Nitrogen Fertility and Seeding Rate Interactions in Flax at Minot

This trial was designed to investigate interactions between levels of nitrogen fertility and seeding rates of flax in order to define optimal production practices with these inputs. Below are combined data from the 2014 and 2015 growing seasons.

Interactions

N Fert Levels	Seeding Rate	Days to Bloom	Days to Mature	Plant Height	Test Weight	Oil Content	Yield
lbs N / A[a]	million pls/A	DAP[c]	DAP[c]	inches	lbs/bu	%	bu/A
25	2	54	94	26	51.5	43.1	17.9
	2.5	55	95	25	51.2	43.3	20.7
	3	54	95	26	51.0	43.5	21.7
	3.5	54	95	26	51.3	44.4	15.8
75	2	54	94	27	51.7	44.1	22.5
	2.5	54	94	28	51.0	41.9	21.8
	3	54	95	28	50.4	43.9	25.0
	3.5	54	95	29	51.6	44.6	22.5
125	2	54	96	27	51.2	43.2	21.1
	2.5	54	97	28	50.9	43.6	28.5
	3	54	97	28	50.2	42.6	26.2
	3.5	54	96	28	50.9	43.5	26.3
LSD 5%		NS	2	NS	NS	1.4	3.4

Nitrogen Fertility Comparisons

N Fert Levels	Days to Bloom	Days to Mature	Plant Height	Test Weight	Oil Content	Yield
lbs N / A[a]	DAP[c]	DAP[c]	inches	lbs/bu	%	bu/A
25	54	95	26	51.2	43.6	19.0
75	54	95	28	51.2	43.7	22.9
125	54	96	28	50.8	43.2	25.5
LSD 5%	NS	1	2	NS	NS	2.0

Seeding Rate Comparisons

Seeding Rate	Days to Bloom	Days to Mature	Plant Height	Test Weight	Oil Content	Yield
million pls/A	DAP[c]	DAP[c]	inches	lbs/bu	%	bu/A
2	54	95	27	51.5	43.5	20.6
2.5	54	95	27	51.0	43.0	23.8
3	54	96	27	50.5	43.4	24.2
3.5	54	95	28	51.3	44.2	21.4
LSD 5%	NS	NS	NS	NS	0.8	2.7

[a] *Nitrogen fertility levels = residual soil N + lbs of actual N applied as urea (46-0-0) in a mid-row band at planting.*

[c] *DAP = days after planting.*

NS= no statistical difference.

Variety = York

Soil Type: Williams Loam

Previous Crop: spring wheat

Conclusions: Interactions between nitrogen fertility levels and seeding rates were detected for grain yield, maturity and oil content. There was a direct relationship between nitrogen fertility and seeding rates so yields increased with increasing amounts of nitrogen and planted seeds. Crop maturity was also slightly prolonged with increased fertility levels and seeding rates. Optimal seeding rate was 2.5 to 3 million seeds per acre. Although the maximum yield response to nitrogen fertility was not achieved, the optimal economic level of nitrogen fertilizer inputs under current market prices (urea @ $0.20/lb and $8/bu flax) would be greater than 75 pounds but less than 125 pounds of N per acre.