

## Nitrogen Fertility and Fungicide Interactions in Flax at Minot

This trial was designed to investigate interactions between levels of nitrogen fertility and the timing of fungicide applications on flax in order to define optimal production practices with these inputs. Below are combined data from 2014, 2015 and 2016 growing seasons.

### Interactions

N Fert Levels	Fungicide Timing <sup>b</sup>	Days to Bloom	Days to Mature	Plant Height	Test Weight	Oil Content	Grain Yield	Return on Investment
lbs N / A <sup>a</sup>		DAP <sup>c</sup>	DAP <sup>c</sup>	inches	lbs/bu	%	bu/A	\$ <sup>d</sup>
25	untreated	53	92	25	52.8	42.8	18.3	119
	w / herb	53	93	25	52.8	43.5	19.1	107
	10% blm	53	92	24	53.4	43.8	19.9	113
	100% blm	53	93	25	53.4	43.4	20.4	116
75	untreated	53	94	26	53.7	43.5	21.1	121
	w / herb	53	93	26	53.7	43.3	23.6	121
	10% blm	53	92	26	53.3	43.5	25.1	132
	100% blm	53	93	25	53.3	43.2	28.0	152
125	untreated	54	93	27	53.5	42.7	24.4	127
	w / herb	53	92	26	53.7	42.5	24.2	108
	10% blm	53	93	26	53.3	42.8	25.6	118
	100% blm	53	92	26	52.9	42.8	26.0	120
LSD 5%		NS	NS	NS	NS	NS	NS	--

### Nitrogen Fertility Comparisons

N Fert Levels	Days to Bloom	Days to Mature	Plant Height	Test Weight	Oil Content	Grain Yield	Return on Investment
lbs N / A <sup>a</sup>	DAP <sup>c</sup>	DAP <sup>c</sup>	inches	lbs/bu	%	bu/A	\$ <sup>d</sup>
25	53	94	25	53.1	43.4	19.4	127
75	53	95	26	53.5	43.4	24.4	145
125	53	97	26	53.3	42.7	25.1	132
LSD 5%		NS	1	NS	NS	1.8	--

### Timing of Fungicide Application Comparisons

Fungicide Timing <sup>b</sup>	Days to Bloom	Days to Mature	Plant Height	Test Weight	Oil Content	Grain Yield	Return on Investment
	DAP <sup>c</sup>	DAP <sup>c</sup>	inches	lbs/bu	%	bu/A	\$ <sup>d</sup>
Untreated	53	96	26	53.4	43.0	21.4	150
w/herb	53	96	26	53.4	43.1	22.2	138
10% blm	53	95	26	53.4	43.4	23.5	147
100% blm	53	96	26	53.2	43.1	24.8	156
LSD 5%		NS	NS	NS	NS	1.9	--

<sup>a</sup> Nitrogen fertility levels = residual soil N + lbs of actual N applied as urea (46-0-0) prior to planting (2014 and 2015) or applied in a mid-row band at planting (2016).

<sup>b</sup> Fungicide Timing: 8 oz/A Headline (2014) or 8 oz/A Priaxor (2015 and 2016) applied with a grass herbicide, at 10% bloom and at full bloom. <sup>c</sup> DAP = days after planting.

<sup>d</sup> Gross Return on Investment: \$7/bu market price - N @ \$0.35/lb and \$17.84/A fungicide. This figure does not include indirect costs such as application, labor and equipment costs.

NS= no statistical difference.

Previous Crop: spring wheat

Variety = York

Planting Rate: 40 lbs/A

Soil Type: Williams Loam

**Conclusions:** Interactions between nitrogen fertility levels and the timing of fungicide applications were not detected and therefore these inputs should be managed independently. The 125 lb/A N rate prolonged crop maturity and did not significantly enhance yield over the 75 lb/A rate. Fungicide applications during flowering enhanced yield compared to the untreated. Disease was not observed. Basic calculations on optimal return on investment would indicate the use of 75 lbs of N and a fungicide application when the crop is in full bloom.