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Effect of sulphur on growth and yield of opium poppy (*Papaver somniferum*)

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A field experiment was conducted on medium black soil during the winter seasons of 1989–90 and 1990–91 at Mandsaur, to study the effect of 2 sources of sulphur (elemental S and single superphosphate) and 4 levels (0, 15, 30 and 45 kg S/ha) on the growth and yield of opium poppy (*Papaver somniferum* L.). The experiment was laid out in randomized block design. The soil had 263, 7.2, 588, 18 kg/ha available N, P, K and S respectively, with 0.7% organic carbon and 8.2 pH. Plot size was 4 m × 2.4 m. Basal doses of 50, 25.8 and 33.2 kg N, P and K/ha were applied and another 40 kg N/ha was top-dressed at 45 days after sowing. In treatments, adjustment was made for P through diammonium phosphate and urea. Elemental S was applied 15 days before sowing to ensure its oxidation. 'JA 16' opium poppy was sown in the second week of November in both the years at 30 cm apart rows and final population of 32 plants/m^2 was maintained. Observations on plant height, leaf-area index and capsules/plant were recorded from 10 random plants in each plot. Latex yield was further adjusted at 70° consistency.

Application of S increased the latex, seed and husk yields and growth attributes. Latex yield increased significantly up to 30 kg S/ha. No significant difference was observed between 30 an 45 kg S/ha. Increasing levels of S increased the seed and husk yields. Significantly better seed and husk yields were obtained at 45 kg S/ha (Table 1). Plant height, leaf-area index and capsules/plant also increased up to 30 kg S/ha.

No significant differences were observed between 2 sources of S for latex, seed and husk yields and attributing characters except during 1989–90, where single superphosphate recorded better latex yield than elemental S. Interaction between doses and sources of S was not significant.

If only latex is considered, requirement of S is fulfilled when 21.5 and 25.8 kg P/ha were applied through single superphosphate. However, if source of P is changed to non-sulphur-containing fertilizer, 30 kg S should be supplemented for good latex yield. Higher seed yield can be achieved by suppling 45 kg S/ha through single superphosphate and elemental S.

Table 1. Effect of sulphur on latex, seed and husk yields and growth attributes of opium poppy

Treatment	Latex yield (kg/ha)		Seed yield (kg/ha)		Husk yield (kg/ha)		Leaf-area index		Plant height (cm)		Capsules/ plant
	1989–90	1990–91	1989–90	1990–91	1989–90	1990–91	1989–90	1990–91	1989–90	1990–91	1990–91
S (kg/ha)											
0	60.74	27.59	848	517	804	370	3.36	2.08	81.80	81.73	1.00
15	70.27	31.48	975	618	888	488	4.30	3.28	94.40	87.75	1.13
30	72.06	38.16	1058	694	927	534	5.25	3.67	96.30	90.90	1.12
45	78.04	40.08	1126	769	1123	576	5.53	4.28	95.10	92.50	1.23
CD (P = 0.05)	5.69	2.95	48.00	64.3	46.30	39.0	0.41	1.05	2.24	2.71	0.13
S source											
Elemental S	70.04	32.85	1003	634	945	490	4.55	3.14	93.60	87.52	1.13
Single superphosphate	70.37	35.79	1000	666	954	498	4.67	3.55	94.90	88.91	1.12
CD (P = 0.05)	NS	2.08	NS	NS	NS	NS	NS	NS	NS	NS	NS