31.56 per cent (control) to 44.90 per cent. Boron plays a vital role in reproductive phase influencing the seed setting and oil content. (Tamak *et al.* 1997).

From this above results it can be concluded that significantly maximum yield and quality was obtained with gypsum to supply @ 45 S ha^{-1} along with 0.25% B application in sunflower.

Table 1: Influence of sulphur and micronutrients on quality parameters, yield and yield attributes of sunflower.

Treatments	Head Diameter (cm)		Hundred Seed Weight (g)	Seed Yield (Kg ha^{-1})	Stalk yield (Kg ha^{-1})	Protein content (%)	Oil content (%)
	60DAS	Harvest					
T_1-Control	10.76	13.19	4.081	1457.8	2619.4	15.89	31.56
T_2-0.25%$ZnCl_2$	12.49	14.72	4.095	1732.8	2902.2	16.01	32.33
T_3-0.25% $ZnCl_2$+S	18.02	20.69	4.151	2165.0	3530.6	17.22	36.38
T_4-0.50% $ZnCl_2$	14.79	17.14	4.117	1885.6	3155.0	16.26	33.57
T_5-0.50% $ZnCl_2$+S	20.43	23.11	4.175	2302.2	3777.2	18.30	38.84
T_6-0.25%$FeCl_3$	13.30	15.52	4.102	1785.6	2983.3	16.06	32.73
T_7-0.25% $FeCl_3$+S	18.80	21.48	4.158	2215.6	3614.4	17.54	37.14
T_8-0.50% $FeCl_3$	14.50	18.01	4.125	1932.8	3246.7	16.41	34.04
T_9-0.50% $FeCl_3$+S	21.30	23.98	4.185	2348.3	3855.0	18.61	40.47
T_{10}-0.25%MnO	11.65	1.94	4.088	1678.3	2819.4	15.94	31.94
T_{11}-0.25% MnO+S	17.27	19.94	4.143	2131.7	3444.4	16.91	35.65
T_{12}-0.50% MnO	14.06	16.31	4.109	1836.1	3061.7	16.14	33.14
T_{13}-0.50% MnO+S	19.60	22.28	4.166	2264.4	3696.7	17.90	37.95
T_{14}-0.25%B	16.14	18.73	4.133	2077.8	3336.1	16.59	34.66
T_{15}-0.25% B + S	22.27	25.12	4.198	2412.4	3977.2	19.03	42.90
T_{16}-0.50% B	16.56	19.22	4.136	2092.2	3356.7	19.63	34.95
T_{17}-0.50% B+S	21.92	24.73	4.195	2387.8	3931.3	19.00	42.62
CD (p=0.05)	0.61	0.70	0.0059	32.71	74.36	0.047	0.345

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