

## Increasing Protein in Hard Red Winter Wheat

### Purpose:

Worldwide research has shown a potential to increase wheat yields and protein with split nitrogen (N) applications. In Ontario, split N applications rarely seem to increase yield (Johnson, McClure as well as Hooker et al). However, low protein levels continue to plague the hard red winter (HRW) wheat segment of the Ontario industry. This trial evaluated timing and number of nitrogen applications on both yield and protein in HRW, and what the economic implications might be.

### Methods:

Two replicate field scale trials were established at 2 locations in 2014 (more locations were intended, but severe winterkill destroyed other potential locations). Only fields planted with hard red winter wheat were chosen for this trial. The treatments are listed below:

1. 150 N Single application
2. 75 N Normal plus 75 N Growth Stage 32 (2<sup>nd</sup> node)
3. 75 N Normal plus 45 N Growth Stage 32 plus 30 N Heading

Harvest measurements included yield, moisture, test weight, thousand kernel weights, lodging and protein. Samples from each treatment have been sent to be evaluated for baking quality (Bock, University of Guelph).

### Results:

Yield results are summarized in Table 1. Similar to the majority of previous Ontario research, there was no yield response to split N applications at these sites.

**Table 1: Yield Results (bushels/acre)**

Location	150N single	75N Normal + 75N GS 32	75N Normal+ 75N GS 32 + 30 at head
Palmerston	94.4	91.0	88.2
London	83.3	81.8	85.5
<b>Average</b>	<b>88.9</b>	<b>86.4</b>	<b>86.8</b>

The yield results are disappointing but the protein results are very positive. Protein results are summarized in Table 2 and show dramatic differences. These results are based on an extremely small sample size: more research is needed before conclusions are drawn.

**Table 2: Protein Results (%)**

Location	150N single	75N Normal + 75N GS 32	75N Normal + 75N GS 32+ 30N at head
Palmerston	10.4	11.9	12.5
London	10.1	10.7	11.3
<b>Average</b>	<b>10.2</b>	<b>11.3</b>	<b>11.9</b>

**Summary:**

Based on the limited available from 2014, split N applications on HRW has the potential to dramatically increase protein, with no impact on yield. It is not appropriate to make economic recommendations from this small dataset. Each additional pass will cost roughly \$9/acre and return will depend on protein levels achieved, related premiums, and the yield of the field. In the past many purchasers have offered a protein premium of \$5.00/t at 11% protein, increasing by \$1.00/t per 0.1% protein increase, to a maximum of \$15/t at 12%. HRW growers are encouraged to try some strips in their fields to see how HRW responds to split N on their farm.

**Next Steps:**

This project will continue for 2 more years (2014- 2016). Anyone interested in co-operating with this project should contact Peter Johnson at [peter.johnson@bell.net](mailto:peter.johnson@bell.net) or Shane McClure at [shane.mcclure@ontario.ca](mailto:shane.mcclure@ontario.ca)

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**Location of Project Final Report:**

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