

## Split Nitrogen Applications on Soft Red Winter Wheat

### Purpose:

The purpose of this study was to evaluate yield impacts of split nitrogen applications on soft red winter wheat (SRW), and the interaction with planting date. With higher yield levels and nitrogen applications it is hypothesized that splitting N applications, with an early application at green-up followed by a late application at normal timing, will save tillers on the crop, and thus increase yield. It is often theorized that this impact will be greater on late planted wheat that must tiller in the spring as it has not had enough growth to tiller in the fall.

### Methods:

Plots were planted at multiple sites in fall 2009; with all sites being planted in late October through to mid November (normal planting dates would be late September to mid October). A single application of N at 90 or 120 pounds actual N was applied in late April of 2010 as the single N treatment. Split applications consisted of a late March/very early April 2010 application (30 to 60 N depending on site) and then followed by a late April 2010 application for the balance of the nitrogen, 60 lb N/ac. Sites 1-4 received 90lb N/ac and sites 5-10 received 120lb N/ac, as the final total application rate for each treatment. Measurements of test weight, moisture, 1000 kernel weight, and yield were conducted at harvest in summer 2010. Statistics were conducted to determine treatment differences at each site. Site (7) can be compared to site (8), as both were at the same location. Site 8 was planted Nov. 11<sup>th</sup> (ultra late) while Site 7 was planted Oct.21<sup>st</sup>.

### Results:

The following tables are summaries of each parameter measured at the sites.

**Table 1. Impact of N application timings on wheat test weights.**

Site	Treatment	
	Single N	Split N
1	60.0 a*	59.7 a
2	60.1 a	59.3 b
3	61.0 a	61.1 a
4	58.7 a	57.9 b
7	57.7 a	57.4 a
8	59.3 a	60.3 a
9	51.4	49.5
10	56.5	56.3

\* Test weights within a site followed by the same letter are not significantly different.

Sites 1-4 had 90 lb N/ac and sites 7-10 had 120 lb N/ac

At 2 of the 8 sites test weights were significantly different. In both cases the single N application had higher test weight values (~1 lb/bu). This may be due to some N loss with the early N application resulting in insufficient N during grain fill and hence lower test weight. Higher final N rates did not affect test weight when comparing the 90 and 120 lb N/ac sites.

**Table 2. Impact of N application timings on wheat 1000 kernel weights.**

Site	Treatment	
	Single N	Split N
1	37.5 a*	37.2 a
2	36.8 a	36.7 a
3	36.2 a	36.3 a
4	38.2 a	37.9 a
5	34.3	34.2
6	26.3	27.1
9	32.9	34.1
10	38.1	38.3

\* Kernel weights within a site followed by the same letter are not significantly different. Sites 1-4 had 90 lbN/ac and sites 5-10 had 120 lbN/ac

**Summary:**

For wheat that was sown relatively late in the fall (late October through mid-November), single applications of nitrogen (all N in late April) resulted in 1) occasionally lower test weights, 2) no differences in 1000 kernel weights, and 3) only slight increases in SRW wheat yields compared to split applications (one application in late March/very early April of 30 to 60 lb N/acre then followed by a late April application of 60 lb N/ac). The slight increases in yield tended to occur on the site where 120 lbs N/ac were applied as opposed to the sites that received 90 lb N/ac.

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**Table 4. Impact of nitrogen application timing on SRW wheat yields.**

Site	Treatment	
	Single N	Split N
1	76.9 a*	74.8 a
2	76.8 a	71.3 a
3	65.5 a	66.0 a
4	79.0 a	79.8 a
5	107.9	110.3
6	91.8	95.1
7	108.4 a	111.3 a
8	94.6 b	100.0 a
9	61.3	65.1
10	91.8	93.3

\* Yields within a site followed by the same letter are not significantly different. Sites 1-4 had 90 lbN/ac and sites 5-10 had 120 lbN/ac.

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