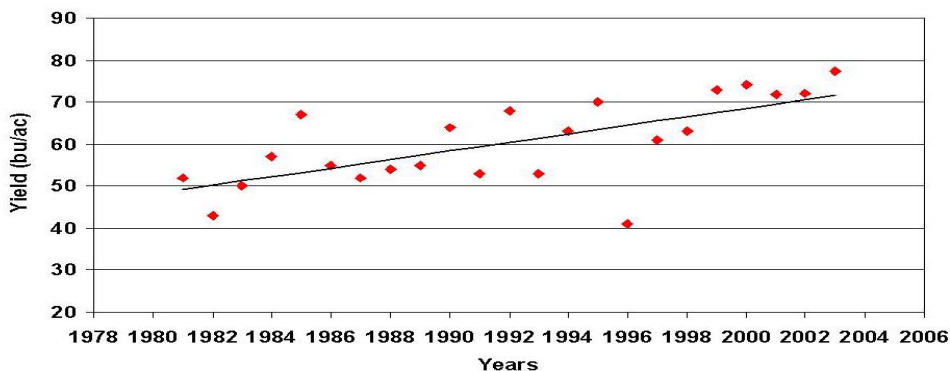


## Nitrogen Management In Ontario Wheat Production (Interim Report)

### Purpose:

Many questions have been raised regarding nitrogen rates and timing options on the wheat crop. Most of the available Ontario nitrogen research was conducted 20 years ago when average yields were only 50 bu/ac, vs the 70 bu trend line yield of today (Figure 7). Other wheat producing regions of the world (U.K., Eu, Australia) are moving towards later nitrogen applications and split applications to increase yield and protein. A re-evaluation of current Ontario recommendations is necessary.

**Figure 7 - Provincial Winter Wheat Yields  
1981 - 2003**



### Methods:

Thirteen co-operators agreed to participate in this project. Locations included Kent, Lambton, Perth, Middlesex, Elgin, Halton, Niagara counties. Most trials were two replicate trials. The Girodat and Fonger locations were intensive locations, investigating rates, timings, and split applications in two replicate tests.

Protein analysis was conducted on grain samples from each plot. Nitrogen is a key component of protein, and protein is a key quality parameter in wheat. Interestingly, high protein is desirable in hard (bread) wheats, while low protein is desirable in pastry wheats. Thus, impacts of nitrogen applications on protein are a major consequence, at opposite ends of the spectrum, depending on market class.

SPAD meter readings were taken at many locations. SPAD readings are a measure of the "greenness" of the crop, which is well co-related to nitrogen. It is hoped that these measurements may be able to help determine additional nitrogen requirements at some point in the future.

**Results:**

**Table 1 - Standard Rates**

Co-operators	N Rates (lbs/ac)		
	60	90	120
	Yields (bu/ac)		
Elgie	99.8	95.9	94.8
Davies	86.0	86.7	84.5
VanGorkum	90.0	94.3	94.3
Girodat	57.9	61.5	62.1
Jeramel Farms	92.5	100.7	102.5
Fonger	88.1	95.3	99.5
VanGorp	90.9	85.0	97.0
Annett	81.0	93.7	94.1
<b>Average</b>	<b>85.8</b>	<b>89.1</b>	<b>91.1</b>

Table 2 and 3 show significant yield loss when rates were reduced below 60 lbs/ac.

**Table 2 - Nitrogen**

Co-operators	N Rates (lbs/ac)			
	0	60	90	120
	Yields (bu/ac)			
Jeramel Farms	70.3	92.5	100.7	102.5
Fonger	64.8	88.1	95.3	99.5
<b>Average</b>	<b>67.6</b>	<b>90.3</b>	<b>98.0</b>	<b>101.0</b>

**Table 3 - 30 lbs Rate Comparison**

Co-operators	N Rates (lbs/ac)			
	30	60	90	120
	Yields (bu/ac)			
Girodat	43.3	57.9	61.5	62.1
Deschamps	70.8	--	--	88.8
Fonger	79.3	88.1	95.3	99.5
<b>Average</b>	<b>64.5</b>			<b>83.5</b>

Table 4 shows no benefit to increased nitrogen rates at one location with hard wheat.

**Table 4 - Top of the Scale**

N Rates (lbs/ac)		
120	140	160
Yields (bu/ac)		
<b>87.0</b>	<b>89.7</b>	<b>88.5</b>

**Summary:**

Table 1 summarizes the yield data from 8 locations using common rates. The standard provincial recommendation is 90 lbs N/ac. In 2 of 8 locations, wheat yields showed no response above 60 lb/ac, and in 4 more of the 8 locations there was no response above 90 lb/ac. Only at the Fonger site was there a consistent yield trend indicating economic response to the 120 lb/ac rate.

Based on this limited data set, the provincial recommendation of 90 lbs/ac on soft wheat appears adequate. There is potential for some growers to use even less nitrogen than this recommendation and still optimize yields.

**Next Steps:**

Further field trials will be required to validate this study over a number of years.

**Acknowledgements:**

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**Project Contacts:**

Please contact Peter Johnson at [peter.johnson@ontario.ca](mailto:peter.johnson@ontario.ca) for more information on this study or if you wish to be involved in similar trials in the future.

**Location of Project Final Report:**

This project is not yet completed, data collected to present resides with Peter Johnson, OMAFRA, Stratford, [peter.johnson@ontario.ca](mailto:peter.johnson@ontario.ca)