Canola Response to Sulfur (S) Fertilization

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The canola plant has a relatively high demand for sulfur (Franzen, 1997). Since fertilizer applications frequently lack this element, deficiencies in the field are not uncommon. This experiment was conducted on a low-S soil to evaluate the response of canola (Hyola 401) to 20 and 40 pounds S/acre in combination with 120 or 220 pounds total soil N/acre. Fertilizer formulations of S were also compared.

The application of 20 pounds S significantly increased test weight and yield, but no additional response was observed at the 40-pound rate (Table 1). Increasing the

N rate from 120 to 220 pounds/acre extended the bloom duration and days to physiological maturity, but did not influence yield or grain quality (Table 2). Neither S nor N significantly affected days to beginning bloom, height, or lodging (data not shown).

Applying S in a readily available form (ammonium sulfate) consistently improved yield compared to the control (Table 2). Commercial S fertilizers varied in effectiveness, with Kmag equal to ammonium sulfate, Tiger 90 less effective, and Sulfur 95 intermediate. Less soluble, elemental sulfur products (e.g. Tiger 90 and Sulfur 95) are useful for longer-term treatment. However, the response during the first season after application will likely be less than from formulations containing sulfur in a more readily available form for plant uptake.

The application of 20 pounds S/acre in a readily available form is recommended for canola fields where an S deficiency is anticipated.

Franzen, D. 1997. Fertilizing mustard and canola. NDSU Extension Service Bulletin SF-1122. North Dakota State University, Fargo. 4 p. •

Table 1. Mean responses of canola to sulfur (S) and nitrogen (N) treatments, 1998.

S	N	Bloom Duration	Physiological Maturity	Test Weight	Kernal Weight	Yield
lbs/ac	lbs/ac	Days	DAP[1]	lbs/bu	g/200	lbs/ac
0	–	21.8	81.1	50.0	.62	2038
20	–	21.5	1.1	51.7	.65	2591
40	–	21.6	80.8	51.9	.64	2560
LSD (.05)		NS[2]	NS	1.0	NS	306
LSD (.01)		NS	NS	1.3	NS	424

1DAP = days after planting; 2NS = non-significant difference

Table 2. Growth and yield responses of canola to sulfur (S) and nitrogen (N), 1998.

S	N	Nutrient Source	Bloom Duration	Physiological Maturity	Ht.	Test Wt.	Kernal Wt.	Yield
lbs/ac	lbs/ac		Days	DAP[1]	cm	lbs/bu	g/200	lbs/ac
20	120	AS[2] + Urea	21.0	80.2	103	51.5	.66	2498
40	120	AS + Urea	21.0	79.2	101	52.0	.63	2540
20	220	AS + Urea	22.0	82.0	104	51.9	.64	2685
40	220	AS + Urea	22.2	82.2	111	51.7	.64	2581
20	120	Tiger 90 + Urea	21.5	80.2	92	50.3	.62	2001
40	120	Tiger 90 + Urea	21.5	80.2	97	50.5	.62	2095
10+10[3]	120	Tiger 90 + Urea + AS	21.2	79.2	101	51.8	.62	2361
20+20[3]	120	Tiger 90 + Urea + AS	21.2	79.2	104	52.0	.63	2404
0	120	Urea	21.8	80.2	99	50.3	.63	2081
0	220	Urea	21.8	82.0	99	49.8	.62	1996
20	120	Sulfur 95 + Urea	21.2	79.8	96	50.8	.61	2210
40	120	Sulfur 95 + Urea	21.8	80.0	102	50.6	.63	2231
20	120	Kmag + Urea	21.0	79.0	107	52.0	.64	2497
40	120	Kmag + Urea	21.5	79.5	106	51.8	.65	2557
Mean			21.5	80.2	102	51.2	.63	2338
CV%			2.2	1.7	5.5	1.4	5.7	11.9
LSD (.05)			.7	1.9	8	1.0	NS	398
LSD (.01)			.9	2.4	11	1.4	NS	533

1DAP = days after planting; 2AS = ammonium sulfate; 3S applied as 50:50, Tiger 90:AS